

Supplementary File S2: SEM-BSE  
images and Energy Dispersive  
Spectroscopy (EDS) mineral analyses  
for heavy mineral separates.

B1: SEM-BSE images and EDS  
mineral analyses for sample S2.



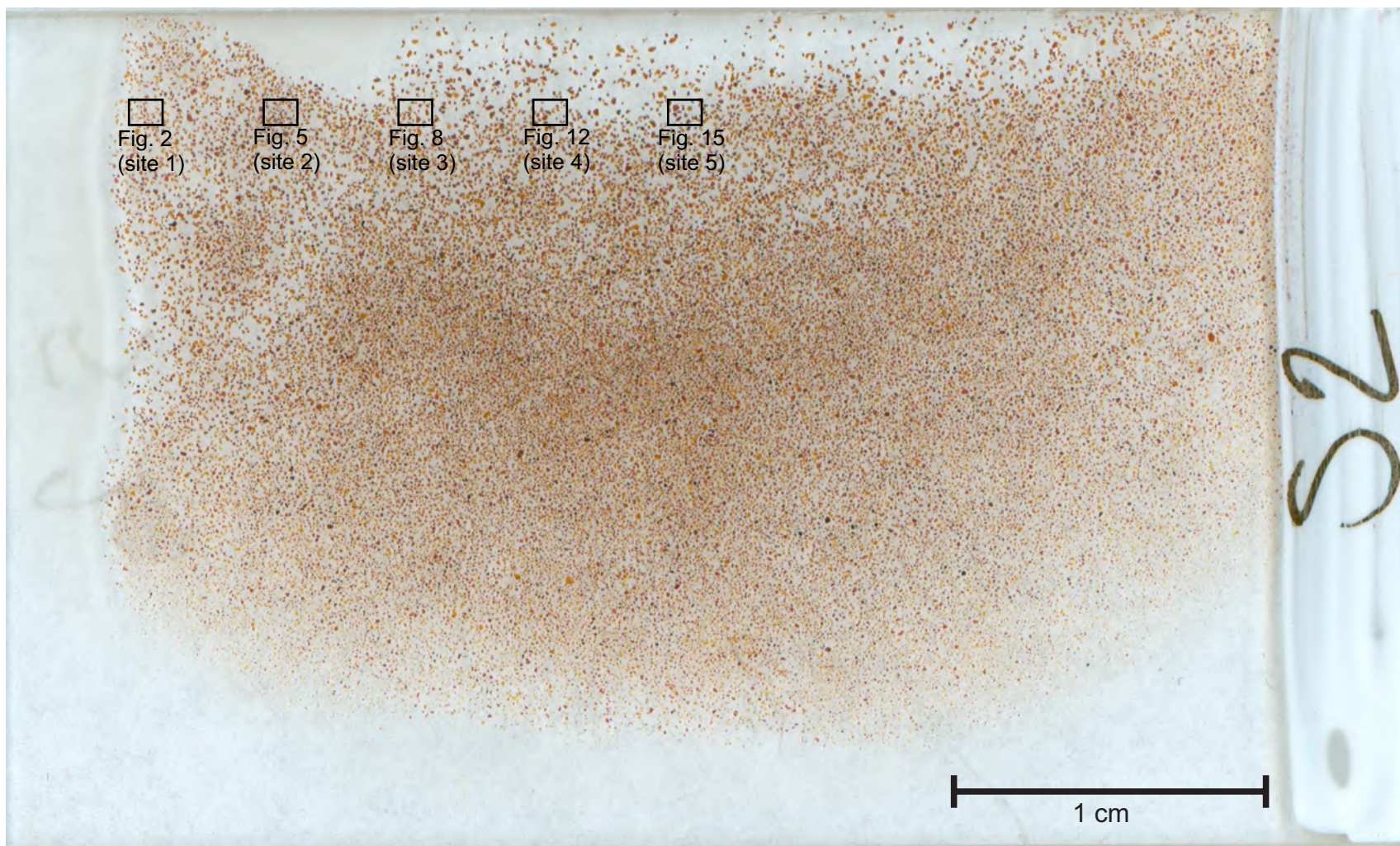


Figure B1.1: Scanned thin section of sample S2 showing the location of analysed sites. This site consists of mostly sandy conglomerate, with this sample coming from a sandy matrix of matrix-supported conglomerate ~1m below present surface.

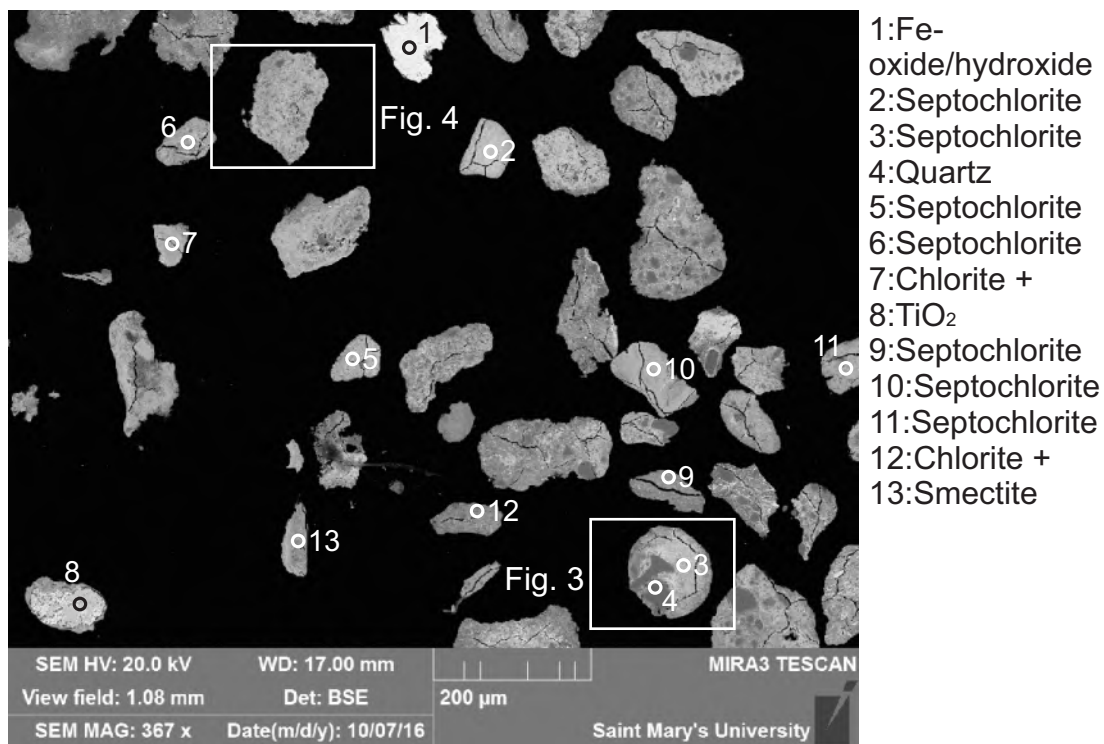


Figure B1.2: Sample S2 site 1 (SEM).

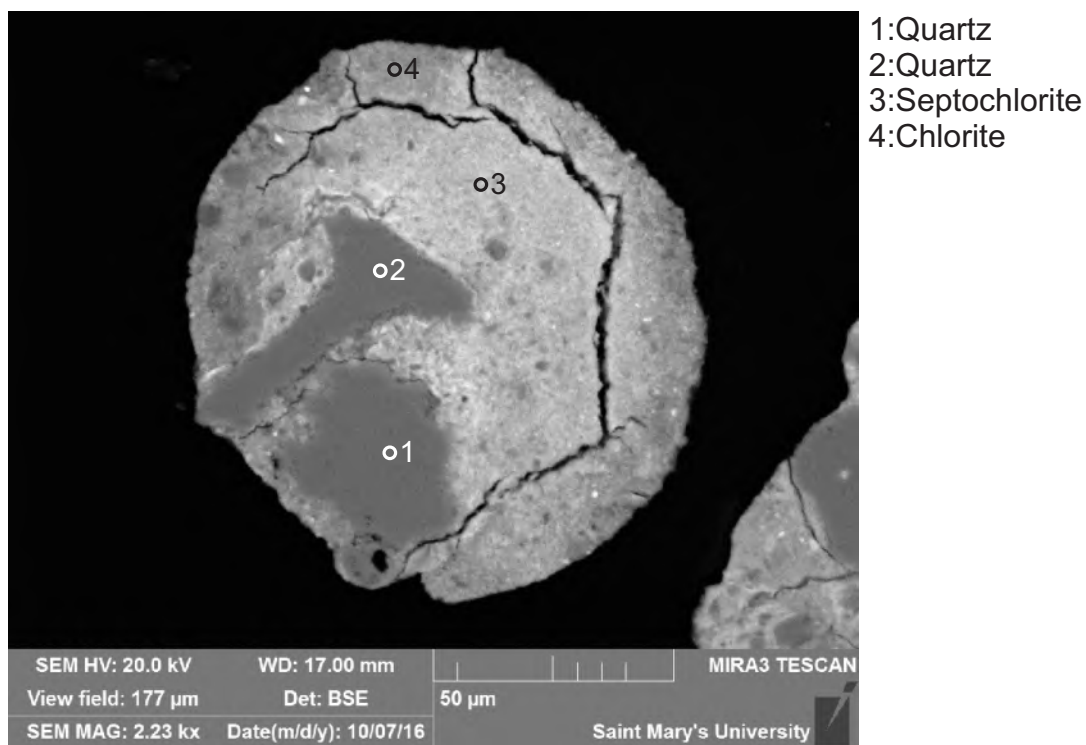
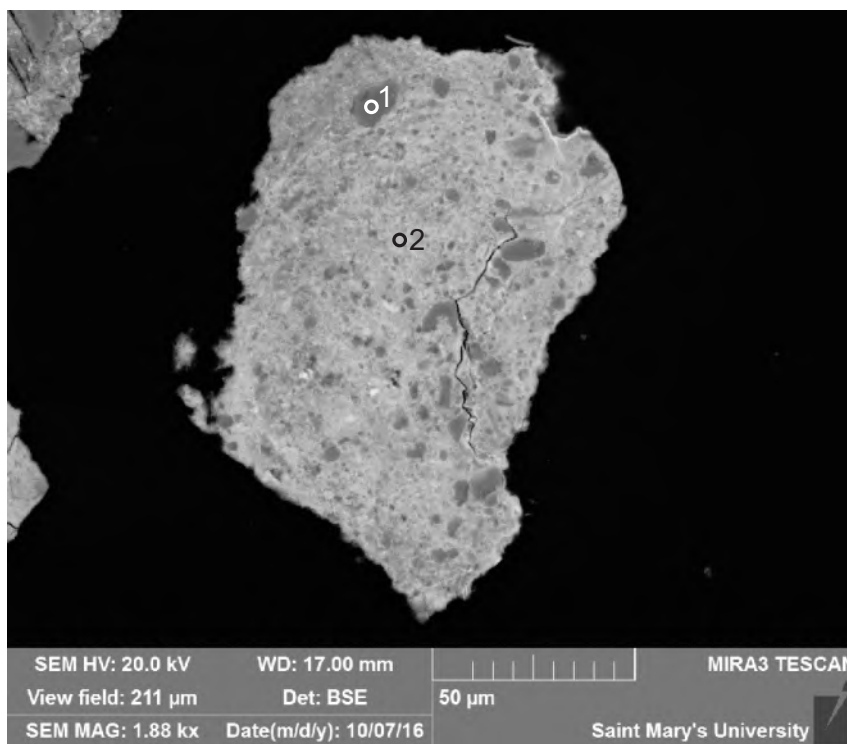


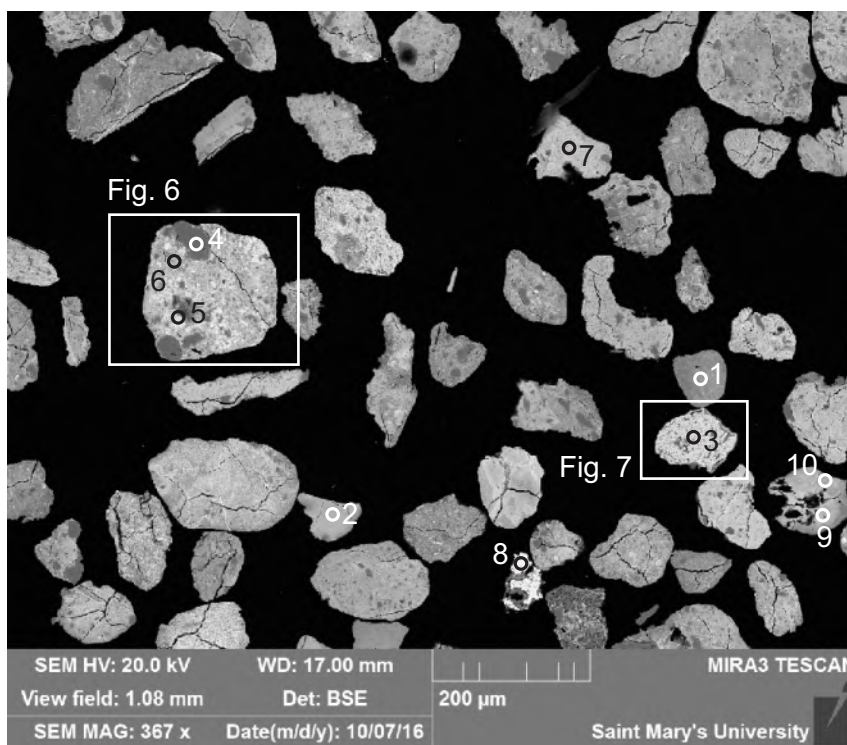
Figure B1.3: Sample S2 site 2 (SEM).





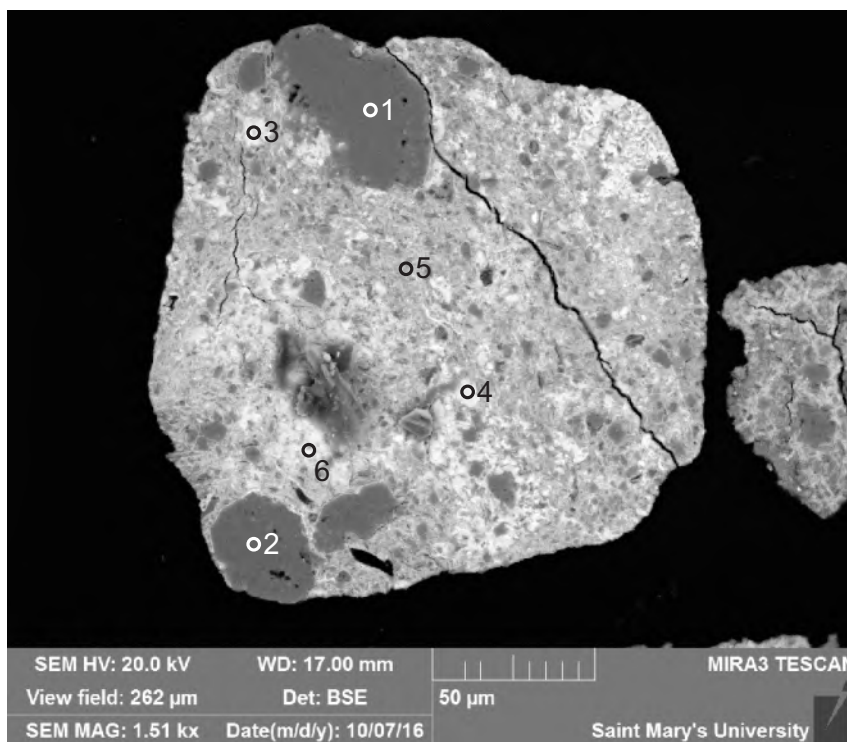
- 1:Quartz
- 2:Chlorite +

Figure B1.4: Sample S2 site 3 (SEM). Mudstone lithic clast consisting of fine-grained quartz and chlorite.



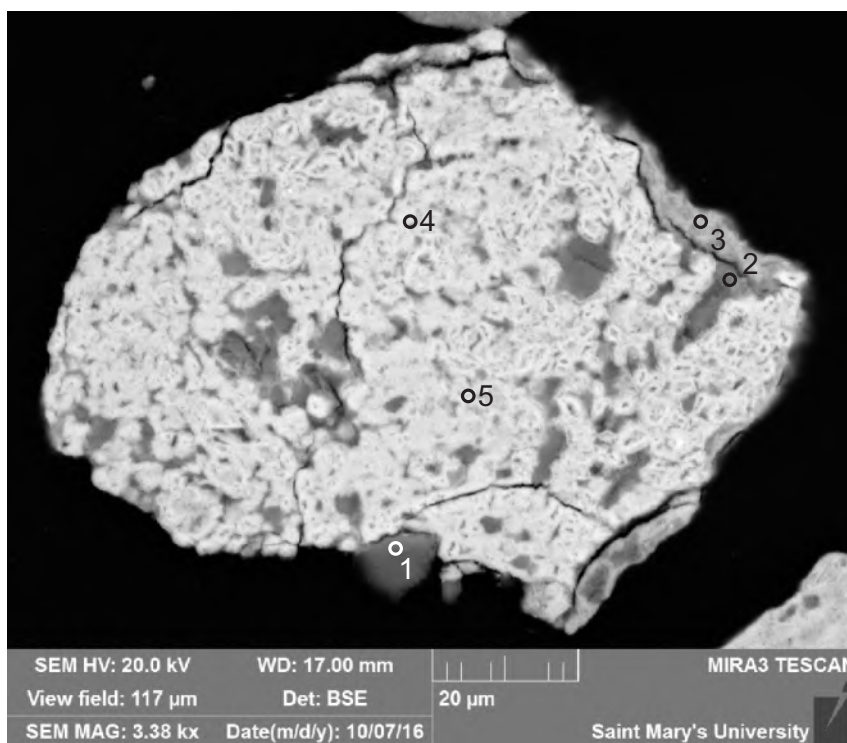
- 1:Septochlorite
- 2:Septochlorite
- 3:Septochlorite
- 4:Quartz
- 5:Septochlorite
- 6:Septochlorite
- 7:Septochlorite
- 8:Fe-oxide/hydroxide +
- 9:Septochlorite +
- 10:Septochlorite

Figure B1.5: Sample S2 site 4 (SEM).



- 1:Quartz
- 2:Quartz
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Septochlorite
- 6:Fe-oxide/hydroxide +

Figure B1.6: Sample S2 site 5 (SEM). Siltstone lithic clast consisting of quartz, septochlorite, and Fe-oxides/hydroxides.



- 1:Kaolinite
- 2:Mix
- 3:Chlorite
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +

Figure B1.7: Sample S2 site 6 (SEM). Fine-grained lithic clast consisting of kaolinite, chlorite, and Fe-oxides/hydroxides ?pedogenic.

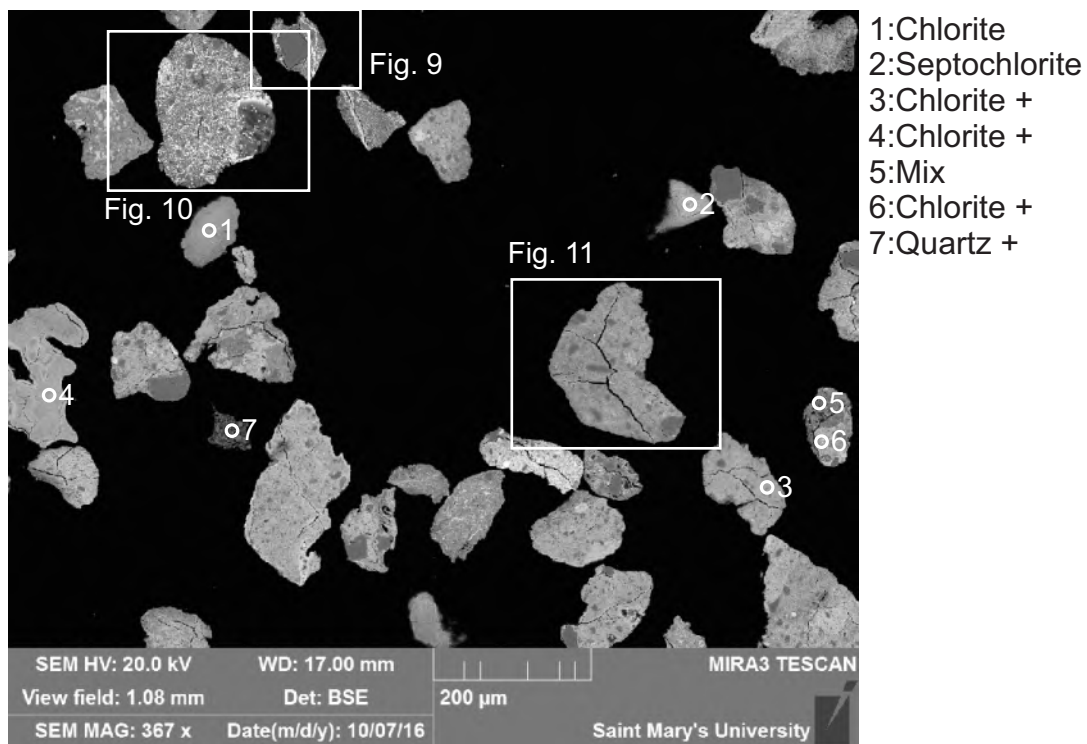


Figure B1.8: Sample S2 site 7 (SEM).

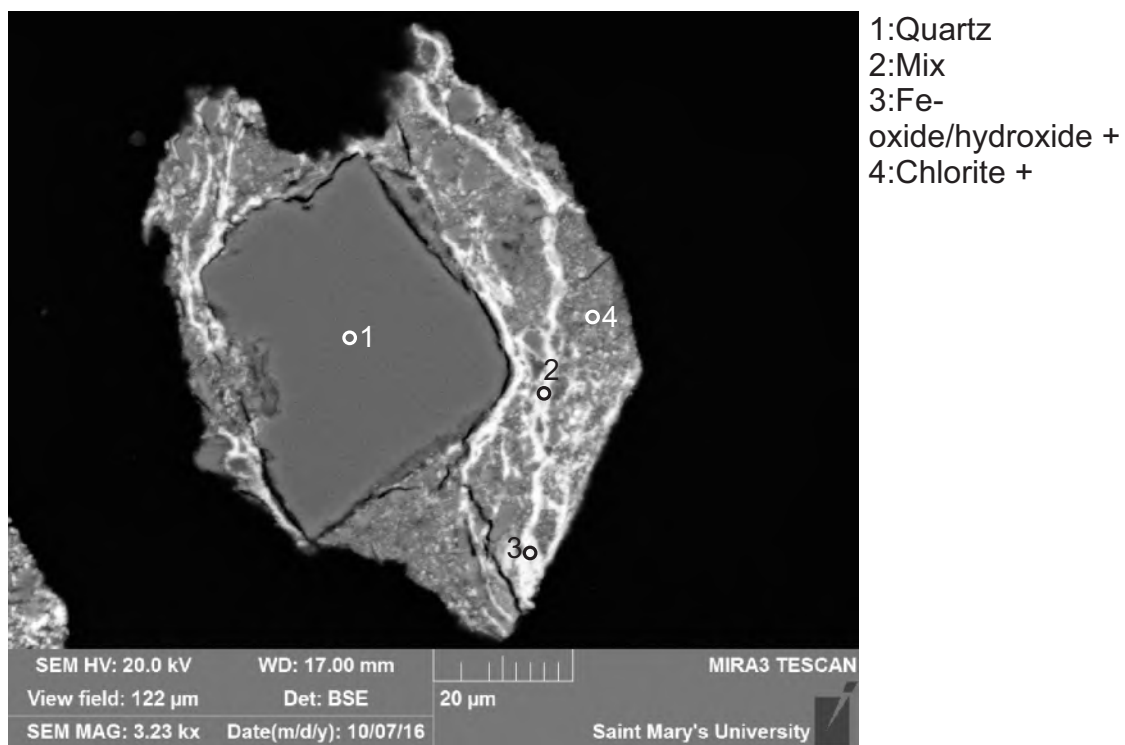
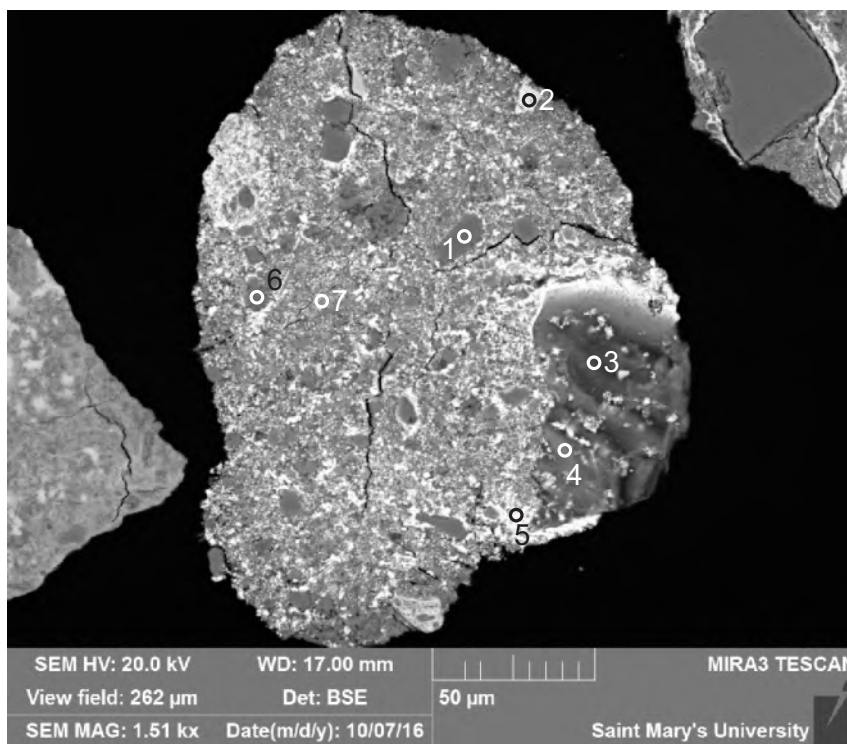
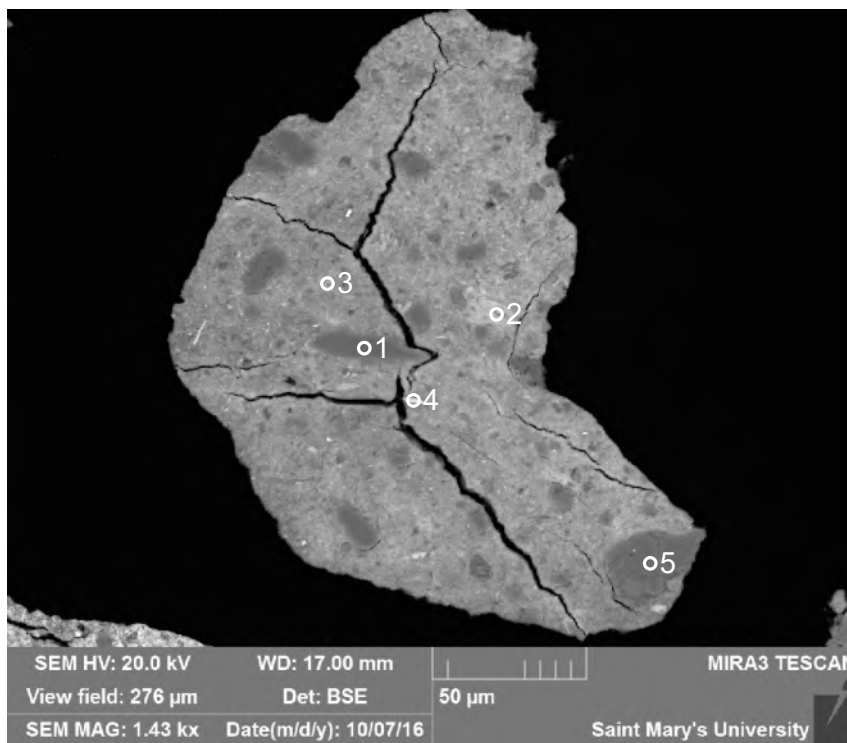


Figure B1.9: Sample S2 site 8 (SEM). Quartz + chlorite with pedogenoc crust.



- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Muscovite
- 4:Muscovite
- 5:Fe-oxide/hydroxide +
- 6:Quartz
- 7:Chlorite +

Figure B1.10: Sample S2 site 9 (SEM). Siltstone lithic clast or rhyolite consisting of quartz, chlorite, muscovite, and Fe-oxides/hydroxides.



- 1:Quartz
- 2:Chlorite
- 3:Chlorite +
- 4:TiO<sub>2</sub> +
- 5:Quartz

Figure B1.11: Sample S2 site 10 (SEM). Siltstone lithic clast consisting of quartz, chlorite, and ?late titania minerals.



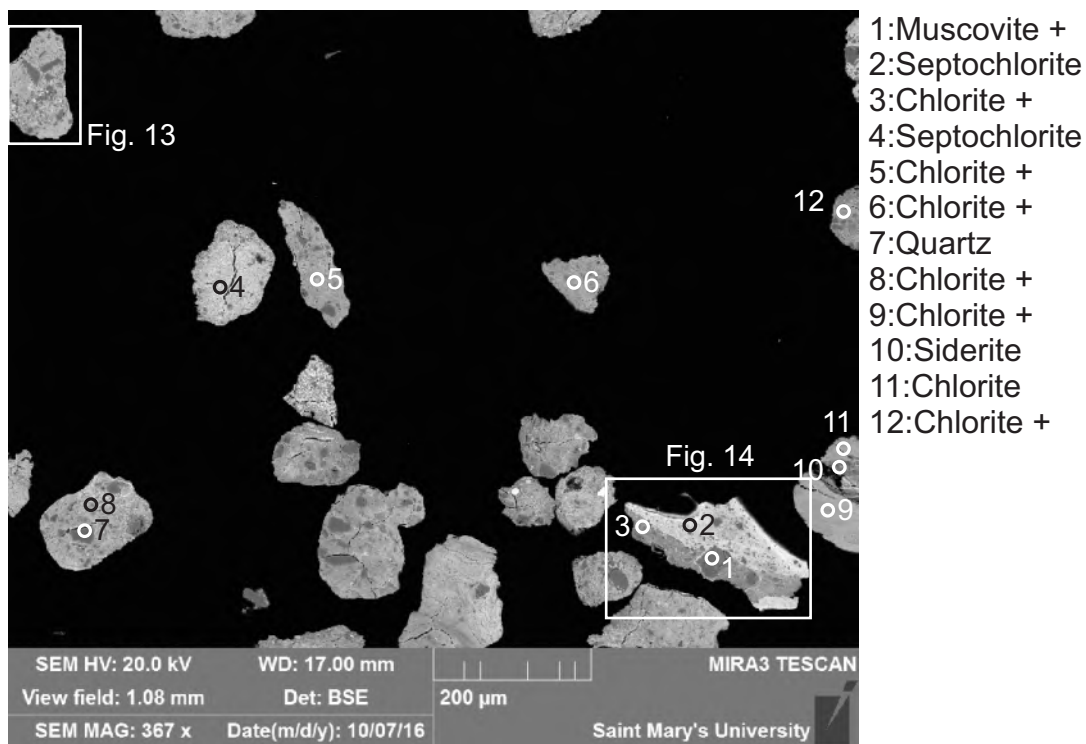


Figure B1.12: Sample S2 site 11 (SEM). Siltstone lithic clast consisting of quartz and chlorite.

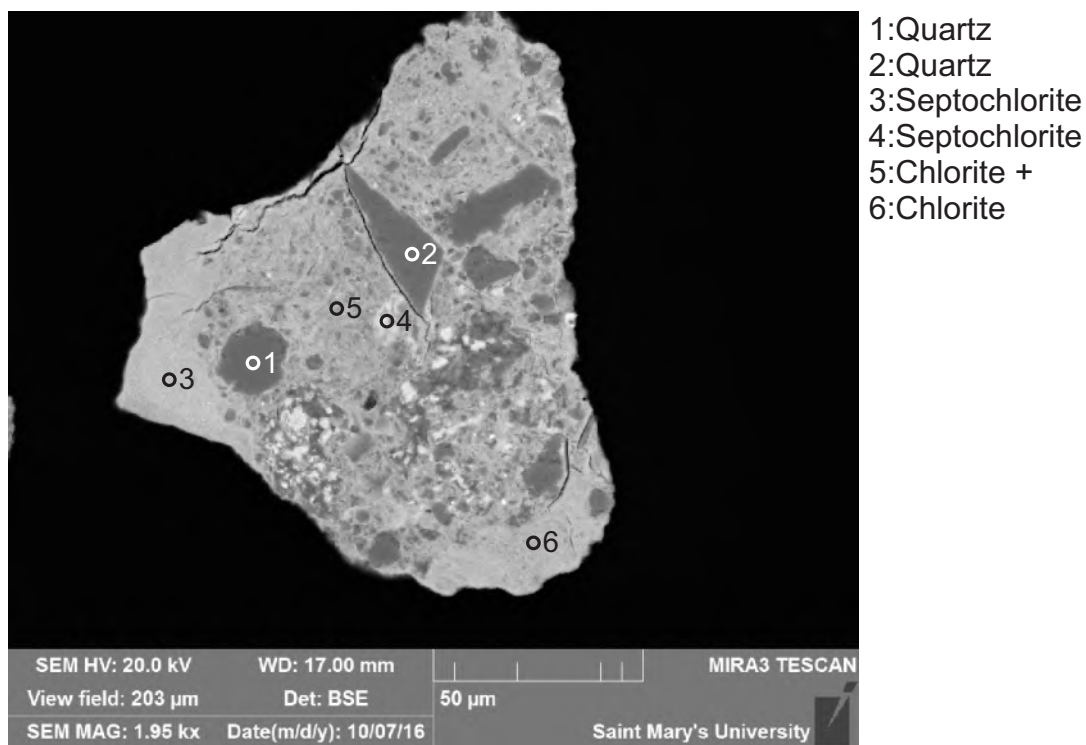
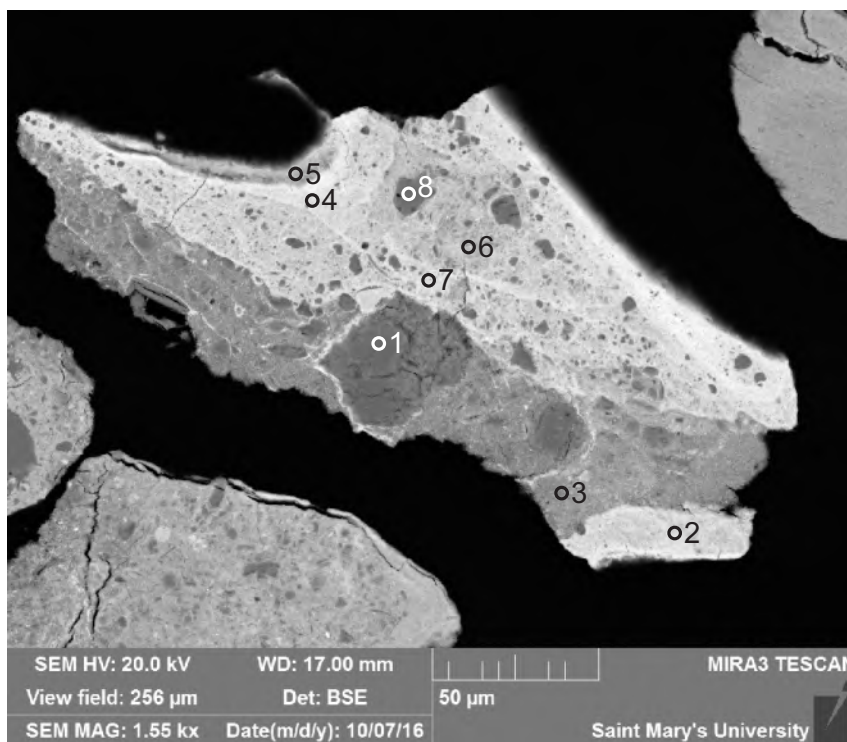
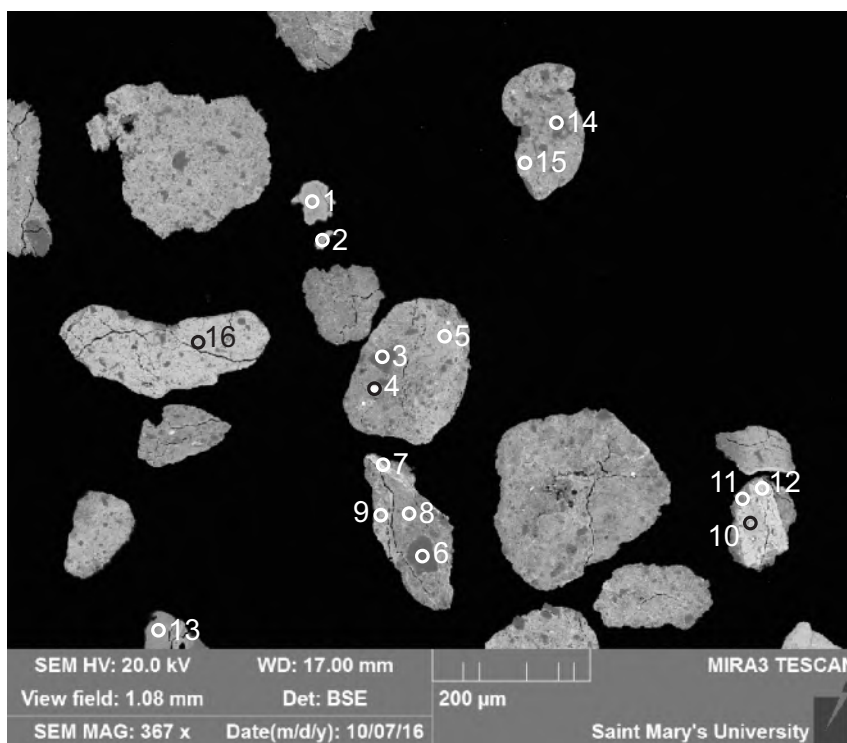


Figure B1.13: Sample S2 site 12 (SEM). Siltstone lithic clast containing subrounded-angular quartz, chlorite, and possible Fe-oxides/hydroxides.



- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Chlorite +
- 4:Septochlorite
- 5:Septochlorite
- 6:Septochlorite
- 7:Septochlorite
- 8:Quartz

Figure B1.14: Sample S2 site 13 (SEM). Siltstone lithic clast consisting of quartz, septochlorite, and Fe-oxides/hydroxides.



- 1:Chlorite
- 2:Chlorite
- 3:Quartz
- 4:Fe-oxide/hydroxide +
- 5:Chlorite +
- 6:Quartz +
- 7:Fe-oxide/hydroxide +
- 8:Chlorite +
- 9:Chlorite +
- 10:Mix
- 11:Mix
- 12:Mix
- 13:Chlorite
- 14:Quartz +
- 15:Chlorite +
- 16:Mix

Figure B1.15: Sample S2 site 14 (SEM). Multiple lithic clasts ?siltstones containing quartz and chlorite.



Table B1.1: EDS analyses of sample S2.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cr2O3	WO3	Total	Actual Total
S2	1	1	Feohy	4.34		1.11	90.78	3.15	0.63									100	77
S2	1	2	Sepchl	21.92	1.56	12.97	62.17				0.63	0.75						100	85
S2	1	3	Sepchl	28.15		15.48	54.60		0.66			1.12						100	90
S2	1	4	Qz	99.39			0.61											100	124
S2	1	5	Sepchl	26.55	0.44	15.45	54.49		0.93	0.32	0.80	1.04						100	92
S2	1	6	Sepchl	38.08		15.57	41.14		1.07			1.32					2.83	100	89
S2	1	7	Chl +	25.95	0.33	17.35	35.62		0.96	0.26	0.47	1.59					2.47	85	89
S2	1	8	TiO2		99.51		0.49											100	108
S2	1	9	Sepchl	30.39		19.41	42.86		1.14	0.29	0.73	1.56	0.84				2.78	100	87
S2	1	10	Sepchl	26.55		18.67	51.23		0.84			1.30	0.76	0.66				100	91
S2	1	11	Sepchl	22.35	0.40	17.96	53.02		1.13	0.32	0.50	1.41					2.91	100	88
S2	1	12	Chl +	43.42	0.46	18.11	32.29		1.57	0.45	0.72	2.13	0.85					100	92
S2	1	13	Sme	64.92		11.74	20.80		0.93			1.62						100	98
S2	2	1	Qz	98.32		0.53	1.16											100	118
S2	2	2	Qz	99.00		0.41	0.60											100	121
S2	2	3	Sepchl	26.13	0.36	14.12	56.07		0.65	0.26	0.50	0.97	0.93					100	92
S2	2	4	Chl	24.92	0.53	14.31	39.83		0.71		0.43	0.92					3.35	85	81
S2	3	1	Qz	99.56			0.44											100	120
S2	3	2	Chl +	28.87	0.54	12.43	40.55		0.71			1.13	0.79					85	92
S2	4	1	Sepchl	22.53	0.76	14.88	56.49		0.92	0.35		0.92					3.14	100	79
S2	4	2	Sepchl	26.70	0.38	19.90	45.46		1.02	0.31		1.41	0.75				4.07	100	91
S2	4	3	Sepchl	18.28	0.41	11.32	66.75		0.76		0.49	0.36	0.86	0.76				100	85
S2	4	4	Qz	99.57			0.43											100	118
S2	4	5	Sepchl	17.90	0.39	8.16	68.39		0.95	0.31		0.68					3.22	100	90
S2	4	6	Sepchl	28.64	0.53	10.24	54.40		1.20	0.26	0.47	1.11				0.34	2.81	100	91
S2	4	7	Sepchl	21.37		12.77	62.08		0.80			0.86					2.11	100	87
S2	4	8	Feohy +	3.71		0.94	95.35											100	82
S2	4	9	Sepchl +	18.11		15.51	59.00		0.81			0.76	0.83				4.99	100	86

Table B1.1: EDS analyses of sample S2.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cr2O3	WO3	Total	Actual Total
S2	4	10	Sepchl	24.54		17.36	52.00		1.01			1.07					4.02	100	87
S2	5	1	Qz	99.60			0.40											100	120
S2	5	2	Qz	99.68			0.32											100	122
S2	5	3	Feohy +	3.26		6.06	86.63		0.75								3.29	100	84
S2	5	4	Feohy +	4.04		6.06	86.42		0.71								2.77	100	85
S2	5	5	Sepchl	24.93	0.44	12.03	55.98		1.25		0.48	1.41					3.48	100	90
S2	5	6	Feohy +	8.93		7.20	79.19		0.89			0.49					3.31	100	88
S2	6	1	Kln	47.24		35.70	4.06											87	80
S2	6	2	Mix	78.66		6.33	14.11		0.45			0.45						100	107
S2	6	3	Chl	27.89	0.44	15.30	36.37		0.93		0.46	1.04					2.58	85	91
S2	6	4	Feohy +	12.69		10.73	71.60	1.67	0.65			0.32	1.37	0.98				100	82
S2	6	5	Feohy +	9.62		11.13	75.11	1.56				0.35	1.28	0.94				100	82
S2	7	1	Chl	24.56	0.38	17.66	36.76		0.81		0.43	1.02					3.37	85	82
S2	7	2	Sepchl	22.21	0.87	14.44	58.32		0.59			0.82					2.73	100	86
S2	7	3	Chl +	46.36	0.34	16.64	29.94		1.19		0.57	1.24					3.71	100	96
S2	7	4	Chl +	27.02		18.43	33.25		0.76		0.47	1.12					3.95	85	89
S2	7	5	Mix	73.99	0.46	9.07	7.83	3.39	0.60		0.54	0.72					3.39	100	91
S2	7	6	Chl +	29.53	0.54	12.66	35.61		1.27	0.25	0.43	1.23					3.47	85	98
S2	7	7	Qz +	88.92		8.10	1.72		0.62			0.65						100	110
S2	8	1	Qz	100.00														100	122
S2	8	2	Mix	24.19		6.89	66.73		0.47			0.73	0.99					100	95
S2	8	3	Feohy +	12.15		5.93	80.20					0.62	1.11					100	89
S2	8	4	Chl +	38.88	0.53	18.20	23.39		1.50		0.54	1.97						85	86
S2	9	1	Qz	98.49		0.35	1.16											100	122
S2	9	2	Feohy +	10.46	0.43	7.02	77.89				0.62		0.89				2.70	100	88
S2	9	3	Ms	48.64	0.32	30.88	2.72		0.97		1.20	8.43			1.84			95	74
S2	9	4	Ms	48.44	0.32	32.95	2.37		0.88		1.15	8.88						95	103
S2	9	5	Feohy +	13.97		7.47	75.30					1.90	1.36					100	88

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Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cr2O3	WO3	Total	Actual Total
S2	9	6	Qz	96.33		1.06	2.44					0.17						100	120
S2	9	7	Chl +	45.56	0.38	17.75	31.00		2.06		0.96	2.28						100	98
S2	10	1	Qz	99.43			0.57											100	124
S2	10	2	Chl	30.70		21.47	30.69		0.88		0.48	0.78						85	88
S2	10	3	Chl +	26.43	0.44	17.36	35.31		0.78		0.40	1.45	0.84				1.99	85	90
S2	10	4	TiO2 +	8.67	75.75	5.97	9.25					0.35						100	98
S2	10	5	Qz	98.79		0.76	0.45											100	120
S2	11	1	Ms +	56.95	0.31	19.76	8.33		2.76		0.51	6.37						95	85
S2	11	2	Sepchl	25.90		10.98	58.58		0.78		0.44	1.32	0.78				1.21	100	97
S2	11	3	Chl +	36.26	0.29	12.45	31.27		1.06		0.49	1.32					1.87	85	98
S2	11	4	Sepchl	19.44	0.43	11.26	64.92		0.86	0.32	0.74	0.82	1.22					100	89
S2	11	5	Chl +	25.82	0.70	17.40	34.64		1.04		0.70	1.33				0.30	3.08	85	97
S2	11	6	Chl +	28.32		16.21	35.00		1.20		0.69	1.53					2.06	85	95
S2	11	7	Qz	99.45			0.55											100	121
S2	11	8	Chl +	35.10		13.61	32.47		1.06		0.72	2.04						85	95
S2	11	9	Chl +	28.35	0.43	19.20	32.53		0.94		0.33	1.18					2.04	85	96
S2	11	10	Sd	5.76		4.04	44.99					0.78					0.43	56	34
S2	11	11	Chl	27.32		18.75	34.86		0.91			1.08					2.09	85	95
S2	11	12	Chl +	53.52		12.36	29.29		0.82		0.51	1.32					2.17	100	95
S2	12	1	Qz	99.33			0.67											100	122
S2	12	2	Qz	99.33			0.67											100	120
S2	12	3	Sepchl	21.74	0.67	15.55	56.42		0.72	0.29	0.53	0.80	1.17				2.11	100	94
S2	12	4	Sepchl	16.80	0.63	11.24	65.61		0.81			1.29	0.98				2.65	100	84
S2	12	5	Chl +	38.55	0.37	15.73	41.45		1.52		0.86	1.52						100	96
S2	12	6	Chl	29.20	0.52	12.75	39.31		0.99		0.72	0.73	0.77					85	95
S2	13	1	Qz	98.84		0.50	0.66											100	121
S2	13	2	Feohy +	12.59		7.97	75.80					0.46	0.94				2.25	100	88
S2	13	3	Chl +	32.55	0.31	13.52	32.78		1.09		0.51	1.52					2.71	85	88

Table B1.1: EDS analyses of sample S2.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cr2O3	WO3	Total	Actual Total
S2	13	4	Sepchl	17.03		8.60	67.76		0.65		0.47	0.74	0.96				3.79	100	93
S2	13	5	Sepchl	24.31	0.43	14.87	54.34		0.82		0.55	0.62					4.06	100	86
S2	13	6	Sepchl	31.38		12.67	52.64		1.01			1.45	0.84					100	95
S2	13	7	Sepchl	22.19	0.54	8.34	66.59		0.73			0.75	0.86					100	93
S2	13	8	Qz	98.72		0.44	0.85											100	122
S2	14	1	Chl	25.46	0.48	17.42	38.83		0.75		0.51	0.85	0.70					85	89
S2	14	2	Chl	29.06	0.42	15.37	36.17		0.60		0.45	0.97					1.96	85	86
S2	14	3	Qz	99.23		0.30	0.47											100	121
S2	14	4	Feohy +	1.87		1.00	97.13											100	91
S2	14	5	Chl +	25.67	0.68	15.65	37.92		0.79	0.21	0.44	1.18					2.46	85	97
S2	14	6	Qz +	86.73		1.62	11.66											100	119
S2	14	7	Feohy +	15.18	0.40	7.03	75.24					0.88	1.27					100	88
S2	14	8	Chl +	45.10		21.12	27.27		2.01		0.57	3.26	0.67					100	95
S2	14	9	Chl +	22.85		14.37	43.33		0.99		0.44	1.50	0.93	0.58				85	91
S2	14	10	Mix		0.54	9.85	14.68	49.26							5.52		20.15	100	61
S2	14	11	Mix	46.71	0.48	11.31	7.70	9.67	0.48		2.81	0.53			14.65		5.66	100	120
S2	14	12	Mix			11.56	16.95	41.68			1.00				8.73		20.09	100	73
S2	14	13	Chl	29.02		17.19	36.35		0.84		0.67	0.94						85	87
S2	14	14	Qz +	81.14	14.07	2.99	0.86		0.34			0.60						100	121
S2	14	15	Chl +	29.27	0.34	16.78	32.94		1.28	0.26		1.61					2.52	85	95
S2	14	16	Mix	18.58	0.50	15.15	62.97		0.60			0.69	1.52					100	84
	+ = indicates that other minerals are present																		

B2: SEM-BSE images and EDS mineral analyses for sample S5.

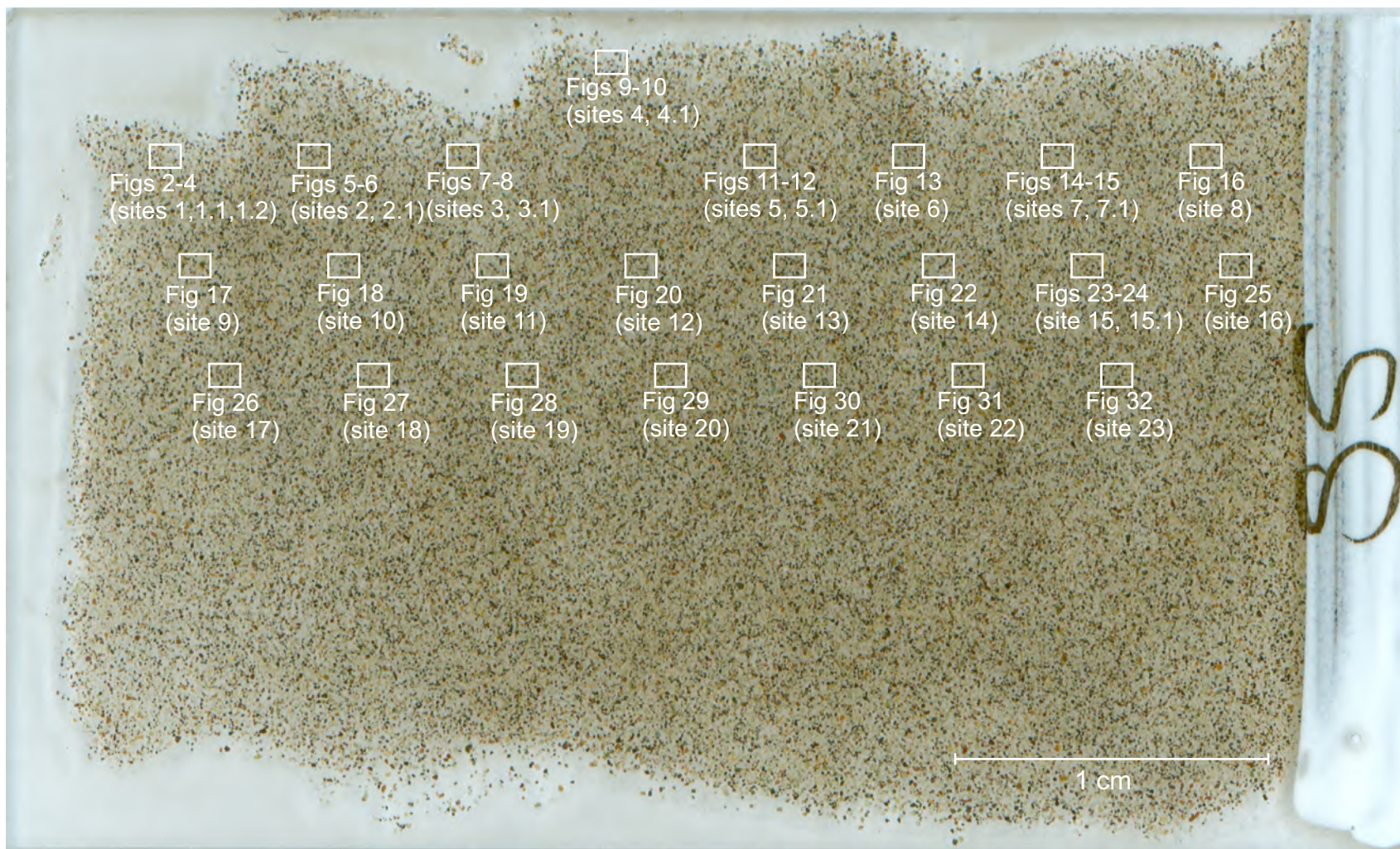


Figure B2.1: Scanned thin section of sample S5 showing the location of analysed sites. This sample comes from the Evinos River ~600m upstream from National Road bridge west side of braid plain by active channel. It consists of fine sand in lee of gravel bar.



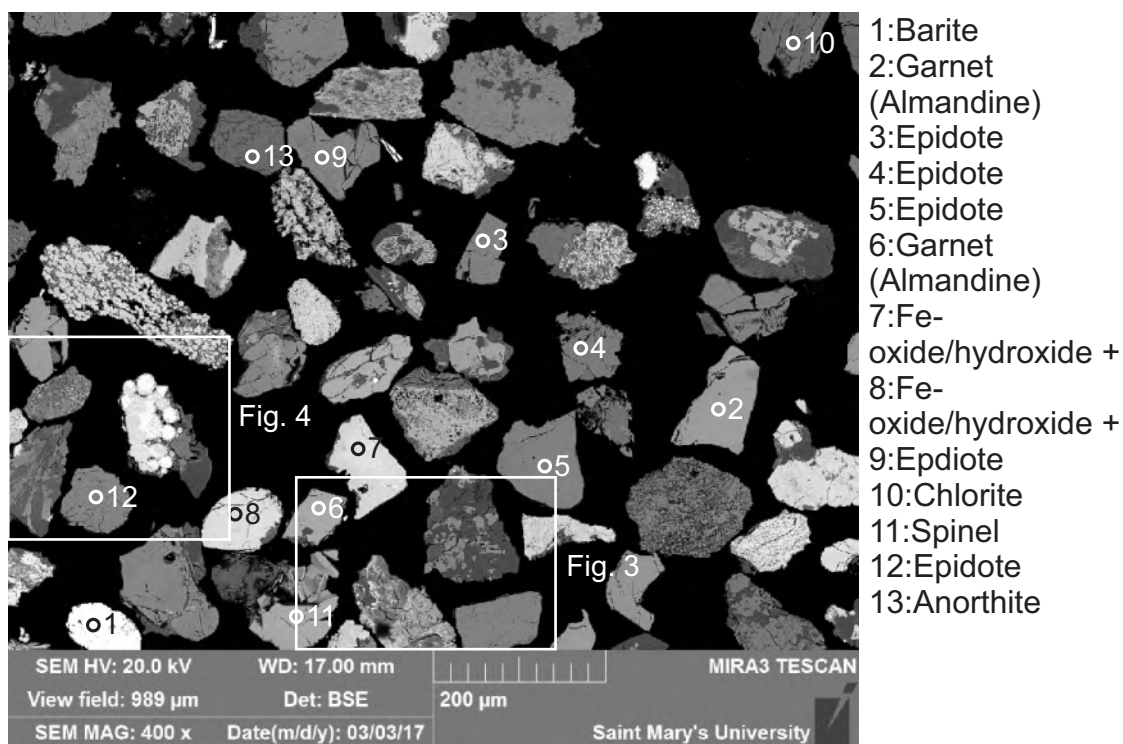


Figure B2.2: Sample S5 site 1 (SEM).

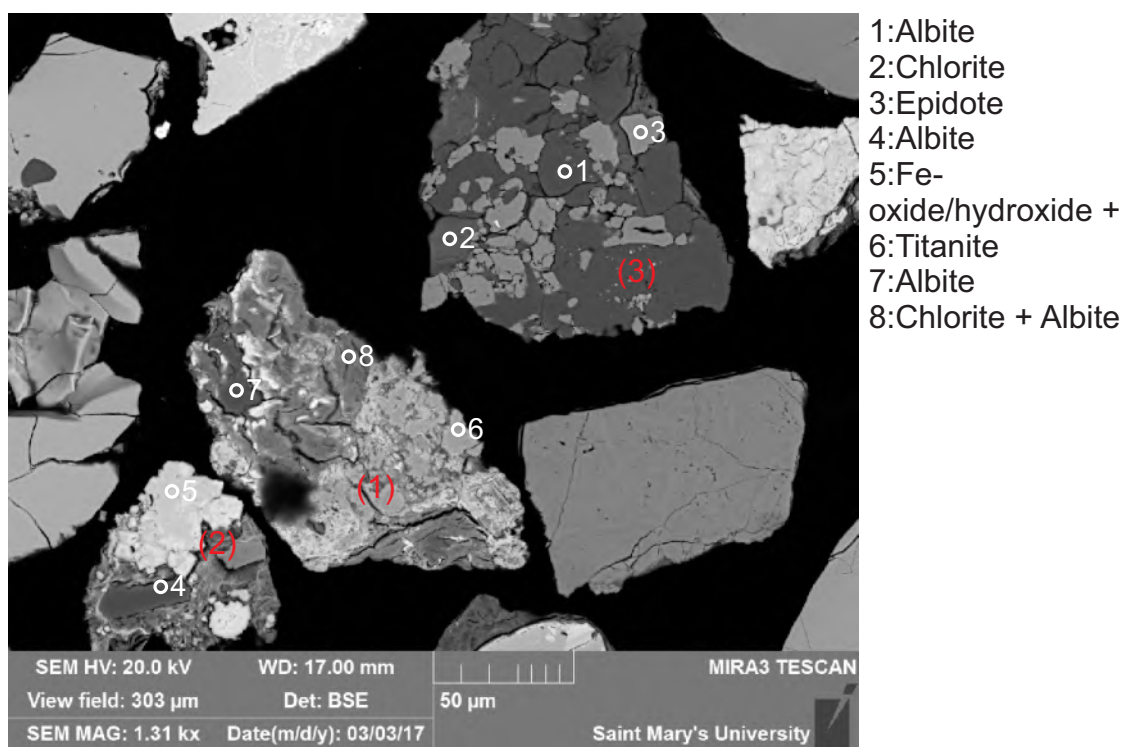
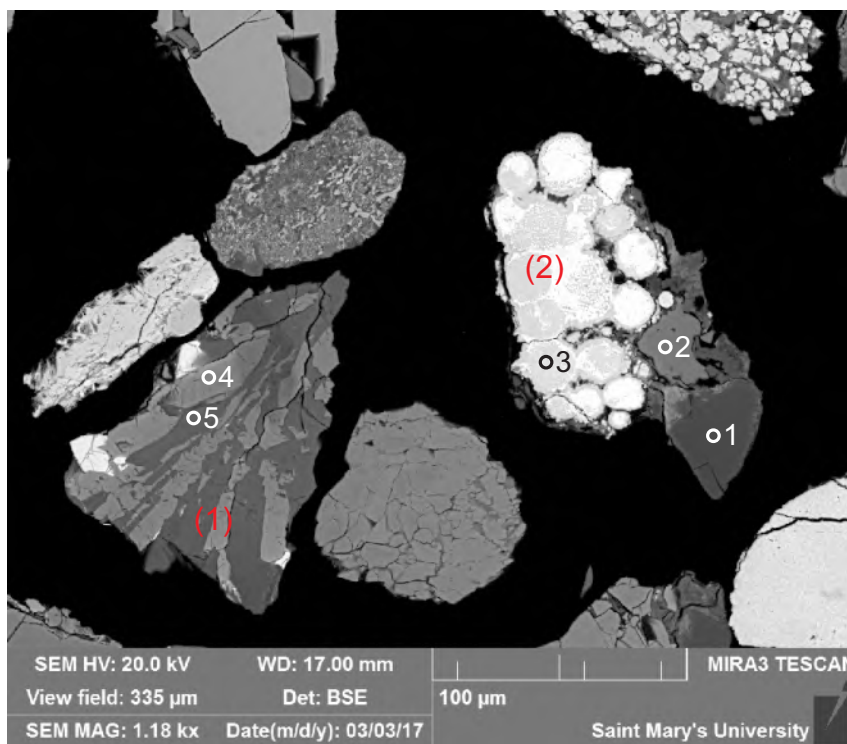
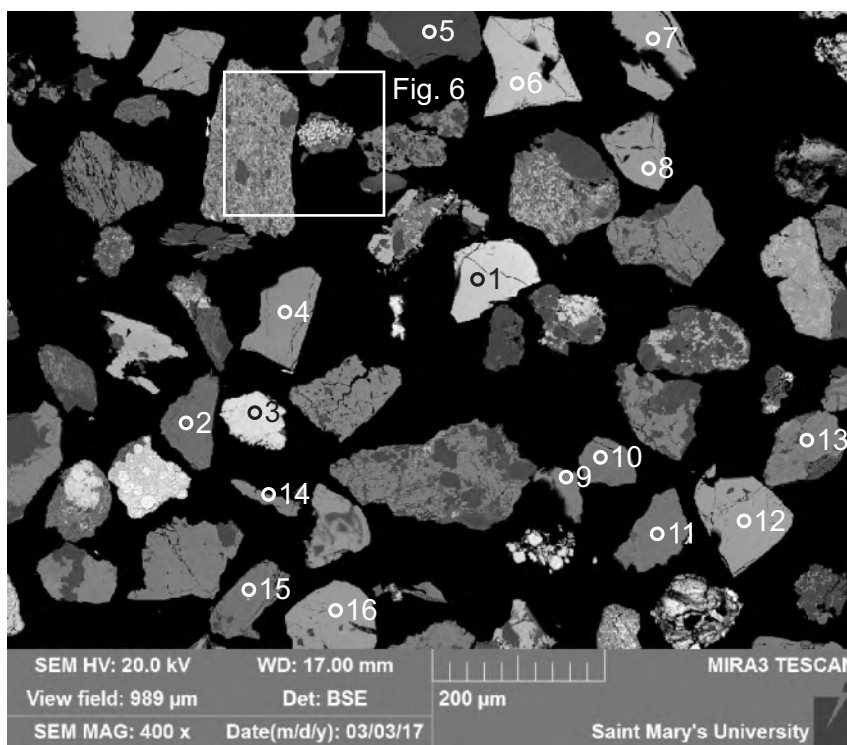


Figure B2.3: Sample S5 site 1.1 (SEM). 1: Lithic clast consisting of titanite, albite and chlorite (metamorphic). 2: clast of Fe-oxides/hydroxides and albite (metamorphic). 3: hydrothermal (vein) of albite, epidote, and chlorite.



- 1:Quartz
- 2:Fluorite
- 3:Fe-oxides/hydroxide +
- 4:Clinopyroxene
- 5:Labradorite

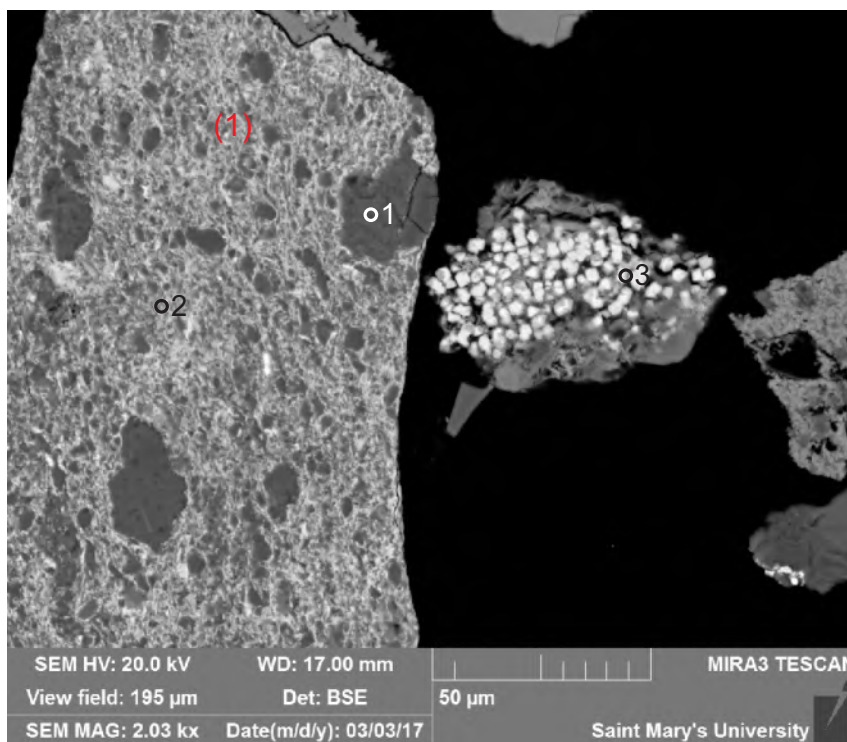
Figure B2.4: Sample S5 site 1.2 (SEM). 1:Foliated mafic; 2: Pedogenic aggregate?



- 1:Chromite
- 2:Amphibole
- 3:Fe-oxide/hydroxide +
- 4:Garnet
- 5:Quartz
- 6:Chromite
- 7:Garnet
- 8:Titanite
- 9:Chlorite
- 10:Apatite +
- 11:Epidote
- 12:Garnet
- 13:Epidote
- 14:Epidote
- 15:Chlorite
- 16:Garnet

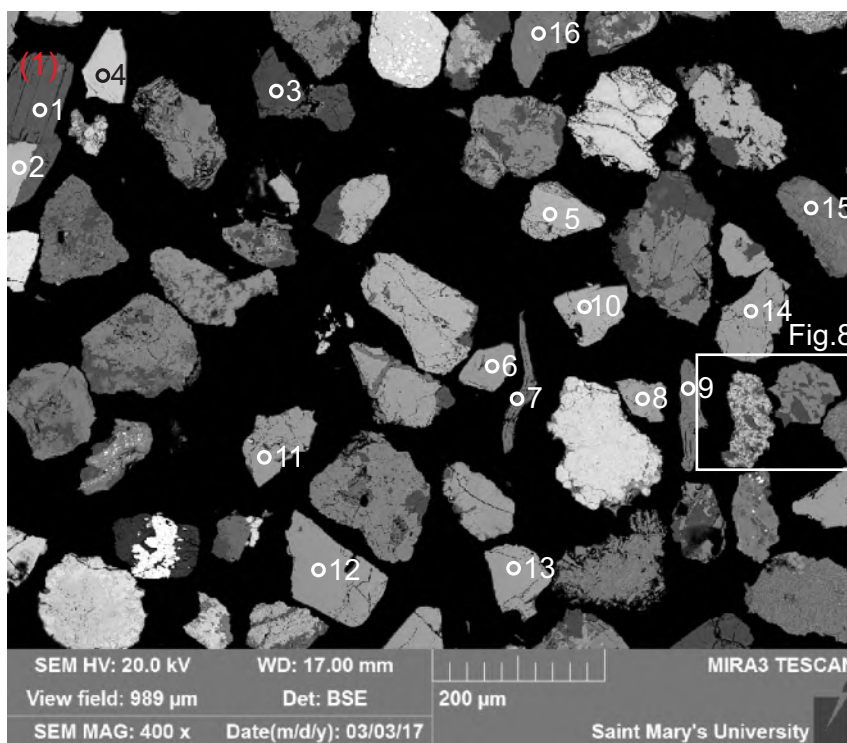
Figure B2.5: Sample S5 site 2 (SEM).





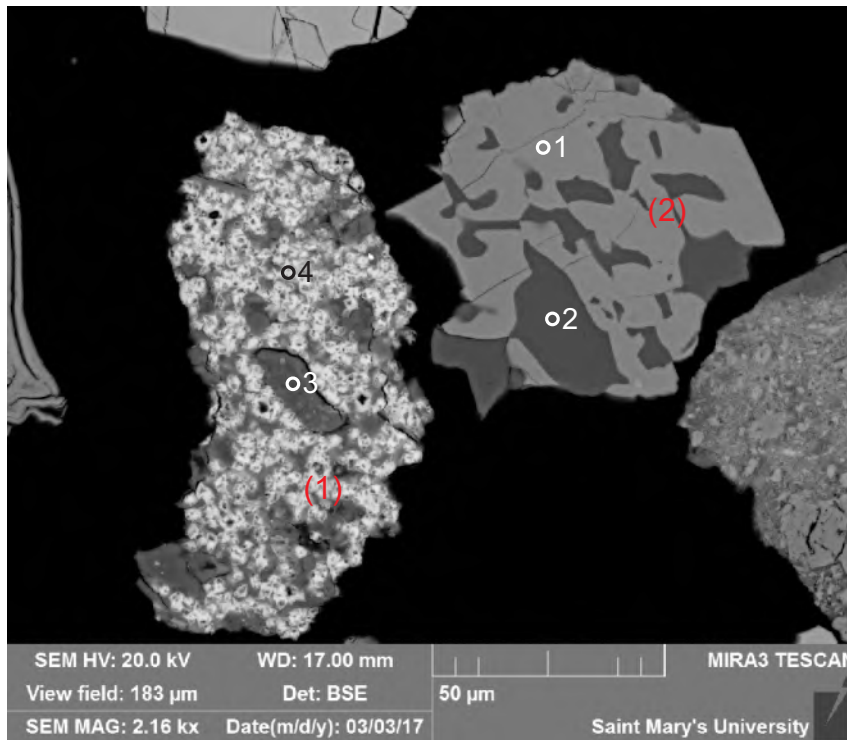
- 1:Quartz +
- 2:Chlorite + Illite
- 3:Fe-oxides/hydroxide +

Figure B2.6: Sample S5 site 2.1 (SEM). 1:Chlorite schist.



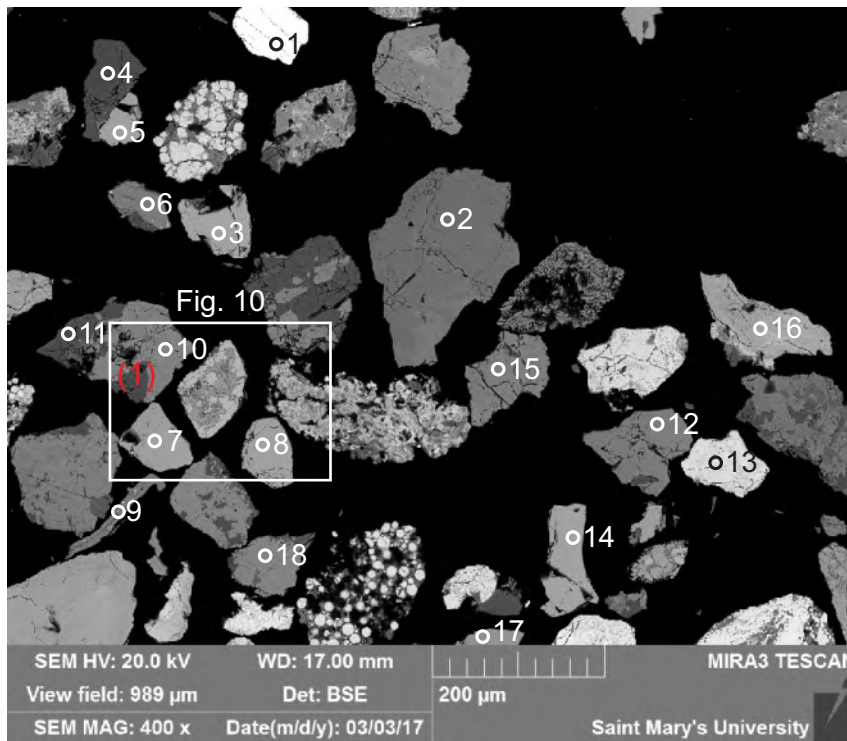
- 1:Muscovite
- 2:TiO<sub>2</sub>
- 3:Albite
- 4:Chromite
- 5:TiO<sub>2</sub>
- 6:Apatite
- 7:Chlorite
- 8:Apatite
- 9:Chlorite
- 10:Spinel
- 11:Garnet
- 12:Garnet
- 13:Garnet
- 14:Garnet
- 15:Pumpellyite
- 16:Epidote

Figure B2.7: Sample S5 site 3 (SEM). 1: Lithic clast (muscovite + TiO<sub>2</sub> (metamorphic)).



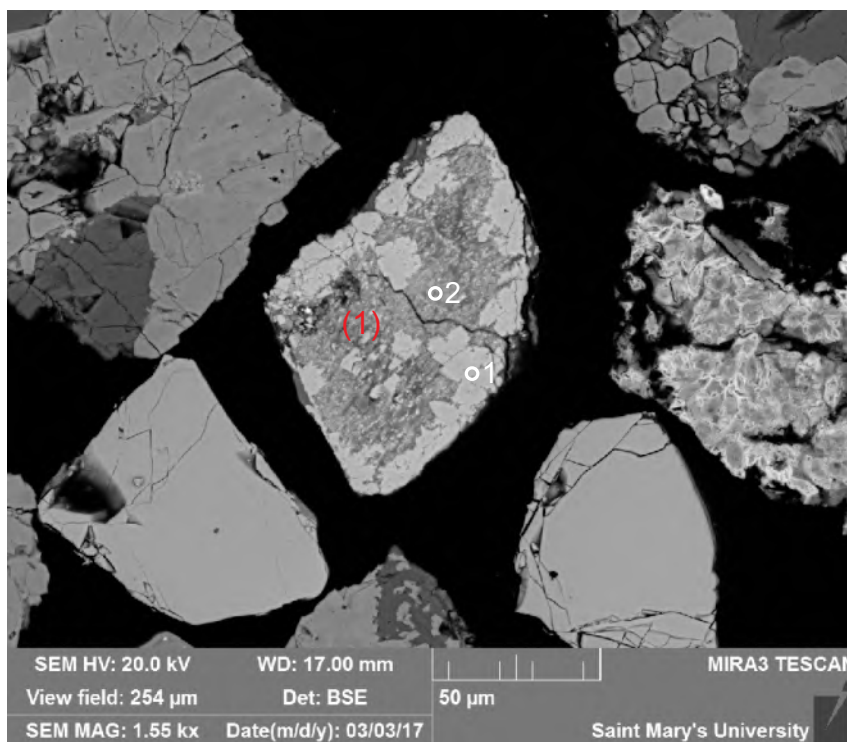
- 1:Epidote
- 2:Quartz
- 3:Tourmaline
- 4:Fe-oxides/hydroxide +

Figure B2.8: Sample S5 site 3.1 (SEM). 1:Pedogenic, 2: hydrothermal quartz + epidote (vein).



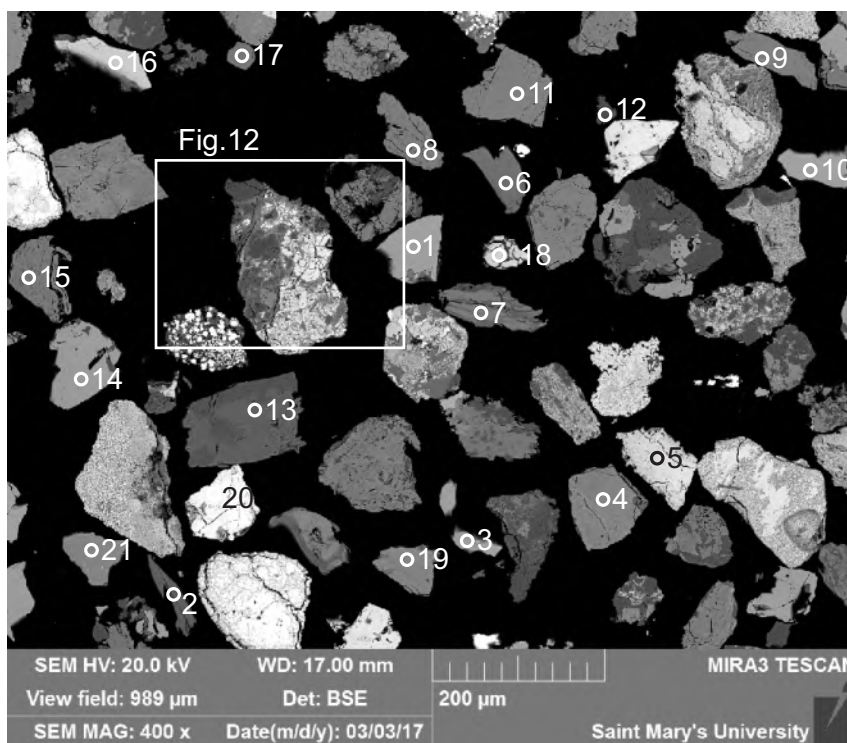
- 1:Zircon
- 2:Epidote +
- 3:Garnet
- 4:Quartz
- 5:Garnet
- 6:Chlorite
- 7:Garnet
- 8:Garnet
- 9:Biotite +
- 10:Epidote
- 11:Quartz
- 12:Clinopyroxene
- 13:Fe-oxide/hydroxide +
- 14:Garnet
- 15:Epidote
- 16:Mix
- 17:Garnet
- 18:Epidote

Figure B2.9: Sample S5 site 4 (SEM). 1: Hydrothermal epidote + quartz (vein).



- 1:TiO<sub>2</sub> +
- 2:Chlorite + TiO<sub>2</sub>

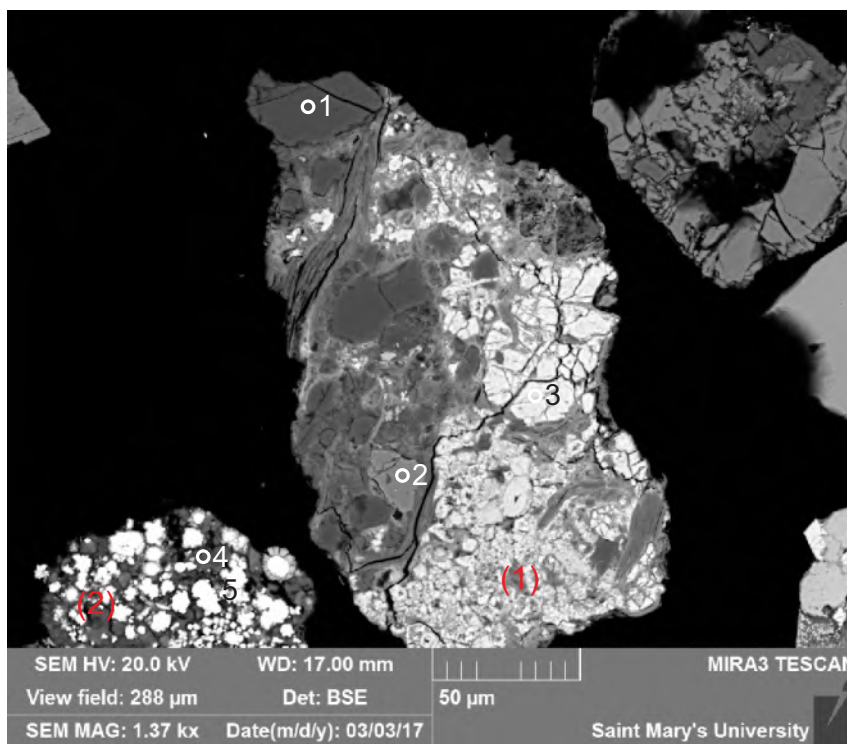
Figure B2.10: Sample S5 site 4.1 (SEM). 1: Titania and chlorite (metamorphic).



- 1:Garnet
- 2:Muscovite
- 3:Garnet
- 4:Epidote
- 5:Rhodochrosite +
- 6:Chlorite
- 7:Chlorite +
- 8:Chlorite
- 9:Chlorite
- 10:Garnet
- 11:Epidote
- 12:Albite
- 13:Muscovite
- 14:Garnet
- 15:Chlorite
- 16:Chromite
- 17:Fluorite
- 18:Fe-oxide/hydroxide +
- 19:Epidote
- 20:Fe-oxide/hydroxide +
- 21:Epidote

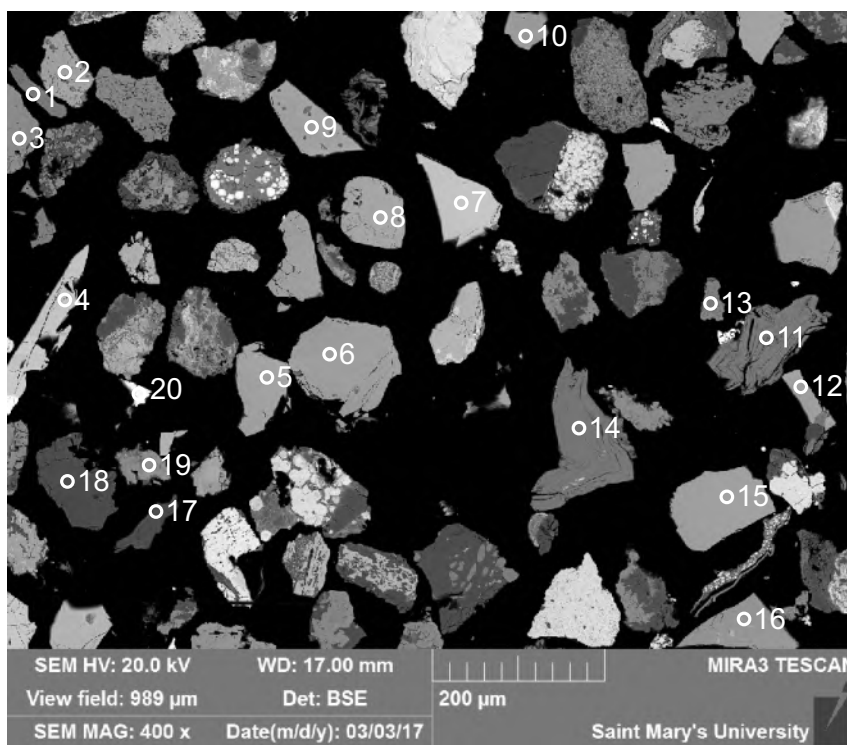
Figure B2.11: Sample S5 site 5 (SEM).





- 1:Quartz
- 2:Epidote
- 3:Fe-oxides/hydroxide +
- 4:Quartz + Muscovite
- 5:Pyrite

Figure B2.12: Sample S5 site 5.1 (SEM). 1: Altered igneous clast consisting of quartz, epidote, and Fe-oxides/hydroxides. 2: Pyrite cemented siltstone.



- 1:Chlorite
- 2:Garnet
- 3:Epidote
- 4:Chromite
- 5:Garnet
- 6:Garnet
- 7:Chromite
- 8:Spinel
- 9:Garnet
- 10:Garnet
- 11:Chlorite
- 12:Garnet
- 13:Epidote
- 14:Chlorite
- 15:Garnet
- 16:Garnet
- 17:Paragonite
- 18:Quartz
- 19:Chlorite
- 20:Fe-oxides/hydroxide +

Figure B2.13: Sample S5 site 6 (SEM).

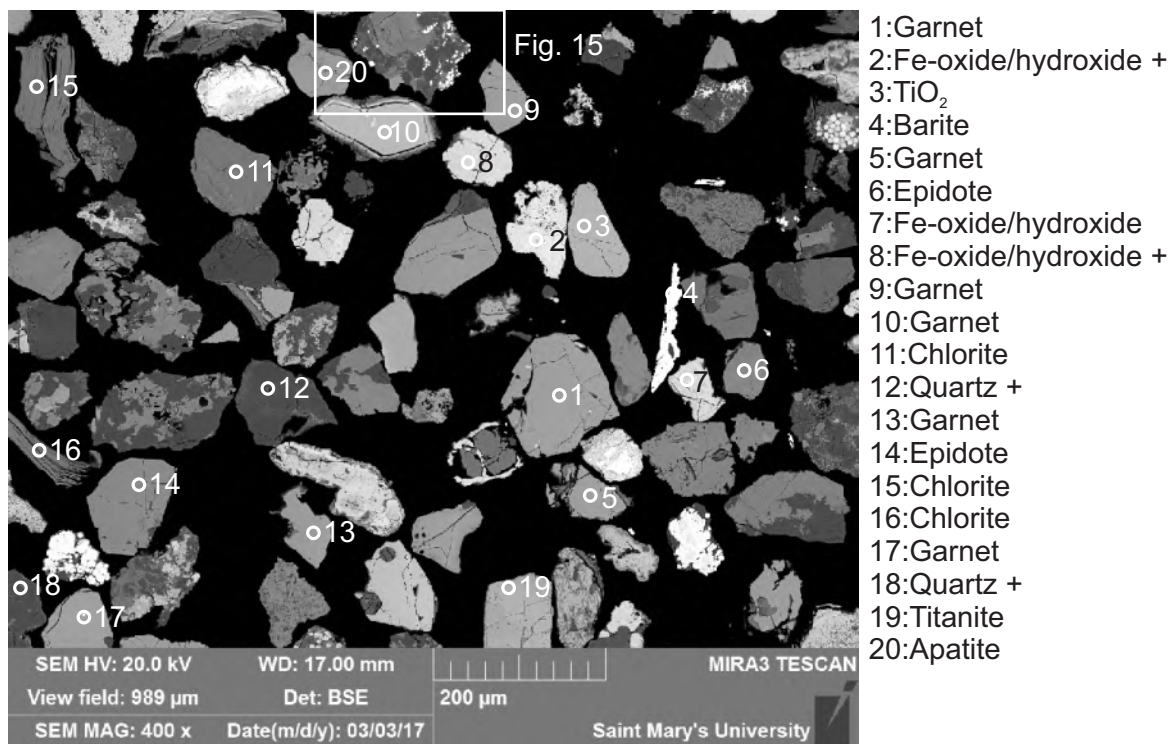


Figure B2.14: Sample S5 site 7 (SEM).

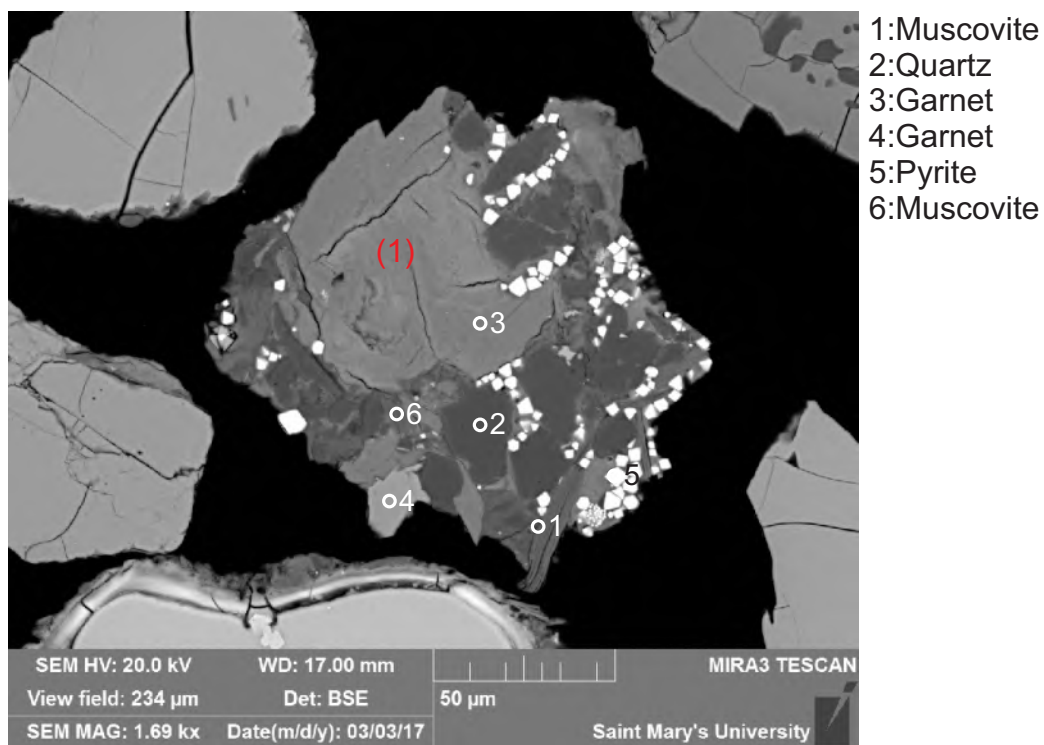
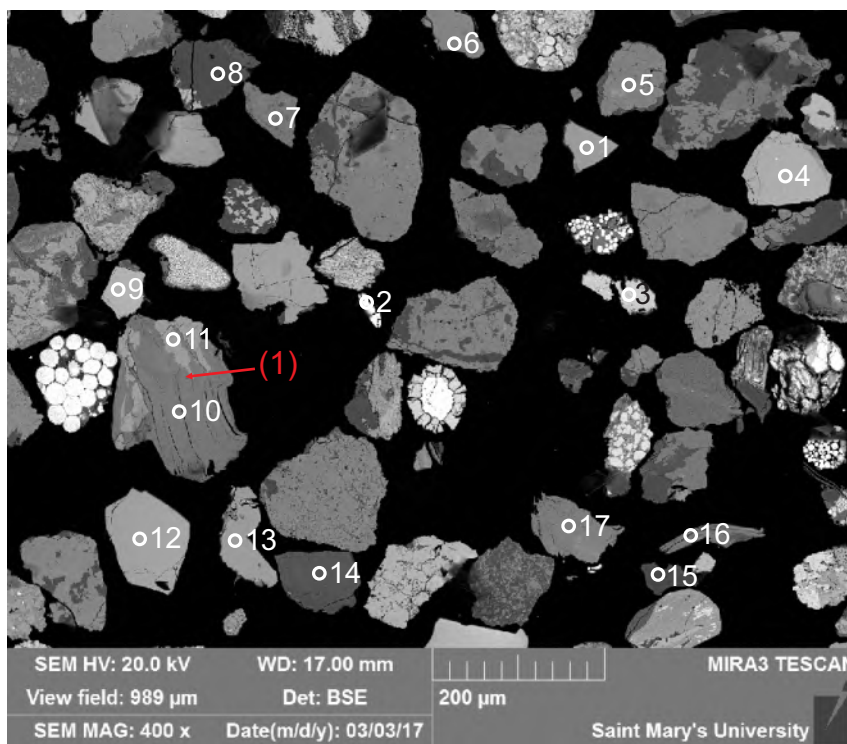
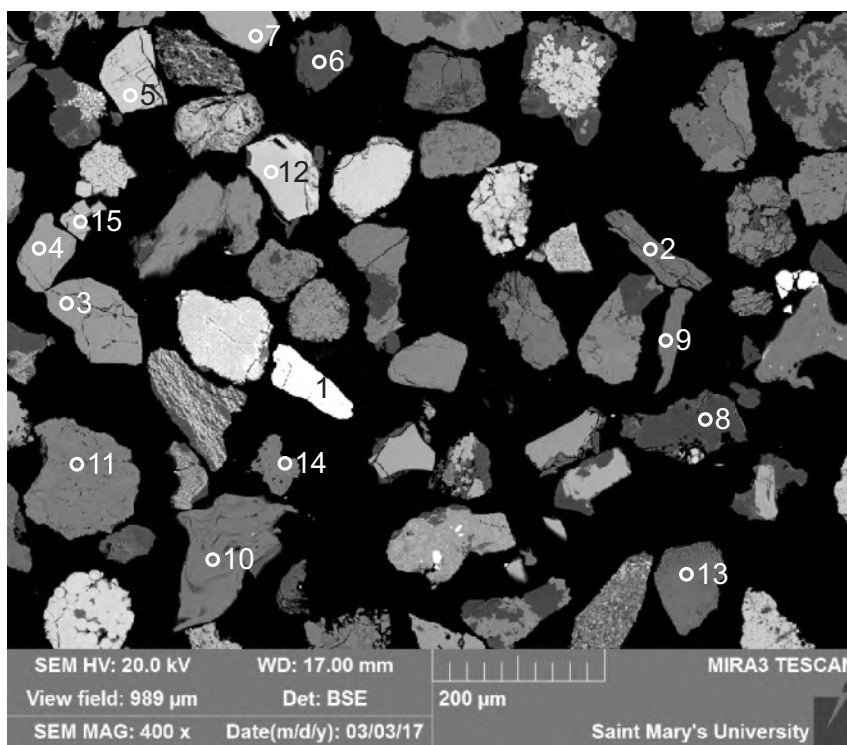


Figure B2.15: Sample S5 site 7.1 (SEM). 1: Lithic clast (?sandstone) consisting of garnet, quartz, and muscovite with pyrite framboids along intergranular boundaries.



- 1: Garnet
- 2: Garbage
- 3: "Ilmenite"
- 4:  $\text{TiO}_2$
- 5: Epidote
- 6: Epidote
- 7: Chlorite + Illite +
- 8: Quartz
- 9:  $\text{TiO}_2$
- 10: Chlorite
- 11: Titanite
- 12: Spinel
- 13: Garnet
- 14: Tourmaline
- 15: Quartz
- 16: Chlorite
- 17: Chlorite

Figure B2.16: Sample S5 site 8 (SEM). Lithic clast (chlorite + titanite, metamorphic).



- 1: Barite
- 2: Chlorite
- 3: Apatite
- 4: Spinel
- 5: Chromite
- 6: Tourmaline +
- 7:  $\text{TiO}_2$
- 8: Quartz
- 9: Chlorite
- 10: Chlorite
- 11: Epidote
- 12: Chromite
- 13: Epidote
- 14: Epidote
- 15: Chromite

Figure B2.17: Sample S5 site 9 (SEM).



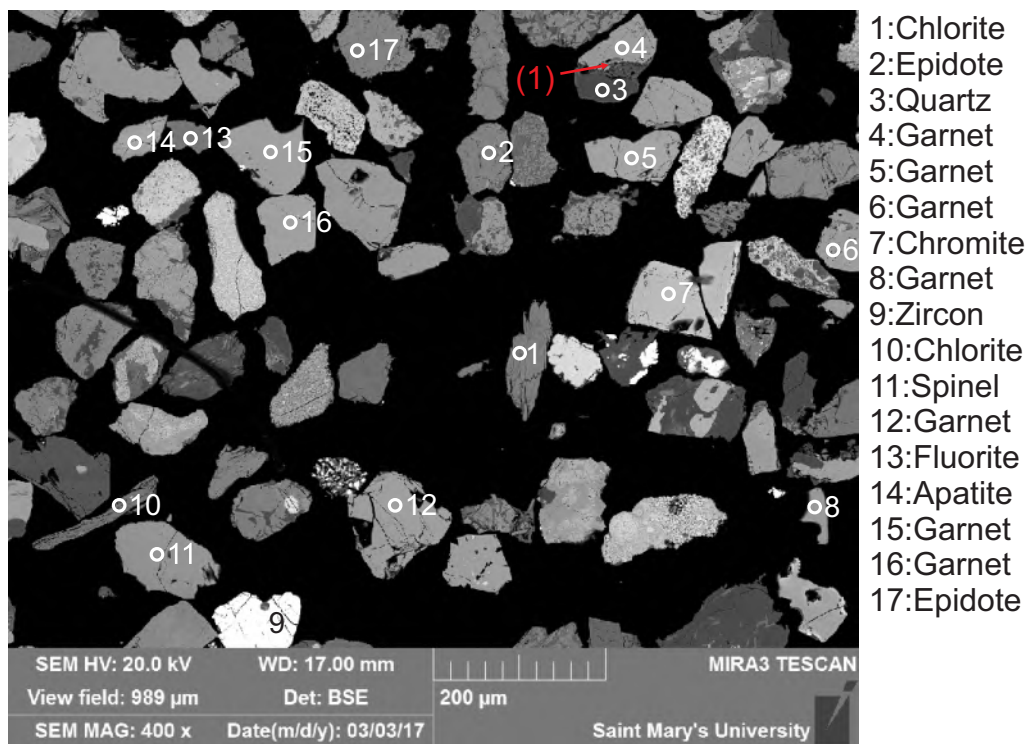


Figure B2.18: Sample S5 site 10 (SEM). 1: Lithic clast (garnet + quartz, metamorphic or sedimentary).

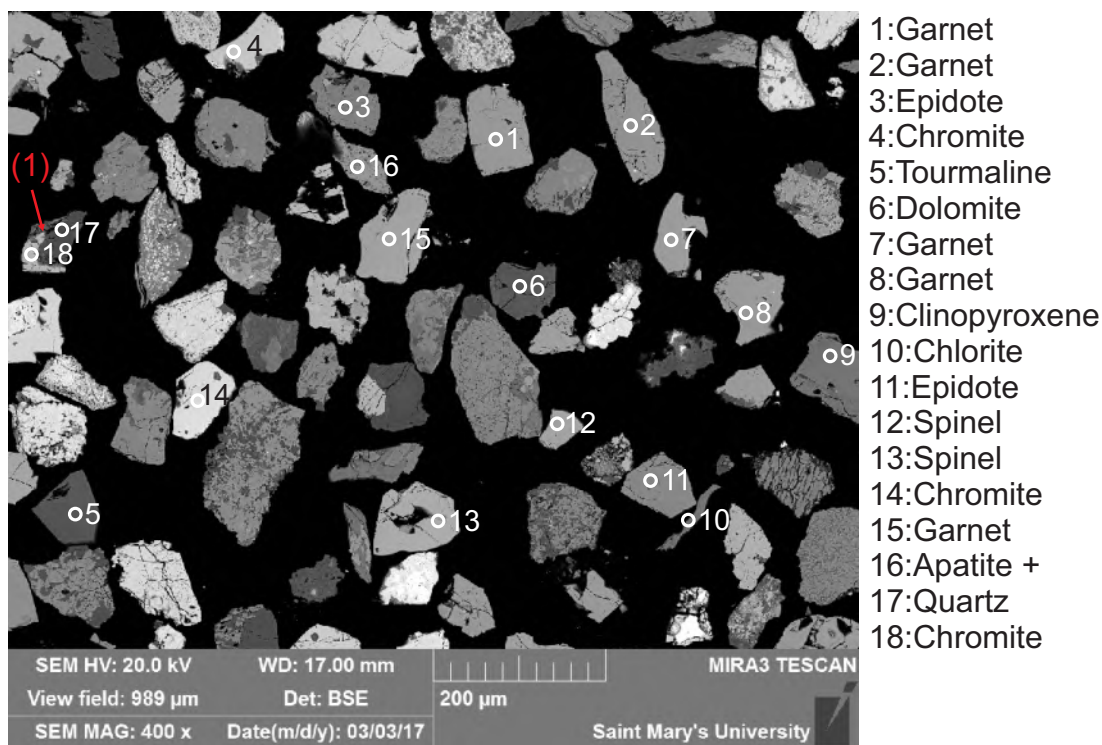


Figure B2.19: Sample S5 site 11 (SEM). Lithic clast (quartz + chromite, sandstone).

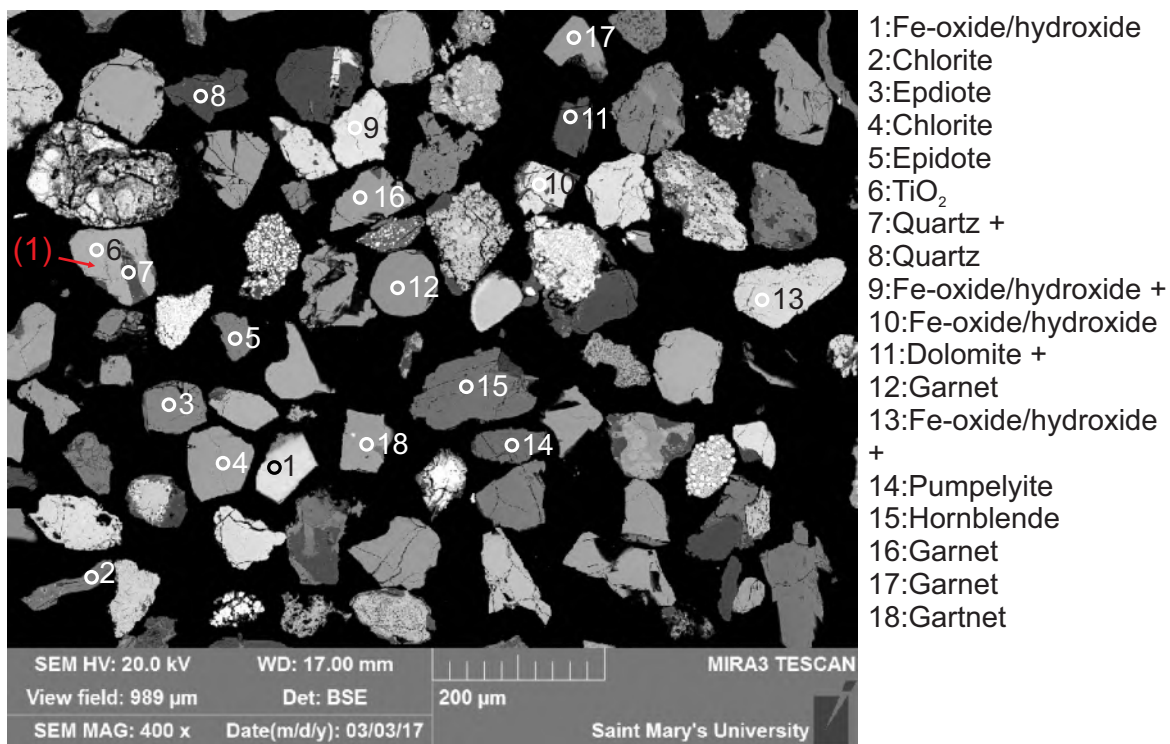


Figure B2.20: Sample S5 site 12 (SEM). 1: Lithic clast (quartz +  $\text{TiO}_2$ , metamorphic).

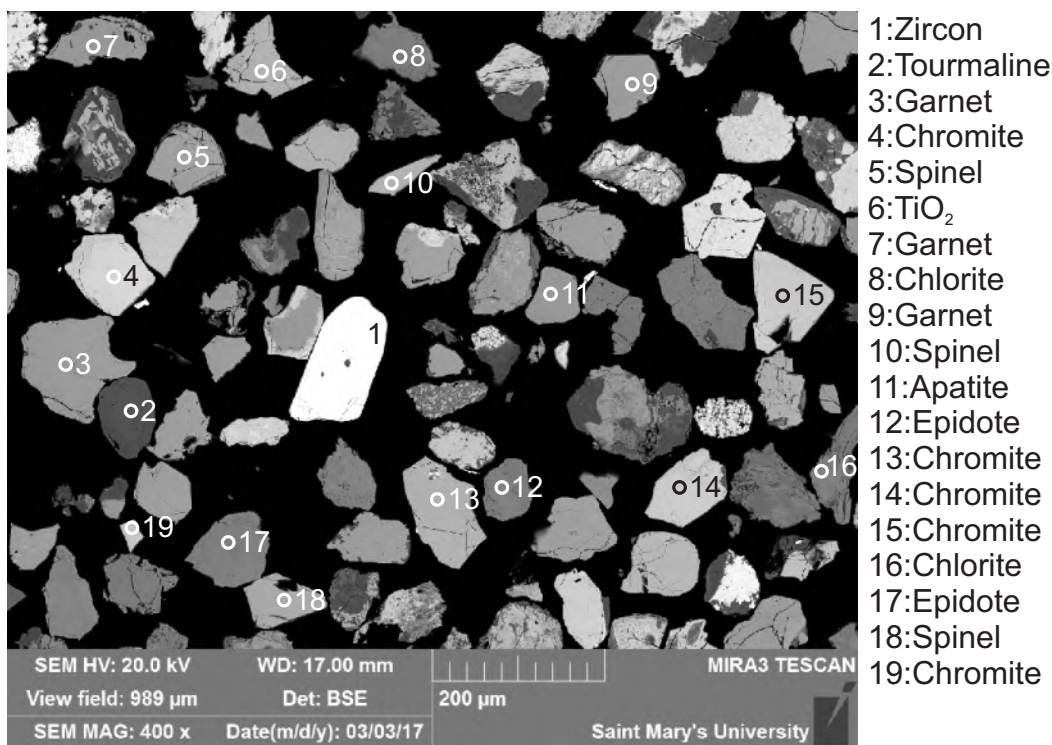


Figure B2.21: Sample S5 site 13 (SEM).



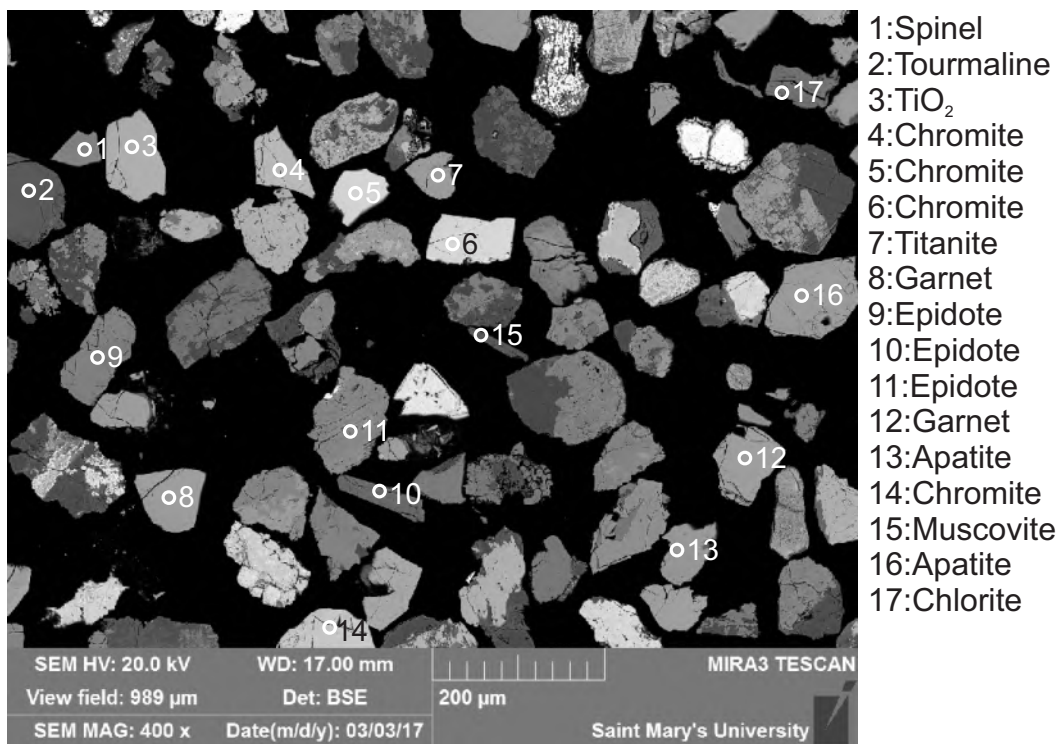


Figure B2.22: Sample S5 site 14 (SEM).

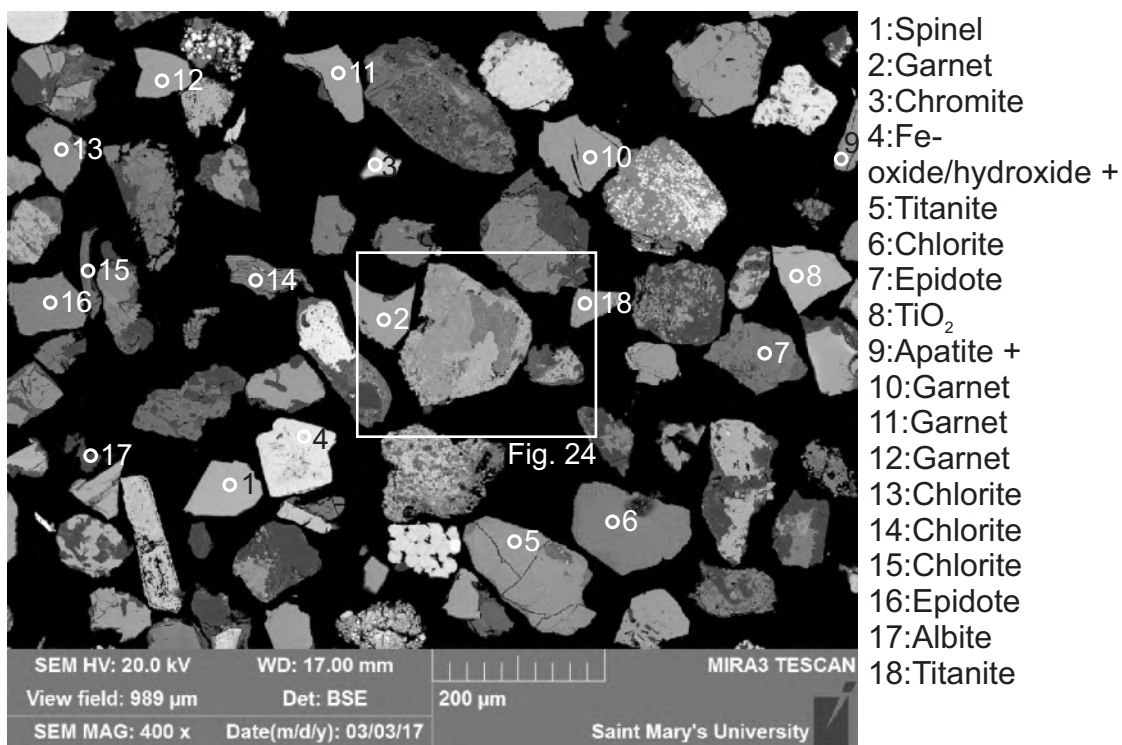
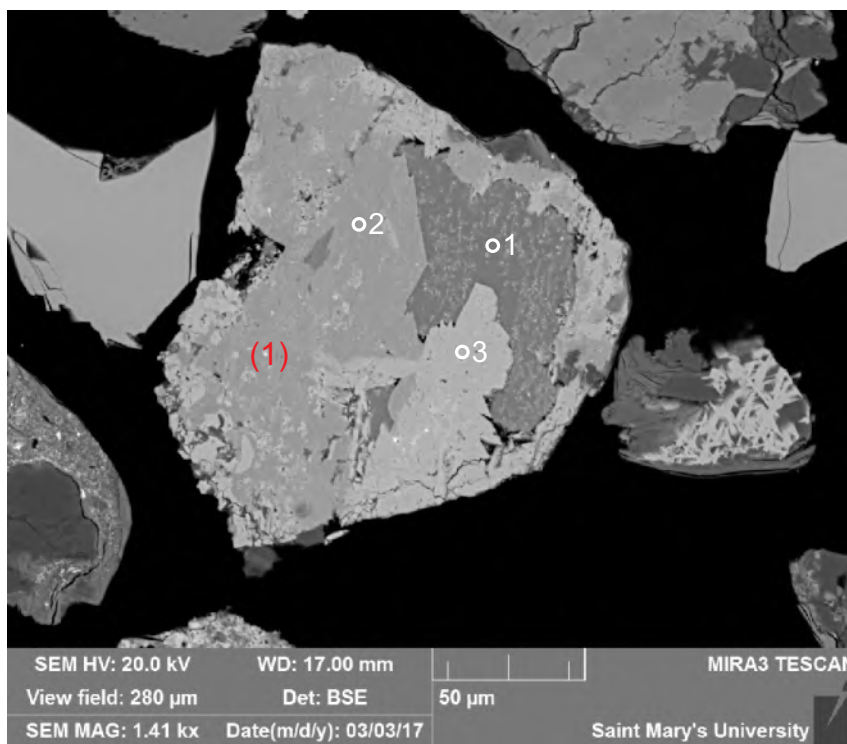
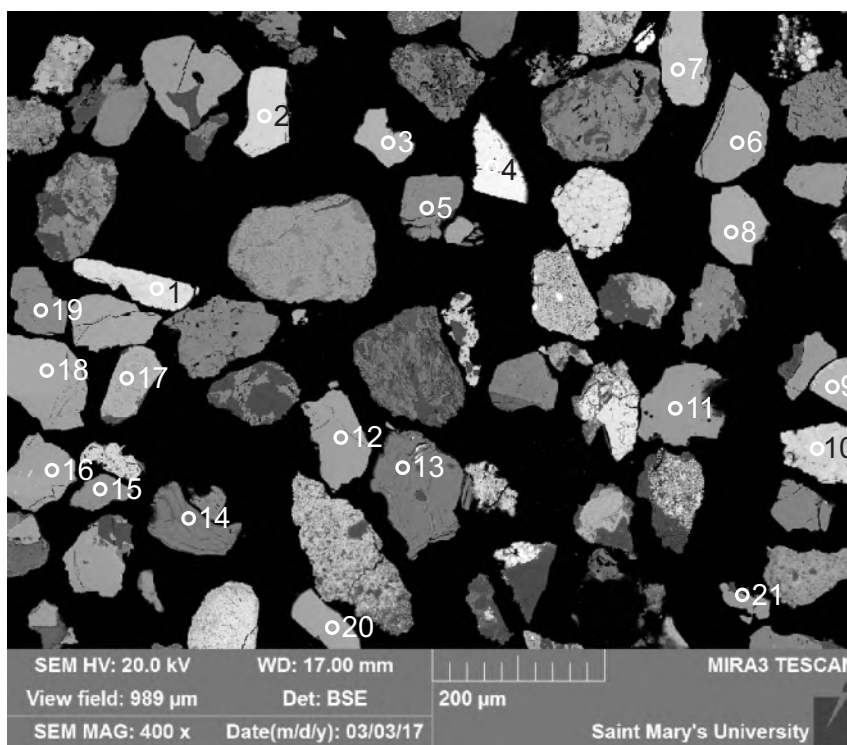


Figure B2.23: Sample S5 site 15 (SEM).



- 1: Fluorite +
- 2: Titanite
- 3: TiO<sub>2</sub>

Figure B2.24: Sample S5 site 15.1 (SEM). 1: Lithic clast consisting of fluorite, titanite, and titania (metamorphic).



- 1: Fe-oxides/hydroxide +
- 2: Chromite
- 3: TiO<sub>2</sub>
- 4: Fe-oxides/hydroxide +
- 5: Epidote
- 6: Apatite
- 7: TiO<sub>2</sub>
- 8: Spinel
- 9: Spinel
- 10: Fe-oxides/hydroxide +
- 11: Garnet
- 12: Garnet
- 13: Chlorite
- 14: Chlorite
- 15: Chlorite
- 16: Garnet
- 17: TiO<sub>2</sub> +
- 18: Garnet
- 19: Epidote
- 20: Garnet
- 21: Garnet

Figure B2.25: Sample S5 site 16 (SEM).

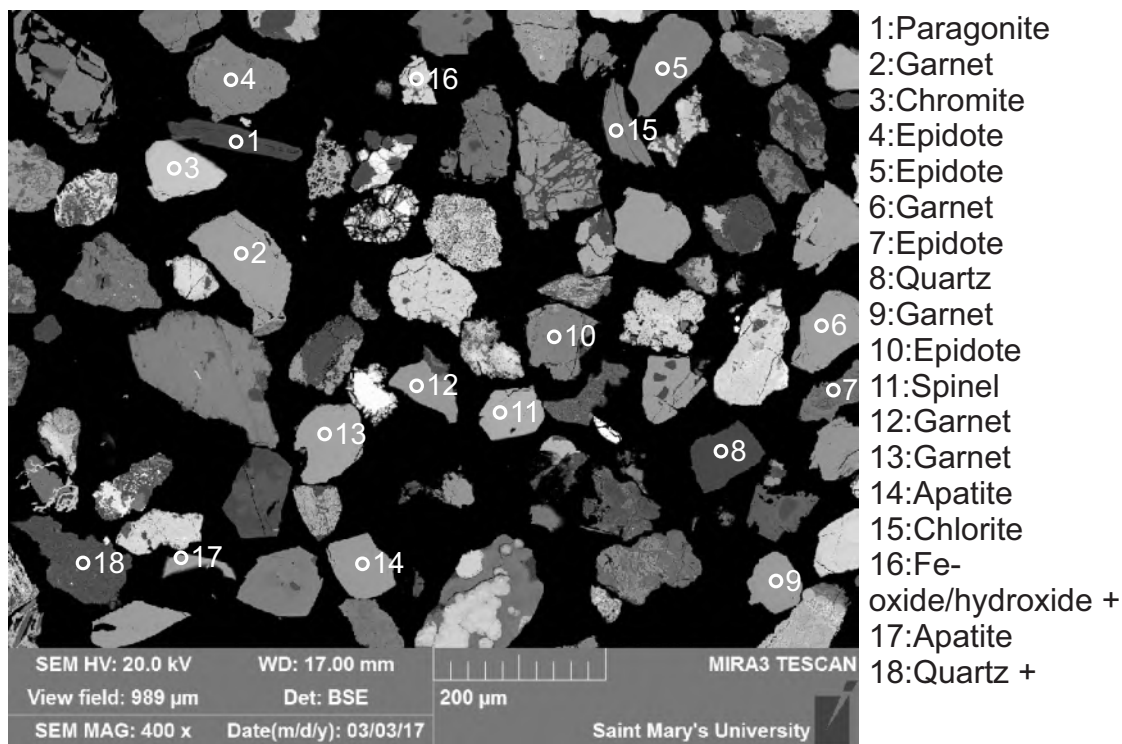


Figure B2.26: Sample S5 site 17 (SEM).

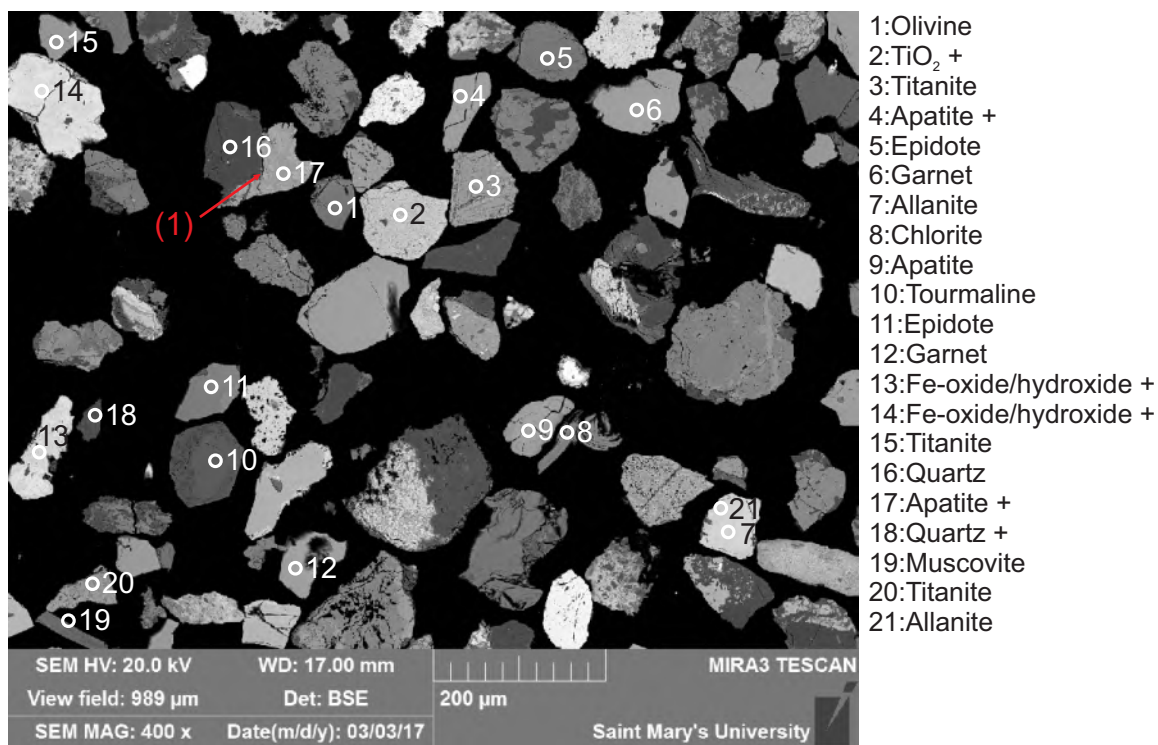


Figure B2.27: Sample S5 site 18 (SEM). 1: Lithic clast (quartz + apatite, igneous).



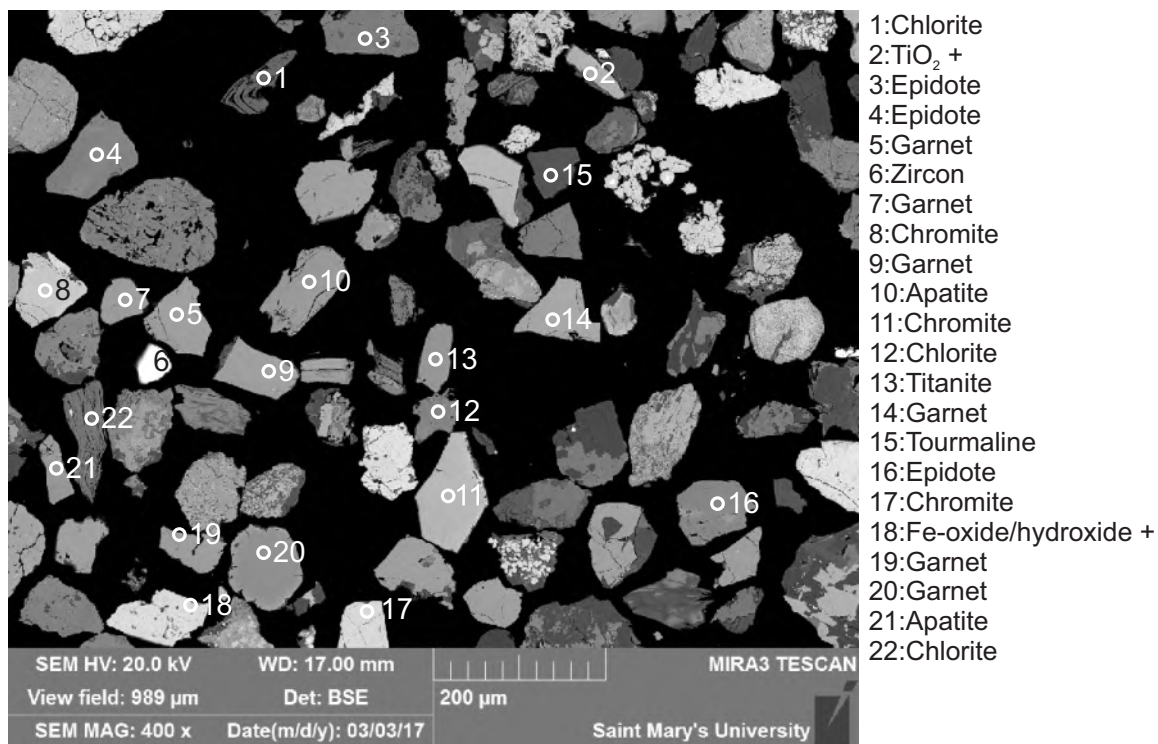


Figure B2.28: Sample S5 site 19 (SEM).

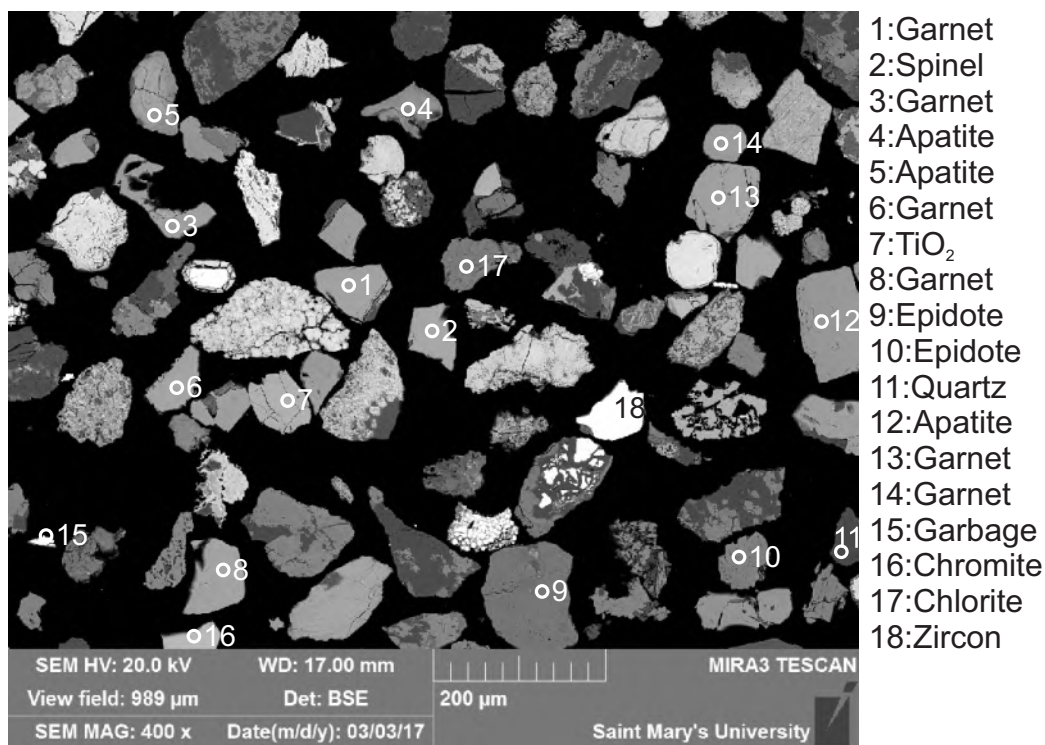


Figure B2.29: Sample S5 site 20 (SEM).

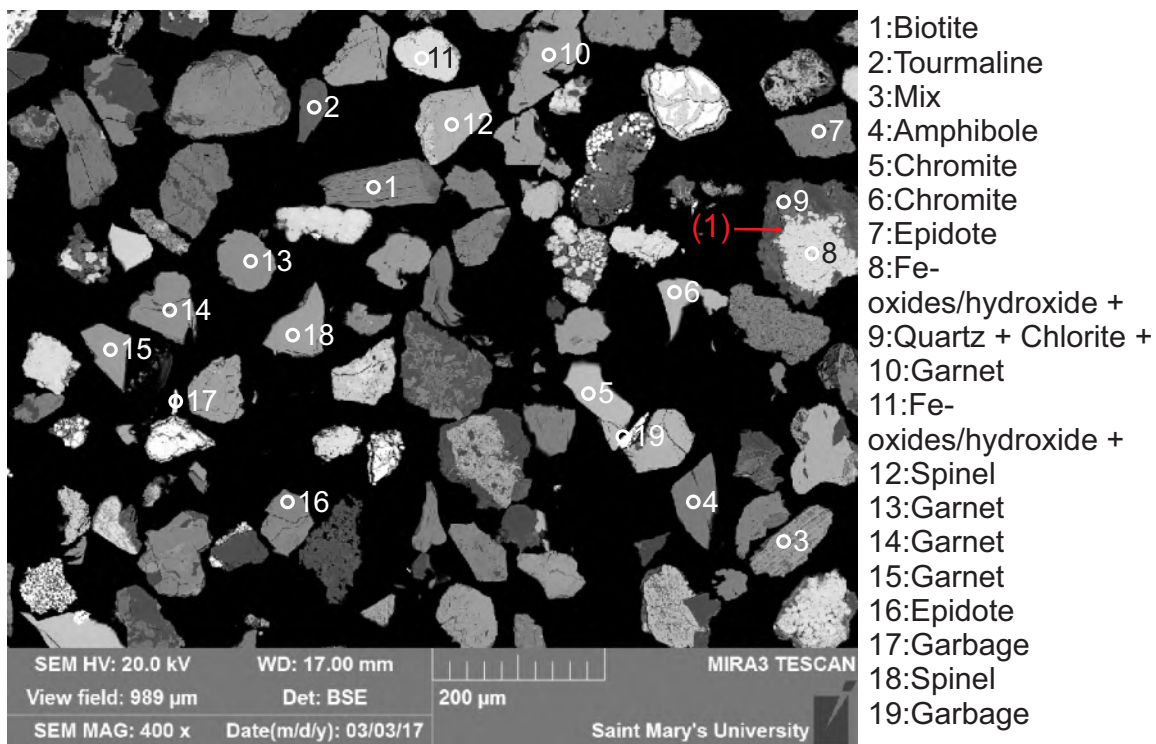


Figure B2.30: Sample S5 site 21 (SEM). 1: Igneous (probably) clast consisting of quartz, fine-grained chlorite, and Fe-oxide/hydroxide.

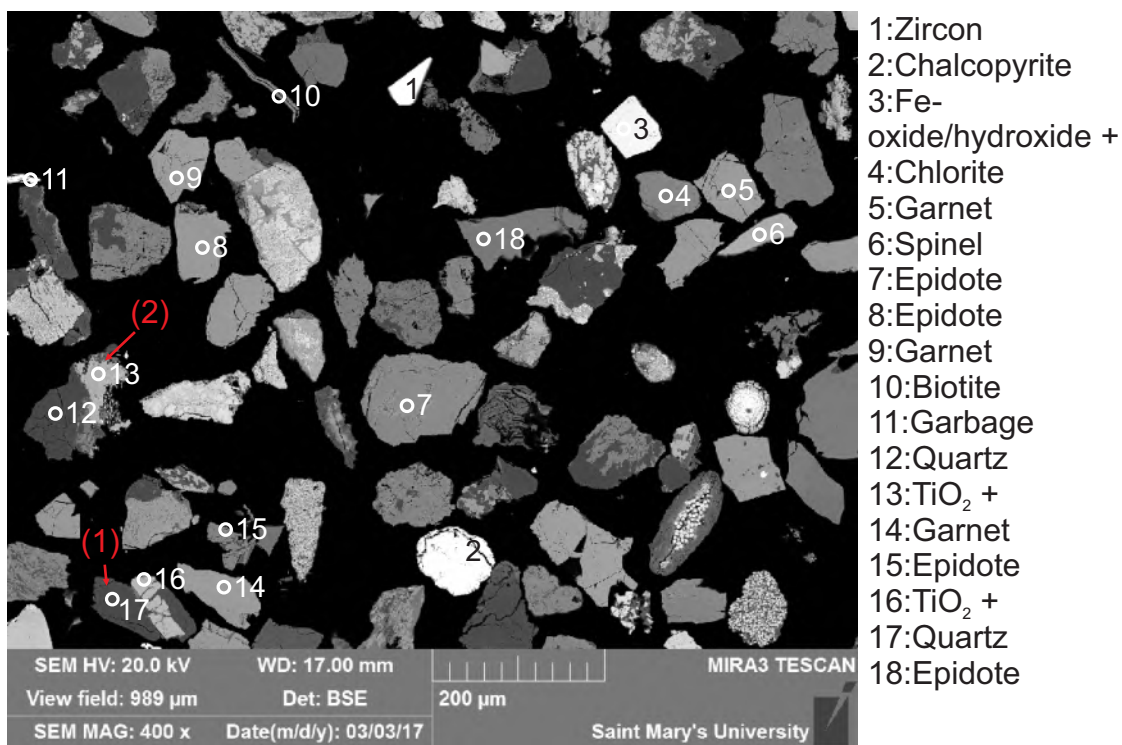


Figure B2.31: Sample S5 site 22 (SEM). 1: Lithic clast (quartz +  $\text{TiO}_2$ , metamorphic). 2: Lithic clast (garnet +  $\text{TiO}_2$ , metamorphic).

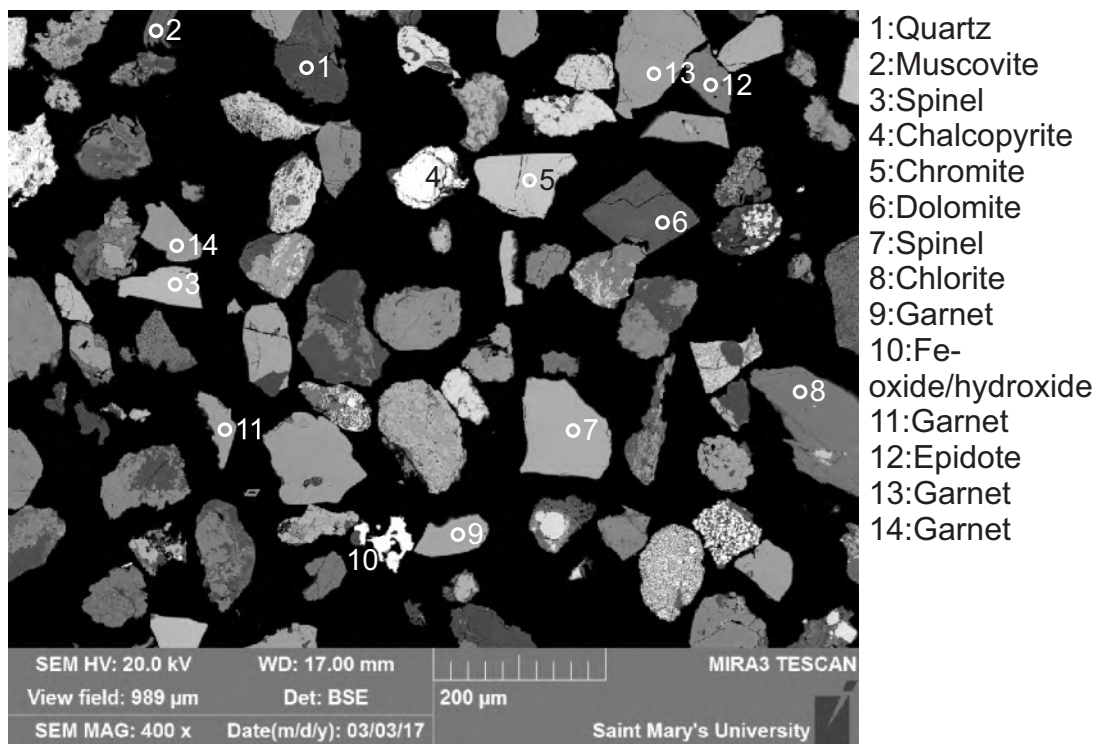


Figure B2.32: Sample S5 site 23 (SEM).

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total	
S5	1	1	Brt											36.56						-0.04				1.55		61.93							100	114
S5	1	2	Grt (Alm)	39.36		21.00	32.79	0.80	3.70	2.34																							100	116
S5	1	3	Ep	40.12		23.34	10.97			22.57																							97	109
S5	1	4	Ep	40.49		27.74	6.07			22.70																							97	113
S5	1	5	Ep	39.50		24.13	10.24	0.44		22.14			0.55																				97	112
S5	1	6	Grt (Alm)	38.81		20.82	30.20	7.07		3.09																							100	113
S5	1	7	Feohy +	7.06	1.81	3.38	86.01			0.70	0.60							0.43															100	91
S5	1	8	Feohy +	3.86			96.14																										100	78
S5	1	9	Ep	40.24		25.73	8.10	0.23		22.70																							97	109
S5	1	10	Chl	26.89		21.39	20.27		16.45																								85	96
S5	1	11	Spl			28.77	15.00		16.13										40.10														100	112
S5	1	12	Ep	40.30		23.57	10.72		0.54	21.86																							97	107
S5	1	13	An	44.50		31.56	0.62			21.97	1.35																						100	109
S5	1.1	1	Ab	69.48		18.49	0.39				11.65																						100	119
S5	1.1	2	Chl	30.61		17.91	11.19	0.34	24.57										0.38														85	100
S5	1.1	3	Ep	39.81		22.08	12.99	0.73		21.40																							97	108
S5	1.1	4	Ab	69.26		18.71	0.40				11.63																						100	121
S5	1.1	5	Feohy +	9.64		4.45	84.11			0.52	0.77								0.52														100	79
S5	1.1	6	Ttn	31.50	36.83	3.45	0.56			26.53					1.13																		100	111
S5	1.1	7	Ab	69.18		18.64	0.49			0.19	11.51																						100	118
S5	1.1	8	Chl + Ab	42.34	0.41	13.92	21.42		16.99	0.60	2.10	0.55																			1.68	100	93	
S5	1.2	1	Qz	99.79			0.21																										100	121
S5	1.2	2	Fl				1.57		0.49	69.76					27.35								0.82										100	81
S5	1.2	3	Feohy +	3.98			87.13			0.69				8.20																			100	87
S5	1.2	4	Cpx	51.61	1.50	3.41	13.05	0.37	15.13	14.52	0.42																						100	117
S5	1.2	5	lab	55.40		27.51	1.14			10.85	5.10																						100	119
S5	2	1	Chr		0.97	15.07	27.72		9.81										46.43														100	107
S5	2	2	Amph	41.68		17.10	10.86		13.24	13.34	0.78																						97	81
S5	2	3	Feohy +	4.66			93.88			0.56				0.90																			100	80
S5	2	4	Grt	40.84		21.53	21.77	0.43	5.48	9.95																							100	113
S5	2	5	Qz	100.00																													100	115
S5	2	6	Chr			18.66	19.97		11.61									0.48	49.29														100	105
S5	2	7	Grt	39.55	0.30	20.67	26.36	3.13	0.91	9.08																							100	109
S5	2	8	Ttn	32.93	38.16	1.15				27.75																							100	109
S5	2	9	Chl	30.02	0.80	19.01	25.33		8.74	0.20	0.37	0.54																					85	98
S5	2	10	Ap +	1.48			0.44			45.24	0.98		38.83	0.77	9.14								3.89								-0.77	100	100	
S5	2	11	Ep	40.24		27.10	6.65	0.23		22.78																							97	110
S5	2	12	Grt	39.31		20.92	31.69	3.28	2.99	1.82																							100	114
S5	2	13	Ep	40.22		25.13	8.47		0.33	22.85																							97	112
S5	2	14	Ep	40.00		21.84	12.80			22.35																							97	109
S5	2	15	Chl	26.25		21.20	23.54		13.72		0.30																						85	97
S5	2	16	Grt	39.62		20.86	24.16	5.00	2.19	8.17																							100	114
S5	2.1	1	Qz +	89.02		5.05	2.48		1.21	0.41	0.29	1.54																					100	110
S5	2.1	2	Chl + Ill	53.37	0.50	7.99	33.81		1.57	0.26		2.50																					100	110
S5	2.1	3	Feohy +	6.75		1.95	88.90	0.98	0.69	0.74																							100	82
S5	3	1	Ms	46.72	0.55	33.84	0.83		0.96		1.94	8.28			1.88																		95	108
S5	3	2	TiO2		99.58		0.42																										100	105
S5	3	3	Ab	68.04		19.92	0.31			0.37	10.84	0.51																					100	115
S5	3	4	Chr			12.08	19.44		10.88										57.60														100	104
S5	3	5	TiO2		99.16		0.84																										100	107

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total	
S5	3	6	Ap							49.92			45.16		4.93																	100	120	
S5	3	7	Chl	25.86		21.59	22.32		14.94		0.29																					85	99	
S5	3	8	Ap	0.58			0.44			47.40	0.30		43.18		5.96									2.14									100	122
S5	3	9	Chl	26.36		21.82	21.94		14.88																								85	103
S5	3	10	Spl			27.31	15.76		14.92										42.00														100	109
S5	3	11	Grt	39.62	0.63	20.94	26.89	0.54	2.24	9.15																							100	114
S5	3	12	Grt	40.46		21.08	26.81	1.05	4.70	5.89																							100	115
S5	3	13	Grt	39.50		20.82	32.13	0.69	2.93	3.93																							100	116
S5	3	14	Grt	39.60		21.11	28.62	0.59	1.75	8.34																							100	114
S5	3	15	Pmp	39.41		20.35	9.89	0.25	2.16	21.93																							94	97
S5	3	16	Ep	39.40		26.66	6.99			23.95																							97	90
S5	3.1	1	Ep	40.48		25.21	9.01	0.27		22.02																							97	111
S5	3.1	2	Qz	99.70			0.30																										100	121
S5	3.1	3	Tur +	49.58	1.23	31.28	9.37		5.41	0.75	0.91	1.46																					100	95
S5	3.1	4	Feohy +	18.63	0.47	6.38	67.01	0.42	2.17	0.70		1.00																			3.23	100	81	
S5	4	1	Zrn	30.96																				67.69					1.35				100	119
S5	4	2	Ep +	47.95		25.13				26.92																							100	109
S5	4	3	Grt	39.20		20.89	33.65	0.85	1.28	4.14																							100	113
S5	4	4	Qz	100.00																													100	117
S5	4	5	Grt	39.66		20.98	29.54	0.97	1.31	7.53																							100	110
S5	4	6	Chl	25.82		22.16	24.41		12.61																								85	96
S5	4	7	Grt	39.65		21.20	31.74	0.86	4.73	1.82																							100	114
S5	4	8	Grt	39.67		20.60	29.76	1.81	1.37	6.78																							100	115
S5	4	9	Bt +	41.22	1.82	19.99	18.07		13.83			5.07																					100	109
S5	4	10	Ep	40.09		23.39	10.94			22.58																							97	109
S5	4	11	Qz	99.78			0.22																										100	118
S5	4	12	Cpx	51.82	0.96	3.66	6.98	0.48	13.48	21.42	1.19																						100	120
S5	4	13	Feohy +	1.70			98.30																										100	81
S5	4	14	Grt	39.12		20.89	36.88		2.62	0.49																							100	116
S5	4	15	Ep	40.75		25.36	8.33			22.56																							97	111
S5	4	16	mix	22.56		13.78	52.61		1.46	0.89	0.60	1.34	1.23			0.24															5.31	100	91	
S5	4	17	Grt	40.61		21.57	24.55	2.54	7.57	3.16																							100	120
S5	4	18	Ep	39.95		23.62	10.91		0.30	22.21																							97	111
S5	4.1	1	TiO2 +	1.49	96.11	0.33	1.20		0.49	0.38																							100	108
S5	4.1	2	Chl + TiO2	23.09	35.37	10.48	16.17		13.85	0.56	0.49																						100	101
S5	5	1	Grt	39.87		20.93	30.25	1.57	3.68	3.71																							100	114
S5	5	2	Ms	47.37	0.88	33.40	1.62		0.91		0.77	10.04																					95	111
S5	5	3	Grt	39.57		19.29	16.28	15.94	2.66	6.26																							100	117
S5	5	4	Ep	39.97		23.77	10.41	0.27		22.58																							97	113
S5	5	5	Rds+			2.52	2.02	76.91	1.65	3.82	1.32	0.25								0.59					8.70					2.22		100	81	
S5	5	6	Chl	26.81		21.34	19.39		17.46																								85	99
S5	5	7	Chl +	33.16		24.77	24.49	0.31	15.66			1.61																					100	95
S5	5	8	Chl	25.18		20.96	27.12		11.74																								85	89
S5	5	9	Chl	24.90		22.21	25.54		12.35																								85	96
S5	5	10	Grt	39.36		20.76	31.56	1.22	1.60	5.50																							100	114
S5	5	11	Ep	40.18		24.32	9.59			22.91																							97	107
S5	5	12	Ab	69.05		18.74	0.47			0.29	11.46																						100	118
S5	5	13	Ms	48.88	0.28	31.42	2.27		1.53		0.95	9.68																					95	113
S5	5	14	Grt	39.89		21.21	27.52	0.48	2.71	8.19																							100	113
S5	5	15	Chl	25.18		22.52	23.49	0.37	13.14		0.31																						85	98



Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total	
S5	5	16	Chr		0.54	20.58	29.16		8.90										40.82													100	106	
S5	5	17	Fl				1.19		0.63	63.53					34.65																		100	87
S5	5	18	Feohy +	11.05			85.99			1.13	0.74			0.83		0.26																	100	84
S5	5	19	Ep	40.27		24.44	10.53			21.75																							97	113
S5	5	20	Feohy +	3.38	3.01	1.60	84.37			0.58	0.52																				6.55		100	94
S5	5	21	Ep	38.99	5.18	22.04	10.31			20.22		0.25																					97	109
S5	5.1	1	Qz	99.40		0.35	0.25																										100	121
S5	5.1	2	Ep	40.51		24.56	9.57			22.36																							97	111
S5	5.1	3	Feohy +	2.82		1.57	94.03			0.45			1.12																				100	84
S5	5.1	4	Qz + Ms	80.42		10.92	1.78		1.50		0.34	4.24		0.80																			100	106
S5	5.1	5	Py	0.26			28.68							71.06																			100	230
S5	6	1	Chl	26.14		21.19	22.63	0.23	14.82																								85	96
S5	6	2	Grt	39.46		20.99	32.87	1.10	3.31	2.28																							100	110
S5	6	3	Ep	39.87		22.29	12.38	0.26		22.20																							97	105
S5	6	4	Chr			17.32	18.44		12.27									0.42	51.55														100	109
S5	6	5	Grt	39.49		20.70	31.57	0.83	1.16	6.26																							100	113
S5	6	6	Grt	39.87		21.14	28.09	2.84	4.94	3.12																							100	115
S5	6	7	Chr			16.81	17.55		11.75									0.34	53.55														100	109
S5	6	8	Spl			32.70	16.01		15.76										35.53														100	110
S5	6	9	Grt	39.57		20.94	31.01	3.10	3.53	1.85																							100	112
S5	6	10	Grt	40.08		21.37	27.68	0.71	4.74	5.42																							100	112
S5	6	11	Chl	26.34		21.66	22.87	0.26	13.88																								85	100
S5	6	12	Grt	39.32		21.12	30.37	3.94	3.07	2.19																							100	116
S5	6	13	Ep	40.05		25.14	9.03		0.49	22.28																							97	110
S5	6	14	Chl	26.35		20.95	22.09		15.61																								85	100
S5	6	15	Grt	39.69		21.04	34.29		3.89	1.09																							100	117
S5	6	16	Grt	39.55	1.52	21.04	25.41	0.64	6.01	5.84																							100	118
S5	6	17	Pg	48.46		37.34	1.09				7.10	1.02																					95	109
S5	6	18	Qz	100.00																													100	120
S5	6	19	Chl	27.01		21.33	29.69		6.97																								85	100
S5	6	20	Feohy +	1.47			96.49	0.84	1.20																								100	95
S5	7	1	Grt	39.38		21.03	31.09	0.92	1.98	5.59																							100	115
S5	7	2	Feohy+	4.30	0.70	1.38	90.04			0.60																					2.98		100	86
S5	7	3	TiO2		97.89		0.38											1.73															100	107
S5	7	4	Brt											36.71					-0.09				1.10		62.29								100	113
S5	7	5	Grt	39.22		20.77	32.77	0.89	2.01	4.34																							100	115
S5	7	6	Ep	39.96		22.56	11.69	0.27		22.51																							97	110
S5	7	7	Feohy +	2.41			84.51			0.89	0.61																				11.58		100	77
S5	7	8	Feohy +	4.16			92.69			0.70			1.64							0.81													100	80
S5	7	9	Grt	39.51		20.88	34.06	1.08	3.43	1.05																							100	111
S5	7	10	Grt	38.22	0.46	9.76	39.57	0.34	3.64	5.90		0.70		0.73					0.69														100	110
S5	7	11	Chl	26.50	1.90	20.17	21.43	1.11	13.90																								85	96
S5	7	12	Qz +	94.13		0.82	4.62			0.43																							100	108
S5	7	13	Grt	39.49		20.84	28.69	4.22	3.35	3.41																							100	115
S5	7	14	Ep	39.83		20.97	13.89			22.30																							97	109
S5	7	15	Chl	25.75		22.07	23.25		13.93																								85	96
S5	7	16	Chl	26.34		20.87	23.21		14.26		0.32																						85	95
S5	7	17	Grt	39.38		21.13	30.90	1.56	3.01	4.02																							100	113
S5	7	18	Qz +	89.99		3.26	4.43		2.32																								100	112
S5	7	19	Ttn	32.86	37.02	1.55	2.08			26.50																							100	107

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S5	7	20	Ap				0.24			48.69			44.07		5.56																1.45	100	114
S5	7.1	1	Ms	49.73	0.48	29.60	2.76		2.05		1.00	9.38																				95	111
S5	7.1	2	Qz	99.24		0.36	0.41																									100	121
S5	7.1	3	Grt	35.90		19.31	26.85		16.02	0.88	0.51			0.55																		100	100
S5	7.1	4	Grt	39.96		21.24	28.39	1.54	2.48	6.39																						100	113
S5	7.1	5	Py	0.30			28.87							70.83																		100	225
S5	7.1	6	Ms	47.52	0.51	32.67	2.61		1.52		0.97	9.20																				95	107
S5	8	1	Grt	39.88		21.26	30.93	1.78	5.12	1.03																						100	112
S5	8	2	Garbage				0.46			3.34	3.53																				92.66	100	108
S5	8	3	"Ilm"	1.68	60.41		36.68		1.24																							100	102
S5	8	4	TiO2		100.00																											100	106
S5	8	5	Ep	39.90		22.75	11.44		1.53	21.39																						97	106
S5	8	6	Ep	39.71		21.77	13.07			22.44																						97	105
S5	8	7	Chl + Ill +	46.60		21.70	8.63		4.14	16.55		2.38																				100	101
S5	8	8	Qz	100.00																												100	115
S5	8	9	TiO2		99.23		0.77																									100	105
S5	8	10	Chl	28.00		17.60	22.75	0.28	16.11	0.25																						85	98
S5	8	11	Ttn	33.48	35.13	2.05	1.63			27.71																						100	110
S5	8	12	Spl			34.20	15.93		15.88										33.99													100	109
S5	8	13	Grt	39.82		21.00	29.90	0.84	3.07	5.37																						100	114
S5	8	14	Tur	42.78	0.47	25.69	7.54		7.68		2.84																					87	102
S5	8	15	Qz	100.00																												100	120
S5	8	16	Chl	27.48		21.58	21.50		14.06		0.38																					85	102
S5	8	17	Chl	27.98		16.89	26.70	0.31	12.45	0.24	0.43																					85	99
S5	9	1	Brt											36.71					0.01						63.28							100	114
S5	9	2	Chl	26.38		21.57	21.61		15.43																							85	97
S5	9	3	Ap						49.38				44.76		5.86																	100	118
S5	9	4	Spl			34.17	15.02		15.64										35.17													100	107
S5	9	5	Chr			9.21	18.22		10.75										61.82													100	104
S5	9	6	Tur +	58.60	0.59	25.64	5.65		6.65	0.76	2.13																					100	102
S5	9	7	TiO2		99.62		0.38																									100	102
S5	9	8	Qz	99.50		0.50																										100	120
S5	9	9	Chl	26.72		20.92	21.62		15.73																							85	99
S5	9	10	Chl	25.54		22.40	23.17		13.89																							85	98
S5	9	11	Ep	40.08		26.15	7.44			23.32																						97	100
S5	9	12	Chr			18.71	31.62		7.20										42.48													100	104
S5	9	13	Ep	42.42	0.38	23.72	5.16	0.27	3.31	20.98		0.76																				97	107
S5	9	14	Ep	40.03		25.71	8.42	0.23		22.60																						97	109
S5	9	15	Chr			20.22	20.43		12.38										46.97													100	93
S5	10	1	Chl	25.25		21.05	26.58	0.24	11.55		0.33																					85	100
S5	10	2	Ep	39.87		23.43	11.09		0.52	22.09																						97	107
S5	10	3	Qz	99.75			0.25																									100	118
S5	10	4	Grt	40.05		20.91	25.86	2.07	1.60	9.50																						100	110
S5	10	5	Grt	39.17	0.31	19.65	17.03	20.24	2.48	1.13																						100	112
S5	10	6	Grt	39.70		20.93	30.58	2.21	4.51	2.07																						100	113
S5	10	7	Chr			22.32	20.19		11.60										45.89													100	110
S5	10	8	Grt	39.88		20.78	28.50	2.51	3.71	4.63																						100	116
S5	10	9	Zrn	31.25																					68.75							100	120
S5	10	10	Chl	27.04		21.16	21.16		15.37										0.27													85	100
S5	10	11	Spl			41.30	14.50		17.67										26.52													100	111

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S5	10	12	Grt	39.46		21.09	32.82	0.47	4.22	1.94																					100	115	
S5	10	13	Fl				0.43			58.47					41.11																	100	96
S5	10	14	Ap				0.39			46.47	1.11		37.67	1.25	6.78													1.18		5.14	100	100	
S5	10	15	Grt	39.69		20.95	30.13	1.62	3.13	4.48																						100	112
S5	10	16	Grt	39.59		21.09	33.04	0.48	3.21	2.57																						100	111
S5	10	17	Ep	47.93	0.25	19.14	10.19			19.50																						97	106
S5	11	1	Grt	40.18		21.35	28.81	0.94	6.11	2.60																						100	113
S5	11	2	Grt	40.84		21.26	24.33	2.83	7.64	3.09																						100	113
S5	11	3	Ep	40.67		25.99	8.06		0.37	21.91																						97	108
S5	11	4	Chr		0.40	21.05	24.76		10.11										43.69													100	106
S5	11	5	Tur	37.91	0.32	32.13	7.40		6.30	1.04	1.90																					87	100
S5	11	6	Dol	0.50				1.63	18.77	33.10																						54	57
S5	11	7	Grt	39.61		20.91	25.92	3.28	1.07	9.22																						100	113
S5	11	8	Grt	39.75		21.13	28.29	0.78	3.75	6.29																						100	115
S5	11	9	Cpx	54.95		2.11	3.54		16.77	22.02									0.59													100	118
S5	11	10	Chl	26.18	0.24	20.87	21.02	0.27	16.07		0.35																					85	99
S5	11	11	Ep	40.09		21.92	12.51			22.47																						97	112
S5	11	12	Spl			35.85	16.59		15.05										32.51													100	113
S5	11	13	Spl			29.37	16.64		15.06										38.93													100	111
S5	11	14	Chr		0.61	11.84	34.80		6.21										46.54													100	106
S5	11	15	Grt	39.43		21.07	30.98	3.65	2.83	2.05																						100	113
S5	11	16	Ap +	1.41		0.79	0.46		0.45	56.88	0.45		24.58	0.65	12.94																1.38	100	96
S5	11	17	Qz	99.46			0.23												0.32													100	119
S5	11	18	Chr			23.74	15.48		14.17										46.61													100	107
S5	12	1	Feohy	4.96			95.04																									100	83
S5	12	2	Chl	26.50		19.31	23.79	0.88	14.14		0.38																					85	98
S5	12	3	Ep	39.81		22.53	11.97	0.33		22.36																						97	110
S5	12	4	Chl	33.49		17.60	23.04	3.58	1.16	6.14																						85	114
S5	12	5	Ep	39.21	0.52	22.73	11.90		2.94	19.69																						97	108
S5	12	6	TiO2		99.60		0.40																									100	106
S5	12	7	Qz +	78.99	3.10	10.66	1.43		1.74			4.09																				100	116
S5	12	8	Qz	99.74			0.26																									100	116
S5	12	9	Feohy +	4.66		1.04	93.82			0.48																						100	80
S5	12	10	Feohy	5.85		0.85	92.04		0.68	0.58																						100	83
S5	12	11	Dol +	3.01		1.17	1.38	3.01	27.06	51.69					12.70																	100	33
S5	12	12	Grt	40.66		21.61	26.20	1.40	9.59	0.54																						100	115
S5	12	13	Feohy +	5.72		0.84	91.93		1.05	0.47																						100	81
S5	12	14	Pmp	46.06		23.70	0.33			25.91																						96	109
S5	12	15	Hbl	48.48	0.53	9.01	8.60		15.23	11.75	1.35								2.05													97	112
S5	12	16	Grt	39.67		20.97	28.99	1.75	2.23	6.39																						100	112
S5	12	17	Grt	39.44		20.26	27.14	0.44	2.66	7.07														2.99								100	111
S5	12	18	Grt	39.82		20.92	31.63	0.87	4.31	2.46																						100	114
S5	13	1	Zrn	30.97																				67.44					1.59			100	122
S5	13	2	Tur	38.65		31.17	7.80		6.65		2.74																					87	98
S5	13	3	Grt	39.99		21.04	26.13	1.35	1.74	9.75																						100	111
S5	13	4	Chr			6.36	20.29		9.54									0.37	63.43													100	104
S5	13	5	Spl			33.89	15.94		16.76										33.41													100	106
S5	13	6	TiO2		99.04		0.96																									100	103
S5	13	7	Grt	40.06		21.26	23.72	1.12	4.26	9.58																						100	108
S5	13	8	Chl	27.18		19.54	24.98		13.30																							85	95

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S5	13	9	Grt	39.53		20.96	23.72	10.72	3.94	1.13																					100	109	
S5	13	10	Chr			24.29	18.48		13.29										43.94													100	106
S5	13	11	Ap							48.90			44.48		5.05																1.58	100	121
S5	13	12	Ep	40.82		28.07	5.51	0.26		22.04	0.30																					97	111
S5	13	13	Spl			26.81	16.98		14.20										42.01													100	110
S5	13	14	Chr			12.58	18.51	1.59	10.05										56.70				0.57									100	109
S5	13	15	Chr			12.97	18.95		11.65										56.42													100	107
S5	13	16	Chl	27.19		19.75	25.81	0.31	11.65		0.29																					85	95
S5	13	17	Ep	40.08		24.91	9.30			22.71																						97	110
S5	13	18	Spl			28.53	16.33		15.34										39.79													100	109
S5	13	19	Chr			15.07	21.75		10.95										52.22													100	106
S5	14	1	Spl		0.41	50.34	13.28		18.50										17.46													100	109
S5	14	2	Tur	38.37	0.53	31.05	8.98		5.40		2.67																					87	96
S5	14	3	TiO2		98.96		0.40												0.64													100	105
S5	14	4	Chr		0.42	19.79	14.87		14.81									0.34	49.77													100	108
S5	14	5	Chr		0.35	8.79	21.61		8.52										60.73													100	106
S5	14	6	Chr			9.72	22.97		7.31									0.42	59.57													100	107
S5	14	7	Ttn	33.07	37.01	1.76	0.41			27.75																						100	108
S5	14	8	Grt	39.41		20.78	29.34	0.70	1.88	7.89																						100	112
S5	14	9	Ep	40.31		24.46	9.31			22.91																						97	108
S5	14	10	Ep	41.29		26.74	2.59		3.40	22.98																						97	107
S5	14	11	Ep	39.91	0.46	21.60	13.05		21.99																							97	112
S5	14	12	Grt	39.42		20.88	34.79	0.61	3.21	1.09																						100	115
S5	14	13	Ap							49.89			44.78		3.64	0.17															1.52	100	123
S5	14	14	Chr			15.57	19.50		10.80										54.13													100	111
S5	14	15	Ms	51.09	0.29	26.24	4.22		2.72		0.32	10.13																				95	106
S5	14	16	Ap				0.41			48.77			44.48		3.96	0.73															1.64	100	121
S5	14	17	Chl	27.80		20.89	20.02		15.79		0.49																					85	95
S5	15	1	Spl			25.98	18.39		13.34										42.28													100	109
S5	15	2	Grt	39.28	0.29	20.73	27.91	4.25	1.52	6.01																						100	113
S5	15	3	Chr			14.84	20.71		9.97									0.35	54.13													100	105
S5	15	4	Feohy +	3.77			95.77			0.46																						100	83
S5	15	5	Ttn	34.73	32.33	3.74	2.69		0.40	26.12																						100	109
S5	15	6	Chl	28.83		19.56	25.61		10.35	0.38									0.27													85	99
S5	15	7	Ep	40.22		26.33	7.93	0.23		22.29																						97	110
S5	15	8	TiO2		99.67		0.33																									100	108
S5	15	9	Ap +	1.25						44.95	0.95		39.89	1.13	8.15									3.28							0.40	100	113
S5	15	10	Grt	39.72		20.82	29.44	0.43	1.51	8.08																						100	111
S5	15	11	Grt	39.51		21.00	27.47	3.11	1.54	7.02									0.35													100	110
S5	15	12	Grt	39.42		21.09	30.11	3.86	3.43	2.08																						100	109
S5	15	13	Chl	26.12		22.26	30.41		6.21																							85	94
S5	15	14	Chl	24.57		22.20	27.60		10.63																							85	97
S5	15	15	Chl	28.18		19.52	18.48		18.83																							85	96
S5	15	16	Ep	39.96		22.47	12.29			22.28																						97	106
S5	15	17	Ab	64.80	0.90	20.93	0.90		0.81	0.68	9.44	1.56																				100	109
S5	15	18	Ttn	32.95	36.88	1.61	0.95			27.61																						100	109
S5	15.1	1	Fl +		3.34		0.25			54.06					42.36																	100	105
S5	15.1	2	Ttn	31.85	34.41	4.53	0.41			26.69					2.12																	100	111
S5	15.1	3	TiO2	0.79	95.59		2.38			1.25																						100	106
S5	16	1	Feohy +	4.36			94.97			0.35									0.32													100	82



Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total		
S5	16	2	Chr			9.07	21.79		8.97									0.43	59.74													100	106		
S5	16	3	TiO2		100.00																												100	107	
S5	16	4	Feohy +	3.15		3.11	91.84												1.08		0.83												100	92	
S5	16	5	Ep	39.71		21.87	13.10			22.32																							97	108	
S5	16	6	Ap							48.85			43.93		5.23	0.35															1.64		100	121	
S5	16	7	TiO2	0.91	97.12		1.97																										100	103	
S5	16	8	Spl			29.15	15.07		15.20										40.57															100	110
S5	16	9	Spl		0.39	26.23	20.04		13.90										39.43															100	111
S5	16	10	Feohy +	8.13		1.26	88.76			0.53			1.01						0.31															100	81
S5	16	11	Grt	39.93		20.41	18.48	3.73	0.48	16.98																								100	116
S5	16	12	Grt	39.22		20.74	16.47	15.49	0.57	7.51																								100	114
S5	16	13	Chl	26.83		19.96	22.70	0.30	15.20																									85	98
S5	16	14	Chl	26.85		20.01	22.63	0.23	14.71		0.57																							85	99
S5	16	15	Chl	25.15		22.25	30.78		6.49		0.33																							85	98
S5	16	16	Grt	39.41		20.96	32.04		1.61	5.98																								100	113
S5	16	17	TiO2 +	12.78	86.30		0.93																											100	108
S5	16	18	Grt	39.27		20.88	32.14	3.04	3.40	1.28																								100	113
S5	16	19	Ep	39.62		21.73	13.19	0.30		22.16																								97	109
S5	16	20	Grt	38.93		20.60	34.97	1.24	1.49	2.77																								100	116
S5	16	21	Grt	40.30		21.24	27.62	0.39	5.66	4.79																								100	119
S5	17	1	Pg	48.37		38.22	0.33				7.38	0.69																						95	106
S5	17	2	Grt	39.36		20.97	34.47	0.38	3.71	1.10																								100	112
S5	17	3	Chr			14.92	17.99		12.23										54.86															100	106
S5	17	4	Ep	40.21		22.99	11.27			22.53																								97	105
S5	17	5	Ep	40.34		24.91	9.06	0.36		22.33																								97	107
S5	17	6	Grt	39.51		20.64	20.58	11.18	2.36	5.72																								100	113
S5	17	7	Ep	41.33	1.13	20.70	7.60		7.91	17.82	0.50																							97	104
S5	17	8	Qz	100.00																														100	122
S5	17	9	Grt	39.14		21.01	24.76	6.85	2.13	6.11																								100	117
S5	17	10	Ep	40.85		24.91	8.70			22.17	0.37																							97	110
S5	17	11	Spl			28.73	17.43		13.89										39.94															100	110
S5	17	12	Grt	40.05		21.41	26.45	1.05	4.51	6.54																								100	115
S5	17	13	Grt	39.17		20.78	34.27	1.05	1.61	3.12																								100	113
S5	17	14	Ap				0.32		0.37	48.11			43.99	0.61	4.48	0.54																1.58		100	123
S5	17	15	Chl	26.76		21.21	27.00	0.31	9.29		0.42																							85	95
S5	17	16	Feohy +	8.62		0.88	89.20		0.55	0.76																								100	75
S5	17	17	Ap				0.23			48.47			43.42	0.45	5.19	0.38																1.86		100	122
S5	17	18	Qz +	91.94	0.51	4.59	1.02		0.63			1.32																						100	112
S5	18	1	Ol	40.41			17.82	0.32	41.46																									100	114
S5	18	2	TiO2 +	1.56	81.57	1.22	12.25	1.19		0.39																						1.83		100	98
S5	18	3	Ttn	32.06	37.30	0.89	2.14			26.88								0.73																100	110
S5	18	4	Ap +	1.17			0.34			47.19	0.86		38.67	0.99	7.63									3.18								-0.04		100	108
S5	18	5	Ep	40.95		22.17	8.57		2.76	22.53																								97	103
S5	18	6	Grt	39.56		20.99	29.56	0.92	1.38	7.60																								100	111
S5	18	7	Aln	37.32		22.72	8.64		0.47	14.66																	4.27	8.87	3.05					100	108
S5	18	8	Chl	27.19		19.90	25.79	0.39	10.99	0.31	0.42																							85	93
S5	18	9	Ap	1.31			0.32			43.83	1.29		39.63	1.40	7.93									3.19				0.98			0.12		100	114	
S5	18	10	Tur	37.54	0.57	31.89	9.87		4.58	0.55	1.98																							87	99
S5	18	11	Ep	40.16		24.19	10.07			22.58																								97	109
S5	18	12	Grt	39.11		20.95	34.17	0.39	2.19	3.19																								100	114

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S5	18	13	Feohy +	7.32			92.31			0.37																					100	78	
S5	18	14	Feohy +	2.26			97.74																								100	75	
S5	18	15	Ttn	33.19	36.96	1.54	0.67		0.35	27.28																					100	108	
S5	18	16	Qz	100.00																											100	117	
S5	18	17	Ap +	4.40	4.60	0.46	0.26			46.91			39.21		4.16																100	115	
S5	18	18	Qz +	89.70	1.83	4.48	1.34		0.95		0.33	1.36																			100	114	
S5	18	19	Ms	49.28	0.89	26.92	4.94		2.20		0.30	10.46																			95	106	
S5	18	20	Ttn	34.33	28.06	4.82	4.68		4.30	22.82								0.99													100	108	
S5	18	21	Aln	37.42		22.09	9.08		0.46	14.61																4.48	9.01	2.84			100	108	
S5	19	1	Chl	27.68		21.92	16.03	0.55	18.81																						85	104	
S5	19	2	TiO2 +	2.48	96.92		0.40			0.21																					100	105	
S5	19	3	Ep	40.35		26.25	7.79			22.62																					97	108	
S5	19	4	Ep	40.13		23.55	10.82			22.50																					97	107	
S5	19	5	Grt	39.96		20.76	26.69	2.86	1.94	7.79																					100	113	
S5	19	6	Zrn	30.86			0.33																	67.55						1.26	100	122	
S5	19	7	Grt	39.89		20.97	27.39	0.87	3.07	7.82																					100	113	
S5	19	8	Chr		0.40	24.34	29.74		9.17										36.34												100	106	
S5	19	9	Grt	39.63		20.83	22.94	6.98	0.95	8.67																					100	114	
S5	19	10	Ap							48.65			44.39		5.27																1.68	100	123
S5	19	11	Chr			22.63	15.23		14.39										47.74												100	111	
S5	19	12	Chl	28.01		19.74	28.25		8.69										0.31												85	95	
S5	19	13	Ttn	32.66	32.25	4.42	0.39			27.58					2.70																100	115	
S5	19	14	Grt	39.22		20.66	35.38	1.00	1.62	2.11																					100	115	
S5	19	15	Tur	38.43	0.90	30.02	6.77		7.84	0.40	2.65																				87	99	
S5	19	16	Ep	39.78		21.44	13.34			22.45																					97	112	
S5	19	17	Chr		0.34	7.91	24.03		7.93										59.79												100	110	
S5	19	18	Feohy +	6.33			93.67																								100	82	
S5	19	19	Grt	39.78		21.57	27.92	1.04	2.37	7.32																					100	115	
S5	19	20	Grt	40.79		21.66	23.82	2.76	10.36	0.61																					100	117	
S5	19	21	Ap							49.36			44.35		6.29																100	121	
S5	19	22	Chl	26.72		20.32	22.66	0.32	14.98																						85	98	
S5	20	1	Grt	39.29		20.99	34.33	0.82	3.74	0.82																					100	114	
S5	20	2	Spl			31.82	16.05		15.74										36.39												100	111	
S5	20	3	Grt	39.66		20.98	29.92	0.47	2.98	5.98																					100	112	
S5	20	4	Ap				0.30			47.82	0.88		39.85	1.64	6.99																2.52	100	107
S5	20	5	Ap							44.31	1.15		39.89	0.99	8.51													1.80		3.34	100	108	
S5	20	6	Grt	39.48		20.32	32.15	3.49	2.67	1.89																					100	114	
S5	20	7	TiO2		99.34		0.66																								100	109	
S5	20	8	Grt	39.06		20.92	33.33	1.24	1.43	4.03																					100	114	
S5	20	9	Ep	40.56		22.91	8.86		1.81	22.86																					97	108	
S5	20	10	Ep	41.23		24.35	9.12			21.67	0.64																				97	114	
S5	20	11	Qz	99.78			0.22																								100	125	
S5	20	12	Ap							49.29			44.90		4.28																1.53	100	124
S5	20	13	Grt	39.23		20.72	26.98	7.59	2.05	3.43																					100	113	
S5	20	14	Grt	39.66		20.86	25.44	2.59	1.18	10.27																					100	113	
S5	20	15	Garbage				1.24			3.54	3.43																			91.78	100	113	
S5	20	16	Chr			21.07	16.88		13.27									0.33	48.45												100	111	
S5	20	17	Chl	25.98	0.25	21.13	25.66		11.47			0.26							0.26												85	97	
S5	20	18	Zrn	30.33			0.45			0.43							0.65							66.48					1.66		100	114	
S5	21	1	Bt	38.36	4.92	17.09	18.22		9.10			8.30																			96	106	

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total	
S5	21	2	Tur	37.55	0.59	27.92	12.21		5.60	0.22	2.91																				87	98		
S5	21	3	Mix	32.55	18.00	11.64	13.54		10.32	13.95																						100	103	
S5	21	4	Amph	47.50	1.49	8.74	12.41	0.22	14.00	10.64	1.41	0.60																				97	115	
S5	21	5	Chr			21.97	17.06		13.35									0.35	47.27														100	112
S5	21	6	Chr			21.42	15.64		14.67										48.27														100	111
S5	21	7	Ep	40.29		24.98	9.63			22.10																							97	110
S5	21	8	Feohy +	5.04			93.79		0.74	0.43																							100	81
S5	21	9	Qz + Chl +	56.17		18.73	15.45		7.29		0.40	1.96																					100	109
S5	21	10	Grt	39.65		20.87	21.71	7.90	1.11	8.77																							100	112
S5	21	11	Feohy +	6.58			91.58		0.66	0.48									0.70														100	80
S5	21	12	Spl		0.37	27.54	18.59		14.23									0.36	38.91														100	108
S5	21	13	Grt	40.99		21.69	21.36	0.67	7.73	7.56																							100	115
S5	21	14	Grt	42.02		23.96	22.15	0.86	8.26	2.76																							100	126
S5	21	15	Grt	40.11		20.94	25.54	1.27	2.62	9.52																							100	113
S5	21	16	Ep	40.00		23.05	11.43			22.52																							97	112
S5	21	17	Garbage				3.68			7.41	0.85	0.50																			87.56	100	82	
S5	21	18	Spl			36.23	15.06		16.44										32.27														100	111
S5	21	19	Garbage		0.72		0.48			3.58	3.12								0.72													91.39	100	112
S5	22	1	Zrn	31.12																				67.32						1.56			100	118
S5	22	2	Cpy	0.17			22.49							52.93								24.40											100	198
S5	22	3	Feohy +	1.24	0.41		98.35																										100	90
S5	22	4	Chl	29.23		21.43	27.33		6.21		0.62	0.18																					85	97
S5	22	5	Grt	39.89		20.92	30.06	0.40	2.51	6.22																							100	113
S5	22	6	Spl			27.39	16.21		14.42										41.99														100	107
S5	22	7	Ep	39.86	0.58	20.47	13.87			22.22																							97	109
S5	22	8	Ep	39.17	0.37	18.66	10.52	9.59		18.68																							97	111
S5	22	9	Grt	39.55		20.65	25.11	6.53	1.12	7.05																							100	111
S5	22	10	Bt	34.34	1.57	16.65	30.43	0.40	4.66			7.95																					96	84
S5	22	11	Garbage				3.67			4.60	3.38	0.43			1.56																	86.36	100	30
S5	22	12	Qz	100.00																													100	119
S5	22	13	TiO2 +	0.51	88.75		10.52			0.21																							100	103
S5	22	14	Grt	39.90		21.28	29.31	0.70	4.47	4.35																							100	115
S5	22	15	Ep	39.15		21.86	12.76		0.59	22.64																							97	99
S5	22	16	TiO2 +	1.48	95.29	0.73	1.69			0.36									0.45														100	104
S5	22	17	Qz	99.79	0.21																												100	121
S5	22	18	Ep	40.31		26.65	7.26			22.79																							97	109
S5	23	1	Qz	100.00																													100	117
S5	23	2	Ms	50.01		27.21	4.38		2.36		0.34	10.47							0.23														95	106
S5	23	3	Spl			25.68	18.32		12.90									0.34	42.77														100	109
S5	23	4	Cpy	1.12		0.55	22.38					0.19		52.21								23.56											100	189
S5	23	5	Chr			14.84	16.61		12.93									0.52	55.09														100	109
S5	23	6	Dol				3.80	0.62	17.97	31.61																							54	57
S5	23	7	Spl		0.49	31.84	20.57		14.09									0.49	32.19		0.32												100	112
S5	23	8	Chl	26.06		21.48	22.24		15.22																								85	101
S5	23	9	Grt	39.29		20.75	31.55	2.71	3.42	2.28																							100	117
S5	23	10	Feohy				100.00																										100	98

Table B2.1: EDS analyses from sample S5.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	Sc2O3	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	SrO	ZrO2	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S5	23	11	Grt	39.84		21.08	32.21	0.51	5.27	1.09																						100	115
S5	23	12	Ep	40.67		28.40	5.17			22.76																						97	108
S5	23	13	Grt	40.12		20.84	26.23	0.72	2.05	10.03																						100	112
S5	23	14	Grt	40.20		21.14	26.99	0.65	6.00	4.78									0.24													100	115
	Notes																																
	" " = indicates that mineral is altered																																
	+ = indicates that other minerals are present																																



B3: SEM-BSE images and EDS  
mineral analyses for sample S8.

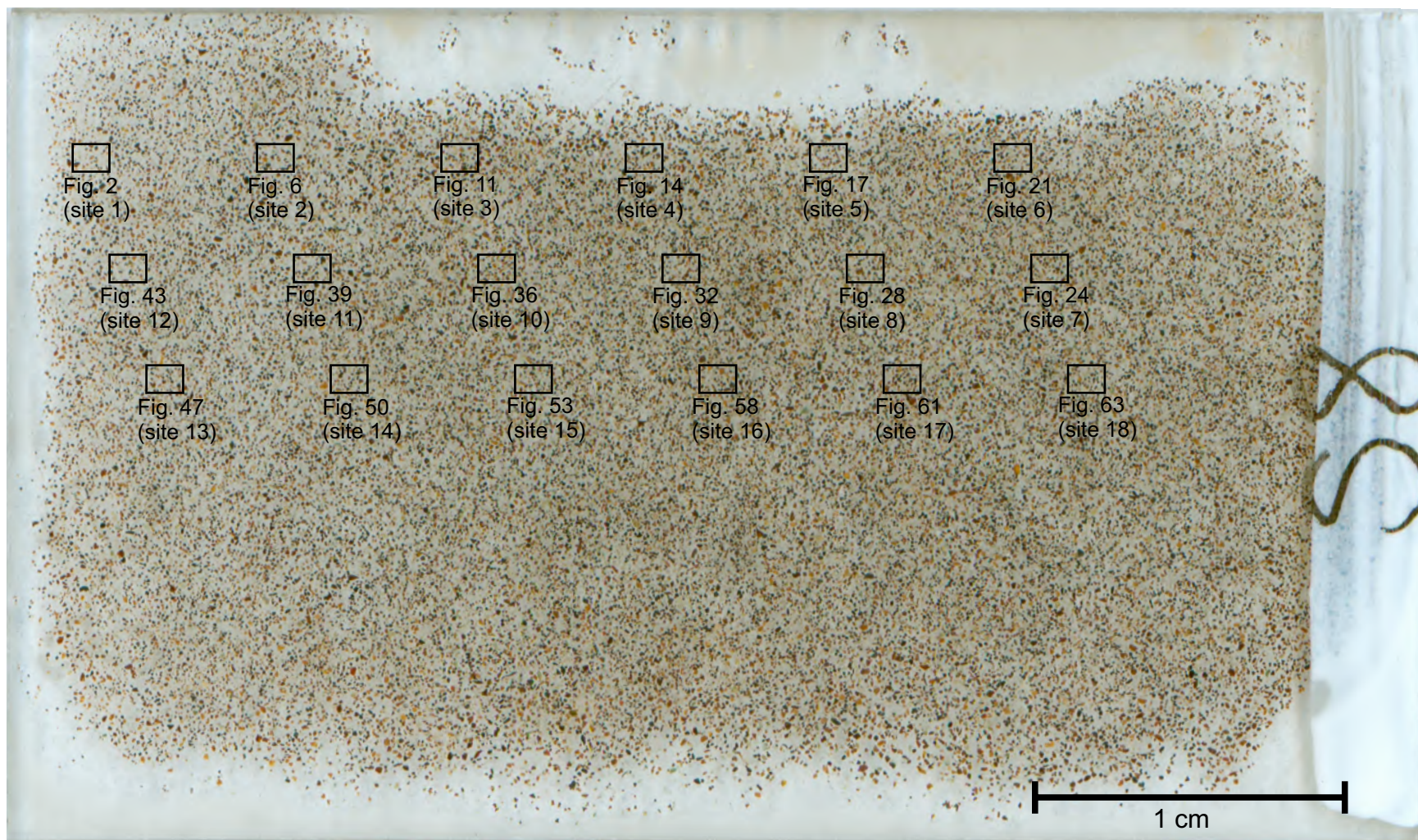


Figure B3.1: Scanned thin section of sample S8 showing the location of the analysed sites. This sample consists of medium sand coming from an overbank deposit.



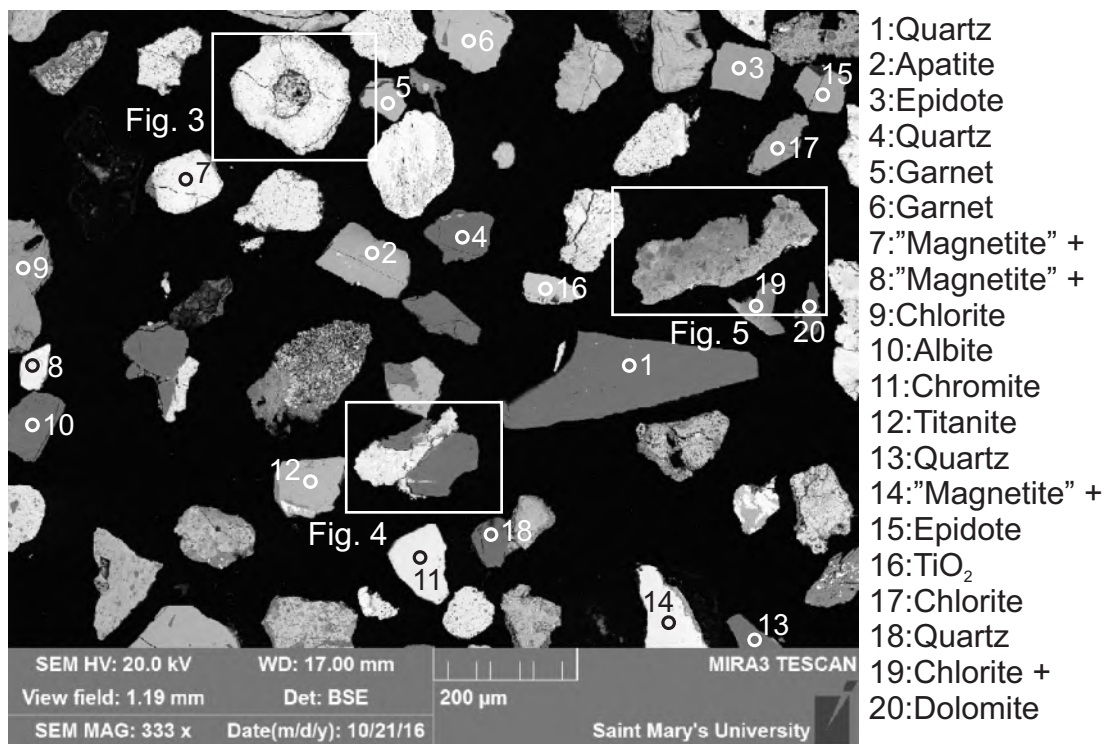


Figure B3.2: Sample S8 site 1 (SEM).

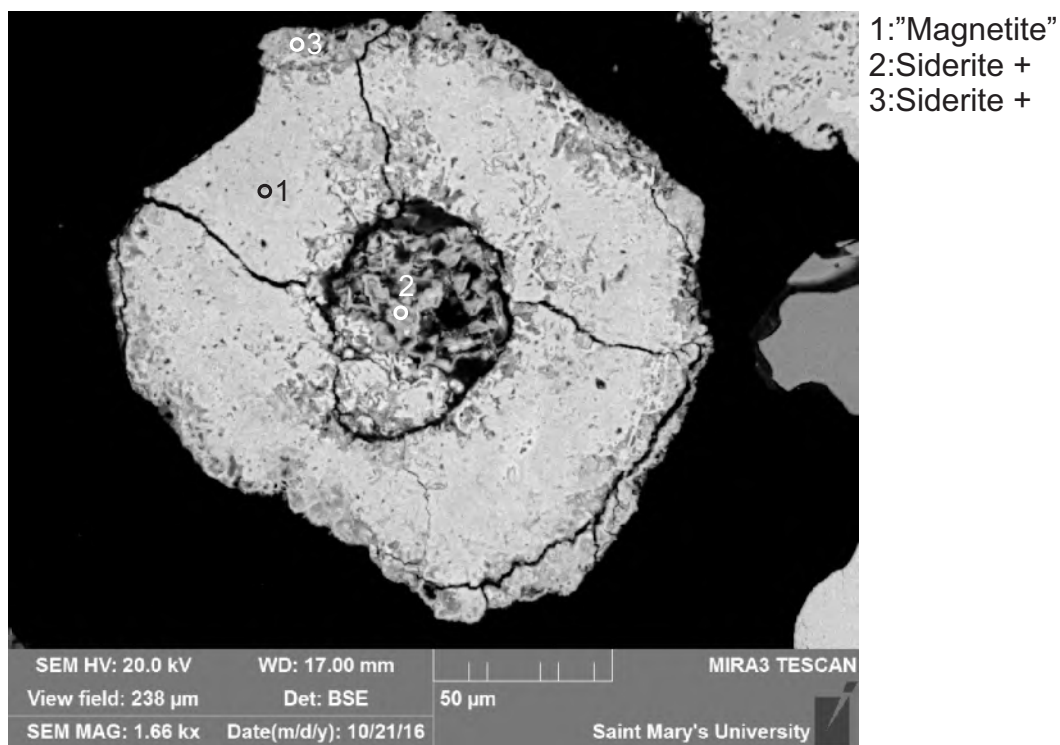
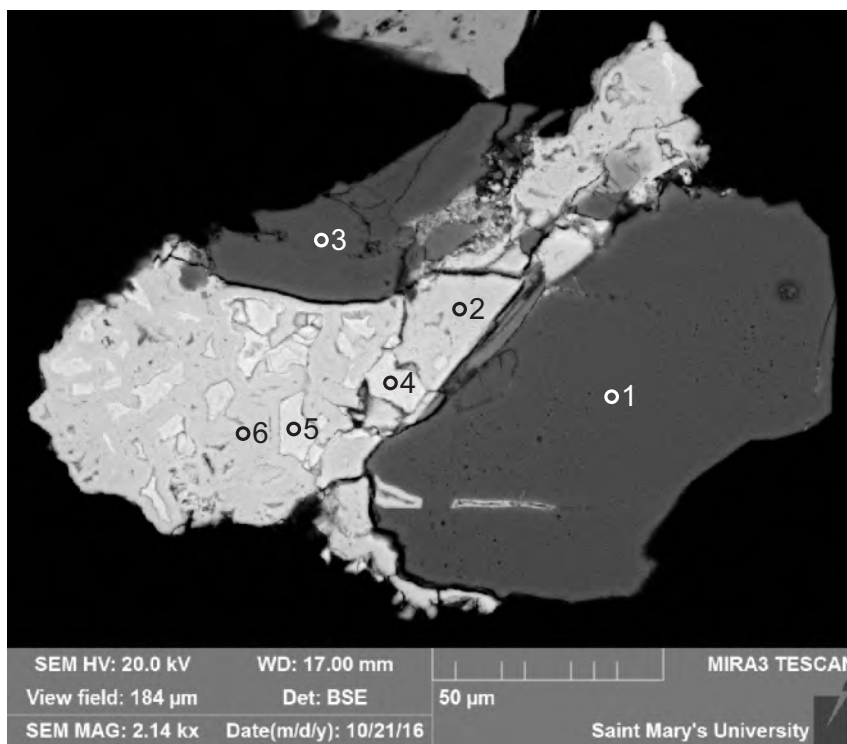
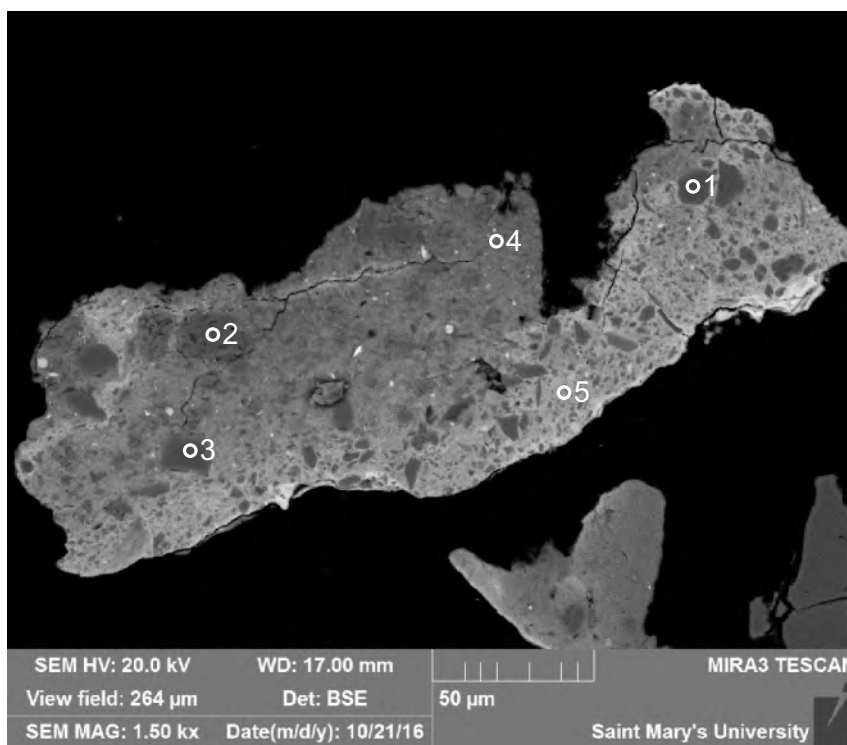


Figure B3.3: Sample S8 site 1.2 (SEM).



- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Albite
- 4:"Magnetite" +
- 5:"Magnetite" +
- 6:Fe-oxide/hydroxide +

Figure B3.4: Sample S8 site 1.3 (SEM). Lithic clast of quartz, albite, and Fe-oxide/hydroxide (hydrothermal?).



- 1:Quartz
- 2:Quartz
- 3:Quartz
- 4:Chlorite + Illite
- 5:Chlorite +

Figure B3.5: Sample S8 site 1.4 (SEM). Siltstone or altered volcanic lithic clast made up of quartz supported in a chlorite + illite matrix.



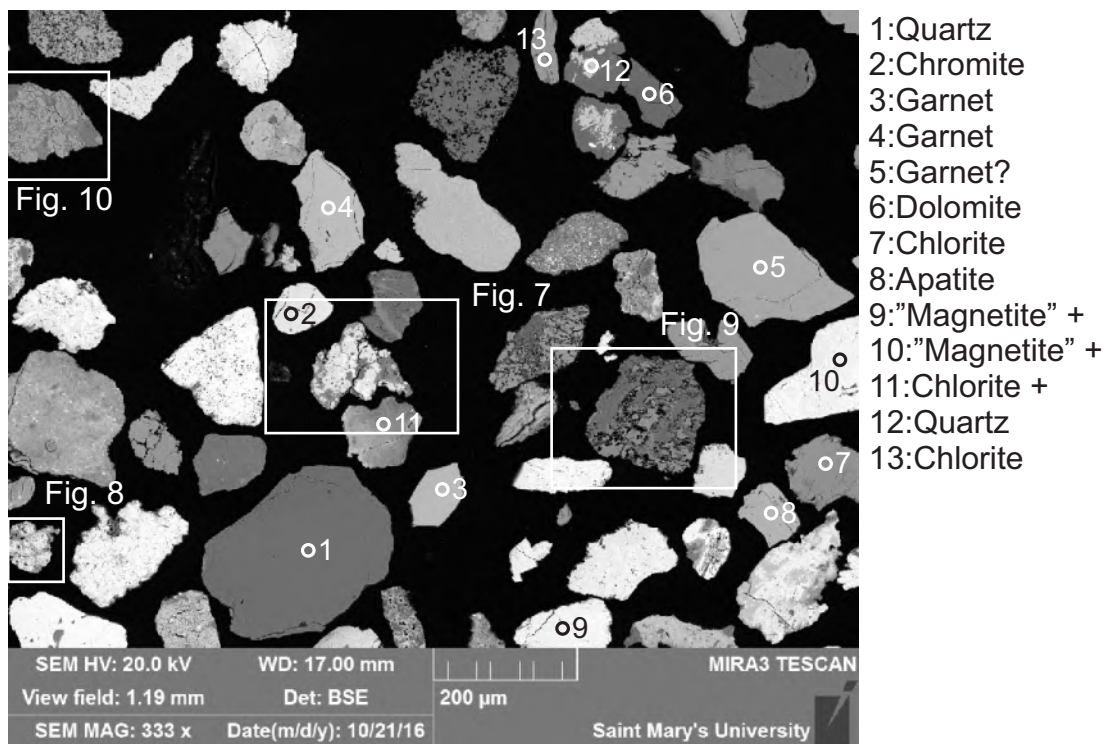


Figure B3.6: Sample S8 site 2 (SEM).

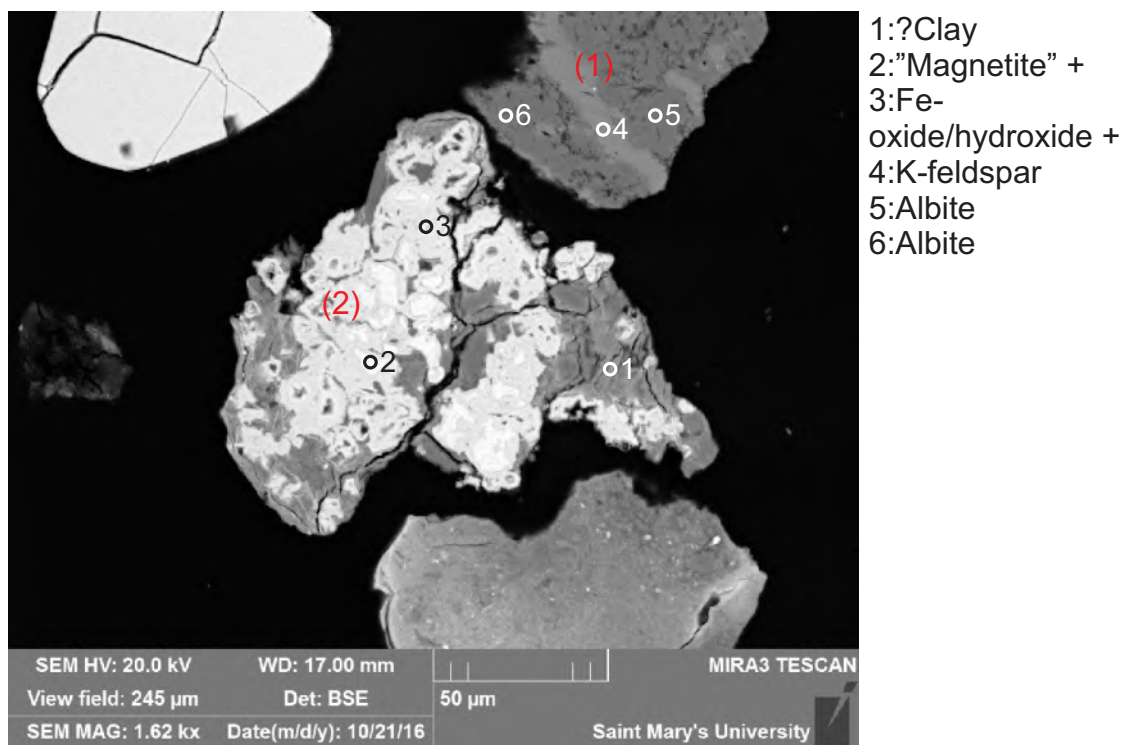
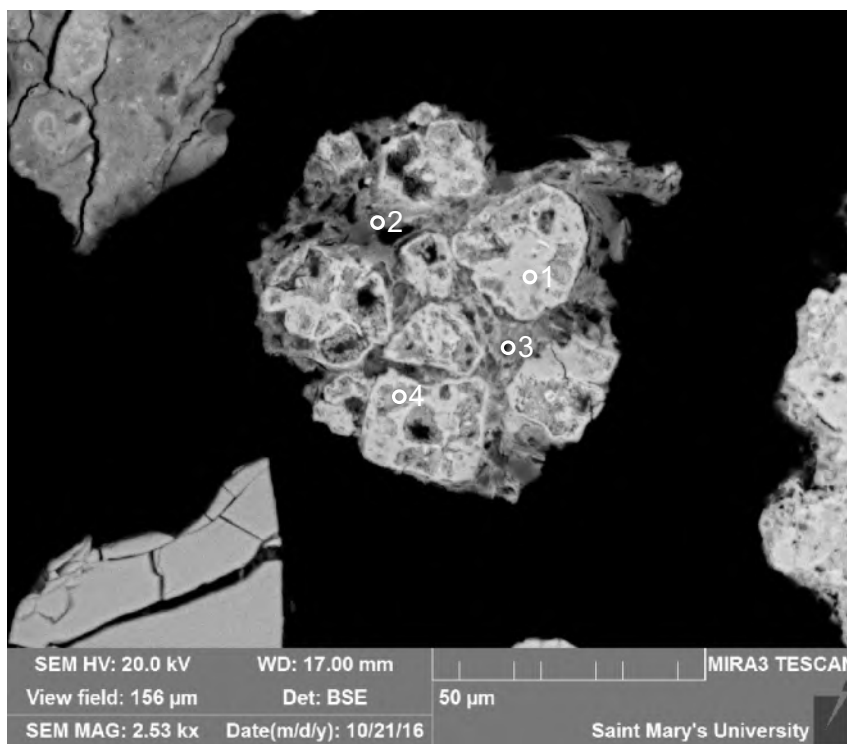
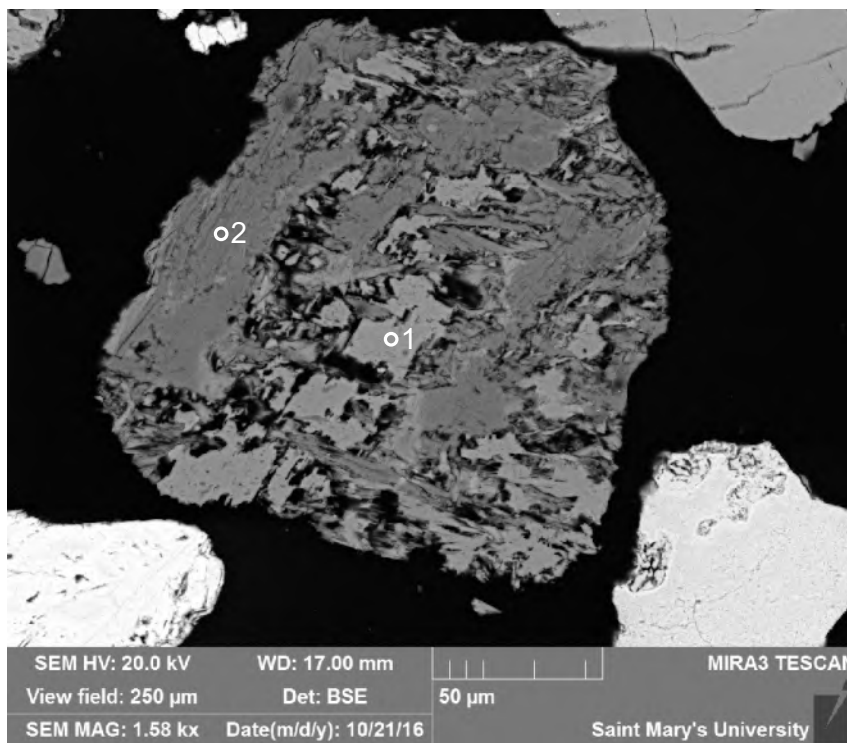


Figure B3.7: Sample S8 site 2.2 (SEM). 1: Granitic lithic clast (albite + K-feldspar). 2: Lithic clast (clay + Fe-oxide/hydroxide, hydrothermal).



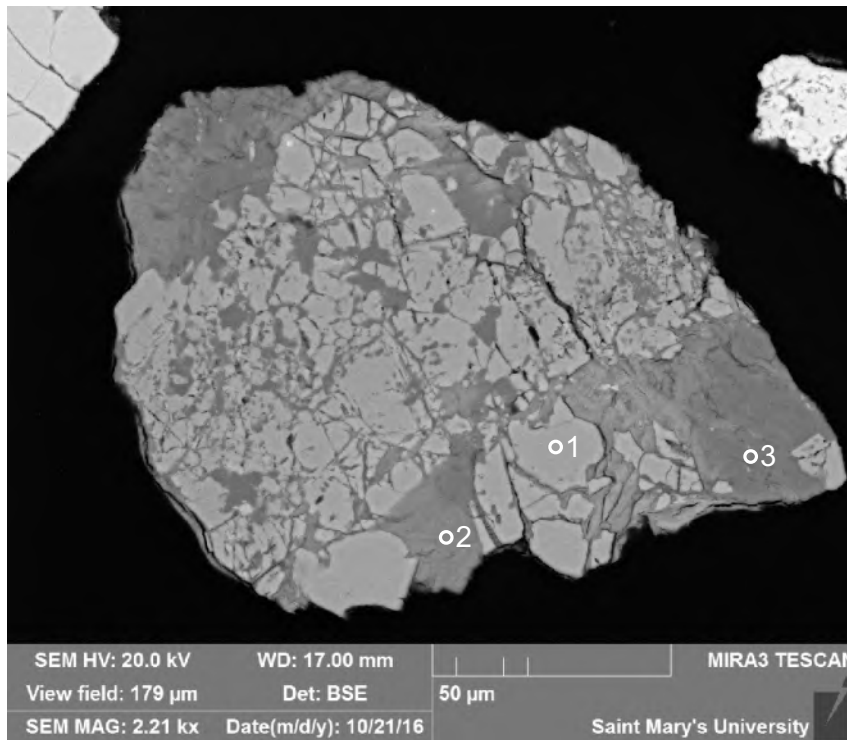
- 1:Fe-oxide/hydroxide +
- 2:Chlorite +
- 3:Chlorite +
- 4:Fe-oxide/hydroxide +

Figure B3.8: Sample S8 site 2.3 (SEM). Lithic clast composed of chlorite, possibly illite, and Fe-oxide/hydroxide, mineralized igneous or pedogenic.



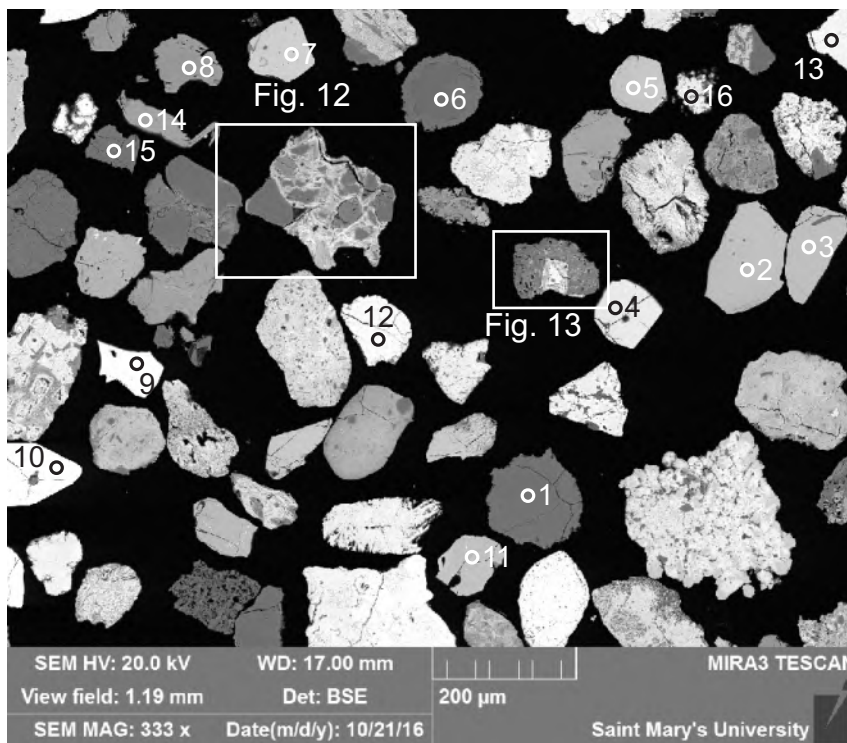
- 1:Epidote
- 2:Albite + Kaolinite

Figure B3.9: Sample S8 site 2.4 (SEM). Lithic clast of epidote + albite (vein probably in ophiolite).



- 1:Epidote
- 2:Chlorite
- 3:Albite

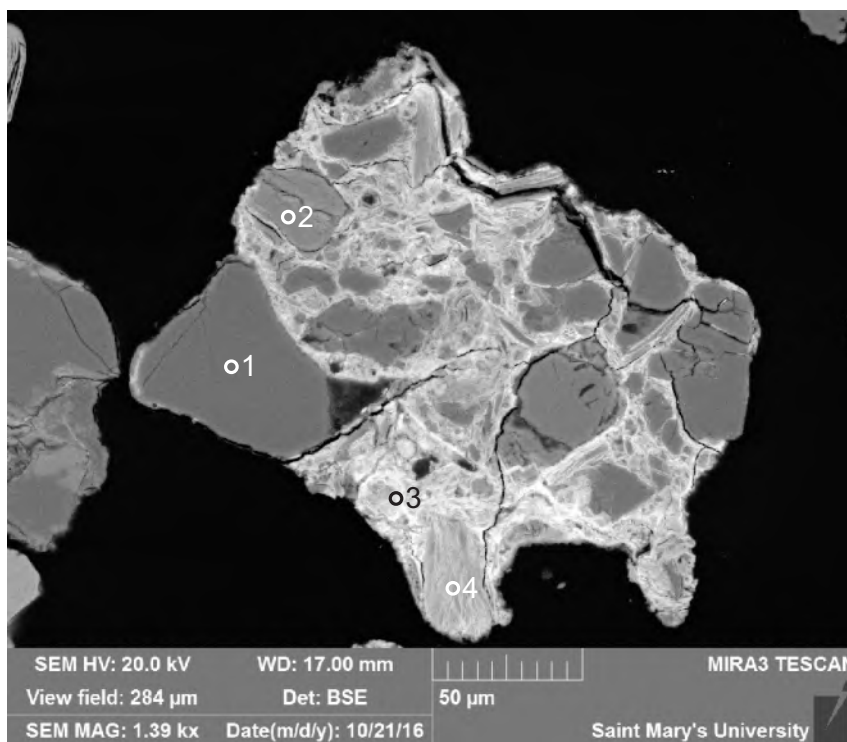
Figure B3.10: Sample S8 site 2.5 (SEM). Lithic clast of epidote + albite + chlorite (epidote-quartz vein probably in ophiolite).



- 1:Quartz
- 2:Spinel
- 3:Garnet
- 4:Chromite
- 5:Spinel
- 6:Quartz
- 7:TiO<sub>2</sub>
- 8:Epidote
- 9:Fe - oxide/hydroxide
- 10:Zircon
- 11:Apatite
- 12:"Magnetite" +
- 13:"Magnetite" +
- 14:Biotite
- 15:Quartz
- 16:"Magnetite" +

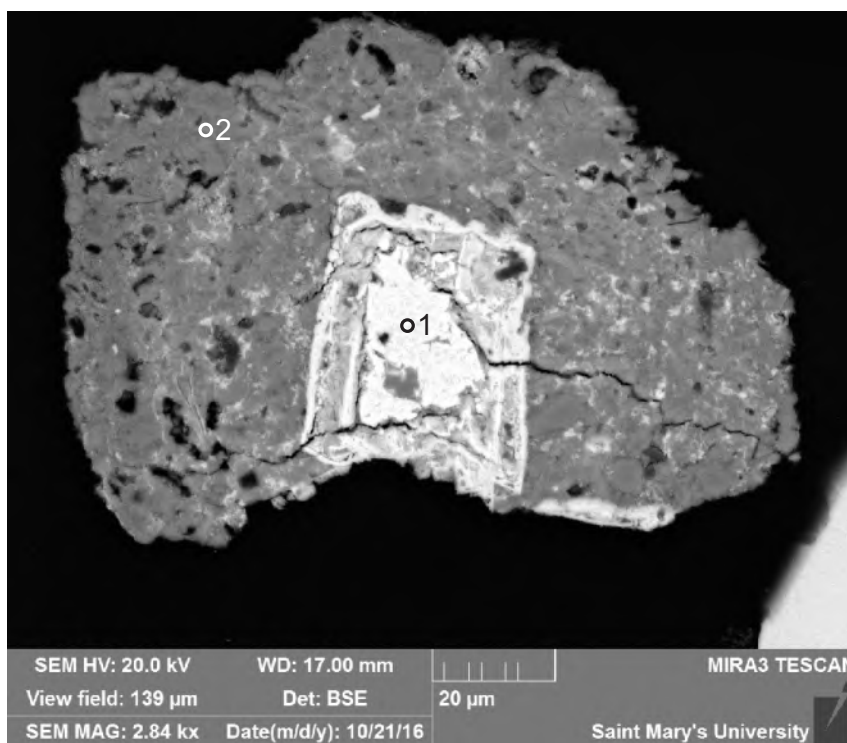
Figure B3.11: Sample S8 site 3 (SEM).





- 1:Quartz
- 2:K-feldspar
- 3:Fe-oxide/hydroxide +
- 4: Chlorite + Fe-oxide/hydroxide

Figure B3.12: Sample S8 site 3.2 (SEM). Siltstone lithic clast composed of subrounded quartz, K-feldspar, chlorite, and Fe-oxide/hydroxide, possibly pedogenic.



- 1:Fe-oxide/hydroxide +
- 2:Clay

Figure B3.13: Sample S8 site 3.3 (SEM). Pedogenic or mudstone lithic clast.



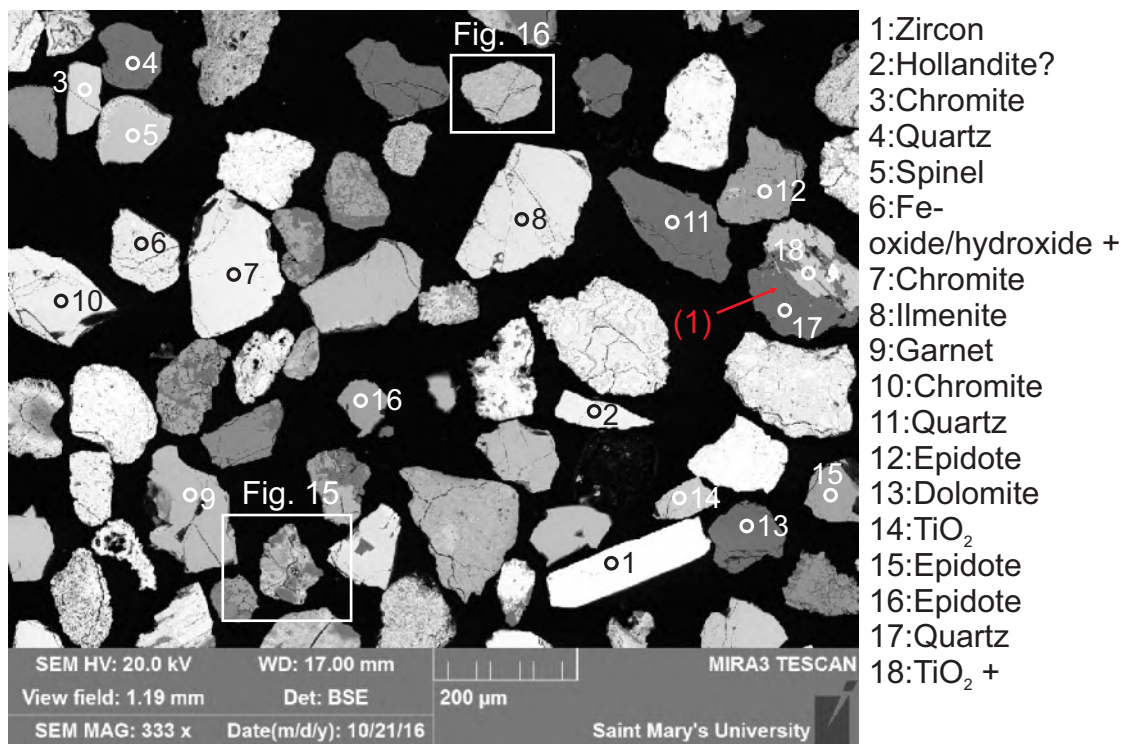


Figure B3.14: Sample S8 site 4 (SEM). 1: Lithic clast of quartz + titania (metamorphic).

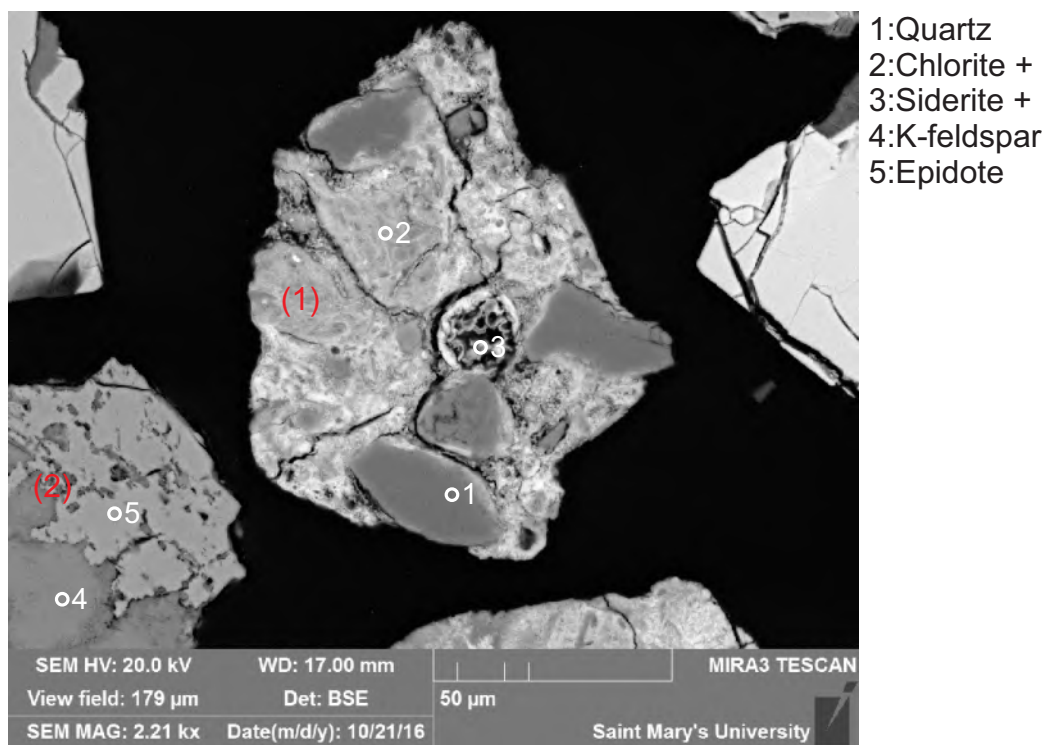
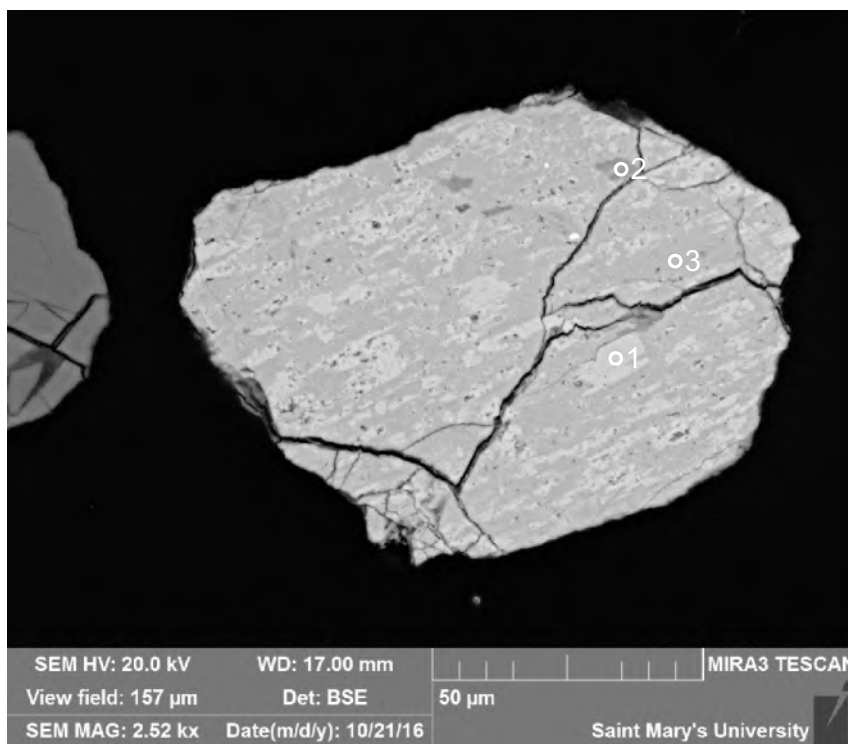
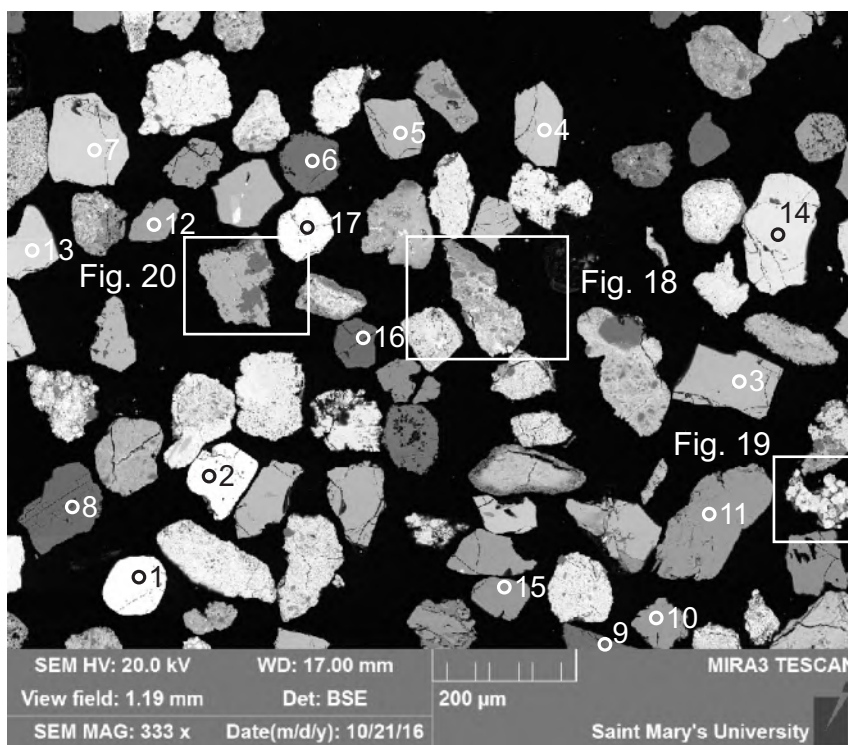


Figure B3.15: Sample S8 site 4.2 (SEM). 1:Siltstone lithic clast (quartz, chlorite, and siderite). 2: Lithic clast (epidote and K-feldspar, epidotized felsic igneous or hydrothermal).



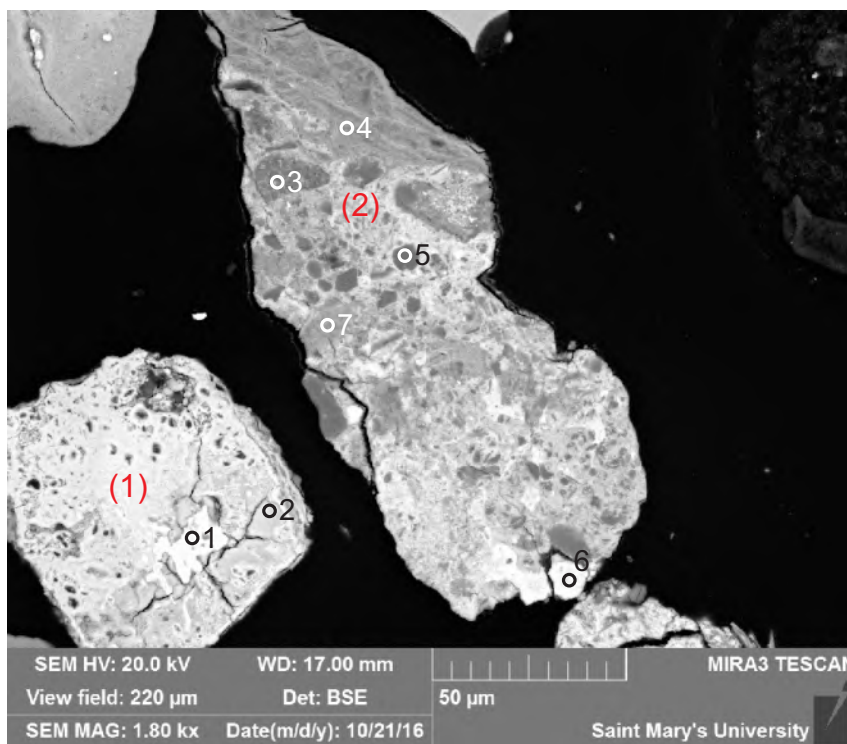
1:TiO<sub>2</sub> +  
2: ?Garnet  
3: Titanite

Figure B3.16: Sample S8 site 4.3 (SEM). Lithic clast of titanite, titania, and ?garnet (metamorphic).



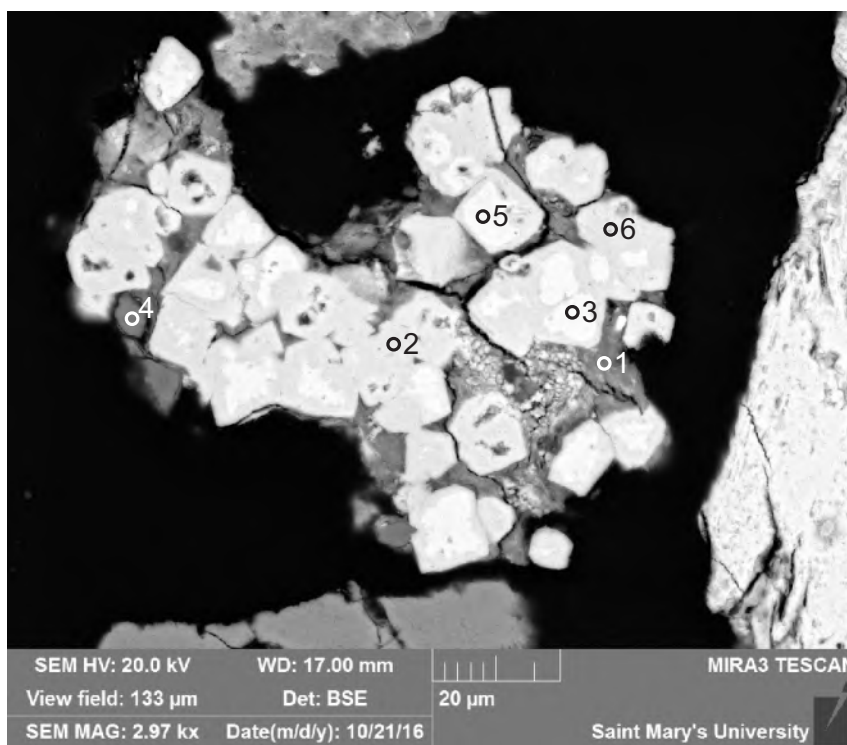
1:Zircon  
2:Zircon  
3:Garnet  
3: Titanite  
4:Chromite  
5:Spinel  
6:Quartz  
7:Chromite  
8:Dolomite  
9:Quartz  
10:Epidote  
11:Chlorite  
12:Epidote  
13:Chromite  
14:Chromite  
15:Epidote  
16:Dolomite  
17:Fe-oxide/hydroxide +

Figure B3.17: Sample S8 site 5 (SEM).



- 1:"Magnetite"
- 2:Fe-oxide/hydroxide +
- 3:Quartz +
- 4:?Chlorite
- 5:Quartz +
- 6:Mn - Oxide/hydroxide +
- 7: Mn-oxide/hydroxide/Fe-oxide/hydroxide +

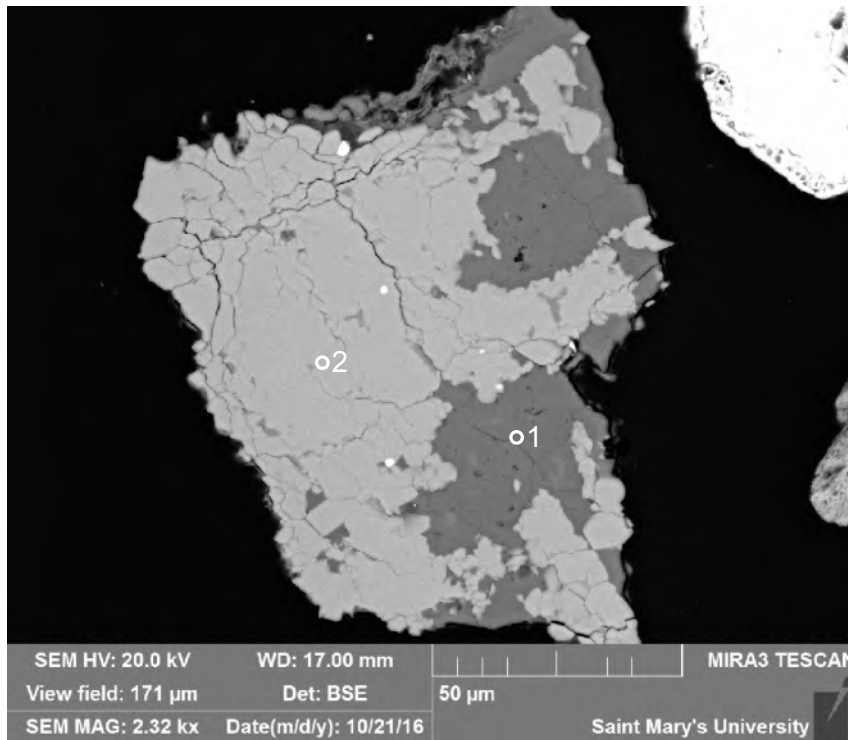
Figure B3.18: Sample S8 site 5.2 (SEM). 1: Altered grain of magnetite (1,2). 2: Siltstone or altered volcanic lithic clast composed of quartz, chlorite, and Mn- Fe-oxide/hydroxide.



- 1:?Clay
- 2:Fe-oxide/hydroxide +
- 3:"Magnetite" +
- 4:Quartz +
- 5:"Magnetite" +
- 6:Fe-oxide/hydroxide +

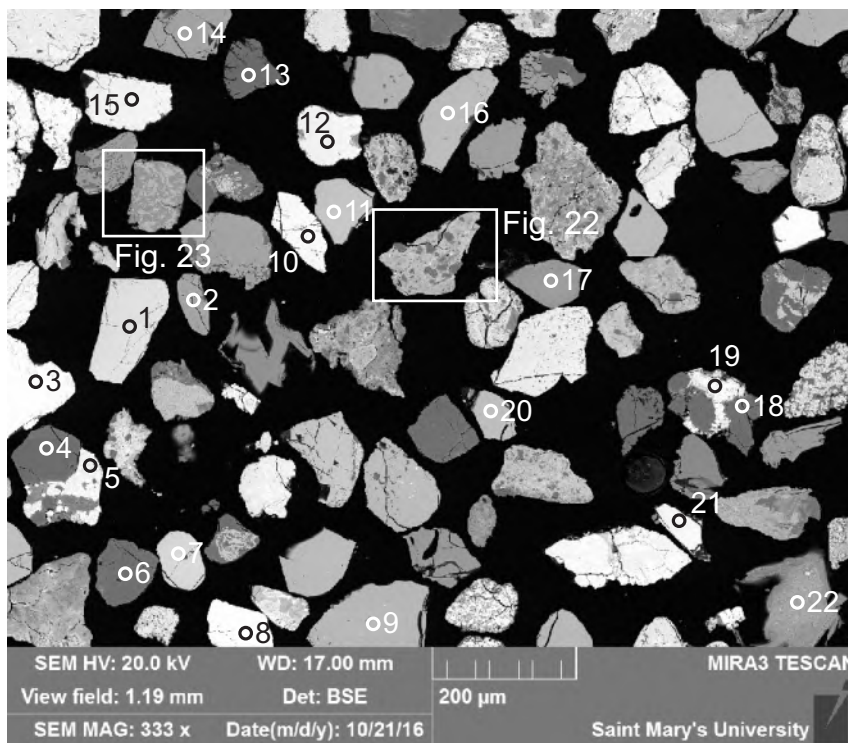
Figure B3.19: Sample S8 site 5.3 (SEM). Aggregate (clay, quartz, Fe-oxide/hydroxide, pedogenic cementation of detrital magnetite).





- 1:Albite
- 2:Titanite

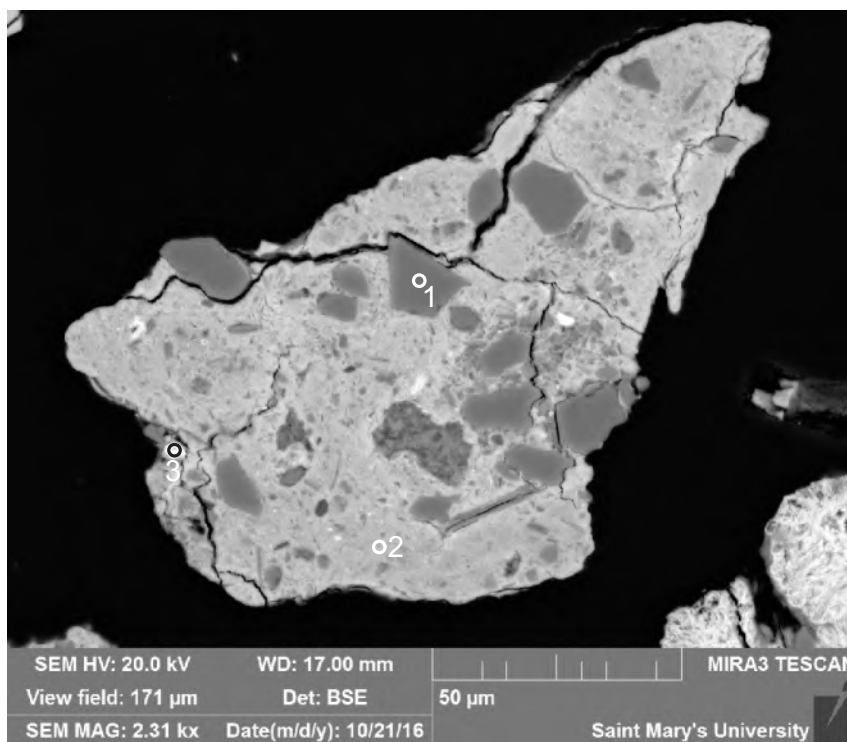
Figure B3.20: Sample S8 site 5.4 (SEM). Lithic clast (albite + titanite, metamorphic).



- 1:Chromite
- 2:Hornblende
- 3:Ilmenite
- 4:Quartz
- 5:Pyrite +
- 6:Quartz +
- 7:Spinel
- 8:"Magnetite"
- 9:Garnet
- 10:Ilmenite
- 11:Epidote
- 12:"Magnetite" +
- 13:Dolomite
- 14:Epidote
- 15:"Magnetite" +
- 16:Garnet
- 17:Apatite
- 18:Quartz
- 19:Pyrite +
- 20:Garnet
- 21:Ilmenite
- 22:Chlorite +

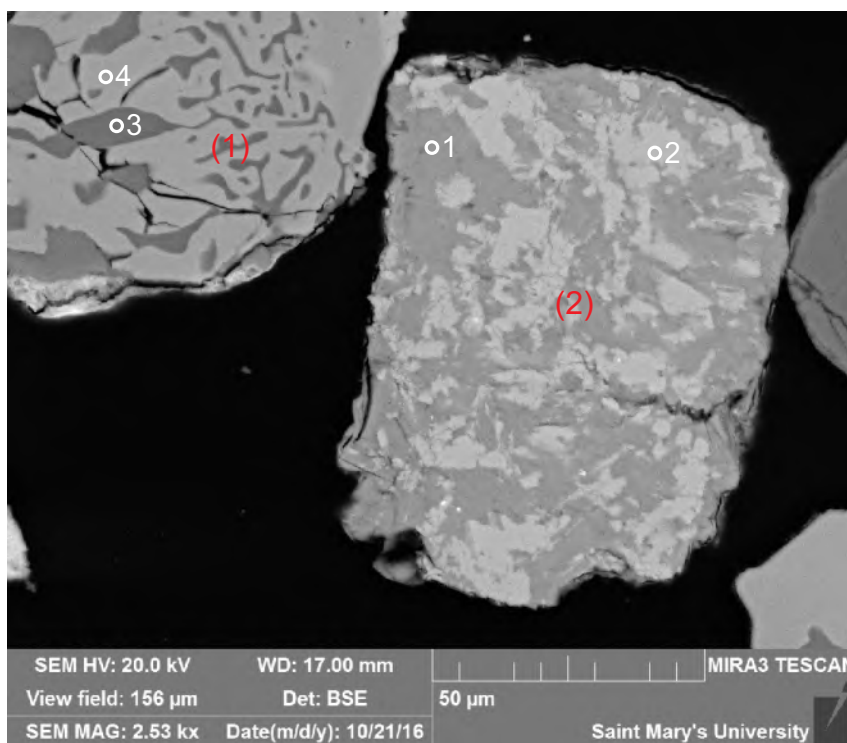
Figure B3.21: Sample S8 site 6 (SEM). Lithic clasts consisting of pyrite (5, 19) and quartz (4, 18) (pyrite cemented sandstone).





- 1:Quartz
- 2:Chlorite +
- 3:"Ilmenite" +

Figure B3.22: Sample S8 site 6.2 (SEM). Siltstone or altered volcanic lithic clast of quartz, chlorite, and ilmenite.



- 1:Chlorite
- 2:Titanite
- 3:Quartz +
- 4:Epidote

Figure B3.23: Sample S8 site 6.3 (SEM). 1: Hydrothermal clast of epidote and quartz (vein). 2: Lithic clast of titanite and chlorite (metamorphic).

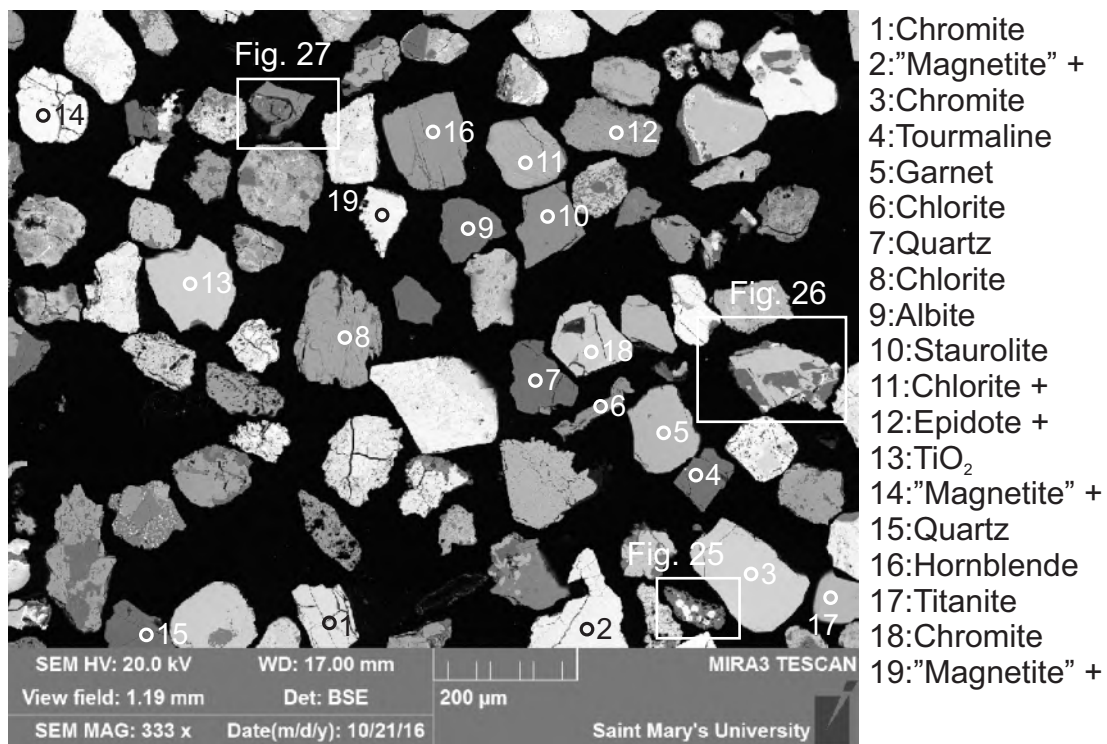


Figure B3.24: Sample S8 site 7 (SEM).

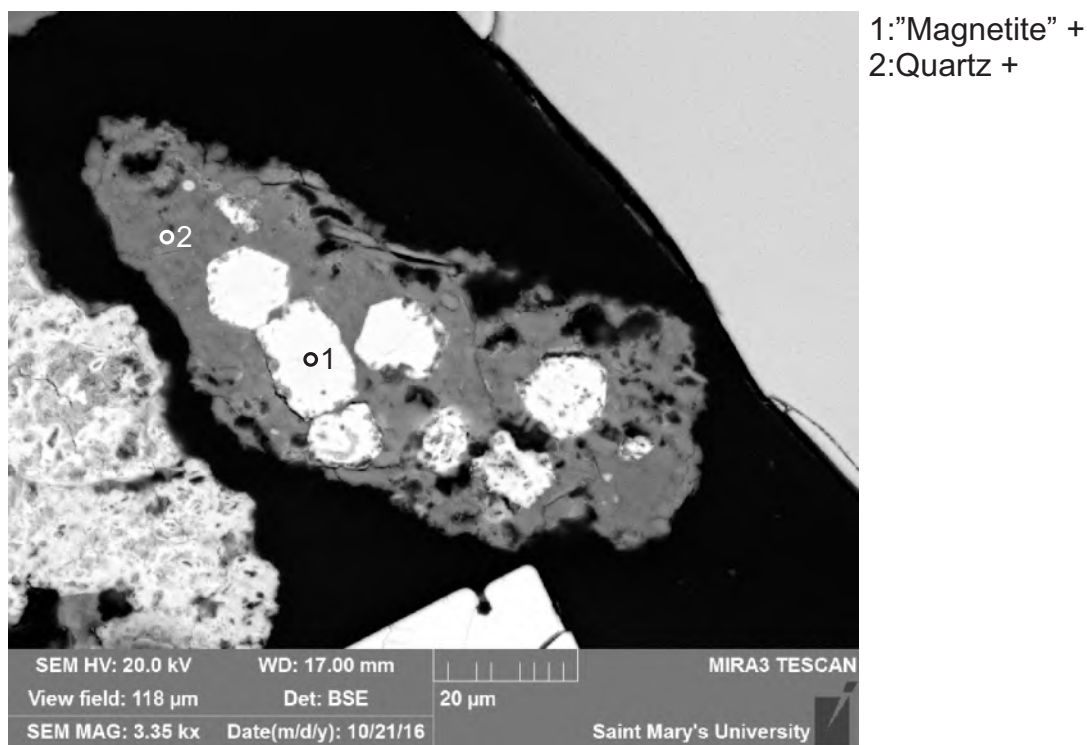
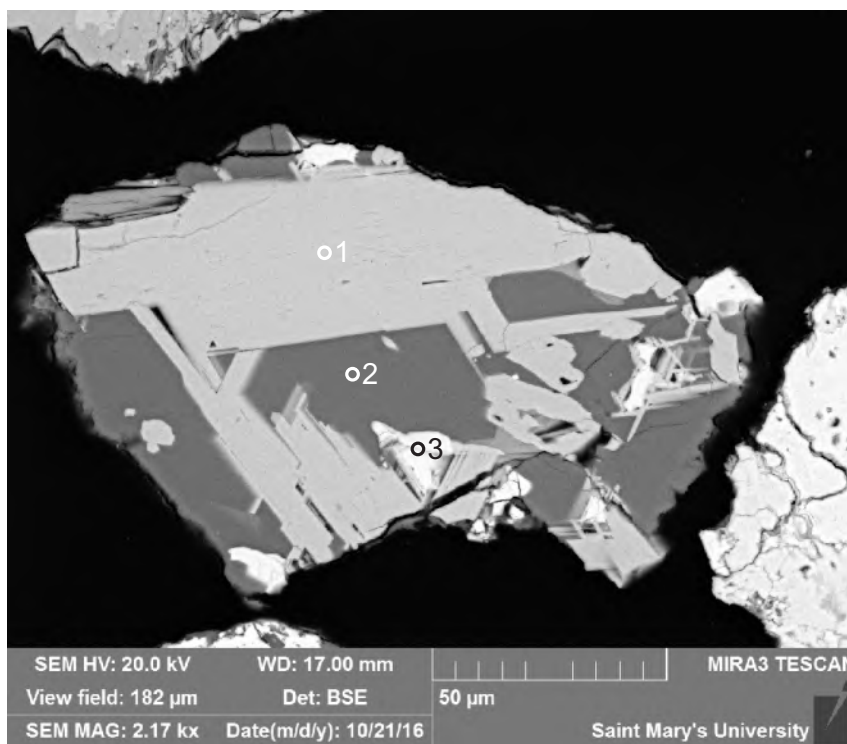
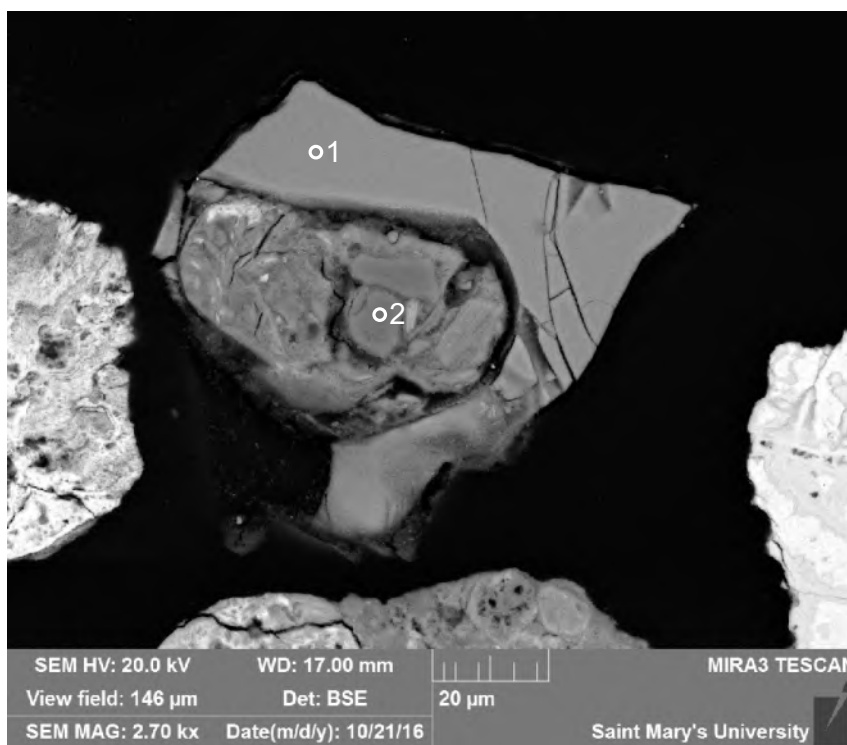


Figure B3.25: Sample S8 site 7.2 (SEM). Lithic clast of magnetite + quartz (hydrothermal vein).



1:TiO<sub>2</sub>  
2:Quartz +  
3:"Ilmenite"

Figure B3.26: Sample S8 site 7.3 (SEM). Lithic clast of quartz, titania, and ilmenite (metamorphic).



1:Staurolite  
2:Quartz

Figure B3.27: Sample S8 site 7.4 (SEM). Lithic clast of staurolite and quartz (metamorphic).

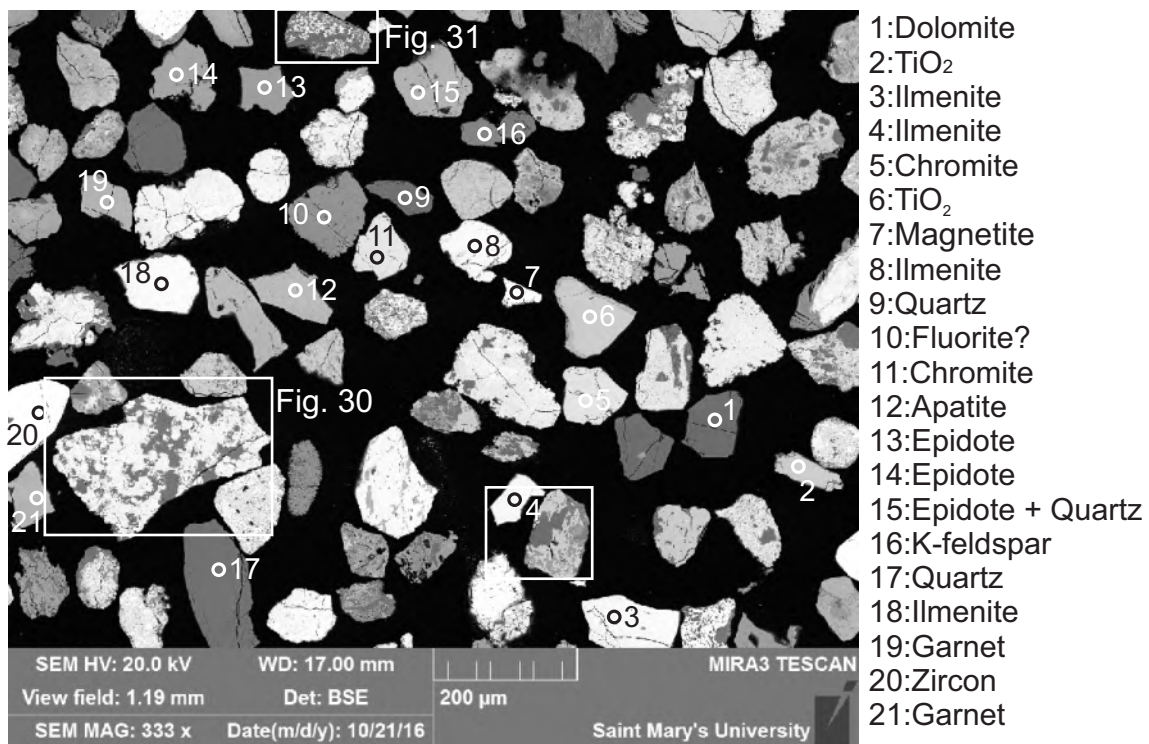


Figure B3.28: Sample S8 site 8 (SEM).

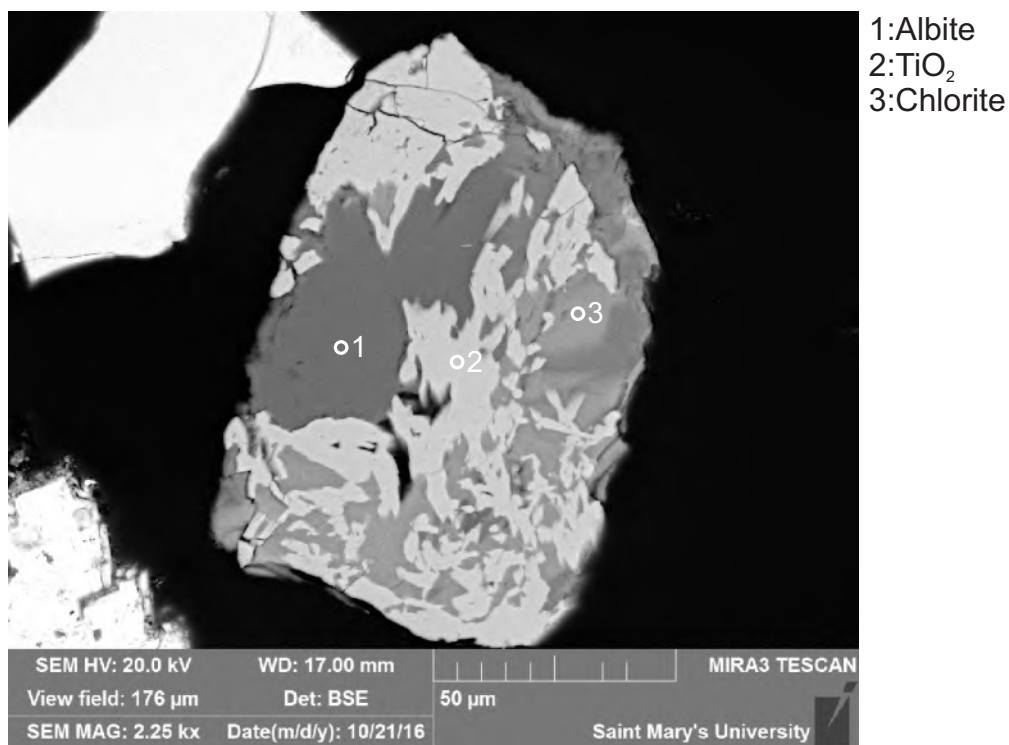
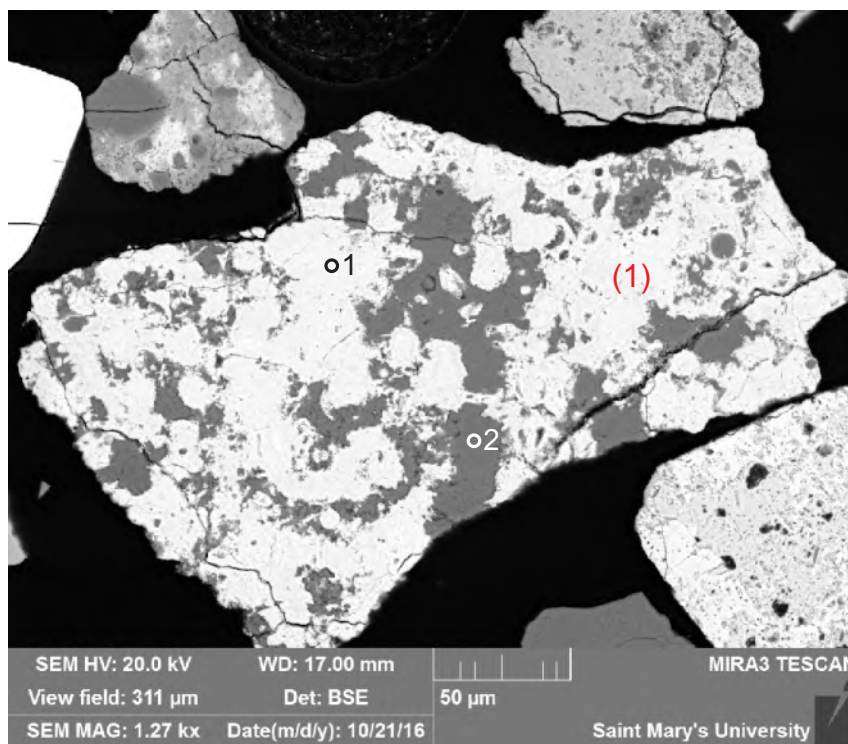


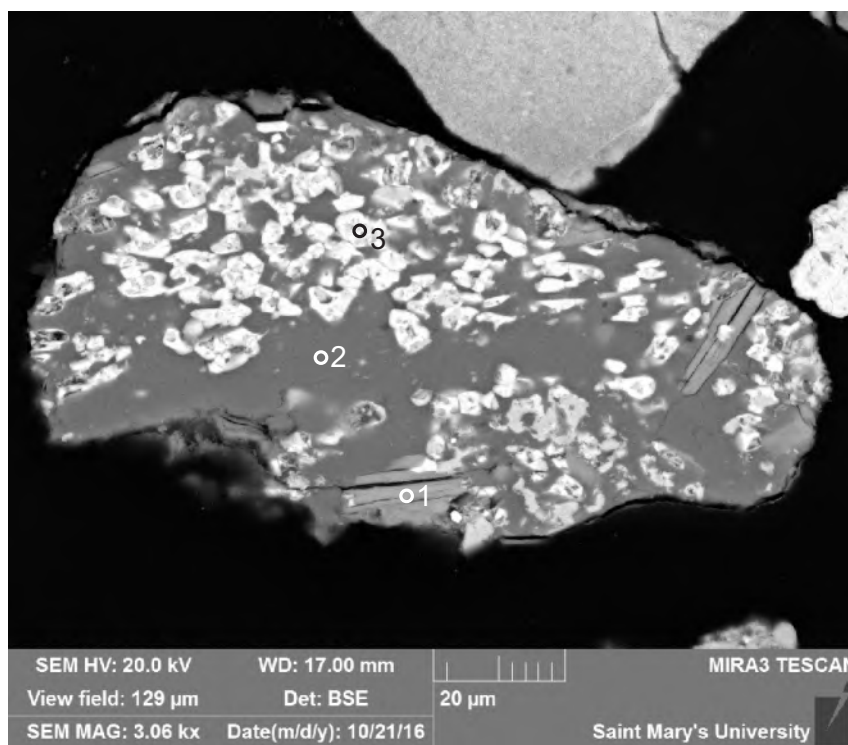
Figure B3.29: Sample S8 site 8.2 (SEM). Lithic clast of albite, chlorite, titania (metamorphic).





1:"Magnetite" +  
2:Quartz

Figure B3.30: Sample S8 site 8.3 (SEM). 1: Lithic clast of quartz and magnetite (hydrothermal vein).



1:"Biotite"  
2:Quartz  
3:"Ilmenite"

Figure B3.31: Sample S8 site 8.4 (SEM). Lithic clast of altered biotite + quartz + ilmenite (metamorphic).

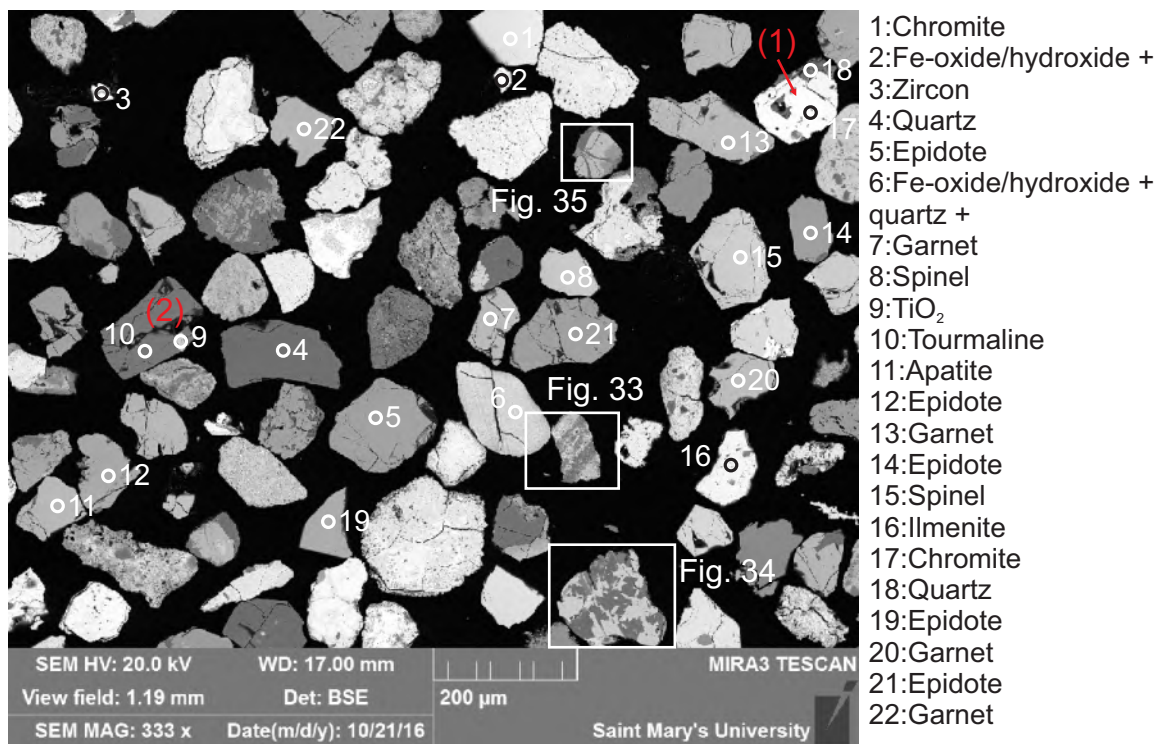


Figure B3.32: Sample S8 site 9 (SEM). 1: Lithic clast (chromite + quartz, sandstone). 2: Lithic clast (titania + tourmaline, metamorphic).

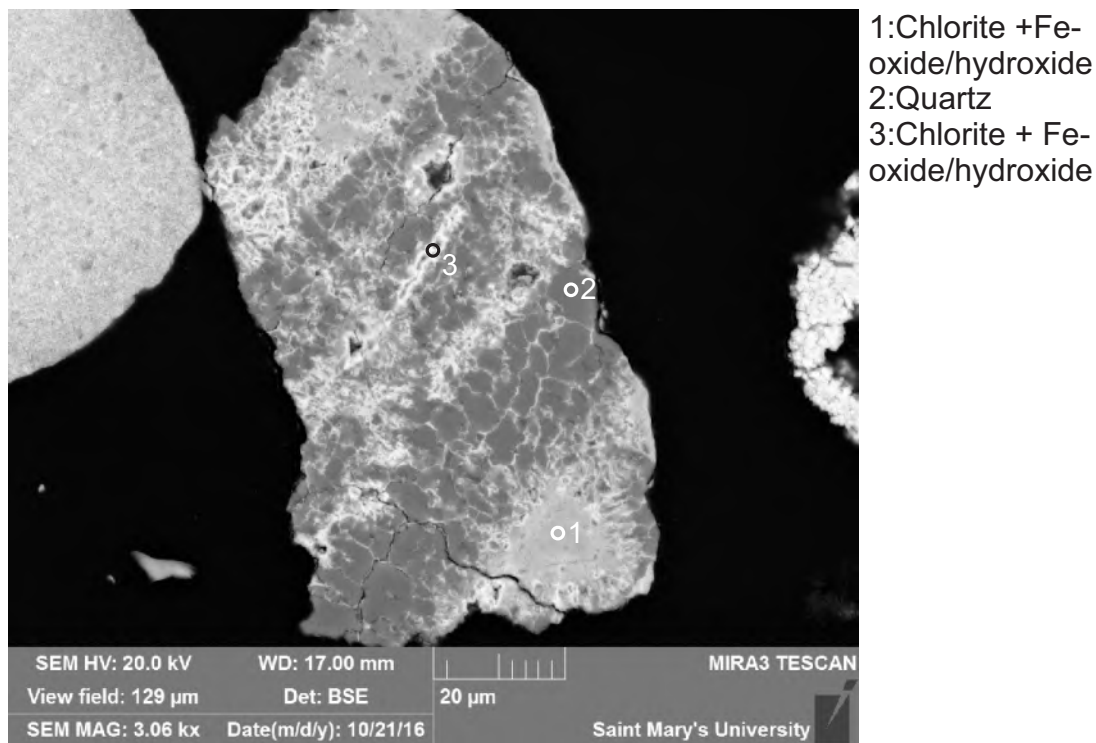


Figure B3.33: Sample S8 site 9.2 (SEM). Laminated siltstone lithic clast (quartz + chlorite + Feoxide/hydroxide).

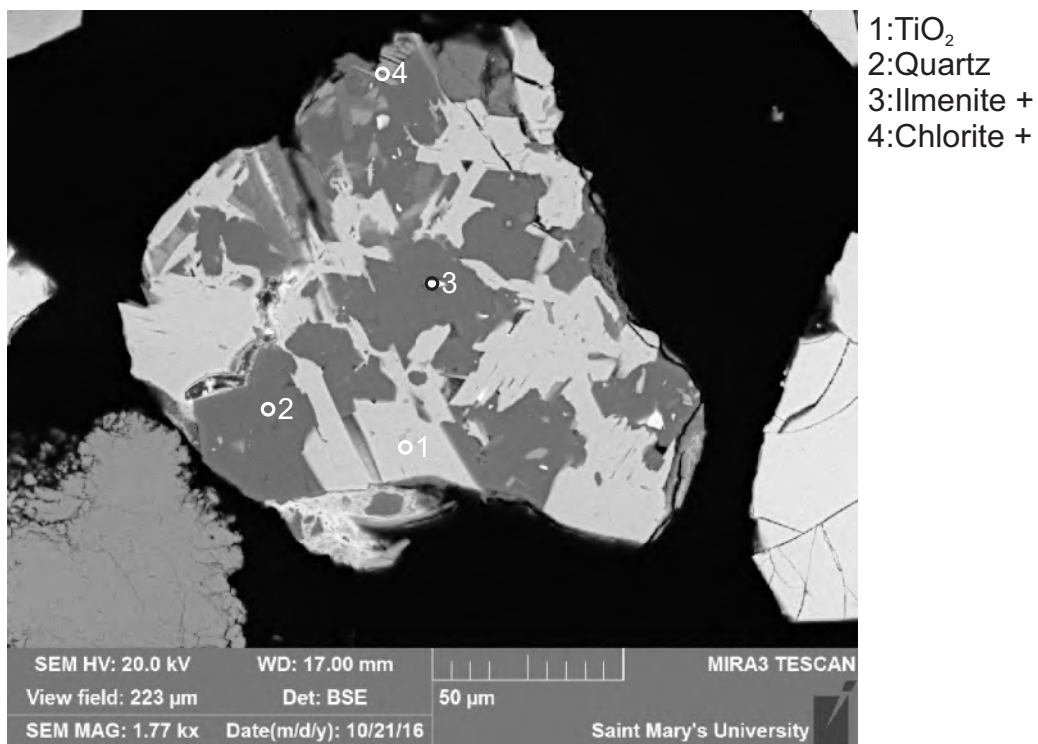


Figure B3.34: Sample S8 site 9.3 (SEM). Lithic clast composed of quartz, titanite, chlorite, and ilmenite (metamorphic).

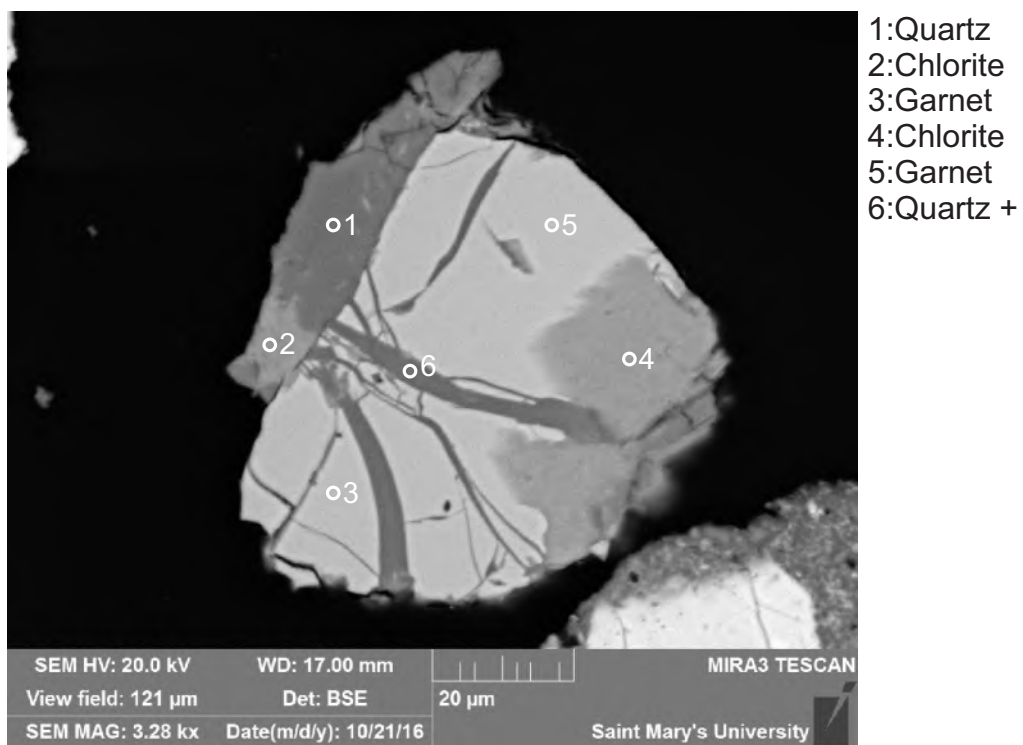


Figure B3.35: Sample S8 site 9.4 (SEM). Lithic clast composed of quartz, chlorite, and garnet (metamorphic with hydrothermal quartz veins).



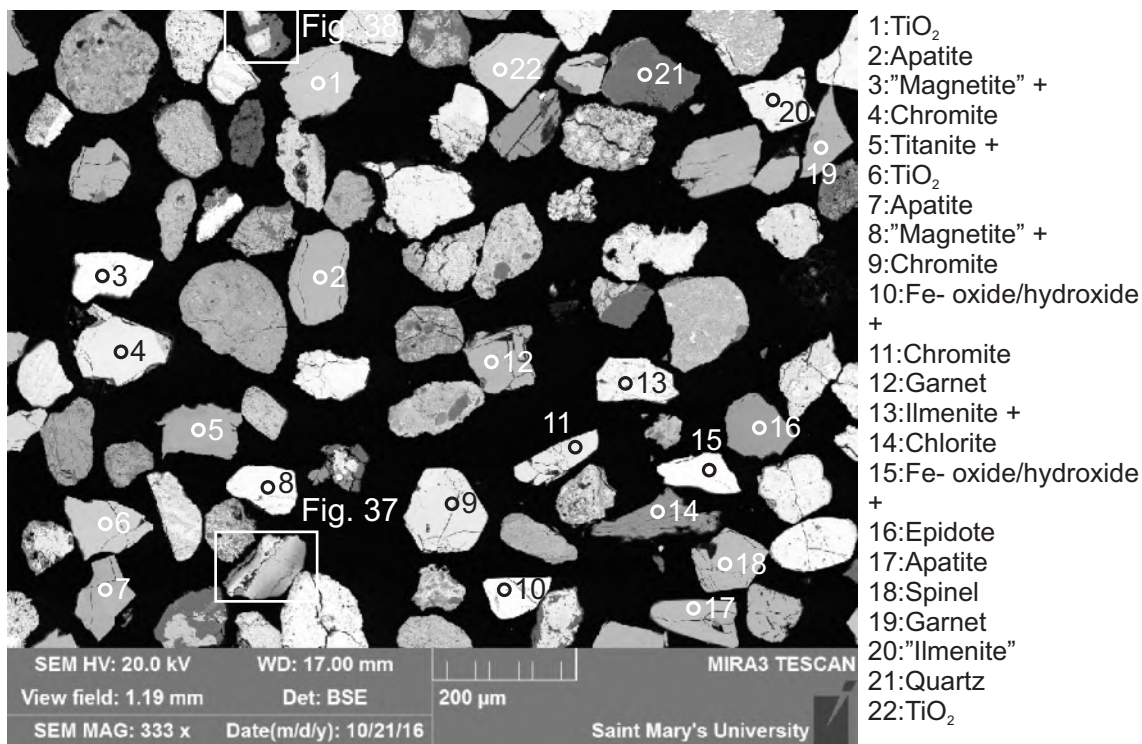


Figure B3.36: Sample S8 site 10 (SEM).

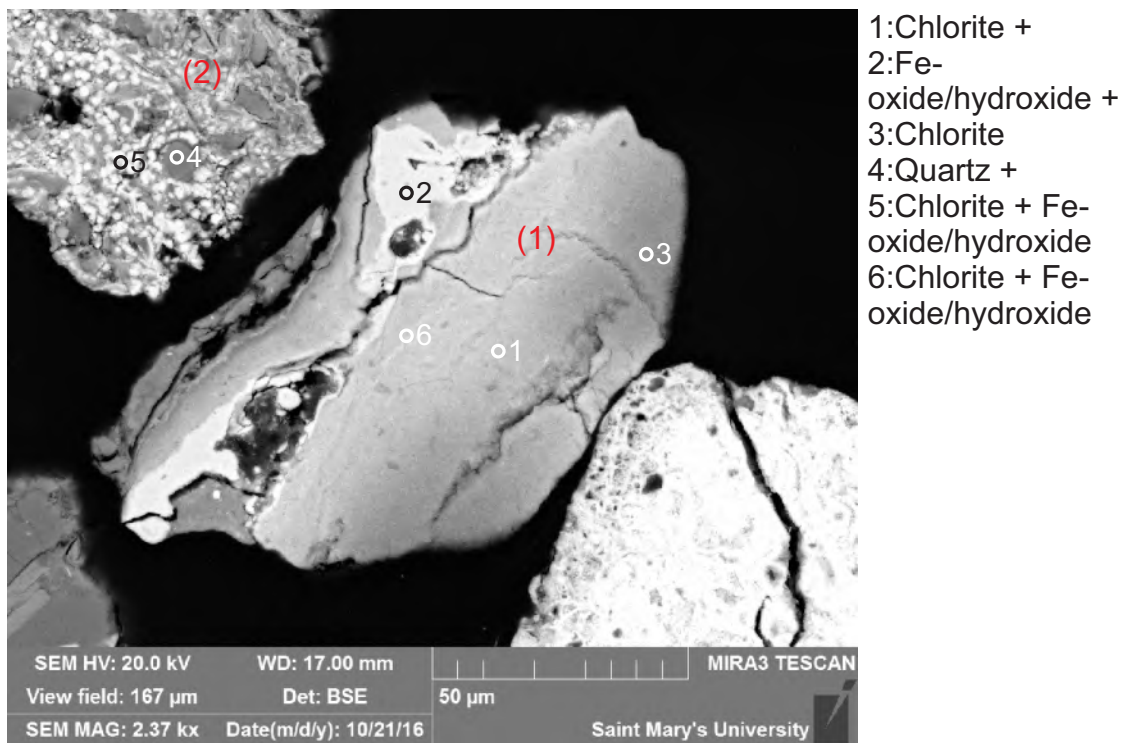
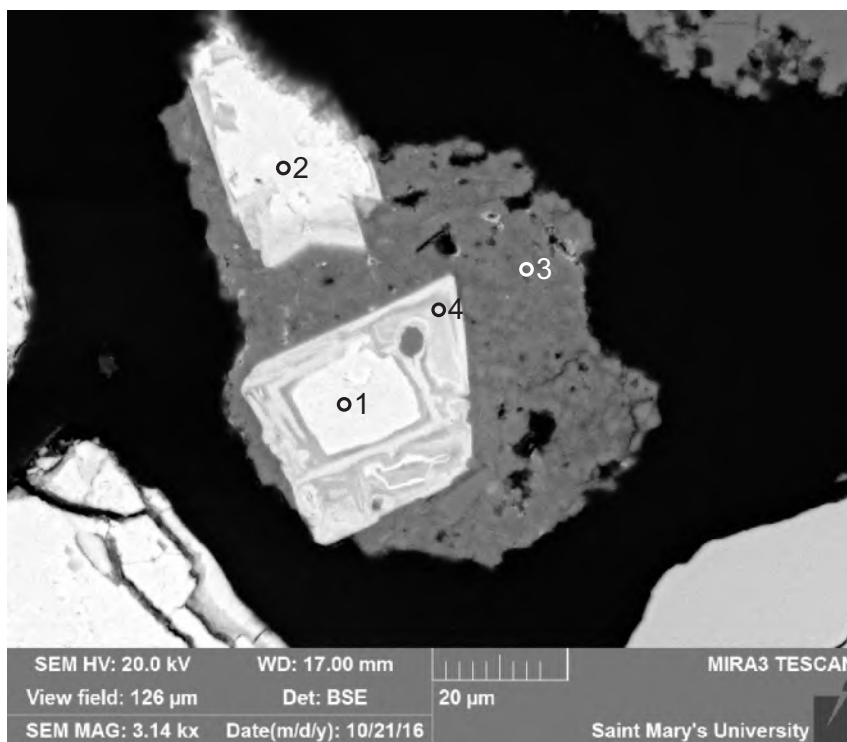


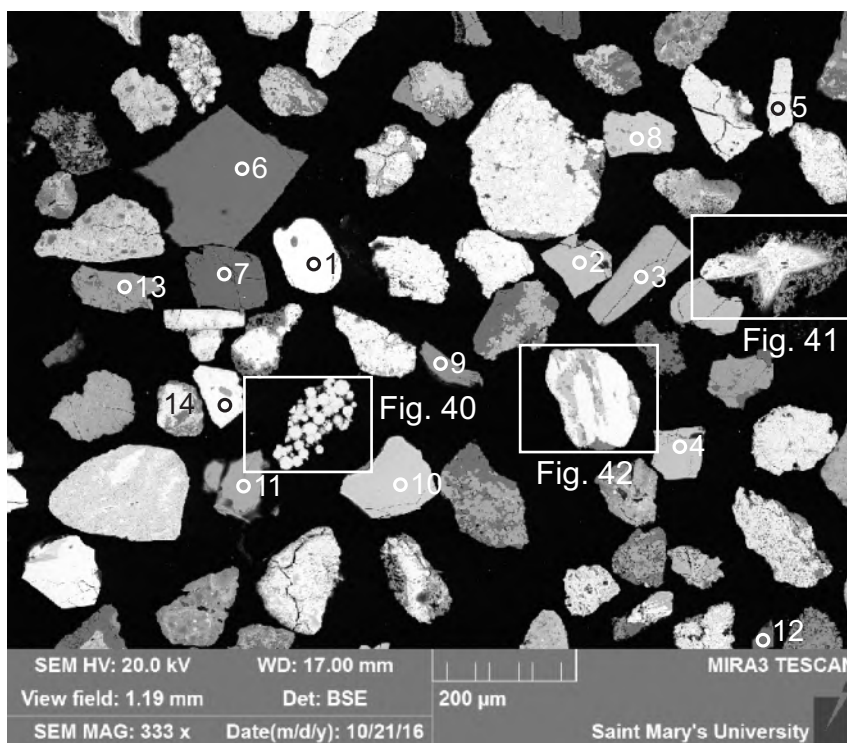
Figure B3.37: Sample S8 site 10.2 (SEM). 1: Lithic clast principally of chlorite (metamorphic or hydrothermal). 2: Pedogenic aggregate or siltstone of quartz, Fe-oxide/hydroxide, and chlorite.





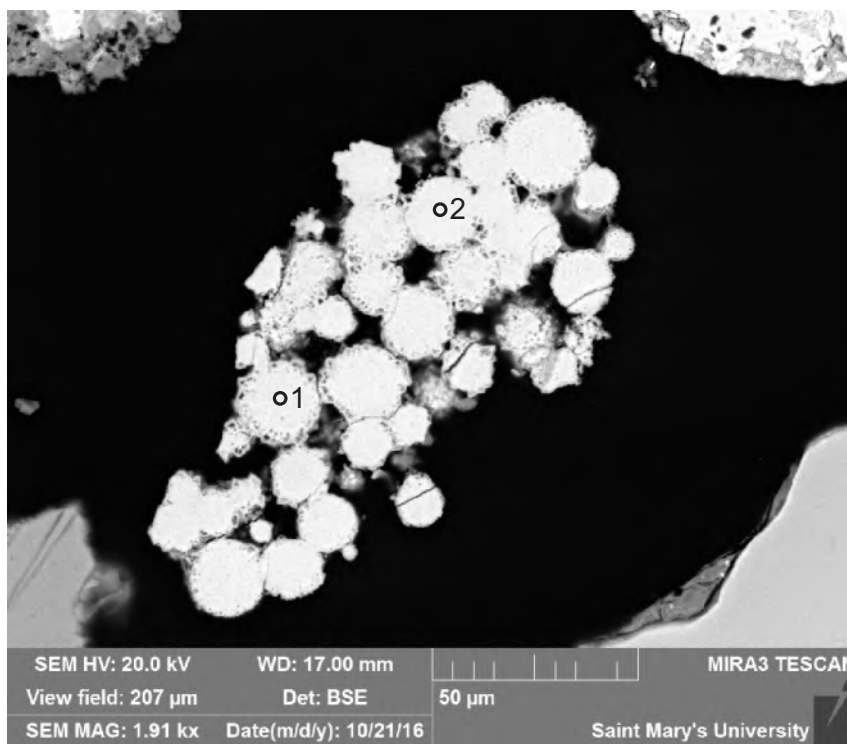
- 1:"Magnetite" +
- 2:"Magnetite" +
- 3:Quartz + Illite
- 4:Fe-oxide/hydroxide +

Figure B3.38: Sample S8 site 10.3 (SEM). Euhedral magnetite and quartz with ~10% illite (hydrothermal).



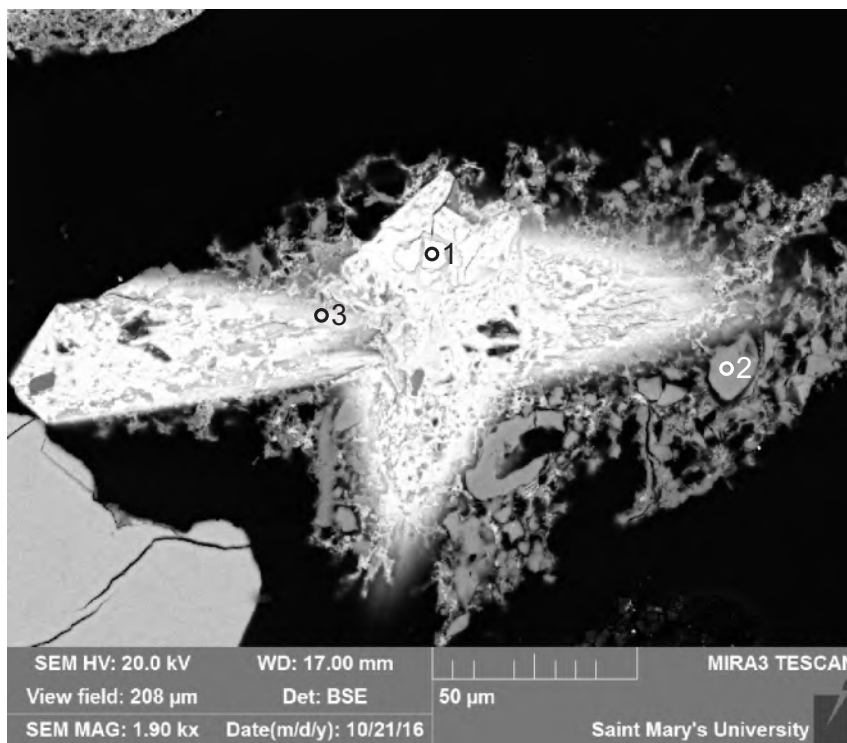
- 1:Zircon
- 2:Garnet
- 3:Apatite
- 4:Spinel
- 5:Fe-oxide/hydroxide +
- 6:Quartz
- 7:Dolomite
- 8:TiO<sub>2</sub>
- 9:Muscovite
- 10:Chromite
- 11:Chlorite
- 12:Quartz
- 13:Epidote +
- 14:Ilmenite

Figure B3.39: Sample S8 site 11 (SEM).



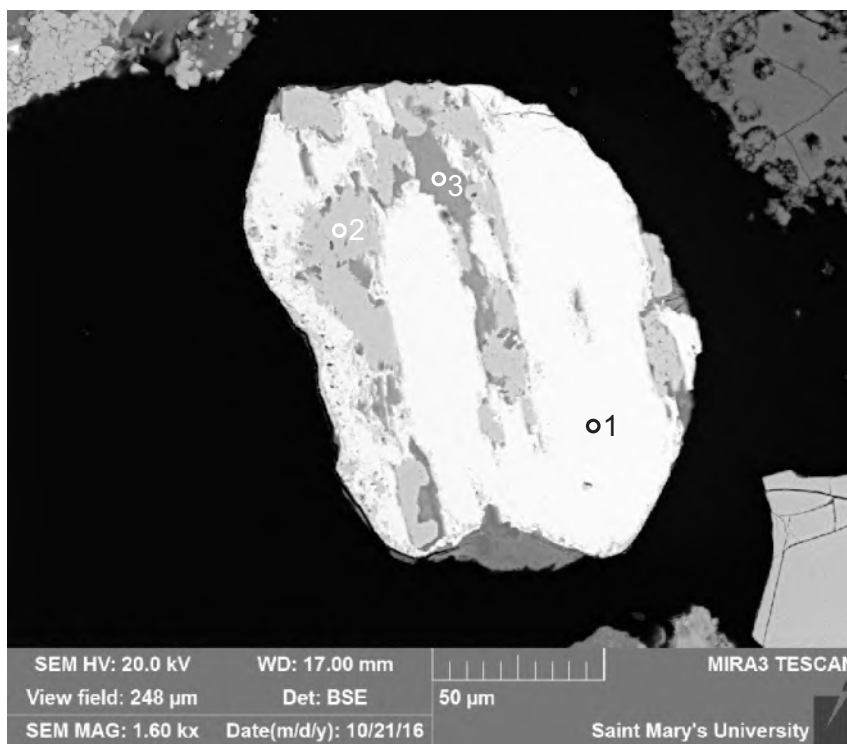
1:"Magnetite" +  
2:"Magnetite" +

Figure B3.40: Sample S8 site 11.2 (SEM). Limonite protoliths of pedogenic origin.



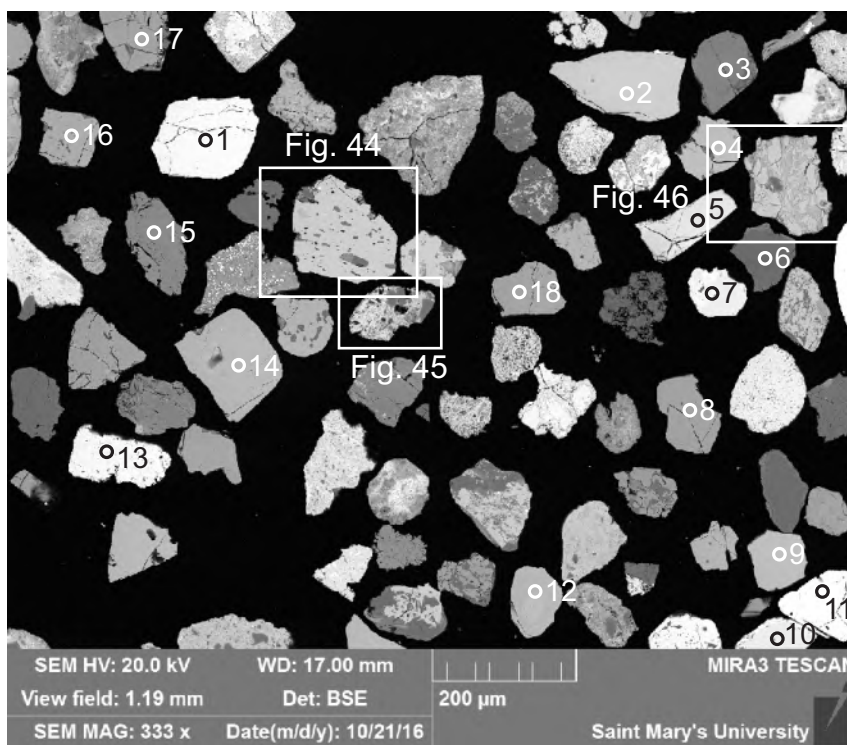
1:Pyrite  
2:Fluorite  
3:Fe-  
oxide/hydroxide +

Figure B3.41: Sample S8 site 11.3 (SEM). Dissolved clast of fluorite, pyrite, and Fe-oxide/hydroxide (compare to Fig. B2.24 and B8.21).



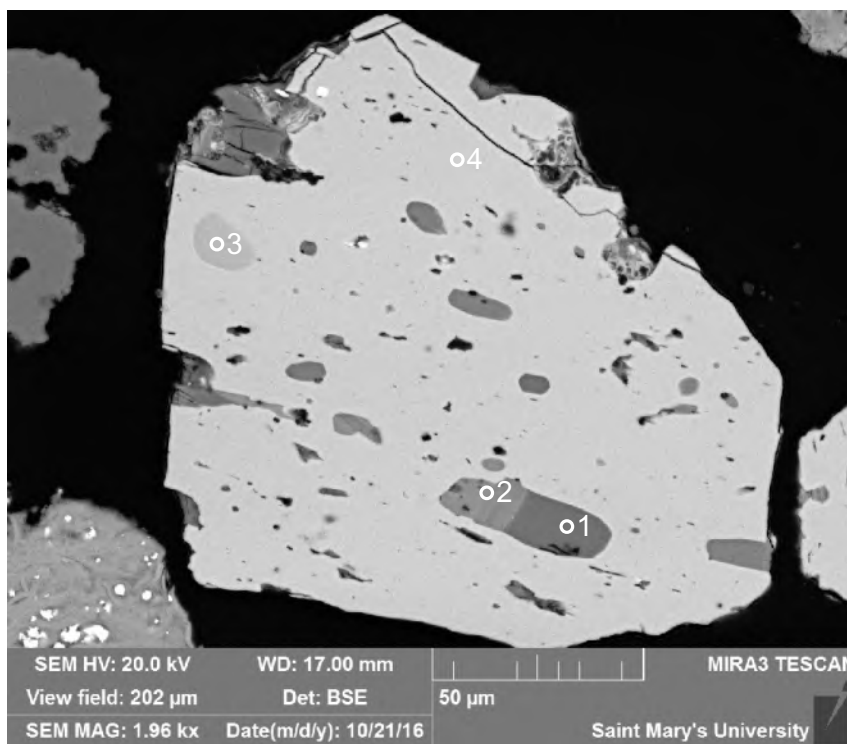
- 1:Ilmenite
- 2:TiO<sub>2</sub>
- 3:Chlorite + TiO<sub>2</sub>

Figure B3.42: Sample S8 site 11.4 (SEM). Lithic clast consisting of ilmenite, titania, and chlorite (metamorphic).



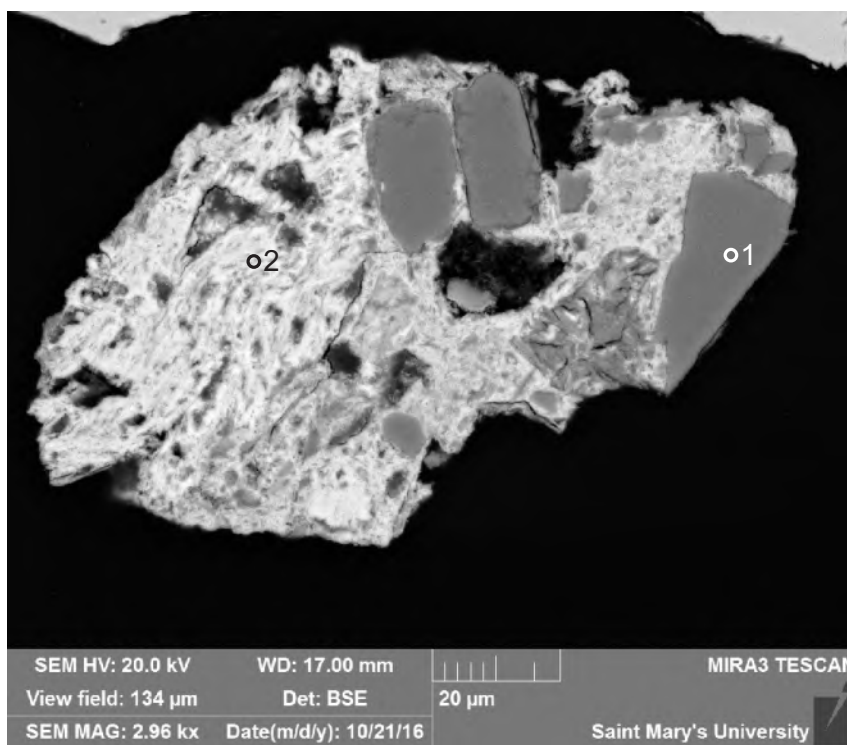
- 1:Ilmenite
- 2:TiO<sub>2</sub>
- 3:Dolomite
- 4:Garnet
- 5:"Magnetite" +
- 6:Dolomite
- 7:Chromite
- 8:Epidote
- 9:Garnet
- 10:Chromite
- 11:Fe-oxide/hydroxide +
- 12:Apatite
- 13:"Magnetite" +
- 14:Apatite
- 15:Epidote
- 16:Garnet?
- 17:Epidote
- 18:Epidote

Figure B3.43: Sample S8 site 12 (SEM).



- 1:Quartz
- 2:Chlorite + ?Albite
- 3:Titanite +
- 4:TiO<sub>2</sub>

Figure B3.44: Sample S8 site 12.2 (SEM). Lithic clast consisting of titania, quartz, titanite, and chlorite + albite (metamorphic).



- 1:Quartz
- 2:Fe-oxide/hydroxide +

Figure B3.45: Sample S8 site 12.3 (SEM). Pedogenic aggregate of limonite cemented quartz grains.



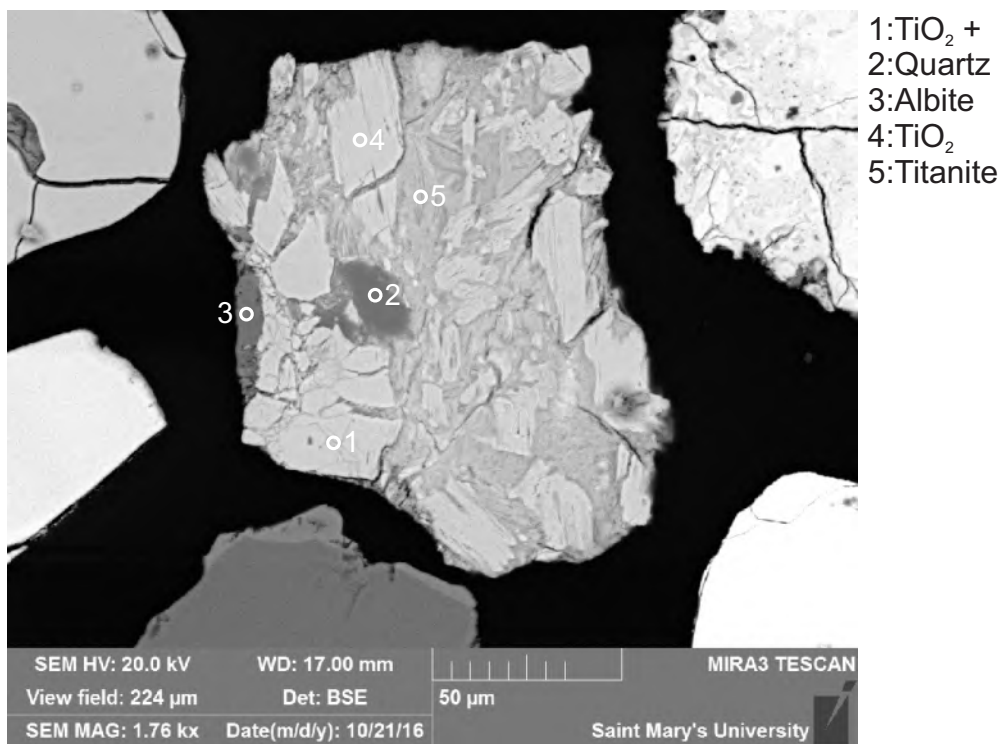


Figure B3.46: Sample S8 site 12.4 (SEM). Lithic clast consisting of quartz, albite, titania, and titanite (metamorphic).

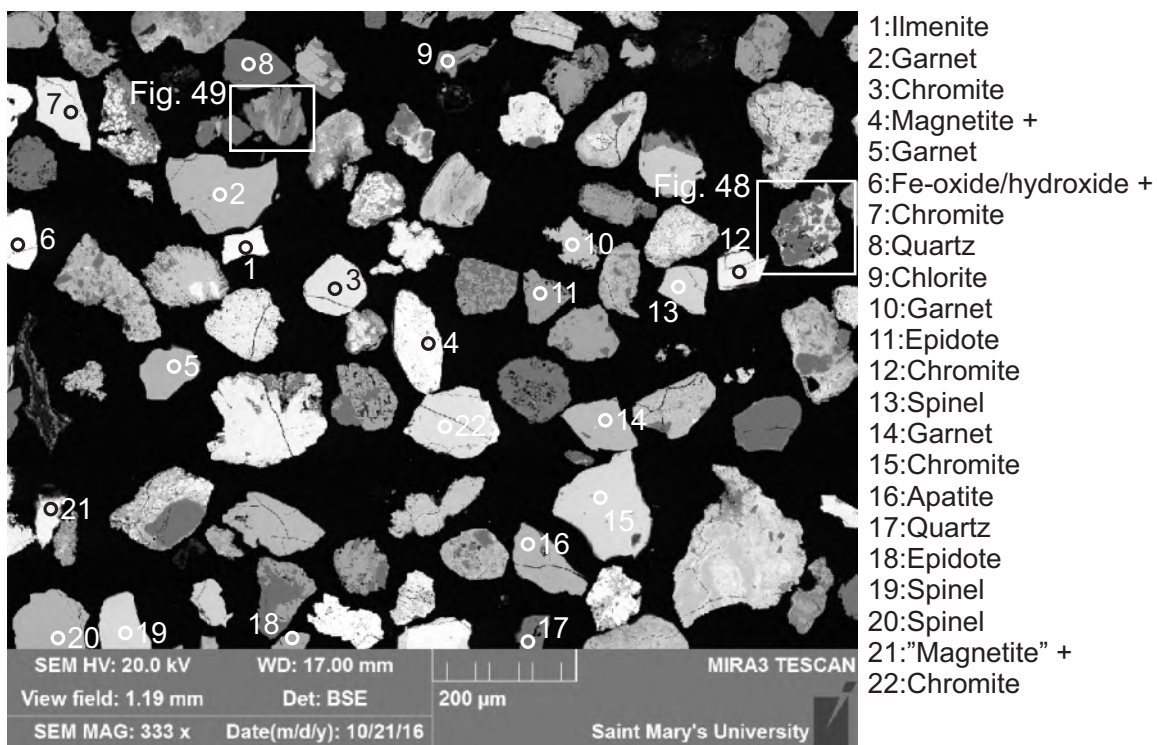
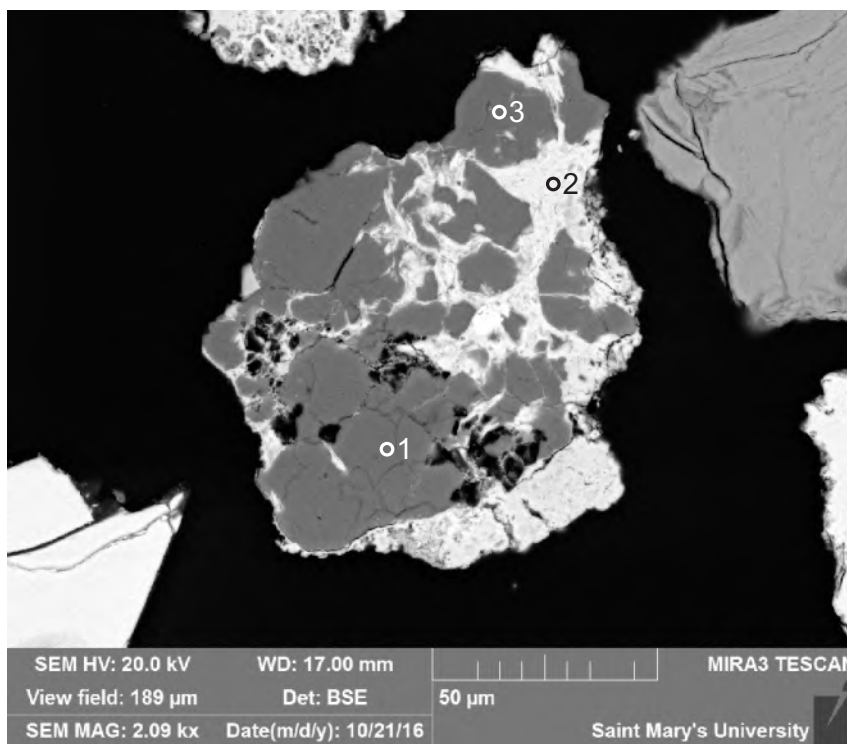
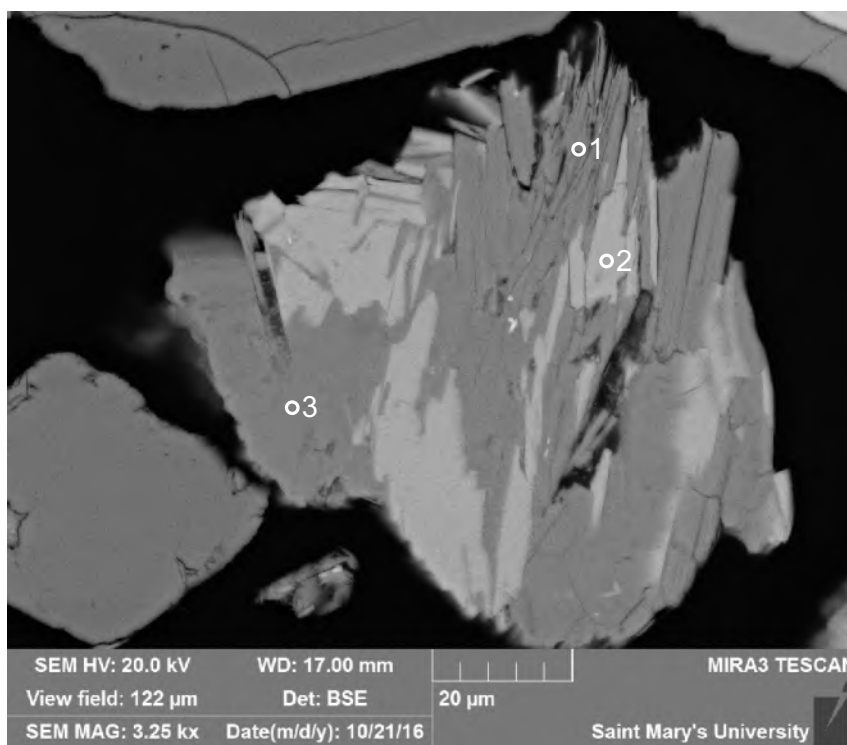


Figure B3.47: Sample S8 site 13 (SEM).



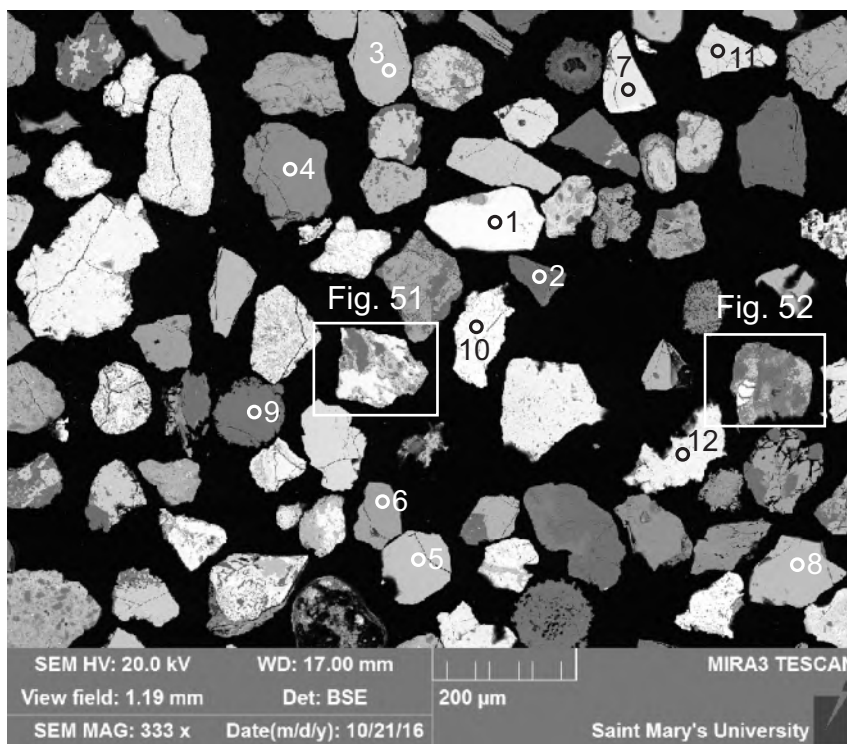
- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Quartz

Figure B3.48: Sample S8 site 13.2 (SEM). Pedogenic aggregate of limonite cemented quartz grains.



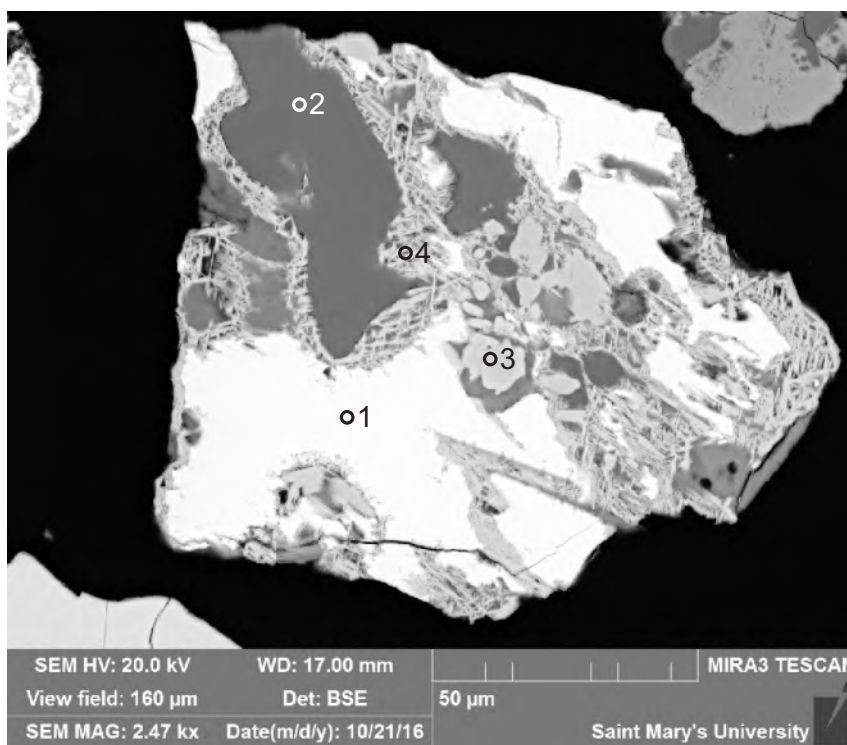
- 1:Muscovite
- 2:Chlorite
- 3:Muscovite

Figure B3.49: Sample S8 site 13.3 (SEM). Lithic clast consisting of muscovite and chlorite (metamorphic).



- 1:Ilmenite
- 2:Quartz
- 3:Apatite
- 4:Staurolite
- 5:Garnet
- 6:Epidote
- 7:Chromite
- 8:Garnet
- 9:Quartz
- 10:Fe-oxide/hydroxide +
- 11:Chromite
- 12:"Magnetite" +

Figure B3.50: Sample S8 site 14 (SEM).



- 1:Ilmenite
- 2:Albite
- 3: $\text{TiO}_2$
- 4: $\text{TiO}_2$

Figure B3.51: Sample S8 site 14.2 (SEM). Lithic clast consisting of titania, albite, and ilmenite (texture looks hydrothermal).



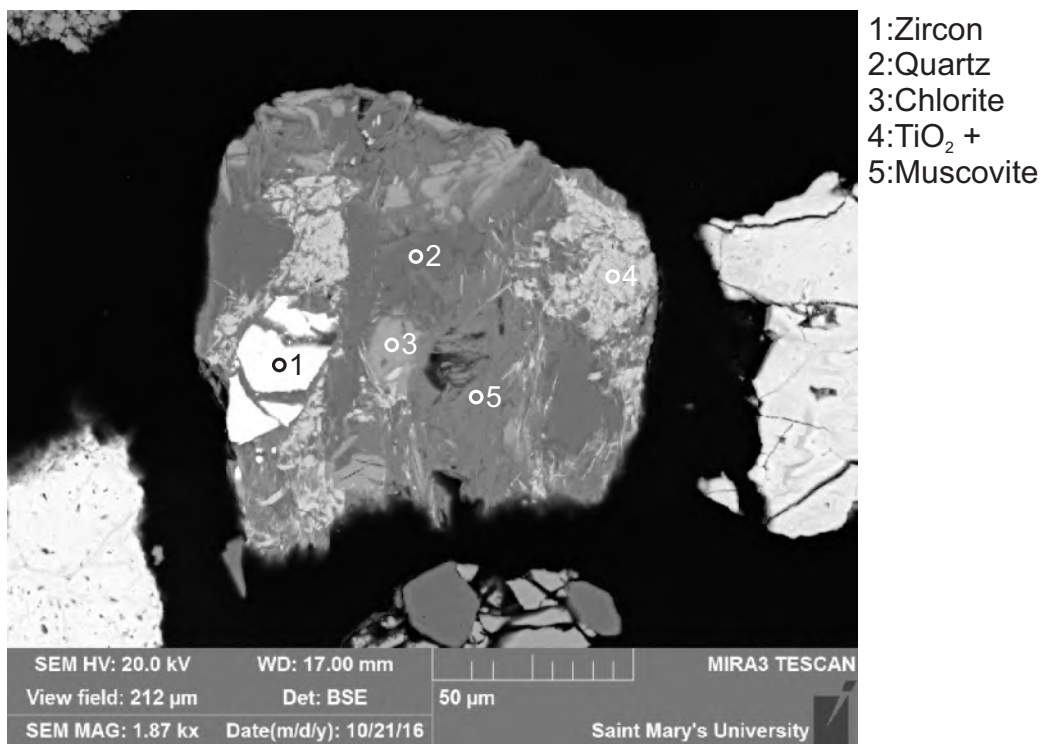


Figure B3.52: Sample S8 site 14.3 (SEM). Lithic clast consisting of quartz, chlorite, muscovite, titania, and zircon (origin uncertain, probably metamorphic).

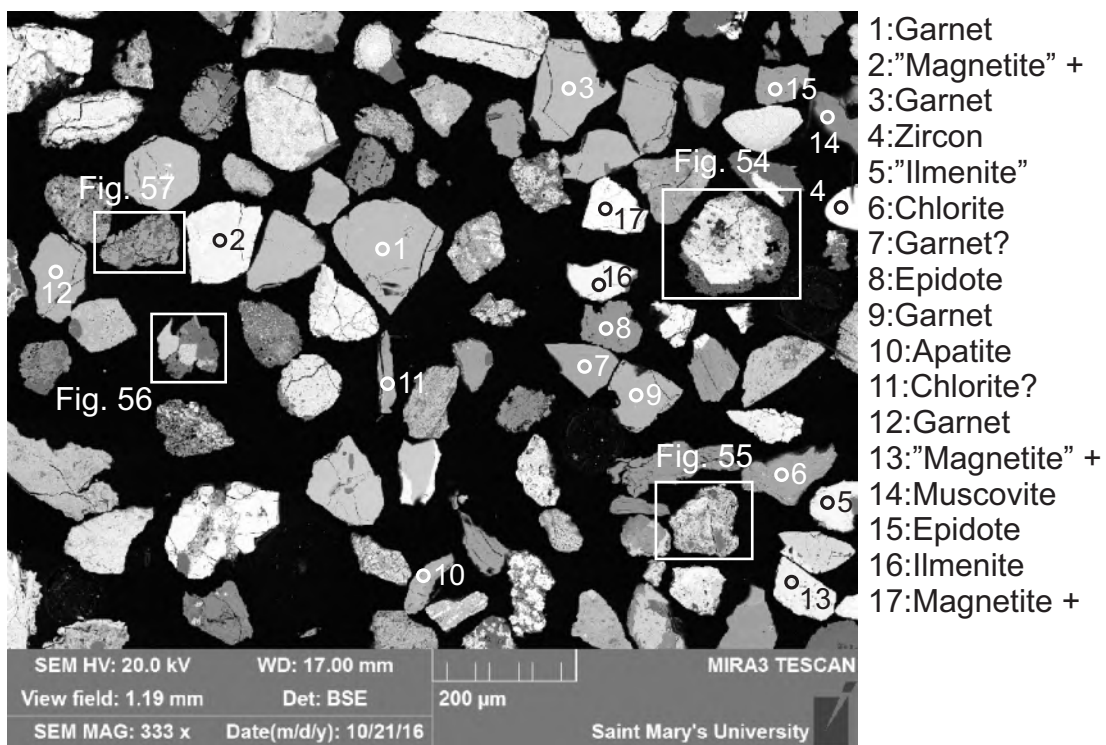
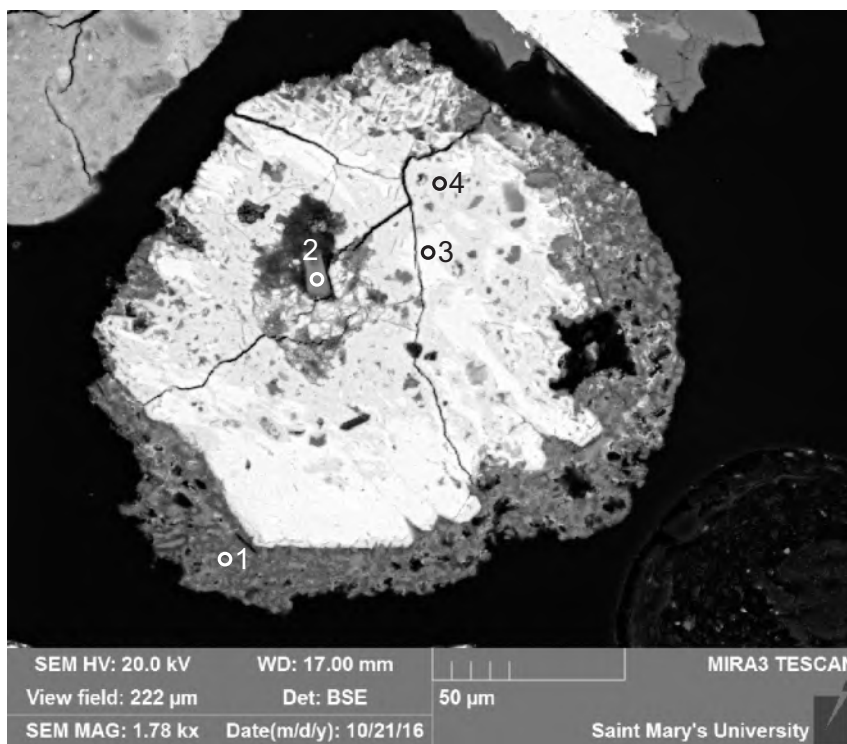


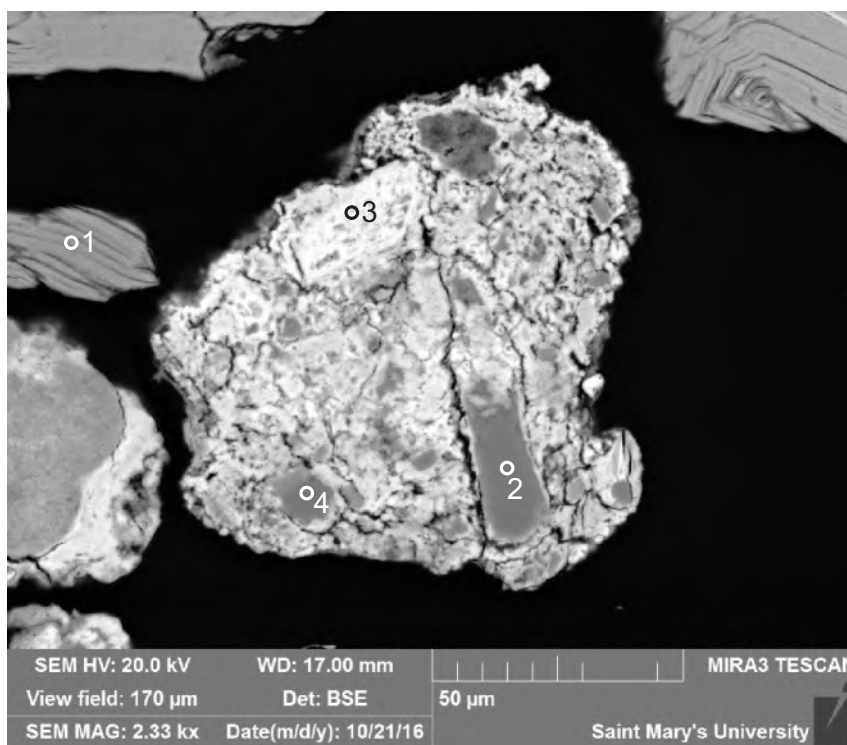
Figure B3.53: Sample S8 site 15 (SEM).





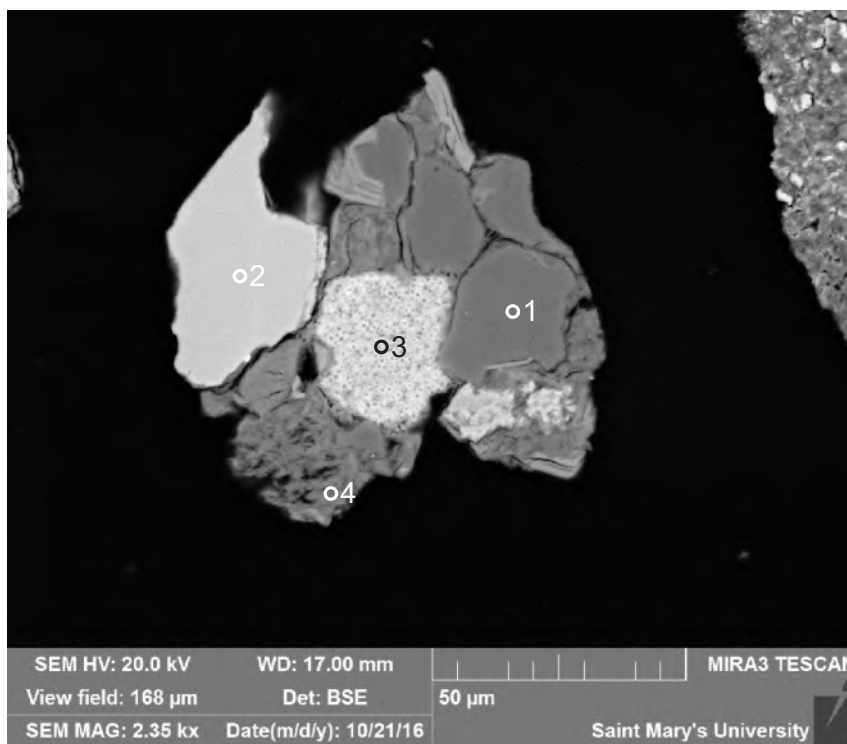
- 1:Quartz +
- 2:Quartz
- 3:"Magnetite" +
- 4:Fe-oxide/hydroxide +

Figure B3.54: Sample S8 site 15.2 (SEM). Lithic clast consisting of quartz and Fe-oxide/hydroxide (compare to Fig. B3.38).



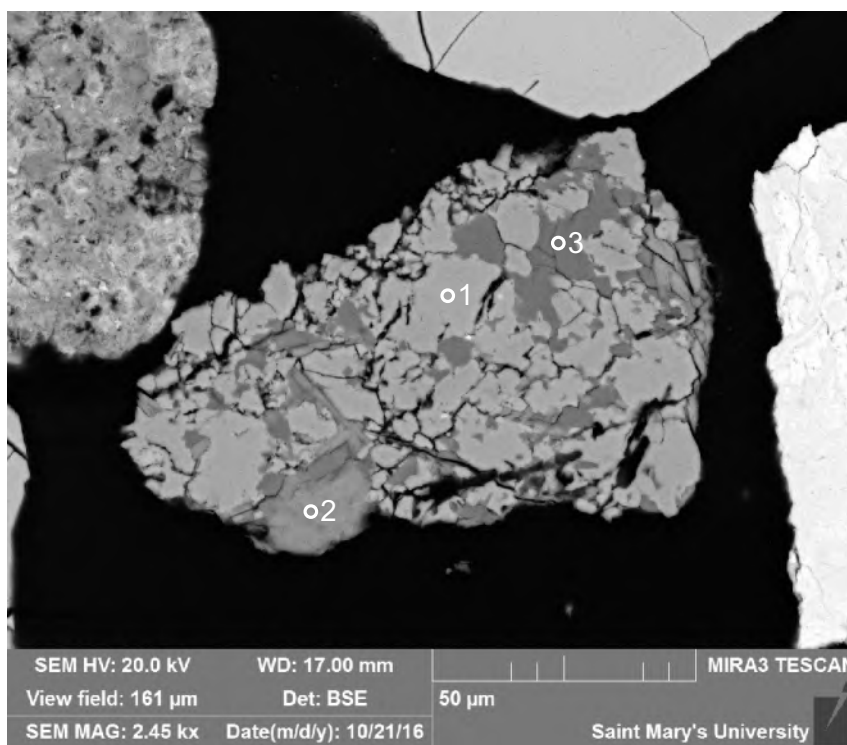
- 1:Chlorite
- 2:Quartz
- 3:Fe-oxide/hydroxide +
- 4:Albite

Figure B3.55: Sample S8 site 15.3 (SEM). Siltstone or altered volcanic lithic clast consisting of quartz, albite, and fine-grained Fe-oxide/hydroxide.



- 1:Quartz
- 2:TiO<sub>2</sub>
- 3:Fe-oxide/hydroxide +
- 4:Albite + Fe-oxide/hydroxide

Figure B3.56: Sample S8 site 15.4 (SEM). Lithic clast consisting of quartz, albite, Fe-oxide/hydroxide, and titania (metamorphic).



- 1:Epidote
- 2:Chlorite
- 3:Quartz

Figure B3.57: Sample S8 site 15.5 (SEM). Hydrothermal epidote, quartz, and chlorite.

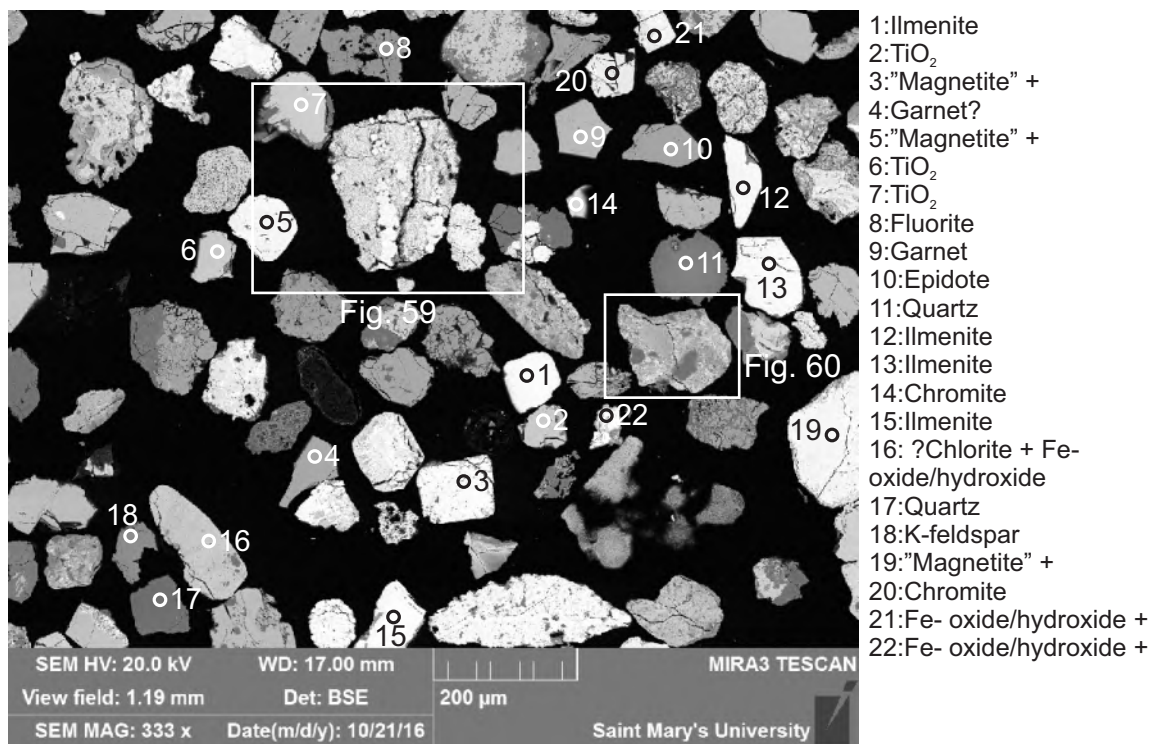


Figure B3.58: Sample S8 site 16 (SEM).

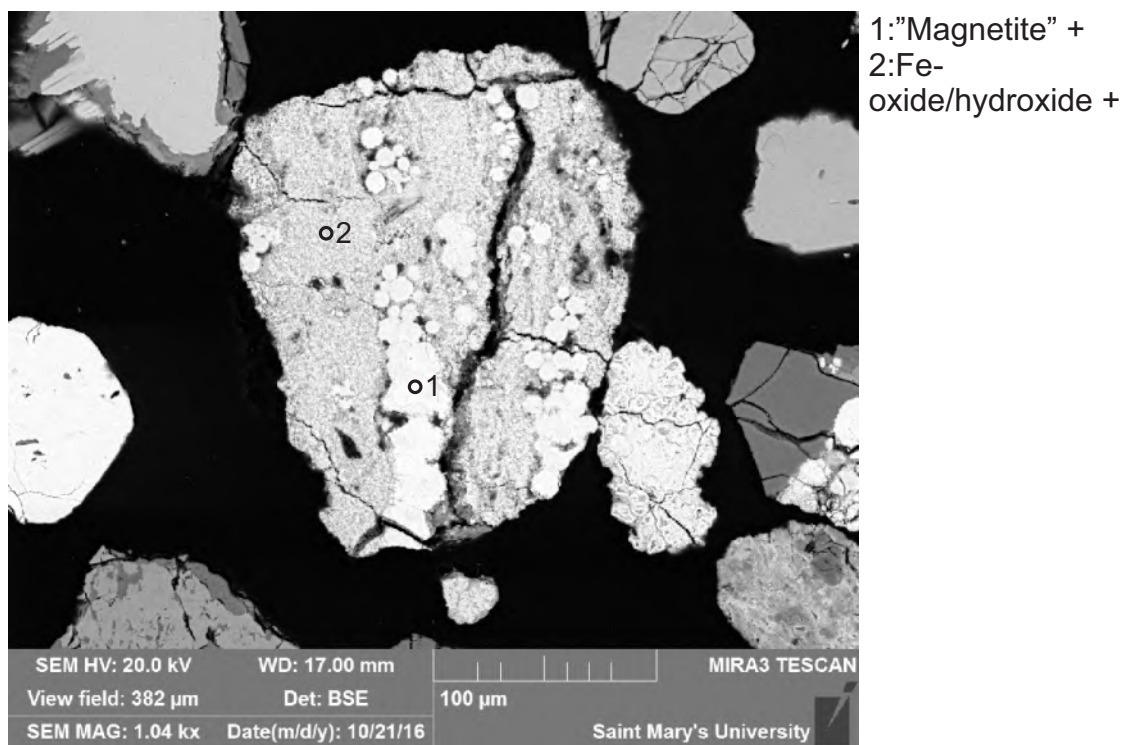
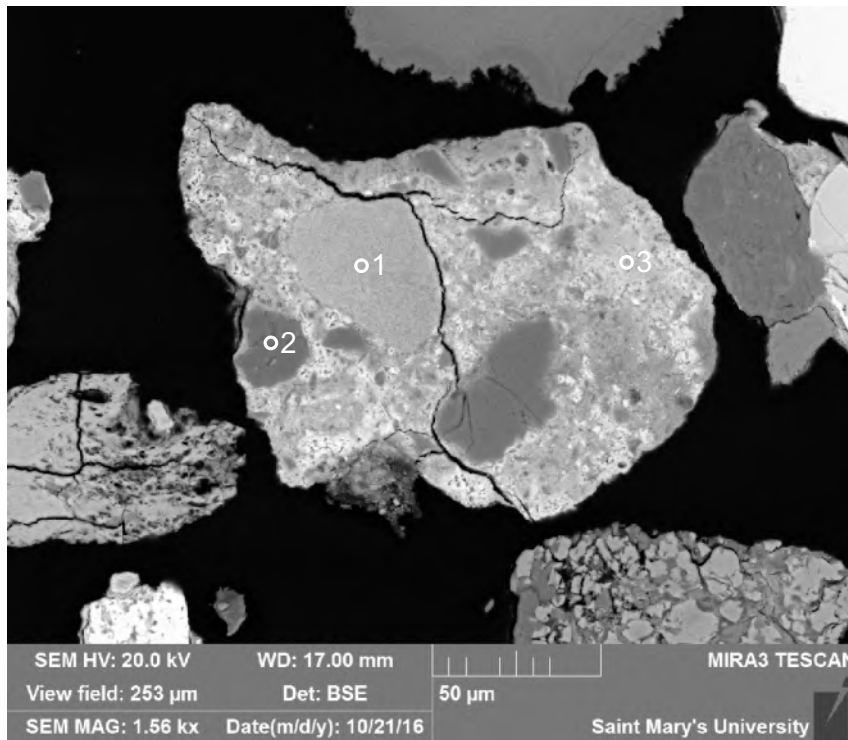


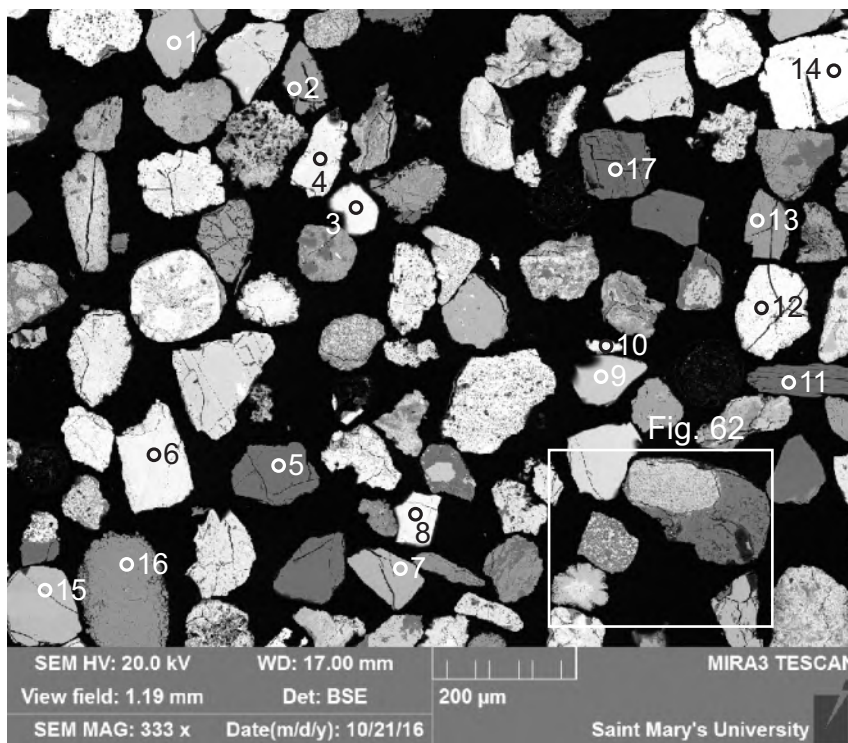
Figure B3.59: Sample S8 site 16.2 (SEM). Magnetite grain highly altered to Fe-oxide/hydroxide (hematite + limonite).





- 1:Chlorite?
- 2:Quartz +
- 3:Chlorite

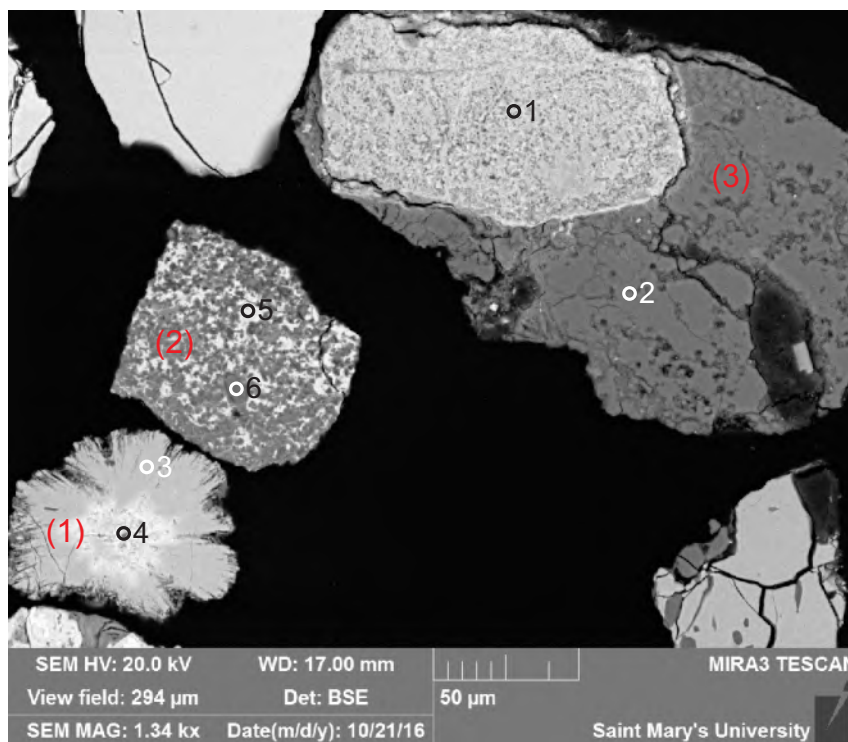
Figure B3.60: Sample S8 site 16.3 (SEM). Siltstone lithic clast.



- 1:Garnet
- 2:Epidote
- 3:Ilmenite
- 4:"Magnetite" +
- 5:Quartz
- 6:"Magnetite" +
- 7:Garnet
- 8:Ilmenite
- 9:Chromite
- 10:"Magnetite" +
- 11:Pg
- 12:Fe-oxide/hydroxide +
- 13:Epidote
- 14:Barite
- 15:Garnet
- 16:Fluorite?
- 17:Dolomite

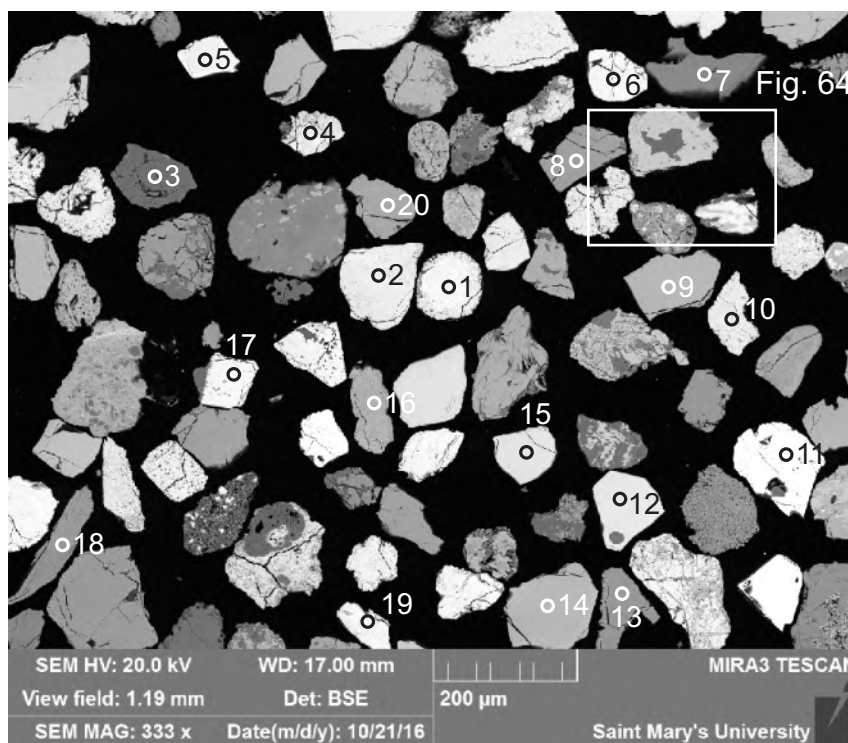
Figure B3.61: Sample S8 site 17 (SEM).





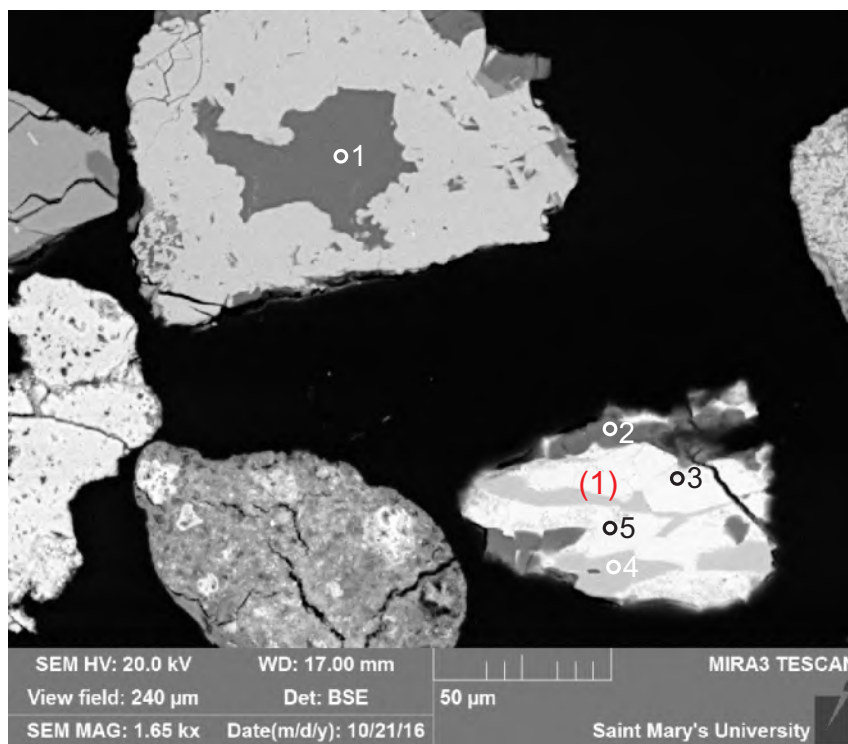
- 1:  $\text{TiO}_2$  +
- 2: Quartz +
- 3: Siderite
- 4: Kaolinite
- 5: Fe-oxide/hydroxide +
- 6: Quartz

Figure B3.62: Sample S8 site 17.2 (SEM). 1: Siderite concretion. 2: Lithic clast of quartz and Fe-oxide/hydroxide (unknown origin). 3: Lithic clast of euhedral titania and quartz with dissolution voids (metamorphic).



- 1: "Magnetite" +
- 2: "Magnetite" +
- 3: Quartz
- 4: Fe-oxide/hydroxide +
- 5: Chromite
- 6: Ilmenite
- 7: Muscovite
- 8: Epidote
- 9: Garnet
- 10: "Magnetite" +
- 11: Zircon
- 12: Chromite
- 13: Epidote
- 14: Garnet
- 15: Chromite
- 16: Apatite
- 17: Ilmenite
- 18: Chlorite
- 19: "Magnetite" +
- 20: Epidote

Figure B3.63: Sample S8 site 18 (SEM).



- 1: Quartz
- 2: Albite +
- 3: "Ilmenite"
- 4:  $\text{TiO}_2$
- 5: Ilmenite

Figure B3.64: Sample S8 site 18.2 (SEM). 1: Lithic clast of albite, ilmenite, and titania and fabric metamorphic. Compare to Figs. B3.29 and B3.34.

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	1	1	Qz	99.68		0.32																						100	119
S8	1	2	Ap				0.28			47.33	1.25		38.98	2.45	6.91												2.79	100	106
S8	1	3	Ep	40.31	0.61	23.76	9.89			22.44																		97	106
S8	1	4	Qz	100.00																								100	119
S8	1	5	Grt	39.97		21.20	27.15	0.82	2.35	8.51																		100	110
S8	1	6	Grt	39.54		20.84	25.11	6.88	0.99	6.65																		100	109
S8	1	7	"Mag" +	4.37			95.63																					100	75
S8	1	8	"Mag" +	3.38		1.10	95.51																					100	73
S8	1	9	Chl	26.81		19.85	22.73		15.61																			85	94
S8	1	10	Ab	69.15		18.92				0.25	11.69																	100	117
S8	1	11	Chr			9.29	21.58		8.58								60.55											100	110
S8	1	12	Ttn	32.63	34.28	2.58	2.39			27.17						0.95												100	111
S8	1	13	Qz	100.00																								100	122
S8	1	14	"Mag" +	3.10			96.90																					100	80
S8	1	15	Ep	40.25		24.96	9.18	0.38		22.23																		97	105
S8	1	16	TiO2		100.00																							100	106
S8	1	17	Chl	28.39		18.25	25.96	0.26	11.71	0.26		0.17																85	91
S8	1	18	Qz	100.00																								100	122
S8	1	19	Chl +	23.28	0.63	18.33	49.14			0.51	0.85	0.41	1.58														5.26	100	68
S8	1	20	Dol						22.42	31.58																		54	56
S8	1.2	1	"Mag"	5.52		1.67	91.09			0.49			1.23															100	78
S8	1.2	2	Sd +	2.83	0.30	2.46	41.94	0.62		0.76	0.69		1.23														5.16	56	69
S8	1.2	3	Sd +	3.46		3.34	43.36			0.62			1.31														3.91	56	70
S8	1.3	1	Qz	99.71			0.29																					100	121
S8	1.3	2	Feohy +	8.55		0.70	86.92			0.57			1.25				2.01											100	79
S8	1.3	3	Ab	66.94		20.50	0.42			1.75	10.39																	100	120
S8	1.3	4	"Mag" +	5.08			94.27			0.65																		100	80
S8	1.3	5	"Mag" +	4.87			94.60			0.54																		100	80
S8	1.3	6	Feohy +	8.59		0.57	87.13			0.66			1.02				1.10					0.93						100	78
S8	1.4	1	Qz	99.55			0.45																					100	121
S8	1.4	2	Qz	99.73			0.27																					100	119
S8	1.4	3	Qz	99.68			0.32																					100	120
S8	1.4	4	Chl + Ill	56.60	0.35	13.87	23.59		0.58	0.26	0.73	1.03	1.02														1.96	100	91
S8	1.4	5	Chl +	30.74	0.37	14.32	36.23			0.26	0.62	0.68	1.77															85	95
S8	2	1	Qz	100.00																								100	120
S8	2	2	Chr		0.36	16.33	25.89		9.12								48.30											100	106
S8	2	3	Grt	39.35		20.68	28.71	1.22	1.17	8.86																		100	113
S8	2	4	Grt	39.40		20.73	32.06	3.14	1.20	3.47																		100	110
S8	2	5	Grt?	41.15		21.93	18.92	0.68	7.59	9.73																		100	113
S8	2	6	Dol						22.29	31.71																		54	54
S8	2	7	Chl	25.90		22.79	20.58		15.73																			85	102
S8	2	8	Ap						0.31	47.67			43.50		6.57												1.94	100	128
S8	2	9	"Mag" +	3.84		0.94	92.37	1.86					1.00															100	82

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	2	10	"Mag" +	3.81		0.63	95.56																					100	78
S8	2	11	Chl +	31.38	0.45	20.87	26.76		0.85	0.50	0.39	0.89	1.15														1.77	85	85
S8	2	12	Qz	99.54	0.46																							100	115
S8	2	13	Chl	25.04		21.85	26.52		11.08		0.51																	85	90
S8	2.2	1	?Clay	57.91	0.54	16.34	11.75		4.04	0.39	1.19	4.88															2.94	100	98
S8	2.2	2	"Mag" +	3.25		1.16	92.32	1.20		0.39			1.28				0.40											100	80
S8	2.2	3	Feohy +	5.88		4.31	86.00			0.52			3.28															100	79
S8	2.2	4	Kfs	65.95		17.70					0.32	15.30													0.73			100	113
S8	2.2	5	Ab	68.89		19.00	0.82		0.54		10.54	0.21																100	111
S8	2.2	6	Ab	68.81		19.05				0.41	10.88	0.85																100	117
S8	2.3	1	Feohy +	7.96		4.37	82.40			0.53	0.93	0.28	3.08			0.46												100	79
S8	2.3	2	Chl +	42.46	0.58	16.91	26.48		2.74		0.94	4.85	0.98														4.08	100	87
S8	2.3	3	Chl +	43.66	0.84	15.37	27.60		3.66		0.66	5.72	0.67														1.83	100	89
S8	2.3	4	Feohy +	6.55		4.38	80.85			0.78	1.03		2.87														3.55	100	76
S8	2.4	1	Ep	41.31		28.98	4.03			22.68																		97	111
S8	2.4	2	Ab + Kln	50.79		36.97	0.44		0.40	0.71	5.96	0.59			4.14													100	113
S8	2.5	1	Ep	40.08		24.77	8.89			22.80							0.47											97	109
S8	2.5	2	Chl	28.99		19.82	12.90	0.26	22.50	0.26							0.27											85	96
S8	2.5	3	Ab	66.82		20.26	0.95		0.70	0.98	10.06	0.22																100	114
S8	3	1	Qz	100.00																								100	122
S8	3	2	Spl			35.65	14.04		15.01								35.30											100	110
S8	3	3	Grt	39.36		20.69	31.45	0.33	1.68	6.50																		100	113
S8	3	4	Chr			12.27	21.78		9.61							0.44	55.91											100	110
S8	3	5	Spl			32.00	17.58		13.90								36.53											100	108
S8	3	6	Qz	100.00																								100	114
S8	3	7	TiO2		99.60		0.40																					100	104
S8	3	8	Ep	40.66		28.77	5.12			22.45																		97	108
S8	3	9	Feohy		5.01	2.64	89.69	0.83	1.20							0.64												100	97
S8	3	10	Zrn	31.10																				67.14		1.76		100	121
S8	3	11	Ap				0.82			47.49			43.22		6.54												1.93	100	128
S8	3	12	"Mag" +	3.14		1.53	93.42						1.92															100	85
S8	3	13	"Mag" +	3.31		1.43	93.46			0.37			1.42															100	79
S8	3	14	Bt	39.68	1.94	18.27	16.75		10.78			8.58																96	104
S8	3	15	Qz	99.07		0.70	0.23																					100	115
S8	3	16	"Mag" +	4.38		0.66	93.41	0.77												0.78								100	77
S8	3.2	1	Qz	99.77			0.23																					100	120
S8	3.2	2	Kfs	66.35		17.90	0.43				0.29	15.02																100	118
S8	3.2	3	Feohy +	14.06		9.69	61.47	1.50	2.55	0.51	1.47	0.57														8.18	100	85	
S8	3.2	4	Chl + Feohy	24.99		13.82	40.70	2.07	11.75	0.53	1.30	0.25															4.60	100	92
S8	3.3	1	Feohy +	3.55		1.61	92.81			0.57			1.45															100	79
S8	3.3	2	Clay	71.15		12.86	10.26		1.76		0.43	3.53																100	102
S8	4	1	Zrn	31.41																				68.59				100	124
S8	4	2	Hol?			2.11		69.06		1.88	3.26				6.42				1.13						6.70		9.43	100	79



Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	4	3	Chr			20.28	17.34		13.21								49.16											100	106
S8	4	4	Qz	100.00																								100	116
S8	4	5	Spl			30.56	17.00		14.52							0.40	37.51											100	107
S8	4	6	Feohy +	6.00		2.52	88.06			0.50			1.64				0.53				0.76							100	78
S8	4	7	Chr			9.27	21.06		8.96								60.70											100	107
S8	4	8	Ilm		55.75		33.68	0.62	9.95																			100	108
S8	4	9	Grt	39.49		21.11	30.66	1.28	3.44	4.02																		100	115
S8	4	10	Chr			11.88	21.83		9.44								56.84											100	106
S8	4	11	Qz	100.00																								100	121
S8	4	12	Ep	39.51		23.77	10.73		0.74	22.04		0.21																97	106
S8	4	13	Dol						22.45	31.55																		54	59
S8	4	14	TiO2		99.39		0.61																					100	112
S8	4	15	Ep	40.56		20.06	3.56			32.82																		97	117
S8	4	16	Ep	39.39		25.91	9.54			22.15																		97	108
S8	4	17	Qz	100.00																								100	122
S8	4	18	TiO2 +	2.68	96.52		0.80																					100	108
S8	4.2	1	Qz	99.67			0.33																					100	118
S8	4.2	2	Chl +	39.76	0.42	18.15	30.95	0.78	1.60	1.10	1.14	1.62														4.47	100	94	
S8	4.2	3	Sd +	3.56		3.58	40.14	1.29	0.45	0.66	0.63		1.01													4.67	56	51	
S8	4.2	4	Kfs	66.11		17.95	0.32				1.06	14.56																100	117
S8	4.2	5	Ep	40.44		25.88	8.01	0.36		22.31																		97	109
S8	4.3	1	TiO2 +	1.13	95.68		0.37			1.95							0.87											100	108
S8	4.3	2	?Grt	31.74	10.11	15.51	19.74		15.39	6.24							1.26											100	102
S8	4.3	3	Ttn	32.15	37.82	1.31	1.40		0.69	26																		100	110
S8	5	1	Zrn	31.03																				66.91		2.06	100	121	
S8	5	2	Zrn	31.35			0.35																	68.29			100	120	
S8	5	3	Grt	39.45		20.89	29.69	2.63	3.50	3.84																		100	114
S8	5	3	Ttn	32.15	37.82	1.31	1.40		0.69	25.96							0.66											100	110
S8	5	4	Chr			27.46	16.00		14.79								41.75											100	107
S8	5	5	Spl			40.65	15.75		16.61								26.99											100	107
S8	5	6	Qz	99.72			0.28																					100	116
S8	5	7	Chr			22.61	16.63		13.33								47.42											100	105
S8	5	8	Dol						22.78	31.22																		54	56
S8	5	9	Qz	100.00																								100	123
S8	5	10	Ep	40.21		26.14	8.08			22.57																		97	114
S8	5	11	Chl	25.75		21.45	24.07		13.74																			85	100
S8	5	12	Ep	40.03		23.64	10.47	0.45		22.42																		97	107
S8	5	13	Chr			24.51	19.55		12.16							0.42	43.35											100	106
S8	5	14	Chr			10.63	23.14		10.46								55.77											100	106
S8	5	15	Ep	40.30		28.33	5.59			22.78																		97	113
S8	5	16	Dol						24.20	29.80																		54	58
S8	5	17	Feohy +	2.42		3.28	84.39			0.39	0.98		1.13				0.72										6.68	100	87
S8	5.2	1	"Mag"	4.37		1.80	92.60						1.24															100	82

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	5.2	2	Feohy +	6.47	0.82	4.26	69.78			0.83	0.83		2.60														14.40	100	76
S8	5.2	3	Qz +	77.58	0.29	6.24	1.29	14.06										0.54										100	103
S8	5.2	4	?Chl	24.55	0.31	23.64	4.83	23.43	0.40	0.62	0.54	0.73		0.48	2.63			0.98									1.86	85	92
S8	5.2	5	Qz +	97.71		0.36		1.93																				100	117
S8	5.2	6	Mnohy +	2.37		8.77	2.21	75.04		0.95	1.04	1.40						0.68							7.55			100	81
S8	5.2	7	Mn-Feohy +	24.48	1.30	22.37	24.94	17.66	0.63	0.90	0.89	0.90	1.17														4.74	100	84
S8	5.3	1	?Clay	68.86		11.35	11.98		3.23	0.33	0.68	3.56																100	97
S8	5.3	2	Feohy +	5.54		5.72	83.78			0.44			3.83							0.69								100	80
S8	5.3	3	"Mag" +	3.04		0.85	93.43	1.17		0.42			1.08															100	80
S8	5.3	4	Qz +	93.18	0.27	3.00	2.16		0.46			0.92																100	110
S8	5.3	5	"Mag" +	3.24		1.06	93.72	0.82					1.15															100	82
S8	5.3	6	Feohy +	5.52		7.05	81.72				0.98		4.07							0.68								100	80
S8	5.4	1	Ab	68.88		19.03	0.27			0.54	10.84	0.44																100	118
S8	5.4	2	Ttn	32.81	37.38	1.36	0.68			27.77																		100	112
S8	6	1	Chr			16.81	19.94		11.26								51.99											100	106
S8	6	2	Hbl	42.33	1.07	10.70	20.93		8.23	12.02	1.16	0.56																97	84
S8	6	3	Ilm		57.45		40.65	1.90																				100	100
S8	6	4	Qz	100.00																								100	117
S8	6	5	Py +	4.41		0.85	48.96			0.36	0.60	0.25		44.57														100	135
S8	6	6	Qz +	97.68		1.37				0.32	0.64																	100	120
S8	6	7	Spl		0.48	26.50	27.49		9.96								35.56											100	108
S8	6	8	"Mag"	3.05			91.87			0.38																	4.69	100	88
S8	6	9	Grt	40.31		21.35	28.72		4.89	4.73																		100	115
S8	6	10	Ilm		49.39		47.21	2.67	0.73																			100	103
S8	6	11	Ep	38.56		4.01	21.87	0.51		32.05																		97	107
S8	6	12	"Mag" +	3.99			92.59	1.22		0.50			1.03							0.67								100	76
S8	6	13	Dol						22.83	31.17																		54	54
S8	6	14	Ep	40.39		20.92	3.40			32.29																		97	108
S8	6	15	"Mag" +	4.54		1.07	92.93		1.07	0.38																		100	76
S8	6	16	Grt	39.69		20.94	31.17	3.03	3.61	1.55																		100	110
S8	6	17	Ap				0.35			46.77	1.29		37.24	2.76	8.71												2.89	100	100
S8	6	18	Qz	99.20		0.32	0.48																					100	119
S8	6	19	Py +	1.64			52.93			0.26	0.40			44.77														100	141
S8	6	20	Grt	38.91		20.74	36.35		2.64	1.35																		100	112
S8	6	21	Ilm		50.89		45.94	1.64	1.53																			100	109
S8	6	22	Chl +	35.86	2.90	18.79	29.01		7.40		0.90	5.16																100	95
S8	6.2	1	Qz	99.41			0.59																					100	120
S8	6.2	2	Chl +	26.94	0.31	16.03	37.48		0.44	0.24	0.59	0.59	1.01														1.36	85	88
S8	6.2	3	"Ilm" +	2.35	31.14	2.91	59.68	0.54			0.69																2.70	100	86
S8	6.3	1	Chl	27.83		19.81	20.78	0.42	16.16																			85	98
S8	6.3	2	Ttn	33.12	37.49	1.30	0.52			27.57																		100	111
S8	6.3	3	Qz +	95.84		1.47	0.89			1.80																		100	120
S8	6.3	4	Ep	40.42		25.22	9.20			22.16																		97	109

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	7	1	Chr		0.42	20.85	30.63		9.31								38.80											100	108
S8	7	2	"Mag" +	3.12		0.62	96.26																					100	83
S8	7	3	Chr			24.50	19.36		13.03								43.11											100	112
S8	7	4	Tur	37.03	1.26	33.35	5.19		6.89	1.08	1.88						0.33											87	102
S8	7	5	Grt	39.69		21.03	29.12	1.71	3.79	4.66																		100	115
S8	7	6	Chl	27.94		18.28	25.61		12.92								0.26											85	92
S8	7	7	Qz	100.00																								100	121
S8	7	8	Chl	26.40		20.24	27.16	0.33	10.44		0.42																	85	99
S8	7	9	Ab	65.29		21.91	0.32			2.87	9.61																	100	116
S8	7	10	St	28.65		43.47	18.93		6.95																			98	102
S8	7	11	Chl +	22.26	0.75	20.26	35.23	0.30	0.59	0.47	0.59	0.42	1.68														2.45	85	90
S8	7	12	Ep +	40.38	0.63	21.98	15.32	0.31	2.97	17.84	0.57																	100	100
S8	7	13	TiO2		99.44		0.56																					100	105
S8	7	14	"Mag" +	3.83		1.27	92.77	0.71					1.42															100	79
S8	7	15	Qz	100.00																								100	120
S8	7	16	Hbl	48.08	0.42	10.54	12.24		13.25	10.02	2.21	0.23																97	108
S8	7	17	Ttn	33.01	32.88	3.90	0.55			28.01					1.65													100	116
S8	7	18	Chr		0.46	24.32	18.87		15.59								40.76											100	109
S8	7	19	"Mag" +	3.52		1.22	92.96	1.14					1.15															100	77
S8	7.2	1	"Mag" +	4.62		1.43	91.36	0.59		0.52			0.98				0.50											100	82
S8	7.2	2	Qz +	84.26	0.27	6.76	5.37		1.16		0.29	1.90																100	111
S8	7.3	1	TiO2	0.62	99.38																							100	107
S8	7.3	2	Qz +	98.61	1.39																							100	121
S8	7.3	3	"Ilm"	1.49	58.81		34.41	5.29																				100	102
S8	7.4	1	St	29.28	0.64	52.33	13.32		2.44																			98	110
S8	7.4	2	Qz	99.65			0.35																					100	121
S8	8	1	Dol				0.31		22.54	31.15																		54	57
S8	8	2	TiO2		99.01		0.99																					100	110
S8	8	3	Ilm		50.67	0.58	45.53	1.03	2.20																			100	107
S8	8	4	Ilm		52.59		45.78	1.63																				100	109
S8	8	5	Chr			13.59	16.32		11.72								58.38											100	108
S8	8	6	TiO2		99.49		0.51																					100	109
S8	8	7	Mag		0.48		98.76	0.41		0.35																		100	90
S8	8	8	Ilm		51.13		46.26	1.61	1.00																			100	104
S8	8	9	Qz	100.00																								100	118
S8	8	10	Fl?							83.24					16.76													100	61
S8	8	11	Chr			8.24	18.42		6.04								67.31											100	97
S8	8	12	Ap							48.95			44.61		4.79												1.64	100	117
S8	8	13	Ep	40.57		25.65	8.27			22.51																		97	106
S8	8	14	Ep	39.79		21.79	12.79			22.63																		97	105
S8	8	15	Ep + Qz	51.83		16.67		4.79		15.62																		100	112
S8	8	16	Kfs	66.91		17.97					0.43	14.69																100	113
S8	8	17	Qz	99.71			0.29																					100	120

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	8	18	Ilm		53.75		41.82	4.43																				100	103
S8	8	19	Grt	40.59		21.48	25.78	0.97	5.89	5.30																		100	110
S8	8	20	Zrn	31.37																				67.28		1.35		100	118
S8	8	21	Grt	40.13		21.32	27.75	0.39	5.02	5.39																		100	112
S8	8.2	1	Ab	69.48	0.42	18.62					11.47																	100	118
S8	8.2	2	TiO2		99.59		0.41																					100	108
S8	8.2	3	Chl	26.29	0.77	21.17	23.62		12.67			0.48																85	99
S8	8.3	1	"Mag" +	4.20			95.80																					100	78
S8	8.3	2	Qz	99.21			0.79																					100	121
S8	8.4	1	"Bt"	35.95	0.66	19.62	30.14		11.75		0.66	1.22																100	95
S8	8.4	2	Qz	99.37	0.27		0.36																					100	121
S8	8.4	3	"Ilm"	4.60	57.05		36.36	1.99																				100	103
S8	9	1	Chr			12.00	20.55		10.97								56.47											100	104
S8	9	2	Feohy +	4.28		2.15	82.91			0.66	0.83		1.69				0.95										6.52	100	83
S8	9	3	Zrn	31.09																				68.91				100	115
S8	9	4	Qz	100.00																								100	119
S8	9	5	Ep	40.37		20.84	1.61	0.52		33.66																		97	114
S8	9	6	Feohy + Qz +	20.07		10.56	61.72		0.70	0.38	0.68	0.80														5.08	100	90	
S8	9	7	Grt	39.73	0.33	20.73	23.52	6.57	0.87	8.25																		100	113
S8	9	8	Spl			29.08	18.34		13.69							0.39	38.49											100	109
S8	9	9	TiO2	0.99	92.40		6.61																					100	102
S8	9	10	Tur	38.43	0.86	29.68	6.37		8.36	0.59	2.71																	87	98
S8	9	11	Ap							49.77			44.92		5.31													100	117
S8	9	12	Ep	39.99		21.04	13.21	0.28		22.48																		97	107
S8	9	13	Grt	39.88		21.17	28.27	0.69	2.74	7.25																		100	111
S8	9	14	Ep	40.15		24.27	10.09			22.49																		97	108
S8	9	15	Spl		0.48	30.45	27.83		11.45								29.78											100	108
S8	9	16	Ilm		53.96		44.32	1.72																				100	109
S8	9	17	Chr			0.66	36.73		4.05								58.56											100	101
S8	9	18	Qz	98.60		0.72	0.69																					100	98
S8	9	19	Ep	39.50		20.64	10.67	2.60		23.59																		97	114
S8	9	20	Grt	39.35		20.80	30.60	1.55	1.22	6.49																		100	114
S8	9	21	Ep	40.49		25.83	8.45	0.44		21.80																		97	110
S8	9	22	Grt	40.61		21.48	28.39	0.32	6.27	2.91																		100	111
S8	9.2	1	Chl + Feohy	25.03	0.43	17.42	51.80			0.71		0.48	4.14															100	89
S8	9.2	2	Qz	99.23			0.53			0.24																		100	119
S8	9.2	3	Chl + Feohy	34.11		1.36	59.39			0.49			4.64															100	93
S8	9.3	1	TiO2		99.58		0.42																					100	107
S8	9.3	2	Qz	97.72	0.35	1.27	0.29					0.37																100	120
S8	9.3	3	Ilm +	14.17	45.64		34.72	5.47																				100	111
S8	9.3	4	Chl +	31.33	0.76	19.91	21.43	0.41	9.15			2.01																85	104
S8	9.4	1	Qz	99.05		0.37	0.58																					100	122
S8	9.4	2	Chl	31.71		16.39	20.57		15.72		0.35						0.25											85	102



Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	9.4	3	Grt	39.91		21.04	31.69		3.06	4.29																		100	114
S8	9.4	4	Chl	28.88		17.64	22.36	0.26	15.85																			85	97
S8	9.4	5	Grt	39.58		21.00	31.97	0.89	3.03	3.53																		100	114
S8	9.4	6	Qz +	95.86		1.61	2.26			0.27																		100	117
S8	10	1	TiO2		99.39		0.61																					100	105
S8	10	2	Ap							45.95	1.35		37.77	2.17	8.53												4.24	100	112
S8	10	3	"Mag" +	1.94		0.68	93.57			0.47																	3.34	100	87
S8	10	4	Chr			8.97	21.77		8.73								60.53											100	104
S8	10	5	Ttn +	37.96	11.06	16.21	11.00			23.78																		100	109
S8	10	6	TiO2		99.66		0.34																					100	106
S8	10	7	Ap			0.56				46.89	1.02		38.91	1.41	9.00												2.20	100	115
S8	10	8	Mag" +	3.44		0.97	93.12			0.49			1.98															100	86
S8	10	9	Chr	1.82		12.05	26.67		7.35							0.58	51.53											100	99
S8	10	10	Feohy +		8.57	2.52	85.92	1.64	1.35																			100	103
S8	10	11	Chr			13.62	28.58		7.34								50.46											100	109
S8	10	12	Grt	40.08		21.02	28.11	0.47	2.84	7.48																		100	114
S8	10	13	Ilm +	14.10	48.00	5.21	27.64	1.41	1.94		1.27	0.44																100	91
S8	10	14	Chl	26.04		21.81	22.36		14.79																			85	101
S8	10	15	Feohy +		9.31	8.73	75.69	0.39	5.22							0.65												100	105
S8	10	16	Ep	39.98		24.17	10.10	0.39		22.37																		97	113
S8	10	17	Ap				0.46			47.95	1.15		39.19	0.82	7.51												2.92	100	110
S8	10	18	Spl			34.39	15.54		16.12								33.96											100	114
S8	10	19	Grt	40.24		21.15	29.91		5.18	3.53																		100	111
S8	10	20	"Ilm"		58.35		37.47	4.18																				100	101
S8	10	21	Qz	99.77			0.23																					100	116
S8	10	22	TiO2		99.49		0.51																					100	105
S8	10.2	1	Chl +	24.64	0.55	15.17	53.52	0.66		0.51	0.65	0.59	0.95														2.76	100	82
S8	10.2	2	Feohy +	5.36		3.54	86.81	1.57		0.36			2.35															100	80
S8	10.2	3	Chl	28.69	0.49	18.70	31.46	0.40	0.70	0.36	0.65	0.82	0.71														2.02	85	77
S8	10.2	4	Qz +	88.13		2.87	4.09		4.91																			100	122
S8	10.2	5	Chl + Feohy	20.33		8.26	60.15		1.57	0.76	0.62	1.11	1.27														5.93	100	89
S8	10.2	6	Chl + Feohy	20.22	0.46	14.18	56.55	0.91	0.55	0.87		0.55	1.57														4.14	100	87
S8	10.3	1	"Mag" +	2.77		1.32	94.49			0.45			0.97															100	79
S8	10.3	2	"Mag" +	3.24		1.00	94.17			0.43			1.16															100	79
S8	10.3	3	Qz + Ill	94.28		2.55	2.56					0.61																100	108
S8	10.3	4	Feohy +	5.15	0.51	5.74	72.01			1.43			3.56														11.60	100	78
S8	11	1	Zrn	31.69																				68.31				100	118
S8	11	2	Grt	39.12		20.59	33.10	1.65	1.63	3.91																		100	113
S8	11	3	Ap			1.01	0.48			45.44	1.31		39.20	2.46	7.48												2.62	100	112
S8	11	4	Spl			31.14	15.94		14.76								38.15											100	113
S8	11	5	Feohy +	5.84		1.90	89.52				0.66		1.31								0.76							100	77
S8	11	6	Qz	100.00																								100	116
S8	11	7	Dol						22.42	31.58																		54	55

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	11	8	TiO2	0.69	98.65		0.65																					100	106
S8	11	9	Ms	49.47	0.38	22.75	9.12		2.33			10.95																95	108
S8	11	10	Chr			27.27	21.60		12.56							0.49	38.08											100	112
S8	11	11	Chl	24.68		21.61	29.91		8.80																			85	97
S8	11	12	Qz	100.00																								100	127
S8	11	13	Ep +	42.32		24.67	8.33			20.45	1.23																	97	113
S8	11	14	Ilm		53.46		44.78	1.76																				100	106
S8	11.2	1	"Mag" +	4.41		1.40	92.44			0.53			1.21															100	79
S8	11.2	2	"Mag" +	5.23		1.45	91.58			0.44			1.30															100	79
S8	11.3	1	Py	0.21			28.52				0.59			70.69														100	231
S8	11.3	2	Fl	2.09		0.45	1.49		0.99	50.91	0.40	0.38			43.29													100	109
S8	11.3	3	Feohy +	5.90		2.43	78.85			1.26	1.26		1.32														8.97	100	83
S8	11.4	1	Ilm		53.52		37.91	8.57																				100	107
S8	11.4	2	TiO2		99.13		0.87																					100	107
S8	11.4	3	Chl + TiO2	24.02	24.20	18.73	19.79	0.70	12.00	0.23		0.33																100	111
S8	12	1	Ilm		52.87		46.15	0.99																				100	104
S8	12	2	TiO2		99.56		0.44																					100	104
S8	12	3	Dol				10.10	0.50	14.71	28.68																		54	56
S8	12	4	Grt	39.17		20.71	34.63	1.71	3.14	0.65																		100	108
S8	12	5	"Mag"	3.99		3.72	91.96			0.33																		100	76
S8	12	6	Dol						22.72	31.28																		54	55
S8	12	7	Chr	7.55	1.09	6.11	32.38	1.18	2.47	1.33	1.91			1.09			43.25										1.64	100	55
S8	12	8	Ep	39.87		23.08	11.65			22.41																		97	111
S8	12	9	Grt	38.99		20.96	28.97	7.27	2.62	1.20																		100	117
S8	12	10	Chr			10.89	23.74		9.30								56.07											100	112
S8	12	11	Feohy +		10.46	2.53	83.36	1.92	1.73																			100	103
S8	12	12	Ap							49.37			44.57		6.06													100	124
S8	12	13	"Mag" +	2.39		2.13	91.68	1.33		0.39			2.08															100	83
S8	12	14	Ap							47.92			44.05		6.47												1.56	100	123
S8	12	15	Ep	41.24		28.44	1.78	0.32	2.37	22.84																		97	103
S8	12	16	Grt?	41.79		21.26	20.92	0.37	7.44	8.21																		100	110
S8	12	17	Ep	40.37		23.42	10.77			22.45																		97	103
S8	12	18	Ep	39.90	0.73	17.93	4.87			33.57																		97	111
S8	12.2	1	Qz	99.20	0.80																							100	121
S8	12.2	2	Chl + ?Ab	57.71	1.58	11.37	10.93		9.95	1.40	7.06																	100	113
S8	12.2	3	Ttn +	32.31	40.10	1.32	0.30			25.97																		100	110
S8	12.2	4	TiO2		99.53		0.47																					100	107
S8	12.3	1	Qz	99.77			0.23																					100	120
S8	12.3	2	Feohy +	10.59	1.40	10.03	70.80			0.61	0.70		2.30														3.57	100	81
S8	12.4	1	TiO2 +	9.77	79.79	2.52	0.36			7.57																		100	110
S8	12.4	2	Qz	99.31	0.69																							100	122
S8	12.4	3	Ab	68.48	0.42	18.89	0.24			0.50	11.23	0.24																100	124
S8	12.4	4	TiO2		99.06		0.53			0.42																		100	108

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	12.4	5	Ttn	32.07	30.12	5.81	8.31		1.75	21.41		0.52																100	105
S8	13	1	Ilm		53.57		45.37	1.06																				100	104
S8	13	2	Grt	39.95		20.91	27.26	0.55	2.14	9.19																		100	111
S8	13	3	Chr		0.54	16.62	27.14		9.18								46.52											100	107
S8	13	4	Mag +	4.48		3.13	91.58	0.81																				100	89
S8	13	5	Grt	40.10		21.54	25.16	0.60	4.69	7.90																		100	112
S8	13	6	Feohy +		6.40	4.31	85.62	0.70	2.98																			100	95
S8	13	7	Chr			11.60	18.79		7.70								61.92											100	101
S8	13	8	Qz	100.00																								100	117
S8	13	9	Chl	26.44		21.23	24.18		13.14																			85	95
S8	13	10	Grt	38.82	0.96	4.24	22.46	0.69		32.83																		100	107
S8	13	11	Ep	40.75		25.94	7.81			22.50																		97	111
S8	13	12	Chr			4.40	20.12		9.52								65.95											100	107
S8	13	13	Spl		0.44	27.47	32.28		12.52							0.46	26.83											100	108
S8	13	14	Grt	39.53		21.02	29.89	1.72	3.05	4.78																		100	116
S8	13	15	Chr			16.72	16.06		13.68								53.55											100	112
S8	13	16	Ap				0.27			49.28	1.16		39.69	2.10	7.51													100	115
S8	13	17	Qz	99.28		0.38	0.35																					100	106
S8	13	18	Ep	39.80		20.70	13.88			22.62																		97	111
S8	13	19	Spl		0.50	25.78	24.42		9.71								39.59											100	107
S8	13	20	Spl			43.05	15.67		17.26								24.02											100	109
S8	13	21	"Mag" +	3.49			94.63			0.40			1.48															100	78
S8	13	22	Chr			20.80	27.29		9.32								42.59											100	109
S8	13.2	1	Qz	99.55			0.45																					100	120
S8	13.2	2	Feohy +	1.99		4.35	87.67			0.53			5.47															100	80
S8	13.2	3	Qz	98.85			0.87			0.29																		100	119
S8	13.3	1	Ms	46.74	0.37	33.40	1.32		0.65		1.28	8.67			2.57													95	110
S8	13.3	2	Chl	24.62		21.79	29.43		9.16																			85	97
S8	13.3	3	Ms	48.57		33.76	1.48		0.75		0.96	9.47																95	108
S8	14	1	Ilm		49.93		48.46	1.60																				100	105
S8	14	2	Qz	100.00																								100	120
S8	14	3	Ap							49.59			45.07		5.34													100	116
S8	14	4	St	28.89	0.65	53.41	12.90		2.16																			98	109
S8	14	5	Grt	38.40		20.48	17.38	22.98	0.75																			100	115
S8	14	6	Ep	40.34	0.57	20.40	1.66			34.03																		97	115
S8	14	7	Chr		0.51	18.96	38.06		6.83							0.45	35.20											100	103
S8	14	8	Grt	39.26		20.67	28.77	3.35	1.69	6.27																		100	118
S8	14	9	Qz	99.76			0.24																					100	117
S8	14	10	Feohy +	7.02		4.10	81.58	0.44		0.55	0.68	0.52	0.86														4.26	100	91
S8	14	11	Chr			19.64	25.05		10.12								45.19											100	104
S8	14	12	"Mag" +	4.55		0.78	92.39	1.17		0.39									0.73									100	80
S8	14.2	1	Ilm		52.80		33.61	13.59																				100	107
S8	14.2	2	Ab	68.13	1.39	18.66	0.30				11.51																	100	120

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S8	14.2	3	TiO2		97.62		2.38																					100	106
S8	14.2	4	TiO2	4.91	90.68	2.21	2.21																					100	105
S8	14.3	1	Zrn	30.97			0.39																	68.64				100	119
S8	14.3	2	Qz	95.50		2.84	0.35				0.79	0.53																100	120
S8	14.3	3	Chl	26.30		20.70	28.58		9.43																			85	97
S8	14.3	4	TiO2 +	14.34	74.33	5.55	4.00		1.05			0.73																100	108
S8	14.3	5	Ms	49.09		32.26	1.27		1.20		0.57	8.87			1.74													95	110
S8	15	1	Grt	39.55		21.41	32.93	0.40	4.06	1.65																		100	113
S8	15	2	"Mag" +	1.58			98.42																					100	77
S8	15	3	Grt	39.33		20.74	29.74	3.28	1.80	5.12																		100	111
S8	15	4	Zrn	31.00																				67.60		1.40		100	122
S8	15	5	"Ilm"		57.18		40.47	2.34																				100	109
S8	15	6	Chl	25.71		19.80	29.29		10.21																			85	102
S8	15	7	Grt?	41.09		21.52	20.28	0.58	8.45	8.08																		100	116
S8	15	8	Ep	44.63		21.07	6.11		4.92	20.27																		97	113
S8	15	9	Grt	40.14		21.28	29.42	0.47	5.24	3.46																		100	115
S8	15	10	Ap							47.36	1.10		38.12	1.96	9.06												2.40	100	114
S8	15	11	Chl?	30.41	0.91	20.13	42.06		1.20	0.65		1.28	1.01														2.35	100	91
S8	15	12	Grt	40.32		21.50	23.62	0.95	3.11	10.51																		100	112
S8	15	13	"Mag" +	4.79			93.81	0.54					0.86															100	82
S8	15	14	Ms	49.12	0.43	24.17	7.95		2.32		0.28	10.74																95	105
S8	15	15	Ep	40.42		20.25	2.59			33.74																		97	111
S8	15	16	Ilm		53.80		44.83	1.37																				100	107
S8	15	17	Mag +	3.33		1.83	90.16	1.08		0.51			1.04														2.06	100	91
S8	15.2	1	Qz +	88.74		4.21	5.20		0.55		0.43	0.88																100	93
S8	15.2	2	Qz	99.28			0.72																					100	199
S8	15.2	3	"Mag" +	3.34		2.08	92.54			0.37			1.23				0.44											100	84
S8	15.2	4	Feohy +	8.95		6.34	82.80			0.33			1.58															100	81
S8	15.3	1	Chl	26.89		19.93	21.63		16.23		0.32																	85	93
S8	15.3	2	Qz	99.32			0.68																					100	120
S8	15.3	3	Feohy +	3.47		1.63	86.53																				8.37	100	77
S8	15.3	4	Ab	68.15		18.57	1.78				11.50																	100	122
S8	15.4	1	Qz	99.67			0.33																					100	121
S8	15.4	2	TiO2		99.45		0.55																					100	108
S8	15.4	3	Feohy +	8.00	0.60	6.52	71.45		0.95	1.26	0.88																10.34	100	75
S8	15.4	4	Ab + Feohy +	57.37		17.46	10.88		5.39	0.58	8.05	0.26																100	96
S8	15.5	1	Ep	39.91		22.76	11.82	0.30		22.22																		97	110
S8	15.5	2	Chl	36.16		20.32	22.36	0.55	19.84	0.53		0.23																100	94
S8	15.5	3	Qz	99.13		0.32	0.29				0.27																	100	121
S8	16	1	Ilm		50.29		48.14	1.57																				100	106
S8	16	2	TiO2		98.57					0.37							1.06											100	110
S8	16	3	"Mag" +	2.94		0.70	96.37																					100	82
S8	16	4	Grt?	41.08		22.11	23.90	0.62	11.43	0.87																		100	116



Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SrO	ZrO2	BaO	HfO2	WO3	Total	Actual Total	
S8	16	5	"Mag" +	3.40			92.62	2.02		0.37			0.92							0.67								100	79	
S8	16	6	TiO2	0.77	98.98					0.26																		100	106	
S8	16	7	TiO2		99.61		0.39																					100	105	
S8	16	8	Fl				0.29			58.95					40.76													100	96	
S8	16	9	Grt	39.53		20.79	14.20	15.56		9.91																		100	111	
S8	16	10	Ep	40.22		20.66	3.01			33.12																		97	112	
S8	16	11	Qz	98.23						0.19	0.42																1.16	100	116	
S8	16	12	Ilm		53.83		44.53	1.64																				100	105	
S8	16	13	Ilm		52.26		45.03	2.71																				100	107	
S8	16	14	Chr			18.84	18.62		11.88								50.67												100	107
S8	16	15	Ilm		50.81		47.76	1.43																				100	108	
S8	16	16	?Chl + Feohy	28.45	0.37	13.20	55.35			0.36		0.34	1.93																100	89
S8	16	17	Qz	100.00																								100	121	
S8	16	18	Kfs	66.05		18.10					1.68	13.33													0.84			100	117	
S8	16	19	"Mag" +	3.18		1.15	93.52			0.46			1.68															100	83	
S8	16	20	Chr	0.81		10.74	23.92		9.92								54.62											100	100	
S8	16	21	Feohy +	5.50		2.85	87.26			0.71			2.84							0.84								100	77	
S8	16	22	Feohy +	11.42	0.53	2.62	83.14			0.88			1.40															100	88	
S8	16.2	1	"Mag" +	2.96		1.57	92.82	0.91		0.34			1.41															100	82	
S8	16.2	2	Feohy +	5.24		5.74	78.22			0.60	0.92		2.85														6.43	100	80	
S8	16.3	1	Chl?	31.00	0.82	22.71	42.18		0.54	0.38	0.77	0.60	1.00															100	92	
S8	16.3	2	Qz +	90.37		6.60	1.94				0.30	0.79																100	120	
S8	16.3	3	Chl	29.74	0.38	21.27	28.97		0.98	0.38	0.40	1.97	0.91															85	92	
S8	17	1	Grt	39.69		21.03	27.85	6.00	3.66	1.77																		100	109	
S8	17	2	Ep	40.65		28.24	5.57			22.54																		97	106	
S8	17	3	Ilm		53.55		44.25	2.19																				100	105	
S8	17	4	"Mag" +	2.74		0.74	94.72			0.52			1.28															100	80	
S8	17	5	Qz	100.00																								100	121	
S8	17	6	"Mag" +	3.39			96.61																					100	77	
S8	17	7	Grt	40.22		21.09	28.01	1.15	4.38	5.16																		100	116	
S8	17	8	Ilm		51.12		48.88																					100	107	
S8	17	9	Chr			27.85	17.84		13.84								40.47											100	112	
S8	17	10	"Mag" +	3.88		0.88	93.03			0.59							1.63											100	82	
S8	17	11	Pg	48.31		38.23	0.45				7.30	0.72																95	108	
S8	17	12	Feohy +	3.92		1.27	88.90			0.73			0.86														4.32	100	85	
S8	17	13	Ep	40.59		25.59	8.48	0.32		22.02																		97	110	
S8	17	14	Brt											36.60				-0.04					1.31		62.13			100	111	
S8	17	15	Grt	39.30		21.20	31.85	2.30	3.91	1.43																		100	112	
S8	17	16	Fl?						0.56	71.13					28.31													100	81	
S8	17	17	Dol						22.94	31.06																		54	56	
S8	17.2	1	TiO2 +	2.69	76.88	3.93	12.15			0.88	0.75		2.72															100	95	
S8	17.2	2	Qz +	94.43	0.50	3.04	0.85		0.41		0.31	0.47																100	113	
S8	17.2	3	Sd				54.35	0.43		1.22																		56	58	

Table B3.1: EDS analyses for sample S8.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	SiO	ZrO2	BaO	HfO2	WO3	Total	Actual Total	
S8	17.2	4	Kln	44.57		6.43	30.98		0.39	1.65		0.35															1.63	86	95	
S8	17.2	5	Feohy +	5.70		4.59	85.03			0.40			4.28															100	79	
S8	17.2	6	Qz	99.38			0.62																					100	120	
S8	18	1	"Mag" +	5.14		1.02	93.43			0.40																		100	79	
S8	18	2	"Mag" +	4.77		1.38	92.57	0.79		0.49																		100	77	
S8	18	3	Qz	100.00																								100	116	
S8	18	4	Feohy +	7.51		2.98	86.57			0.46			2.47															100	78	
S8	18	5	Chr		0.39	19.00	34.26	1.68	0.62								41.28				2.76							100	101	
S8	18	6	Ilm		50.18		47.99	1.83																				100	101	
S8	18	7	Ms	48.44	0.67	27.70	6.03		1.56			10.60																95	105	
S8	18	8	Ep	39.59		24.08	11.57			21.77																		97	105	
S8	18	9	Grt	39.54		20.99	28.26	1.26	1.55	8.41																		100	112	
S8	18	10	"Mag" +	3.32		2.11	94.57																					100	77	
S8	18	11	Zrn	30.84																			67.66		1.50			100	124	
S8	18	12	Chr			9.79	20.41		10.72								59.09												100	109
S8	18	13	Ep	40.00	0.30	27.63	6.01	0.27		22.79																			97	113
S8	18	14	Grt	39.64		21.10	31.27	0.90	5.09	2.00																			100	117
S8	18	15	Chr			12.06	19.98		10.90								57.06												100	108
S8	18	16	Ap				0.29			46.08	1.57		38.72	2.10	8.14												3.10	100	114	
S8	18	17	Ilm		53.73		42.95	3.32																					100	105
S8	18	18	Chl	26.90		19.96	22.58	0.30	15.26																				85	97
S8	18	19	"Mag" +	3.98			94.47		1.07	0.48																			100	81
S8	18	20	Ep	39.73	0.71	17.25	5.66	1.27	0.51	31.88																			97	110
S8	18.2	1	Qz	99.55	0.45																								100	119
S8	18.2	2	Ab +	66.82	7.22	13.40	2.64			1.35	8.58																		100	124
S8	18.2	3	"Ilm"		56.06		41.17	2.77																					100	105
S8	18.2	4	TiO2		99.13		0.87																						100	108
S8	18.2	5	Ilm		54.60		42.67	2.74																					100	106
	Notes																													
	" " = indicates that mineral is altered																													
	+ = indicates other minerals present																													

B4: SEM-BSE images and EDS  
mineral analyses for sample S9.

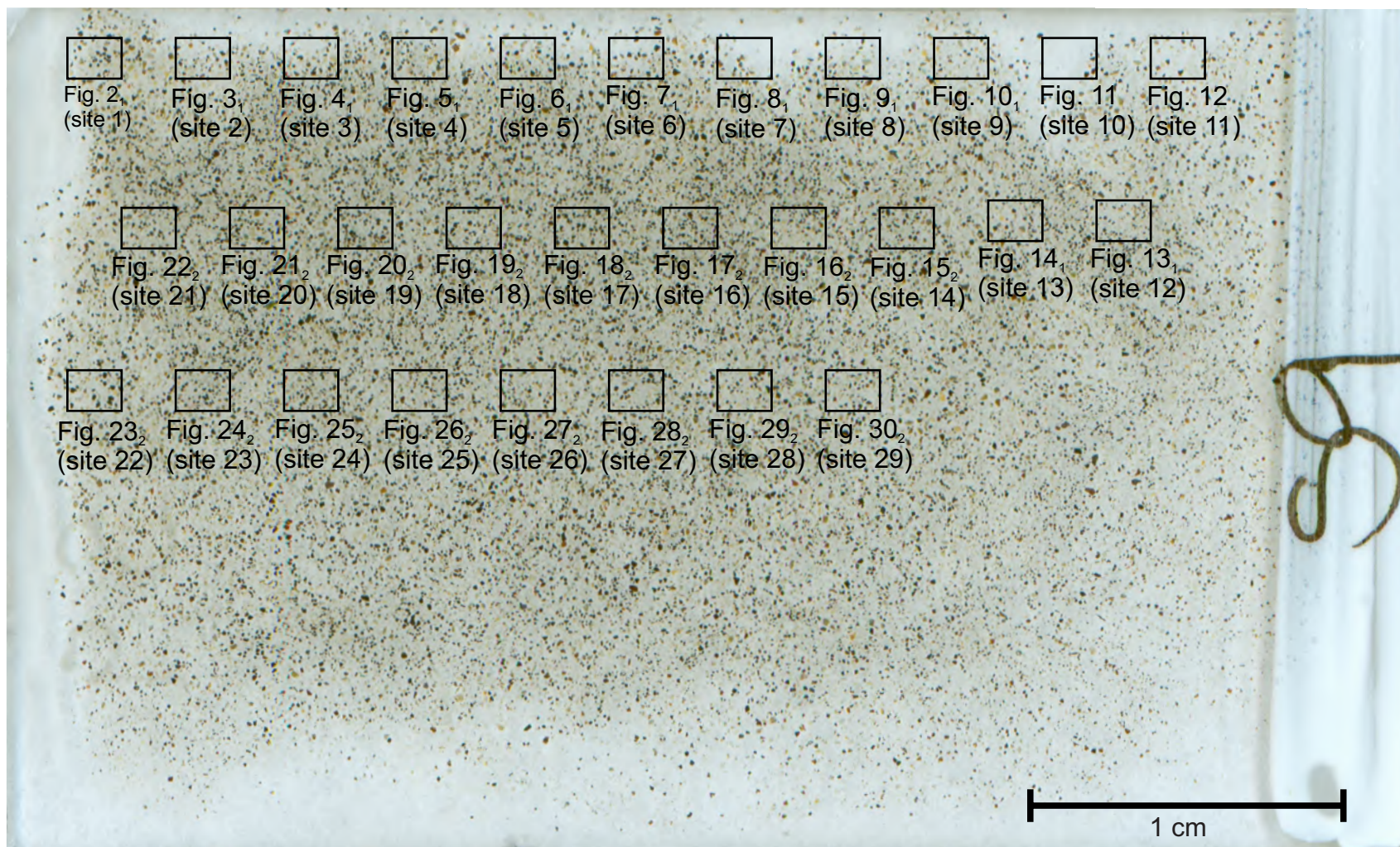


Figure B4.1: Scanned thin section of sample S9 showing the location of analysed sites. This sample is of heavy mineral separates from a bouldery erosive river that consisted of sand patches of medium - coarse grain. The subscripts indicate the tables where the sites can be found 1 = Table 1-3.1, 2 = Table 1-3.2.



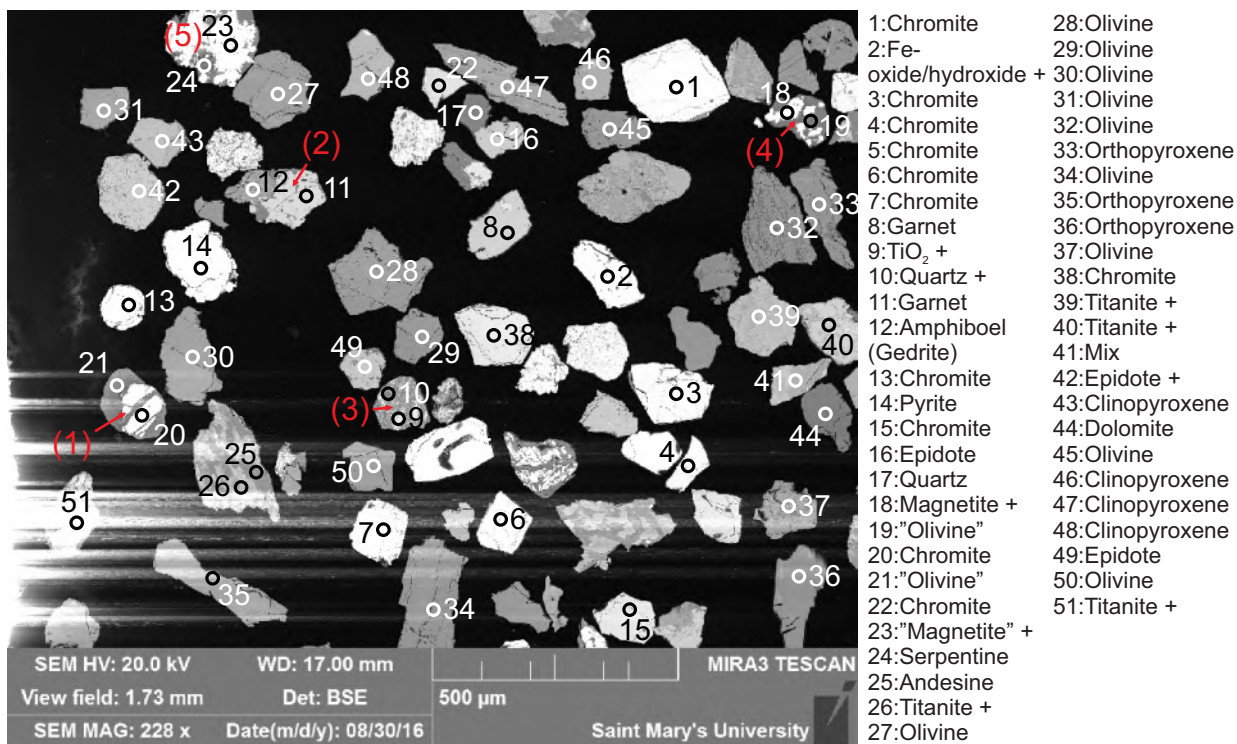


Figure B4.2: Sample S9 site 1 (SEM). 1: Lithic clast (altered olivine + chromite, ophiolite). 2: Lithic clast (garnet + gedrite, metamorphic). 3: Lithic clast (quartz + titania, metamorphic). 4: Lithic clast (olivine + magnetite, ophiolite). 5: Lithic clast (magnetite + serpentine, ophiolite).

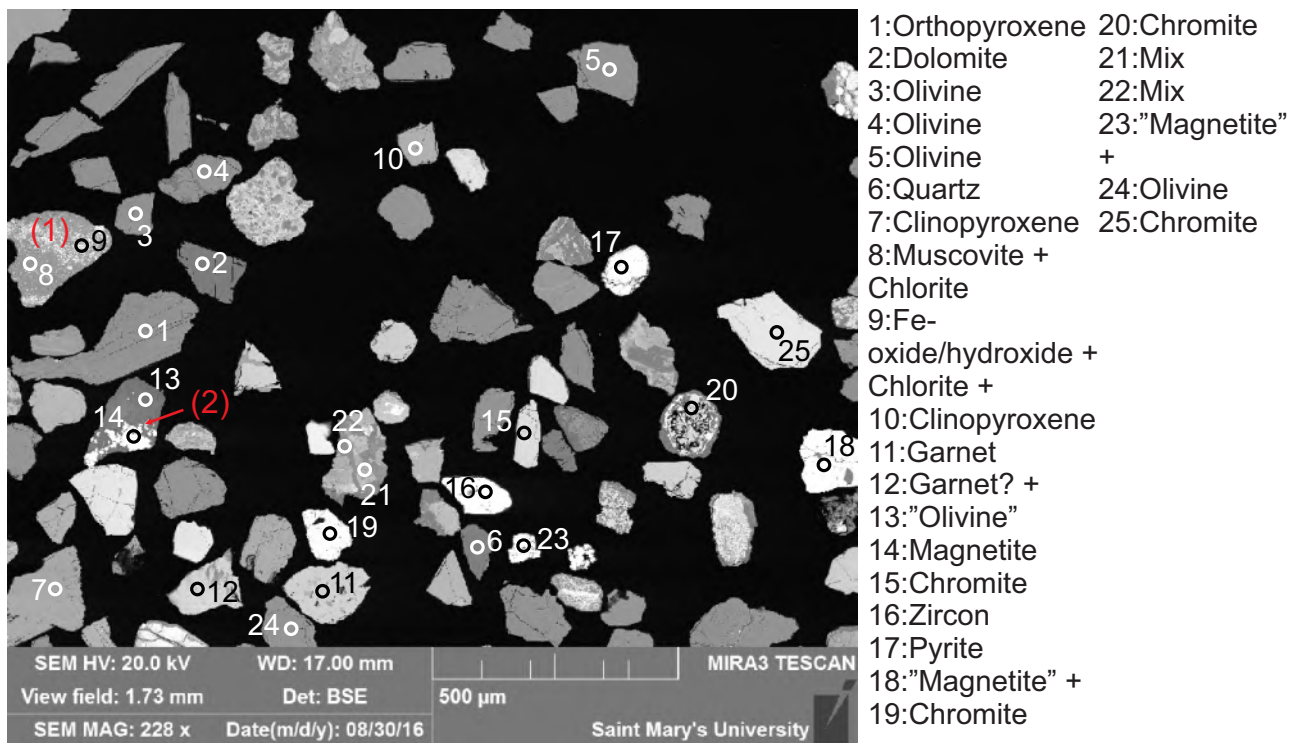


Figure B4.3: Sample S9 site 2 (SEM). 1: Lithic clast (muscovite + chlorite + Fe-oxide/hydroxide, metamorphic). 2: Lithic clast (olivine + magnetite, ophiolite).

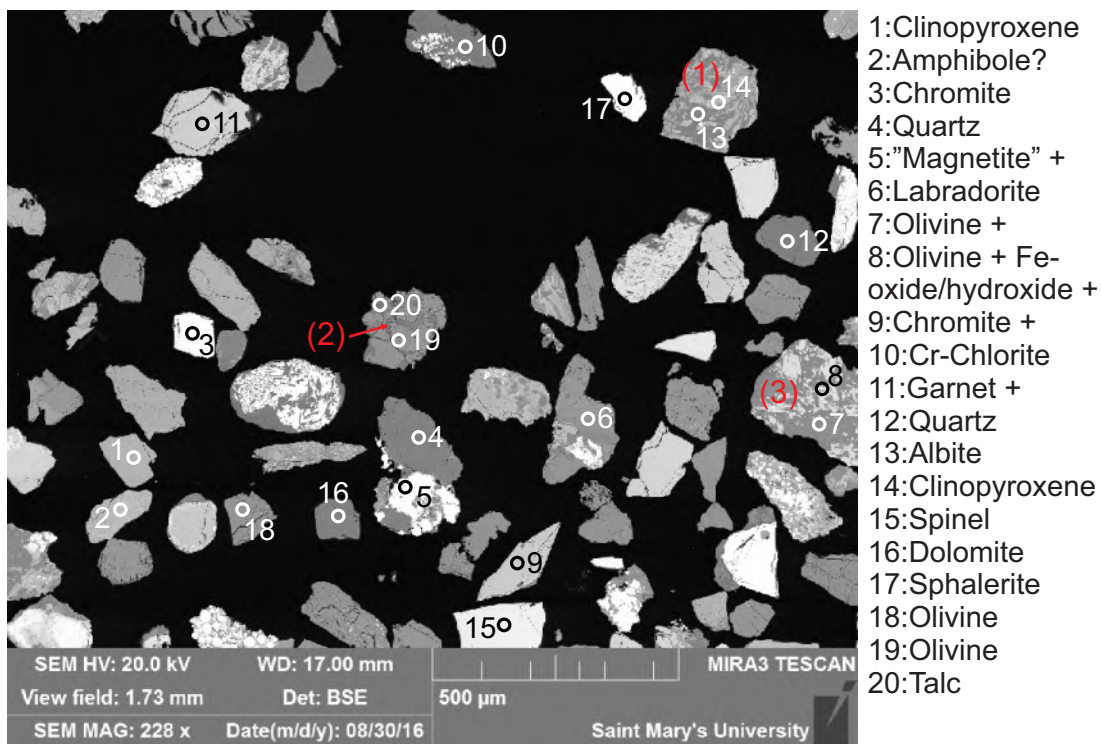


Figure B4.4: Sample S9 site 3 (SEM). 1: Granitic lithic clast (albite + clinopyroxene, metaophiolite). 2: Olivine with talc along fractures. 3: Lithic clast (olivine + Fe-oxide/hydroxide probably magnetite, ophiolite).

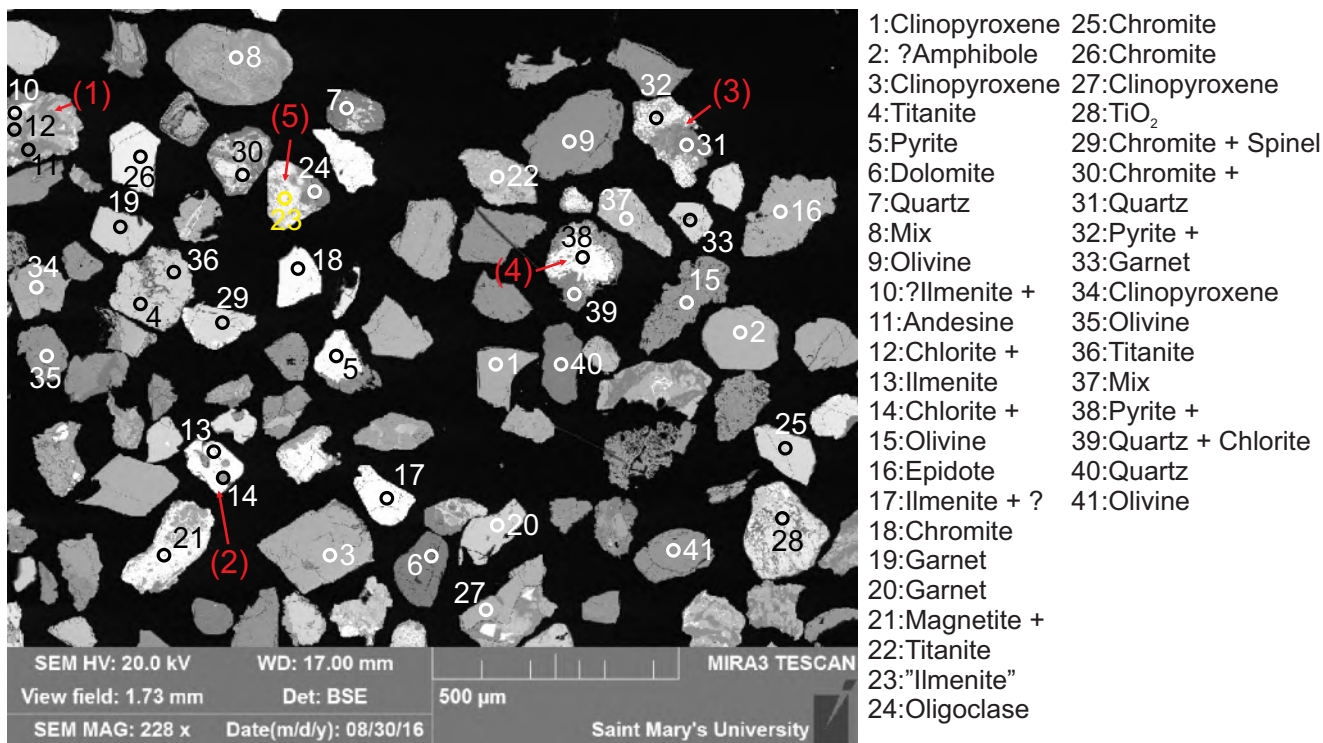
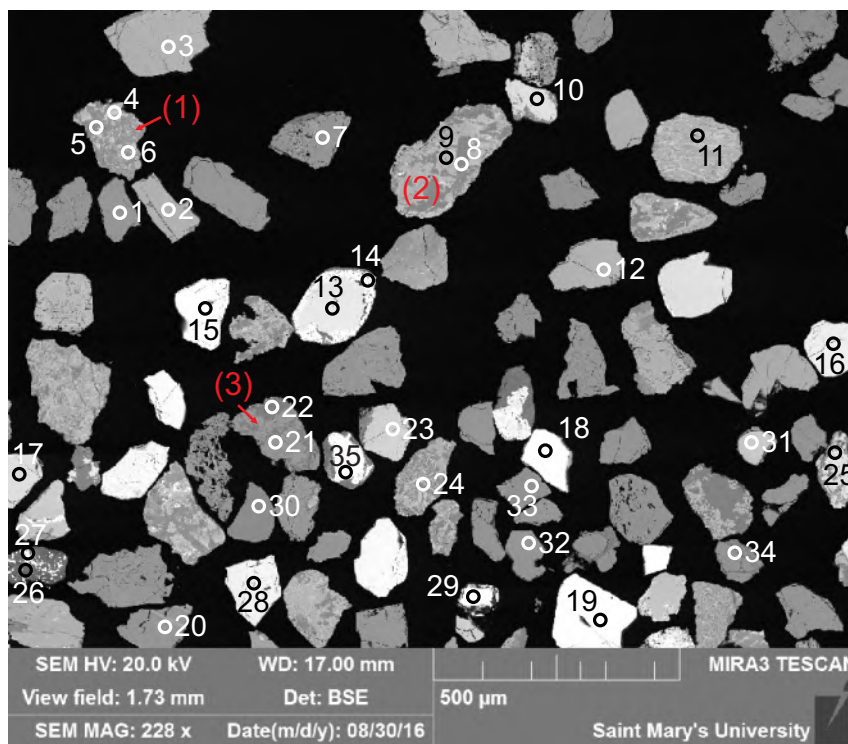


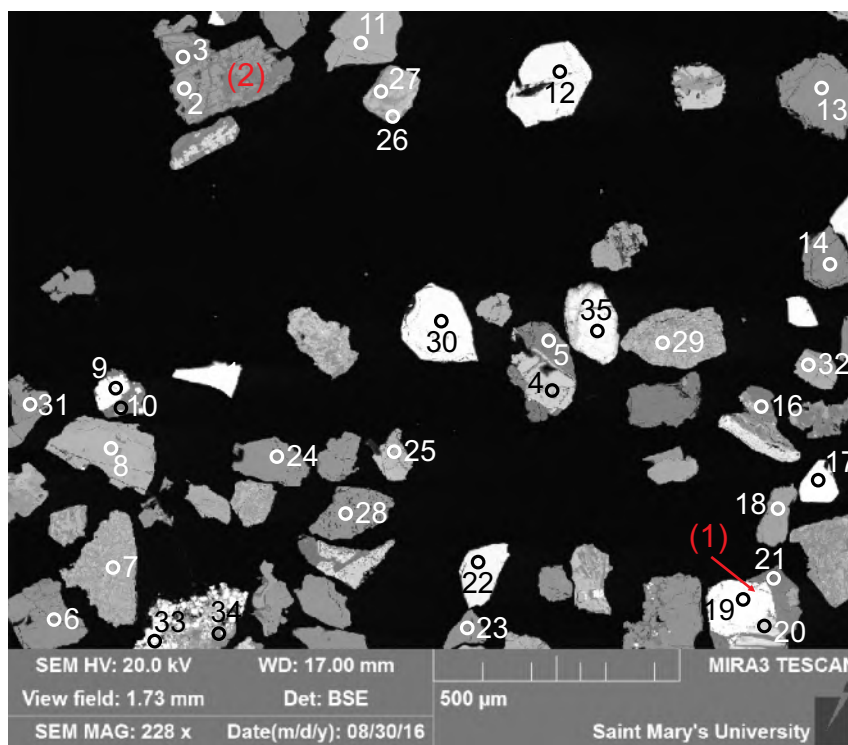
Figure B4.5: Sample S9 site 4 (SEM). 1: Lithic clast (chlorite + andesine + ilmenite, igneous). 2: ilmenite grain with chlorite inclusions. 3: Lithic clast (quartz + pyrite, hydrothermal). 4: Lithic clast (quartz + pyrite, concretion in siltstone). 5: Lithic clast (oligoclase + ilmenite, igneous).





- |                    |                      |
|--------------------|----------------------|
| 1: Olivine         | 25: TiO <sub>2</sub> |
| 2: Orthopyroxene   | 26: Altered Olivine  |
| 3: Clinopyroxene   | 27: ?                |
| 4: Clinopyroxene   | 28: Chromite         |
| 5: Andesine        | 29: Pyrite           |
| 6: ? Clinopyroxene | 30: Tourmaline       |
| 7: Olivine         | 31: Apatite + REE    |
| 8: Albite          | 32: Olivine          |
| 9: Clinopyroxene?  | 33: Olivine          |
| 10: Garnet         | 34: Olivine          |
| 11: Titanite?      | 35: Chromite +       |
| 12: Clinopyroxene  |                      |
| 13: Chromite       |                      |
| 14: Chromite       |                      |
| 15: Chromite       |                      |
| 16: Chromite       |                      |
| 17: Chromite       |                      |
| 18: Chromite       |                      |
| 19: Chromite       |                      |
| 20: Orthopyroxene  |                      |
| 21: Olivine        |                      |
| 22: Talc           |                      |
| 23: Apatite        |                      |
| 24: Albite         |                      |

Figure B4.6: Sample S9 site 5 (SEM). 1: Lithic clast (andesine + clinopyroxene, volcanic). 2: Lithic clast (albite + clinopyroxene, igneous). 3: Olivine grain altering to talc, ophiolite.



- |                   |                          |
|-------------------|--------------------------|
| 1: Chromite       | 25: Clinopyroxene?       |
| 2: Amphibole      | 26: ? Clinopyroxene +    |
| 3: Albite         | 27: Amphibole            |
| 4: Spinle +       | 28: Olivine              |
| 5: Garnet?        | 29: ? Amphibole          |
| 6: Olivine        | 30: Chromite             |
| 7: Epidote?       | 31: Olivine              |
| 8: Clinopyroxene  | 32: Clinopyroxene?       |
| 9: Magnetite      | 33: Fe-oxide/hydroxide + |
| 10: "Olivine"     | 34: Quartz +             |
| 11: Clinopyroxene | 35: Ilmenite             |
| 12: Chromite      |                          |
| 13: Olivine       |                          |
| 14: Olivine       |                          |
| 15: Chromite      |                          |
| 16: Quartz        |                          |
| 17: Chromite      |                          |
| 18: Chlorite      |                          |
| 19: Pentlandite   |                          |
| 20: Chromite +    |                          |
| 21: "Olivine"     |                          |
| 22: Chromite      |                          |
| 23: Olivine       |                          |
| 24: Olivine       |                          |

Figure B4.7: Sample S9 site 6 (SEM). 1: Lithic clast (chromite + olivine + pentlandite, ophiolite). 2: Lithic clast (amphibole + albite, igneous).

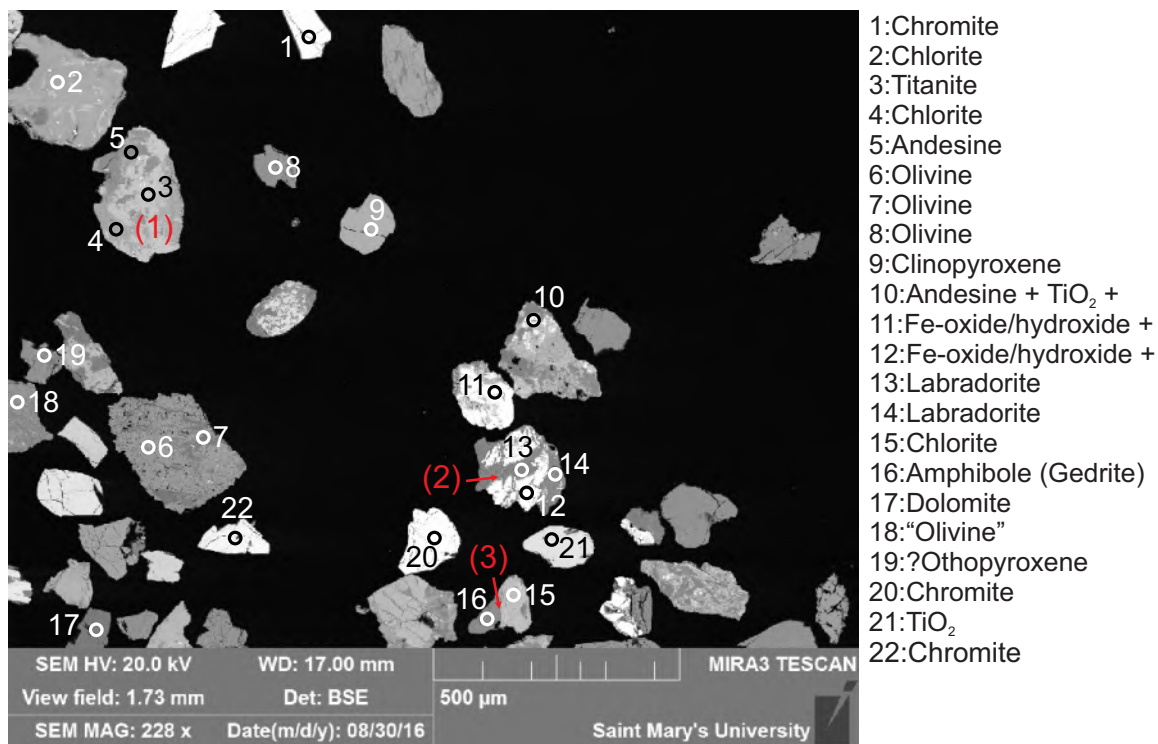


Figure B4.8: Sample S9 site 7 (SEM). 1: Lithic clast (titanite + chlorite + plagioclase, metamorphic). 2: Lithic clast (labradorite, igneous). 3: Lithic clast (chlorite + gedrite, metamorphic).

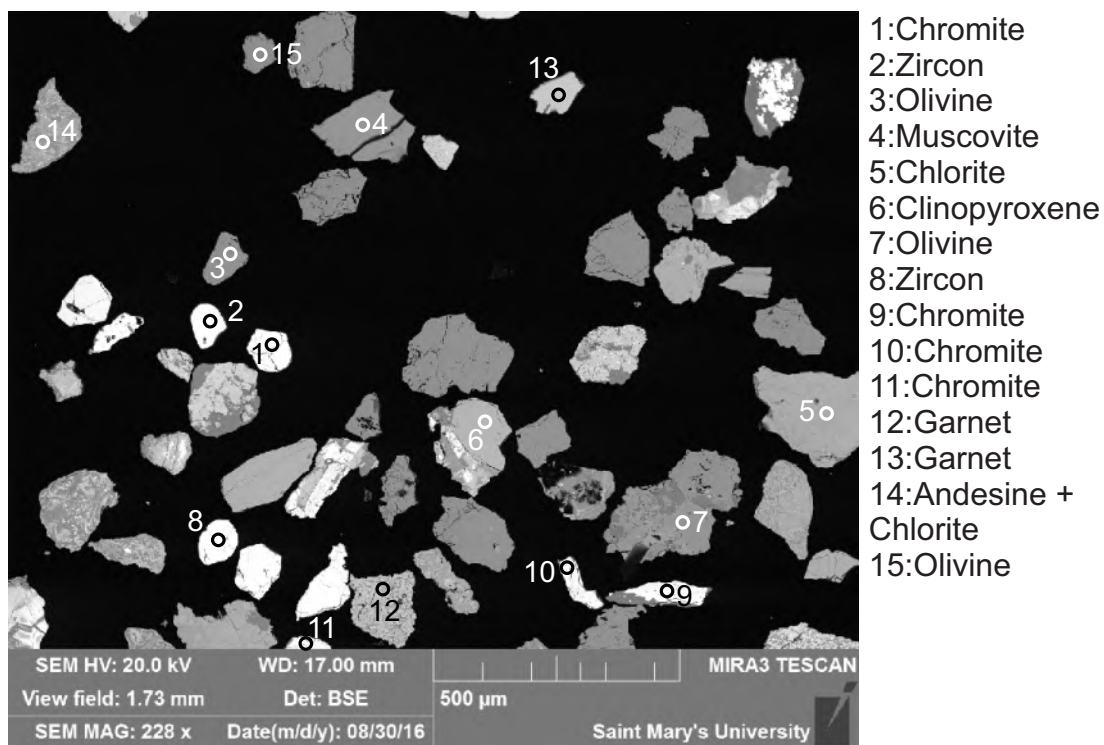
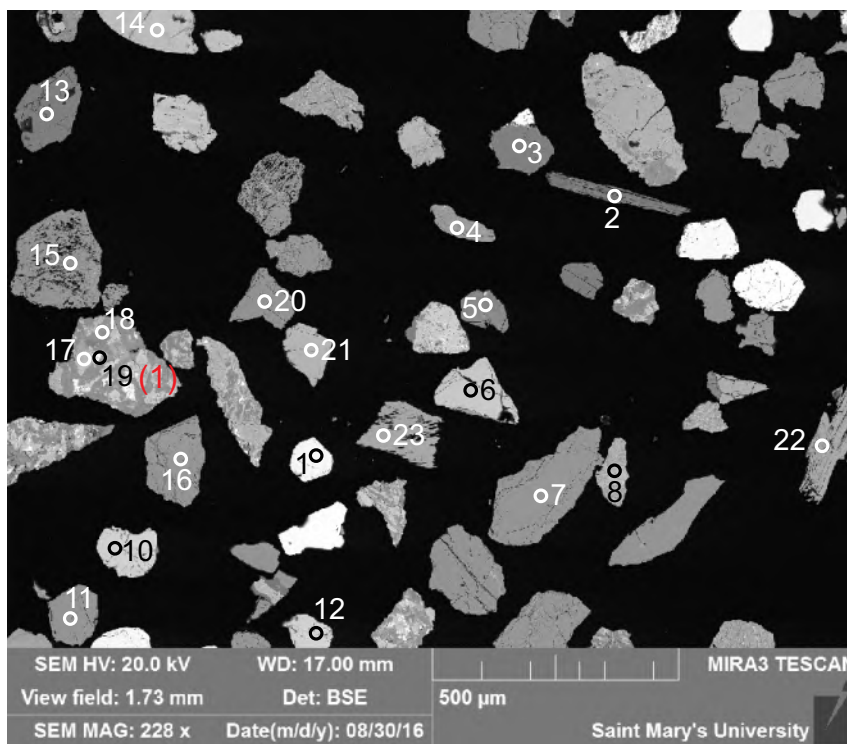


Figure B4.9: Sample S9 site 8 (SEM).





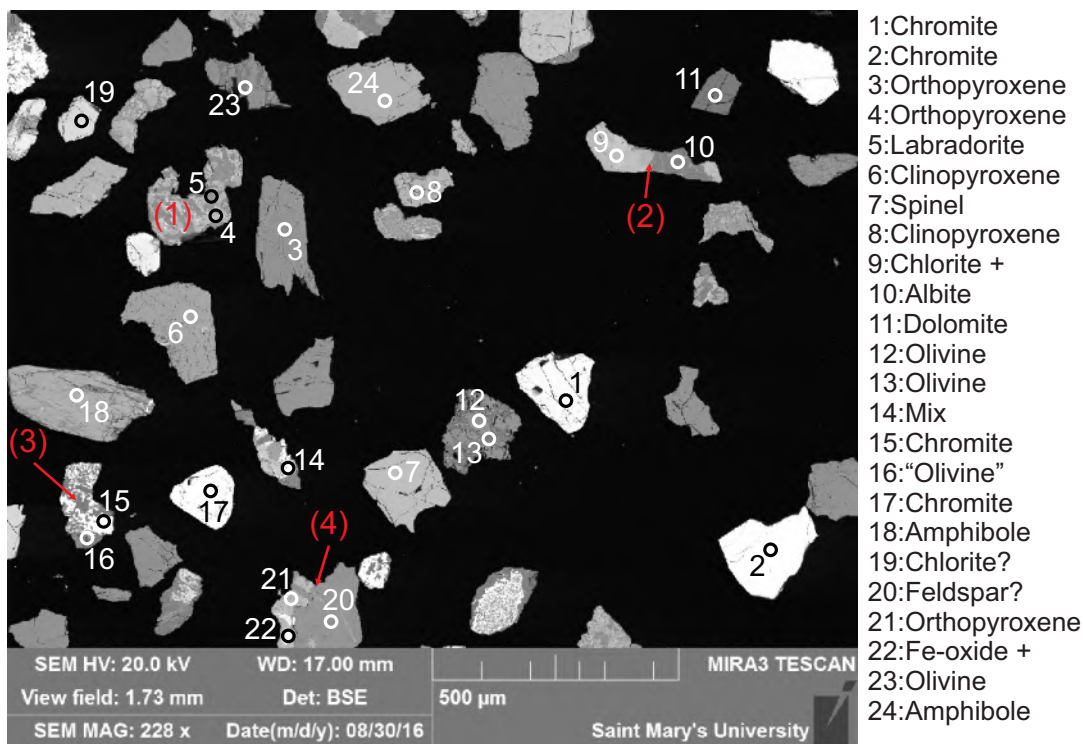
- 1:Chromite
- 2:?
- 3:Quartz
- 4:Muscovite +
- 5:Tourmaline
- 6:Spinel
- 7:Olivine
- 8:Amphibole
- 9:Chromite
- 10:?Garnet
- 11:Olivine
- 12:Apatite
- 13:Dolomite
- 14:Amphibole
- 15:Olivine
- 16:Olivine
- 17:Clinopyroxene
- 18:Oligoclase
- 19:Fe-oxide/hydroxide
- +
- 20:Olivine
- 21:Clinopyroxene
- 22:Chlorite
- 23:Clinopyroxene

Figure B4.10: Sample S9 site 9 (SEM). 1: Lithic clast (clinopyroxene + oligoclase + Fe-oxide/hydroxide, igneous).



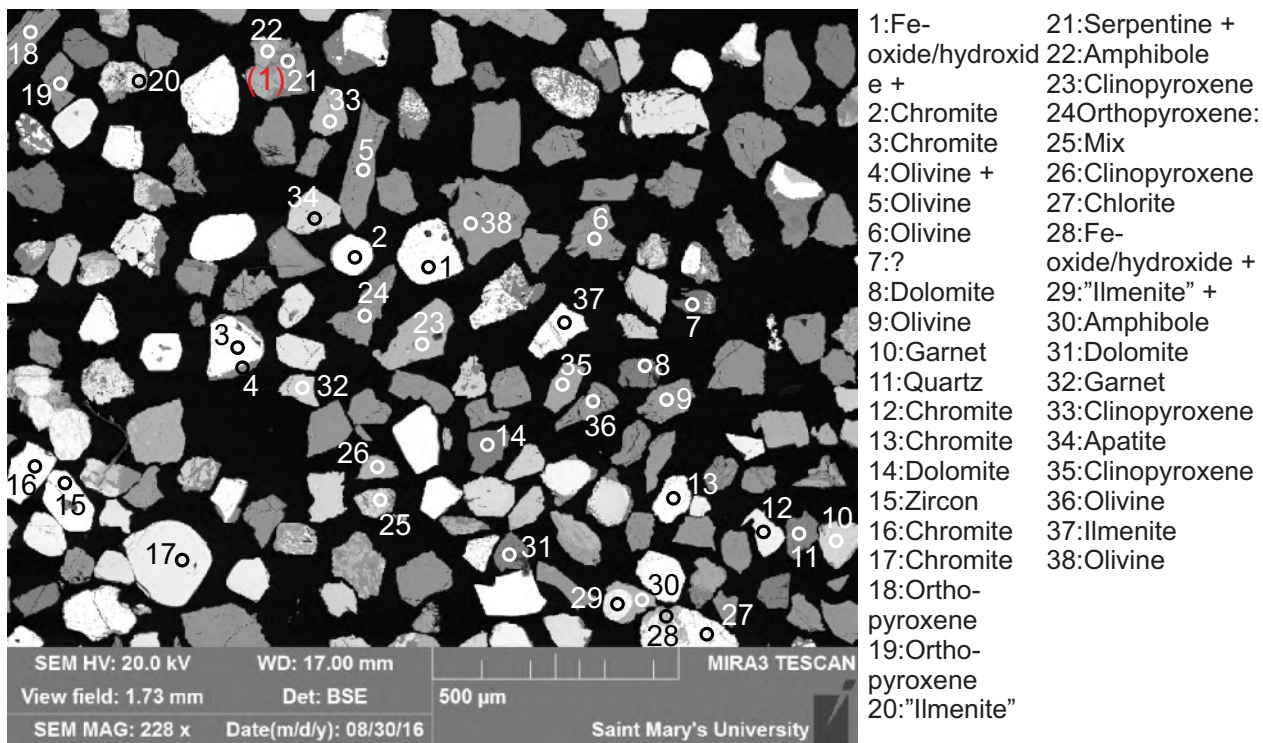
- 1:Chromite
- 2:Olivine
- 3:Clinopyroxene
- 4:Garnet
- 5:Quartz
- 6:Quartz +
- 7:Spinel
- 8:Chromite
- 9:Chromite

Figure B4.11: Sample S9 site 10 (SEM). 1: Lithic clast (spinel + quartz, metaophiolite?).



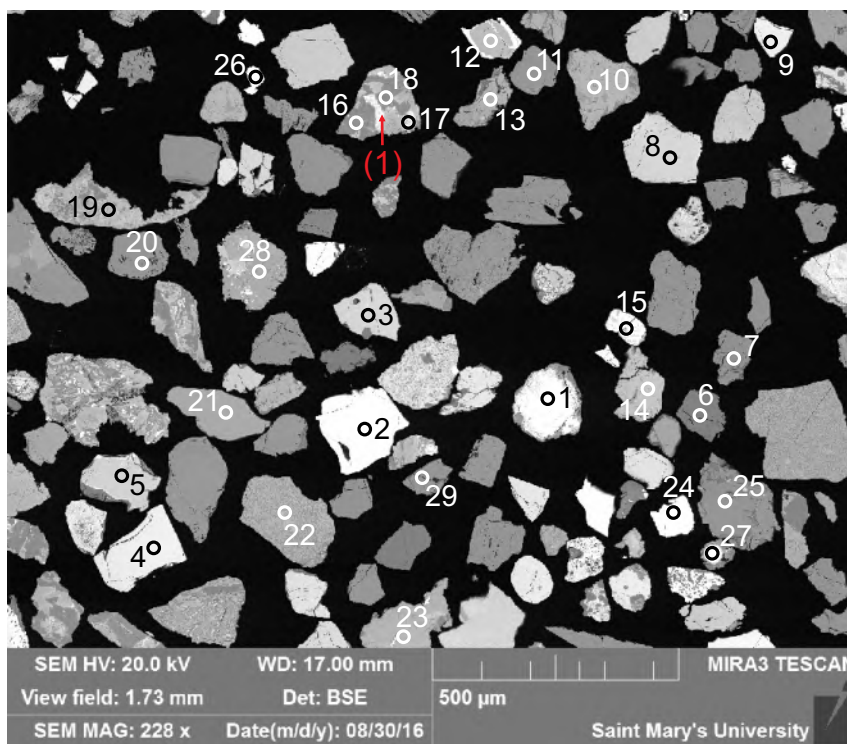
- 1:Chromite
- 2:Chromite
- 3:Orthopyroxene
- 4:Orthopyroxene
- 5:Labradorite
- 6:Clinopyroxene
- 7:Spinel
- 8:Clinopyroxene
- 9:Chlorite +
- 10:Albite
- 11:Dolomite
- 12:Olivine
- 13:Olivine
- 14:Mix
- 15:Chromite
- 16:"Olivine"
- 17:Chromite
- 18:Amphibole
- 19:Chlorite?
- 20:Feldspar?
- 21:Orthopyroxene
- 22:Fe-oxide +
- 23:Olivine
- 24:Amphibole

Figure B4.12: Sample S9 site 11 (SEM). 1: Lithic clast (orthopyroxene + labradorite, igneous). 2: Lithic clast (chlorite + albite, metamorphic). 3: Lithic clast (chromite + olivine, ophiolite). 4: Lithic clast (feldspar? + orthopyroxene + Fe-oxide/hydroxide, igneous).



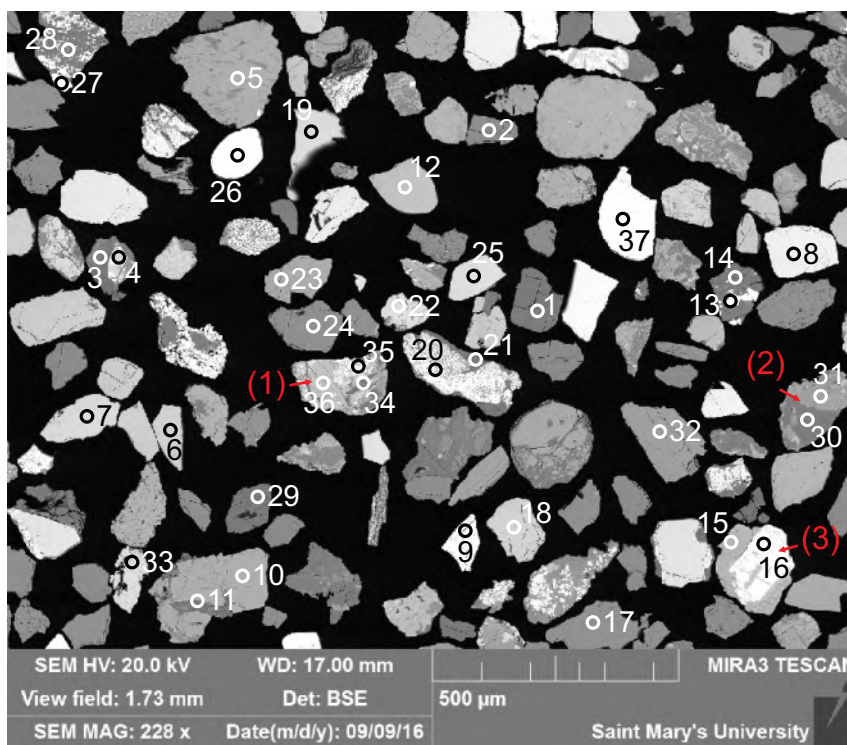
- 1:Fe-oxide/hydroxide +
- 2:Chromite
- 3:Chromite
- 4:Olivine +
- 5:Olivine
- 6:Olivine
- 7:?
- 8:Dolomite
- 9:Olivine
- 10:Garnet
- 11:Quartz
- 12:Chromite
- 13:Chromite
- 14:Dolomite
- 15:Zircon
- 16:Chromite
- 17:Chromite
- 18:Orthopyroxene
- 19:Orthopyroxene
- 20:"Ilmenite"
- 21:Serpentine +
- 22:Amphibole
- 23:Clinopyroxene
- 24:Orthopyroxene
- 25:Mix
- 26:Clinopyroxene
- 27:Chlorite
- 28:Fe-oxide/hydroxide +
- 29:"Ilmenite" +
- 30:Amphibole
- 31:Dolomite
- 32:Garnet
- 33:Clinopyroxene
- 34:Apatite
- 35:Clinopyroxene
- 36:Olivine
- 37:Ilmenite
- 38:Olivine

Figure B4.13: Sample S9 site 12 (SEM). 1: Lithic clast (serpentine + amphibole, ?metaophiolite).



- |                  |                  |
|------------------|------------------|
| 1:"Magnetite"    | 24:Zircon        |
| 2:Chromite       | 25:Orthopyroxene |
| 3:Garnet         | 26:Magnetite     |
| 4:Chromite       | 27:"Magnetite"   |
| 5:Spinel         | 28:Flourite      |
| 6:Dolomite       | 29:Olivine       |
| 7:Olivine        |                  |
| 8:Spinel         |                  |
| 9:Chromite       |                  |
| 10:Epidote       |                  |
| 11:Olivine       |                  |
| 12:Spinel        |                  |
| 13:Clinopyroxene |                  |
| 14:Chlorite      |                  |
| 15:"Ilmenite" +  |                  |
| 16:Oligoclase +  |                  |
| 17:Titanite + ?  |                  |
| 18:Andesine      |                  |
| 19:Mix           |                  |
| 20:Olivine       |                  |
| 21:Clinopyroxene |                  |
| 22:Mix           |                  |
| 23:Chlorite      |                  |

Figure B4.14: Sample S9 site 13 (SEM). 1: Lithic clast (oligoclase + andesine + titanite + Fe-oxide/hydroxide, ?metamorphic).



- |                         |                                  |
|-------------------------|----------------------------------|
| 1:Dolomite              | 27:"Magnetite"                   |
| 2:Olivine               | 28:Fe-oxide/hydroxide +          |
| 3:Serpentine            | 29:Dolomite                      |
| 4:Spinel                | 30:Albite                        |
| 5:Chlorite              | 31:Chlorite                      |
| 6:Chlorite              | 32:Clinopyroxene                 |
| 7:Chromite              | 33:TiO <sub>2</sub>              |
| 8:Chromite              | 34:Albite                        |
| 9:Ti-Magnetite          | 35:Titanite + Fe-oxide/hydroxide |
| 10:Clinopyroxene        | 36:Titanite                      |
| 11:Albite +             | 37:"Ilmenite"                    |
| 12:Spinel               |                                  |
| 13:Fe-oxide/hydroxide + |                                  |
| 14:Serpentine           |                                  |
| 15:Clinopyroxene        |                                  |
| 16:"Ilmenite" +         |                                  |
| 17:Olivine              |                                  |
| 18:Spinel               |                                  |
| 19:Spinel               |                                  |
| 20:Chromite +           |                                  |
| 21:Al-Serpentine        |                                  |
| 22:TiO <sub>2</sub>     |                                  |
| 23:Clinopyroxene        |                                  |
| 24:Olivine              |                                  |
| 25:TiO <sub>2</sub>     |                                  |
| 26:Chromite             |                                  |

Figure B4.15: Sample S9 site 14 (SEM). 1: Lithic clast (titanite +Fe-oxide/hydroxide + albite, metamorphic). 2: Lithic clast (albite + chlorite, metamorphic). 3: Lithic clast (clinopyroxene + "ilmenite", igneous).



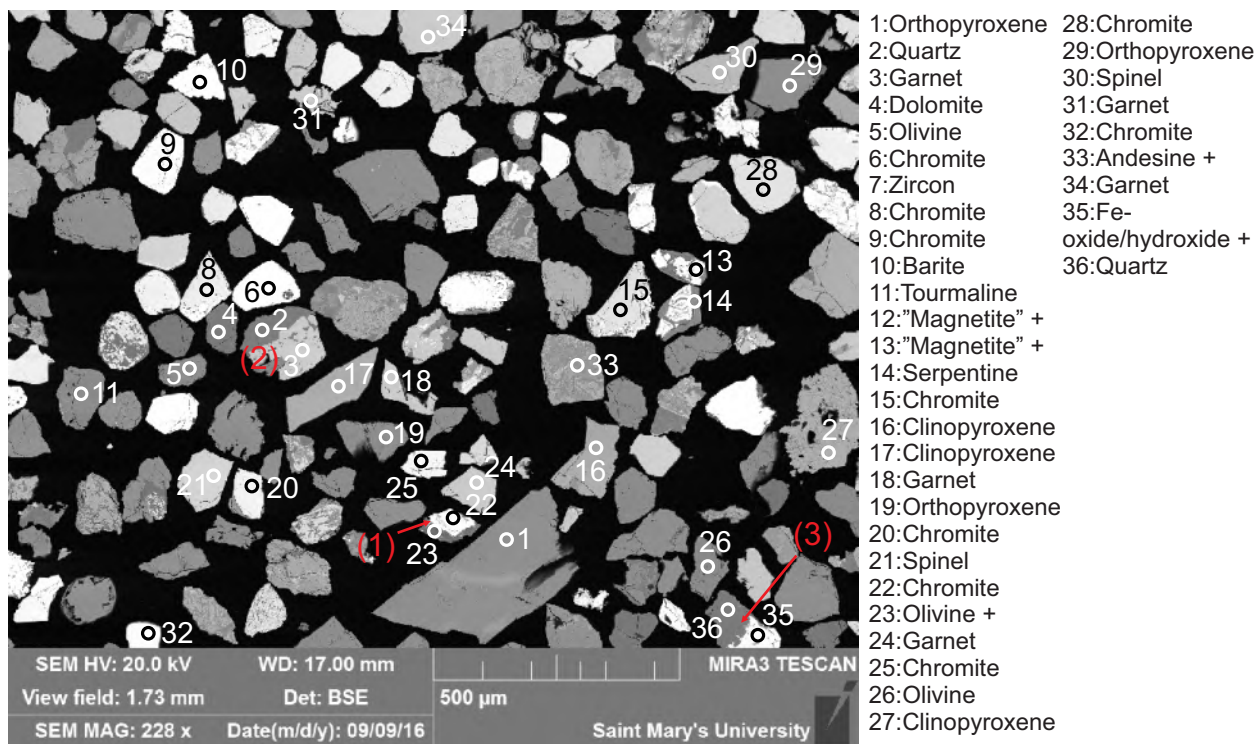


Figure B4.16: Sample S9 site 15 (SEM). 1: Lithic clast (chromite + "olivine", ophiolite). 2: Lithic clast (quartz + garnet, metamorphic). 3: Lithic clast (quartz + Fe-oxide/hydroxide, metamorphic or hydrothermal).

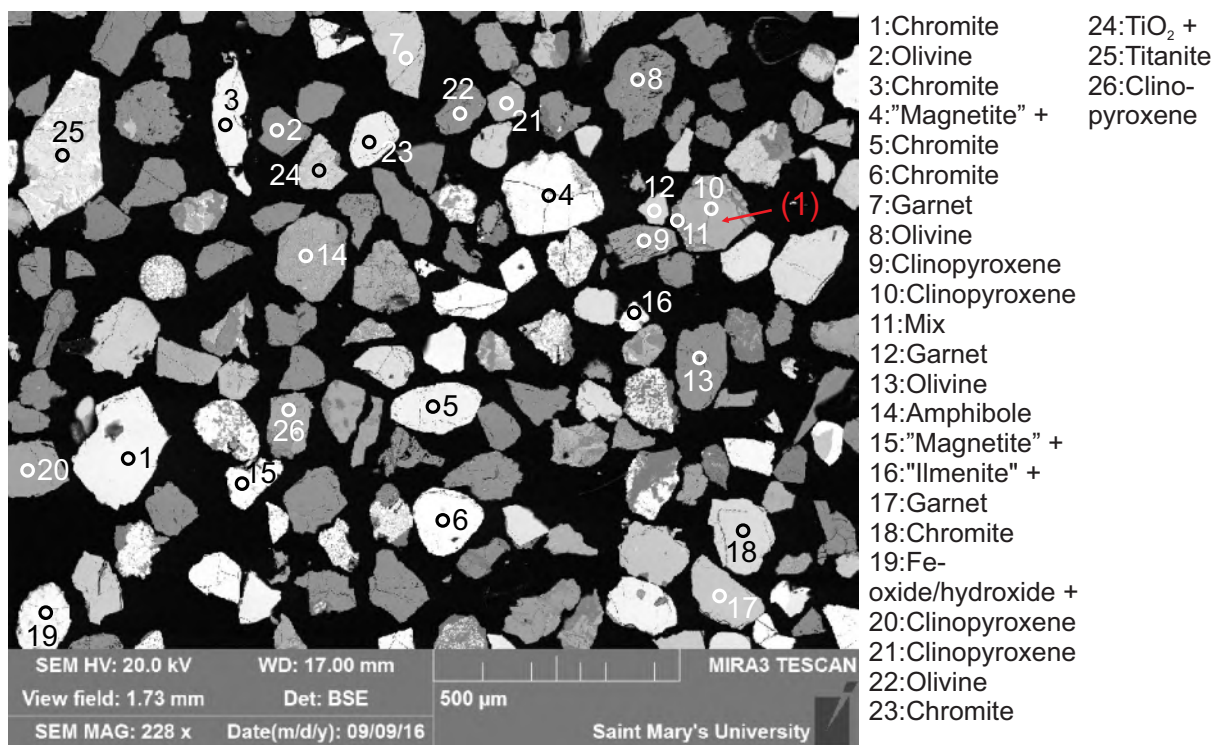


Figure B4.17: Sample S9 site 16 (SEM). 1: Altered grain of clinopyroxene.



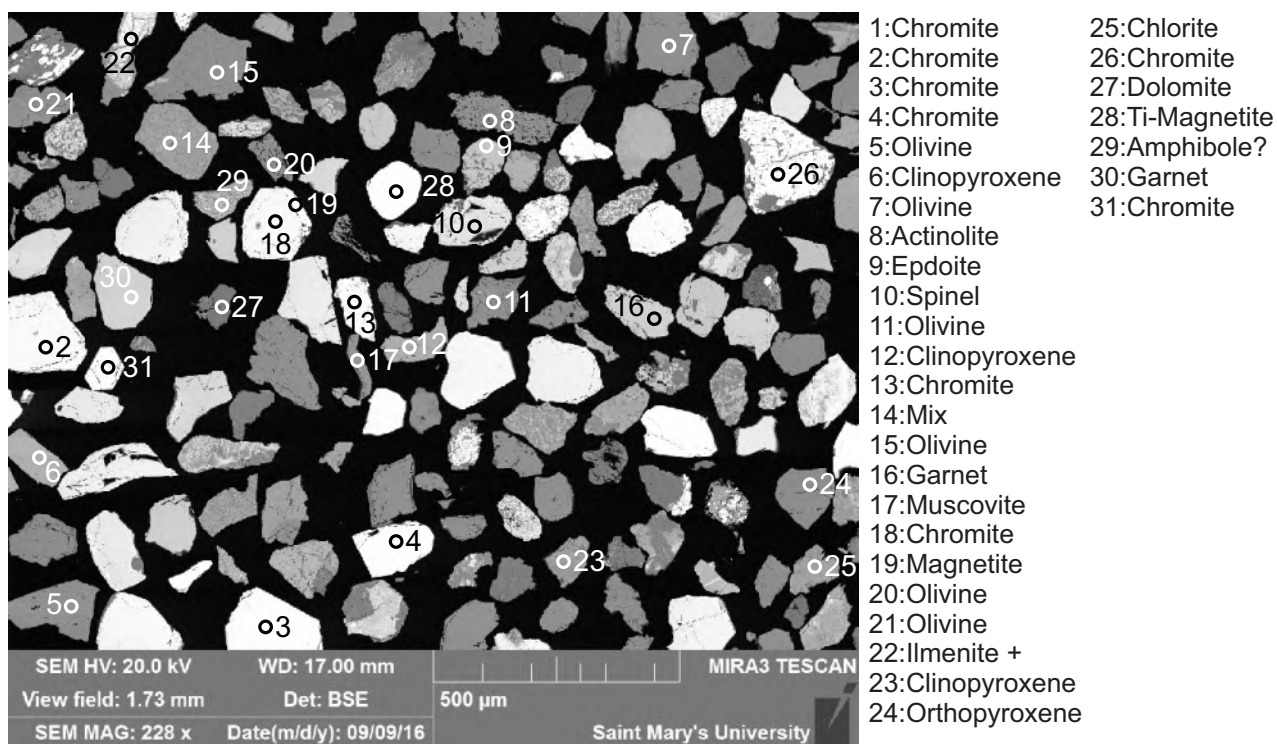


Figure B4.18: Sample S9 site 17 (SEM).

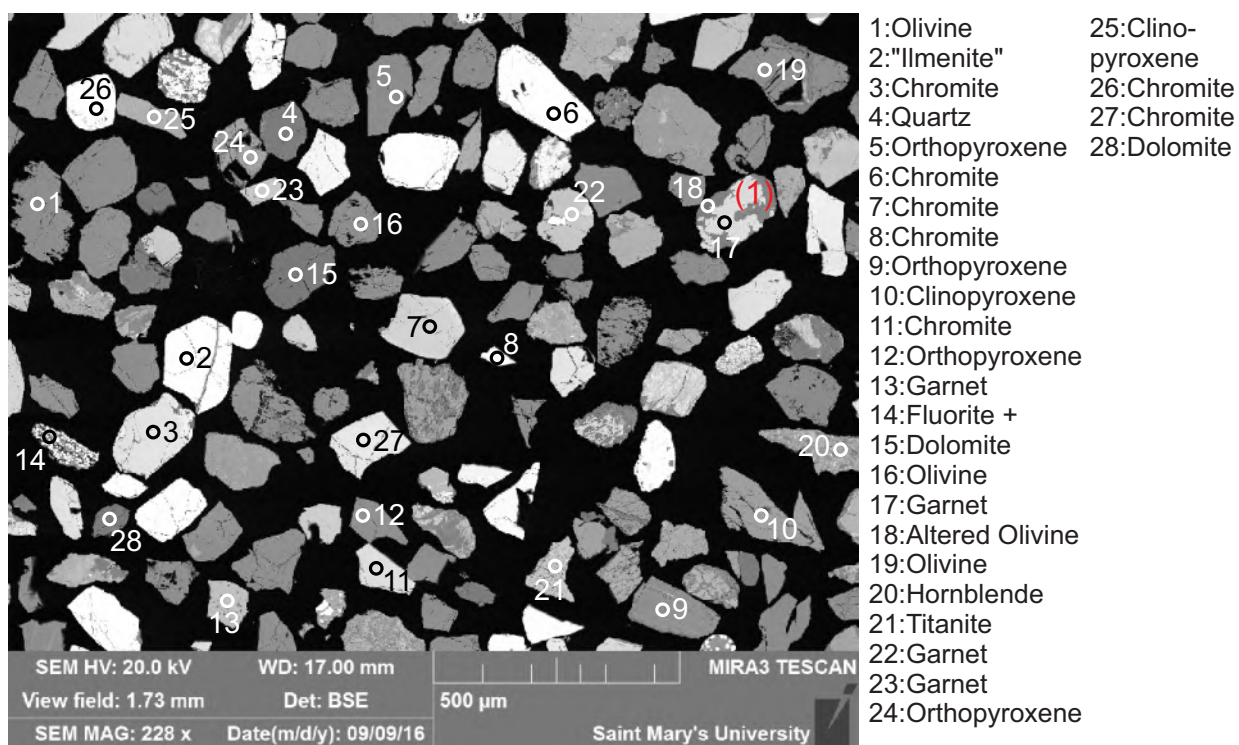
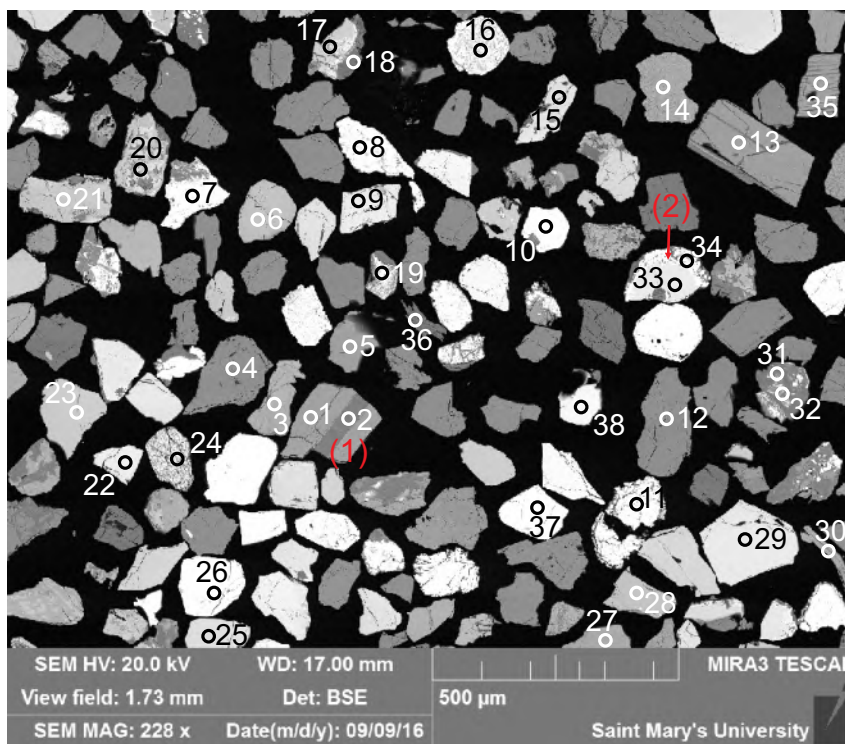
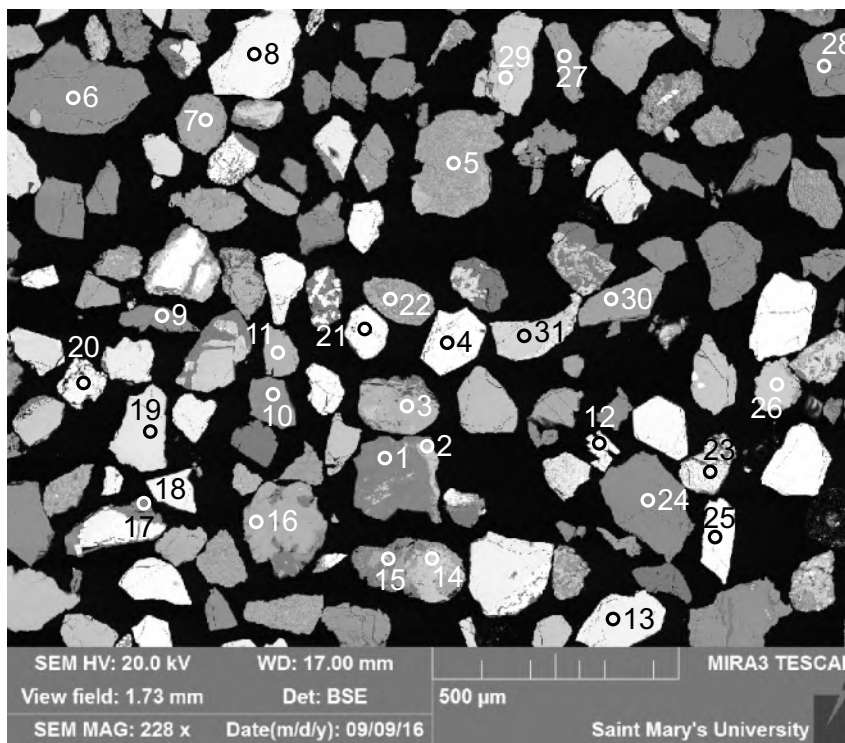


Figure B4.19: Sample S9 site 18 (SEM). 1: Lithic clast (grossular garnet + olivine, ?ophiolite).



- |                         |                              |
|-------------------------|------------------------------|
| 1: Clinopyroxene        | 23: Garnet                   |
| 2: Olivine +            | 24: $\text{TiO}_2$ + ?Garnet |
| 3: Chlorite             | 25: $\text{TiO}_2$           |
| 4: Olivine              | 26: Chromite                 |
| 5: Clinopyroxene        | 27: Chlorite                 |
| 6: Spinel               | 28: Spinel                   |
| 7: Fe-oxide/hydroxide + | 29: Chromite                 |
| 8: "Magnetite" +        | 30: Biotite                  |
| 9: Chromite             | 31: Olivine                  |
| 10: "Ilmenite" +        | 32: Mix                      |
| 11: Pyrite              | 33: Chromite                 |
| 12: Olivine             | 34: Magnetite +              |
| 13: Clinopyroxene       | 35: Clinopyroxene            |
| 14: Mix                 | 36: Illite                   |
| 15: Chromite            | 37: Ti-Magnetite             |
| 16: "Ilmenite" +        | 38: Chromite                 |
| 17: Spinel +            |                              |
| 18: Chlorite            |                              |
| 19: Chromite +          |                              |
| 20: $\text{TiO}_2$ +    |                              |
| ?Plagioclase            |                              |
| 21: Spinel              |                              |
| 22: Chromite            |                              |

Figure B4.20: Sample S9 site 19 (SEM). 1: Lithic clast (olivine + clinopyroxene, igneous). 2: Lithic clast (chromite + magnetite, ophiolite).



- |                    |                   |
|--------------------|-------------------|
| 1: "Olivine"       | 25: Chromite      |
| 2: Mix             | 26: Garnet        |
| 3: Epidote         | 27: Chlorite      |
| 4: Chromite        | 28: Olivine       |
| 5: Andesine +      | 29: Garnet        |
| 6: Olivine         | 30: Clinopyroxene |
| 7: Epidote         | 31: Spinel        |
| 8: Chromite        |                   |
| 9: Olivine         |                   |
| 10: Orthopyroxene  |                   |
| 11: Garnet         |                   |
| 12: Ti-Magnetite + |                   |
| 13: Chromite       |                   |
| 14: Titanite       |                   |
| 15: Mix            |                   |
| 16: Chlorite       |                   |
| 17: Chromite       |                   |
| 18: Olivine        |                   |
| 19: Chromite       |                   |
| 20: Pyrite +       |                   |
| 21: Chromite       |                   |
| 22: Plagioclase +  |                   |
| 23: "Ilmenite" +   |                   |
| 24: Olivine        |                   |

Figure B4.21: Sample S9 site 20 (SEM).



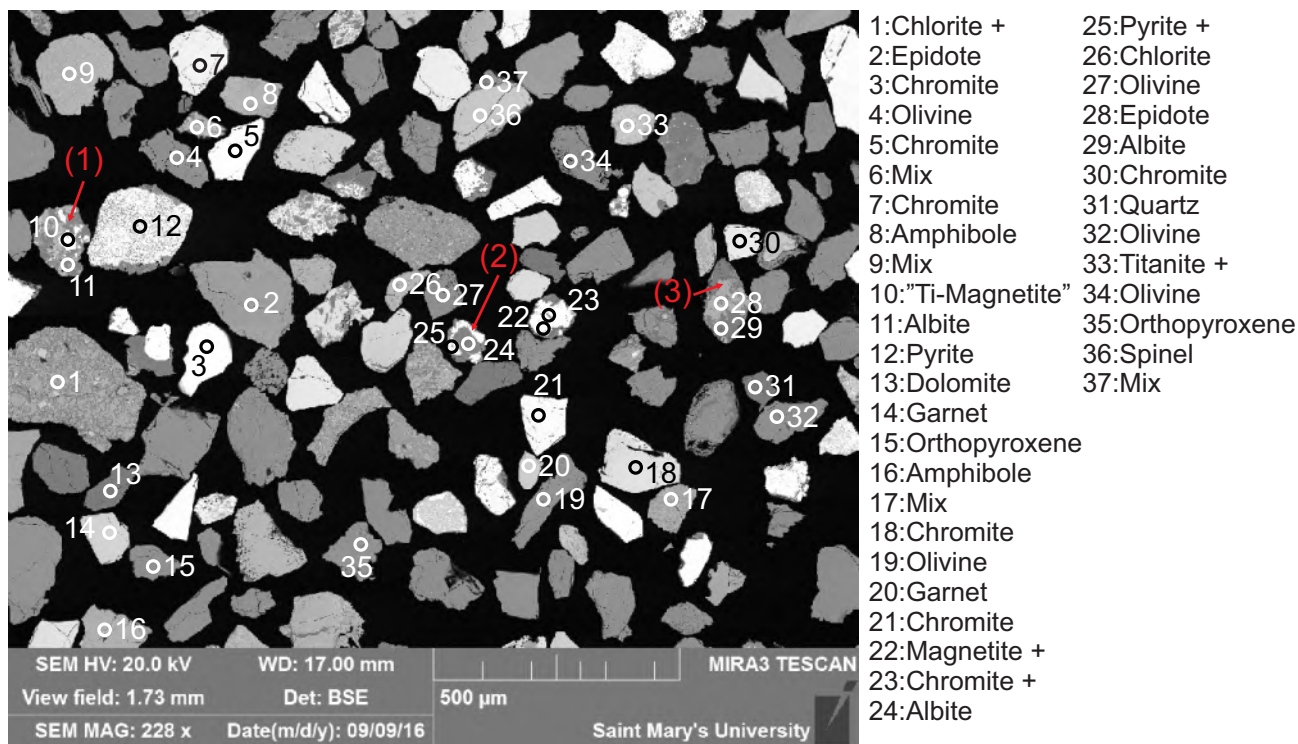


Figure B4.22: Sample S9 site 21 (SEM). 1: Lithic clast (Ti-magnetite + albite, ?igneous). 2: Lithic clast (albite + pyrite, ?uncertain origin). 3: Lithic clast (epidote + albite, metamorphic or hydrothermal).

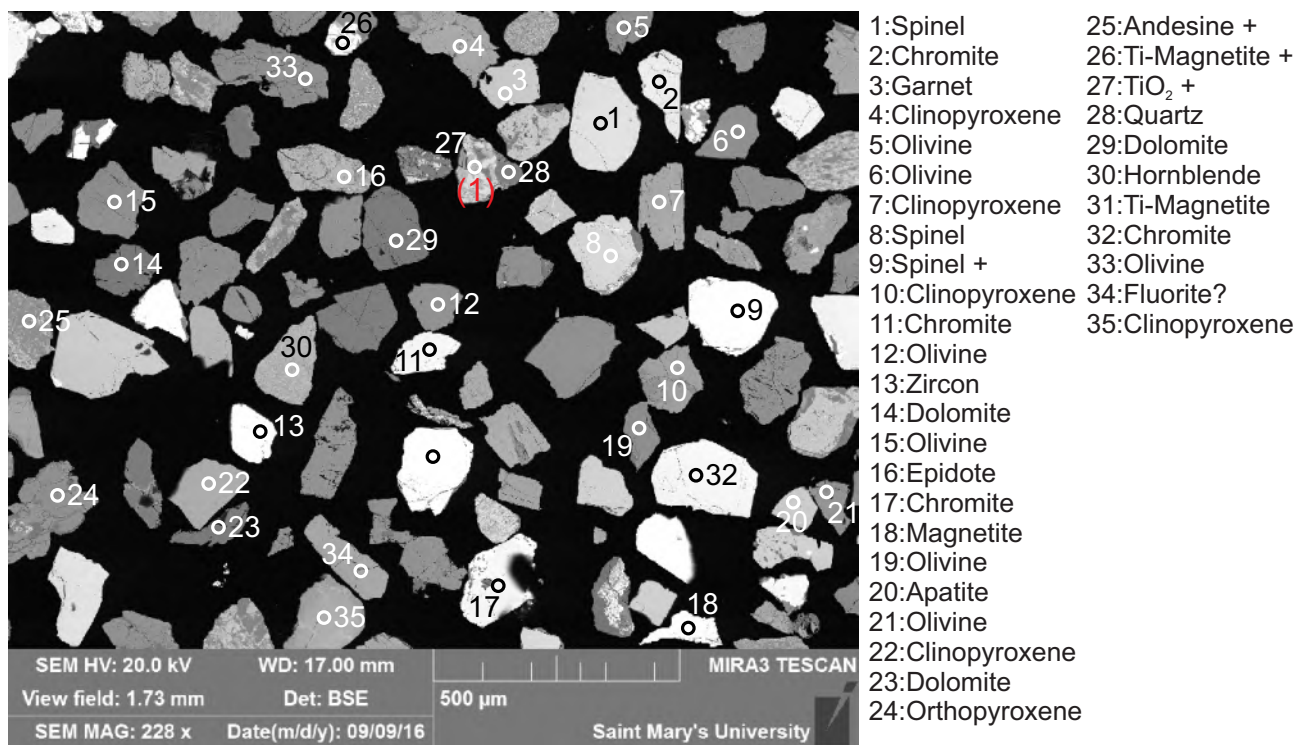
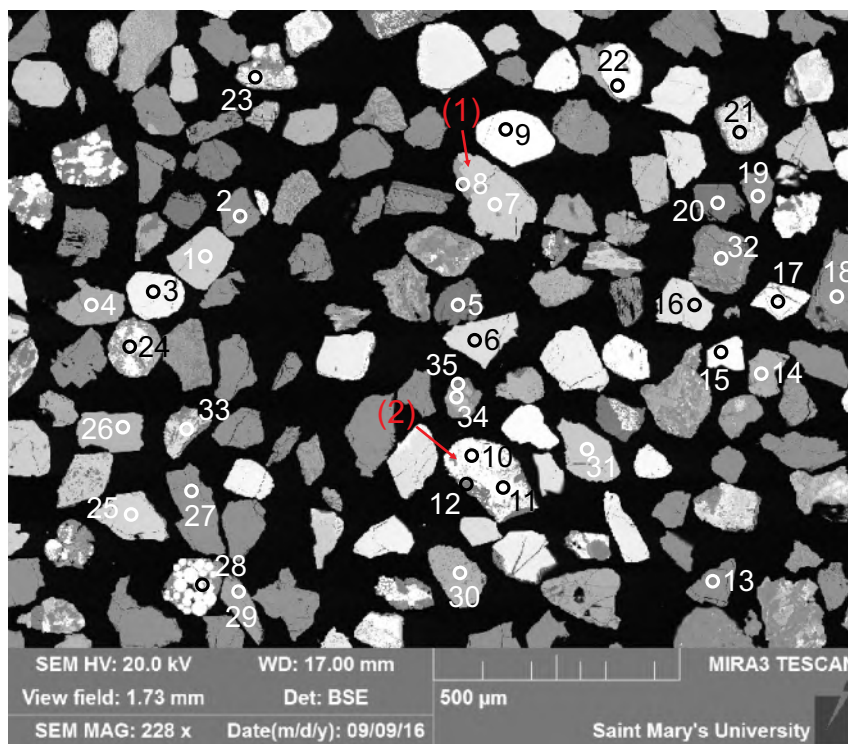
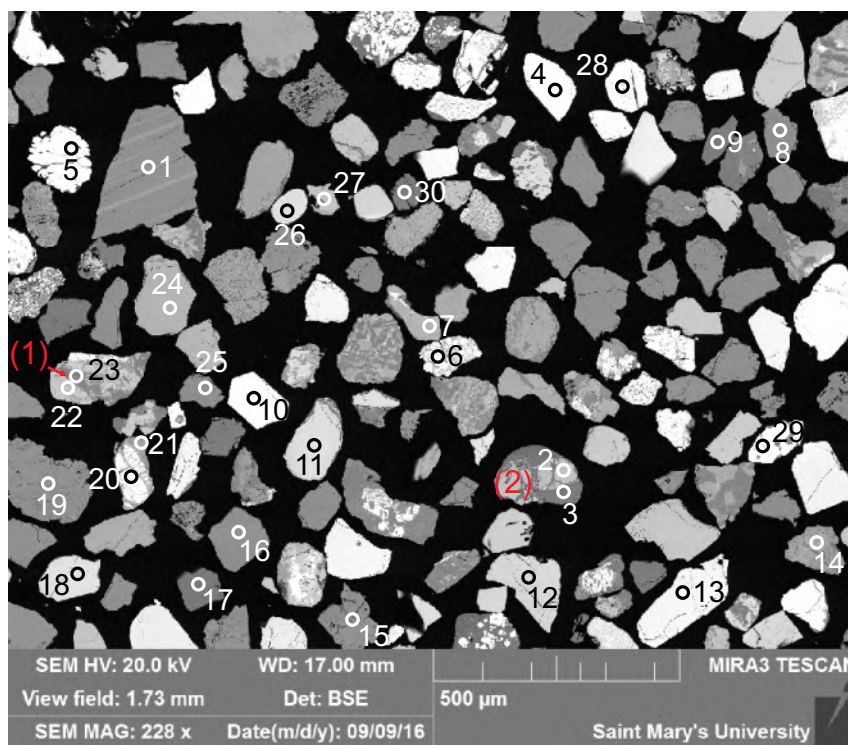


Figure B4.23: Sample S9 site 22 (SEM). 1: Lithic clast (titania + quartz, metamorphic).



- |                   |                         |
|-------------------|-------------------------|
| 1: Spinel         | 25: Spinel              |
| 2: Olivine        | 26: Clinopyroxene       |
| 3: Chromite       | 27: Olivine             |
| 4: Clinopyroxene  | 28: Fe-oxide/hydroxide+ |
| 5: Dolomite       | 29: Actinolite          |
| 6: Chromite       | 30: Epidote             |
| 7: Garnet         | 31: Epidote             |
| 8: Chlorite       | 32: Olivine             |
| 9: Zircon         | 33: Garnet              |
| 10: Chromite +    | 34: Epidote             |
| 11: Chromite +    | 35: Albite              |
| 12: "Olivine"     |                         |
| 13: Olivine       |                         |
| 14: Epidote       |                         |
| 15: Chromite      |                         |
| 16: Chromite      |                         |
| 17: Chromite      |                         |
| 18: Olivine       |                         |
| 19: Orthopyroxene |                         |
| 20: Dolomite      |                         |
| 21: Chromite +    |                         |
| 22: Ti-Magnetite  |                         |
| 23: Pyrite        |                         |
| 24: Ti-Magnetite  |                         |

Figure B4.24: Sample S9 site 23 (SEM). 1: Lithic clast (garnet + chlorite, metamorphic). 2: Lithic clast (chromite + olivine, ophiolite).



- |                                 |                   |
|---------------------------------|-------------------|
| 1: Orthopyroxene                | 24: Clinopyroxene |
| 2: Spinel                       | 25: Olivine       |
| 3: "Orthopyroxene" or "Olivine" | 26: Chromite      |
| 4: Zircon                       | 27: Titanite      |
| 5: Magnetite +                  | 28: Magnetite     |
| 6: Pyrite                       | 29: Zircon        |
| 7: Spinel                       | 30: Dolomite      |
| 8: Olivine                      |                   |
| 9: Quartz                       |                   |
| 10: Chromite                    |                   |
| 11: Spinel                      |                   |
| 12: Titanite                    |                   |
| 13: Chromite                    |                   |
| 14: Olivine                     |                   |
| 15: Olivine                     |                   |
| 16: Olivine                     |                   |
| 17: Dolomite                    |                   |
| 18: Chromite                    |                   |
| 19: Orthopyroxene               |                   |
| 20: Magnetite                   |                   |
| 21: Amphibole                   |                   |
| 22: Titanite                    |                   |
| 23: Albite                      |                   |

Figure B4.25: Sample S9 site 24 (SEM). 1: Lithic clast (titanite + albite, metamorphic). 2: Lithic clast (spinel + orthopyroxene, ophiolite).



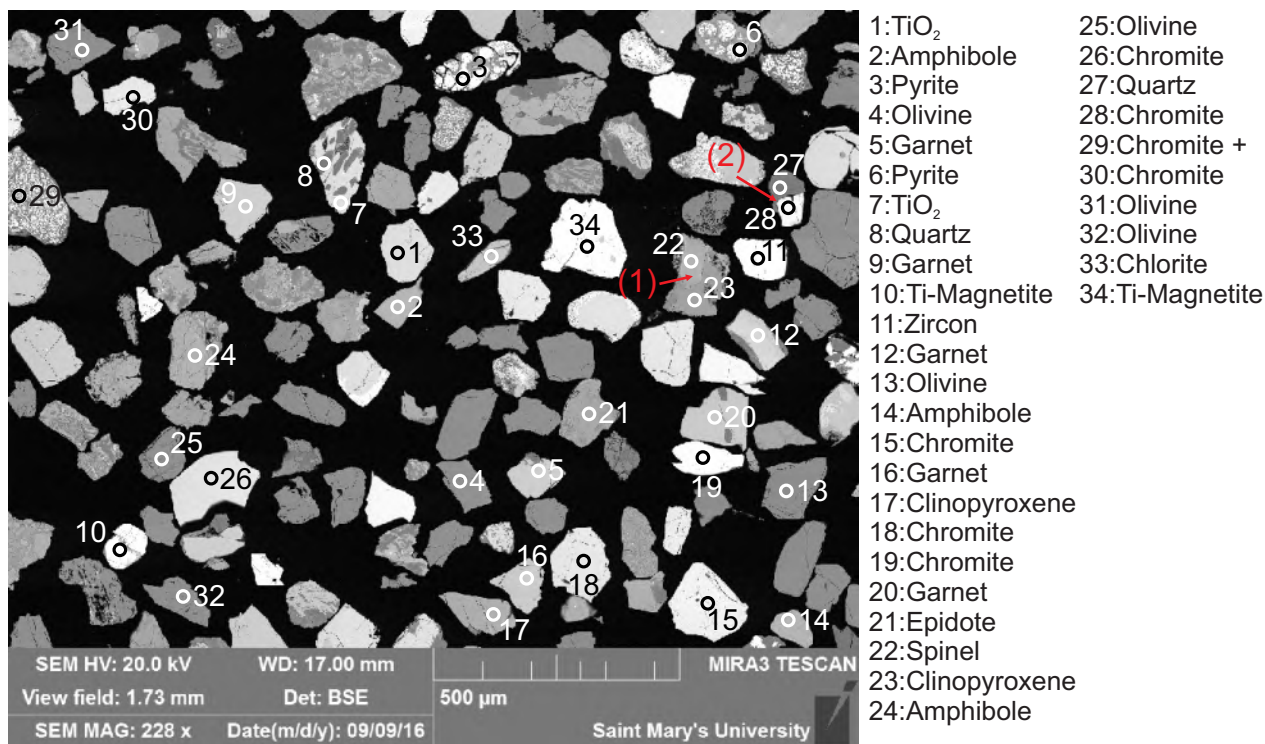


Figure B4.26: Sample S9 site 25 (SEM). 1: Lithic clast (spinel + clinopyroxene, ophiolite). 2: Lithic clast (quartz + chromite, metamorphic or sandstone).

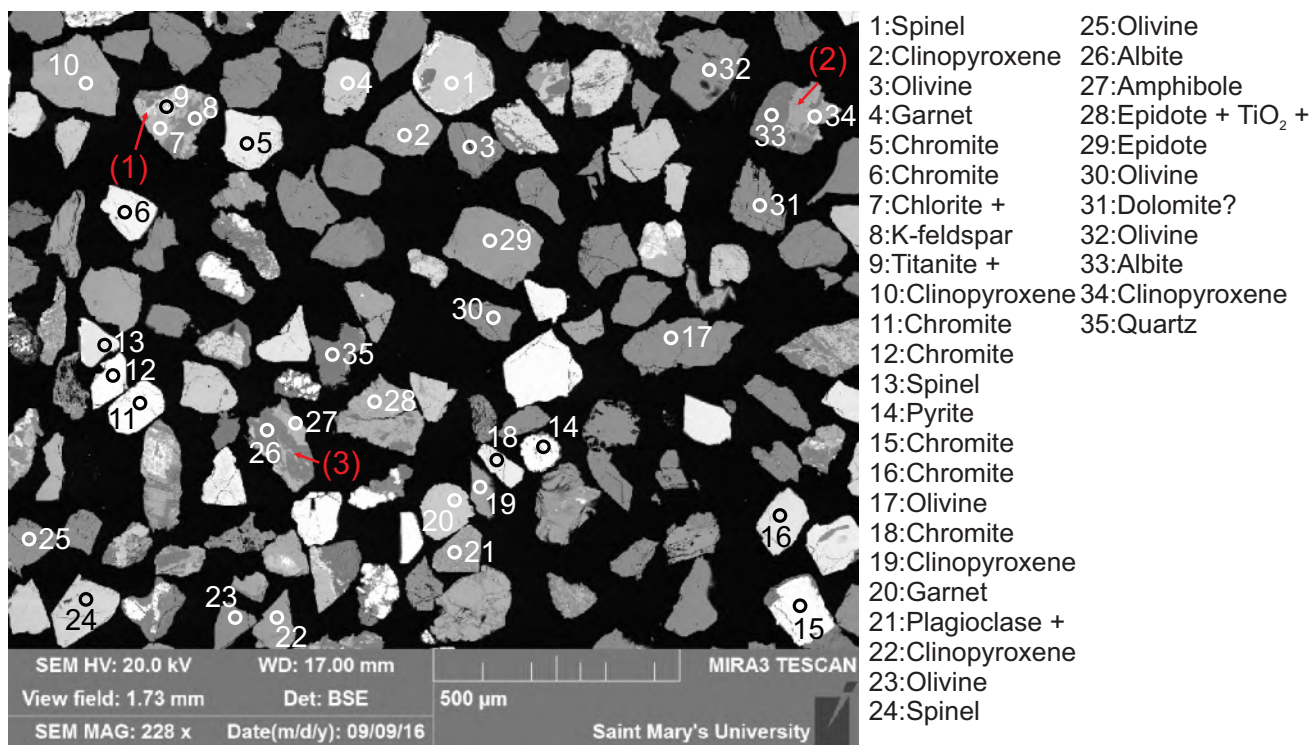
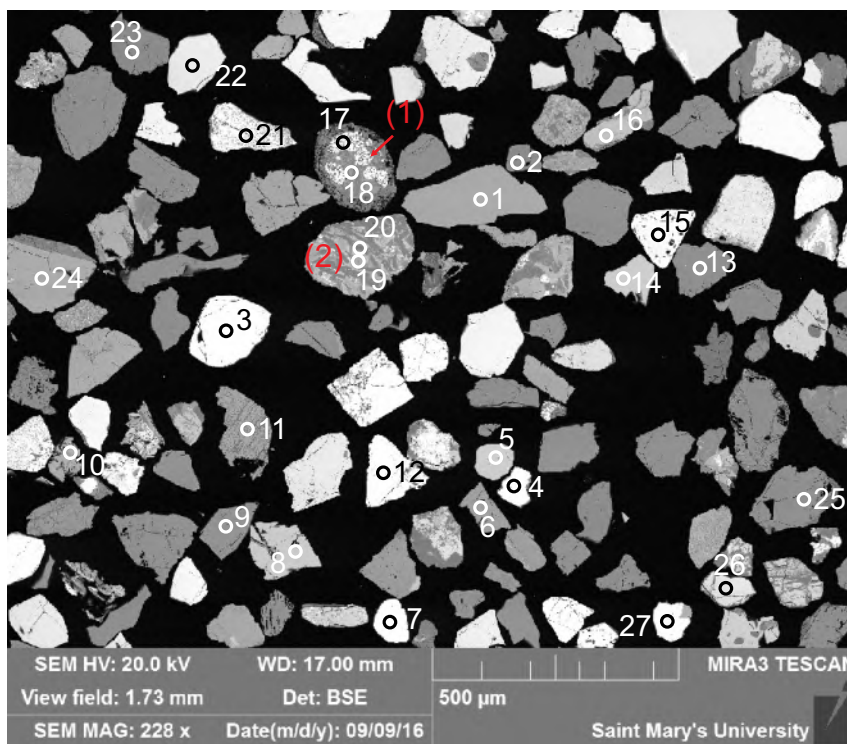
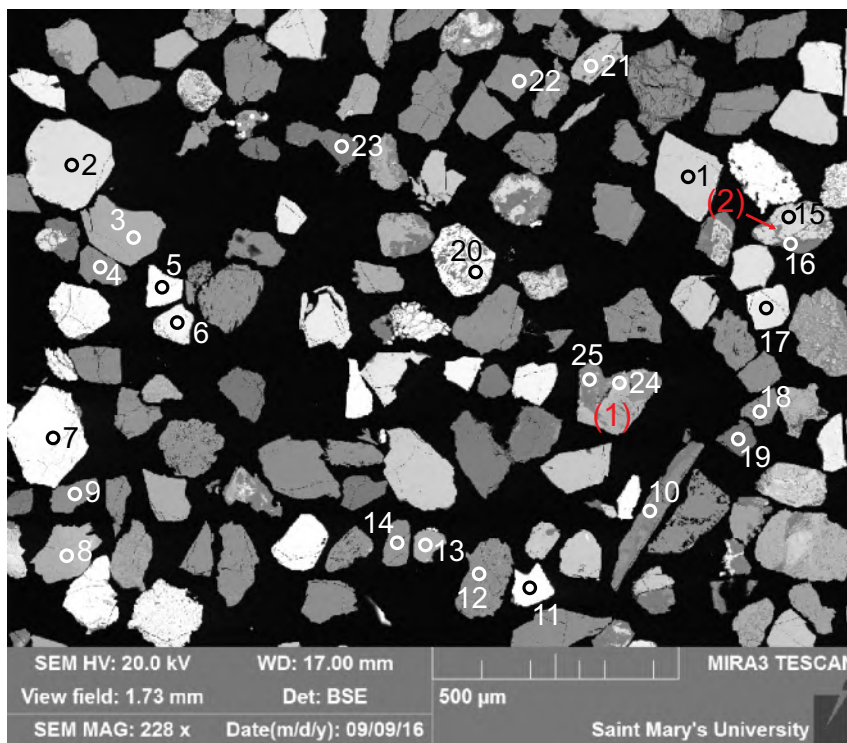


Figure B4.27: Sample S9 site 26 (SEM). 1: Lithic clast (chlorite + K-feldspar + titanite, igneous). 2: Lithic clast (albite + clinopyroxene, igneous or metamorphic). 3: Lithic clast (albite + amphibole, igneous).



- |                   |                    |
|-------------------|--------------------|
| 1: Clinopyroxene  | 24: Clinopyroxene  |
| 2: Orthopyroxene  | 25: Olivine        |
| 3: Chromite       | 26: Chromite       |
| 4: Zircon         | 27: Ti-Magnetite + |
| 5: Garnet         |                    |
| 6: Clinopyroxene  |                    |
| 7: Monazite       |                    |
| 8: Garnet         |                    |
| 9: Olivine        |                    |
| 10: Chlorite      |                    |
| 11: Clinopyroxene |                    |
| 12: "Magnetite" + |                    |
| 13: Olivine       |                    |
| 14: Chlorite      |                    |
| 15: Chromite      |                    |
| 16: Chlorite      |                    |
| 17: Pyrite        |                    |
| 18: Fluorite +    |                    |
| 19: Chlorite +    |                    |
| Plagioclase       |                    |
| 20: Albite        |                    |
| 21: Chromite      |                    |
| 22: Spinel        |                    |
| 23: Olivine       |                    |

Figure B4.28: Sample S9 site 27 (SEM). 1: Dissolved lithic clast of fluorite + pyrite, hydrothermal or diagenetic. 2: Lithic clast (chlorite + plagioclase, igneous).



- |                   |              |
|-------------------|--------------|
| 1: Spinel         | 25: Quartz + |
| 2: Chromite       |              |
| 3: Clinopyroxene  |              |
| 4: Olivine        |              |
| 5: Ti-Magnetite   |              |
| 6: Spinel         |              |
| 7: Chromite       |              |
| 8: Clinopyroxene  |              |
| 9: Olivine        |              |
| 10: Orthopyroxene |              |
| 11: Zircon        |              |
| 12: Olivine       |              |
| 13: Spinel        |              |
| 14: Bad Analysis  |              |
| 15: Garnet        |              |
| 16: "Olivine"     |              |
| 17: Chromite      |              |
| 18: Olivine       |              |
| 19: Dolomite      |              |
| 20: Chromite      |              |
| 21: Garnet        |              |
| 22: Olivine       |              |
| 23: Quartz        |              |
| 24: Amphibole     |              |

Figure B4.29: Sample S9 site 28 (SEM). 1: Lithic clast (quartz + amphibole, igneous or metamorphic). 2: Lithic clast (altered olivine + grossular garnet, metaophiolite).

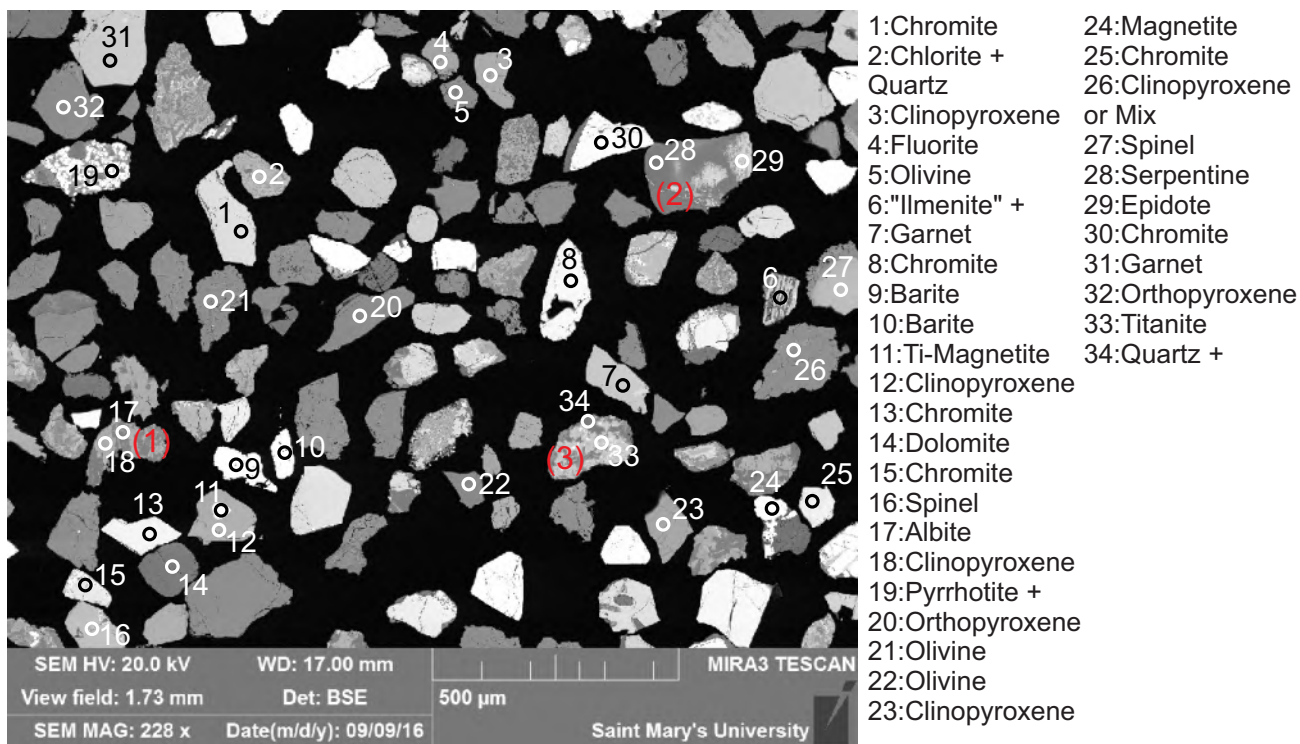


Figure B4.30: Sample S9 site 29 (SEM). 1: Lithic clast (albite + clinopyroxene, igneous). 2: Lithic clast (serpentine + epidote, hydrothermal in ophiolite). 3: Lithic clast (quartz + titanite, ?metamorphic).



Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	1	1	Chr			15.05	22.74		10.50								0.45	51.27							100	101
S9	1	2	Feohy +	10.92		0.56	82.53			0.67								0.50						4.82	100	77
S9	1	3	Chr			16.92	19.81		11.44									51.83							100	108
S9	1	4	Chr			19.43	18.47		12.02									50.09							100	111
S9	1	5	Chr			13.10	20.44		9.67								0.46	56.34							100	105
S9	1	6	Chr		0.31	16.73	23.23		10.27									49.46							100	108
S9	1	7	Chr			17.80	25.44		10.51								0.42	45.83							100	107
S9	1	8	Grt	40.29		21.40	30.38	0.45	5.10	2.39															100	110
S9	1	9	TiO2 +	1.17	98.01	0.42	0.41																		100	101
S9	1	10	Qz +	96.84	3.16																				100	118
S9	1	11	Grt	40.59		21.72	28.02	0.69	3.37	5.62															100	107
S9	1	12	Amph (Ged)	43.32		17.50	14.56		19.00	0.98	1.27	0.36													97	75
S9	1	13	Chr		1.09	24.46	24.84		12.82								0.48	36.30							100	81
S9	1	14	Py	0.51			43.45							55.42							0.62				100	142
S9	1	15	Chr			28.24	19.42		13.76									38.57							100	113
S9	1	16	Ep	39.87		20.53	11.21	3.89		21.50															97	108
S9	1	17	Qz	100.00																					100	115
S9	1	18	Mag	1.94			93.51		4.55																100	89
S9	1	19	"Ol"	50.89		0.40	4.10		44.60																100	90
S9	1	20	Chr		0.49	28.06	23.65		11.95								0.54	35.31							100	86
S9	1	21	"Ol"	51.01		0.79	2.76		45.20							0.24									100	67
S9	1	22	Chr			31.01	15.74		15.04									38.22							100	102
S9	1	23	Mag +	1.82			98.18																		100	82
S9	1	24	Srp	41.72			5.83		37.99	0.19														1.27	87	77
S9	1	25	Ads	58.79		25.89	0.89			7.36	6.31	0.76													100	113
S9	1	26	Ttn +	36.11	15.56	10.11	11.39		7.95	16.51	0.42		1.95												100	102
S9	1	27	Ol	42.34			6.70		50.65										0.31						100	111
S9	1	28	Ol	41.92			7.89		49.86										0.33						100	114
S9	1	29	Ol	42.16			7.16		50.35										0.32						100	116
S9	1	30	Ol	42.33			7.35		49.99										0.32						100	111
S9	1	31	Ol	42.29			6.25		51.18										0.28						100	110
S9	1	32	Ol	44.22		0.42	8.99		45.92										0.45						100	95
S9	1	33	Opx	57.36		2.77	6.95		32.37	0.29								0.26							100	110
S9	1	34	Ol	42.20			6.90		50.53										0.37						100	127
S9	1	35	Opx	56.60		3.39	4.92		33.73	0.73								0.64							100	114
S9	1	36	Opx	57.04		2.16	4.87		33.11	2.13								0.69							100	124
S9	1	37	Ol	41.95			8.03		49.72										0.31						100	121
S9	1	38	Chr			26.37	15.70		14.40									43.52							100	107
S9	1	39	Ttn +	36.73	13.58	11.49	15.72		10.12	12.36															100	103
S9	1	40	Ttn +	37.57	18.26	12.61	5.94			25.62															100	109
S9	1	41	Mix	53.45		15.89	17.25		4.20	1.40		7.82													100	97



Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	1	42	Ep +	43.36	0.31	22.25	8.15	0.35	4.63	17.95															97	88
S9	1	43	Cpx	55.06	0.84	2.48	4.62		17.29	18.92	0.47							0.32							100	99
S9	1	44	Dol						23.03	30.97															54	57
S9	1	45	OI	42.07			8.18		49.43										0.32						100	113
S9	1	46	Cpx	53.36	1.06	3.52	6.18		16.44	19.13								0.31							100	108
S9	1	47	Cpx	55.82		2.29	1.63		18.25	21.33								0.67							100	110
S9	1	48	Cpx	53.75	0.53	2.10	9.69	0.29	14.80	18.53	0.32														100	108
S9	1	49	Ep	42.19		21.82	11.69			20.90	0.41														97	106
S9	1	50	OI	41.94			7.82		49.89										0.36						100	118
S9	1	51	Ttn +	43.87	25.62	3.58	1.44		1.39	22.47				0.96		0.66									100	44
S9	2	1	Opx	57.04		2.46	4.74		34.66	0.36								0.75							100	118
S9	2	2	Dol						22.93	31.07															54	55
S9	2	3	OI	41.89			7.22		50.47										0.42						100	113
S9	2	4	OI	42.09			7.59		50.32																100	112
S9	2	5	OI	42.08			8.27		49.19										0.46						100	112
S9	2	6	Qz	100.00																					100	124
S9	2	7	Cpx	55.31		1.65	4.04		17.36	20.82	0.35							0.47							100	110
S9	2	8	Ms + Chl	49.94		19.64	6.53		3.04		0.39	7.46													87	98
S9	2	9	Feohy + Chl +	21.65	2.88	8.61	61.86		1.46	0.74		2.80													100	95
S9	2	10	Cpx	52.75	1.52	2.78	8.48		15.26	18.85	0.36														100	110
S9	2	11	Grt	40.00		20.85	21.56	2.80	0.38	14.41															100	114
S9	2	12	Grt? +	37.83	0.86	1.85	23.22		5.41	29.00								0.29					1.54		100	101
S9	2	13	"OI"	50.87			1.49		46.48						1.16										100	94
S9	2	14	Mag	0.90			98.60		0.50																100	92
S9	2	15	Chr	10.46		18.78	20.16		13.22		0.46							36.93							100	94
S9	2	16	Zrn	31.52																		68.48			100	132
S9	2	17	Py	0.67		0.24	30.66		0.24					68.18											100	209
S9	2	18	"Mag" +	1.96			98.04																		100	80
S9	2	19	Chr			16.43	20.26		10.89									52.42							100	109
S9	2	20	Chr		0.44	31.63	25.26		10.97									31.70							100	68
S9	2	21	Mix	45.65	1.20	9.21	19.82	0.40	16.24	6.84	0.63														100	103
S9	2	22	Mix	58.67		27.43	1.10			3.98	5.44	3.39													100	115
S9	2	23	"Mag" +	4.50			94.99			0.51															100	84
S9	2	24	OI	41.83			7.80		49.97										0.40						100	119
S9	2	25	Chr			24.63	16.14		14.08									45.15							100	109
S9	3	1	Cpx	50.41	2.73	5.01	6.81		13.66	20.77	0.61														100	112
S9	3	2	Amph?	43.81	4.64	8.20	16.31	0.39	10.14	12.16	1.05	0.31													97	107
S9	3	3	Chr			15.35	24.01		8.95									51.69							100	106
S9	3	4	Qz	100.00																					100	123
S9	3	5	"Mag" +	5.66			92.85		1.11	0.38															100	82
S9	3	6	Lab	55.94		27.63	0.58			10.37	5.49														100	119

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	3	7	Ol +	49.31			8.42		40.16	0.37														1.74	100	97
S9	3	8	Ol + Feohy +	44.85		0.41	12.23		31.34	10.08														1.10	100	98
S9	3	9	Chr +			41.30	14.86		17.05									26.79							100	115
S9	3	10	Cr-Chl	33.10		15.30	2.81		32.02	0.18								1.59							85	95
S9	3	11	Grt +	39.79		21.32	28.14	1.90	3.50	5.35															100	109
S9	3	12	Qz	100.00																					100	119
S9	3	13	Ab	68.66		18.99	0.34			0.54	10.88	0.58													100	114
S9	3	14	Cpx	49.27	4.97	2.67	15.97	0.42	9.73	16.96															100	110
S9	3	15	Spl			24.67	21.40		12.50								0.44	41.00							100	114
S9	3	16	Dol						22.65	31.35															54	57
S9	3	17	Sp				0.22							50.46						49.32					100	185
S9	3	18	Ol	41.80			7.09		50.73										0.38						100	120
S9	3	19	Ol	41.90			7.17		50.63										0.30						100	119
S9	3	20	Tlc	66.26			0.89		32.85																100	123
S9	4	1	Cpx	52.10	1.66	4.09	5.44		15.16	20.40	0.46							0.70							100	117
S9	4	2	? Amph	45.81	2.56	10.15	13.47		12.39	10.43	2.19														97	113
S9	4	3	Cpx	52.48	1.03	3.80	7.86		16.05	18.78															100	115
S9	4	4	Ttn	32.19	36.66	1.14	0.92			27.56					1.53										100	101
S9	4	5	Py	0.24			30.61							68.91					0.23						100	217
S9	4	6	Dol						22.36	31.64															54	57
S9	4	7	Qz	99.61		0.39																			100	116
S9	4	8	Mix	48.37		14.79	5.56	0.33	11.64	19.32															100	98
S9	4	9	Ol	41.61			7.17		50.78										0.44						100	115
S9	4	10	? Ilm +	14.17	8.82	2.49	67.61		1.36	5.55															100	90
S9	4	11	Ads	56.84		26.49	0.99			9.52	5.77	0.40													100	113
S9	4	12	Chl +	35.30	6.08	14.63	25.92	0.36	12.16	5.55															100	95
S9	4	13	Ilm		52.20		46.24	0.45	1.11																100	91
S9	4	14	Chl +	41.82	0.92	12.96	19.18		24.15	0.45	0.51														100	96
S9	4	15	Ol	42.20			8.20		49.29										0.31						100	123
S9	4	16	Ep	40.39		26.83	7.31			22.47															97	109
S9	4	17	Ilm + ?	1.25	19.46	2.95	71.40	1.11	2.73								1.08								100	101
S9	4	18	Chr			15.73	19.53		10.84								0.36	53.53							100	107
S9	4	19	Grt	40.00		20.65	25.59	3.49	0.88	9.40															100	108
S9	4	20	Grt	39.98	0.32	21.14	24.71	1.24	2.70	9.92															100	118
S9	4	21	Mag +	2.46	0.89	1.04	95.61																		100	90
S9	4	22	Ttn	34.49	28.97	6.47	3.70			26.37															100	110
S9	4	23	"Ilm"		67.47		28.44		4.09																100	95
S9	4	24	Olig	64.86		21.31	0.53			3.35	9.19	0.76													100	116
S9	4	25	Chr		0.33	31.63	17.34		15.80									34.90							100	112
S9	4	26	Chr			21.88	17.24		12.78									48.09							100	104
S9	4	27	Cpx	52.60	1.79	2.61	6.68		15.14	20.70	0.49														100	120

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	4	28	TiO2	0.90	89.78		8.55			0.78															100	109
S9	4	29	Chr + Spl	0.62		37.63	21.24		14.75									25.76							100	107
S9	4	30	Chr +	25.98		5.73	18.04	0.91	4.22	25.08								20.05							100	96
S9	4	31	Qz	100.00																					100	116
S9	4	32	Py +	24.63		8.36	25.16		13.71	0.37	0.64			27.12											100	98
S9	4	33	Grt	39.63		21.17	32.76	2.49	2.19	1.77															100	114
S9	4	34	Cpx	53.38	0.75	3.70	5.24		16.78	18.99	0.31							0.87							100	111
S9	4	35	Ol	41.96			7.48		50.23										0.33						100	114
S9	4	36	Ttn	33.14	36.25	1.79	0.89			27.93															100	107
S9	4	37	Mix	33.64	6.89	10.19	20.33		8.86	8.24	0.73			11.12											100	110
S9	4	38	Py +	8.10		2.03	26.01		0.66		1.60			61.20					0.41						100	188
S9	4	39	Qz + Chl	92.24		2.98	2.29		1.88			0.62													100	122
S9	4	40	Qz	100.00																					100	122
S9	4	41	Ol	41.74			8.53		49.38										0.35						100	124
S9	5	1	Ol	41.89			8.36		49.47										0.28						100	112
S9	5	2	Opx	55.47		1.06	16.32	0.39	25.21	1.54															100	112
S9	5	3	Cpx	50.60	2.78	4.38	8.23		13.85	19.51	0.65														100	107
S9	5	4	Cpx	50.57	1.94	2.80	16.84	0.45	11.11	15.96	0.32														100	108
S9	5	5	Ads	55.04	1.69	25.02	1.72		0.48	10.55	5.50														100	111
S9	5	6	?Cpx	53.90	0.89	4.81	13.06	0.37	19.75	6.21	1.00														100	115
S9	5	7	Ol	41.98			8.14		49.48										0.40						100	115
S9	5	8	Ab	66.68		20.35	0.53			1.81	10.33	0.30													100	114
S9	5	9	Cpx?	52.01	1.46	3.59	12.04	0.38	16.31	14.21															100	112
S9	5	10	Grt	36.70		0.52	26.96		1.36	34.47															100	98
S9	5	11	Ttn?	35.64	22.30	7.43	11.05	0.28	6.47	16.83															100	100
S9	5	12	Cpx	51.10	2.04	3.90	8.56		13.49	20.51	0.40														100	114
S9	5	13	Chr			28.30	22.72		13.57									35.41							100	107
S9	5	14	Chr	0.73	0.86	2.99	46.55	1.57	3.77									43.52							100	99
S9	5	15	Chr			9.23	20.99		9.06									60.72							100	105
S9	5	16	Chr			23.81	21.22		11.53									43.45							100	109
S9	5	17	Chr			31.72	13.85		16.52									37.92							100	105
S9	5	18	Chr			3.98	20.68		9.06									66.29							100	110
S9	5	19	Chr			7.41	22.89		8.35								0.36	60.99							100	113
S9	5	20	Opx	55.33		4.65	5.69		33.08	0.37								0.87							100	116
S9	5	21	Ol	41.98			7.54		50.13										0.34						100	119
S9	5	22	Tlc	58.77		1.81	2.66		36.13									0.64							100	100
S9	5	23	Ap							48.84			44.72		6.44										100	123
S9	5	24	Ab	68.38		18.78	0.54			0.67	11.62														100	119
S9	5	25	TiO2	4.43	84.07	1.40	8.56		1.54																100	103
S9	5	26	"Ol"	51.18			3.66		42.98						1.81				0.35						100	80
S9	5	27	?	14.75			66.57		18.68																100	104

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	5	28	Chr			20.21	19.01		12.45									48.32							100	109
S9	5	29	Py				28.39							71.61											100	241
S9	5	30	Tur	38.05	0.50	31.38	7.04		7.03	0.43	2.38							0.20							87	100
S9	5	31	Ap + REE							45.61	1.28		39.28	1.01	8.98								1.52	2.32	100	109
S9	5	32	Ol	41.89			8.36		49.33										0.41						100	123
S9	5	33	Ol	42.16			6.89		50.63										0.32						100	121
S9	5	34	Ol	42.18			8.73		49.10																100	123
S9	5	35	Chr +	7.01	0.57	3.72	59.39	0.80	7.81									20.70							100	106
S9	6	1	Chr			11.05	17.92		11.39								0.39	59.26							100	106
S9	6	2	Amph	54.49		4.75	4.98		20.21	11.75	0.82														97	106
S9	6	3	Ab	69.32		18.75					11.93														100	111
S9	6	4	Spl +	6.88	0.35	35.61	13.72		15.92	0.40	0.67			0.64	3.76			22.06							100	105
S9	6	5	Grt?	39.17		19.17	7.46		33.44	0.41	0.34														100	100
S9	6	6	Ol	42.16			7.73		49.82										0.29						100	114
S9	6	7	Ep?	43.19	0.27	19.74	10.10		6.41	17.29															97	101
S9	6	8	Cpx	54.15	0.43	1.14	10.75	0.48	14.39	18.65															100	111
S9	6	9	Mag				97.93		0.82									0.67	0.58						100	91
S9	6	10	"Ol"	49.67		1.56	3.54		44.83									0.40							100	98
S9	6	11	Cpx	52.22	1.37	4.24	4.92		15.46	20.61	0.39							0.79							100	108
S9	6	12	Chr			15.67	21.18		10.49									52.66							100	102
S9	6	13	Ol	42.07			7.93		50.00																100	111
S9	6	14	Ol	41.86			6.98		50.50									0.22	0.44						100	116
S9	6	15	Chr	1.25		10.44	19.08		9.79		0.74						0.55	54.43						3.72	100	104
S9	6	16	Qz	99.74			0.26																		100	122
S9	6	17	Chr			8.95	27.69		8.48									54.88							100	110
S9	6	18	Chl	27.08		20.44	21.00		16.24									0.24							85	103
S9	6	19	Pn	0.36			30.46							44.79					24.39						100	183
S9	6	20	Chr +	21.76	0.68	2.83	28.54	2.05	22.56	0.60						0.38		20.10		0.50					100	100
S9	6	21	"Ol"	48.96		2.28	3.49		45.27																100	105
S9	6	22	Chr			18.03	20.20		10.74								0.43	50.61							100	113
S9	6	23	Ol	42.06			7.70		49.93										0.30						100	123
S9	6	24	Ol	41.89			8.01		49.69										0.41						100	117
S9	6	25	Cpx?	52.62	1.31	2.45	11.04	0.27	14.00	17.95	0.36														100	116
S9	6	26	?Cpx +	42.06		1.69	18.03		16.44	21.78															100	96
S9	6	27	Amph	43.66		1.05	12.52		27.38	12.39															97	98
S9	6	28	Ol	41.68			9.83		48.16										0.33						100	114
S9	6	29	?Amph	48.13	3.14	8.42	15.27	0.31	9.25	9.82	2.66														97	114
S9	6	30	Chr			12.09	18.50		10.98									58.42							100	107
S9	6	31	Ol	41.81			8.47		49.34										0.38						100	113
S9	6	32	Cpx?	52.03	0.90	3.88	9.58	0.30	15.59	17.73															100	115
S9	6	33	Feohy +	11.78		3.43	80.18		2.36	0.61	0.52		1.12												100	82



Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	6	34	Qz +	90.95		4.40	1.21		0.47	0.24		2.74													100	118
S9	6	35	Ilm		43.91		53.54	1.38	1.17																100	101
S9	7	1	Chr			10.78	21.52		9.03								0.39	58.27							100	99
S9	7	2	Chl	29.65		18.34	21.09		15.36			0.56													85	89
S9	7	3	Ttn	33.51	29.89	3.84	2.98		1.80	24.47					2.78		0.72								100	107
S9	7	4	Chl	32.88	0.27	13.02	20.87	0.26	17.16	0.54															85	93
S9	7	5	Ads	58.32		24.39	2.13		0.70	7.14	7.05	0.28													100	109
S9	7	6	Ol	40.51			14.22	0.81	44.02										0.43						100	91
S9	7	7	Ol	39.48		13.41	6.45	0.61	37.17						1.51			0.98	0.39						100	97
S9	7	8	Ol	42.07			8.28		49.37										0.28						100	113
S9	7	9	Cpx	49.57	3.21	5.16	7.32		13.26	20.87	0.61														100	110
S9	7	10	Ads + TiO2 +	56.02	9.40	9.73	9.46		1.00	8.34	6.05														100	118
S9	7	11	Feohy +	6.48	0.36	1.27	88.96	0.46	1.34	0.64	0.49														100	77
S9	7	12	Feohy +	8.14	1.31	3.38	81.84		3.68	0.53	0.48	0.32					0.32								100	90
S9	7	13	Lab	60.58		23.21	2.21		1.99	10.12	0.48	1.42													100	105
S9	7	14	Lab	63.54		23.10				11.17		2.19													100	103
S9	7	15	Chl	26.60	0.56	17.02	31.34	0.55	8.93																85	102
S9	7	16	Amph (Ged)	42.89		13.57	14.24		24.69	1.02	0.41	0.18													97	100
S9	7	17	Dol						23.52	30.48															54	55
S9	7	18	"Ol"	48.59			8.00		42.94	0.48															100	88
S9	7	19	?Opx	55.97			8.62		34.63	0.47									0.31						100	95
S9	7	20	Chr			11.35	21.00		10.39									57.26							100	109
S9	7	21	TiO2		99.62		0.38																		100	110
S9	7	22	Chr			15.55	17.31		12.24									54.90							100	107
S9	8	1	Chr			7.91	16.98		13.55									61.57							100	104
S9	8	2	Zrn	30.94																		69.06			100	114
S9	8	3	Ol	41.72			8.31	0.23	49.40										0.34						100	114
S9	8	4	Ms	51.00	0.35	25.11	4.42		3.09		0.33	10.69													95	103
S9	8	5	Chl	29.00		19.19	21.19	1.84	13.77																85	100
S9	8	6	Cpx	51.76	1.63	3.13	10.65	0.26	12.53	19.51	0.53														100	115
S9	8	7	Ol	42.09			8.66		48.89										0.37						100	122
S9	8	8	Zrn	30.60																		69.40			100	119
S9	8	9	Chr			17.13	22.10		9.99									50.27		0.49					100	111
S9	8	10	Chr			0.62	39.88	0.91	3.28									55.32							100	107
S9	8	11	Chr			13.85	23.86		10.06									52.23							100	108
S9	8	12	Grt	41.22	0.50	14.58	8.85	0.31	0.31	34.23															100	113
S9	8	13	Grt	40.39		20.70	28.58	0.55	4.03	5.75															100	107
S9	8	14	Ads + Chl	55.76	0.67	16.71	7.20		6.33	8.75	4.58														100	102
S9	8	15	Ol	41.93			7.50		50.27										0.30						100	110
S9	9	1	Chr			19.28	21.13		12.33									47.25							100	109
S9	9	2	?	46.32		11.88	4.67		34.62	0.53	0.45					0.20		1.33							100	93

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	9	3	Qz	100.00																					100	118
S9	9	4	Ms +	50.04	0.50	25.20	6.24		2.00		0.27	10.75													95	107
S9	9	5	Tur	38.58	0.32	34.67	6.08		5.20	0.37	1.78														87	101
S9	9	6	Spl			41.27	12.57		17.78									28.38							100	112
S9	9	7	Ol	41.69			8.82		49.06										0.43						100	122
S9	9	8	Amph	43.21	1.84	10.72	18.12	0.27	12.11	10.22	0.50														97	114
S9	9	9	Chr			12.98	18.61		11.44								0.41	56.56							100	110
S9	9	10	?Grt	39.80		20.93	20.66	7.73	0.58	10.30															100	112
S9	9	11	Ol	41.98			8.27		49.43										0.32						100	116
S9	9	12	Ap							48.63			44.74		6.63										100	125
S9	9	13	Dol						22.40	31.60															54	52
S9	9	14	Amph	43.86	2.91	9.46	18.43	0.32	9.94	11.51	0.56														97	102
S9	9	15	Ol	42.02			7.28		50.37										0.32						100	115
S9	9	16	Ol	41.98			8.15		49.42										0.45						100	118
S9	9	17	Cpx?	52.68	1.09	2.69	14.37	0.27	15.76	13.15															100	112
S9	9	18	Olig	60.58		24.89	1.36		0.29	4.76	6.59	1.52													100	112
S9	9	19	Feohy +	25.60	9.11	6.81	46.21	0.36	0.62	6.85	4.44														100	107
S9	9	20	Ol	42.03			7.53		50.44																100	117
S9	9	21	Cpx	52.43	1.50	3.37	7.61		14.79	19.93	0.36														100	116
S9	9	22	Chl	25.42		20.02	22.81	0.27	13.64		0.43				2.41										85	101
S9	9	23	Cpx	54.39		3.04	1.93		17.67	22.11								0.85							100	118
S9	10	1	Chr			9.87	21.67		8.94								0.46	59.05							100	101
S9	10	2	Ol	41.60			8.26		49.77										0.37						100	117
S9	10	3	Cpx	48.23	3.42	6.83	6.99		13.00	20.21	0.62							0.70							100	114
S9	10	4	Grt	40.04		21.07	28.43	1.77	3.71	4.98															100	117
S9	10	5	Qz	100.00																					100	119
S9	10	6	Qz +	94.26		4.14	0.31		0.27		0.38	0.64													100	113
S9	10	7	Spl			27.36	20.62		13.18									38.84							100	105
S9	10	8	Chr		0.65	23.23	25.00		11.38									39.74							100	104
S9	10	9	Chr			19.91	17.63		12.65									49.81							100	104
S9	11	1	Chr			18.42	29.26		9.36								0.51	42.45							100	108
S9	11	2	Chr			1.24	54.92	4.69	1.66									36.76		0.73					100	103
S9	11	3	Opx	56.50		3.27	5.67		33.59	0.38								0.59							100	113
S9	11	4	Opx	51.42	0.59	3.92	19.83	0.37	18.09	5.40	0.38														100	111
S9	11	5	Lab	55.82		27.18	0.97			11.18	4.85														100	113
S9	11	6	Cpx	54.44		3.05	2.08		17.48	22.11								0.83							100	115
S9	11	7	Spl			46.10	13.62		18.35									21.93							100	112
S9	11	8	Cpx	51.95	1.14	3.08	10.60	0.37	14.41	18.01	0.45														100	109
S9	11	9	Chl +	29.97	0.69	14.19	29.46	0.28	8.74	1.28	0.39														85	93
S9	11	10	Ab	68.65		19.16				0.72	11.46														100	115
S9	11	11	Dol						22.53	30.43					1.03										54	54

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	11	12	Ol	42.11			7.30		50.23										0.35						100	119
S9	11	13	Ol	42.64			9.65		47.29										0.42						100	100
S9	11	14	Mix	26.08	9.81	12.08	35.36	0.43	15.11	0.51		0.62													100	104
S9	11	15	Chr		0.54	3.42	39.45	0.99	2.60								0.45	52.55							100	102
S9	11	16	"Ol"	49.56			4.86		42.67						1.94				0.97						100	73
S9	11	17	Chr			7.28	24.44		7.91									60.37							100	106
S9	11	18	Amph	54.38	0.48	2.66	13.17	0.33	14.75	10.39	0.84														97	108
S9	11	19	Chl ?	33.26		17.84	28.10	4.38	0.99	0.42															85	106
S9	11	20	Feld?	54.65		30.12	0.92			5.59	3.13	4.24			1.35										100	113
S9	11	21	Opx	48.03	6.37	5.08	16.89	0.27	13.52	9.52	0.32														100	111
S9	11	22	Fe-oxide +	16.49	13.84	2.92	55.37		1.49	9.18							0.70								100	100
S9	11	23	Ol	42.08			6.70	0.20	50.63										0.39						100	115
S9	11	24	Amph	44.31	3.93	10.49	10.62		14.16	10.64	2.64	0.21													97	107
S9	12	1	Feohy +		12.98	3.08	80.56	0.48	2.91																100	95
S9	12	2	Chr			6.42	26.94		7.96									58.68							100	105
S9	12	3	Chr			6.51	27.06		8.51									57.92							100	106
S9	12	4	Ol +	46.04			7.69		42.78						1.98	0.17		0.42					0.93		100	98
S9	12	5	Ol	41.94			7.76		49.94										0.35						100	116
S9	12	6	Ol	42.18			8.37		49.15										0.29						100	118
S9	12	7	?	38.77		20.06	2.93		37.92									0.32							100	99
S9	12	8	Dol	0.37					20.78	30.93					1.92										54	57
S9	12	9	Ol	43.06			9.20	0.21	47.53																100	124
S9	12	10	Grt	39.24		20.64	27.65	5.26	1.57	5.63															100	116
S9	12	11	Qz	99.80			0.20																		100	127
S9	12	12	Chr			18.99	16.58		13.02									51.40							100	114
S9	12	13	Chr		0.35	10.74	35.61	0.92	5.20									47.20							100	110
S9	12	14	Dol						22.72	31.28															54	58
S9	12	15	Zrn	31.18																		68.82			100	117
S9	12	16	Chr			7.88	20.77		8.99								0.41	61.95							100	104
S9	12	17	Chr			22.62	17.46		14.51									45.41							100	109
S9	12	18	Opx	56.64		3.12	5.12		33.93	0.57								0.62							100	111
S9	12	19	Opx	55.89		3.76	5.52		33.60	0.46								0.76							100	112
S9	12	20	"Ilm"		82.07		17.93																		100	95
S9	12	21	Serp +	41.85	0.43	12.80	4.54		34.50	3.85					2.03										100	99
S9	12	22	Amph	43.17	3.72	12.65	9.40	0.24	13.36	10.84	3.08	0.53													97	107
S9	12	23	Cpx	53.80	0.54	1.50	9.91	0.41	14.53	19.04	0.27														100	117
S9	12	24	Opx	58.39		1.09	6.19		34.02	0.31															100	109
S9	12	25	Mix	20.44	34.04	4.58	24.85	3.68	9.77	1.64	1.01														100	104
S9	12	26	Cpx	54.31	0.75	1.34	8.70	0.26	13.78	20.35	0.50														100	117
S9	12	27	Chl	29.36		8.87	28.90		15.60	1.01	0.98							0.28							85	95
S9	12	28	Fe-oxide +	11.66		3.49	80.10		2.45	0.96	0.80							0.54							100	88

Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	12	29	"Ilm" +	19.15	45.58	3.38	11.77	2.79	1.16	16.16															100	111
S9	12	30	Amph	45.72	2.13	10.29	12.98	0.29	12.58	10.65	2.36														97	118
S9	12	31	Dol						22.67	31.33															54	59
S9	12	32	Grt	40.01		21.00	29.99	0.72	3.01	5.28															100	113
S9	12	33	Cpx	54.87		1.65	7.48	0.35	15.00	20.20	0.46														100	116
S9	12	34	Ap	0.50			0.25			49.66	0.32		44.73		4.06	0.48									100	111
S9	12	35	Cpx	54.32		3.07	1.98		17.44	22.58								0.61							100	119
S9	12	36	Ol	41.38	0.35	0.86	9.45		42.67	0.44					4.85										100	86
S9	12	37	Ilm		58.81		39.45	0.77	0.96																100	65
S9	12	38	Ol	42.07			7.59		49.97										0.37						100	117
S9	13	1	"Mag"	4.29			92.64			0.34			0.77						0.75		1.21				100	85
S9	13	2	Chr			11.09	20.87		10.35								0.41	57.27							100	111
S9	13	3	Grt	39.54		20.82	31.95	2.66	3.51	1.52															100	114
S9	13	4	Chr			22.42	17.59		13.32									46.67							100	109
S9	13	5	Spl			38.53	14.73		16.79									29.96							100	109
S9	13	6	Dol						22.71	31.29															54	57
S9	13	7	Ol	42.02			7.24		50.32										0.42						100	114
S9	13	8	Spl		0.42	36.28	17.94		15.38									29.98							100	107
S9	13	9	Chr		0.82	20.96	24.69		14.86								0.43	38.23							100	101
S9	13	10	Ep	40.20		25.43	8.90			22.47															97	105
S9	13	11	Ol	41.87			8.70		49.06										0.37						100	114
S9	13	12	Spl			48.06	15.71		17.92									18.31							100	106
S9	13	13	Cpx	54.58	0.31	1.13	8.81	0.24	15.00	19.66	0.27														100	113
S9	13	14	Chl	24.57		20.74	32.50	0.27	6.93																85	101
S9	13	15	"Ilm" +	12.01	23.47	2.01	51.94	0.72		8.90							0.95								100	104
S9	13	16	Olig +	60.15		23.94	1.96		0.50	4.99	7.22	1.25													100	112
S9	13	17	Ttn + ?	25.19	19.59	3.13	34.15	0.36	0.61	16.97															100	100
S9	13	18	Ads	60.65		23.84	0.85			6.86	7.79														100	113
S9	13	19	Mix	39.40	0.67	14.23	25.21	0.44	14.95	4.65	0.45														100	93
S9	13	20	Ol	41.44			9.17		48.95										0.44						100	96
S9	13	21	Cpx	54.05		3.19	1.92		17.18	22.56								1.11							100	117
S9	13	22	Mix	43.20	1.50	11.18	22.57		11.75	9.11	0.69														100	104
S9	13	23	Chl	26.20		19.47	27.28		11.25	0.30	0.50														85	97
S9	13	24	Zrn	31.44																		68.56			100	125



Table B4.1: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	ZrO2	Ce2O3	WO3	Total	Actual Total
S9	13	25	Opx	59.08		0.38	4.96		35.27	0.31															100	125
S9	13	26	Mag	0.75			98.02		0.73									0.50							100	90
S9	13	27	"Mag"	6.34		0.88	91.34		0.85	0.59															100	88
S9	13	28	Fl	0.42			2.82	0.71		60.17					35.88										100	92
S9	13	29	Ol	41.95			7.91		49.84										0.30						100	120
			Notes																							
			" " = indicates that mineral is altered																							
			+ = indicates other minerals present																							

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	14	1	Dol						22.75	31.25																						54	57
S9	14	2	Ol	42.02			7.38		50.59																							100	112
S9	14	3	Srp	42.71			5.03	0.23	37.27	0.20								0.44		0.34												87	94
S9	14	4	Spl		0.38	36.15	19.65		14.83								0.39	28.60														100	105
S9	14	5	Chl	26.48		21.05	25.08		12.39																							85	95
S9	14	6	Chl	33.59		17.65	25.28	2.31	1.57	4.59																						85	110
S9	14	7	Chr			29.78	16.50		14.94									38.78														100	106
S9	14	8	Chr			15.98	19.60		12.63									51.79														100	105
S9	14	9	Ti-Mag	0.68	18.01	3.01	74.53	0.99	1.85								0.93															100	100
S9	14	10	Cpx	50.41	2.11	5.25	7.43	0.24	13.77	20.37	0.43																					100	114
S9	14	11	Ab +	61.37		23.72					14.05				0.86																	100	105
S9	14	12	Spl			42.33	15.08		17.19									25.41														100	107
S9	14	13	Feohy +	4.70		1.24	76.03		5.14									12.89														100	98
S9	14	14	Srp	40.72		2.07	4.41		35.65	0.24					1.65			0.50													1.74	87	97
S9	14	15	Cpx	52.69	0.99	1.82	13.94	0.39	14.70	15.20	0.27																					100	119
S9	14	16	"Ilm" +	7.62	26.73	1.56	56.04	0.65		6.18							1.22															100	104
S9	14	17	Ol	41.76			8.50	0.21	49.12											0.41												100	124
S9	14	18	Spl			33.25	15.84		15.16								0.33	35.42														100	113
S9	14	19	Spl		0.82	31.00	20.39		13.89								0.44	33.47														100	104
S9	14	20	Chr +	7.56		9.07	44.03		10.29									29.05														100	104
S9	14	21	Al-Srp	39.84		16.80	3.55		39.29									0.51														100	99
S9	14	22	TiO2	0.64	98.69	0.38	0.29																									100	106
S9	14	23	Cpx	52.25	1.88	3.71	6.49		15.65	19.60	0.42																					100	117
S9	14	24	Ol	41.74			8.11	0.20	49.55											0.40												100	117
S9	14	25	TiO2		99.70		0.30																									100	105
S9	14	26	Chr			9.67	24.19		8.40								0.53	57.21														100	102
S9	14	27	"Mag"	1.03			95.95	1.53	1.49																							100	88
S9	14	28	Feohy +	11.61		0.45	71.97		15.49									0.48														100	100
S9	14	29	Dol						22.69	31.31																						54	56
S9	14	30	Ab	68.53		19.24				0.74	11.49																					100	121
S9	14	31	Chl	29.90		17.10	19.93	0.24	17.09	0.48	0.26																					85	100
S9	14	32	Cpx	53.86		3.55	1.91		17.40	22.34								0.94														100	118
S9	14	33	TiO2	0.51	99.49																											100	105
S9	14	34	Ab	62.22	0.53	23.30	0.39			0.51	13.04																					100	104
S9	14	35	Ttn + Feohy	15.65	28.02	2.78	41.66	0.56		11.34																						100	101
S9	14	36	Ttn	35.34	27.89	5.59	2.24			27.02					1.93																	100	109
S9	14	37	"Ilm"		14.73	2.90	78.38	0.76	2.27								0.96															100	95
S9	15	1	Opx	55.78		4.08	5.56		33.48	0.35								0.75														100	122
S9	15	2	Qz	100.00																												100	119
S9	15	3	Grt	39.43		21.01	29.22	1.04	2.20	7.11																						100	111
S9	15	4	Dol						22.71	31.29																						54	55
S9	15	5	Ol	42.17			7.84		49.64											0.34												100	114
S9	15	6	Chr		0.73	2.66	57.91		2.93									35.77														100	98
S9	15	7	Zrn	31.01																				67.38						1.61		100	118
S9	15	8	Chr			19.73	17.04		12.52									50.71														100	105
S9	15	9	Chr			12.20	24.82		9.34									53.64														100	101
S9	15	10	Brt											37.00					0.01							62.99						100	107
S9	15	11	Tur	38.28	0.48	29.20	9.07		6.75	0.60	2.63																					87	96

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total		
S9	15	12	"Mag" +	4.68			92.09	1.09		0.44				1.68																		100	81		
S9	15	13	"Mag" +	1.14			98.04											0.34		0.48												100	94		
S9	15	14	Srp	41.74		0.38	8.67		34.16									1.24													0.81	87	97		
S9	15	15	Chr			26.97	20.70		12.25								0.40	39.24			0.45												100	109	
S9	15	16	Cpx	52.55	1.28	2.95	8.85	0.31	15.11	18.95																							100	117	
S9	15	17	Cpx	54.09	0.41	1.39	9.29	0.36	14.83	19.32	0.31																						100	115	
S9	15	18	Grt	39.99		21.06	23.57	4.35	1.28	9.75																							100	112	
S9	15	19	Opx	56.80		2.96	5.34		33.72	0.65								0.54															100	119	
S9	15	20	Chr			16.99	19.17		11.02									52.82															100	107	
S9	15	21	Spl			32.27	14.74		15.46								0.36	37.17															100	108	
S9	15	22	Chr			9.69	23.02		8.15									59.14															100	108	
S9	15	23	Ol +	51.32			2.20		46.49																								100	102	
S9	15	24	Grt	39.69		21.13	29.93		1.45	7.80																							100	115	
S9	15	25	Chr			15.12	20.55		9.74									54.59															100	107	
S9	15	26	Ol	42.09			6.45		51.03											0.43													100	123	
S9	15	27	Cpx	50.05	2.40	4.94	8.33		13.07	20.81	0.40																						100	117	
S9	15	28	Chr			24.81	17.89		13.02									44.28																100	104
S9	15	29	Opx	56.38		3.57	5.56		33.51	0.39								0.58															100	110	
S9	15	30	Spl			46.44	12.78		18.59									22.19															100	107	
S9	15	31	Grt	40		21	32		3	4																							100	107	
S9	15	32	Chr			9.38	24.82		9.52									56.28															100	105	
S9	15	33	Ads +	56.54	0.86	17.40	7.13		4.87	7.59	5.61																						100	113	
S9	15	34	Grt	37.98		19.93	24.83	2.34	1.68	10.97			2.27																				100	106	
S9	15	35	Feohy	6.30		1.43	88.88		0.77											2.62													100	82	
S9	15	36	Qz	99.76			0.24																										100	127	
S9	16	1	Chr			14.15	16.38		12.62									56.85															100	106	
S9	16	2	Ol	41.86			8.90		49.24																								100	113	
S9	16	3	Chr			14.28	20.25		10.87									54.60															100	103	
S9	16	4	"Mag" +	6.11			93.50			0.39																							100	79	
S9	16	5	Chr			21.74	23.64		10.85									43.76															100	109	
S9	16	6	Chr			8.01	26.58		7.67									57.74															100	109	
S9	16	7	Grt	39.51		21.23	29.57	4.42	3.19	2.08																							100	107	
S9	16	8	Ol	41.69			8.15		49.78											0.38													100	111	
S9	16	9	Cpx	52.57	0.24	6.03	2.43		15.99	21.23	0.51							0.99															100	115	
S9	16	10	Cpx	48.94	3.46	5.18	9.03	0.30	12.18	20.25	0.66																						100	112	
S9	16	11	Mix	53.73		18.11	8.93	0.47	9.58	0.81	2.63	3.09			2.64																		100	105	
S9	16	12	Grt	39.33		20.88	35.17	1.69	2.11	0.82																							100	111	
S9	16	13	Ol	42.01			8.62		48.95											0.41													100	113	
S9	16	14	Amph	44.71	1.67	14.76	10.08		9.32	10.35	0.64	1.84			3.63																	97	111		
S9	16	15	"Mag" +	3.69		0.86	95.05			0.40																							100	84	
S9	16	16	"Ilm" +	1.94	18.06	4.20	70.04	1.13	2.75								1.36	0.53															100	97	
S9	16	17	Grt	39.42		20.98	27.75	0.78	2.28	8.79																							100	119	
S9	16	18	Chr			28.75	17.23		14.20									39.82															100	114	
S9	16	19	Feohy +	9.33		3.56	84.72		1.34	0.41		0.63																					100	85	
S9	16	20	Cpx	54.60		2.74	1.77		17.36	22.68								0.84															100	112	
S9	16	21	Cpx	53.77	1.01	1.40	8.87	0.28	13.81	20.38	0.49																						100	111	
S9	16	22	Ol	41.70			8.39		49.51											0.40													100	114	
S9	16	23	Chr			17.26	17.68		14.18									50.88															100	105	

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	16	24	TiO2 +	6.36	87.47		0.46			5.70																						100	103
S9	16	25	Ttn	30.56	37.83	0.88	5.34	1.11		24.28																						100	103
S9	16	26	Cpx	53.47	0.43	3.30	4.92		16.70	20.90								0.27														100	115
S9	17	1	Chr		0.31	15.05	24.87		8.78									50.99														100	106
S9	17	2	Chr			16.57	18.97		10.86									53.60														100	104
S9	17	3	Chr			11.78	22.20		9.80									56.22														100	108
S9	17	4	Chr			8.37	21.62		9.37									60.63														100	110
S9	17	5	Ol	41.93			8.26		49.35											0.46												100	115
S9	17	6	Cpx	50.64	2.28	4.48	8.50		12.69	20.93	0.48																					100	110
S9	17	7	Ol	42.00			8.59		49.41																							100	110
S9	17	8	Act	55.62		2.79	2.78		25.55	10.25																						97	111
S9	17	9	Ep	39.43		20.26	18.45	1.22	0.60	17.03																						97	109
S9	17	10	Spl		0.45	30.85	24.63		12.22									31.86														100	107
S9	17	11	Ol	43.27			8.69		47.62											0.42												100	102
S9	17	12	Cpx	55.14		0.77	8.73	0.46	15.11	19.78																						100	116
S9	17	13	Chr	0.73	0.72	2.00	55.87	2.81	1.14									36.72														100	97
S9	17	14	Mix	46.18	1.06	14.95	18.74	0.28	12.16	3.47	3.16																					100	92
S9	17	15	Ol	41.91			8.36		49.38											0.35												100	112
S9	17	16	Grt	39.93		21.40	29.93	4.49	3.32	0.93																						100	109
S9	17	17	Ms	51.14	0.41	24.37	4.95		3.12			11.01																				95	108
S9	17	18	Chr			13.52	19.01		11.33									56.13														100	106
S9	17	19	Mag	0.78			97.42											1.80														100	94
S9	17	20	Ol	39.82			13.07		46.44											0.67												100	106
S9	17	21	Ol	41.84			7.97		49.88											0.31												100	110
S9	17	22	Ilm +	15.27	16.20	2.96	52.86	0.54	3.30	8.23							0.64															100	96
S9	17	23	Cpx	58.35		1.34	4.41	0.23	21.51	14.17																						100	119
S9	17	24	Opx	56.44		2.69	4.79		31.65	3.68								0.74														100	121
S9	17	25	Chl	27.83		18.69	21.38		16.79									0.31														85	103
S9	17	26	Chr	0.63		2.31	35.85	3.49	3.40									53.62			0.70											100	101
S9	17	27	Dol	0.57			1.78		20.91	30.73																						54	55
S9	17	28	Ti-Mag		17.84	4.16	71.37	0.51	4.49								1.62															100	95
S9	17	29	Amph?	44.75	2.95	9.64	19.04	0.50	9.88	8.32	1.76	0.16																				97	109
S9	17	30	Grt	39.64		20.37	30.83	1.15	1.52	6.49																						100	109
S9	17	31	Chr			9.68	23.30		10.92									56.10														100	104
S9	18	1	Ol	41.81			7.90		49.95											0.34												100	113
S9	18	2	"Ilm"	1.96	19.57	3.24	72.62	1.54									1.07															100	95
S9	18	3	Chr		0.42	26.77	18.83		13.37									40.61														100	107
S9	18	4	Qz	100.00																												100	116
S9	18	5	Opx	57.84		1.27	4.98		34.93	0.34								0.63														100	113
S9	18	6	Chr			10.62	27.29		8.72									53.36														100	103
S9	18	7	Chr			30.65	12.83		17.40									39.11														100	110
S9	18	8	Chr		0.38	10.53	36.26		6.29									46.55														100	107
S9	18	9	Opx	55.55		4.25	5.78		33.09	0.68								0.66														100	124
S9	18	10	Cpx	54.38		3.21	1.94		17.05	22.60								0.81														100	120
S9	18	11	Chr			26.42	15.70		14.00									43.89														100	112
S9	18	12	Opx	56.17		3.69	5.42		33.66	0.30								0.76														100	120
S9	18	13	Grt	41.61		21.29	26.23	1.05	8.74	1.07																						100	114
S9	18	14	Fl +	1.09		0.40	8.54		0.58	44.72	0.68			5.20	38.79																	100	96



Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	18	15	Dol						22.74	31.26																						54	55
S9	18	16	Ol	42.20			7.84		49.96																							100	105
S9	18	17	Grt	38.15	0.76		26.39			34.27								0.44														100	103
S9	18	18	"Ol"	49.90			5.43		44.67																							100	98
S9	18	19	Ol	41.87			8.43		49.70																							100	110
S9	18	20	Hbl	45.35	3.47	11.26	13.71	0.27	9.12	9.70	3.22		0.90																			97	113
S9	18	21	Ttn	34.67	33.31	2.40	1.54		1.84	25.26							0.98															100	113
S9	18	22	Grt	40.05		21.36	27.54	2.40	5.94	2.72																						100	111
S9	18	23	Grt	40.06		21.19	29.74	0.35	3.77	4.89																						100	110
S9	18	24	Opx	57.72		1.86	15.46	0.36	20.95	3.35	0.29																					100	110
S9	18	25	Cpx	54.56	0.34	1.19	9.16	0.34	15.11	19.32																						100	109
S9	18	26	Chr			7.51	29.91		7.21									55.37														100	99
S9	18	27	Chr			22.33	16.35		13.81									47.50														100	110
S9	18	28	Dol						24.01	29.99																						54	57
S9	19	1	Cpx	53.99		3.52	1.85		17.19	22.66								0.79														100	116
S9	19	2	Ol +	44.77		2.08	9.34		41.58							0.26		1.98														100	96
S9	19	3	Chl	27.98		17.60	23.79	0.34	15.29												0.58											85	99
S9	19	4	Ol	41.60			9.41		48.41																							100	96
S9	19	5	Cpx	55.34		2.01	1.67		17.88	22.60								0.50														100	115
S9	19	6	Spl			42.33	14.57		17.20								0.34	25.56														100	108
S9	19	7	Feohy +	7.22	3.00	2.48	86.23					1.07																				100	88
S9	19	8	"Mag" +	4.95		0.80	93.79			0.45																						100	75
S9	19	9	Chr			20.34	16.79		13.00								0.38	49.48														100	107
S9	19	10	"Ilm" +	3.54	13.37	5.23	73.46	2.66									1.00	0.37			0.37											100	95
S9	19	11	Py	0.39			30.88							68.73																		100	212
S9	19	12	Ol	41.75			8.38		49.47											0.40												100	117
S9	19	13	Cpx	54.73		2.71	1.75		17.77	22.27								0.77														100	115
S9	19	14	Mix	48.29	2.19	14.25	12.56	0.30	9.50	10.21	0.55	2.15																				100	106
S9	19	15	Chr			27.64	21.97		11.76									38.64														100	104
S9	19	16	"Ilm" +	15.15	22.13	5.53	50.49	0.66	3.24	0.45	1.07	0.35					0.92															100	93
S9	19	17	Spl +	2.96		34.00	15.80		16.06									31.17														100	104
S9	19	18	Chl	33.92		14.03	2.18		31.96	0.19					2.25			0.48														85	96
S9	19	19	Chr +	2.52	0.65		66.68	1.10	2.37									26.25		0.43												100	97
S9	19	20	Mix	16.02	70.60	0.84	0.85		0.64	11.05																						100	106
S9	19	21	Spl			39.59	17.63		15.58									0.33	26.86													100	102
S9	19	22	Chr			18.14	17.13		12.57									52.16														100	106
S9	19	23	Grt	40.13		20.91	28.19	1.31	1.78	7.68																						100	109
S9	19	24	TiO2 + ?Grt	10.31	0.54	7.61	65.88	4.39	0.79	1.18	1.40																				7.90	100	80
S9	19	25	TiO2		100.00																											100	106
S9	19	26	Chr			7.96	22.07		8.30									61.68														100	106
S9	19	27	Chl	25.59		21.68	24.78		12.64		0.31																					85	103
S9	19	28	Spl			40.77	15.65		17.32									26.26														100	115
S9	19	29	Chr			21.92	17.83		12.33									47.91														100	114
S9	19	30	Bt	38.75	4.06	17.82	18.90		9.56		0.32	6.60																				96	108
S9	19	31	Ol	46.35		0.60	10.45		40.56									2.04														100	100
S9	19	32	Mix	29.77		2.49	30.30		31.24									6.20														100	111
S9	19	33	Chr			23.35	24.45		12.28									39.92														100	107
S9	19	34	Mag +	4.66	0.48	1.05	90.30		1.97									1.55														100	90

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	19	35	Cpx	54.40	0.30	2.33	5.04		16.10	21.22	0.29							0.32														100	109
S9	19	36	Ill	49.48		39.12	0.58		0.41		7.66	0.95			1.80																	100	110
S9	19	37	Ti-Mag		18.58	2.98	73.95	0.58	2.85								1.06															100	101
S9	19	38	Chr			9.38	17.35		12.51									60.75														100	109
S9	20	1	"Ol"	49.43			6.63		42.25	0.20																				1.49	100	101	
S9	20	2	Mix	40.31		1.00	22.53		8.77	27.39																						100	108
S9	20	3	Ep	40.10	0.26	22.33	12.06			22.25																						97	110
S9	20	4	Chr			5.52	22.44		7.51								0.36	64.16														100	109
S9	20	5	Ads +	53.38	1.82	14.40	10.82		7.05	7.22	5.31																					100	112
S9	20	6	Ol	41.69			8.35		49.66											0.30												100	112
S9	20	7	Ep	40.59		26.60	6.68			22.52								0.60														97	106
S9	20	8	Chr			13.42	17.89		11.95								0.44	56.31														100	103
S9	20	9	Ol	41.55			8.03		50.01											0.41												100	116
S9	20	10	Opx	55.94		3.77	5.35		32.86	1.38								0.70														100	118
S9	20	11	Grt	41.84		22.11	16.48	0.46	11.41	7.45								0.25														100	114
S9	20	12	Ti-Mag +	6.49	4.55	1.14	79.02		1.19	3.71							1.66	2.24														100	97
S9	20	13	Chr		0.50	20.47	26.36		10.79									41.88														100	115
S9	20	14	Ttn	43.31	29.92	1.59	0.91			23.52							0.75															100	115
S9	20	15	Mix	73.37	12.25	2.02	1.03			11.34																						100	122
S9	20	16	Chl	26.82	0.54	19.12	24.32	0.36	13.85																							85	98
S9	20	17	Chr			14.32	20.26		10.64									54.78														100	106
S9	20	18	Ol	46.87			5.73		43.10	0.24								0.59													3.47	100	99
S9	20	19	Chr			23.74	19.37		12.27								0.46	44.15														100	108
S9	20	20	Py +	9.71		3.85	62.41		4.17	0.57				16.04				0.50													2.75	100	97
S9	20	21	Chr			10.26	25.13		8.92									55.69														100	107
S9	20	22	Plag +	56.29	0.67	15.81	8.65	0.29	3.94	9.21	5.15																					100	119
S9	20	23	"Ilm" +	7.41	60.78	1.37	19.24	2.90	4.83	0.42					3.04																	100	114
S9	20	24	Ol	41.95			7.00		50.63											0.42												100	123
S9	20	25	Chr	5.09	0.55	2.97	50.49	3.76	4.73									31.61			0.80											100	104
S9	20	26	Grt	39.73		20.81	29.69	2.01	3.76	3.73								0.28														100	115
S9	20	27	Chl	26.55		21.12	21.74		15.59																							85	93
S9	20	28	Ol	41.95			8.31		49.36											0.38												100	110
S9	20	29	Grt	40.00		20.93	28.00		1.05	10.01																						100	108
S9	20	30	Cpx	54.55		2.86	1.82		17.16	22.58								1.03														100	117
S9	20	31	Spl			35.17	17.98		15.10								0.33	31.42														100	111
S9	21	1	Chl +	34.81	0.92	13.04	9.60	0.66	20.32	3.10					2.56																	85	95
S9	21	2	Ep	46.56		23.90	0.48			26.06																						97	108
S9	21	3	Chr			9.27	20.89		9.48									60.36														100	106
S9	21	4	Ol	41.80			7.89		49.95											0.36												100	114
S9	21	5	Chr			10.30	22.19		9.51									58.00														100	104
S9	21	6	Mix	48.74	2.39	5.18	14.75	0.39	12.18	15.41	0.60						0.36															100	115
S9	21	7	Chr			16.98	17.31		12.31									53.40														100	103
S9	21	8	Amph	43.80	1.82	10.45	17.17	0.31	12.51	10.41	0.53																				97	106	
S9	21	9	Mix	44.30	3.80	12.36	17.69	0.35	10.45	9.05	1.61	0.38																			100	102	
S9	21	10	"Ti-Mag"		16.98		83.02																									100	89
S9	21	11	Ab	65.93		19.32	1.79		0.90	0.91	10.75	0.40																				100	112
S9	21	12	Py	3.77		1.10	30.14		2.39					62.60																		100	180
S9	21	13	Dol						22.76	31.24																						54	56

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	21	14	Grt	39.16		20.71	29.95	4.58	1.49	4.12																						100	111
S9	21	15	Opx	57.38		2.42	5.60		33.77	0.37								0.46														100	118
S9	21	16	Amph	46.07	0.99	6.46	17.43		12.01	12.12	1.93																					97	86
S9	21	17	Mix	41.61	12.34	7.99	11.67		5.98	17.66	0.61				2.15																	100	115
S9	21	18	Chr			27.52	17.98		13.65								0.36	40.48														100	115
S9	21	19	Ol	41.86			8.50		49.36											0.28												100	121
S9	21	20	Grt	39.65		20.71	21.09	7.46	0.62	10.05								0.43														100	118
S9	21	21	Chr			10.66	19.10		10.68									59.56														100	110
S9	21	22	Mag +	1.76			96.31		0.57									1.36														100	98
S9	21	23	Chr +	7.51		1.05	39.38	0.58	34.55	0.29								16.64														100	97
S9	21	24	Ab	67.85		19.61	0.22			1.23	11.09																					100	119
S9	21	25	Py +	3.58		1.46	26.37	0.49	2.94	0.19	0.45			64.52																		100	209
S9	21	26	Chl	26.36		21.04	26.43	0.93	9.71		0.39	0.15																				85	102
S9	21	27	Ol	42.06			7.19		50.36											0.38												100	120
S9	21	28	Ep	40.35		26.02	8.56			22.08																						97	111
S9	21	29	Ab	68.72		18.99	0.22			0.42	11.64																					100	116
S9	21	30	Chr			17.68	16.22		13.38									52.72														100	107
S9	21	31	Qz	100.00																												100	123
S9	21	32	Ol	40.93			9.14	0.96	46.34						2.19					0.43												100	106
S9	21	33	Ttn +	29.81	41.73	1.96	1.81		0.57	24.12											0.36											100	106
S9	21	34	Ol	42.06			7.00		50.58											0.36												100	115
S9	21	35	Opx	56.18			6.67	0.21	36.94																							100	122
S9	21	36	Spl			40.52	15.01		16.67									27.81														100	106
S9	21	37	Mix	45.97		14.26	12.68		20.19	1.20	0.79	0.68			3.50			0.74														100	102
S9	22	1	Spl		0.55	27.28	21.23		14.23									36.71														100	104
S9	22	2	Chr			18.51	17.17		12.38								0.41	51.54														100	96
S9	22	3	Grt	40.23		21.30	27.77	0.53	3.42	6.75																						100	108
S9	22	4	Cpx	54.14	0.55	3.95	8.78		16.93	15.28	0.37																					100	88
S9	22	5	Ol	41.94			8.46		49.60																							100	110
S9	22	6	Ol	42.06			8.09		49.57											0.28												100	114
S9	22	7	Cpx	51.43	0.87	5.26	7.06		15.23	19.85	0.28																					100	113
S9	22	8	Spl			33.56	20.83		13.60								0.38	31.63														100	108
S9	22	9	Spl +		1.82	15.86	37.52	0.82	6.00								0.51	37.47														100	107
S9	22	10	Cpx	55.10		2.06	1.84		17.66	22.85								0.49														100	118
S9	22	11	Chr			15.98	20.86		11.13								0.46	51.57														100	108
S9	22	12	Ol	41.65			8.37	0.24	49.34											0.40												100	119
S9	22	13	Zrn	31.25																				67.11					1.64		100	122	
S9	22	14	Dol				0.27		22.62	31.11																						54	53
S9	22	15	Ol	41.69			7.42	0.23	50.30											0.36												100	113
S9	22	16	Ep	41.83	1.57	20.33	11.62		0.81	20.85																						97	106
S9	22	17	Chr			18.44	25.45		10.16									45.96														100	112
S9	22	18	Mag	0.66			98.96			0.38																						100	94
S9	22	19	Ol	42.14			7.38		50.07											0.41												100	121
S9	22	20	Ap							48.29			44.68		5.81																1.22	100	130
S9	22	21	Ol	42.08			8.45		49.12											0.36												100	120
S9	22	22	Cpx	52.30	1.73	3.30	6.74		14.62	20.77	0.54																					100	115
S9	22	23	Dol						22.40	31.60																						54	56
S9	22	24	Opx	57.83		1.80	5.65		34.34	0.37																						100	115

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	22	25	Ads +	59.48		20.73	2.55		3.04	7.55	6.65																					100	109
S9	22	26	Ti-Mag +	15.61	2.54	5.10	68.25	0.40	5.93	1.71	0.48																					100	93
S9	22	27	TiO2 +	48.49	42.45	5.48	1.86		0.52	0.32		0.88																				100	109
S9	22	28	Qz	100.00																												100	118
S9	22	29	Dol						16.17	35.91					1.92																	54	44
S9	22	30	Hbl	44.53	2.05	8.02	19.44	0.46	11.78	10.24	0.48																					97	110
S9	22	31	Ti-Mag	0.89	18.84	3.70	71.89	1.47	1.91								1.30															100	99
S9	22	32	Chr		0.58	16.87	23.10		11.37									48.08														100	113
S9	22	33	Ol	41.72			7.30		50.63											0.35												100	112
S9	22	34	Fl?							71.62					26.85								1.52									100	82
S9	22	35	Cpx	45.02		3.00	18.37		14.38	18.40	0.82																					100	102
S9	23	1	Spl			38.20	15.90		16.33								0.36	29.21														100	107
S9	23	2	Ol	41.68			8.38		49.49											0.45												100	112
S9	23	3	Chr		0.93	20.86	26.34		10.34								0.46	41.08														100	105
S9	23	4	Cpx	53.06	0.98	3.20	7.20		15.81	19.48	0.28																					100	112
S9	23	5	Dol						22.74	31.26																						54	56
S9	23	6	Chr		0.34	28.24	19.32		13.89									38.21														100	110
S9	23	7	Grt	39.79		21.13	27.05	1.50	1.42	9.12																						100	112
S9	23	8	Chl	28.39	0.69	16.93	23.31	0.26	14.36	0.71	0.35																					85	98
S9	23	9	Zrn	30.81																				67.66						1.53		100	119
S9	23	10	Chr +	3.13		1.09	67.40	1.53	2.61									24.24														100	101
S9	23	11	Chr +	3.42	0.58	1.13	67.74	0.89	3.70									22.54														100	104
S9	23	12	"Ol"	45.71		7.48	4.78		41.22									0.82														100	100
S9	23	13	Ol	42.12			7.35		50.16											0.37												100	124
S9	23	14	Ep	40.09		25.79	7.91			22.73							0.48															97	111
S9	23	15	Chr			13.42	23.71		8.96								0.42	53.49														100	110
S9	23	16	Chr			24.59	17.89		13.84								0.42	43.27														100	110
S9	23	17	Chr			11.69	26.49		9.52									52.29														100	106
S9	23	18	Ol	41.60			8.29		49.72											0.38												100	117
S9	23	19	Opx	57.56		1.61	5.83		34.35	0.39								0.25														100	115
S9	23	20	Dol						22.76	31.24																						54	55
S9	23	21	Chr +	7.92	0.95	3.79	37.56	1.24	8.79									39.75														100	97
S9	23	22	Ti-Mag		10.36	3.24	83.35	0.60	1.22								1.22															100	93
S9	23	23	Py	0.87			34.40							64.73																		100	182
S9	23	24	Ti-Mag	0.96	3.37		95.67																									100	89
S9	23	25	Spl			32.78	14.56		15.69								0.34	36.63														100	109
S9	23	26	Cpx	49.91	1.12	5.13	9.58	0.48	11.36	21.89	0.53																					100	112
S9	23	27	Ol	41.82			7.92		49.93											0.33												100	118
S9	23	28	Feohy +	7.97		0.93	82.51			0.61	0.63			7.34																		100	87
S9	23	29	Act	55.45	0.37	2.78	7.72		18.68	11.66	0.34																					97	114
S9	23	30	Ep	40.25		24.86	9.27			22.62																						97	113
S9	23	31	Ep	38.97		20.00	14.27	5.63	0.31	17.82																						97	117
S9	23	32	Ol	42.10			8.32		49.26											0.33												100	119
S9	23	33	Grt	37.78		0.41	27.05		0.90	33.86																						100	103
S9	23	34	Ep	40.56		22.54	12.74	0.49	0.43	20.25																						97	108
S9	23	35	Ab	63.58		19.60	1.97		2.61		9.01	3.24																				100	119
S9	24	1	Opx	56.64		3.30	5.64		33.62	0.30								0.50														100	114
S9	24	2	Spl			44.11	14.61		17.44									23.84														100	113



Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	24	3	"Opx" or "Ol"	50.02		2.93	7.39		38.81	0.48								0.38														100	101
S9	24	4	Zrn	31.13																				68.87								100	112
S9	24	5	Mag +	1.17			97.87		0.96																							100	90
S9	24	6	Py	0.76			32.92							66.33																		100	201
S9	24	7	Spl			51.25	13.40		18.72									16.30		0.32												100	111
S9	24	8	Ol	42.02			7.51		50.15											0.32												100	113
S9	24	9	Qz	100.00																												100	116
S9	24	10	Chr			7.72	24.51		8.35									59.42														100	107
S9	24	11	Spl			30.77	21.44		13.50								0.41	33.89														100	110
S9	24	12	Ttn	32.92	34.48	1.43	2.35			27.27					1.55																	100	114
S9	24	13	Chr			13.89	18.73		11.56								0.34	55.48														100	115
S9	24	14	Ol	39.99			17.37		41.02																						1.63	100	115
S9	24	15	Ol	41.91			7.76		50.02											0.32												100	120
S9	24	16	Ol	41.99			7.60		50.05											0.36												100	119
S9	24	17	Dol						22.97	31.03																						54	56
S9	24	18	Chr			25.28	15.91		14.17								0.38	44.26														100	108
S9	24	19	Opx	57.33		2.19	5.55		34.14	0.37								0.41														100	115
S9	24	20	Mag			0.67	97.94										0.98	0.41														100	93
S9	24	21	Amph	45.75	1.54	10.39	12.82		15.14	9.51	1.59							0.25														97	107
S9	24	22	Ttn	34.63	21.36	9.41	10.33		6.88	17.39																						100	103
S9	24	23	Ab	65.34		18.94	2.29		2.57	0.63	9.93	0.30																				100	113
S9	24	24	Cpx	50.29	2.67	4.18	9.69	0.27	11.81	20.39	0.70																					100	112
S9	24	25	Ol	41.86			7.13	0.27	50.38											0.36												100	117
S9	24	26	Chr		0.37	24.10	16.21		16.62									42.70														100	107
S9	24	27	Ttn	34.97	27.94	5.93	2.70		1.35	25.01					1.43		0.66															100	107
S9	24	28	Mag	0.53	0.81	1.02	91.68										2.36	3.60														100	92
S9	24	29	Zrn	31.11																				67.35						1.53	100	123	
S9	24	30	Dol						22.79	31.21																						54	55
S9	25	1	TiO2		100.00																											100	106
S9	25	2	Amph	44.19	2.38	8.97	18.20	0.24	11.83	10.14	1.06																					97	110
S9	25	3	Py	0.82			29.42		0.40	0.17				68.72								0.48										100	205
S9	25	4	Ol	41.89			8.27		49.44											0.39												100	122
S9	25	5	Grt	39.86		20.71	29.15	0.42	1.46	8.40																						100	116
S9	25	6	Py				28.99							71.01																		100	210
S9	25	7	TiO2		99.56		0.44																									100	104
S9	25	8	Qz	99.59	0.41																											100	118
S9	25	9	Grt	39.55		21.33	32.68	1.14	3.93	1.38																						100	109
S9	25	10	Ti-Mag	6.42	15.27	3.93	69.33	0.62	2.91			0.40					1.13															100	99
S9	25	11	Zrn	31.05																				67.28						1.67	100	121	
S9	25	12	Grt	37.51		1.31	25.11		3.52	32.55																						100	105
S9	25	13	Ol	42.07			7.65		49.96											0.32												100	122
S9	25	14	Amph	41.21	3.78	9.69	19.36	0.32	10.98	10.61	0.49		0.55																			97	113
S9	25	15	Chr			13.73	20.86		9.33									56.08														100	95
S9	25	16	Grt	39.85		20.94	29.17	1.38	3.18	5.49																						100	118
S9	25	17	Cpx	53.97	0.73	1.61	8.93	0.30	14.01	20.01	0.44																					100	120
S9	25	18	Chr			25.60	20.21		11.94								0.36	41.89														100	114
S9	25	19	Chr			7.51	20.71		9.46									62.31														100	111
S9	25	20	Grt	39.96		21.18	30.50	1.03	4.95	2.38																						100	117

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	25	21	Ep	41.49		22.89	7.93		2.31	22.38																						97	107
S9	25	22	Spl			51.13	12.92		18.86									16.75		0.34												100	111
S9	25	23	Cpx	53.81		4.93	1.94		16.06	21.44	0.77							1.06														100	116
S9	25	24	Amph	46.31	1.16	10.17	15.75	0.40	11.15	10.03	1.67	0.37																				97	110
S9	25	25	Ol	42.03			7.53		50.12											0.31												100	119
S9	25	26	Chr			25.20	15.88		13.92									44.99														100	110
S9	25	27	Qz	100.00																												100	118
S9	25	28	Chr		0.51	17.29	32.33		7.96									41.91														100	103
S9	25	29	Chr +	23.76	0.34	11.05	14.41		26.36						2.34		0.38	21.35														100	94
S9	25	30	Chr			20.81	17.16		12.93									49.10														100	103
S9	25	31	Ol	42.04			7.31		50.37											0.28												100	110
S9	25	32	Ol	41.56			7.85		50.25											0.33												100	117
S9	25	33	Chl	25.40		17.98	35.51	0.67	5.43																							85	97
S9	25	34	Ti-Mag		18.42	2.91	74.61	0.60	2.51								0.96															100	97
S9	26	1	Spl			36.16	17.97		15.59								0.44	29.84														100	105
S9	26	2	Cpx	53.91	0.34	3.43	4.46		17.10	19.33	0.52							0.89														100	111
S9	26	3	Ol	41.68	0.25	0.47	6.72		44.82	0.19					5.30			0.28		0.29												100	113
S9	26	4	Grt	39.96		21.20	26.98	0.70	1.66	9.51																						100	108
S9	26	5	Chr			19.15	19.54		11.91									49.40														100	103
S9	26	6	Chr	0.59		14.58	18.40		11.97									54.46														100	103
S9	26	7	Chl +	32.31		12.45	24.89	0.27	13.33	1.20	0.37	0.18																			85	87	
S9	26	8	Kfs	58.94		26.48	1.01			1.79	6.12	4.62			1.04																	100	110
S9	26	9	Ttn +	40.95	17.21	9.36	13.38		1.45	14.28	3.25	0.13																				100	103
S9	26	10	Cpx	51.85	1.87	3.85	6.38		14.94	20.71	0.40																					100	107
S9	26	11	Chr			10.98	22.96		9.44									56.61														100	105
S9	26	12	Chr			8.58	21.41		9.48								0.39	60.13														100	104
S9	26	13	Spl		0.50	27.68	28.56		11.28									31.97														100	103
S9	26	14	Py	0.21			28.45							71.35																		100	229
S9	26	15	Chr			10.84	24.33		8.21									56.62														100	113
S9	26	16	Chr			21.54	17.35		13.20								0.44	47.47														100	114
S9	26	17	Ol	41.71			8.05		49.93											0.31												100	119
S9	26	18	Chr			19.65	20.84		11.58								0.42	47.52														100	110
S9	26	19	Cpx	54.39		2.87	2.12		17.25	22.46								0.91														100	118
S9	26	20	Grt	39.57		20.86	25.50	2.87	1.62	9.58																						100	115
S9	26	21	Plag +	56.39	1.12	13.45	8.75		6.37	8.34	5.58																					100	120
S9	26	22	Cpx	56.46		0.42	1.37		18.02	23.44								0.30														100	118
S9	26	23	Ol	41.75			8.09		49.83											0.32												100	118
S9	26	24	Spl			31.01	16.01		16.36									36.62														100	106
S9	26	25	Ol	42.15			8.06		49.79																							100	114
S9	26	26	Ab	66.85		20.33				1.94	10.73	0.15																				100	118
S9	26	27	Amph	43.63	0.71	10.98	19.19	0.42	8.40	10.95	1.47	1.25																			97	103	
S9	26	28	Ep + TiO2 +	48.13	10.86	14.00	6.16		1.38	19.47																						100	111
S9	26	29	Ep	46.75		23.40	1.47		0.80	24.58																						97	105
S9	26	30	Ol	41.85			7.53		50.30											0.31												100	119
S9	26	31	Dol?				9.09	1.87	15.42	27.61																						54	57
S9	26	32	Ol	41.88			8.27		49.50											0.34												100	110
S9	26	33	Ab	68.12		19.51				1.25	11.13																					100	112
S9	26	34	Cpx	51.70	1.37	3.34	11.28	0.28	15.62	16.00	0.40																					100	106

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total		
S9	26	35	Qz	100.00																												100	119		
S9	27	1	Cpx	52.58	1.31	3.85	5.55		15.42	20.59								0.70															100	113	
S9	27	2	Opx	58.38		0.71	5.24		35.11	0.31								0.25															100	116	
S9	27	3	Chr		0.34	12.13	31.93		7.47									48.13															100	104	
S9	27	4	Zrn	31.24																				68.76									100	123	
S9	27	5	Grt	39.69		20.91	28.46	4.27	4.58	2.09																							100	116	
S9	27	6	Cpx	53.97	0.29	3.41	1.85		16.66	22.72								1.11																100	119
S9	27	7	Mnz	0.97						1.04			36.32		0.08										4.21		16.13	29.92	11.34					100	104
S9	27	8	Grt	40.35		21.01	26.74	0.35	2.19	9.36																								100	114
S9	27	9	OI	41.85			8.49		49.27											0.39														100	119
S9	27	10	Chl	28.27		18.26	1.28		1.60	33.39					2.21																			85	88
S9	27	11	Cpx	55.21	0.31	3.47	7.50		17.92	13.86	1.72																							100	113
S9	27	12	"Mag" +	5.04		1.46	92.24			0.47			0.79																					100	87
S9	27	13	OI	41.59			8.11		49.94											0.36														100	117
S9	27	14	Chl	33.86		17.76	28.63		3.91	0.84																								85	113
S9	27	15	Chr			13.45	24.97		9.77									51.81																100	106
S9	27	16	Chl	29.04		14.82	31.99	0.31	8.55	0.31																								85	95
S9	27	17	Py	0.52			28.85		0.27					70.36																				100	215
S9	27	18	Fl +	21.33		6.30	2.94		5.59	26.03	2.12	0.44			35.25																			100	131
S9	27	19	Chl + Plag	40.30	0.87	14.12	23.75	0.49	13.90	5.97	0.60																							100	102
S9	27	20	Ab	66.64		20.34	0.46			1.71	10.63	0.22																						100	117
S9	27	21	Chr	3.51		15.29	29.64	0.81	5.52									45.23																100	91
S9	27	22	Spl		0.92	26.30	27.19		11.00								0.44	34.15																100	103
S9	27	23	OI	41.94			6.49		51.19											0.37														100	111
S9	27	24	Cpx	53.28	0.75	3.93	6.49		16.89	18.09	0.29							0.28																100	111
S9	27	25	OI	41.49			8.82		49.36											0.34														100	122
S9	27	26	Chr		0.41	24.28	21.58		12.58									41.15																100	115
S9	27	27	Ti-Mag +	1.89	16.19	3.64	73.99	0.89	2.25								1.14																	100	103
S9	28	1	Spl			32.09	14.88		15.64								0.37	37.02																100	107
S9	28	2	Chr			28.52	20.38		13.05									38.05																100	103
S9	28	3	Cpx	51.01	2.17	3.83	8.10		13.96	20.45	0.48																							100	110
S9	28	4	OI	41.91			8.78		48.96											0.35														100	109
S9	28	5	Ti-Mag	0.99	17.57	3.76	72.79	1.63	1.75								1.15	0.37																100	95
S9	28	6	Spl		0.35	21.37	33.49		7.39								0.46	36.95																100	105
S9	28	7	Chr			8.62	22.38		9.39									59.61																100	104
S9	28	8	Cpx	51.11	0.92	3.77	14.80	0.37	13.13	14.49	1.42																							100	109
S9	28	9	OI	42.11			7.62		49.92											0.36														100	114
S9	28	10	Opx	59.00		0.36	5.36	0.23	35.04																									100	124
S9	28	11	Zrn	31.25																					68.75									100	124
S9	28	12	OI	42.40			9.35		47.87											0.38														100	120
S9	28	13	Spl			54.69	11.49		20.06									13.75																100	114
S9	28	14	Bad Analysis	31.44						25.64					0.89																			100	148
S9	28	15	Grt	37.29		0.59	27.21		0.34	34.56																								100	102
S9	28	16	"OI"	49.73		0.88	4.74		42.16																							2.49		100	77
S9	28	17	Chr		0.49	23.56	24.66		11.45									39.83																100	108
S9	28	18	OI	41.70			8.56		49.34											0.40														100	120
S9	28	19	Dol						22.78	31.22																								54	57
S9	28	20	Chr			9.03	27.67		6.66								0.51	55.61			0.52													100	106

Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	28	21	Grt	41.13	1.33	15.40	7.40	0.63	0.52	33.59																						100	108
S9	28	22	Ol	41.81			8.69		49.17											0.33												100	113
S9	28	23	Qz	100.00																												100	116
S9	28	24	Amph	50.79	0.54	1.24	19.92	0.66	13.03	10.82																						97	116
S9	28	25	Qz +	92.91		3.90	0.76				2.43																					100	118
S9	29	1	Chr			25.26	15.07		14.89									44.79														100	106
S9	29	2	Chl + Qz	58.71		12.28	23.78	0.68	4.56																							100	96
S9	29	3	Cpx	51.59	2.21	4.16	6.67		14.40	20.42	0.56																					100	113
S9	29	4	Fl						0.77	53.89					45.34																	100	102
S9	29	5	Ol	43.25			8.63		47.78											0.34												100	115
S9	29	6	"Ilm" +	24.70	44.85	0.97	7.89	1.42	0.37	18.88							0.91															100	110
S9	29	7	Grt	39.80		20.75	29.92	1.24	2.92	5.37																						100	116
S9	29	8	Chr			12.15	18.53		11.14									58.18														100	107
S9	29	9	Brt											25.71					-0.02							46.49						100	160
S9	29	10	Brt											25.69					-0.14							46.73						100	160
S9	29	11	Ti-Mag		14.84	2.74	77.87	0.44	2.97	0.27							0.87															100	99
S9	29	12	Cpx	54.49	0.40	1.33	9.25	0.36	14.86	19.32																						100	114
S9	29	13	Chr			16.20	18.46		11.93								0.46	52.95														100	108
S9	29	14	Dol						22.97	31.03																						54	56
S9	29	15	Chr			22.01	21.79		13.57								0.35	42.28														100	106
S9	29	16	Spl			44.37	15.41		17.14									23.08														100	109
S9	29	17	Ab	66.68		20.15	0.82			0.91	10.65	0.79																				100	116
S9	29	18	Cpx	49.65	1.09	5.58	13.09	0.30	14.86	14.38	0.69							0.36														100	106
S9	29	19	Po +	2.20			54.09		0.44	0.36				42.91																		100	127
S9	29	20	Opx	58.79			4.85	0.22	35.45	0.44								0.25														100	118
S9	29	21	Ol	41.73			8.56		49.37											0.33												100	110
S9	29	22	Ol	42.31			5.98		51.30											0.42												100	121
S9	29	23	Cpx	52.52	1.32	3.98	4.89		16.35	19.63	0.52							0.79														100	128
S9	29	24	Mag				97.22		1.53									0.42		0.83												100	100
S9	29	25	Chr			15.25	17.30	1.25	11.99								0.38	53.84														100	113
S9	29	26	"Cpx" or Mix	58.55		3.84	1.99		22.93	12.23								0.46														100	115



Table B4.2: EDS analyses of sample S9.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	As2O3	SrO	ZrO2	Ag2O	BaO	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S9	29	27	Spl			43.76	14.58		17.43									24.23														100	109
S9	29	28	Srp	43.31		0.70	3.94		37.85	0.26								0.94														87	92
S9	29	29	Ep	39.72		0.93	18.26		12.02	24.23								1.84														97	98
S9	29	30	Chr			12.51	25.06		8.16									54.27														100	103
S9	29	31	Grt	40.20		20.96	24.75	4.81	1.54	7.74																						100	106
S9	29	32	Opx	57.47		2.10	5.08		34.74	0.32								0.28														100	111
S9	29	33	Ttn	32.84	36.41	1.61	0.67			27.16					1.31																	100	115
S9	29	34	Qz +	88.23	1.43	5.74				1.14	3.46																					100	117
			Notes																														
			" " = indicates that mineral is altered																														
			+ = indicates other minerals present																														

**B5: SEM-BSE images and EDS  
mineral analyses for sample S10**

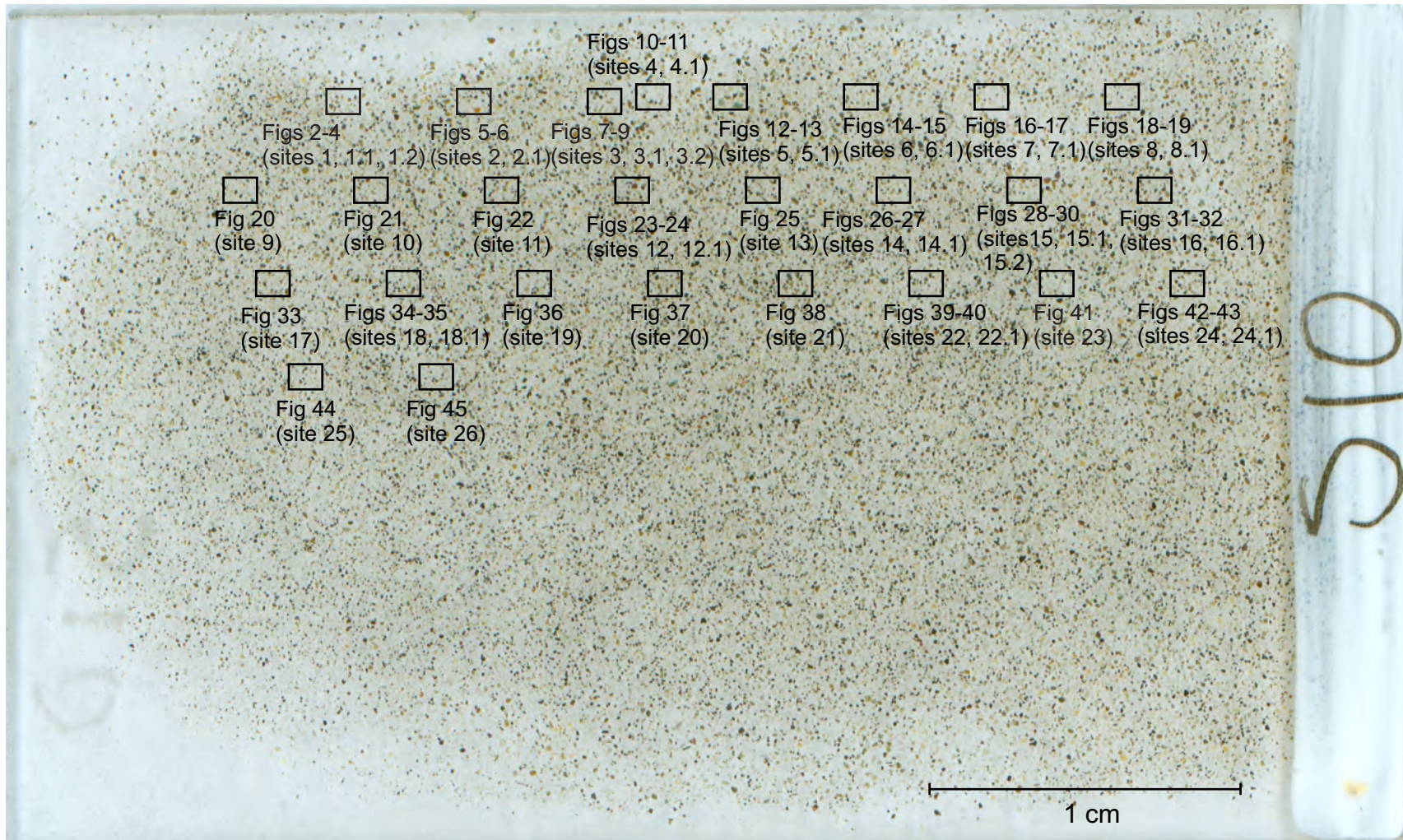


Figure B5.1: Scanned thin section of sample S10 showing the location of analysed sites. This sample comes from the Upper Arachthos River which is very bouldery and erosive. In lee of boulders there are some sand patches. It consists of muddy fine sand with some granules.

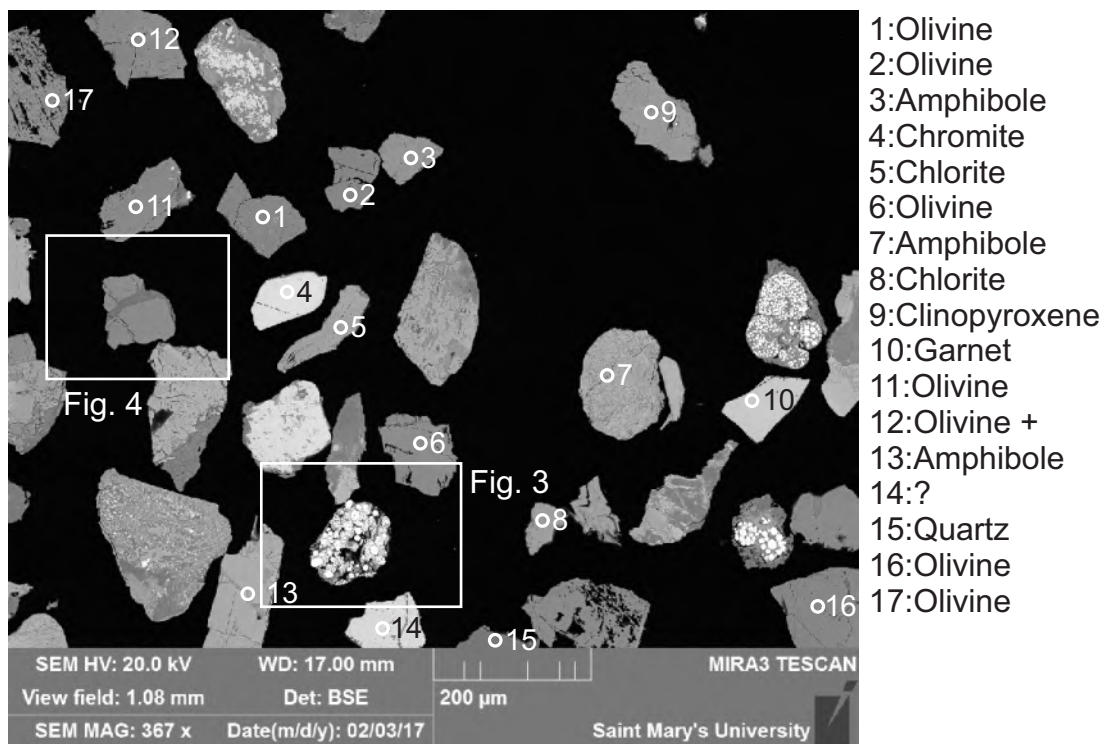


Figure B5.2: Sample 10 site 1 (SEM).

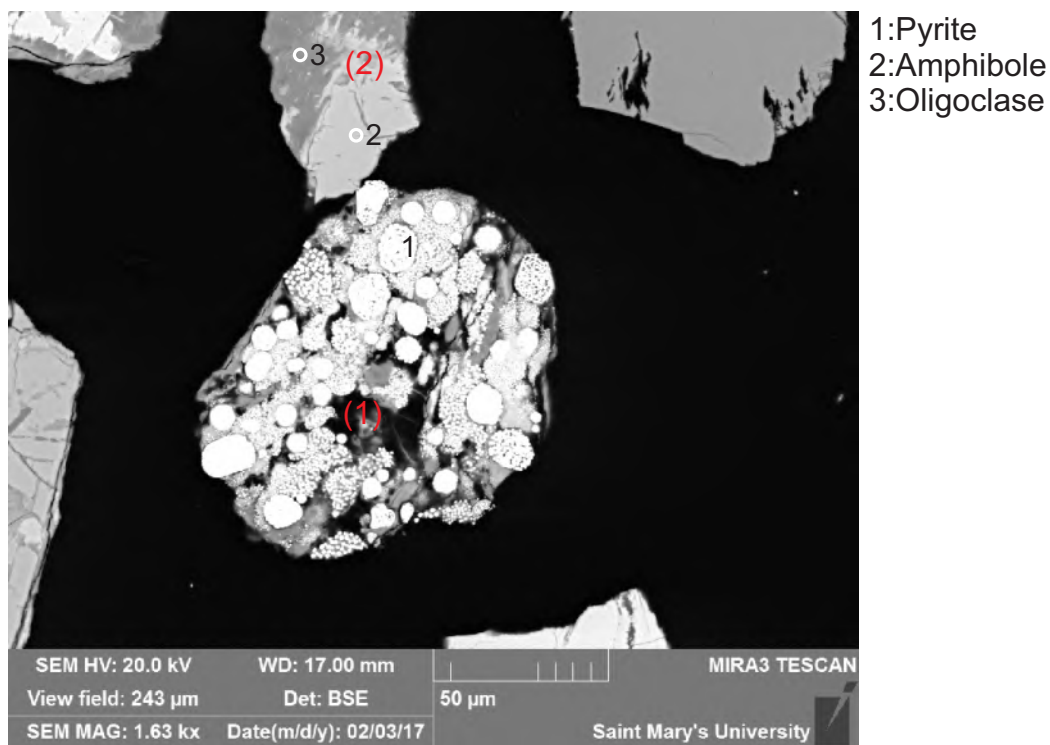
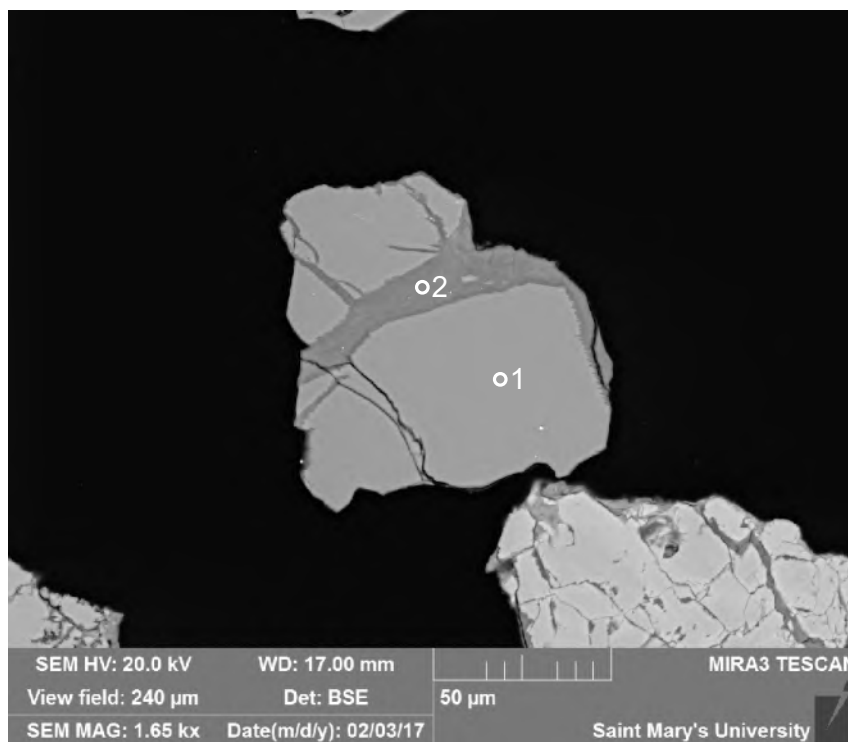


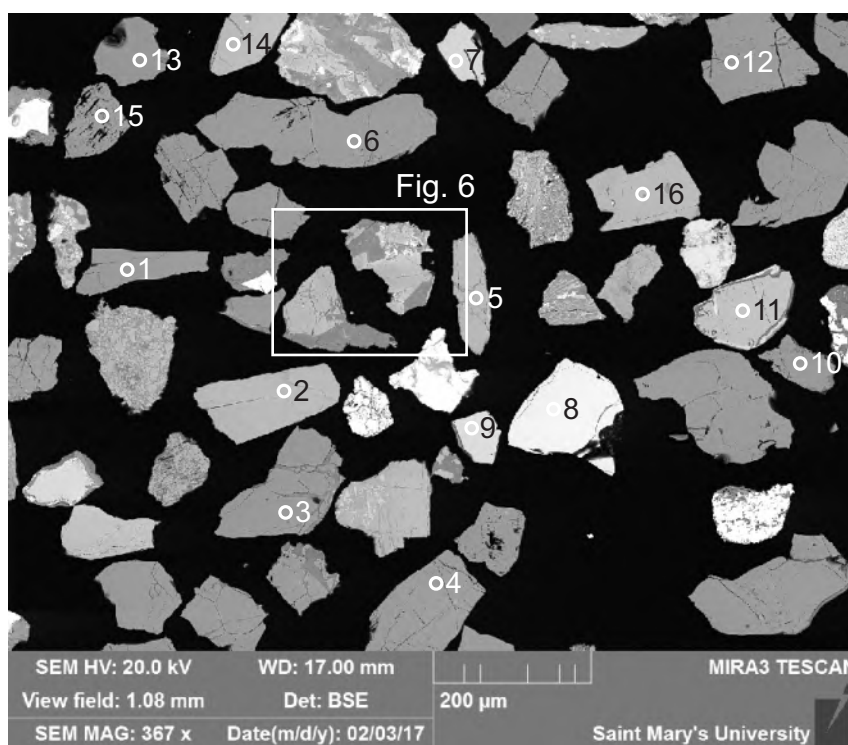
Figure B5.3: Sample 10 site 1.1 (SEM). 1: Lithic clast (pyrite cemented sandstone) 2: Lithic clast composed of amphibole + oligoclase, metamorphic.





- 1:Olivine
- 2:Olivine

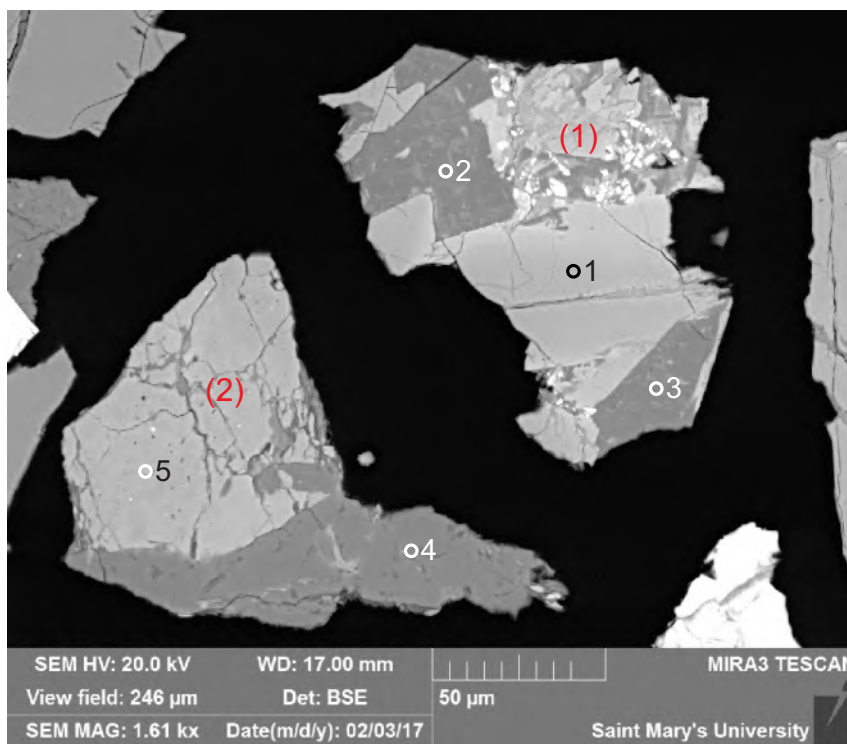
Figure B5.4: Sample 10 site 1.2 (SEM). Grain of altered olivine.



- 1:Actinolite
- 2:Amphibole
- 3:Olivine
- 4:Actinolite
- 5:Amphibole
- 6:Olivine
- 7:Garnet
- 8:Spinel
- 9:Garnet
- 10:Orthopyroxene
- 11:Spinel
- 12:Olivine
- 13:Olivine
- 14:Clinopyroxene
- 15:Olivine
- 16:Orthopyroxene

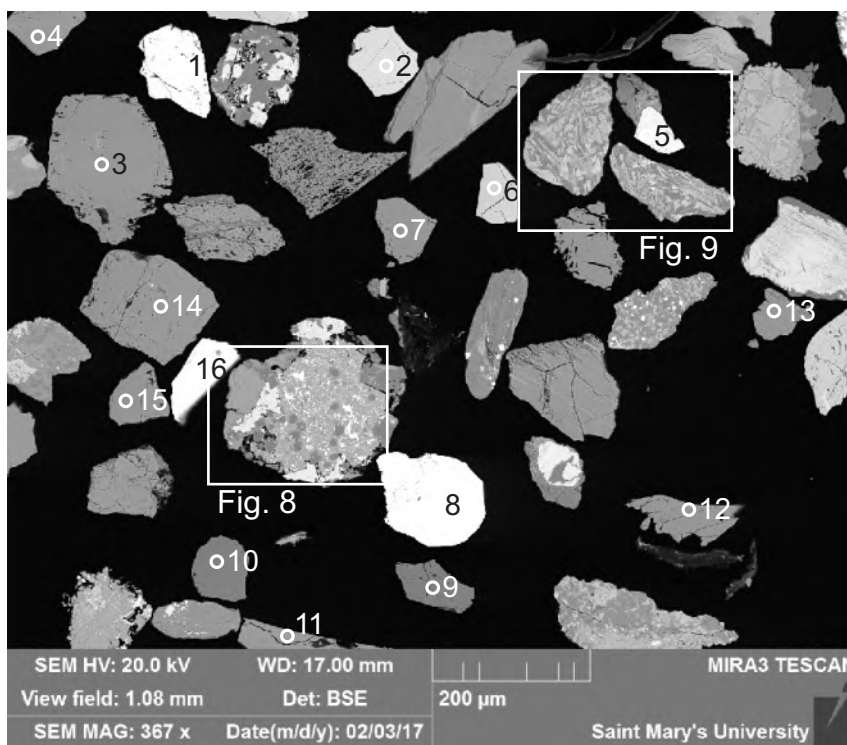
Figure B5.5: Sample 10 site 2 (SEM).





- 1: Clinopyroxene
- 2: Albite
- 3: Albite
- 4: Albite
- 5: Amphibole

Figure B5.6: Sample 10 site 2.1 (SEM). 1: Lithic clast (clinopyroxene + albite, ophiolite or metaophiolite). 2: Lithic clast (albite + amphibole, metaophiolite).



- 1: Chromite
- 2: Garnet
- 3: Olivine
- 4: Olivine
- 5: Chromite
- 6: Apatite
- 7: Olivine
- 8: Ti-Magnetite
- 9: Dolomite
- 10: Dolomite
- 11: Olivine
- 12: Orthopyroxene
- 13: Olivine
- 14: Olivine
- 15: Olivine
- 16: Chromite

Figure B5.7: Sample 10 site 3 (SEM).

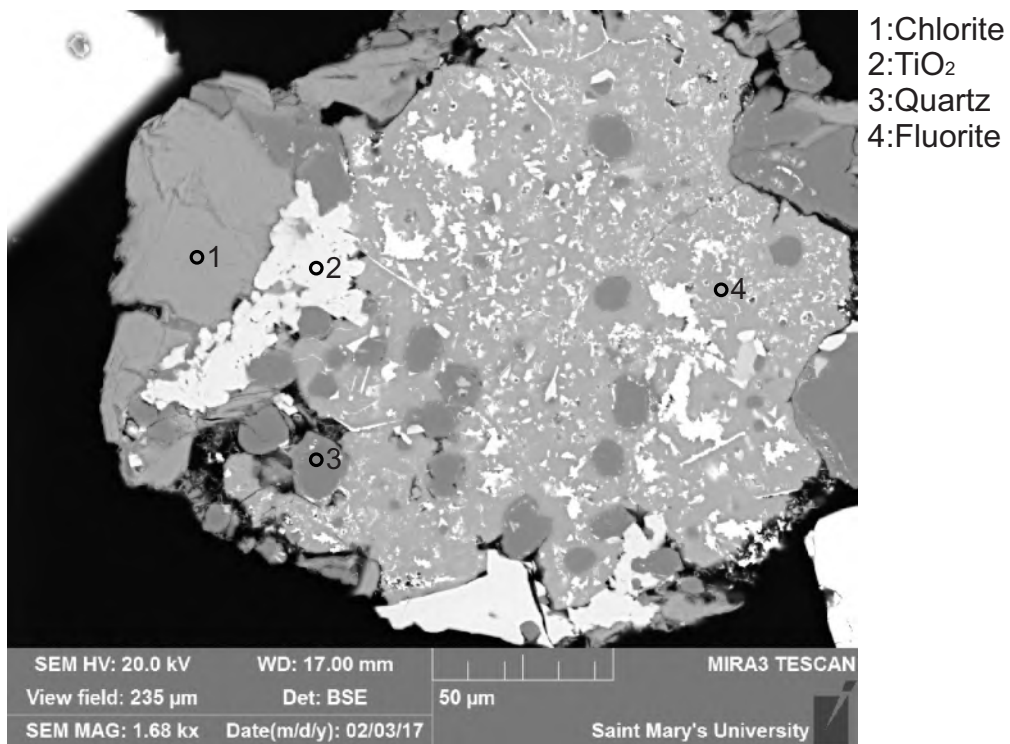


Figure B5.8: Sample 10 site 3.1 (SEM). Lithic clast composed of chlorite, fluorite, quartz, and titania, appears hydrothermal.

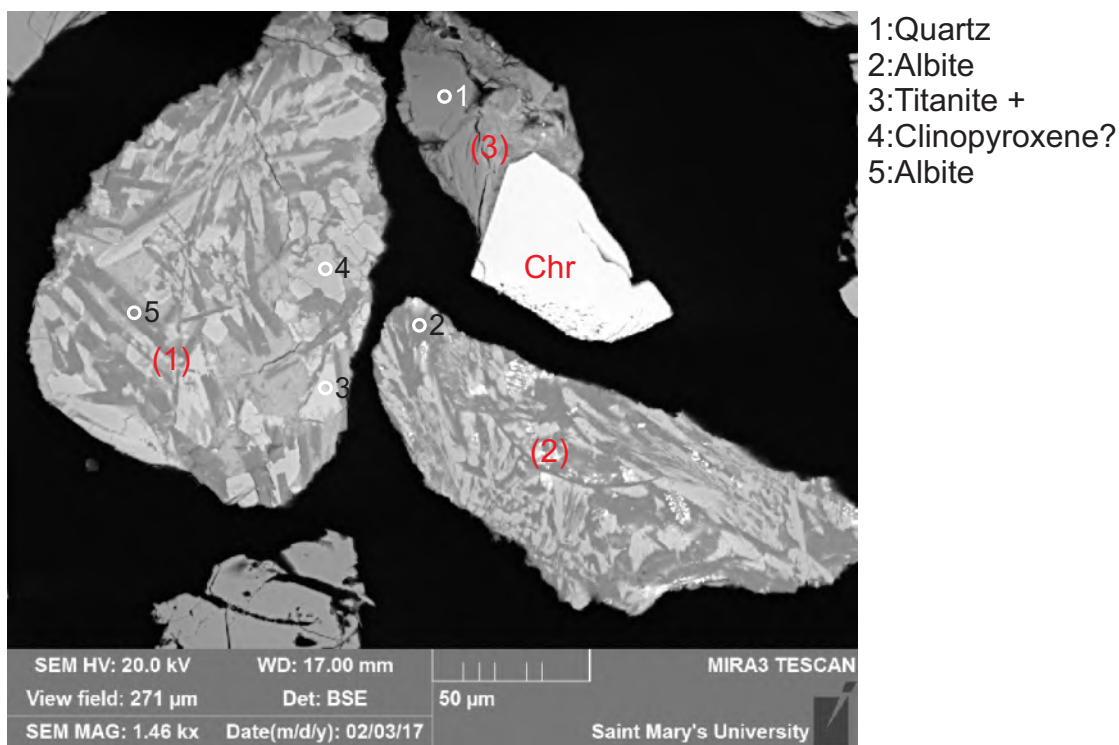


Figure B5.9: Sample 10 site 3.2 (SEM). 1,2: Lithic clast composed of titanite, clinopyroxene, and albite (metaophiolite). 3: Lithic clast (sandstone)

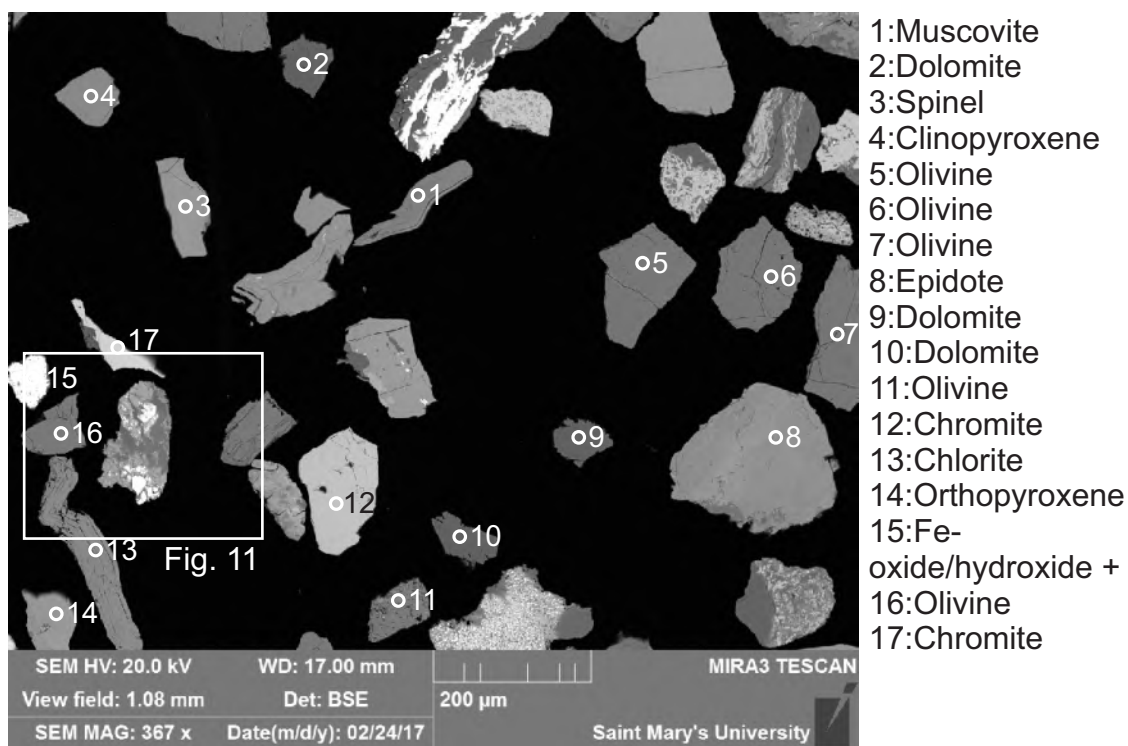


Figure B5.10: Sample 10 site 4 (SEM).

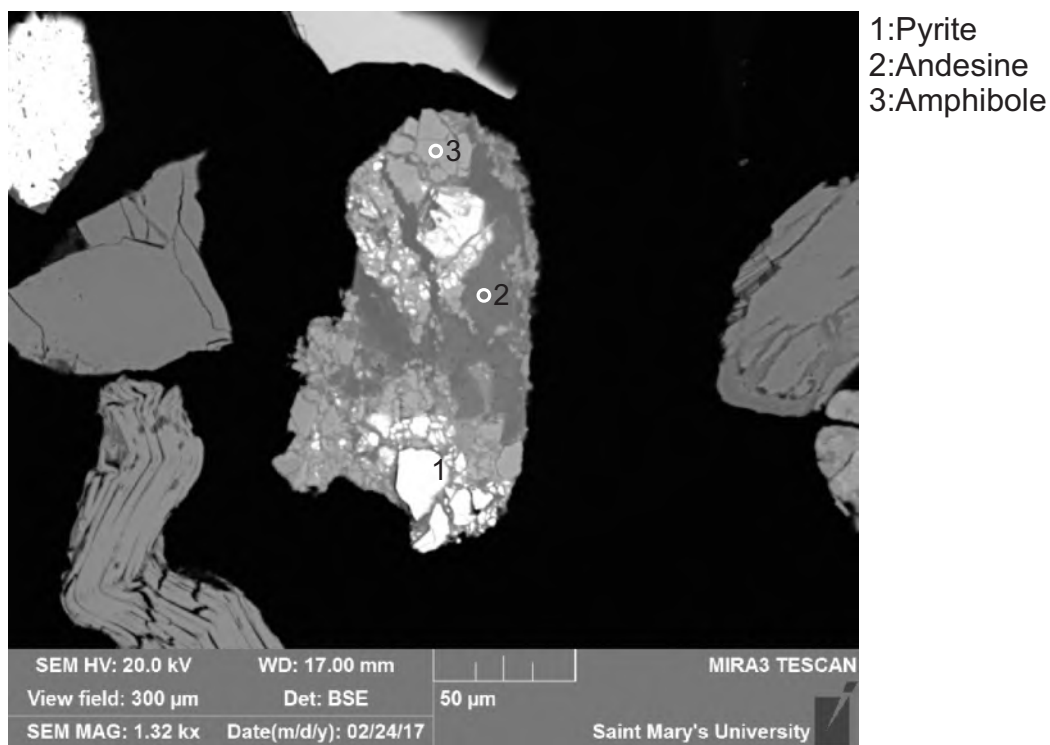


Figure B5.11: Sample 10 site 4.1 (SEM). Lithic clast composed of pyrite, andesine, and amphibole (andesine is primary igneous, but overall texture is hydrothermal).

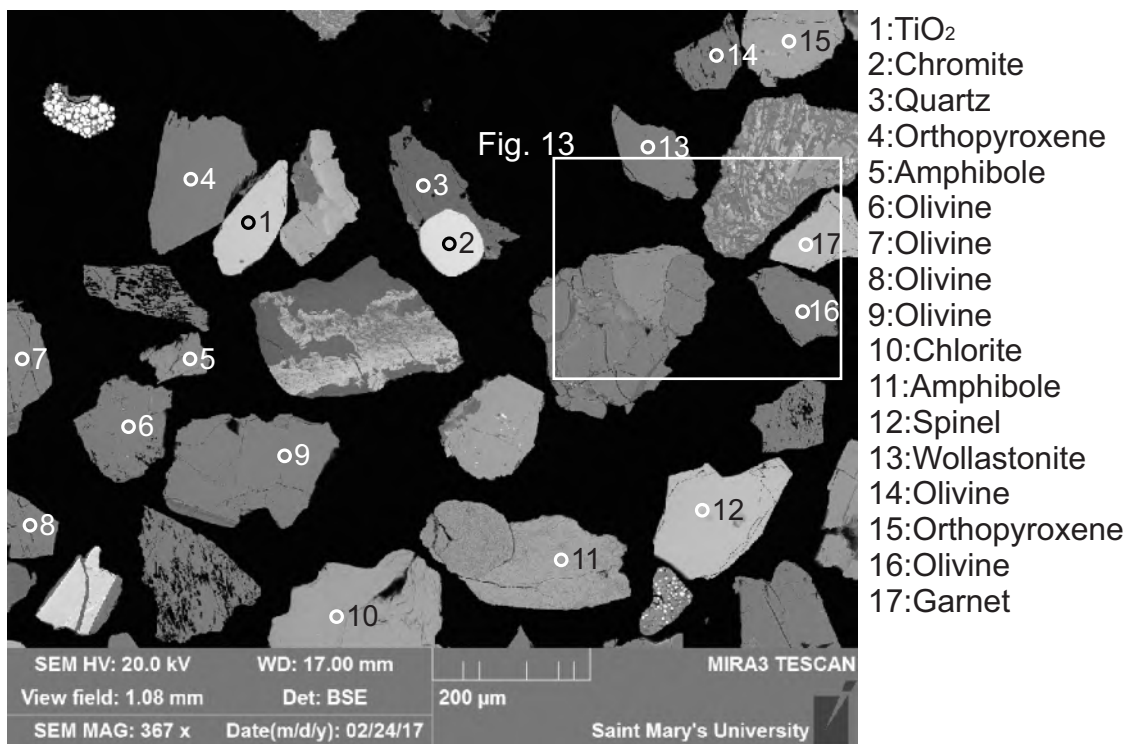


Figure B5.12: Sample 10 site 5 (SEM).

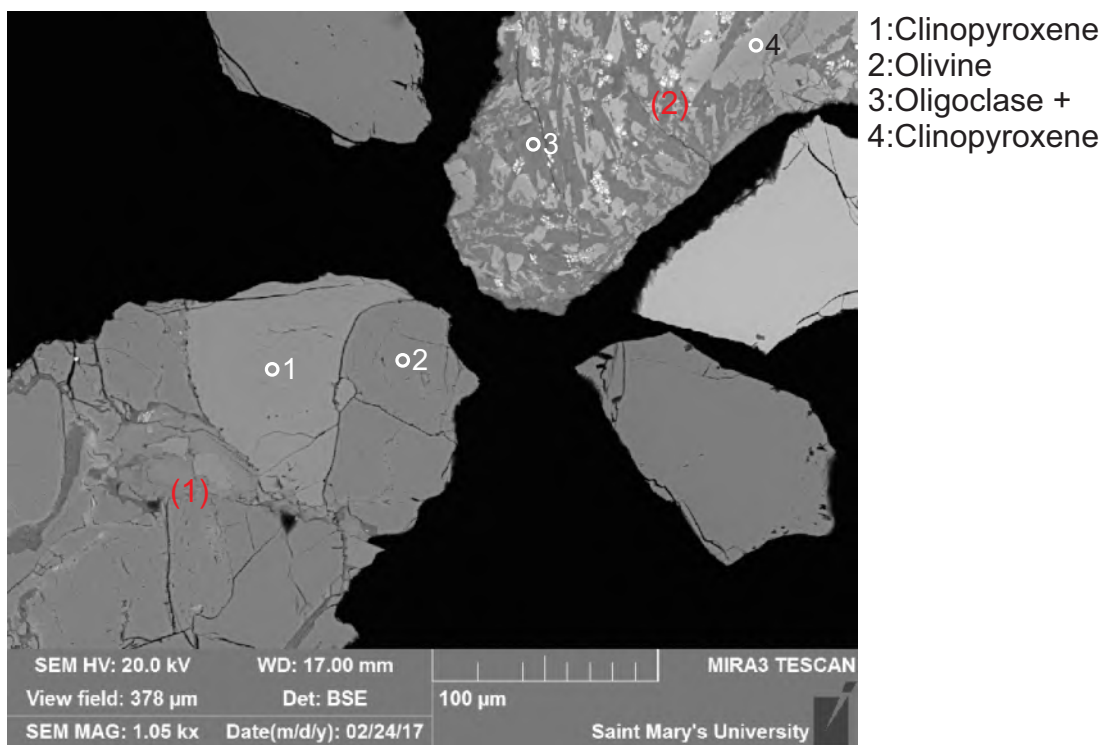


Figure B5.13: Sample 10 site 5.1 (SEM). 1: Lithic clast (clinopyroxene + olivine, ophiolite). 2: Lithic clast (albite + clinopyroxene, metaophiolite). See Fig. B5.9.



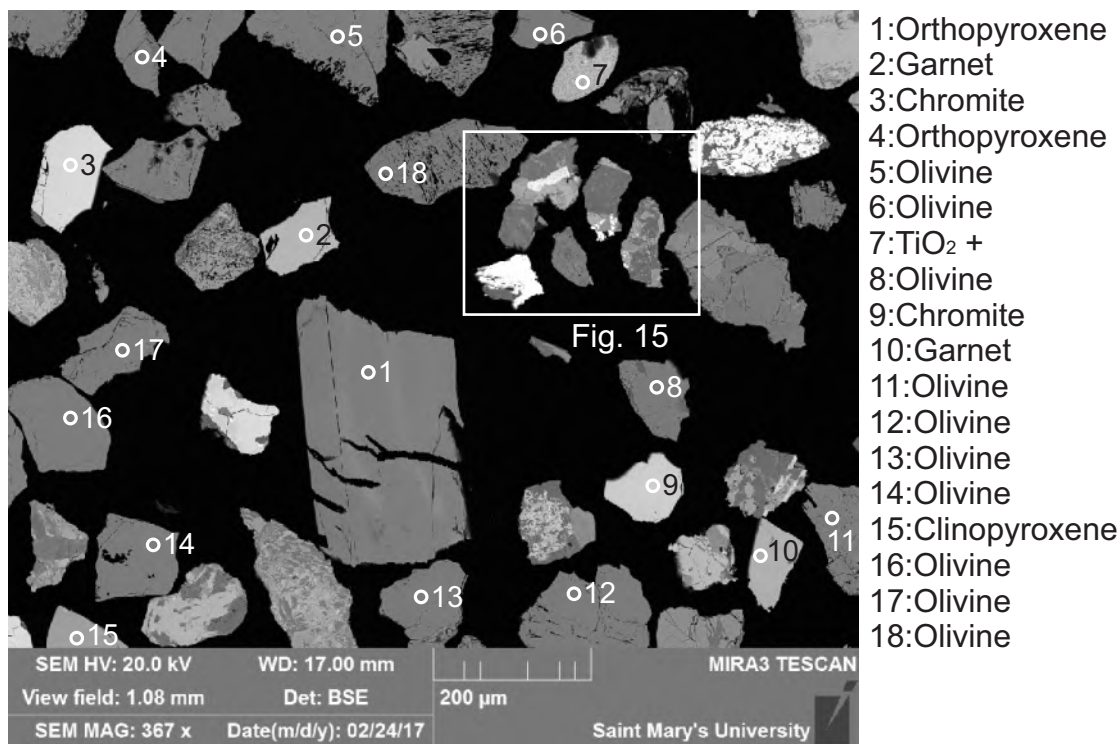


Figure B5.14: Sample 10 site 6 (SEM).

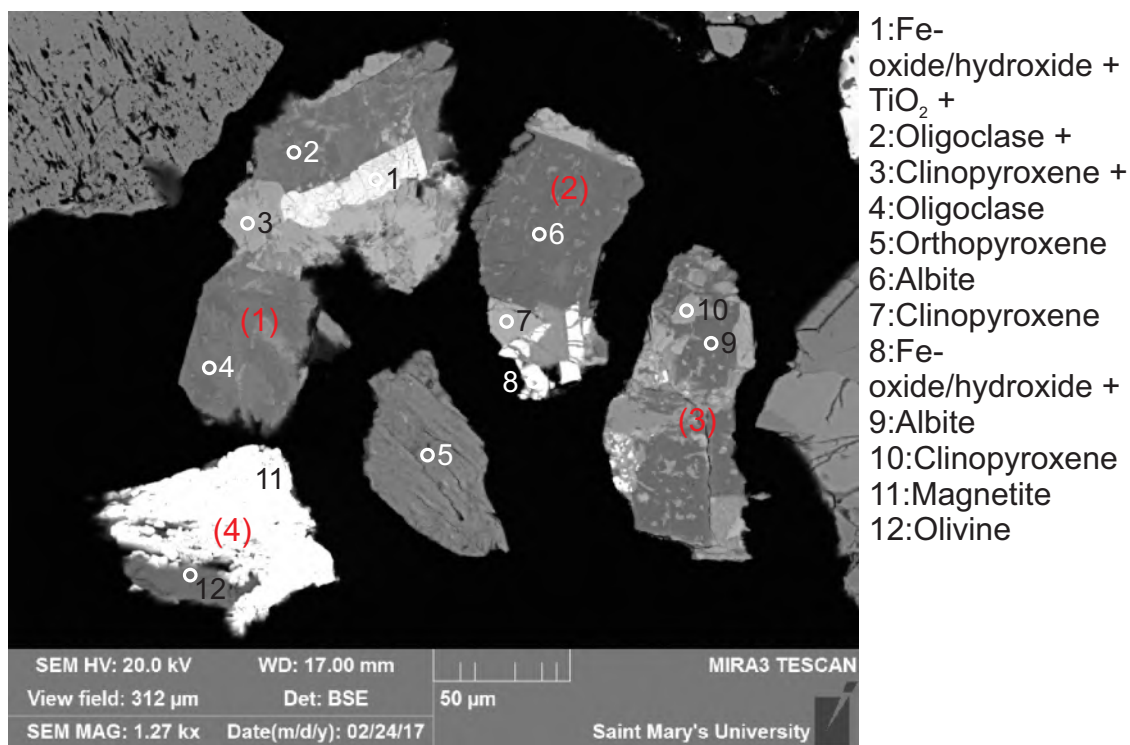


Figure B5.15: Sample 10 site 6.1 (SEM). Lithic clasts in this site consist of albite + clinopyroxene ± Fe-oxide/hydroxide ± oligoclase (metaophiolite). Other lithic clast (4) consists of olivine + magnetite (ophiolite).

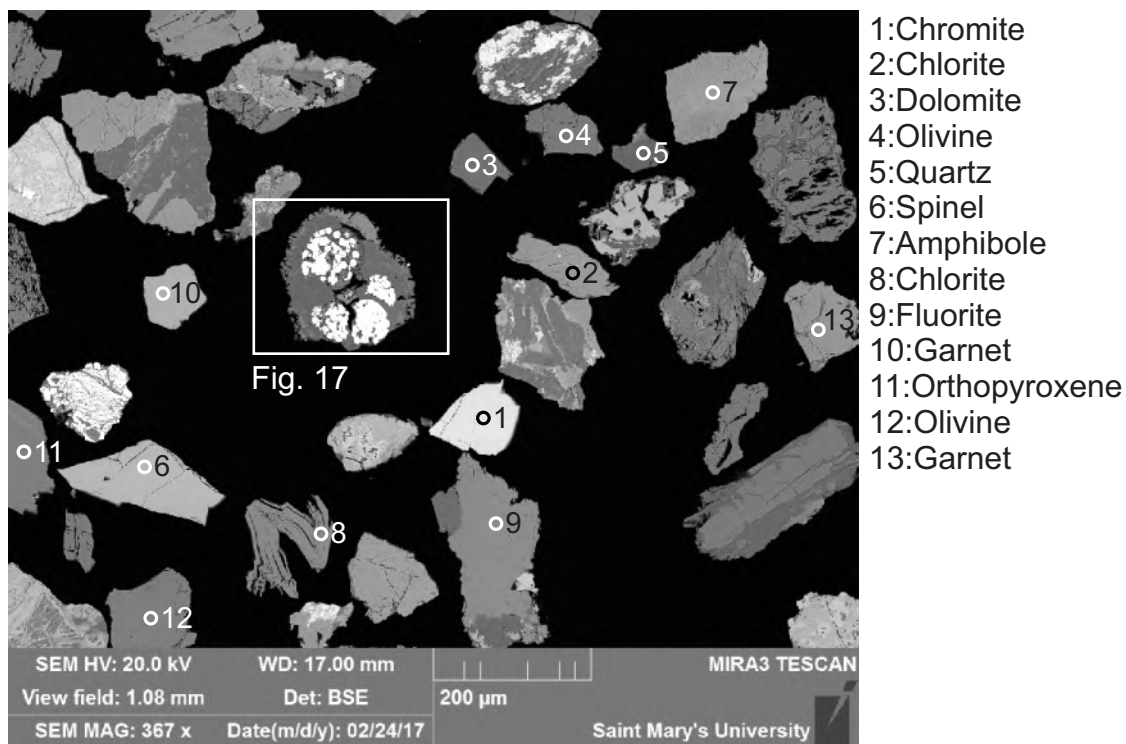


Figure B5.16: Sample 10 site 7 (SEM).

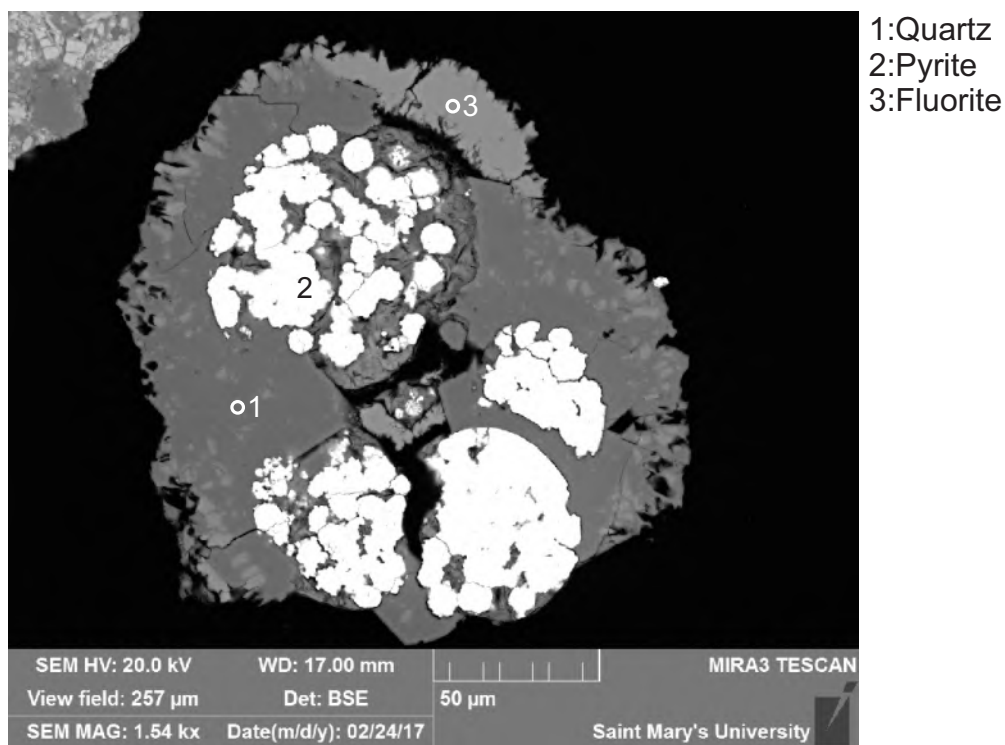


Figure B5.17: Sample 10 site 7.1 (SEM). Lithic clast consisting of quartz + fluorite + pyrite (hydrothermal).

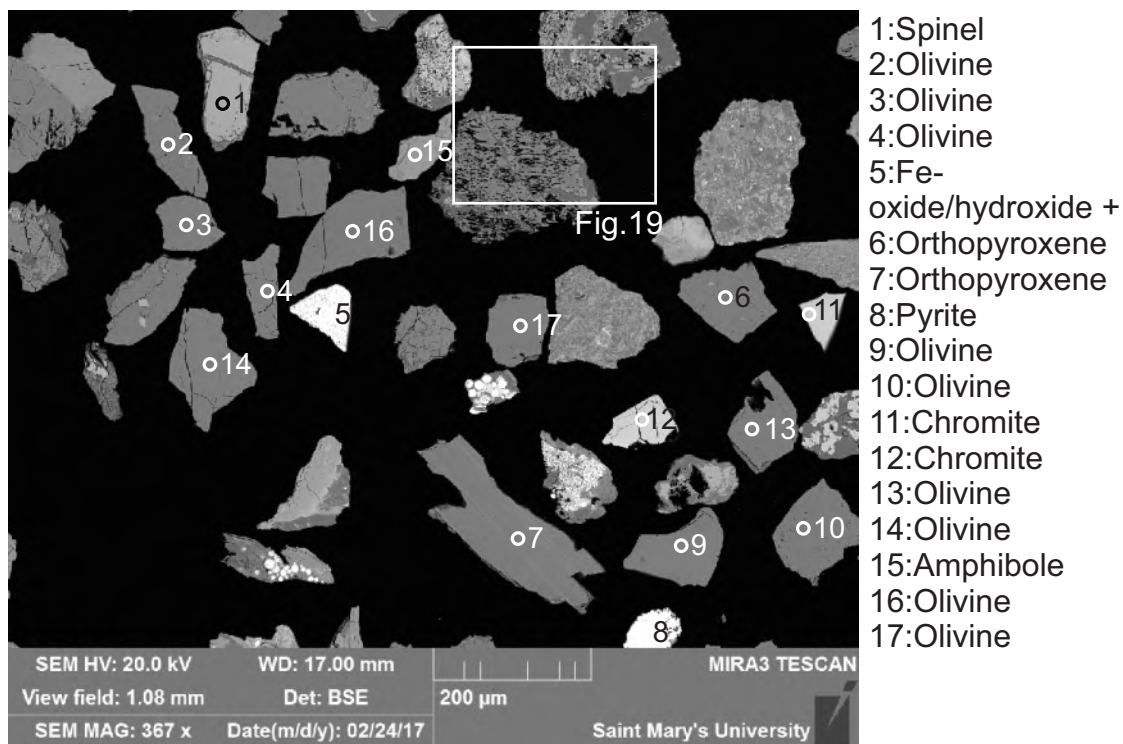


Figure B5.18: Sample 10 site 8 (SEM).

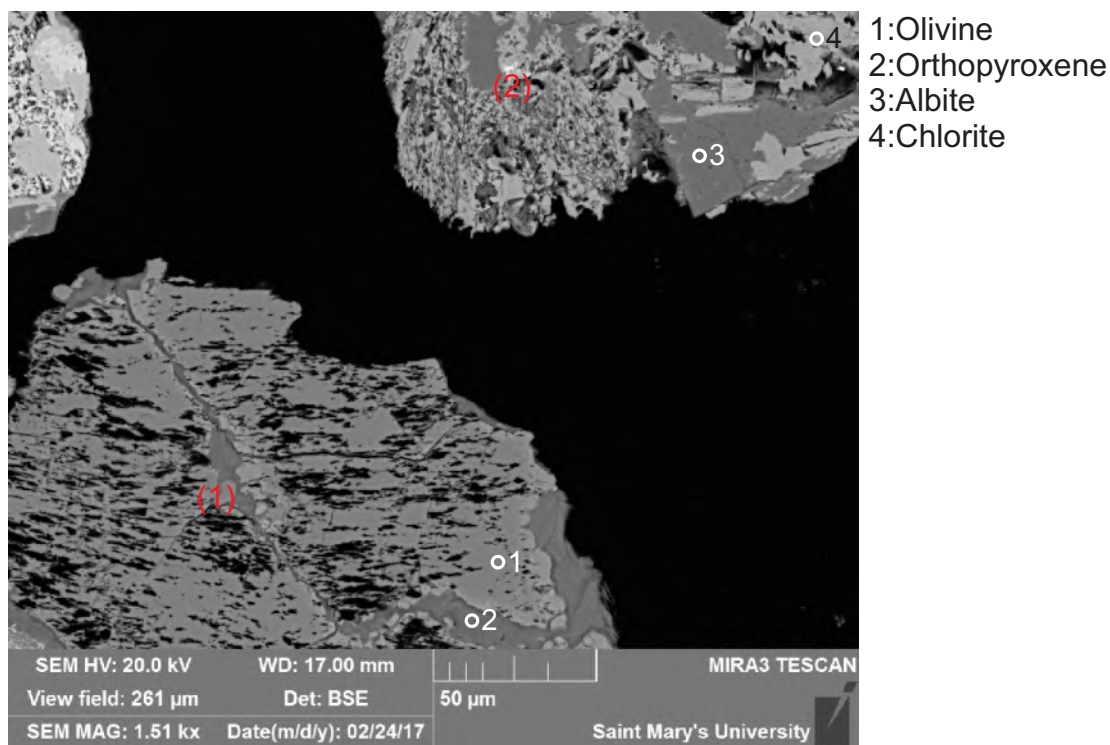


Figure B5.19: Sample 10 site 8.1 (SEM). 1: Lithic clast (olivine + pyroxene, ophiolite or metaophiolite). 2: Lithic clast (albite + chlorite, metaophiolite).



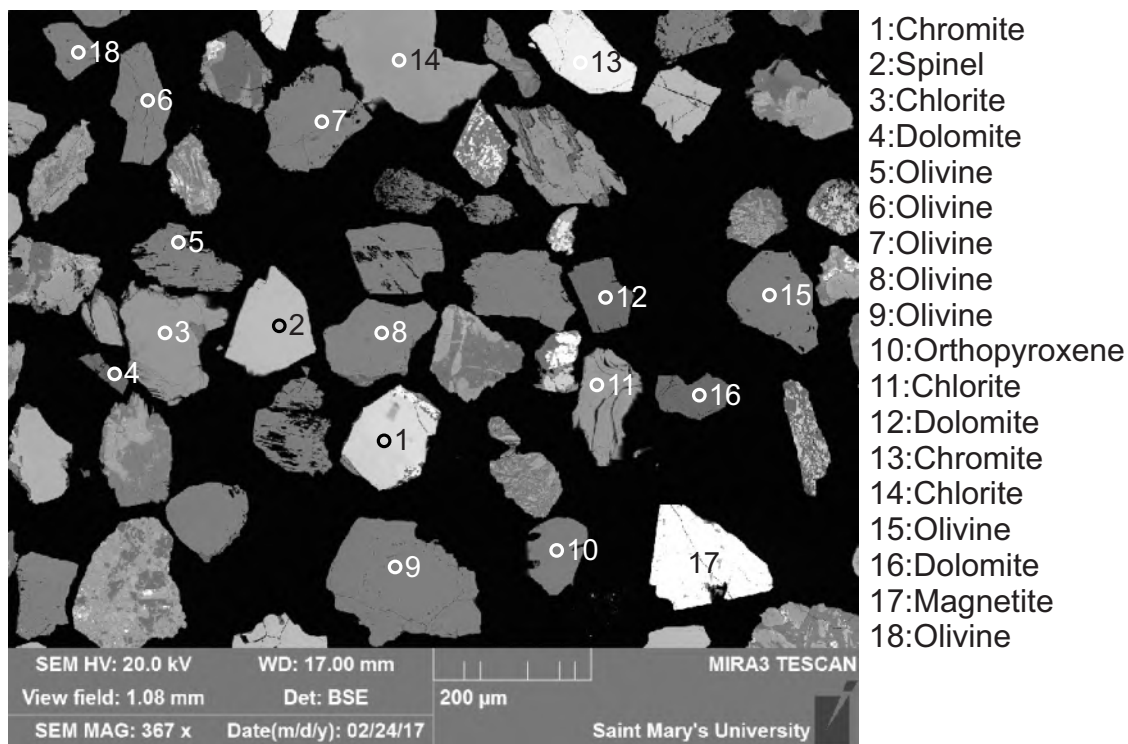


Figure B5.20: Sample 10 site 9 (SEM).

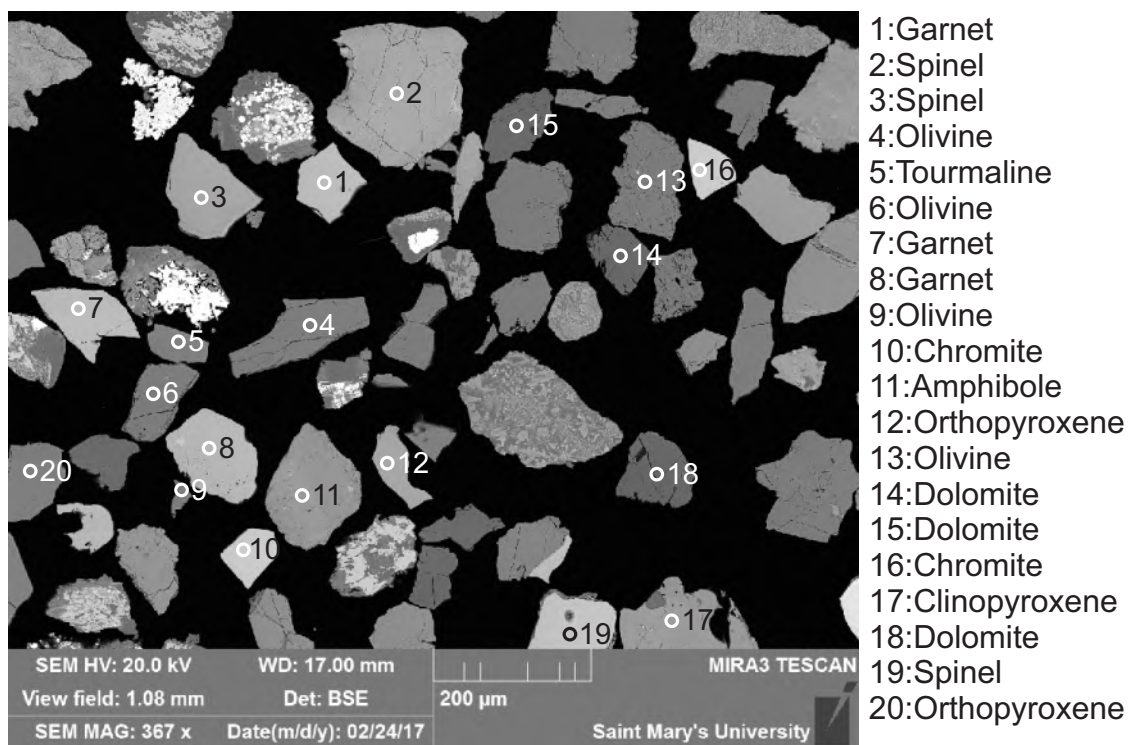


Figure B5.21: Sample 10 site 10 (SEM).



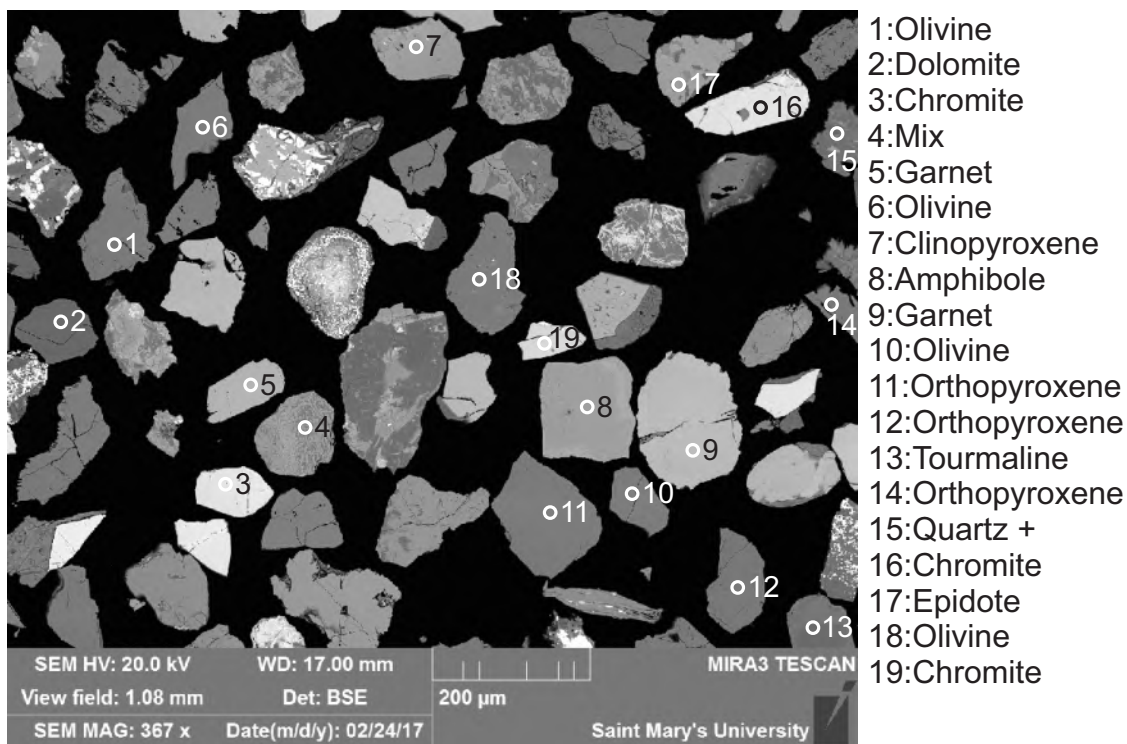


Figure B5.22: Sample 10 site 11 (SEM).

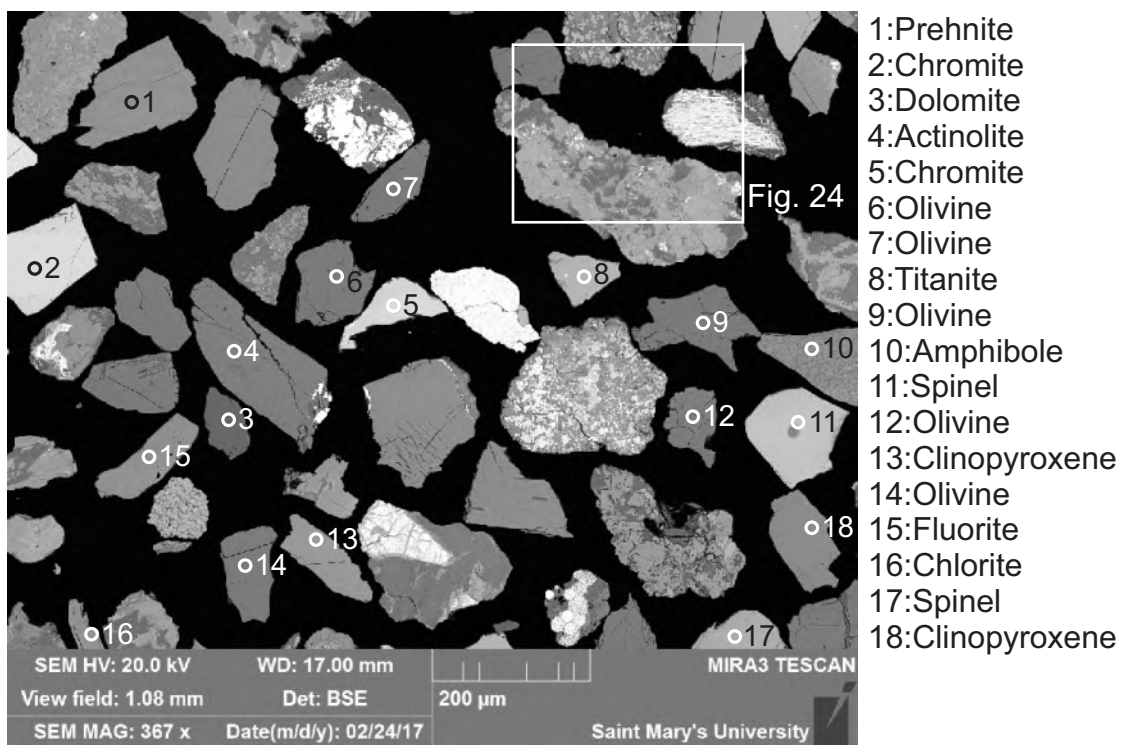
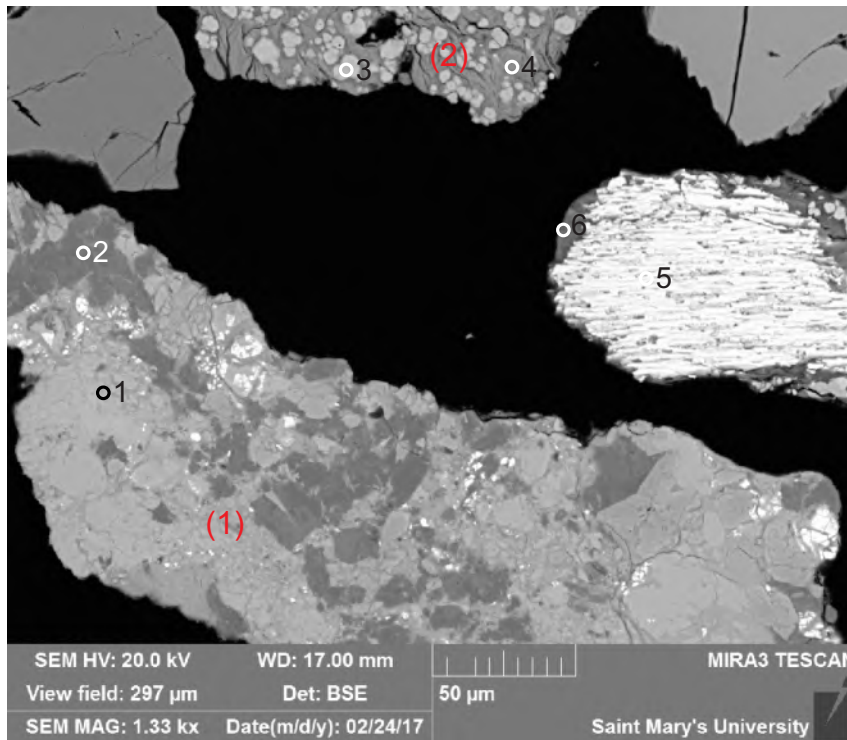
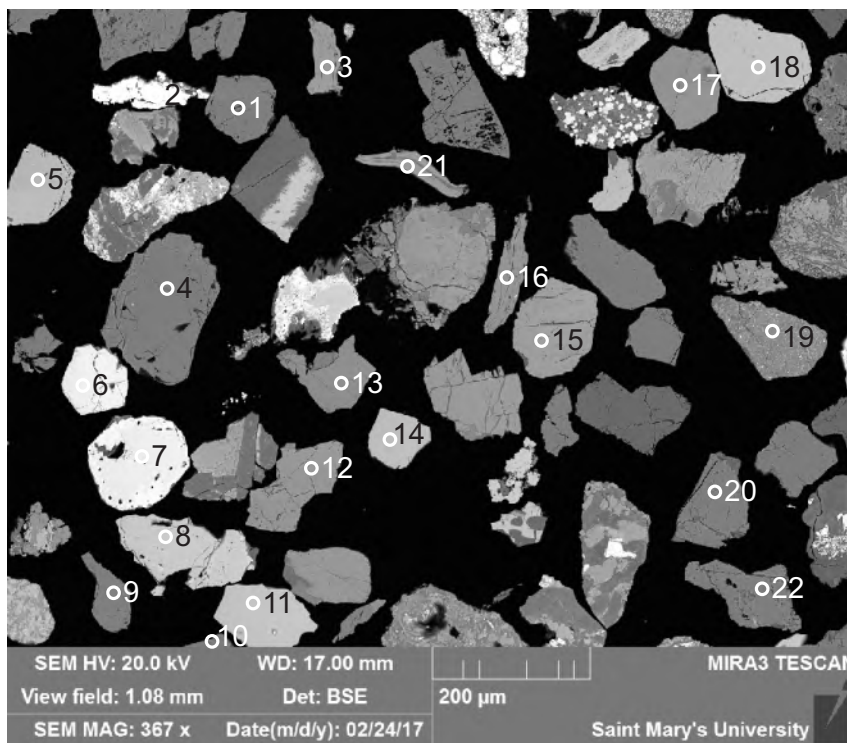


Figure B5.23: Sample 10 site 12 (SEM).



- 1: Titanite +
- 2: Oligoclase
- 3: Garnet
- 4: Chlorite +
- 5: Ilmenite +
- 6: Clay

Figure B5.24: Sample 10 site 12.1 (SEM). 1: Lithic clast (titanite + oligoclase, may be metamorphic, some textural similarity to Fig. B5.11 - hydrothermal). 2: Lithic clast (garnet + ?chlorite, metamorphic).



- 1: Olivine
- 2: Magnetite
- 3: Chlorite
- 4: Olivine
- 5: Garnet
- 6: Chromite
- 7: Chromite
- 8: Spinel
- 9: Olivine
- 10: Olivine
- 11: Spinel
- 12: Clinopyroxene
- 13: Clinopyroxene
- 14: Garnet
- 15: Epidote
- 16: Chlorite
- 17: ?
- 18: Garnet
- 19: Amphibole
- 20: Olivine
- 21: Chlorite
- 22: Olivine

Figure B5.25: Sample 10 site 13 (SEM).

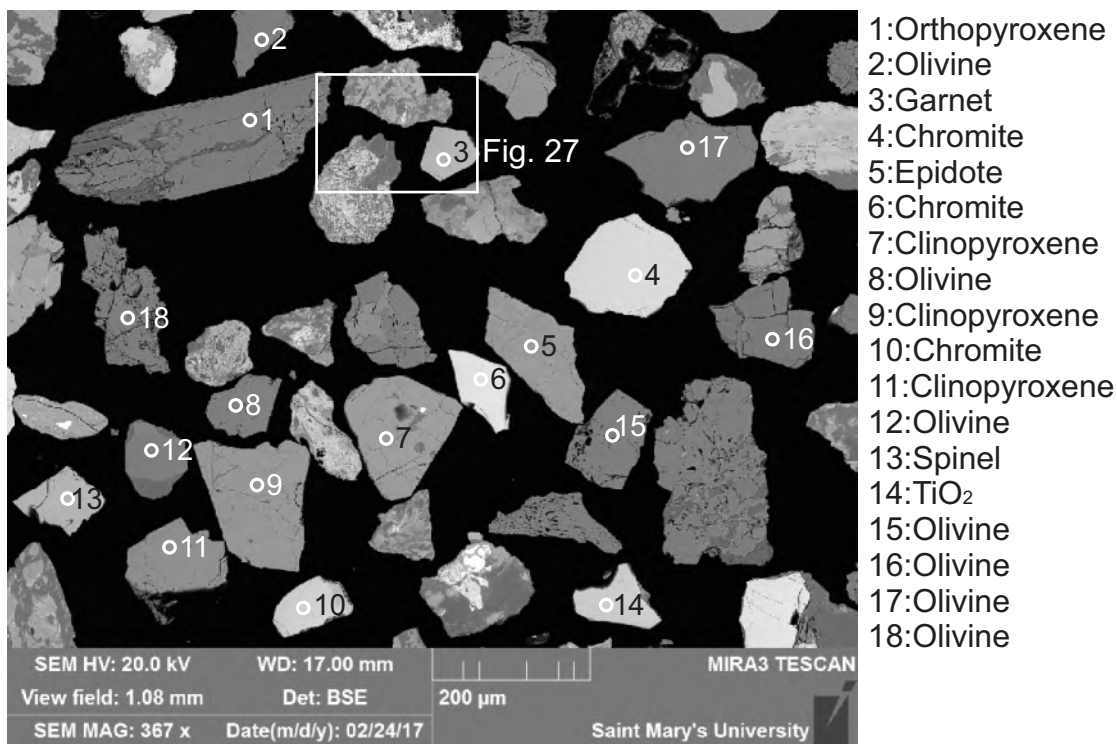


Figure B5.26: Sample 10 site 14 (SEM).

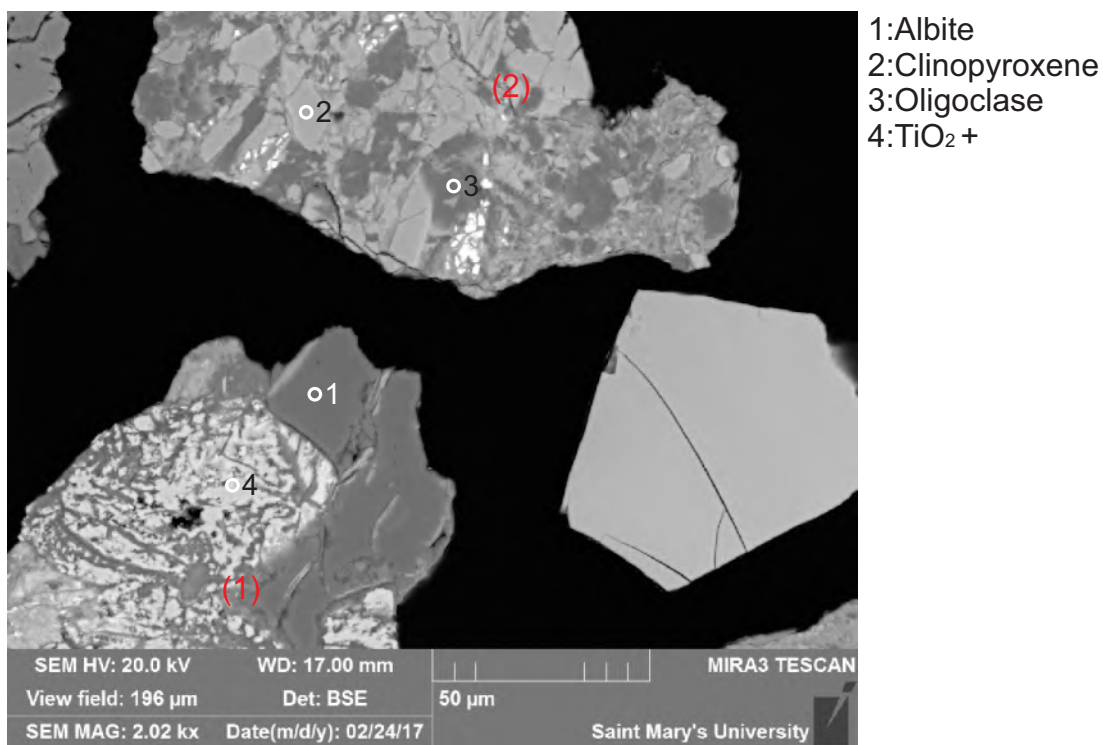


Figure B5.27: Sample 10 site 14.1 (SEM). 1: Lithic clast (albite + titania, metamorphic). 2: Lithic clast (clinopyroxene + oligoclase, similar to Fig. B5.11, hydrothermal altered igneous).



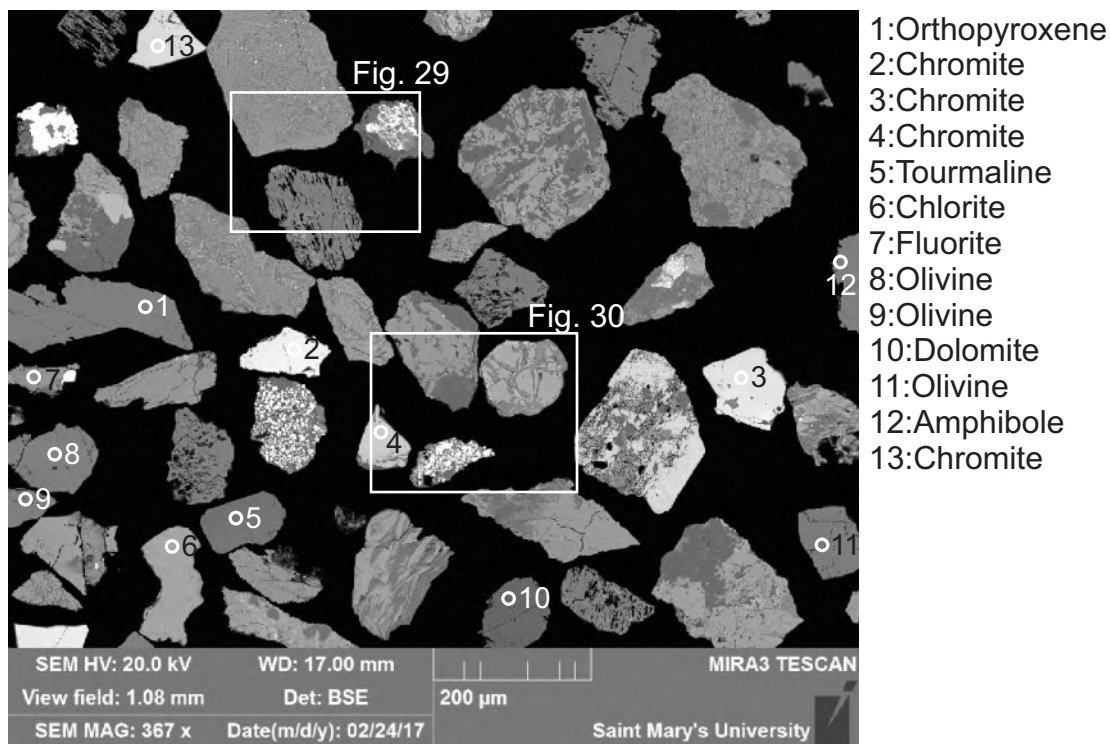


Figure B5.28: Sample 10 site 15 (SEM).

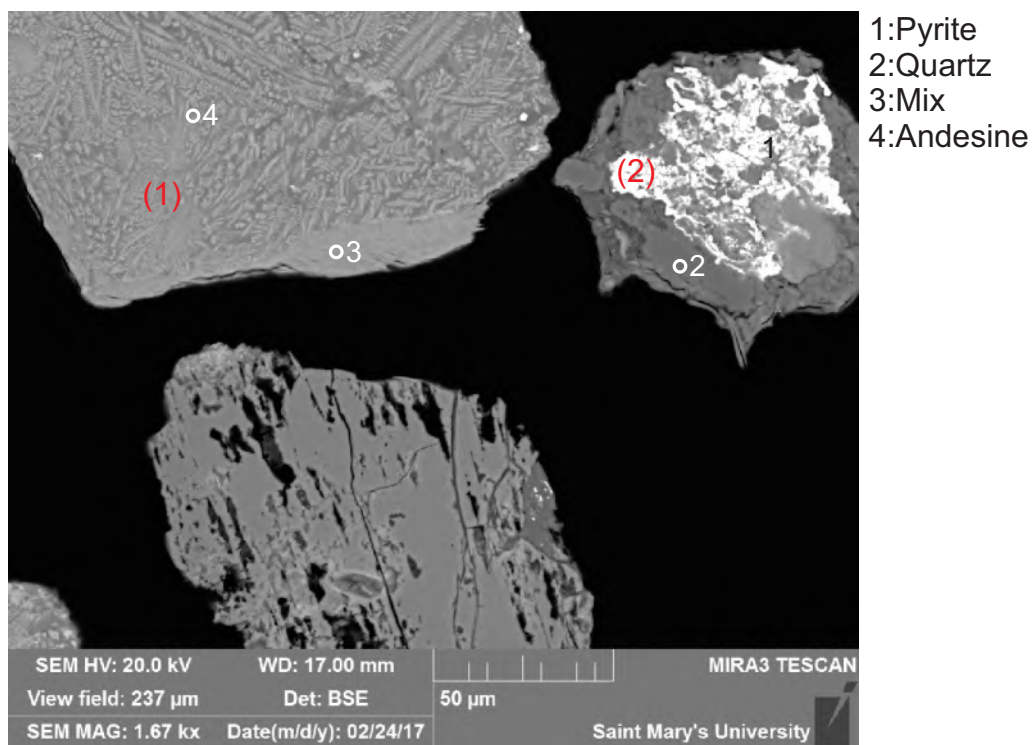
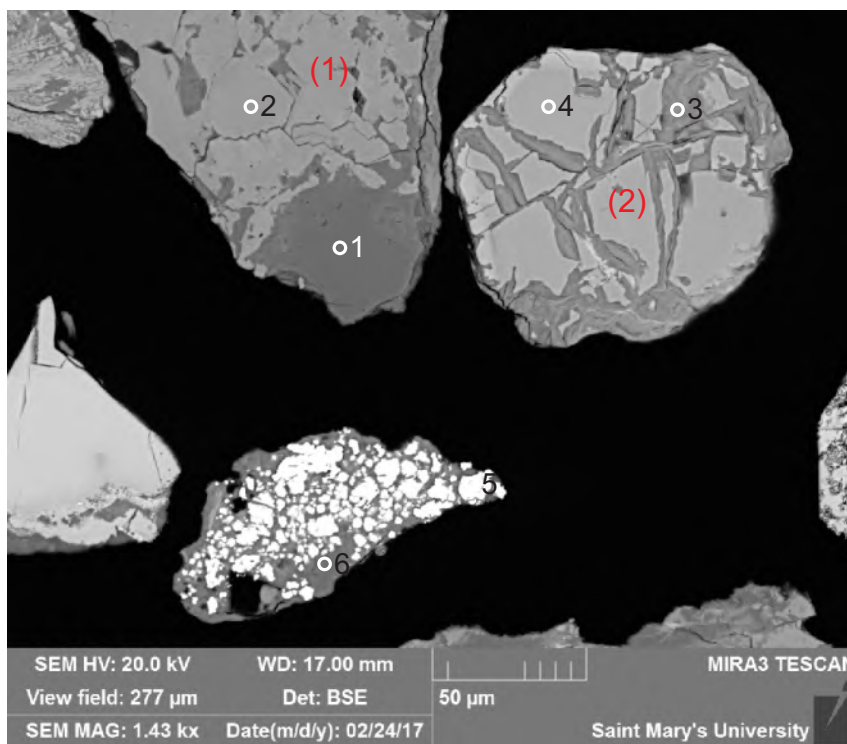


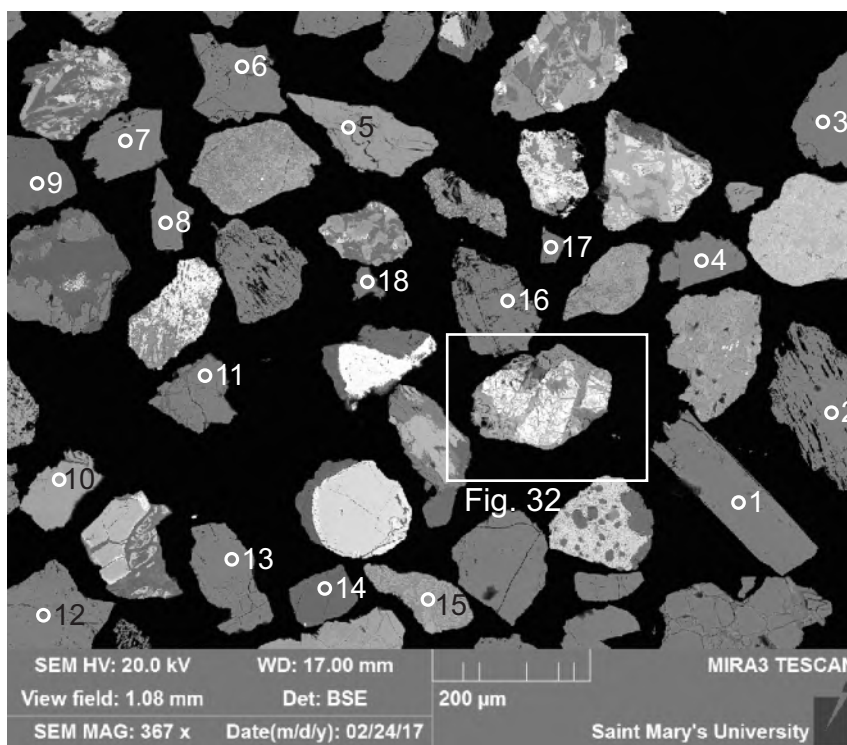
Figure B5.29: Sample 10 site 15.1 (SEM). 1: Lithic clast (chlorite + andesine, altered volcanic). 2: Lithic clast (pyrite + quartz, hydrothermal vein).





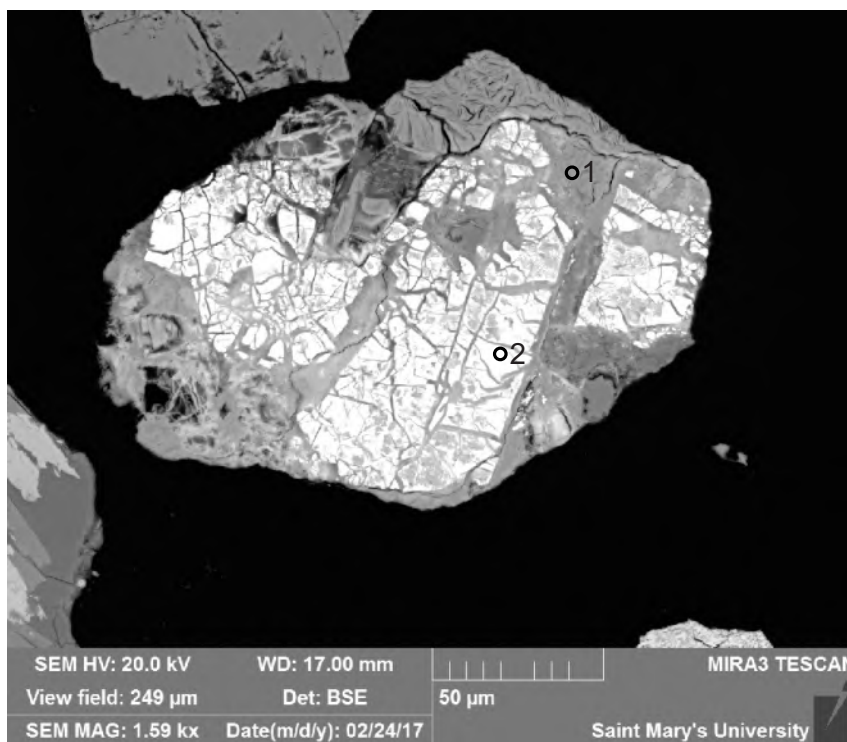
- 1:Quartz
- 2:Epidote
- 3: ?Chlorite +
- 4:Garnet
- 5:Pyrite
- 6:Quartz

Figure B5.30: Sample 10 site 15.2 (SEM). 1: Lithic clast (quartz + epidote, hydrothermal vein). 2: Lithic clast (garnet + chlorite, metamorphic).



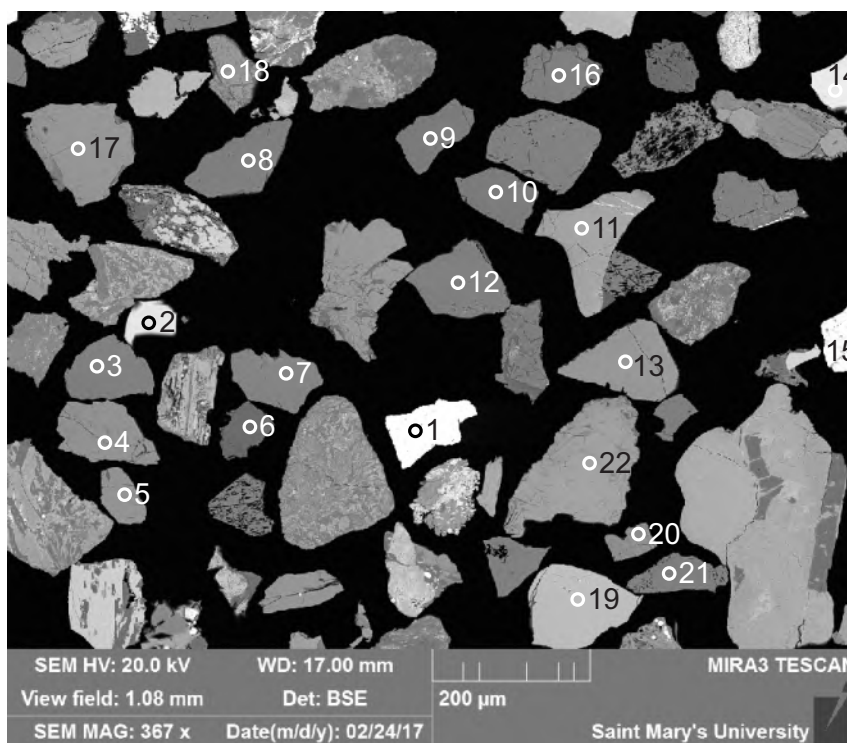
- 1:Orthopyroxene
- 2:Olivine
- 3:Olivine
- 4:Olivine
- 5:Chlorite
- 6:Olivine
- 7:Orthopyroxene
- 8:Orthopyroxene
- 9:Dolomite
- 10:Chlorite
- 11:Olivine
- 12:Olivine
- 13:Olivine
- 14:Quartz
- 15:Amphibole
- 16:Olivine
- 17:Orthopyroxene
- 18:Olivine

Figure B5.31: Sample 10 site 16 (SEM).



- 1:Chlorite +
- 2:Fe-oxide/hydroxide +

Figure B5.32: Sample 10 site 16.1 (SEM). Lithic clast consisting of chlorite + Fe-oxide/hydroxide, originally magnetite in hydrothermal vein, cf. Fig. B3.25.



- 1:Barite
- 2:Chromite
- 3:Olivine
- 4:Clinopyroxene
- 5:Clinopyroxene
- 6:Dolomite
- 7:Olivine
- 8:Olivine
- 9:Olivine
- 10:Olivine
- 11:Spinel
- 12:Olivine
- 13:Fluorite
- 14:Chromite
- 15:"Ilmenite"
- 16:Olivine
- 17:Clinopyroxene
- 18:Epidote
- 19:Spinel
- 20:Clinopyroxene
- 21:Orthopyroxene
- 22:Chlorite

Figure B5.33: Sample 10 site 17 (SEM).

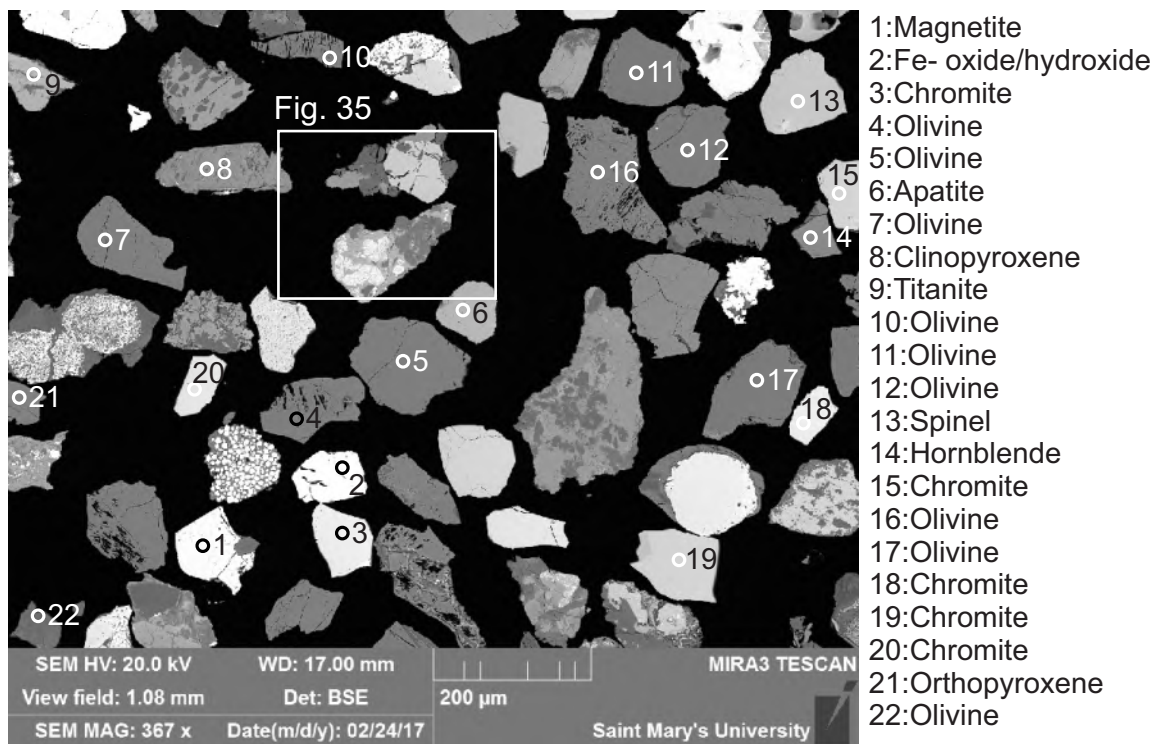


Figure B5.34: Sample 10 site 18 (SEM).

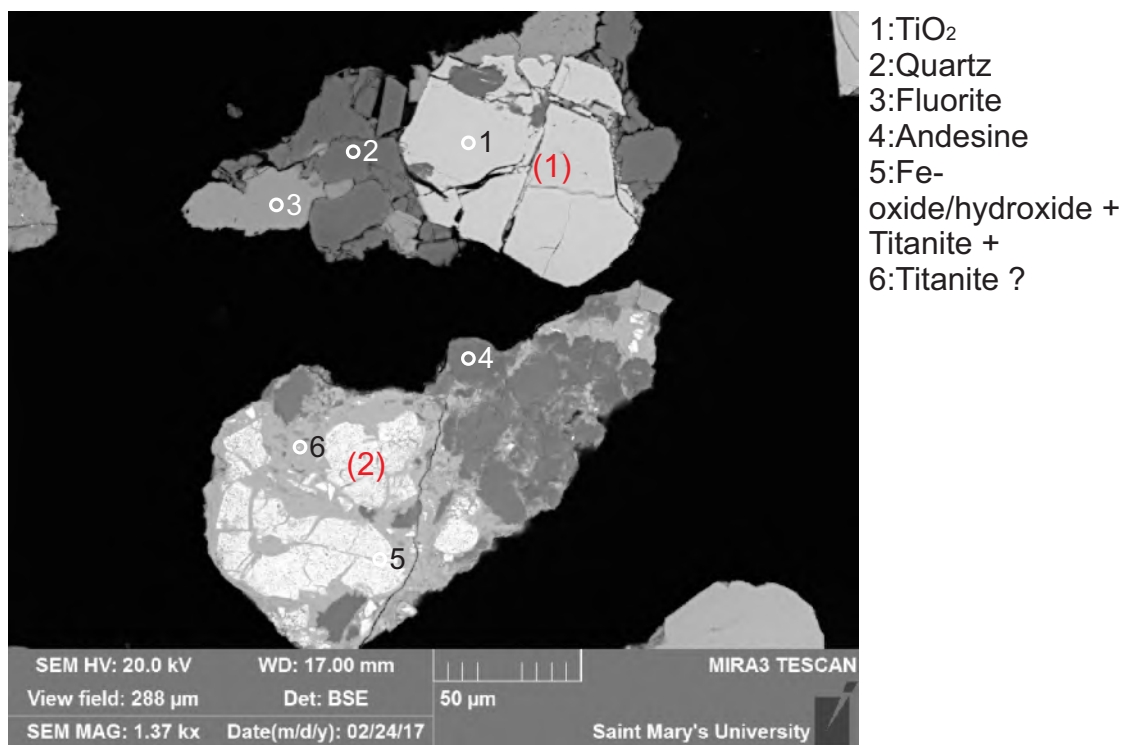


Figure B5.35: Sample 10 site 18.1 (SEM). 1: Lithic clast (quartz, fluorite, titania, hydrothermal vein). 2: Lithic clast (andesine, titanite, Fe-oxide/hydroxide, similar to Fig. B5.24, metamorphic or hydrothermal).



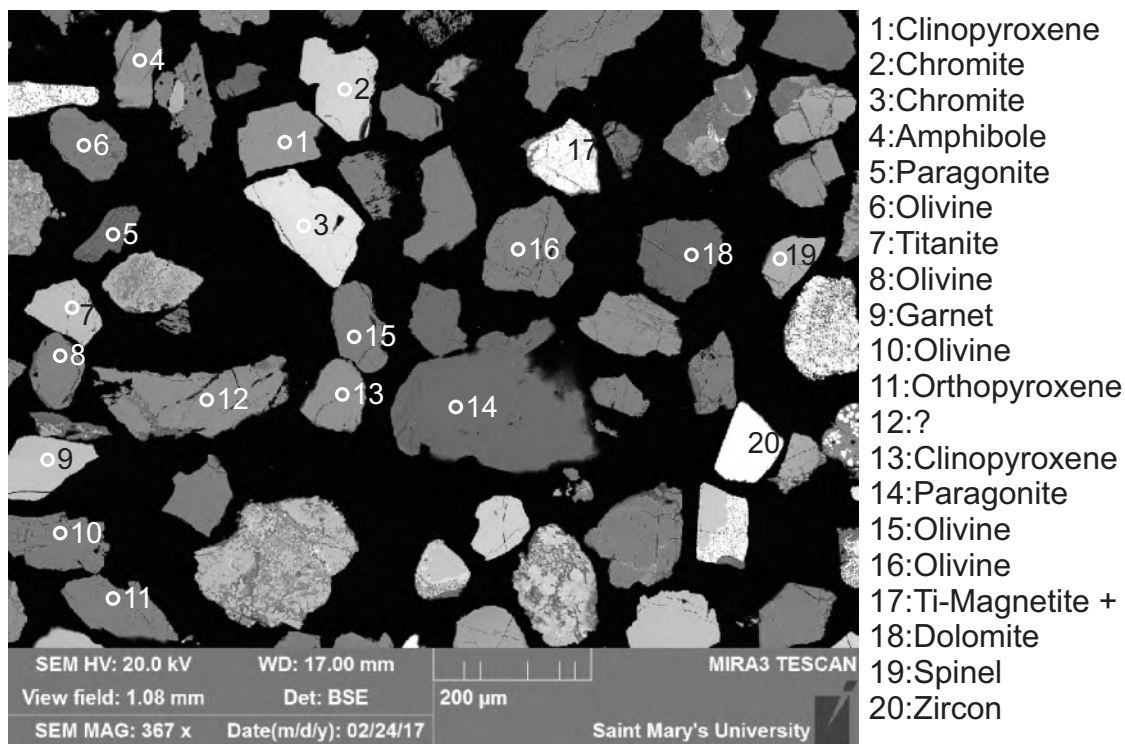


Figure B5.36: Sample 10 site 19 (SEM).

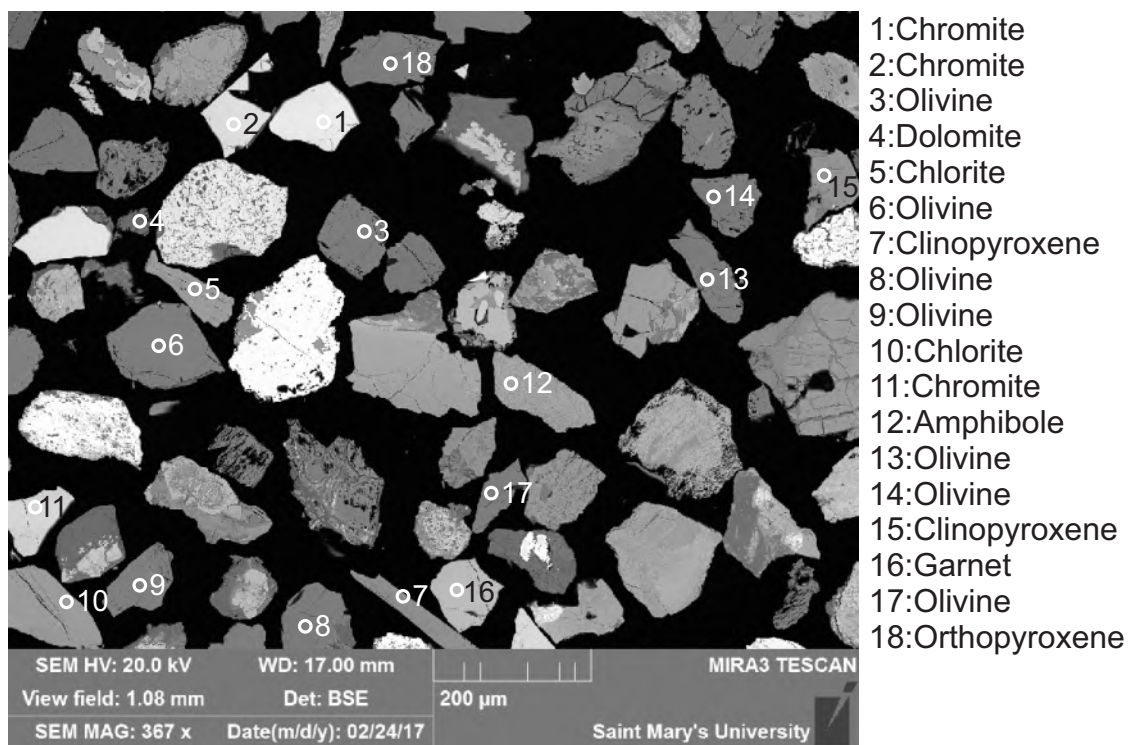


Figure B5.37: Sample 10 site 20 (SEM).



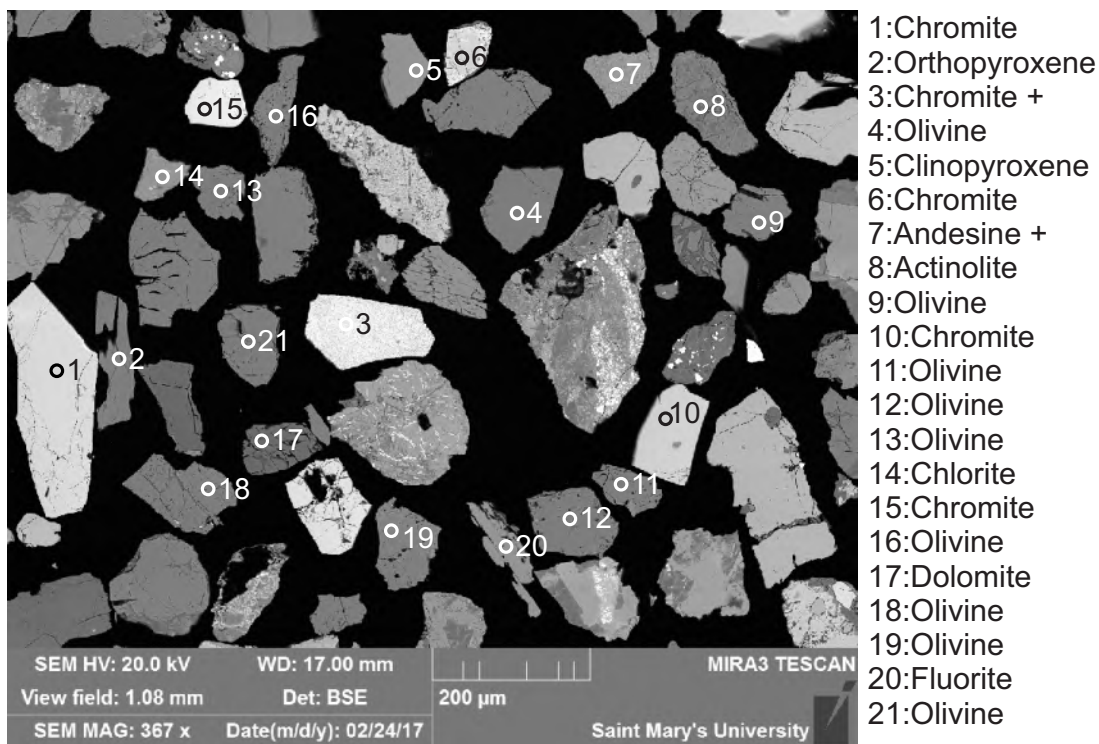


Figure B5.38: Sample 10 site 21 (SEM).

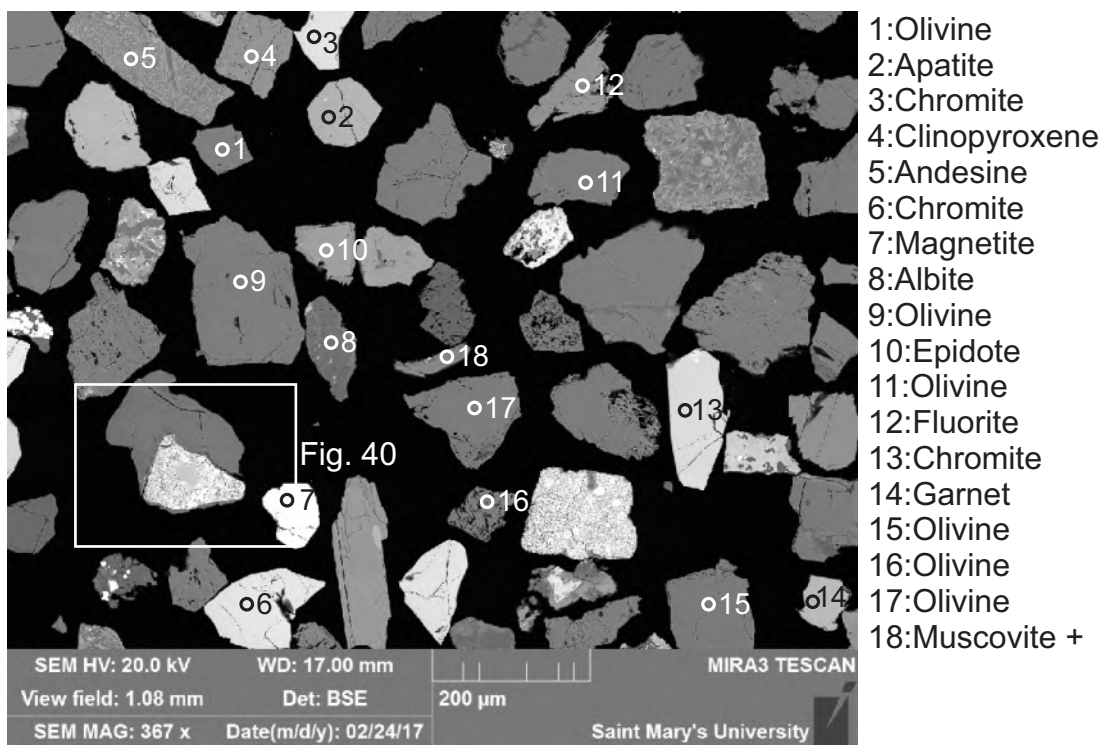
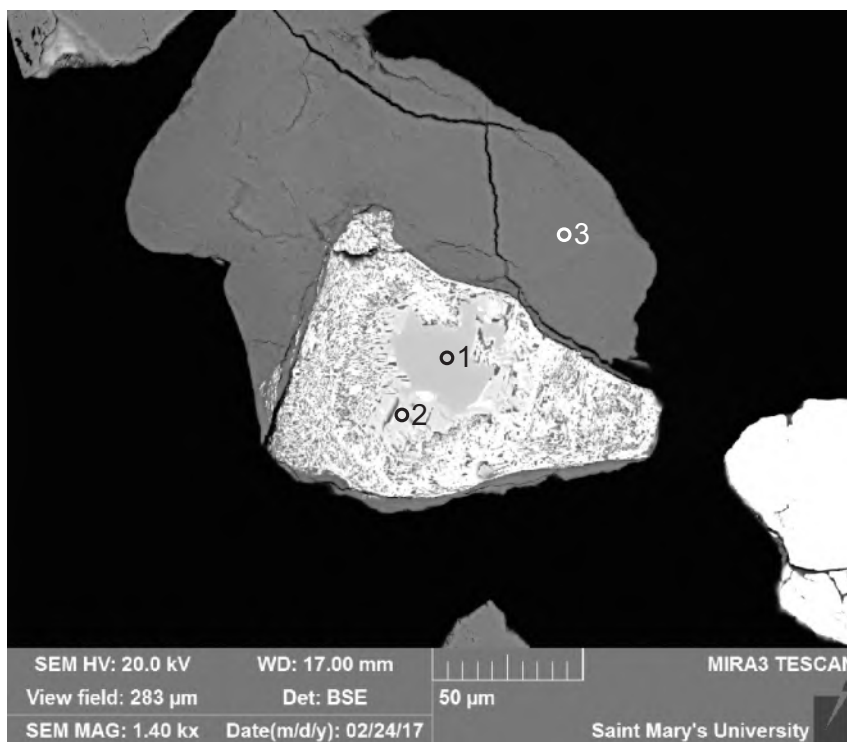
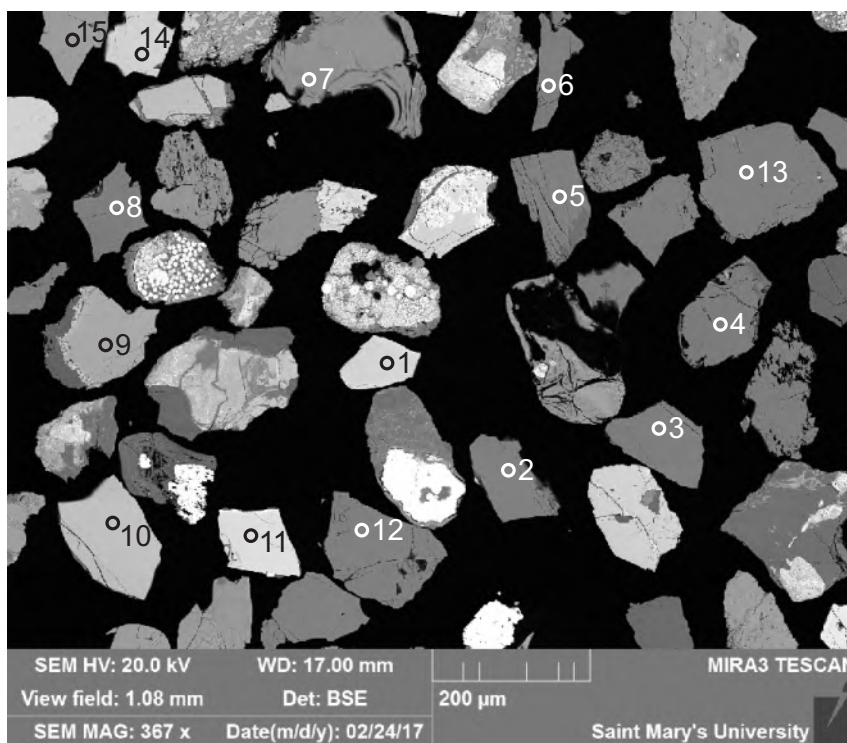


Figure B5.39: Sample 10 site 22 (SEM).



- 1: Spinel
- 2: Chromite
- 3: ?Chlorite +  
Serpentine

Figure B5.40: Sample 10 site 22.1 (SEM). Lithic clast consisting of spinel + chromite + mix (?altered olivine), ophiolite or metaophiolite.



- 1: Chromite
- 2: Orthopyroxene
- 3: Orthopyroxene
- 4: Olivine
- 5: Orthopyroxene
- 6: Orthopyroxene
- 7: Chlorite
- 8: Orthopyroxene
- 9: Spinel
- 10: Spinel
- 11: Chromite
- 12: Olivine
- 13: Olivine
- 14: Chromite
- 15: Clinopyroxene

Figure B5.41: Sample 10 site 23 (SEM).

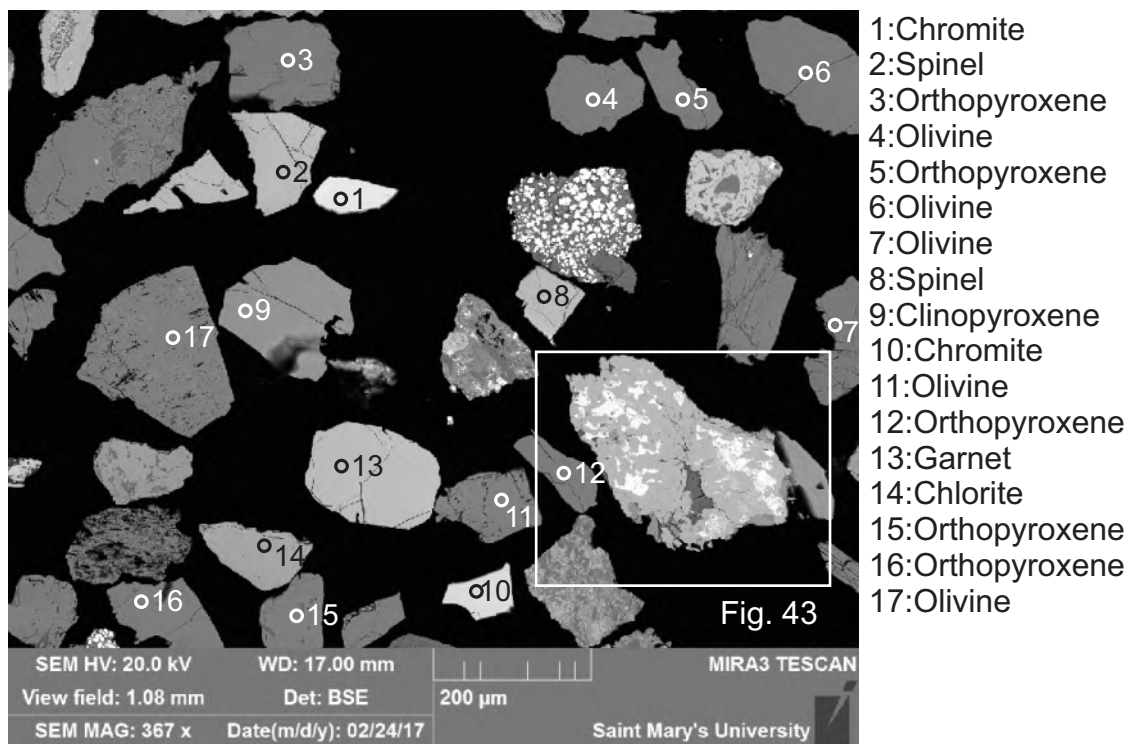


Figure B5.42: Sample 10 site 24 (SEM).

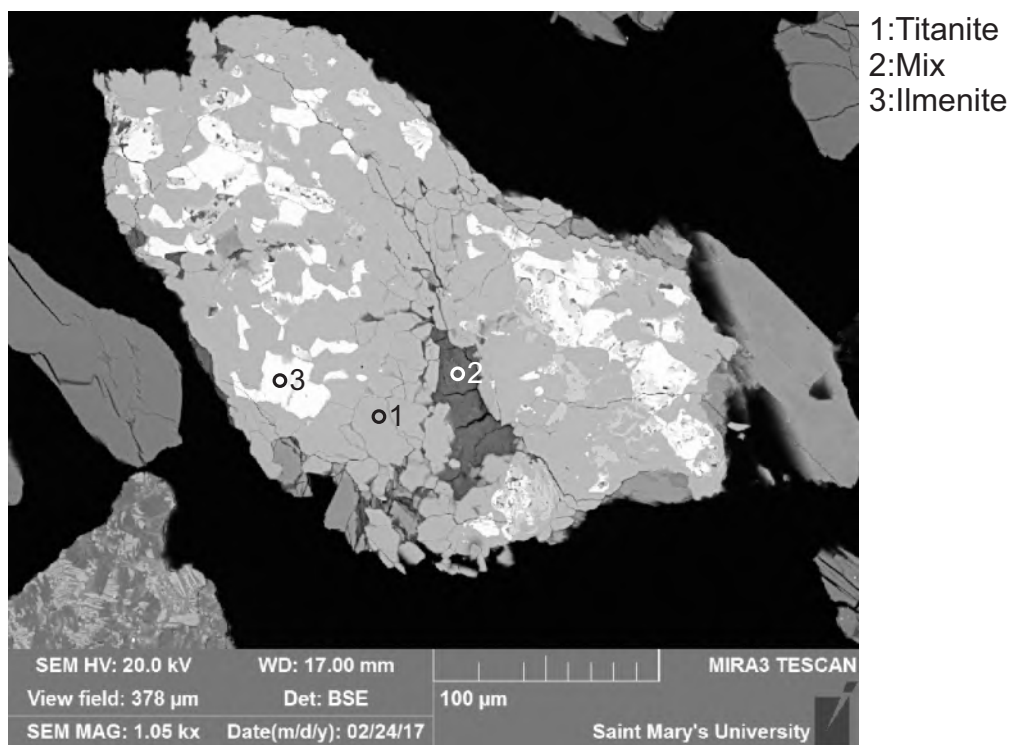


Figure B5.43: Sample 10 site 24.1 (SEM). Lithic clast of ilmenite replaced by titanite. Metamorphic.



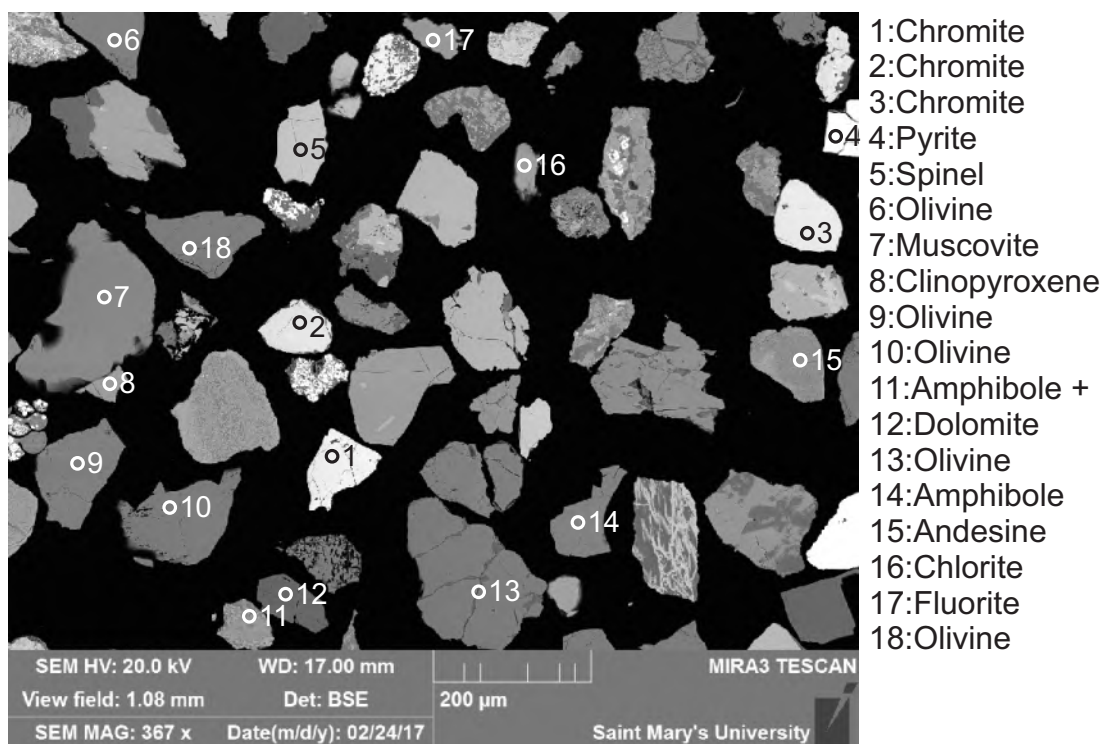


Figure B5.44: Sample 10 site 25 (SEM).

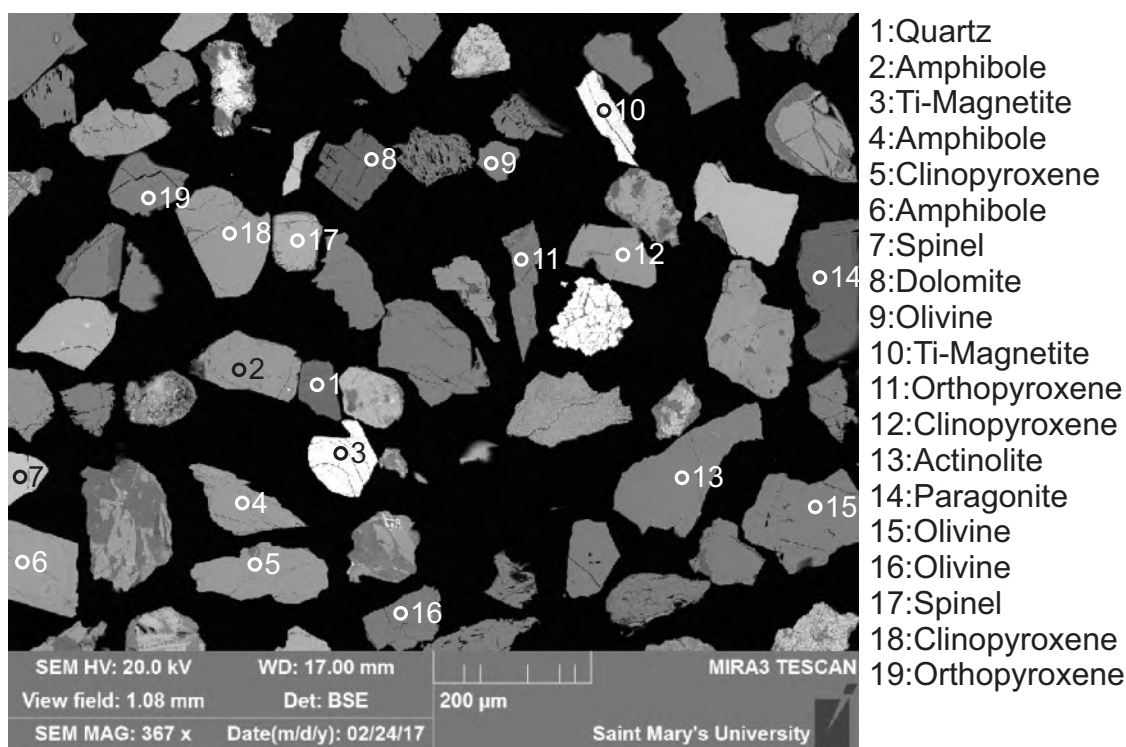


Figure B5.45: Sample 10 site 26 (SEM).



Table B5.1: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	PtO2	Total	Actual Total
S10	3.2	1	Qz	99.76			0.24														100	128
S10	3.2	2	Ab	65.21	0.66	17.25	2.87		1.01	2.27	10.74										100	128
S10	3.2	3	Ttn +	34.50	23.37	6.83	6.95		2.75	23.90			1.70								100	116
S10	3.2	4	Cpx	49.78	2.23	5.29	11.82	0.28	14.23	15.93	0.44										100	123
S10	3.2	5	Ab	65.74		21.01	0.76			2.18	9.80	0.51									100	127
S10	3.1	1	Chl	27.46	0.24	20.10	17.54	0.25	19.10									0.31			85	105
S10	3.1	2	TiO2		98.62		0.89			0.49											100	115
S10	3.1	3	Qz	99.82						0.18											100	130
S10	3.1	4	Fl		1.36		1.48		0.36	60.93					35.87						100	100
S10	3	1	Chr			15.65	23.01		10.97									50.38			100	112
S10	3	2	Grt	39.25		20.62	27.25	7.73	0.91	4.24											100	118
S10	3	3	Ol	42.06			6.87		50.64										0.43		100	123
S10	3	4	Ol	41.90			8.85		48.93										0.32		100	121
S10	3	5	Chr			22.60	19.25		12.60								0.40	45.15			100	114
S10	3	6	Ap							48.66			44.55		6.79						100	130
S10	3	7	Ol	42.07			7.33		50.26										0.34		100	125
S10	3	8	Ti-Mag		18.83	3.70	72.48	0.57	3.03								1.38				100	108
S10	3	9	Dol						21.92	30.96					1.12						54	61
S10	3	10	Dol						22.61	31.39											54	61
S10	3	11	Ol	41.67			9.02		48.98										0.33		100	129
S10	3	12	Opx	57.59		2.10	5.22		34.37	0.31								0.41			100	132
S10	3	13	Ol	41.75			8.28		49.59										0.37		100	127
S10	3	14	Ol	41.93			8.03		49.67										0.38		100	125
S10	3	15	Ol	42.36			7.37		49.93										0.34		100	126
S10	3	16	Chr			15.69	18.92		10.97								0.40	54.02			100	116
S10	2.1	1	Cpx	52.33	1.15	3.39	9.49	0.28	15.34	17.46	0.56										100	123
S10	2.1	2	Ab	66.17		20.90	0.45			1.77	9.92	0.80									100	126
S10	2.1	3	Ab	67.43		20.10	0.42			1.06	10.27	0.71									100	126
S10	2.1	4	Ab	66.28		18.84	1.44		2.33	0.93	10.17										100	124
S10	2.1	5	Amph	51.82	0.35	4.89	14.57		13.60	11.20	0.57										97	117
S10	2	1	Act	55.88		1.77	5.09		33.16	0.47								0.64			97	126

Table B5.1: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	PtO2	Total	Actual Total
S10	2	2	Amph	50.21	1.19	6.77	12.27	0.31	14.16	10.87	1.21										97	123
S10	2	3	Ol	41.82			7.55		50.13										0.51		100	129
S10	2	4	Act	57.13		2.68	2.58		22.67	11.20	0.34							0.41			97	127
S10	2	5	Amph	47.12	1.98	8.99	12.65	0.22	13.46	10.59	1.98										97	121
S10	2	6	Ol	41.71			8.71		49.16										0.42		100	123
S10	2	7	Grt	40.13		21.22	22.00	5.71	3.63	7.31											100	120
S10	2	8	Spl		0.31	27.43	20.83		13.27									38.17			100	120
S10	2	9	Grt	39.77		20.74	28.45	6.68	2.94	1.41											100	125
S10	2	10	Opx	57.63		1.99	5.45		34.23	0.36								0.34			100	128
S10	2	11	Spl			48.53	13.78		18.52									19.17			100	121
S10	2	12	Ol	42.25			9.71		47.70										0.33		100	112
S10	2	13	Ol	42.18			7.42		50.08										0.32		100	123
S10	2	14	Cpx	52.92	1.35	2.55	9.01	0.29	14.19	19.13	0.56										100	124
S10	2	15	Ol	42.04			8.80		48.89										0.27		100	116
S10	2	16	Opx	55.08	0.40	1.14	15.85	0.56	24.05	2.92											100	125
S10	1.2	1	Ol	41.91			8.66		49.11										0.32		100	128
S10	1.2	2	Ol	49.07			5.41		45.21										0.32		100	107
S10	1.1	1	Py	1.00		0.31	30.56		0.45		0.22			65.93						1.52	100	224
S10	1.1	2	Amph	49.98	1.36	2.18	15.69	0.45	11.87	15.15	0.31										97	123
S10	1.1	3	Olig	61.28		20.26	2.35		1.06	5.38	8.25		1.42								100	126
S10	1	1	Ol	42.39			6.38		50.83										0.40		100	127
S10	1	2	Ol	41.98			7.57		50.09										0.36		100	125
S10	1	3	Amph	46.29	1.21	10.40	5.74		19.60	9.91	2.29					0.25		1.30			97	118
S10	1	4	Chr			24.53	16.22		13.86									45.39			100	119
S10	1	5	Chl	25.90		21.31	23.36		14.20									0.24			85	105
S10	1	6	Ol	42.05			8.34		49.17										0.44		100	129
S10	1	7	Amph	50.04	1.48	11.08	12.55	0.26	8.84	9.50	3.25										97	126
S10	1	8	Chl	27.33		20.39	22.08		15.20												85	108
S10	1	9	Cpx	55.14		2.32	2.06		17.90	22.10								0.48			100	122
S10	1	10	Grt	39.42		20.77	29.46	1.71	1.39	7.26											100	125
S10	1	11	Ol	41.35			9.01		49.21										0.43		100	119

Table B5.1: EDS analyses from sample 10.

[illegible]

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	4	1	Ms	49.33	0.57	25.68	6.14		2.35			10.93																95	117
S10	4	2	Dol				0.28		22.74	30.98																		54	109
S10	4	3	Spl			50.92	12.40		18.89									17.43	0.36									100	117
S10	4	4	Cpx	53.42		4.37	2.68		16.69	21.29	0.51							1.04										100	117
S10	4	5	Ol	42.18			7.52		49.91										0.39									100	106
S10	4	6	Ol	42.14			7.44		50.13										0.29									100	116
S10	4	7	Ol	41.99			8.48		49.20										0.33									100	126
S10	4	8	Ep	40.59		27.85	5.50			23.06																		97	122
S10	4	9	Dol						22.49	31.51																		54	98
S10	4	10	Dol						22.44	31.56																		54	118
S10	4	11	Ol	44.84			10.82		44.03										0.31									100	112
S10	4	12	Chr			27.75	14.79		15.04									42.43										100	113
S10	4	13	Chl	26.82		19.90	22.47		15.81																			85	98
S10	4	14	Opx	54.87	0.40	0.85	18.30	0.56	23.32	1.70																		100	98
S10	4	15	Feohy +	1.19			95.78	1.48	1.55																			100	117
S10	4	16	Ol	41.64			8.47		49.47										0.42									100	117
S10	4	17	Chr			20.28	18.60		12.60									48.52										100	107
S10	4.1	1	Py				29.09							70.91														100	107
S10	4.1	2	Ads	60.43		24.25	0.97			6.98	7.37																	100	113
S10	4.1	3	Amph	50.05	1.22	2.09	16.60	0.38	11.88	14.47	0.31																	97	104
S10	5	1	TiO2		99.63		0.37																					100	99
S10	5	2	Chr			18.83	24.07		10.44									46.66										100	117
S10	5	3	Qz	100.00																								100	115
S10	5	4	Opx	56.77		3.40	5.47		33.37	0.39								0.60										100	121
S10	5	5	Amph	44.97	2.14	12.83	8.31	0.22	15.01	11.19	2.31																	97	99
S10	5	6	Ol	42.25			7.85	0.21	49.33										0.36									100	119
S10	5	7	Ol	41.98			8.51		49.12										0.39									100	114
S10	5	8	Ol	41.92			8.84		48.85										0.39									100	115
S10	5	9	Ol	41.64			8.73		49.21										0.42									100	101
S10	5	10	Chl	24.78		21.53	28.37	0.26	10.06																			85	101
S10	5	11	Amph	44.63	3.23	8.43	15.29	0.31	11.30	13.06	0.59	0.16																97	119
S10	5	12	Spl			36.30	17.49		15.03								0.33	30.85										100	113
S10	5	13	Wo	53.84						46.16																		100	100
S10	5	14	Ol	41.02			8.06		49.09										0.41							1.42		100	109
S10	5	15	Opx	53.92	0.29	0.70	21.13	0.90	21.45	1.60																		100	117
S10	5	16	Ol	41.72			7.51	0.22	50.23										0.33									100	119
S10	5	17	Grt	39.80		20.89	27.15	1.44	2.21	8.51																		100	114
S10	5.1	1	Cpx	53.28		5.61	2.10		15.98	21.34	0.72							0.98										100	100
S10	5.1	2	Ol	41.91			8.80		48.91										0.38									100	104
S10	5.1	3	Olig +	58.78		23.33	2.56		1.39	6.93	7.01																	100	102
S10	5.1	4	Cpx	50.23	2.03	5.69	9.09		14.65	17.96	0.35																	100	119
S10	6	1	Opx	55.80		3.97	5.45		32.82	1.27								0.68										100	115
S10	6	2	Grt	40.11		21.13	28.46	1.91	3.48	4.91																		100	101
S10	6	3	Chr			17.39	17.03		12.72									52.86										100	120



Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	6	4	Opx	56.27		3.28	5.82		32.77	1.13								0.74										100	113
S10	6	5	Ol	41.15			10.52		47.93											0.40								100	114
S10	6	6	Ol	42.16			7.40		50.15											0.29								100	115
S10	6	7	TiO2 +	6.77	84.89	1.86	2.49		4.00																			100	99
S10	6	8	Ol	42.10			8.13		49.37											0.40								100	108
S10	6	9	Chr			22.76	15.72		14.57									46.96										100	119
S10	6	10	Grt	40.29		21.06	26.42	0.62	4.14	7.47																		100	107
S10	6	11	Ol	41.92			9.16		48.54											0.38								100	121
S10	6	12	Ol	41.84			8.13		49.67											0.36								100	112
S10	6	13	Ol	42.23			7.56		49.87											0.35								100	102
S10	6	14	Ol	42.17			8.24		49.59																			100	116
S10	6	15	Cpx	53.19	1.03	1.61	9.78	0.38	12.72	20.54	0.74																	100	112
S10	6	16	Ol	42.14			7.82		50.04																			100	117
S10	6	17	Ol	41.97			8.37		49.34											0.32								100	117
S10	6	18	Ol	42.11			7.25		50.30											0.34								100	119
S10	6.1	1	Feohy + TiO2 +	17.90	21.83	1.73	43.00			14.74							0.79											100	113
S10	6.1	2	Olig +	60.74		24.79	1.53		0.60	3.06	6.60	2.68																100	120
S10	6.1	3	Cpx +	48.80	6.80	2.52	12.35	0.27	10.40	18.36	0.51																	100	57
S10	6.1	4	Olig	62.06		24.21	0.74			3.88	7.77	1.34																100	107
S10	6.1	5	Opx	51.51		7.46	15.60		23.18	1.19	0.60	0.25				0.22												100	118
S10	6.1	6	Ab	67.88		20.02	0.23			1.33	10.54																	100	223
S10	6.1	7	Ttn	34.92	26.87	5.72	4.77		1.87	25.08							0.76											100	113
S10	6.1	8	Feohy +	10.10	2.61	4.07	77.43	0.80	3.81	0.65	0.52																	100	118
S10	6.1	9	Ab	68.99		18.77	0.24			0.56	11.44																	100	105
S10	6.1	10	Cpx	50.86	1.61	4.09	10.64	0.27	14.34	17.82	0.37																	100	57
S10	6.1	11	Mag	1.91			95.00		3.09																			100	99
S10	6.1	12	Ol	48.38			6.16		43.33																	2.13		100	106
S10	7	1	Chr			12.29	18.91		10.56								0.42	57.82										100	116
S10	7	2	Chl	26.36		20.57	25.83	0.39	11.64									0.22										85	109
S10	7	3	Dol				6.37	0.51	18.08	29.04																		54	98
S10	7	4	Ol	41.85			8.43		49.29											0.43								100	93
S10	7	5	Qz	100.00																								100	114
S10	7	6	Spl			37.92	16.31		16.45									28.91			0.41							100	106
S10	7	7	Amph	45.25	2.70	8.20	16.57	0.33	10.81	11.96	0.87	0.32																97	111
S10	7	8	Chl	27.20		20.59	19.69	0.22	17.31																			85	99
S10	7	9	Fl						0.81	59.31				0.68	39.19													100	114
S10	7	10	Grt	40.36		21.12	26.03	2.09	5.07	5.33																		100	107
S10	7	11	Opx	56.21		3.52	5.69		32.50	1.37								0.71										100	113
S10	7	12	Ol	41.90			8.48		49.23											0.38								100	111
S10	7	13	Grt	34.81	1.15	22.60	1.46			39.97																		100	109
S10	7.1	1	Qz	94.28			0.38			5.34																		100	86
S10	7.1	2	Py	0.40			29.02				0.25			70.32														100	114
S10	7.1	3	Fl							59.27					40.73													100	57
S10	8	1	Spl			44.57	14.25		17.89									23.29										100	106

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	8	2	Ol	41.95			7.60		50.10											0.35								100	119
S10	8	3	Ol	41.98			7.65		50.06											0.31								100	112
S10	8	4	Ol	41.79			8.96		48.94											0.31								100	118
S10	8	5	Feohy +	1.35	0.42	0.98	64.35	1.25	1.56									30.07										100	119
S10	8	6	Opx	57.52		1.66	6.53		34.05	0.24																		100	112
S10	8	7	Opx	56.34		3.75	5.39		33.30	0.41								0.81										100	114
S10	8	8	Py	0.13			28.27	0.28						71.32														100	120
S10	8	9	Ol	41.80			8.45		49.33											0.42								100	100
S10	8	10	Ol	42.11			7.86		49.60											0.43								100	106
S10	8	11	Chr			23.15	17.39		13.79								0.41	45.27										100	121
S10	8	12	Chr			21.42	16.25		14.23									48.10										100	113
S10	8	13	Ol	42.18			7.97		49.50											0.35								100	56
S10	8	14	Ol	41.74			8.92		48.99											0.35								100	107
S10	8	15	Amph	46.25	2.14	10.02	13.79		12.50	10.56	1.72																	97	115
S10	8	16	Ol	42.43			6.75		50.46											0.35								100	118
S10	8	17	Ol	42.15			7.57		49.90											0.39								100	115
S10	8.1	1	Ol	41.95			8.18		49.48											0.39								100	118
S10	8.1	2	Opx	58.81		4.24	2.57		33.22		0.75							0.40										100	120
S10	8.1	3	Ab	69.29		18.78				0.42	11.52																	100	92
S10	8.1	4	Chl	27.27		17.55	27.17	0.38	11.90	0.38	0.34																	85	118
S10	9	1	Chr			23.42	18.85		12.17									45.56										100	121
S10	9	2	Spl			36.81	15.98		16.17								0.32	30.71										100	115
S10	9	3	Chl	25.83		22.01	22.47		14.69																			85	116
S10	9	4	Dol				0.26		22.66	31.08																		54	119
S10	9	5	Ol	41.93			8.10		49.70											0.28								100	122
S10	9	6	Ol	41.63			8.47		49.42											0.48								100	94
S10	9	7	Ol	41.99			8.67		48.99											0.35								100	99
S10	9	8	Ol	42.14			8.22		49.19											0.45								100	96
S10	9	9	Ol	41.92			7.82		49.84											0.41								100	115
S10	9	10	Opx	57.60		1.86	5.69		34.22	0.40								0.23										100	117
S10	9	11	Chl	25.68		21.50	24.07	0.24	13.51																			85	94
S10	9	12	Dol						22.58	31.42																		54	106
S10	9	13	Chr			8.79	20.84		9.57									60.79										100	113
S10	9	14	Chl	26.86		19.74	23.44		14.96																			85	124
S10	9	15	Ol	42.28			7.07		50.28											0.38								100	114
S10	9	16	Dol						22.55	31.45																		54	114
S10	9	17	Mag	1.04			97.32	0.74	0.90																			100	108
S10	9	18	Ol	42.19			8.38		49.10											0.33								100	105
S10	10	1	Grt	39.31		20.94	30.54	0.27	1.65	7.29																		100	101
S10	10	2	Spl			47.21	13.54		18.01									20.82			0.41							100	111
S10	10	3	Spl			47.59	14.35		18.36									19.41		0.29								100	98
S10	10	4	Ol	42.02			7.49		50.10											0.40								100	116
S10	10	5	Tur	37.33	0.30	32.08	12.00		2.84	0.34	2.11																	87	120
S10	10	6	Ol	42.05			7.68		49.82											0.45								100	119

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	10	7	Grt	39.60		20.94	31.46	0.75	3.93	3.32																		100	121
S10	10	8	Grt	39.69	0.32	21.05	24.72	1.04	1.96	11.21																		100	116
S10	10	9	Ol	42.21			8.35		49.12											0.32								100	105
S10	10	10	Chr			26.51	15.68		14.87									42.94										100	116
S10	10	11	Amph	52.46		4.88	12.51		14.48	12.08	0.58																	97	99
S10	10	12	Opx	54.20	0.28		22.67	0.85	20.46	1.54																		100	113
S10	10	13	Ol	42.02			8.05		49.46											0.46								100	112
S10	10	14	Dol				0.33		22.65	31.02																		54	118
S10	10	15	Dol						22.48	31.52																		54	110
S10	10	16	Chr			24.61	15.32		14.80									45.27										100	116
S10	10	17	Cpx	53.19	0.71	3.53	7.89		15.53	19.14																		100	121
S10	10	18	Dol						17.52	35.55					0.93													54	103
S10	10	19	Spl			32.15	18.24		14.10									35.51										100	112
S10	10	20	Opx	57.55		2.28	5.50		34.00	0.42								0.25										100	115
S10	11	1	Ol	42.08			7.45		50.20											0.28								100	95
S10	11	2	Dol						22.68	31.32																		54	118
S10	11	3	Chr		0.31	22.12	36.53		5.82								0.40	34.82										100	123
S10	11	4	Mix	52.39	1.06	14.15	13.48	0.25	6.85	5.96	3.93	1.92																100	117
S10	11	5	Grt	39.75		21.18	29.45	0.44	4.21	4.97																		100	110
S10	11	6	Ol	41.79			8.30		49.53											0.37								100	55
S10	11	7	Cpx	52.93	1.06	1.57	12.83	0.43	12.70	18.04	0.44																	100	110
S10	11	8	Amph	42.04	2.17	10.49	19.03	0.36	12.12	9.88	0.91																	97	57
S10	11	9	Grt	39.28		20.84	30.62	3.21	1.83	4.23																		100	111
S10	11	10	Ol	41.39			9.92		48.30											0.39								100	118
S10	11	11	Opx	56.59		3.31	5.60		33.44	0.52								0.54										100	120
S10	11	12	Opx	57.04		2.64	5.72		33.96	0.27								0.38										100	118
S10	11	13	Tur	37.87	0.79	32.45	4.82		7.77	0.96	2.35																	87	111
S10	11	14	Opx	56.83		2.95	5.42		33.91	0.32								0.57										100	116
S10	11	15	Qz +	86.50		7.58	2.37		1.03		0.31	2.21																100	113
S10	11	16	Chr			13.64	24.70		9.88									51.78										100	120
S10	11	17	Ep	40.14		23.20	11.25			22.41																		97	119
S10	11	18	Ol	41.82			8.25		49.57											0.36								100	114
S10	11	19	Chr			16.92	19.60		12.55								0.51	50.41										100	120
S10	12	1	Prh	45.88		21.02	3.60			25.50																		96	57
S10	12	2	Chr			18.66	16.53		12.86									51.95										100	112
S10	12	3	Dol						22.49	31.51																		54	112
S10	12	4	Act	57.98		1.64	2.49		22.20	12.40								0.29										97	116
S10	12	5	Chr			20.03	19.83		11.72									48.42										100	109
S10	12	6	Ol	42.39			7.60		49.75											0.27								100	115
S10	12	7	Ol	42.15			8.04		49.81																			100	111
S10	12	8	Ttn	32.54	35.61	2.07	0.67			27.74					1.38													100	113
S10	12	9	Ol	42.28			8.52		48.75											0.45								100	111
S10	12	10	Amph	45.24	2.40	14.33	9.79		11.41	11.96	0.60	1.28																97	118
S10	12	11	Spl			32.57	19.62		14.75								0.37	32.70										100	94

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	12	12	Ol	42.15			8.21		49.24											0.40								100	119
S10	12	13	Cpx	53.44	0.60	1.75	9.62	0.34	14.47	19.40	0.38																	100	116
S10	12	14	Ol	41.93			8.42		49.27											0.38								100	119
S10	12	15	Fl	1.42			0.62	0.31	1.28	56.34					40.02													100	118
S10	12	16	Chl	26.83		20.06	22.92	0.46	14.73																			85	118
S10	12	17	Spl			42.45	16.11		16.75									24.70										100	111
S10	12	18	Cpx	55.11		1.91	1.83		17.72	22.84								0.59										100	115
S10	12.1	1	Ttn +	35.44	25.99	5.76	6.22		1.46	24.07							1.06											100	117
S10	12.1	2	Olig	61.27	0.29	23.61	1.36			5.03	7.72	0.72																100	108
S10	12.1	3	Grt	39.35	1.67	10.52	13.90			34.56																		100	124
S10	12.1	4	Chl +	41.47		14.17	22.73		18.75	2.34	0.54																	100	120
S10	12.1	5	Ilm +	2.47	50.41	0.63	33.84	11.03	1.63																			100	107
S10	12.1	6	Clay	52.07	0.29	7.92	10.63		23.76	2.57	0.57	0.26	0.84			1.09												100	109
S10	13	1	Ol	42.23			7.39		50.01											0.37								100	117
S10	13	2	Mag	0.72			99.28																					100	112
S10	13	3	Chl	25.17		21.76	26.61		11.46																			85	120
S10	13	4	Ol	41.99			8.07		49.56											0.38								100	123
S10	13	5	Grt	36.66	8.28	19.52	25.56	1.31	3.79	4.88																		100	116
S10	13	6	Chr			10.11	23.15		7.94								0.39	57.86			0.55							100	122
S10	13	7	Chr			14.18	26.80		8.52									50.49										100	122
S10	13	8	Spl			30.31	17.58		14.68									37.44										100	120
S10	13	9	Ol	42.07			8.10		49.42											0.40								100	109
S10	13	10	Ol	42.08			7.52		50.07											0.34								100	98
S10	13	11	Spl			31.17	15.03		16.23									37.56										100	114
S10	13	12	Cpx	52.59	0.52	4.60	4.47		16.21	20.75								0.87										100	120
S10	13	13	Cpx	55.62		1.30	1.72		17.96	23.12								0.27										100	107
S10	13	14	Grt	39.32		20.75	32.82	0.95	2.03	4.13																		100	83
S10	13	15	Ep	40.12		23.72	10.50		22.67																			97	119
S10	13	16	Chl	26.43		21.30	22.10		15.17																			85	109
S10	13	17	?	47.65		21.51	4.69		26.15																			100	113
S10	13	18	Grt	39.20		20.88	31.19	3.99	3.09	1.65																		100	120
S10	13	19	Amph	52.19	3.16	10.34	10.72		6.77	10.19	3.63																	97	114
S10	13	20	Ol	42.79			8.10		48.67											0.44								100	48
S10	13	21	Chl	25.41		21.80	25.86		11.93																			85	114
S10	13	22	Ol	41.85			8.06		49.72											0.37								100	116
S10	14	1	Opx	58.64		1.17	4.90		35.05	0.24																		100	112
S10	14	2	Ol	41.97			8.61		49.12											0.29								100	119
S10	14	3	Grt	39.94		21.31	28.47	0.61	4.35	5.32																		100	117
S10	14	4	Chr			19.58	18.23		12.31								0.41	49.47										100	116
S10	14	5	Ep	40.60		26.12	7.34		0.35	22.58																		97	106
S10	14	6	Chr			14.45	20.66		10.89									54.00										100	96
S10	14	7	Cpx	53.93	0.51	1.47	9.90	0.29	15.09	18.81																		100	115
S10	14	8	Ol	41.75			9.19		48.74											0.32								100	124
S10	14	9	Cpx	53.17	1.45	2.18	6.08	0.26	15.78	20.63	0.45																	100	232



Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	14	10	Chr			25.58	20.11		12.52									41.79										100	116
S10	14	11	Cpx	54.19		3.33	2.86		19.76	19.02								0.83										100	110
S10	14	12	Ol	42.12			8.34		49.10											0.43								100	114
S10	14	13	Spl			39.24	14.87		16.88									29.02										100	111
S10	14	14	TiO2		99.56		0.44																					100	111
S10	14	15	Ol	42.13			8.30		49.27											0.29								100	99
S10	14	16	Ol	42.36			6.92		50.32											0.40								100	54
S10	14	17	Ol	41.89			8.56		49.26											0.29								100	113
S10	14	18	Ol	41.82			8.17		49.61											0.41								100	222
S10	14.1	1	Ab	69.13		19.12	0.22				11.33	0.20																100	114
S10	14.1	2	Cpx	50.13	2.25	3.31	14.55	0.35	11.17	18.24																		100	116
S10	14.1	3	Olig	65.65		21.04	0.76			2.31	9.73	0.52																100	114
S10	14.1	4	TiO2 +	2.09	92.38	0.59	3.92		0.65	0.36																		100	117
S10	15	1	Opx	56.34		3.64	5.67		32.98	0.68								0.70										100	102
S10	15	2	Chr			10.43	26.91		7.75									54.91										100	112
S10	15	3	Chr		0.43	17.79	24.95		10.35									46.48										100	121
S10	15	4	Chr			29.38	21.22		12.84									36.55										100	117
S10	15	5	Tur	38.24	0.37	32.49	6.46		6.57	0.78	2.09																	87	114
S10	15	6	Chl	24.99		21.08	29.89		9.04																			85	119
S10	15	7	Fl	0.49					0.98	51.20	0.34				47.00													100	117
S10	15	8	Ol	41.99			8.50		49.13											0.38								100	117
S10	15	9	Ol	42.05			7.46		50.04											0.45								100	121
S10	15	10	Dol						22.52	31.48																		54	107
S10	15	11	Ol	41.82			8.41		49.35											0.42								100	123
S10	15	12	Amph	50.53	0.31	10.05	2.65		19.86	11.78	1.14							0.69										97	112
S10	15	13	Chr			16.80	19.35		13.35									50.50										100	113
S10	15.1	1	Py	2.06			29.24		0.59	0.29	0.80			67.03														100	56
S10	15.1	2	Qz	99.64			0.30																		0.06			100	108
S10	15.1	3	?Chl	37.90		14.22	29.16	0.49	16.28	1.32	0.63																	100	118
S10	15.1	4	Ads	56.51	1.36	15.27	8.66		4.11	8.43	5.65																	100	116
S10	15.2	1	Qz	100.00																								100	109
S10	15.2	2	Ep	40.31		27.46	6.28			22.95																		97	109
S10	15.2	3	Mix	42.28		14.52	21.76	0.37	17.69	2.25	0.81	0.31																100	109
S10	15.2	4	Grt	41.54		17.61	5.96			34.89																		100	120
S10	15.2	5	Py	0.26			28.17				0.24			71.08						0.24								100	117
S10	15.2	6	Qz	99.81			0.19																					100	107
S10	16	1	Opx	57.98		1.54	5.82		34.38	0.28																		100	113
S10	16	2	Ol	41.79			8.59		49.23											0.39								100	97
S10	16	3	Ol	42.00			7.75		49.96											0.29								100	116
S10	16	4	Ol	41.90			8.00		49.69											0.40								100	111
S10	16	5	Chl	27.19		22.41	23.08		12.07			0.26																85	110
S10	16	6	Ol	41.89			8.76		49.05											0.30								100	118
S10	16	7	Opx	57.46		2.01	5.31		34.26	0.37								0.58										100	105
S10	16	8	Opx	58.07		1.19	5.45	0.26	34.53	0.26								0.24										100	117

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	16	9	Dol						22.49	31.51																		54	108
S10	16	10	Chl	24.83		22.19	27.12		10.86																			85	110
S10	16	11	OI	41.81			8.04		49.84											0.30								100	116
S10	16	12	OI	41.98			7.81		49.83											0.38								100	110
S10	16	13	OI	41.89			7.96		49.77											0.38								100	118
S10	16	14	Qz	100.00																								100	110
S10	16	15	Amph	41.36	1.46	13.00	17.93	0.27	12.81	9.64	0.53																	97	114
S10	16	16	OI	41.91			8.37		49.28											0.44								100	117
S10	16	17	Opx	57.19		2.77	5.44		33.75	0.54								0.32										100	112
S10	16	18	OI	42.10			7.19		50.34											0.37								100	93
S10	16.1	1	Chl +	39.14	0.52	17.65	24.52	0.27	15.61	0.75	1.54																	100	114
S10	16.1	2	Feohy +	4.99	5.41	1.67	85.98	0.93		0.48	0.54																	100	112
S10	17	1	Brt											36.45					-0.11					63.66				100	110
S10	17	2	Chr		0.91	21.58	30.19		8.32								0.46	38.53										100	115
S10	17	3	OI	42.18			7.48		49.91											0.44								100	113
S10	17	4	Cpx	53.31		4.04	1.88		16.53	22.88	0.30							1.06										100	116
S10	17	5	Cpx	53.46		4.86	2.54		16.09	21.85	0.40							0.81										100	98
S10	17	6	Dol						22.66	31.34																		54	115
S10	17	7	OI	41.86			9.31		48.53											0.30								100	207
S10	17	8	OI	41.90			7.74		49.93											0.43								100	102
S10	17	9	OI	41.94			6.82		50.82											0.43								100	112
S10	17	10	OI	41.95			7.31		50.43											0.31								100	110
S10	17	11	Spl			49.50	13.37		18.49									18.64										100	115
S10	17	12	OI	43.33			11.49		44.05											0.65								100	56
S10	17	13	Fl							57.07						42.21							0.72					100	102
S10	17	14	Chr			11.73	22.78		8.92									56.57										100	119
S10	17	15	"Ilm"		20.05		77.57	1.62									0.76											100	111
S10	17	16	OI	41.98			8.30		49.25											0.47								100	113
S10	17	17	Cpx	53.03	1.24	3.12	4.03		16.13	21.50	0.34							0.60										100	121
S10	17	18	Ep	41.73		23.93	7.31		2.88	21.14																		97	110
S10	17	19	Spl			37.78	17.05		15.46									29.71										100	116
S10	17	20	Cpx	52.87		5.16	2.45		16.33	22.04	0.33							0.83										100	112
S10	17	21	Opx	57.55		2.06	5.43		34.26	0.44								0.26										100	118
S10	17	22	Chl	26.03		20.13	26.38	0.47	11.98																			85	107
S10	18	1	Mag	3.13			94.94		1.25	0.68																		100	126
S10	18	2	Feohy		5.36	1.95	89.98	0.92	1.23								0.56											100	113
S10	18	3	Chr			8.84	20.46		9.70									61.00										100	120
S10	18	4	OI	42.01			8.45		49.16											0.38								100	112
S10	18	5	OI	42.20			7.67		49.80											0.33								100	117
S10	18	6	Ap							48.59			44.27		5.52												1.63	100	53
S10	18	7	OI	41.80			8.25		49.62											0.32								100	115
S10	18	8	Cpx	54.12	0.42	2.94	5.64	0.26	16.13	19.60	0.89																	100	108
S10	18	9	Ttn	33.37	29.21	5.87	0.84			26.84					3.87													100	120
S10	18	10	OI	42.23			7.89		49.52											0.35								100	110

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	18	11	Ol	42.34			6.31		51.06											0.29								100	105
S10	18	12	Ol	42.24			7.51		49.90											0.35								100	120
S10	18	13	Spl		0.32	32.49	19.99		13.67									33.53										100	117
S10	18	14	Hbl	48.06	1.10	9.77	6.85		17.64	11.45	1.86							0.27										97	121
S10	18	15	Chr			20.55	16.98		13.43								0.34	48.71										100	116
S10	18	16	Ol	41.53			9.58		48.52											0.37								100	118
S10	18	17	Ol	41.96			7.54		50.23											0.28								100	117
S10	18	18	Chr			10.18	22.69		8.24									58.88										100	101
S10	18	19	Chr			21.36	15.87		13.55									49.22										100	121
S10	18	20	Chr			11.95	19.89		10.94								0.39	56.83										100	120
S10	18	21	Opx	56.48		3.05	5.79		33.43	0.74								0.51										100	115
S10	18	22	Ol	46.71		1.51	7.21		43.74							0.34				0.48								100	111
S10	18.1	1	TiO2		99.75					0.25																		100	117
S10	18.1	2	Qz	100.00																								100	56
S10	18.1	3	Fl						0.53	48.96					50.51													100	113
S10	18.1	4	Ads	59.83		24.91	0.84			7.50	6.71	0.21																100	119
S10	18.1	5	Feohy + Ttn +	14.78	3.44	4.91	69.79	0.35	4.51	2.23																		100	119
S10	18.1	6	Ttn ?	39.00	24.45	4.47	5.98		1.74	24.35																		100	111
S10	19	1	Cpx	54.20	0.48	2.40	4.85		17.00	20.57								0.50										100	117
S10	19	2	Chr		0.37	23.14	18.21		15.49									42.79										100	94
S10	19	3	Chr			15.06	19.52		11.09									54.33										100	107
S10	19	4	Amph	44.47	0.63	13.46	9.87		14.07	11.11	3.03	0.35																97	113
S10	19	5	Pg	48.34		38.15	0.34			0.32	7.12	0.73																95	99
S10	19	6	Ol	42.08			7.25		50.35											0.32								100	108
S10	19	7	Ttn	29.93	36.53	1.92	0.42			29.21					2.00													100	117
S10	19	8	Ol	42.09			8.28		49.25											0.38								100	115
S10	19	9	Grt	39.28		21.09	30.50	0.71	1.13	7.30																		100	111
S10	19	10	Ol	42.26			6.04		51.25											0.44								100	115
S10	19	11	Opx	59.03			5.33		35.64																			100	111
S10	19	12	?	47.79		24.96				27.25																		100	101
S10	19	13	Cpx	51.15		2.97	5.67		18.49	20.16	0.42							1.13										100	112
S10	19	14	Pg	48.72		37.80	0.30				7.31	0.87																95	99
S10	19	15	Ol	42.16			7.79		49.69											0.36								100	112
S10	19	16	Ol	41.85			8.33		49.42											0.40								100	122
S10	19	17	Ti-Mag +	2.79	12.99	4.94	74.32	0.84	2.80								1.32											100	106
S10	19	18	Dol						22.42	31.58																		54	109
S10	19	19	Spl			43.77	14.95		17.16									24.11										100	107
S10	19	20	Zrn	30.97																			67.52			1.51		100	109
S10	20	1	Chr			12.20	20.24		10.26									57.30										100	107
S10	20	2	Chr			16.21	18.54		11.89								0.43	52.92										100	226
S10	20	3	Ol	41.98			7.29		50.43											0.31								100	109
S10	20	4	Dol						22.98	31.02																		54	108
S10	20	5	Chl	26.21		20.29	25.70	0.35	12.20									0.26										85	110
S10	20	6	Ol	41.80			8.60		49.22											0.38								100	116

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	20	7	Cpx	54.03		3.66	2.10		16.96	22.42								0.83										100	112
S10	20	8	Ol	42.06			7.42		50.22											0.30								100	112
S10	20	9	Ol	42.16			8.23		49.61																			100	114
S10	20	10	Chl	29.93		15.85	23.36	0.26	15.28	0.32																		85	108
S10	20	11	Chr			24.97	20.01		12.42									42.60										100	113
S10	20	12	Amph	44.30	2.70	8.95	17.93	0.30	11.04	10.78	0.70	0.31																97	119
S10	20	13	Ol	42.03			8.24		49.42											0.31								100	119
S10	20	14	Ol	41.78			8.24		49.61											0.37								100	118
S10	20	15	Cpx	53.46	0.86	2.51	6.02		15.76	21.09								0.31										100	109
S10	20	16	Grt	39.19		21.00	32.21	0.30	2.09	5.21																		100	117
S10	20	17	Ol	41.92			7.86		49.79											0.43								100	117
S10	20	18	Opx	57.86		1.72	5.33		34.50	0.27								0.33										100	114
S10	21	1	Chr			19.28	17.00		12.66									51.06										100	107
S10	21	2	Opx	58.54		0.55	5.01		35.15	0.33								0.43										100	81
S10	21	3	Chr +	6.24	0.61	1.67	48.56	0.82	5.14									36.96										100	57
S10	21	4	Ol	42.02			7.42		50.20											0.36								100	99
S10	21	5	Cpx	53.10	1.40	2.82	4.82		16.21	20.51	0.54							0.61										100	122
S10	21	6	Chr			25.98	22.06		11.94									40.02										100	113
S10	21	7	Ads +	45.71	1.34	11.82	18.99	0.40	13.39	7.24	1.10																	100	114
S10	21	8	Act	58.88			3.76		21.54	12.81																		97	117
S10	21	9	Ol	41.54			8.76		49.31											0.39								100	117
S10	21	10	Chr			22.67	17.49		13.80								0.35	45.69										100	116
S10	21	11	Ol	41.61			8.55		49.48											0.36								100	119
S10	21	12	Ol	42.11			8.35		49.11											0.43								100	114
S10	21	13	Ol	41.89			7.75		49.94											0.41								100	59
S10	21	14	Chl	26.38		21.71	22.14		14.23		0.54																	85	116
S10	21	15	Chr			11.38	25.66		8.75									54.22										100	119
S10	21	16	Ol	41.87			9.39		48.38											0.36								100	123
S10	21	17	Dol				0.35		22.32	31.33																		54	115
S10	21	18	Ol	41.82			8.44		49.27											0.47								100	122
S10	21	19	Ol	41.82			8.85		48.90											0.44								100	120
S10	21	20	Fl							54.64					45.36													100	56
S10	21	21	Ol	42.34			7.47		49.83											0.36								100	113
S10	22	1	Ol	41.78			8.48		49.40											0.34								100	120
S10	22	2	Ap						49.73			44.69		5.58														100	100
S10	22	3	Chr			14.40	21.15		11.04									53.42										100	120
S10	22	4	Cpx	54.74	0.48	2.00	5.38		17.51	19.52	0.37																	100	96
S10	22	5	Ads	57.98	1.12	15.58	8.36		3.74	6.39	6.83																	100	119
S10	22	6	Chr			12.21	18.55		11.43									57.81										100	116
S10	22	7	Mag	1.27			98.73																					100	120
S10	22	8	Ab	65.11		22.13	0.38			1.97	9.37	1.03																100	112
S10	22	9	Ol	42.11			7.53		50.00											0.36								100	109
S10	22	10	Ep	40.26		23.80	10.25	0.30		22.38																		97	58
S10	22	11	Ol	41.91			7.80		49.85											0.44								100	108



Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	22	12	Fl							56.20					43.80													100	116
S10	22	13	Chr			18.78	19.80		11.45									49.96										100	97
S10	22	14	Grt	39.35		20.62	24.16	7.73	0.91	7.23																		100	103
S10	22	15	Ol	42.11			6.86		50.69											0.35								100	94
S10	22	16	Ol	41.81			8.83		49.03											0.32								100	119
S10	22	17	Ol	41.96			7.75		49.93											0.36								100	110
S10	22	18	Ms +	52.14	0.48	22.82	5.27		3.19		0.27	10.83																95	96
S10	22.1	1	Spl			30.79	17.83		13.78									37.60										100	114
S10	22.1	2	Chr			22.42	28.59		7.51									40.90			0.57							100	116
S10	22.1	3	?Chl + Srp	44.79		12.52	12.59		27.30	2.05	0.43							0.33										100	115
S10	23	1	Chr			21.84	17.44		14.54									46.18										100	122
S10	23	2	Opx	56.36		3.40	5.72		33.60	0.28								0.63										100	115
S10	23	3	Opx	56.15		4.04	5.74		33.05	0.32								0.70										100	113
S10	23	4	Ol	42.23			7.54		49.88											0.36								100	104
S10	23	5	Opx	54.85		4.59	5.92		33.35	0.34								0.95										100	109
S10	23	6	Opx	56.82		3.01	5.40		33.75	0.41								0.62										100	118
S10	23	7	Chl	27.14		20.60	20.21		17.05																			85	122
S10	23	8	Opx	57.82		1.90	5.32		34.52	0.45																		100	118
S10	23	9	Spl			46.65	13.47		18.25									21.63										100	108
S10	23	10	Spl			35.44	16.46		15.89									32.21										100	101
S10	23	11	Chr			18.96	19.33		11.53									50.18										100	114
S10	23	12	Ol	42.07			8.12		49.80																			100	109
S10	23	13	Ol	42.02			8.45		49.17											0.36								100	108
S10	23	14	Chr			23.72	15.52		14.57									46.19										100	117
S10	23	15	Cpx	52.05	1.79	2.78	9.28	0.28	13.02	20.02	0.78																	100	119
S10	24	1	Chr			13.00	19.57		10.55									56.88										100	112
S10	24	2	Spl			36.30	14.18		16.53									32.99										100	109
S10	24	3	Opx	58.55		1.13	4.68		34.88	0.42								0.34										100	110
S10	24	4	Ol	41.87			8.38		49.31											0.43								100	116
S10	24	5	Opx	57.58		2.15	5.48	0.23	34.09	0.46																		100	118
S10	24	6	Ol	41.74			7.90	0.24	49.72											0.40								100	119
S10	24	7	Ol	42.36			7.14		50.19											0.31								100	107
S10	24	8	Spl		0.42	36.12	17.55		16.12									29.79										100	57
S10	24	9	Cpx	53.50		3.71	4.04		17.03	20.87								0.86										100	215
S10	24	10	Chr			17.26	17.32		12.20									53.22										100	116
S10	24	11	Ol	42.20			8.48		48.92											0.40								100	108
S10	24	12	Opx	57.14		2.70	5.68		33.75	0.33								0.40										100	100
S10	24	13	Grt	39.20		20.97	28.77	5.61	3.36	2.08																		100	125
S10	24	14	Chl	29.23		15.44	28.87	0.23	11.22																			85	113
S10	24	15	Opx	56.05		4.00	5.57		32.49	1.07								0.82										100	97
S10	24	16	Opx	57.41		1.99	5.71		34.18	0.44								0.27										100	113
S10	24	17	Ol	42.18			8.03		49.46											0.32								100	108
S10	24.1	1	Ttn	32.72	37.65	0.62	0.47			27.77							0.77											100	112
S10	24.1	2	Mix	55.39	0.34	8.65	8.23		24.19	1.46	1.32	0.42																100	97

Table B5.2: EDS analyses from sample 10.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	ZnO	SrO	ZrO2	BaO	Yb2O3	HfO2	WO3	Total	Actual Total
S10	24.1	3	Ilm		50.62		46.38	2.32		0.68																		100	96
S10	25	1	Chr			7.70	21.60		8.63									62.08										100	119
S10	25	2	Chr			15.90	24.92		10.03									49.15										100	115
S10	25	3	Chr			11.27	25.09		8.47									55.16										100	118
S10	25	4	Py	0.11			28.91							70.98														100	115
S10	25	5	Spl			32.33	19.93		13.11								0.36	33.76			0.51							100	112
S10	25	6	Ol	41.90			8.08		49.72											0.29								100	100
S10	25	7	Ms	51.37	0.46	23.58	5.97		2.75			10.88																95	98
S10	25	8	Cpx	49.35	3.20	5.14	8.77	0.24	12.35	20.17	0.78																	100	101
S10	25	9	Ol	41.93			8.45		49.23											0.39								100	117
S10	25	10	Ol	42.04			7.28		50.29											0.39								100	120
S10	25	11	Amph +	51.05	2.30	12.57	9.36		7.62	12.78	3.10		1.22															100	107
S10	25	12	Dol						22.40	31.60																		54	121
S10	25	13	Ol	42.26			7.46		50.01											0.27								100	106
S10	25	14	Amph	50.51		7.76	3.01		20.43	11.74	1.85	0.15						1.56										97	117
S10	25	15	Ads	55.34	1.65	12.51	9.96	0.24	6.65	8.76	4.88																	100	118
S10	25	16	Chl	27.36		16.74	27.96	1.05	11.89																			85	110
S10	25	17	Fl							51.53					48.47													100	122
S10	25	18	Ol	41.76			7.82		50.05											0.37								100	120
S10	26	1	Qz	100.00																								100	56
S10	26	2	Amph	47.94	0.48	5.83	12.13	0.44	16.40	13.47	0.32																	97	123
S10	26	3	Ti-Mag	0.61	17.27	3.54	75.45	0.92	0.95								1.25											100	118
S10	26	4	Amph	46.49	2.20	9.85	12.26	0.23	12.95	10.90	2.11																	97	120
S10	26	5	Cpx	54.29	0.57	1.95	7.27		16.87	19.05																		100	57
S10	26	6	Amph	46.55	2.09	9.12	13.89	0.26	12.56	10.65	1.88																	97	97
S10	26	7	Spl			34.60	17.86		14.59									32.95										100	111
S10	26	8	Dol						22.86	31.14																		54	114
S10	26	9	Ol	42.08			8.25		49.28											0.39								100	114
S10	26	10	Ti-Mag	1.09	18.27	4.03	71.43	0.52	3.72								0.95											100	99
S10	26	11	Opx	56.43		3.36	5.67		33.39	0.51								0.64										100	115
S10	26	12	Cpx	49.86	3.01	5.09	6.34		13.91	20.99	0.55							0.25										100	119
S10	26	13	Act	55.49	0.27	3.93	2.39		21.57	12.18	0.35							0.81										97	96
S10	26	14	Pg	47.72		37.63	0.44				7.49	0.79			0.94													95	116
S10	26	15	Ol	41.84			8.99		48.79											0.38								100	97
S10	26	16	Ol	42.05			7.04		50.52											0.39								100	114
S10	26	17	Spl			45.32	14.25		17.89									22.55										100	117
S10	26	18	Cpx	51.12	1.79	4.29	7.74		14.42	19.96	0.39							0.30										100	112
S10	26	19	Opx	56.84		2.63	6.04		33.72	0.27								0.50										100	112
		Notes																											
		" "	= indicates that mineral is altered																										
		+	= indicates that other minerals are present																										

B6: SEM-BSE images and EDS  
mineral analyses for sample S11.

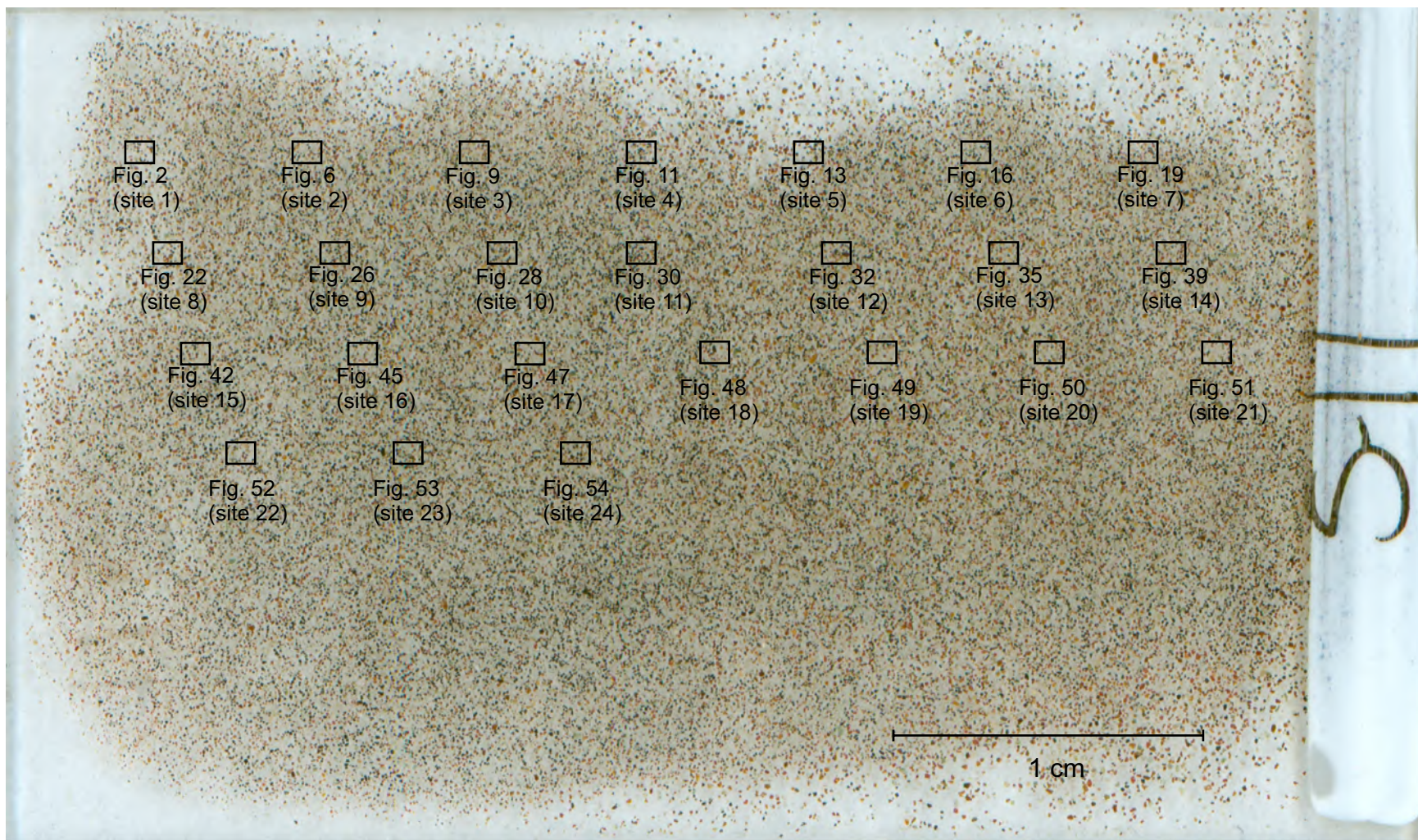


Figure B6.1: Scanned thin section of sample S11 showing the location of analysed sites. This sample comes from a sandy bank ~30cm above the water level from the Lower Louros River. In flood, none rises ~2m.



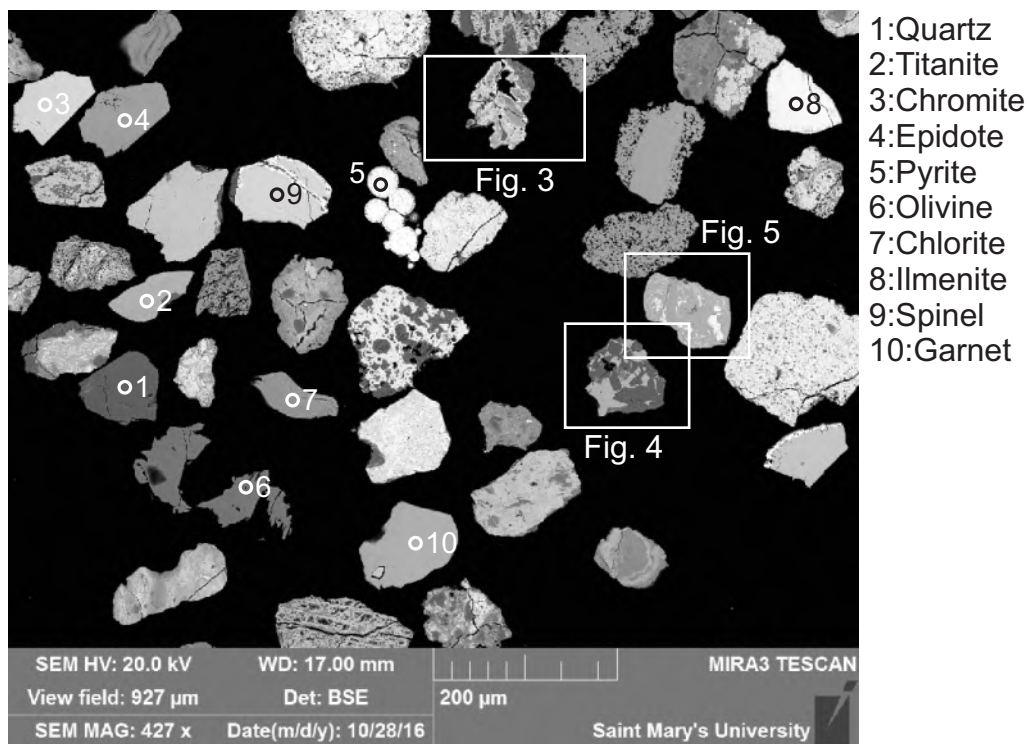


Figure B6.2: Sample S11 site 1 (SEM).

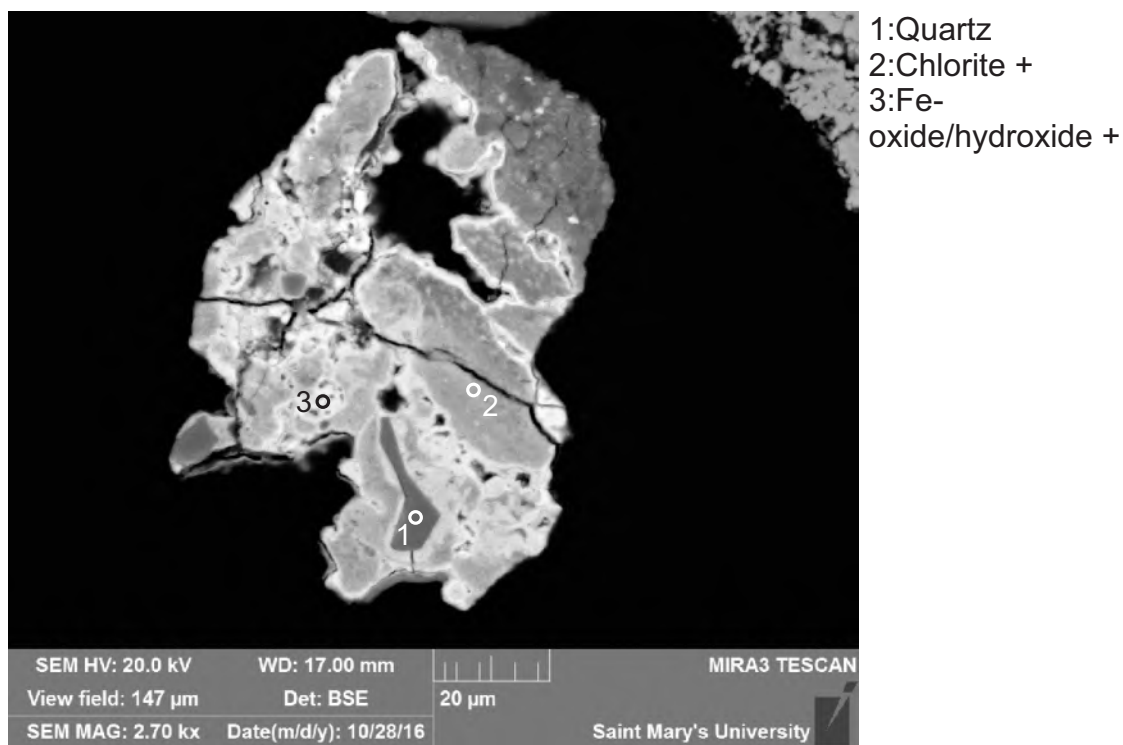


Figure B6.3: Sample S11 site 1.2 (SEM). Lithic clast consisting of quartz + chlorite + Fe-oxide/hydroxide. Probably hydrothermal, possibly pedogenic.



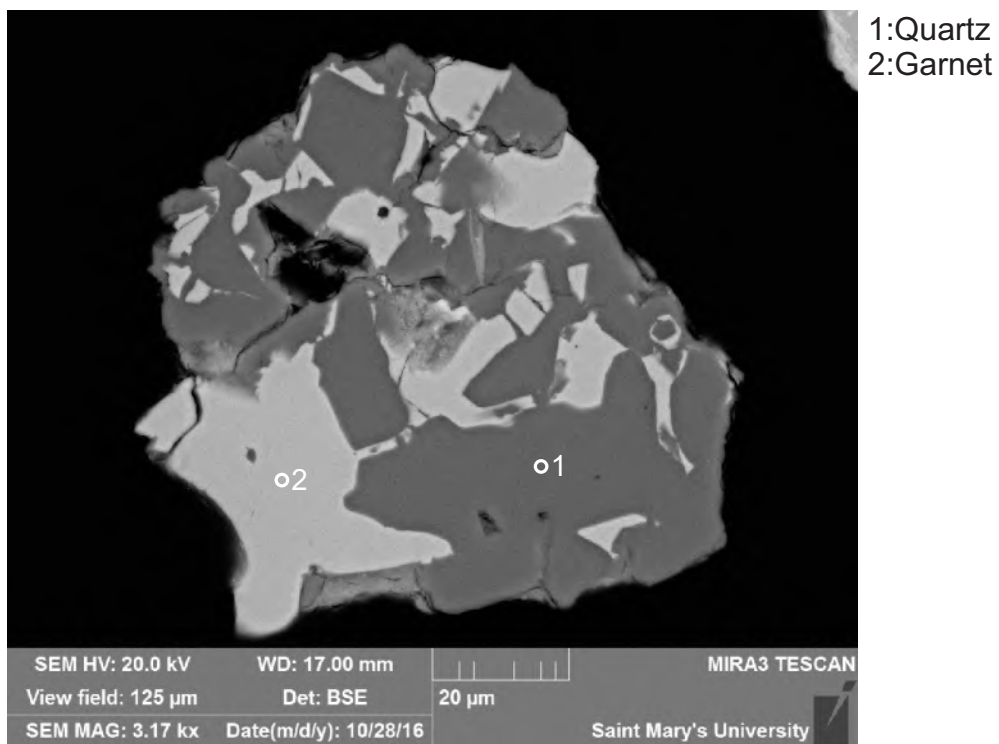


Figure B6.4: Sample S11 site 1.3 (SEM). Lithic clast consisting of garnet + quartz (metamorphic).

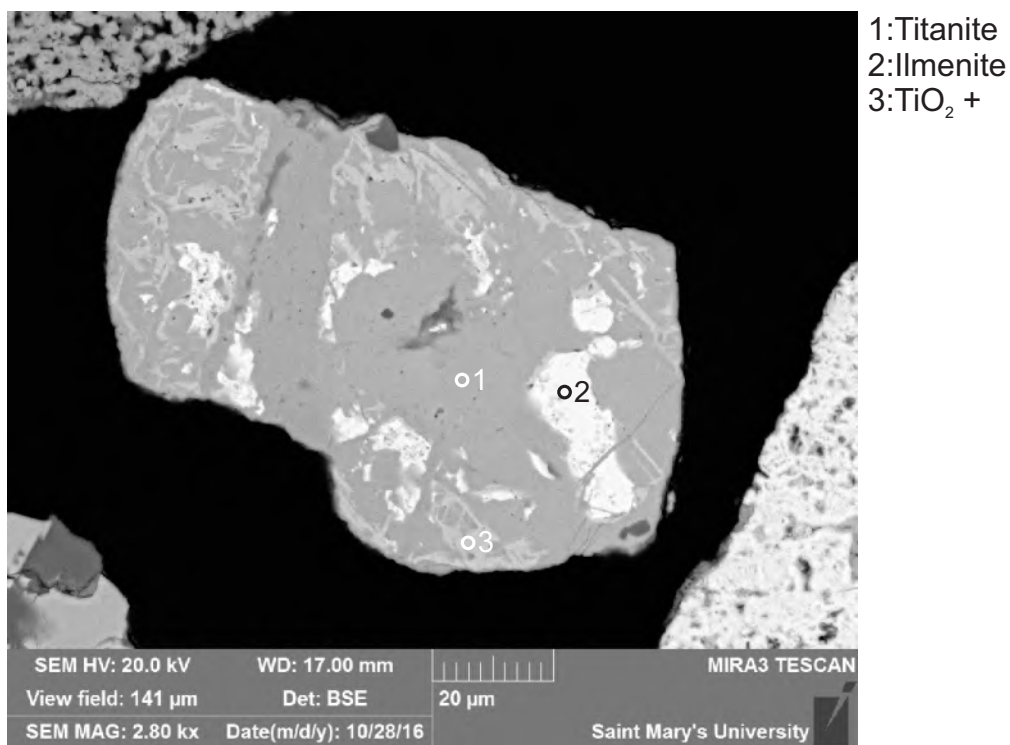


Figure B6.5: Sample S11 site 1.4 (SEM). Lithic clast consisting of titanite + ilmenite + titania. Similar to Fig. B5.43, metamorphic.

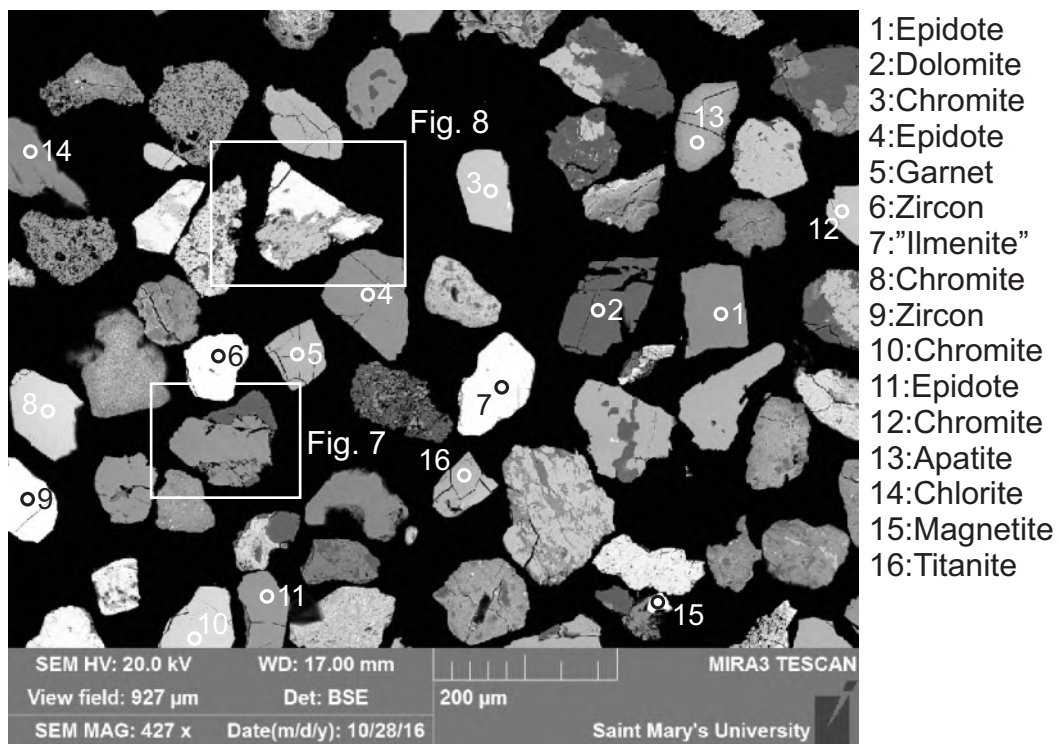


Figure B6.6: Sample S11 site 2 (SEM).

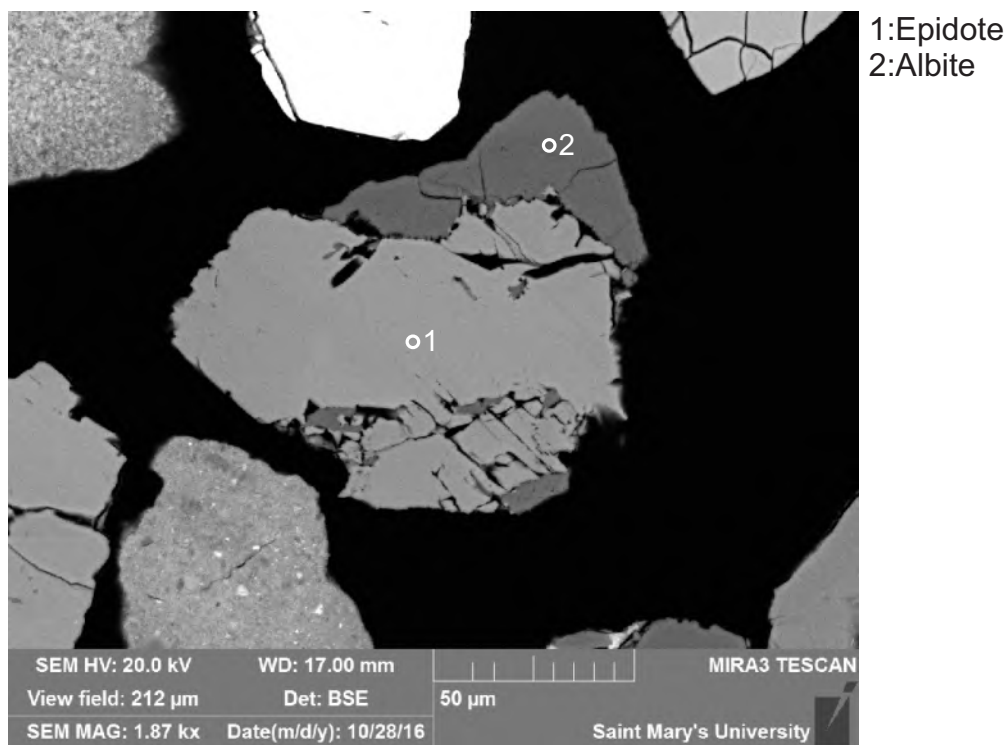


Figure B6.7: Sample S11 site 2.2 (SEM). Lithic clast consisting of epidote + albite, epidote vein.

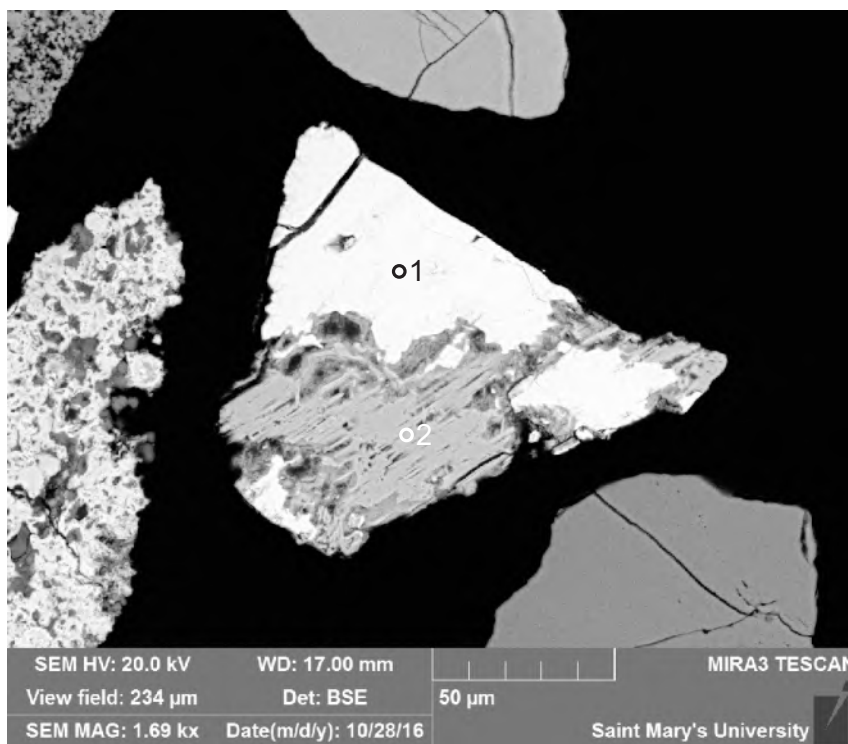


Figure B6.8: Sample S11 site 2.3 (SEM). Partially altered Ilmenite

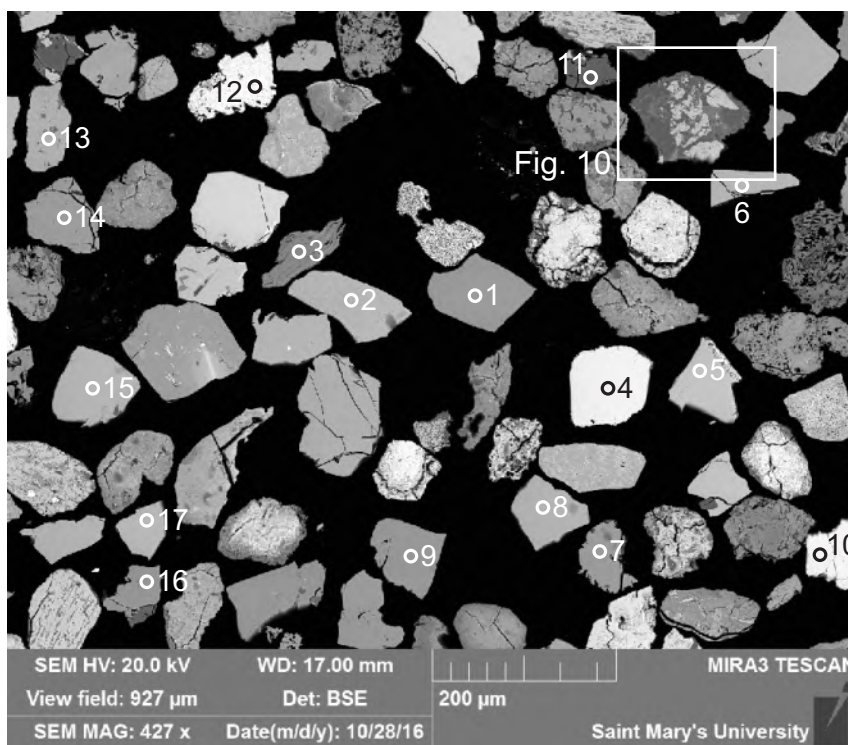
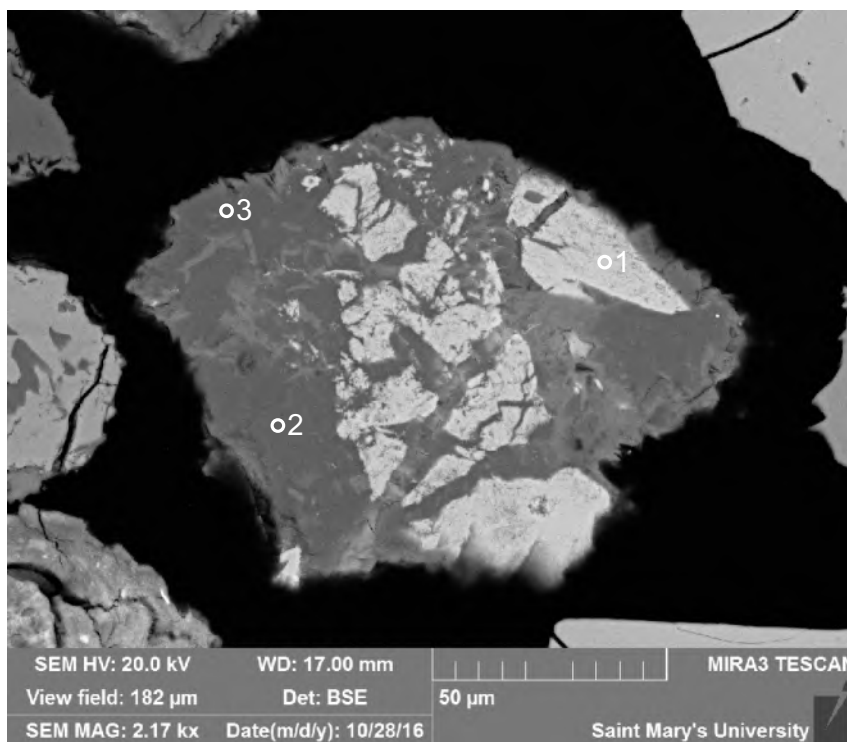
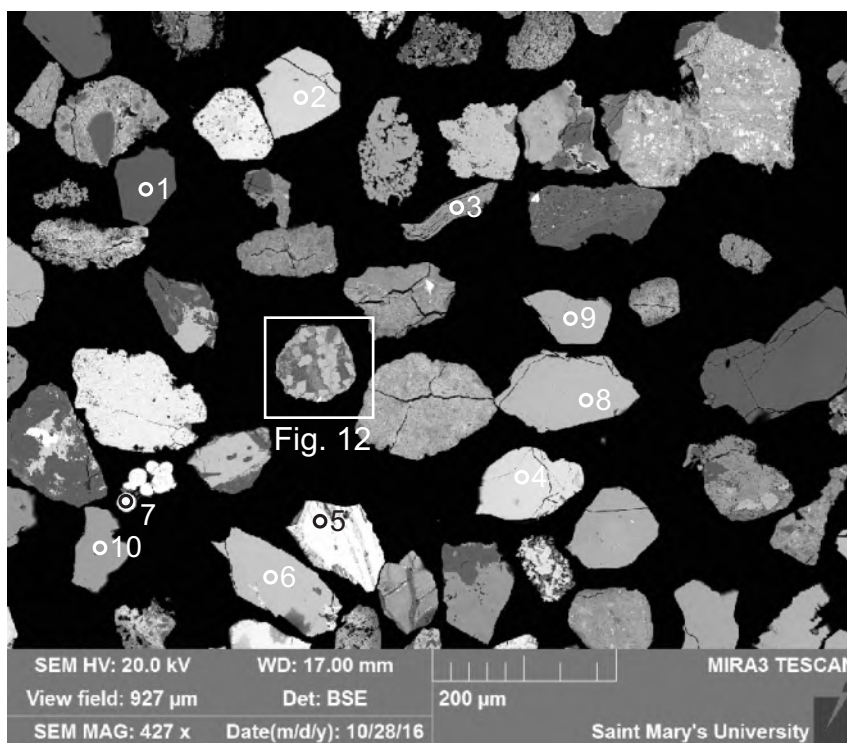


Figure B6.9: Sample S11 site 3 (SEM).



- 1:TiO<sub>2</sub> +
- 2:Quartz
- 3:Quartz

Figure B6.10: Sample S11 site 3.2 (SEM). Lithic clast of quartz + titania, and probably chlorite. Hydrothermal or metamorphic (cf. Fig. B6.12).



- 1:Tourmaline
- 2:Chromite
- 3:Chlorite
- 4:Chromite
- 5:"Ilmenite"
- 6:TiO<sub>2</sub>
- 7:Pyrite
- 8:Spinel
- 9:Garnet
- 10:Garnet

Figure B6.11: Sample S11 site 4 (SEM).



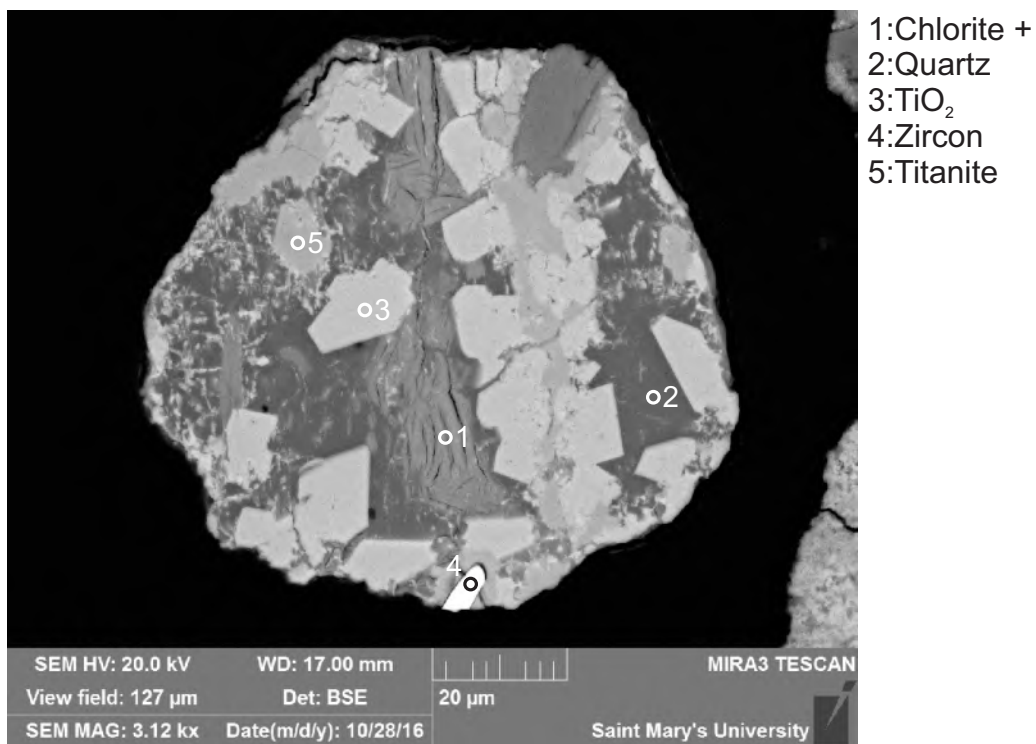


Figure B6.12: Sample S11 site 4.2 (SEM). Lithic clast composed of chlorite + quartz + titanite + titania + zircon (metamorphic).

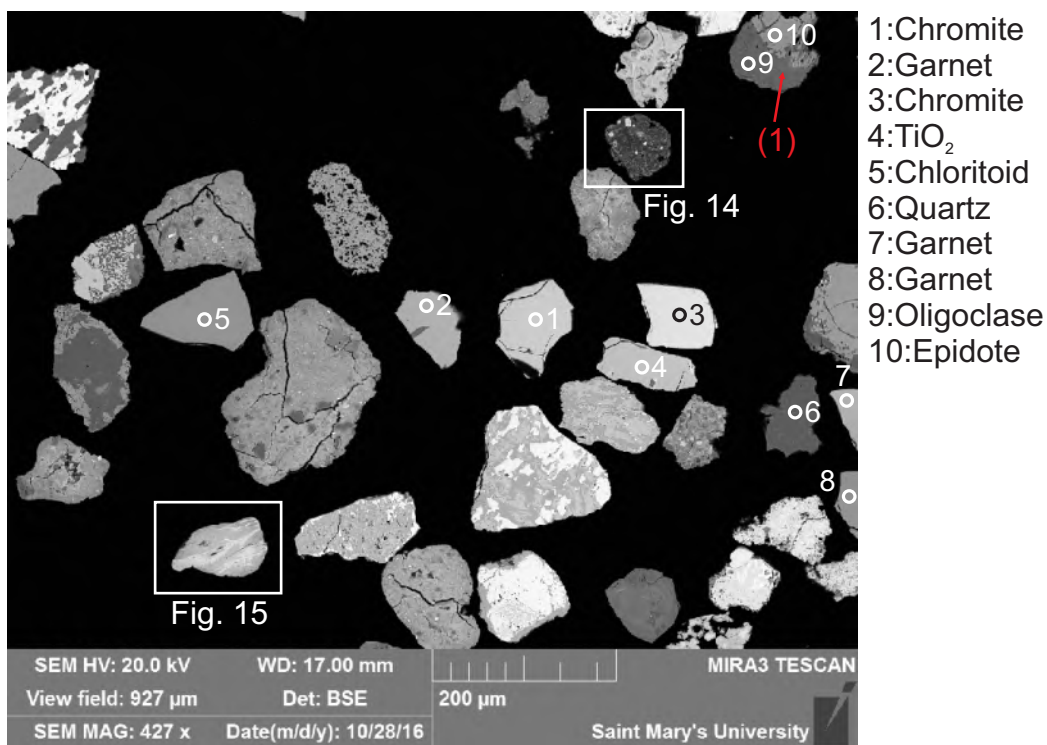
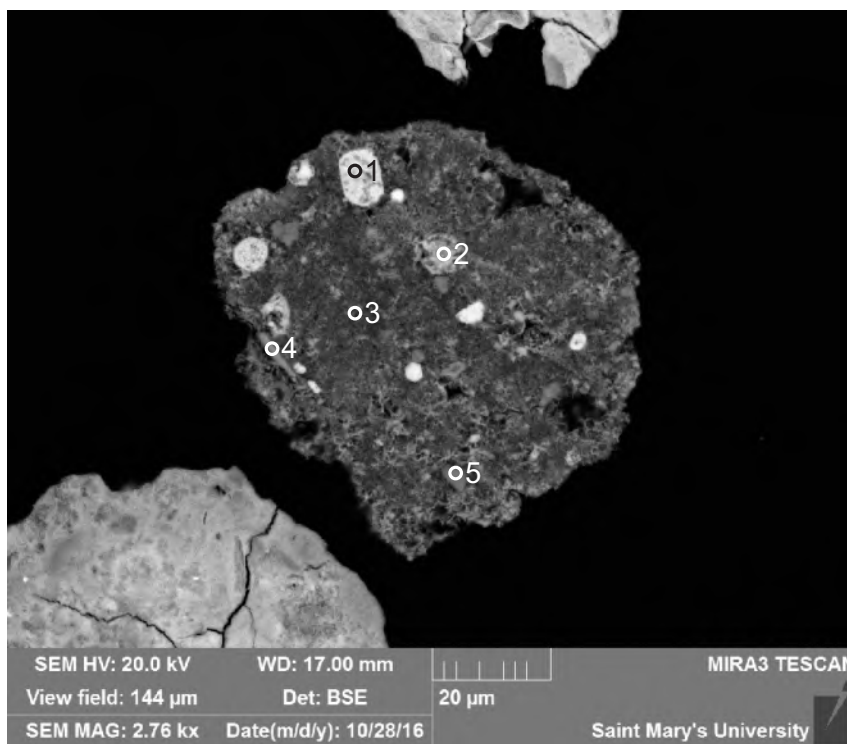


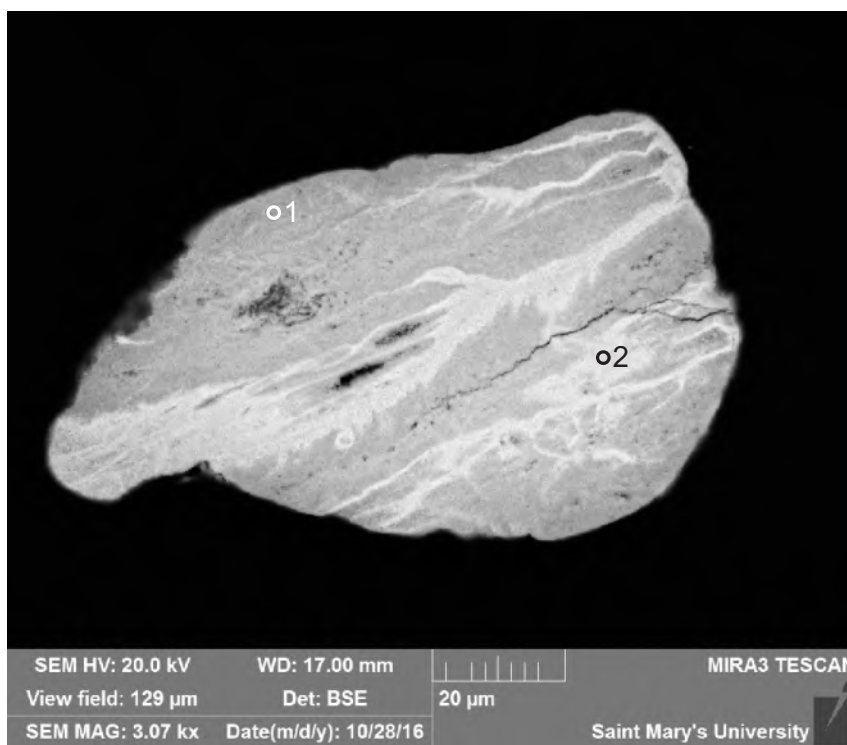
Figure B6.13: Sample S11 site 5 (SEM). 1: Lithic clast (albite + epidote).





- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide + Apatite
- 3:Apatite +
- 4:Muscovite + Apatite +
- 5:Quartz + Apatite

Figure B6.14: Sample S11 site 5.2 (SEM). Lithic clast of apatite + quartz + muscovite + Fe-oxide/hydroxide. Phosphate siltstone. "Apatite" is probably francolite.



- 1:Siderite
- 2:"Magnetite" +

Figure B6.15: Sample S11 site 5.3 (SEM). ?Foliated lithic clast of siderite + magnetite (hydrothermal).

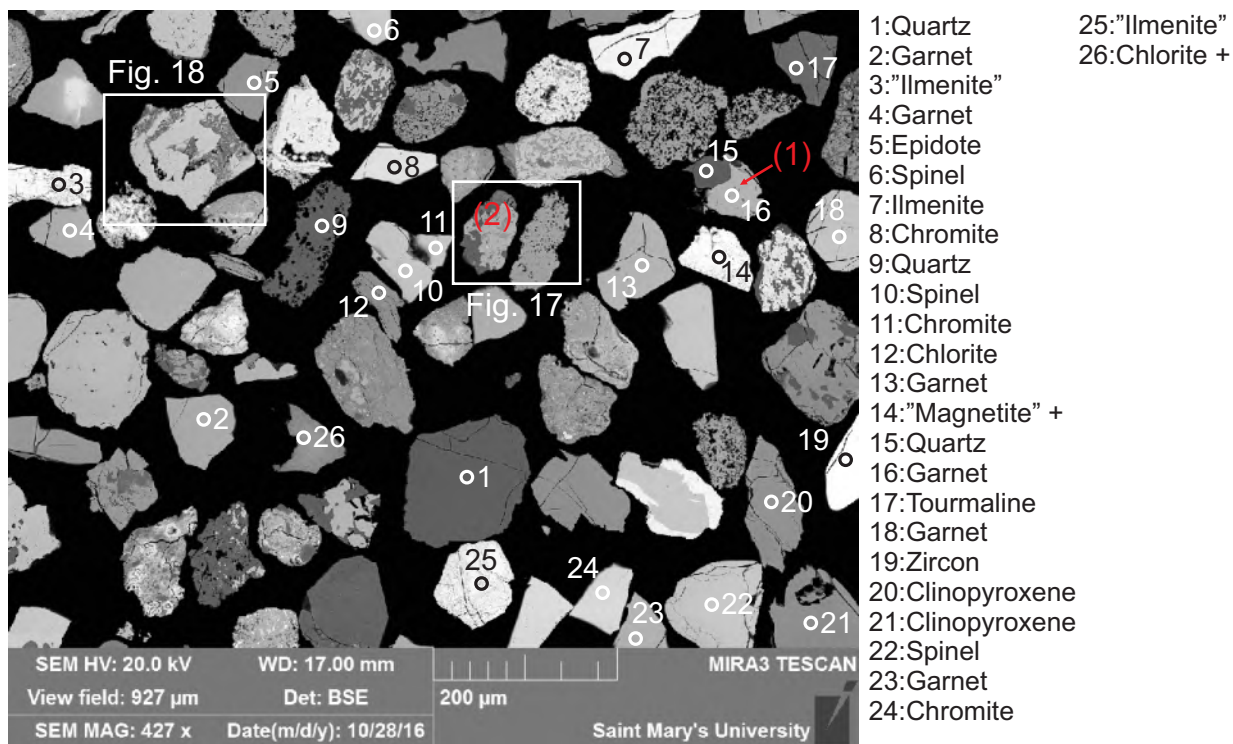


Figure B6.16: Sample S11 site 6 (SEM). 1: Lithic clast (quartz + garnet, metamorphic).

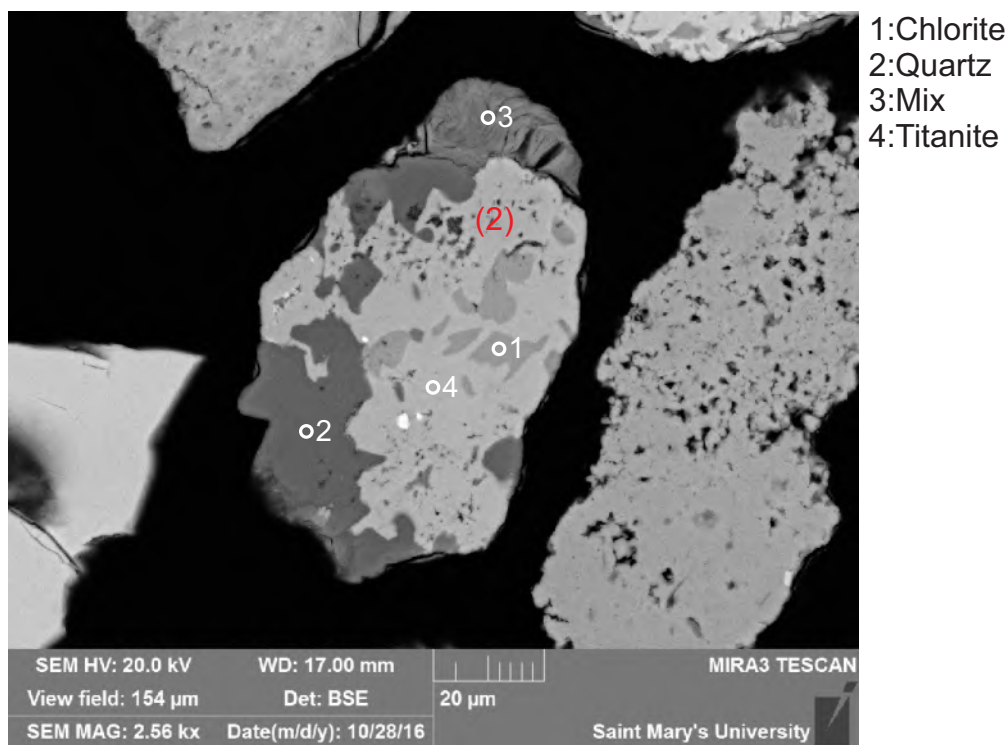
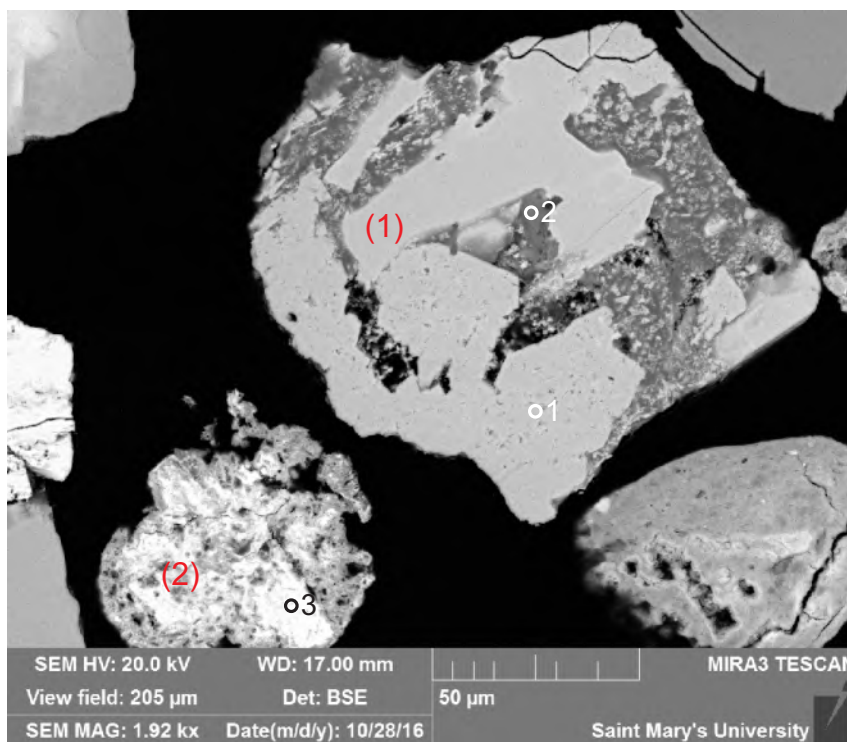
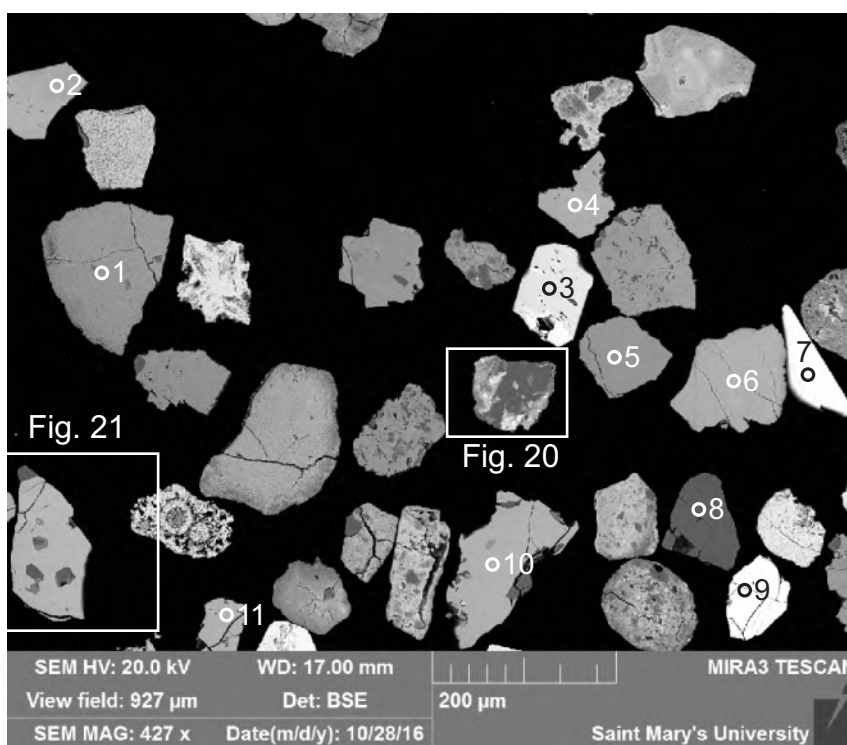


Figure B6.17: Sample S11 site 6.2 (SEM). Lithic clast consisting of chlorite + quartz + titanite. Metamorphic (cf. Fig. B6.12).



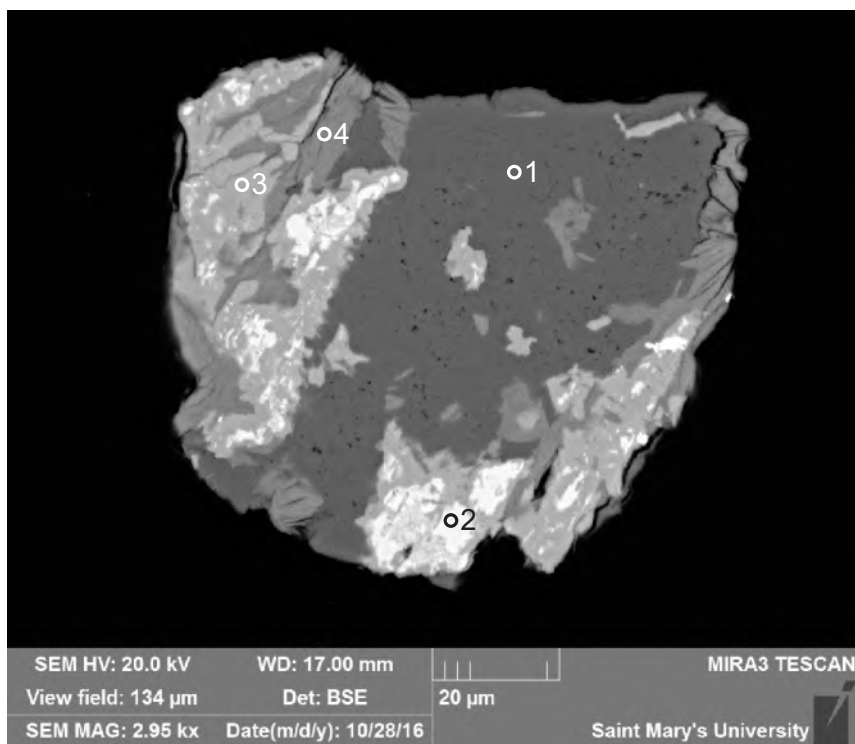
- 1:TiO<sub>2</sub>
- 2:Muscovite +
- 3:"Magnetite" +

Figure B6.18: Sample S11 site 6.3 (SEM). 1: Lithic clast composed of titania + muscovite (metamorphic, muscovite schist with rutile porphyroblasts). 2: Lithic clast of quartz + magnetite (cf. Fig. B3.54).



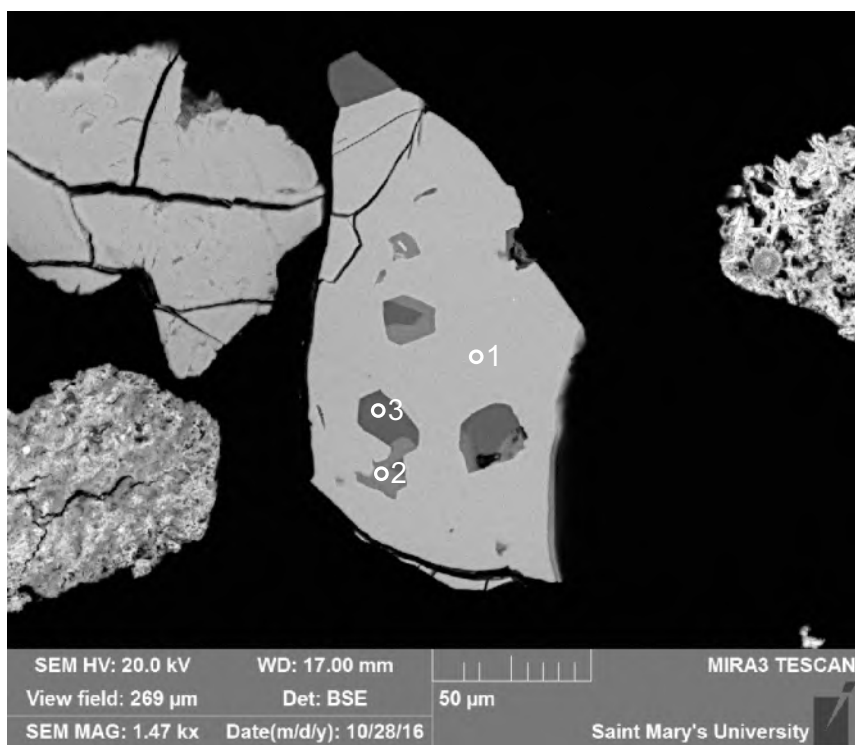
- 1:Apatite +
- 2:Garnet
- 3:Chromite
- 4:Garnet
- 5:Epidote
- 6:Apatite
- 7:Fe-oxide/hydroxide
- 8:Dolomite
- 9:"Chromite"
- 10:Garnet
- 11:Garnet

Figure B6.19: Sample S11 site 7 (SEM).



- 1:Albite
- 2:Ilmenite
- 3:Titanite
- 4:Chlorite

Figure B6.20: Sample S11 site 7.2 (SEM). Lithic clast consisting of albite + ilmenite + titanite + chlorite (metamorphic), cf. B5.43, B3.29.



- 1:Garnet
- 2:Chlorite
- 3:Quartz

Figure B6.21: Sample S11 site 7.3 (SEM). Lithic clast consisting of garnet with inclusions of quartz + chlorite. Metamorphic.



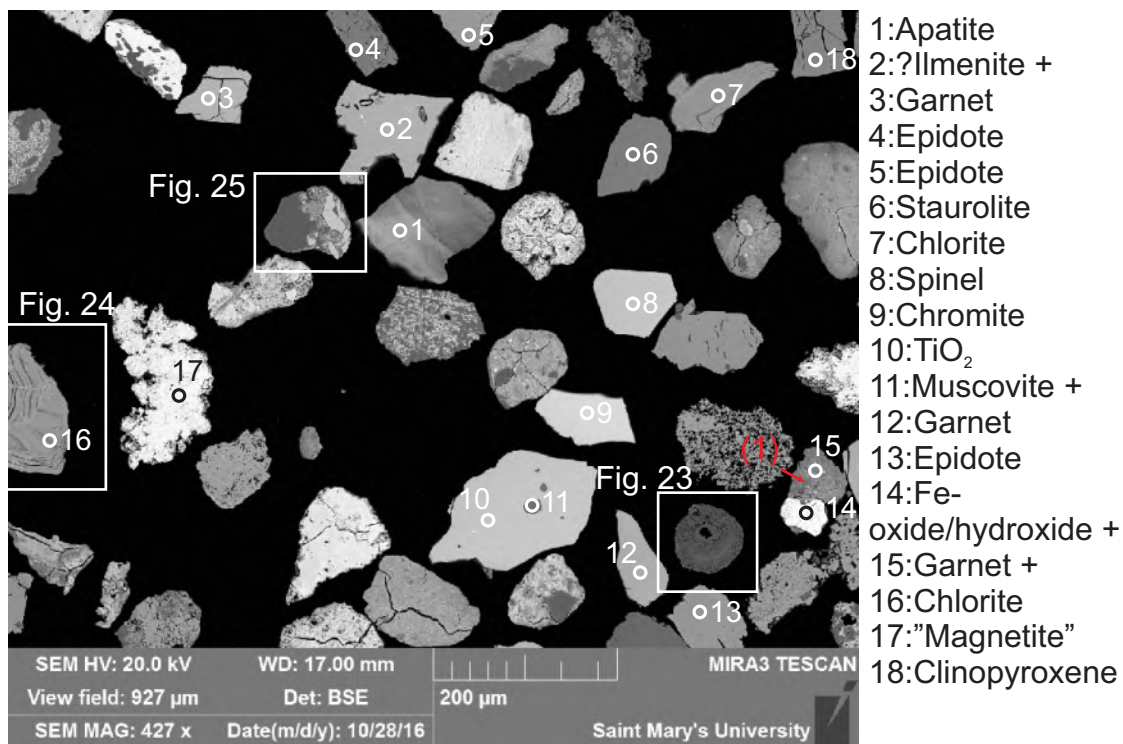


Figure B6.22: Sample S11 site 8 (SEM). Lithic clast consisting of garnet + Fe-oxide/hydroxide.

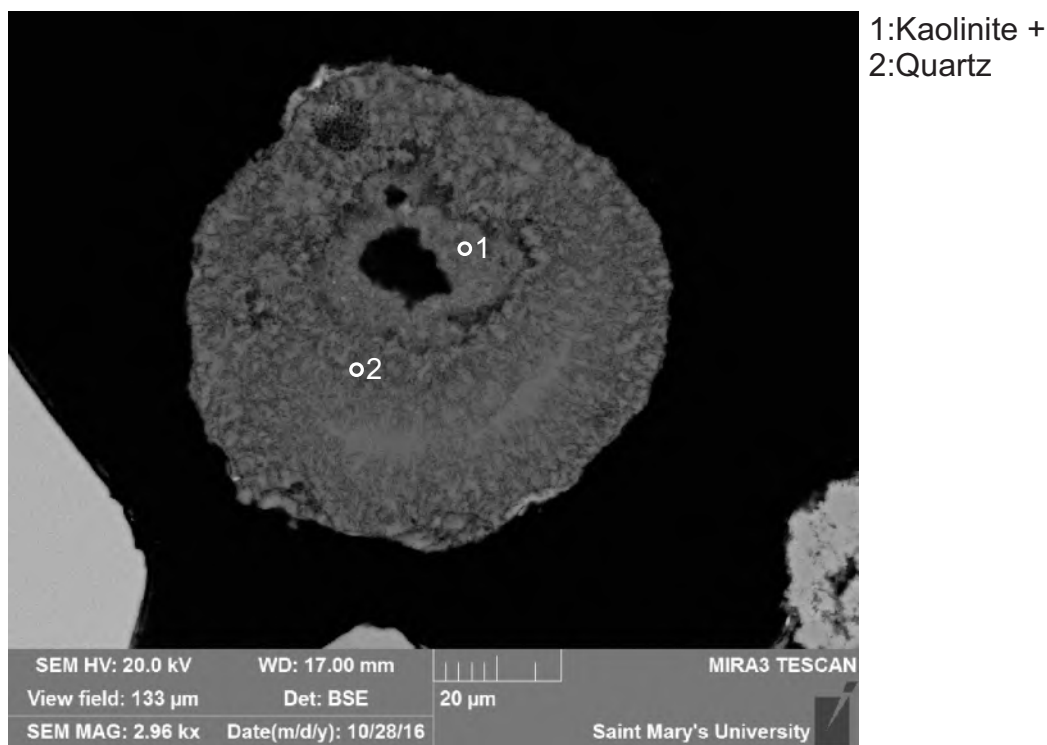
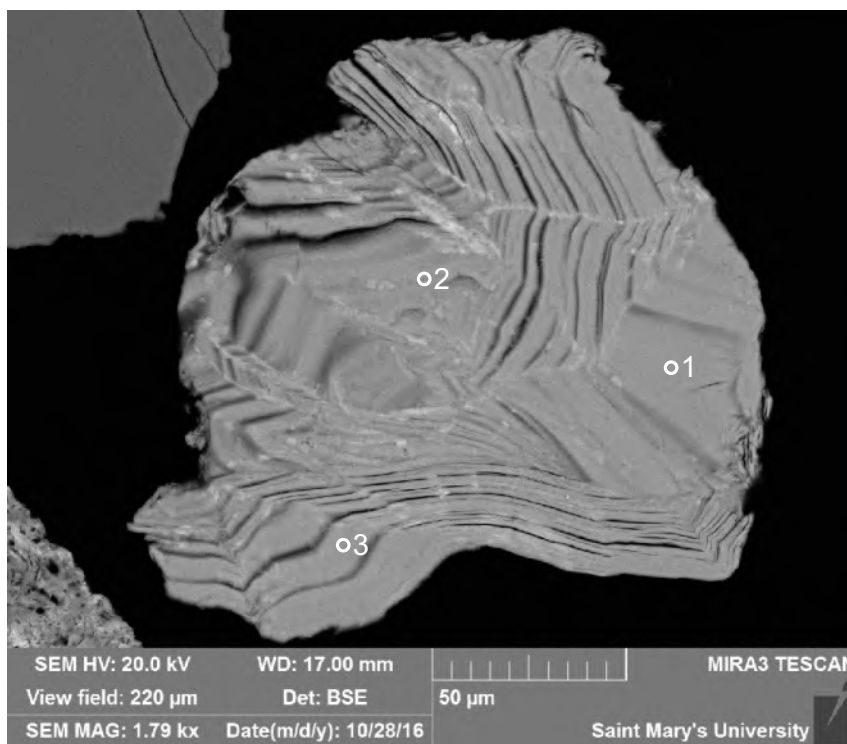
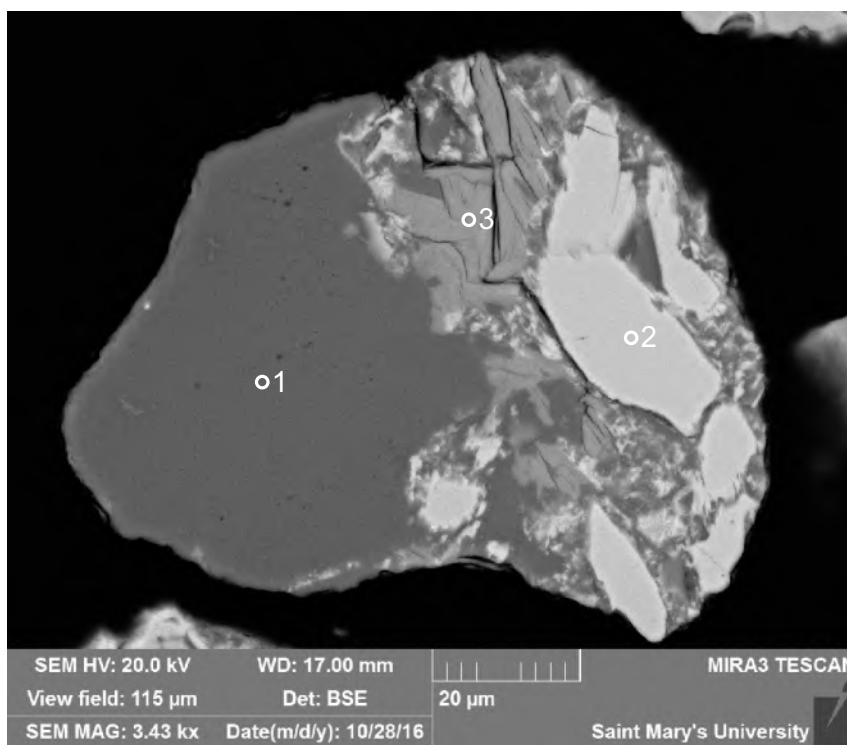


Figure B6.23: Sample S11 site 8.2 (SEM). Pedogenetic clast.



- 1:Chlorite
- 2:Chlorite
- 3:Chlorite

Figure B6.24: Sample S11 site 8.3 (SEM). Deformed chlorite clast (chlorite schist).



- 1:Quartz
- 2:TiO<sub>2</sub>
- 3:Garnet

Figure B6.25: Sample S11 site 8.4 (SEM). Lithic clast consisting of quartz + garnet + titania (metamorphic).

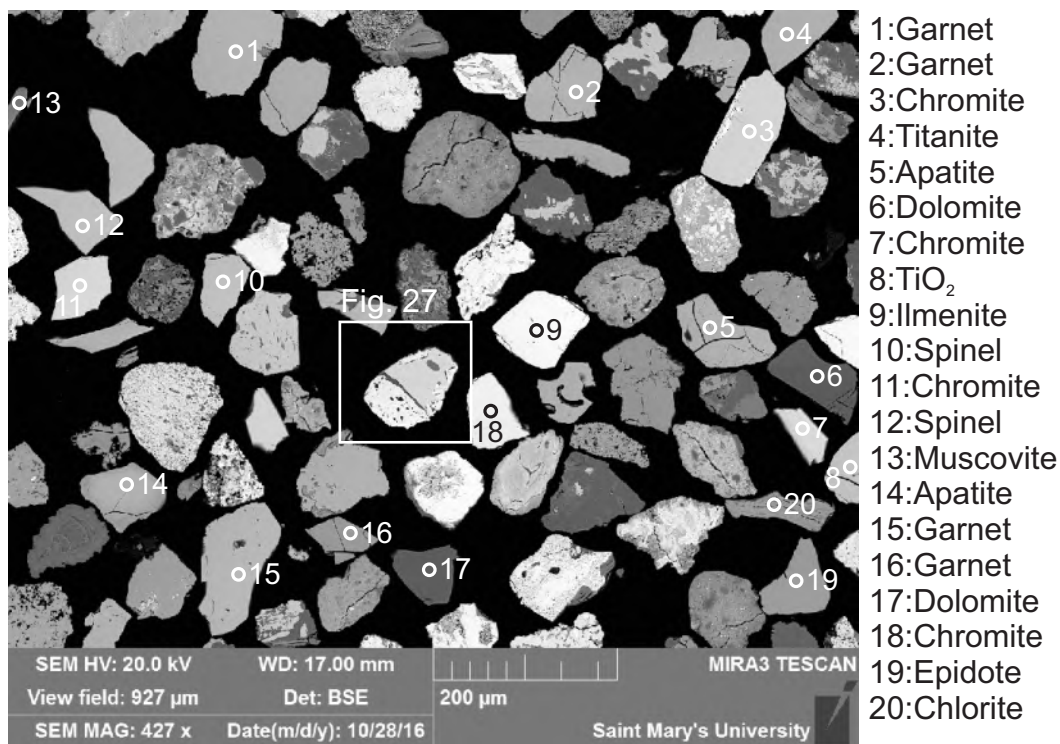


Figure B6.26: Sample S11 site 9 (SEM).

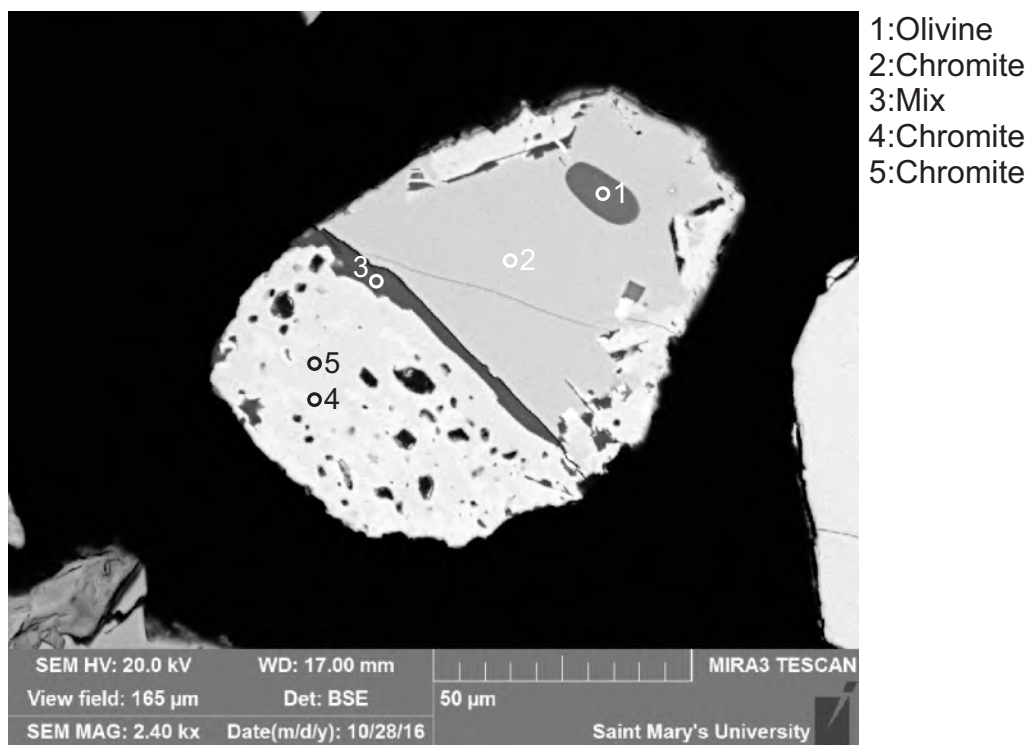


Figure B6.27: Sample S11 site 9.2 (SEM). Lithic clast consisting of chromite with olivine inclusions. Ophiolite.

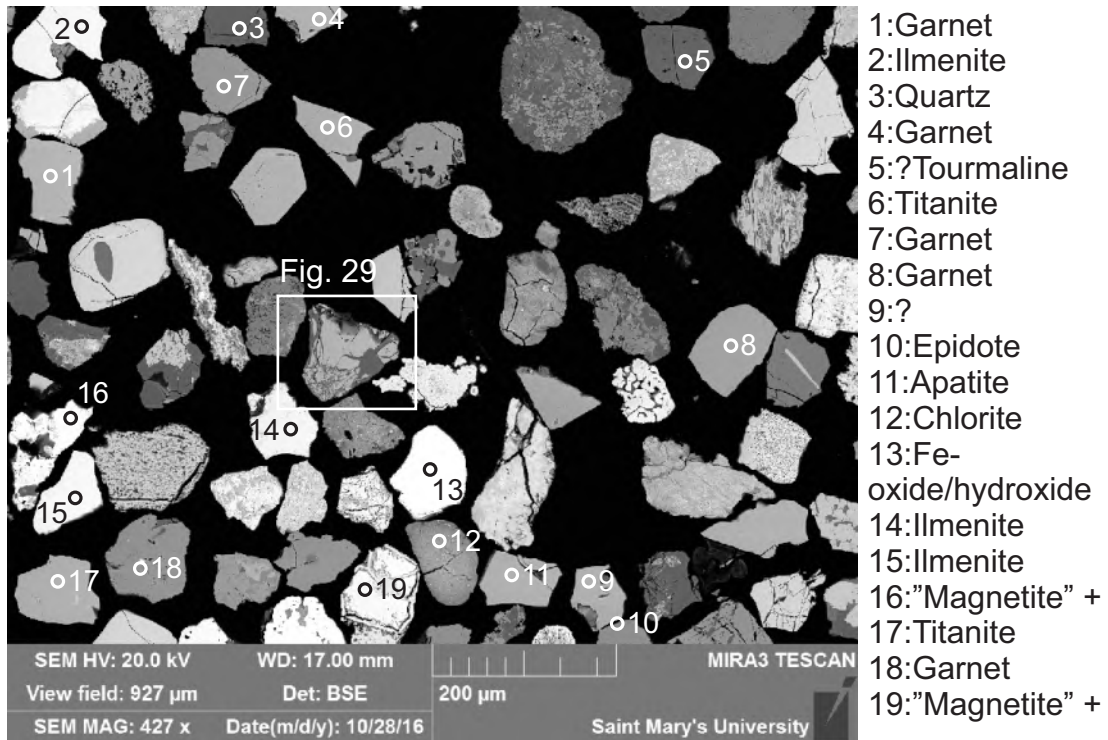


Figure B6.28: Sample S11 site 10 (SEM).

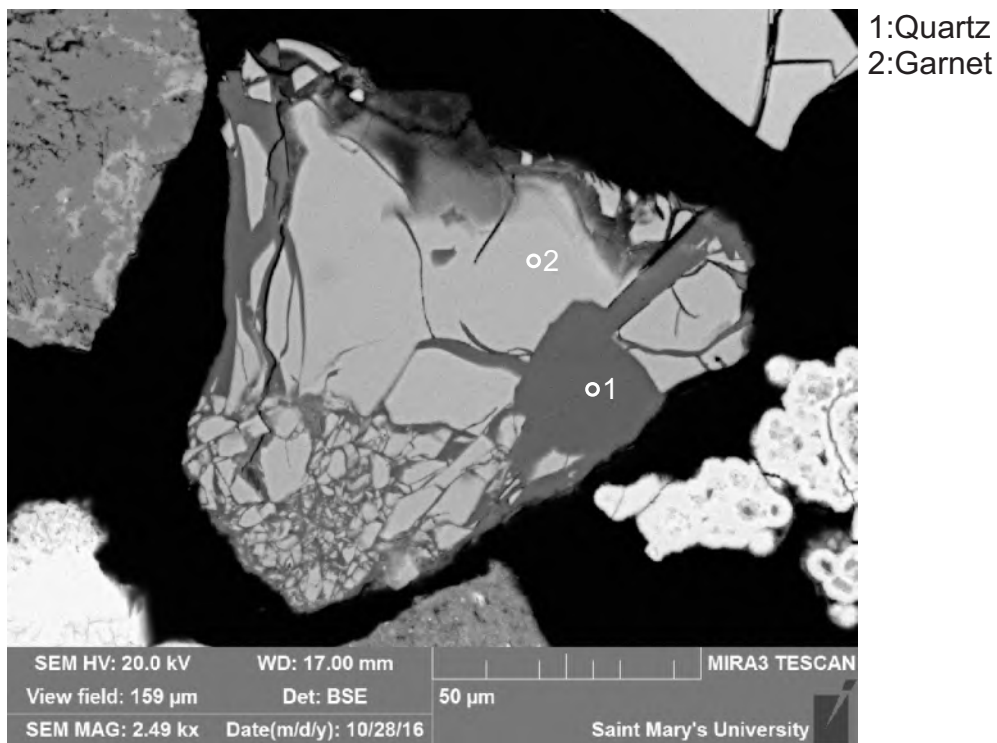


Figure B6.29: Sample S11 site 10.2 (SEM). Lithic clast of quartz + garnet (metamorphic).



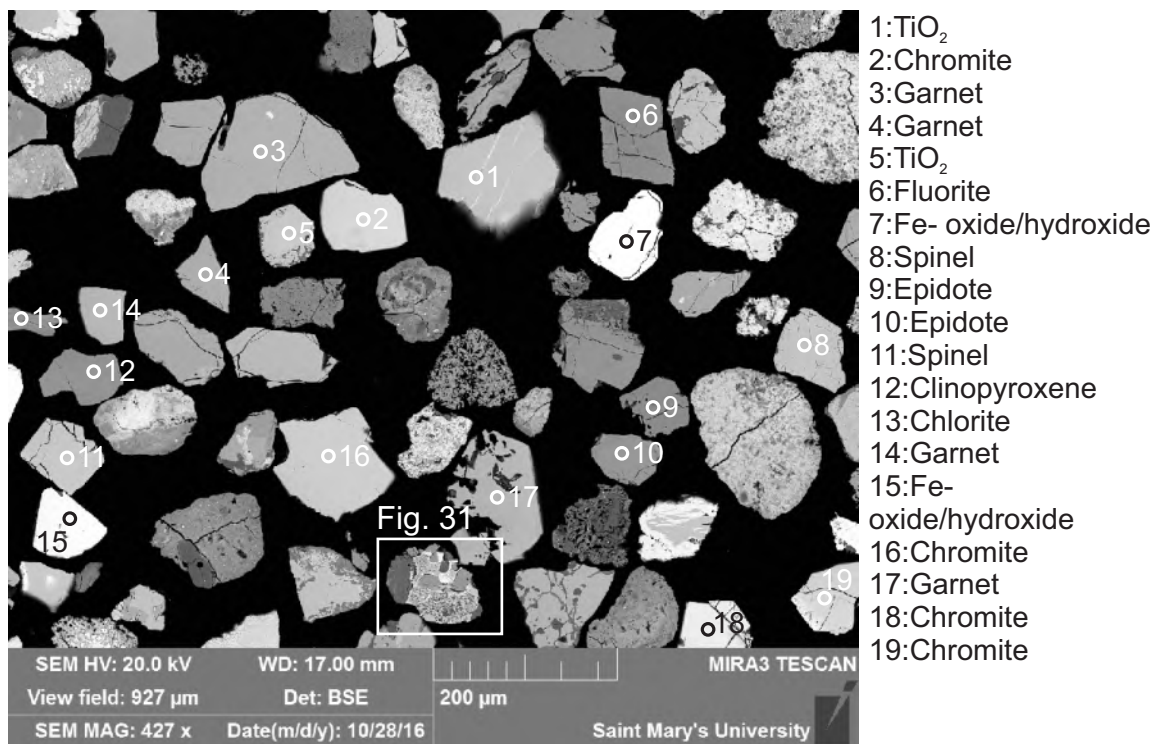


Figure B6.30: Sample S11 site 11 (SEM).

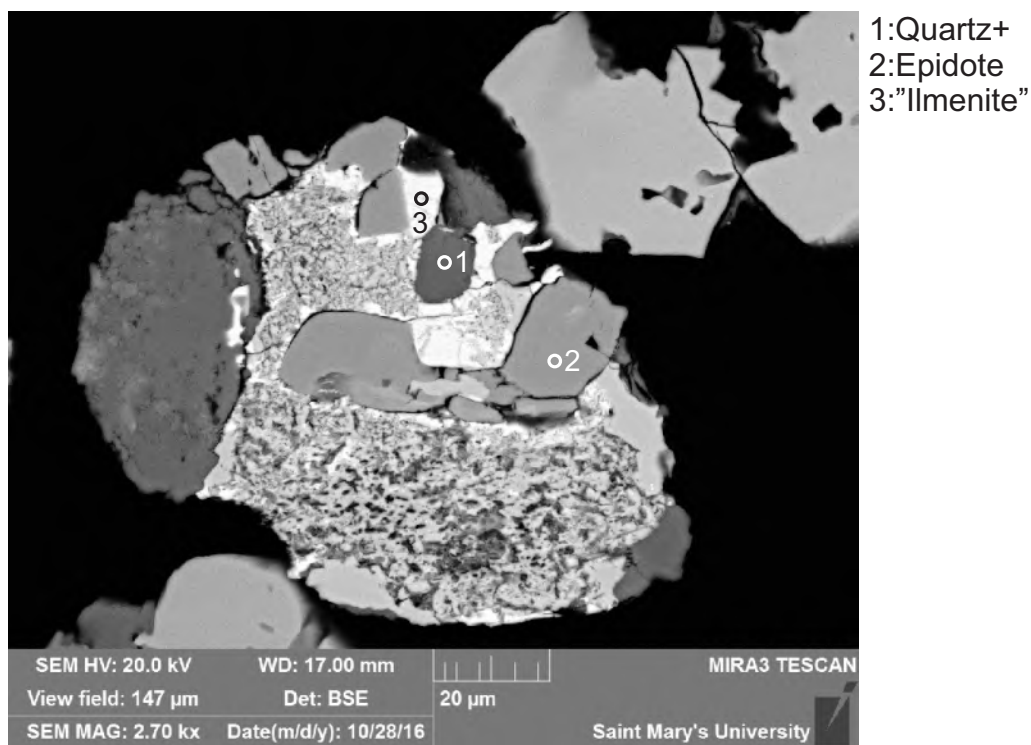


Figure B6.31: Sample S11 site 11.2 (SEM). Lithic clast consisting of quartz + epidote + ilmenite. Spongy mineral is probably titania replacing ilmenite. Hydrothermal vein.

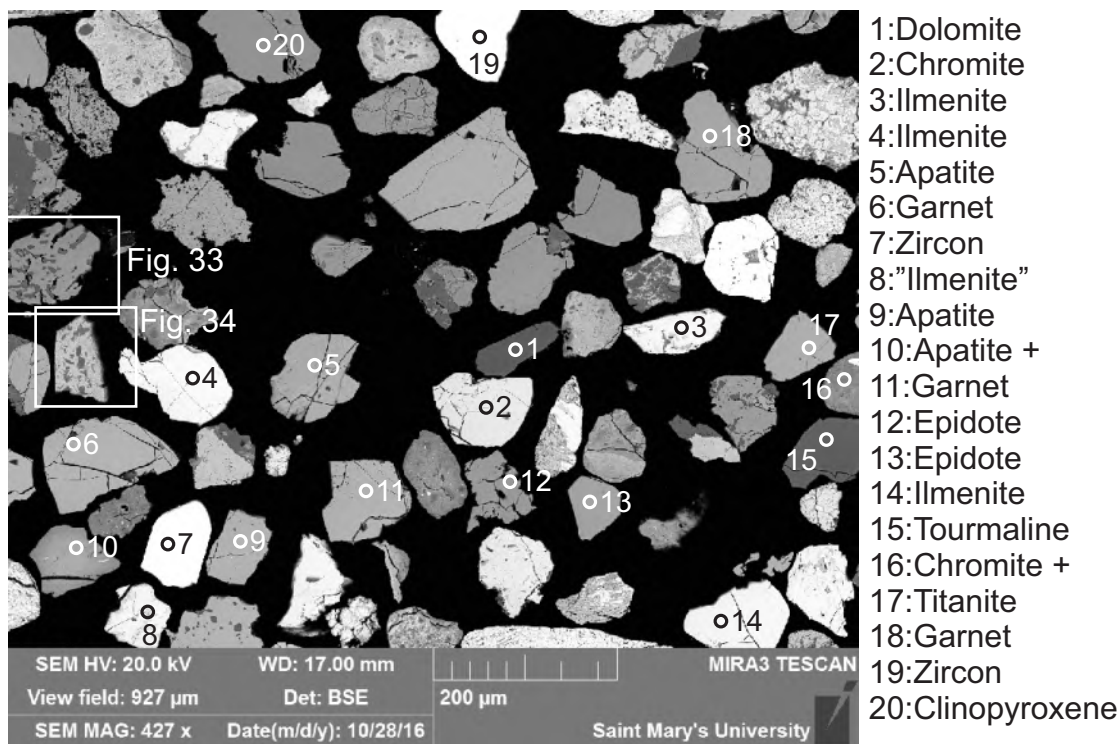


Figure B6.32: Sample S11 site 12 (SEM).

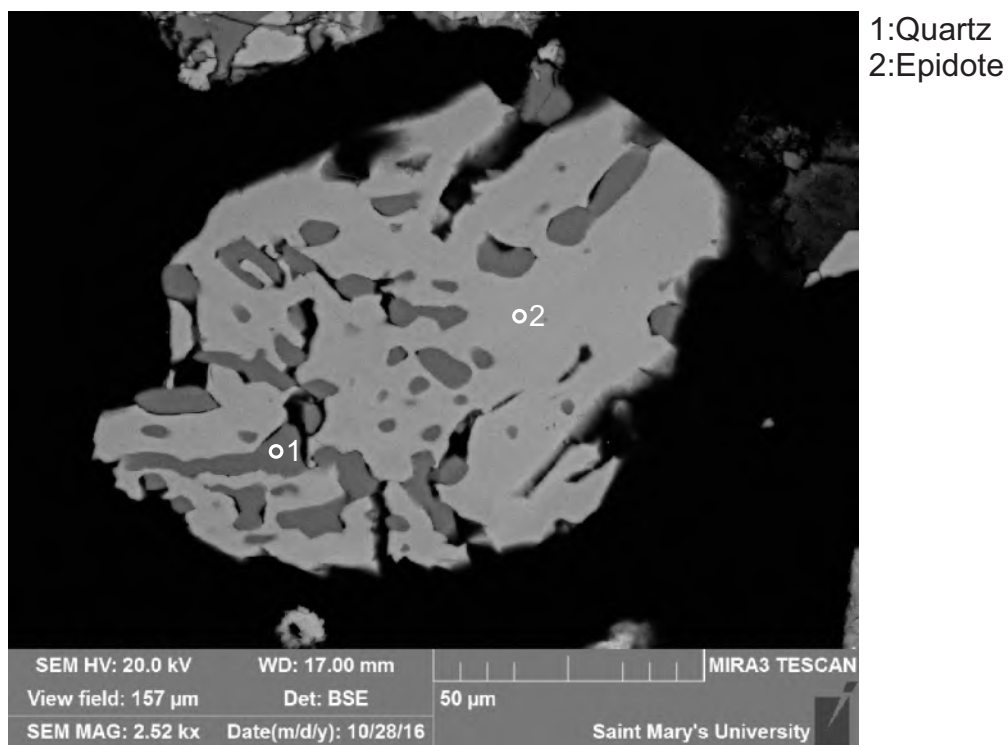
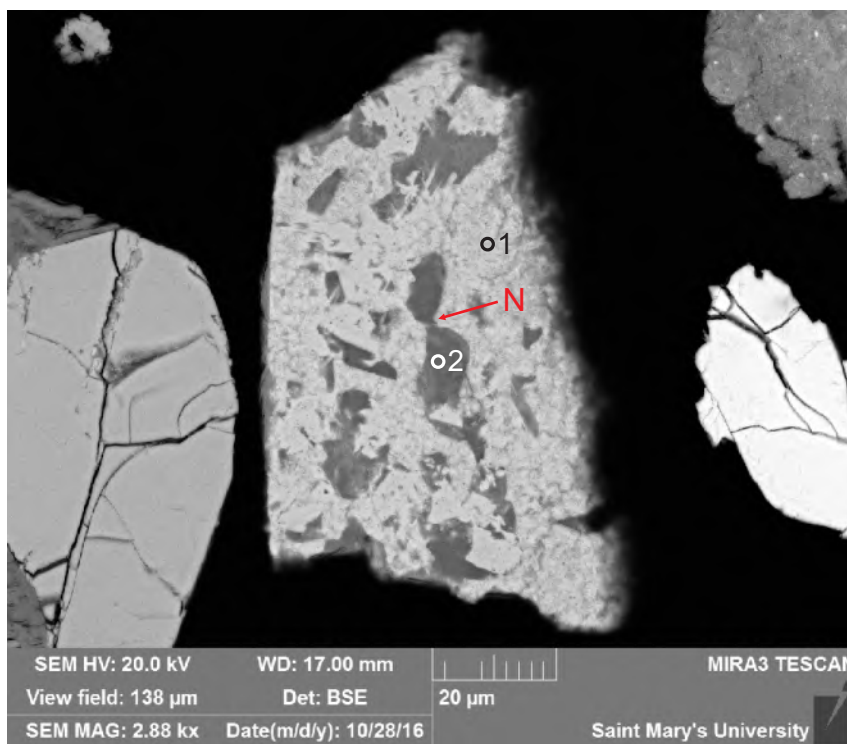
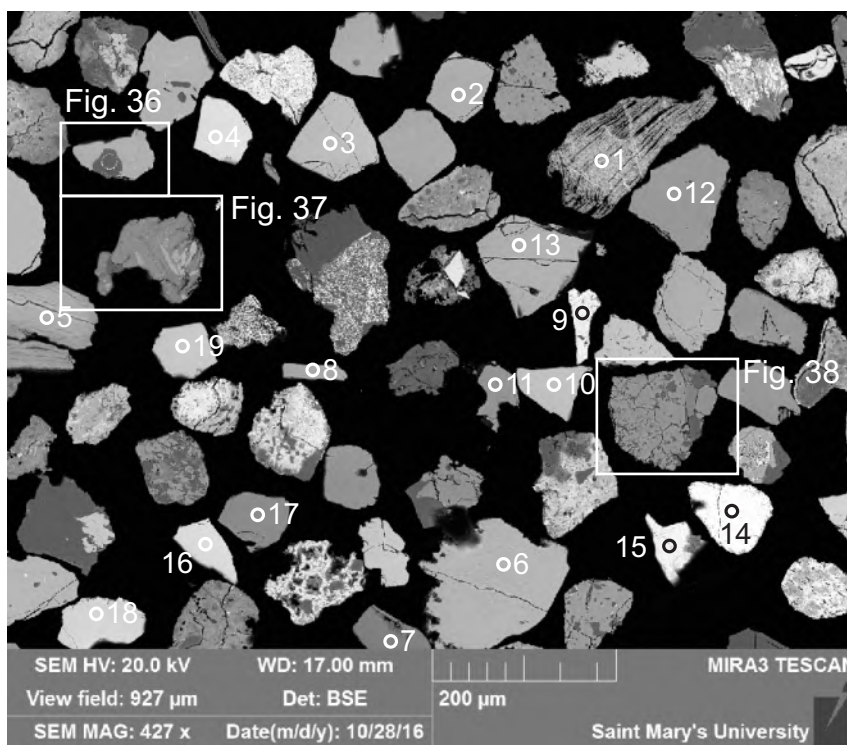


Figure B6.33: Sample S11 site 12.2 (SEM). Hydrothermal clast of quartz + epidote.



1:TiO<sub>2</sub>  
2:Quartz +  
N = necking

Figure B6.34: Sample S11 site 12.3 (SEM). Lithic clast of titania + quartz, probably altered ilmenite with quartz inclusions. Igneous.



1:Mix  
2:Garnet  
3:Spinel  
4:Chromite  
5:Apatite +  
6:Apatite +  
7:Chlorite  
8:Apatite  
9:"Magnetite" +  
10:Chromite  
11:Garnet  
12:Garnet  
13:Spinel  
14:Fe-oxide/hydroxide +  
15:Ilmenite  
16:Chromite  
17:Epidote  
18:Chromite  
19:Chromite

Figure B6.35: Sample S11 site 13 (SEM).

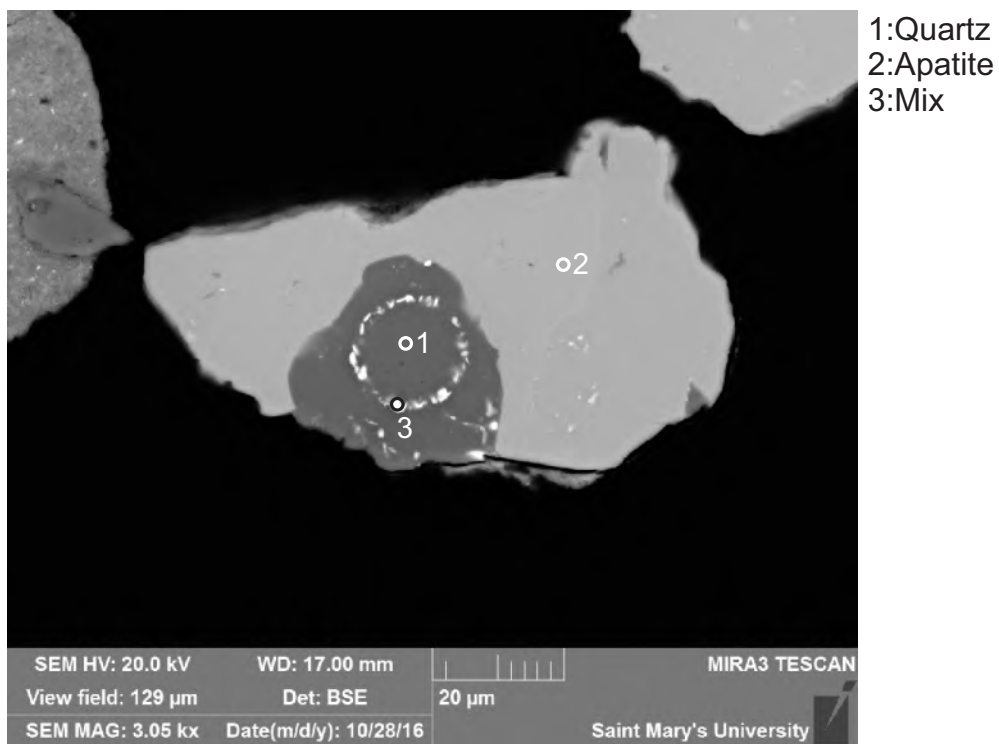


Figure B6.36: Sample S11 site 13.2 (SEM). Lithic clast consisting of quartz + apatite + Fe-oxide/hydroxide. ?Igneous.

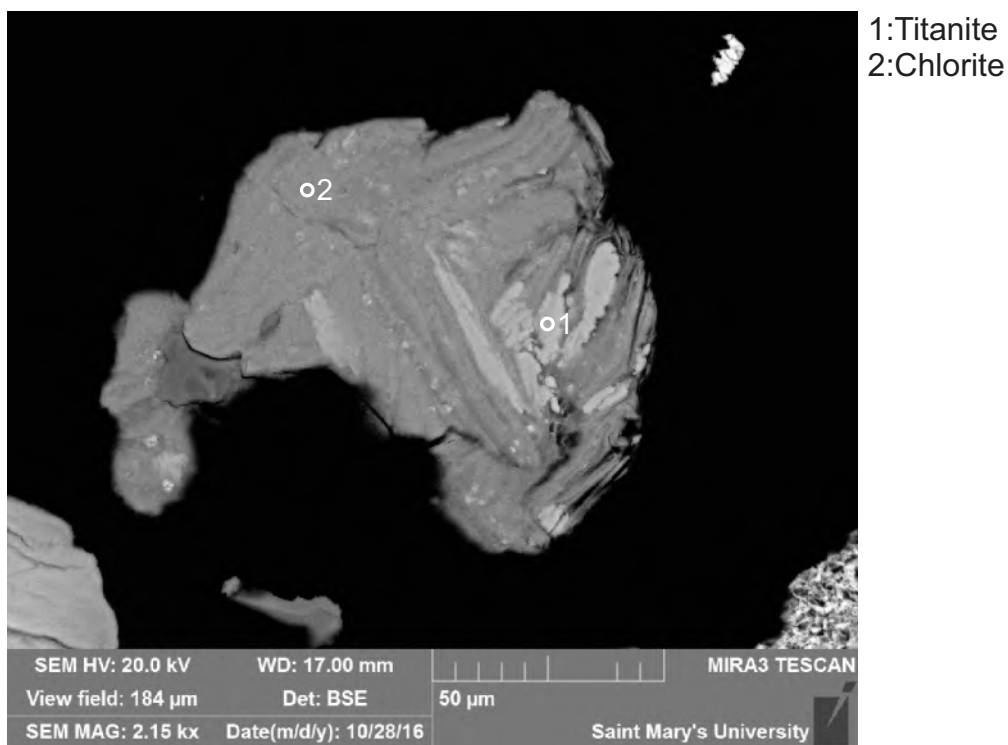
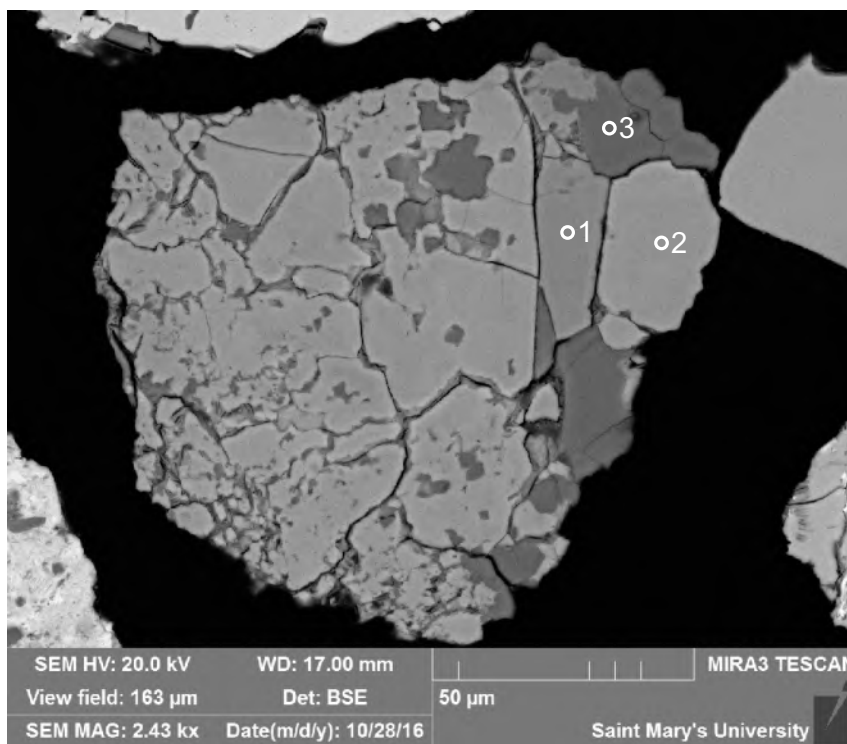


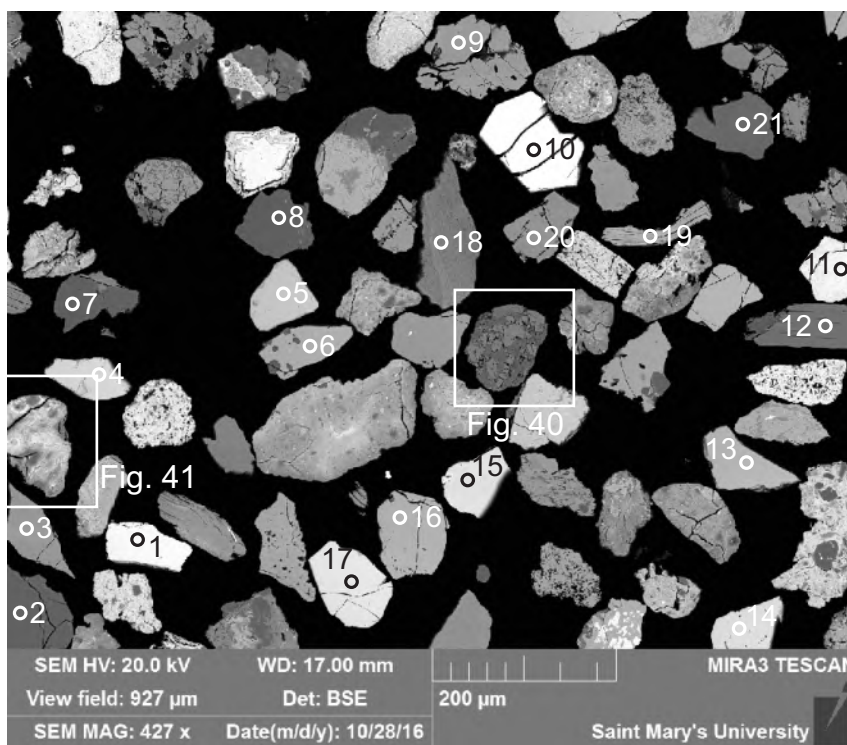
Figure B6.37: Sample S11 site 13.3 (SEM). Lithic clast consisting of titanite + chlorite. Metamorphic.





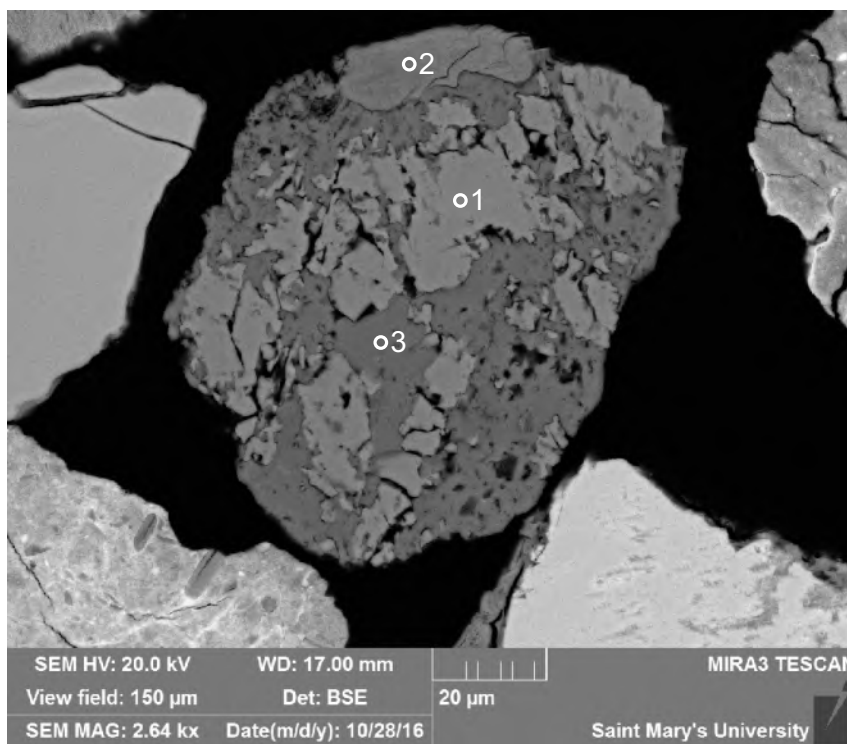
- 1:Epidote
- 2:Epidote
- 3:Quartz

Figure B6.38: Sample S11 site 13.4 (SEM). Hydrothermal clast of epidote + quartz.



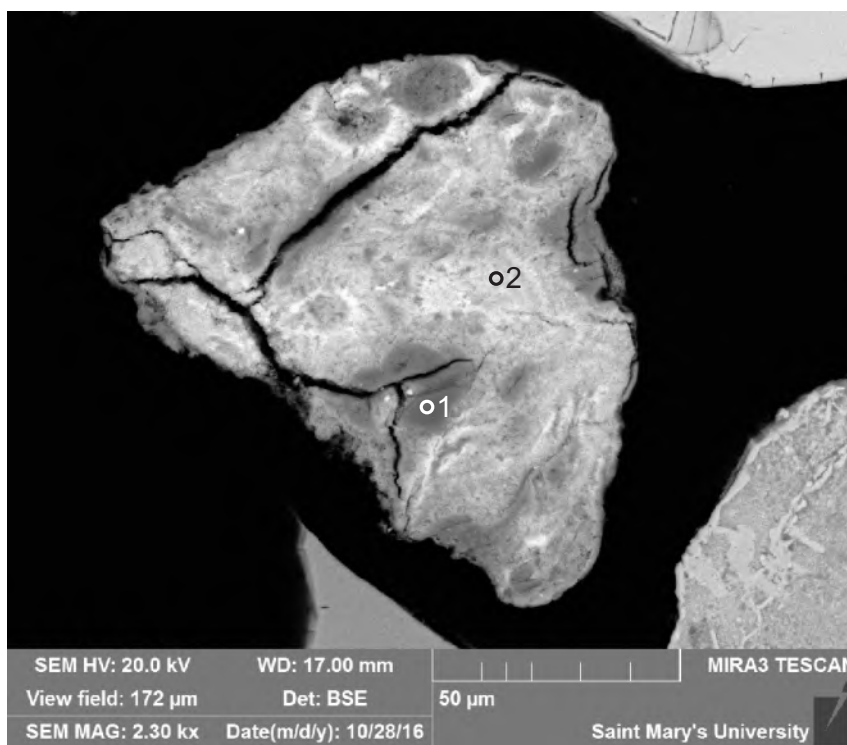
- 1:Ilmenite
- 2:Quartz
- 3:Garnet
- 4:Chromite
- 5:TiO<sub>2</sub>
- 6:Garnet
- 7:Quartz
- 8:Quartz
- 9:Garnet
- 10:Fe-oxide/hydroxide
- 11:Ilmenite
- 12:Orthopyroxene
- 13:Garnet
- 14:Chromite
- 15:Chromite
- 16:Titanite
- 17:Chromite
- 18:Apatite
- 19:Biotite +
- 20:Epidote
- 21:Tourmaline

Figure B6.39: Sample S11 site 14 (SEM).



1:Epidote  
2:Chlorite  
3:Albite

Figure B6.40: Sample S11 site 14.2 (SEM). Lithic clast consisting of epidote + chlorite + albite. Hydrothermal.



1:Quartz  
2:Mix (Feohy,  
chlorite, apatite)

Figure B6.41: Sample S11 site 14.3 (SEM). Texture appears hydrothermal.

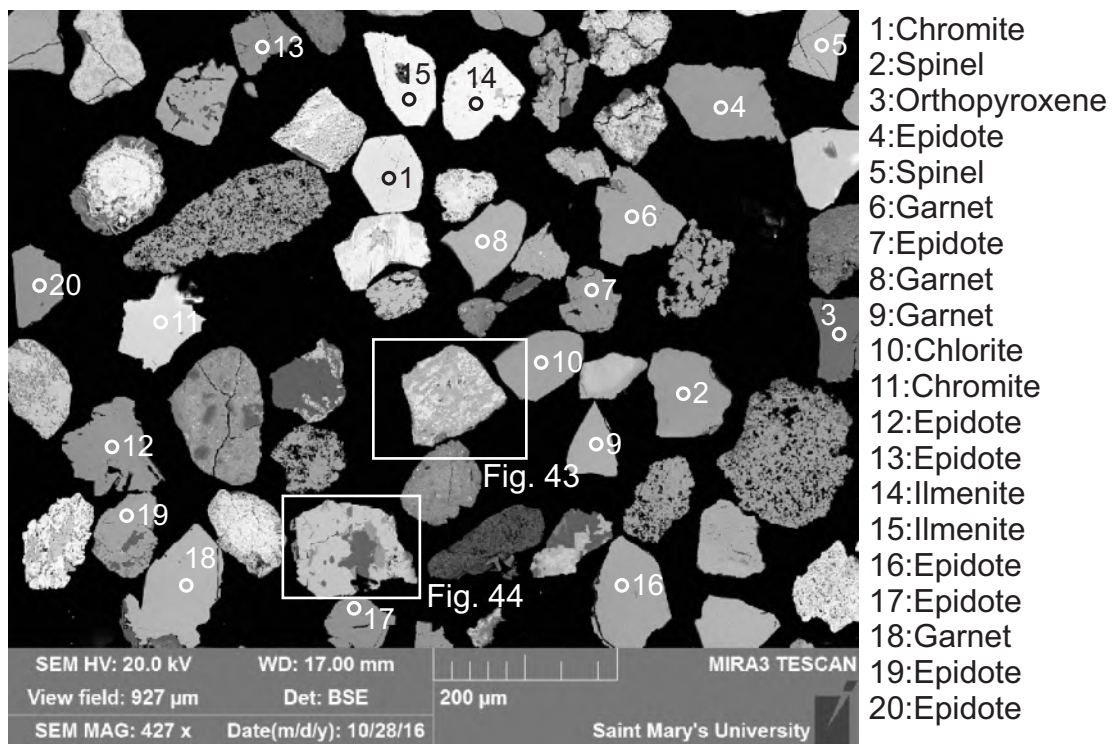


Figure B6.42: Sample S11 site 15 (SEM).

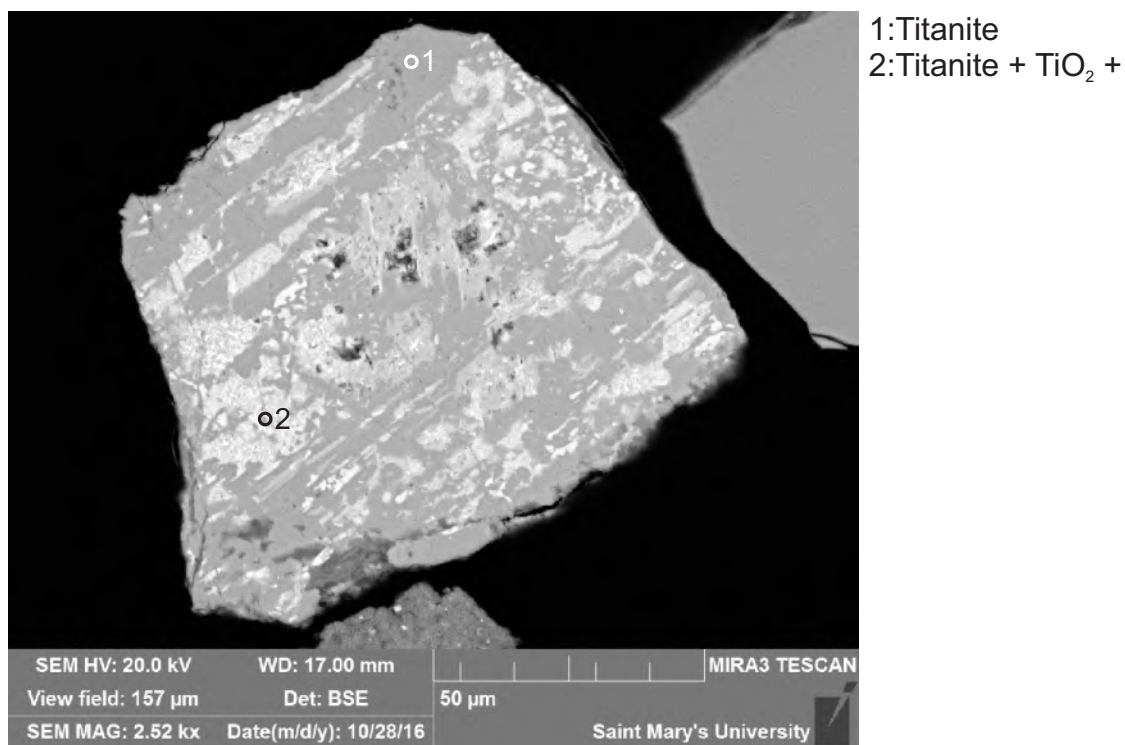
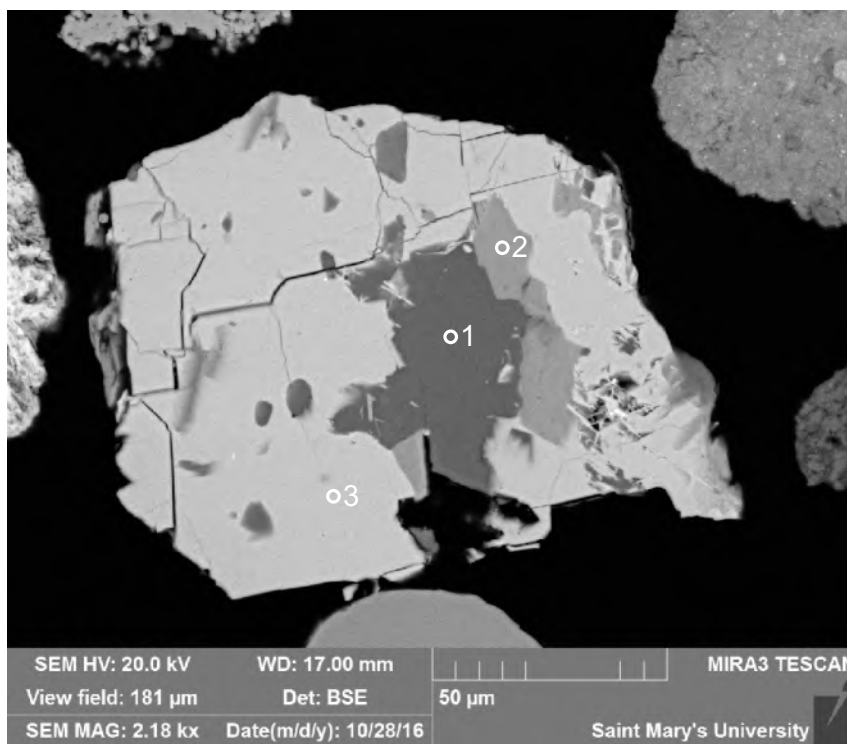


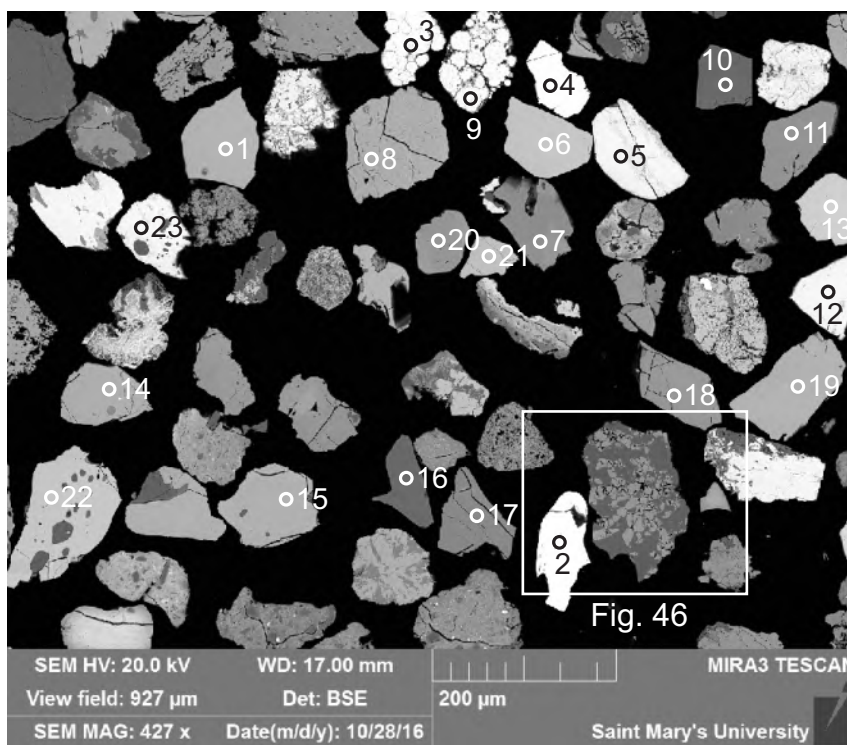
Figure B6.43: Sample S11 site 15.2 (SEM). Lithic clast of titanite + titania. Metamorphic.





- 1:Quartz
- 2:Chlorite +
- 3:TiO<sub>2</sub>

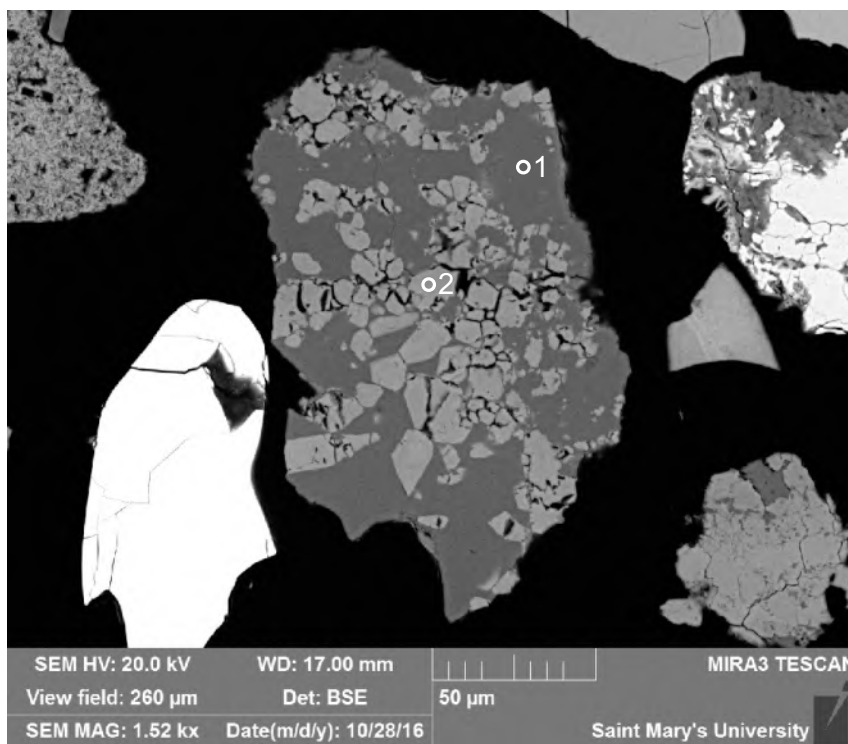
Figure B6.44: Sample S11 site 15.3 (SEM). Lithic clast of quartz + chlorite + titania. Metamorphic.



- 1:Garnet
- 2:Zircon
- 3:Pyrite
- 4:Fe- oxide/hydroxide
- 5:Ilmenite
- 6:TiO<sub>2</sub>
- 7:Epidote
- 8:Apatite
- 9:Pyrite
- 10:Tourmaline
- 11:Epidote
- 12:Ilmenite
- 13:Chromite
- 14:Titanite
- 15:Garnet
- 16:Tourmaline
- 17:Clinopyroxene
- 18:Garnet
- 19:Garnet
- 20:Garnet
- 21:Spinel
- 22:TiO<sub>2</sub>
- 23:Ilmenite

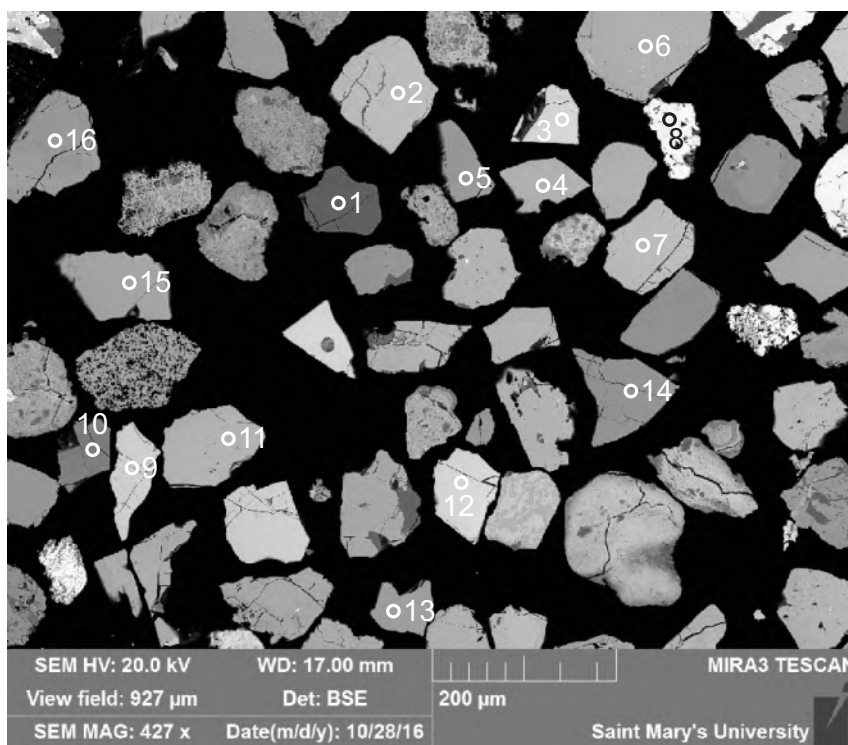
Figure B6.45: Sample S11 site 16 (SEM).





- 1:Quartz
- 2:Epidote

Figure B6.46: Sample S11 site 16.2 (SEM). Hydrothermal clast of quartz + epidote.



- 1:Dolomite
- 2:Titanite
- 3:Chromite
- 4:Garnet
- 5:Garnet
- 6:Garnet
- 7:Titanite
- 8:Magnetite +
- 9:Chromite
- 10:Staurolite
- 11:Garnet
- 12:Chromite
- 13:Garnet
- 14:Clinopyroxene
- 15:Garnet
- 16:Epidote

Figure B6.47: Sample S11 site 17 (SEM).

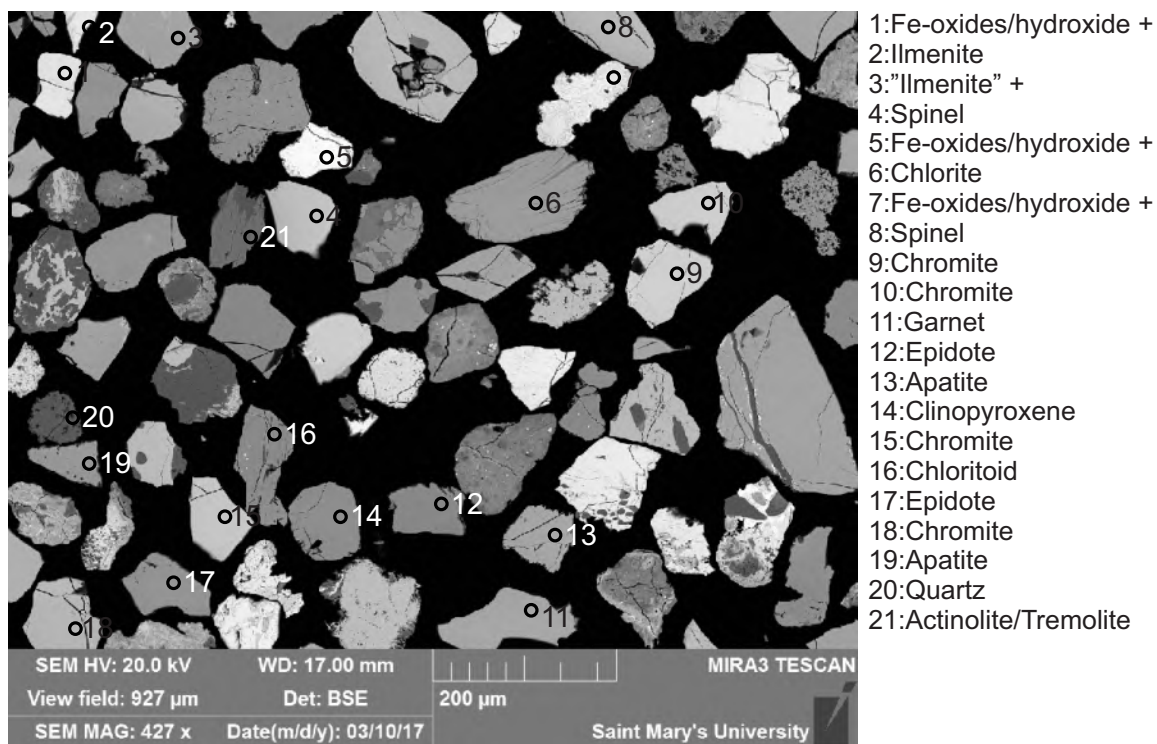


Figure B6.48: Sample S11 site 18 (SEM).

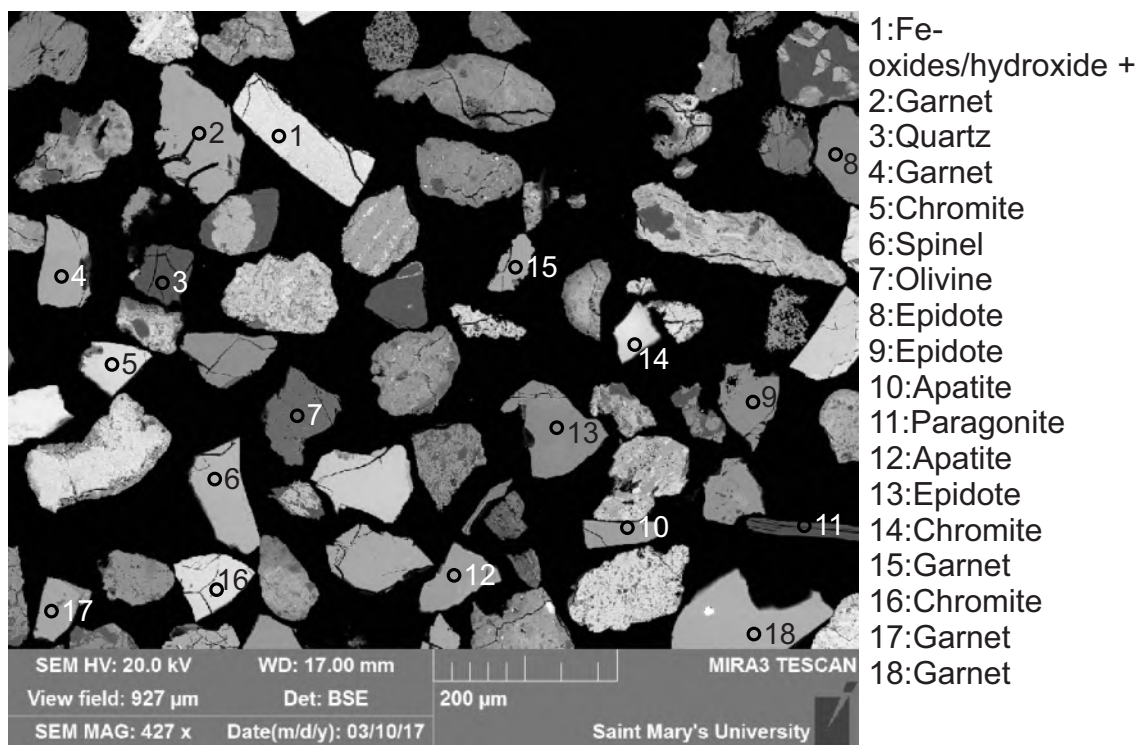


Figure B6.49: Sample S11 site 19 (SEM).

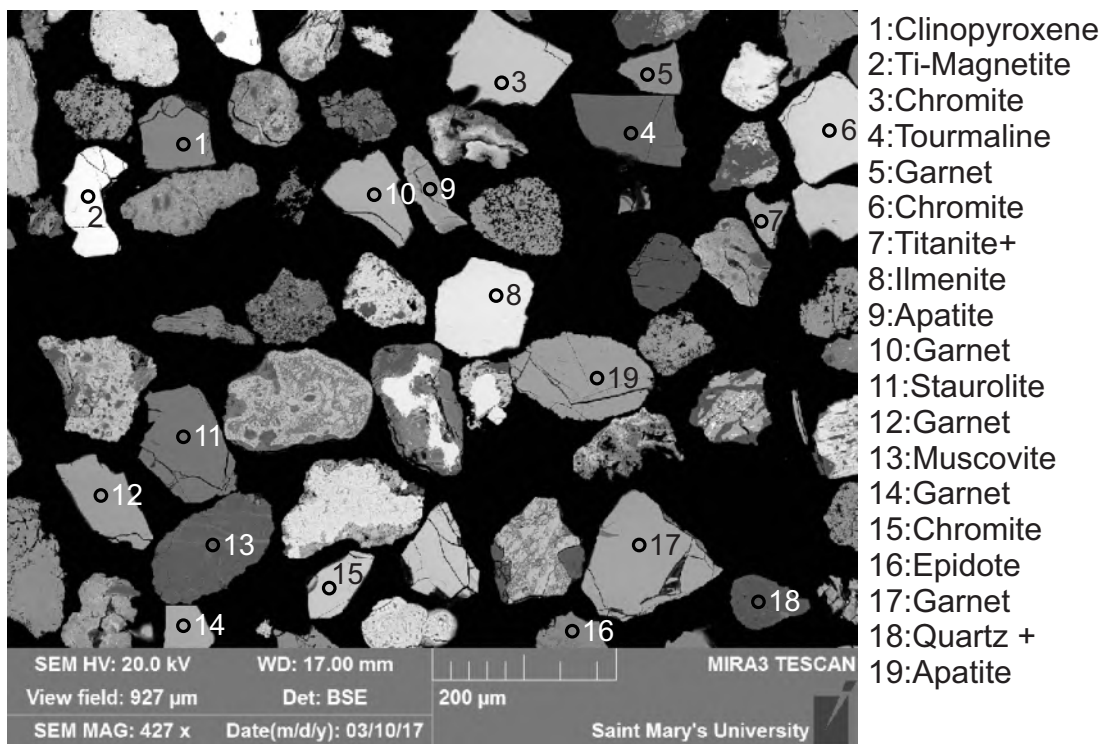


Figure B6.50: Sample S11 site 20 (SEM).

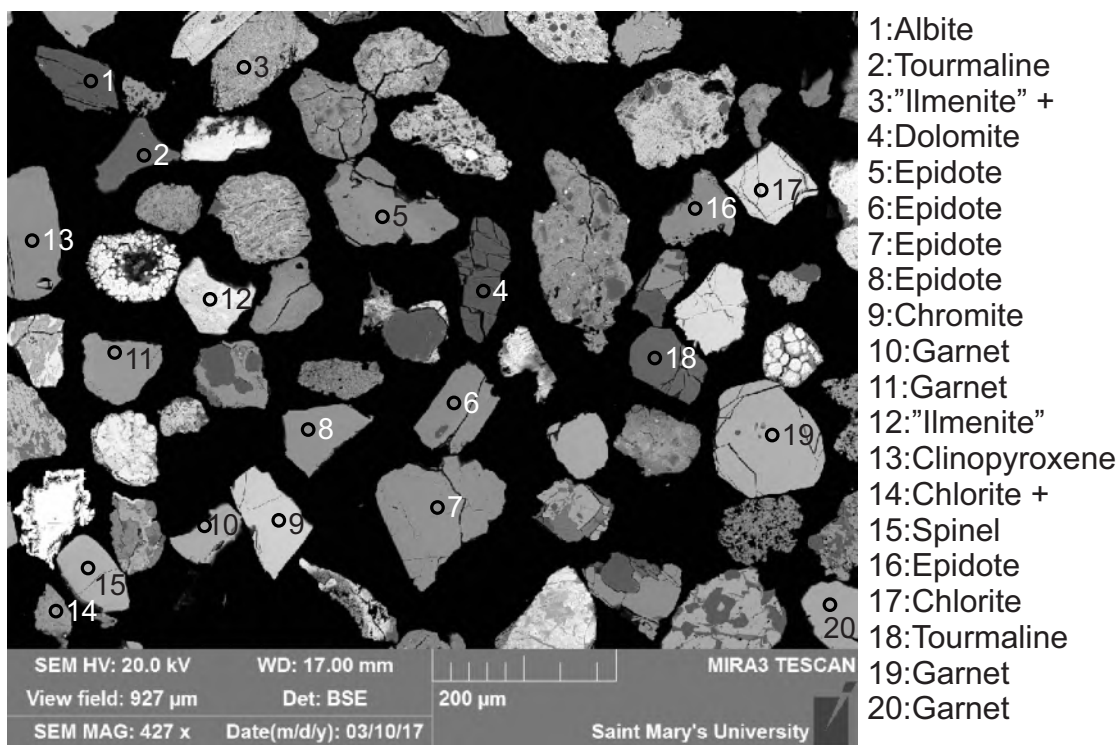


Figure B6.51: Sample S11 site 21 (SEM).



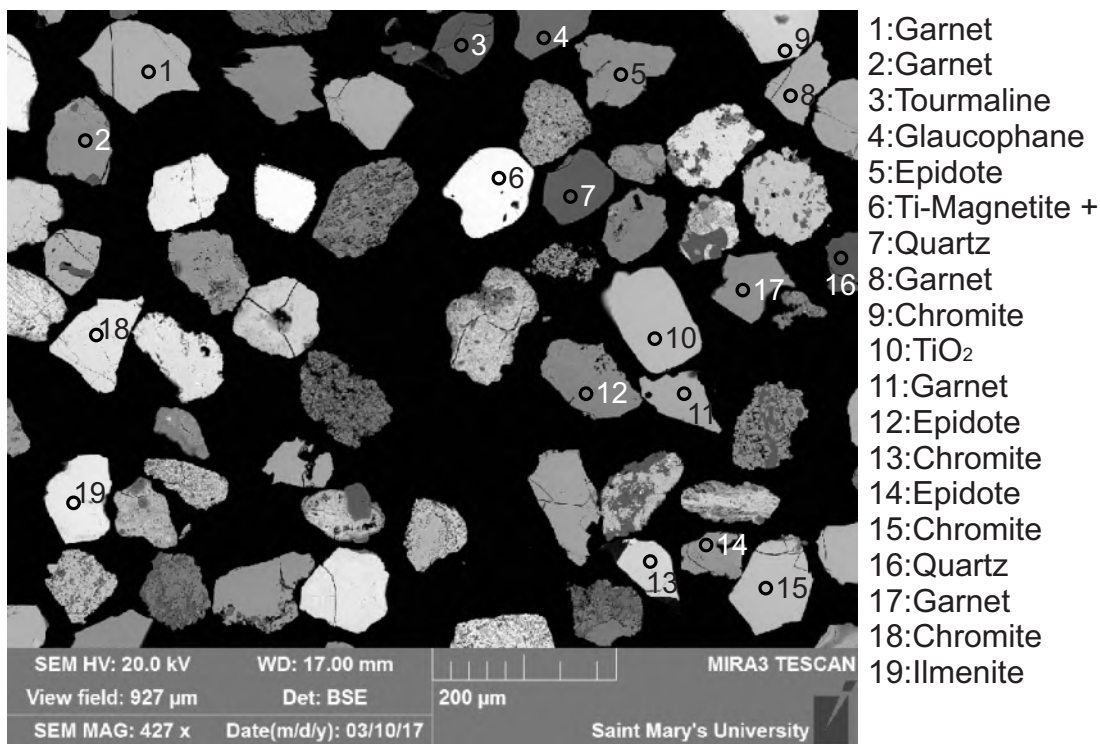


Figure B6.52: Sample S11 site 22 (SEM).

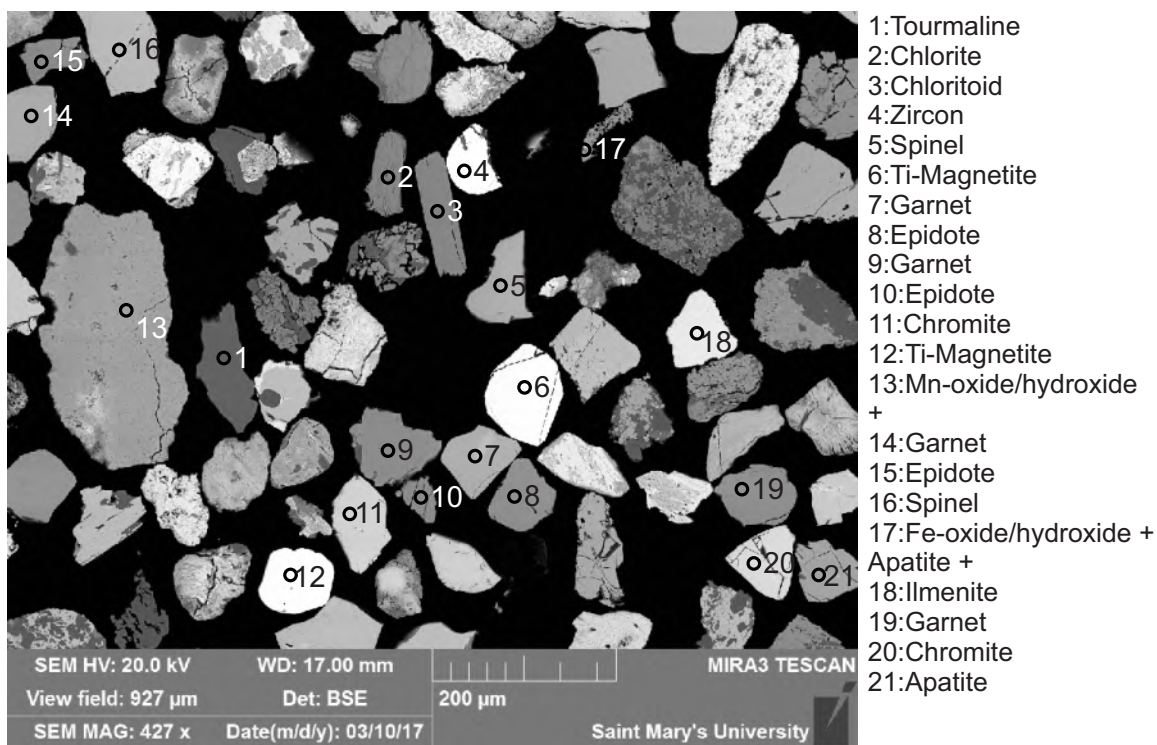


Figure B6.53: Sample S11 site 23 (SEM).



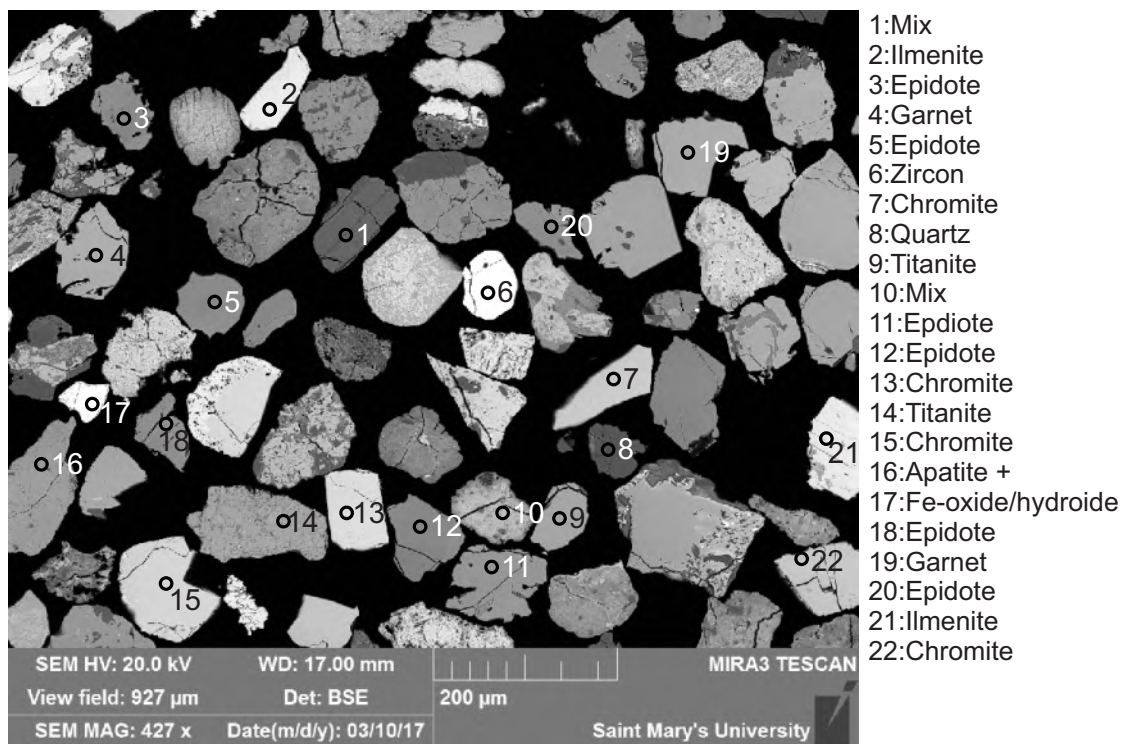


Figure B6.54: Sample S11 site 24 (SEM).

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	1	1	Qz	100.00																							100	119
S11	1	2	Ttn	33.57	35.23	2.70	0.41			28.08																	100	109
S11	1	3	Chr			19.77	18.58		12.31								49.33										100	106
S11	1	4	Ep	39.57		21.36	13.45			22.62																	97	106
S11	1	5	Py	0.23			30.79			0.35	0.48			68.15													100	200
S11	1	6	Ol	41.97			8.61		49.06									0.36									100	116
S11	1	7	Chl	25.97		20.14	25.68	0.49	12.72																		85	98
S11	1	8	Ilm		53.17		44.36	2.47																			100	104
S11	1	9	Spl		0.40	25.09	26.95		10.41								37.16										100	106
S11	1	10	Grt	39.82		21.31	30.76	0.61	5.96	1.54																	100	115
S11	1.2	1	Qz	99.05			0.95																				100	120
S11	1.2	2	Chl +	26.84	1.10	23.94	37.54	0.40	0.57	0.41	1.01	0.97	2.63													4.59	100	92
S11	1.2	3	Feohy +			11.32	69.71	0.77		0.53	0.99		5.53				0.39									10.76	100	82
S11	1.3	1	Qz	100.00																							100	119
S11	1.3	2	Grt	40.17		21.09	26.29	1.11	1.25	10.08																	100	113
S11	1.4	1	Ttn	32.88	37.66	0.73	0.64			28.09																	100	111
S11	1.4	2	Ilm		53.05		36.91	9.45		0.59																	100	105
S11	1.4	3	TiO2 +	1.53	95.57		0.46			2.44																	100	108
S11	2	1	Ep	40.41		28.23	5.50			22.86																	97	111
S11	2	2	Dol				3.11	0.32	21.05	29.51																	54	57
S11	2	3	Chr			23.54	16.65		14.35								45.46										100	108
S11	2	4	Ep	40.09		25.39	9.10			22.42																	97	110
S11	2	5	Grt	40.65		21.53	29.74	1.87	4.21	2.00																	100	117
S11	2	6	Zrn	30.91																		67.68			1.41		100	122
S11	2	7	"Ilm"		30.44	0.63	67.45	0.40	1.08																		100	101
S11	2	8	Chr			17.08	22.81		11.14								48.97										100	106
S11	2	9	Zrn	30.73																		67.98			1.29		100	121
S11	2	10	Chr			16.78	18.15		11.75								53.33										100	109
S11	2	11	Ep	40.13		23.54	10.94			22.39																	97	111
S11	2	12	Chr		0.48	25.44	19.25		14.15								40.69										100	109
S11	2	13	Ap	1.06			0.33			45.52	1.34		37.80	2.34	8.05						2.77					0.77	100	109
S11	2	14	Chl	27.17		20.44	20.67	0.28	16.45																		85	94
S11	2	15	Mag				100.00																				100	98
S11	2	16	Ttn	32.93	36.92	1.16	1.51			27.48																	100	112
S11	2.2	1	Ep	39.68		24.42	10.40			22.49																	97	110
S11	2.2	2	Ab	69.34		18.81				0.39	11.46																100	118
S11	2.3	1	Ilm		49.46		47.51	3.02																			100	105
S11	2.3	2	TiO2	0.44	99.18		0.38																				100	107
S11	3	1	Grt	41.52		20.67	3.05	0.70		34.06																	100	112
S11	3	2	Grt	34.47		3.41	8.78		1.22	34.90							17.23										100	98
S11	3	3	Chl	32.68	0.45	20.93	25.14	0.50	19.96								0.33										100	96
S11	3	4	Chr			5.24	23.11		7.30								64.34										100	106
S11	3	5	Spl			29.09	16.25		13.64								41.01										100	110
S11	3	6	Grt	39.19		21.06	34.44	0.53	2.36	2.41																	100	111
S11	3	7	Ep	39.67		20.85	6.17	1.76	0.55	28.00																	97	115
S11	3	8	Grt	39.48		21.13	33.94	0.31	4.59	0.56																	100	115
S11	3	9	Ep	40.21		24.35	9.96			22.48																	97	110
S11	3	10	Ilm		54.07		43.05	2.89																			100	109
S11	3	11	Qz	100.00																							100	116
S11	3	12	"Mag" +	2.63		0.99	92.80		0.60	0.47																2.50	100	84

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	3	13	Ttn	33.39	33.95	3.66	0.76			27.03					1.22												100	107
S11	3	14	Ep	39.80		21.38	13.17			22.65																	97	105
S11	3	15	Grt	39.64		20.86	21.92	8.79	0.64	8.16																	100	111
S11	3	16	Ep	40.03		24.53	9.80	0.30		22.34																	97	109
S11	3	17	Grt	39.17		20.79	19.59	15.72	1.57	3.16																	100	112
S11	3.2	1	TiO2 +	3.19	96.13		0.69																				100	105
S11	3.2	2	Qz	97.48	0.46	1.21	0.31					0.55															100	120
S11	3.2	3	Qz	98.68		0.78	0.25					0.29															100	120
S11	4	1	Tur	38.44	0.31	34.95	3.33		7.32	0.75	1.89																87	97
S11	4	2	Chr			19.17	21.86		11.42								47.56										100	105
S11	4	3	Chl	25.40		18.60	30.89	0.88	8.59		0.63																85	95
S11	4	4	Chr			13.02	23.30		11.18								52.51										100	109
S11	4	5	"Ilm"		31.19		68.18	0.63																			100	100
S11	4	6	TiO2		99.45		0.55																				100	109
S11	4	7	Py				30.21	0.59		0.20	0.42			68.58													100	203
S11	4	8	Spl			31.18	15.78		14.65								38.39										100	110
S11	4	9	Grt	39.68		21.07	27.64	5.30	3.03	3.30																	100	114
S11	4	10	Grt	41.12	0.80	16.22	7.47	0.31	0.40	33.68																	100	112
S11	4.2	1	Chl +	37.24	3.01	18.97	24.50	0.32	14.09	0.52	1.01	0.33															100	99
S11	4.2	2	Qz	98.55	1.09	0.36																					100	118
S11	4.2	3	TiO2	0.91	98.33		0.47			0.29																	100	106
S11	4.2	4	Zrn	31.15	1.09		0.38			0.45												66.94					100	117
S11	4.2	5	Ttn	33.01	37.32	1.75	0.49			27.43																	100	111
S11	5	1	Chr			21.99	16.81		13.41								47.80										100	107
S11	5	2	Grt	39.89		21.29	27.95	1.87	2.26	6.74																	100	112
S11	5	3	Chr		0.36	13.08	23.28		8.67								54.61										100	107
S11	5	4	TiO2		100.00																						100	107
S11	5	5	Cld	26.58		40.65	23.25		2.52																		93	99
S11	5	6	Qz	99.67			0.33																				100	120
S11	5	7	Grt	39.52		21.05	28.97	6.22	2.83	1.40																	100	114
S11	5	8	Grt	41.84		21.68	2.16			34.32																	100	116
S11	5	9	Olig	63.60		22.56	0.27			4.50	9.07																100	115
S11	5	10	Ep	40.18		24.38	9.80			22.65																	97	105
S11	5.2	1	Feohy +	4.09	1.38	8.17	68.91	0.64		3.33	0.78		5.78					0.55								6.36	100	78
S11	5.2	2	Feohy + Ap	3.47	1.04	6.00	47.20	0.72		17.99	0.59		17.76													5.22	100	68
S11	5.2	3	Ap +	3.39		2.13	0.79			47.05		0.47	37.96		6.07											2.13	100	53
S11	5.2	4	Ms + Ap +	41.13		25.38	2.35		1.56	10.74	0.37	7.24	11.23														100	92
S11	5.2	5	Qz + Ap	65.64		0.69	0.39			16.30			16.99														100	93
S11	5.3	1	Sd	0.80		0.77	48.66	0.45		0.30	0.53		1.31													3.19	56	65
S11	5.3	2	"Mag" +	1.42			91.31	0.47		0.50			1.93													4.38	100	74
S11	6	1	Qz	100.00																							100	122
S11	6	2	Grt	40.14		21.27	23.31	1.92	3.43	9.93																	100	113
S11	6	3	"Ilm"		66.08		30.82	3.10																			100	98
S11	6	4	Grt	40.02		21.18	28.14	0.43	3.35	6.87																	100	110
S11	6	5	Ep	40.04		24.75	9.38	0.25		22.57																	97	107
S11	6	6	Spl			25.88	18.53		13.85								41.75										100	105
S11	6	7	Ilm		54.80		43.11	2.09																			100	103
S11	6	8	Chr			13.38	19.38		10.16								57.08										100	106
S11	6	9	Qz	100.00																							100	117
S11	6	10	Spl			27.89	17.44		13.72							0.37	40.58										100	109

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	6	11	Chr			28.64	16.42		13.92							0.39	40.63										100	110
S11	6	12	Chl	26.43		19.82	24.59		13.66								0.50										85	99
S11	6	13	Grt	39.74		20.93	31.54	1.73	3.18	2.88																	100	113
S11	6	14	"Mag" +	2.08		0.58	92.88						0.94				0.50									3.02	100	88
S11	6	15	Qz	99.73			0.27																				100	120
S11	6	16	Grt	39.31		21.20	33.73	0.59	3.98	1.19																	100	112
S11	6	17	Tur	37.71	1.31	30.37	8.02		6.37	0.81	2.40																87	97
S11	6	18	Grt	39.39		1.35	25.50			33.76																	100	109
S11	6	19	Zrn	31.08																		67.60			1.32		100	124
S11	6	20	Cpx	53.12	0.87	2.52	9.40	0.26	16.18	17.05	0.34						0.26										100	119
S11	6	21	Grt	53.54	0.49	2.87	4.86		16.76	21.47																	100	119
S11	6	22	Spl			26.16	15.13		14.38								44.33										100	113
S11	6	23	Grt	39.81		21.11	25.81	3.14	2.25	7.88																	100	117
S11	6	24	Chr			17.63	19.10		12.18								51.08										100	112
S11	6	25	"Ilm"		64.08		33.87	2.06																			100	103
S11	6	26	Chl +	28.66	0.56	18.54	30.06		0.91	0.63		1.08	1.10													3.47	85	87
S11	6.2	1	Chl	25.26	0.71	20.93	26.65	0.60	10.36	0.48																	85	98
S11	6.2	2	Qz	100.00																							100	121
S11	6.2	3	Mix	48.76		8.42	19.35		20.00	2.09	0.96	0.42															100	86
S11	6.2	4	Ttn	32.57	35.44	3.07	0.48			27.03					1.41												100	111
S11	6.3	1	TiO2		99.60		0.40																				100	106
S11	6.3	2	Ms +	45.79	8.64	27.05	2.80		2.83		1.12	6.76															95	109
S11	6.3	3	"Mag" +	3.96	0.64	1.78	91.54		0.58				1.49														100	86
S11	7	1	Ap +	12.62		6.08	2.22		0.66	38.03	0.55	0.73	32.61		6.50												100	108
S11	7	2	Grt	40.25		21.31	25.26	0.81	4.25	8.12																	100	110
S11	7	3	Chr			12.41	23.07		8.36								56.16										100	107
S11	7	4	Grt	39.67		21.19	26.89	3.54	1.03	7.68																	100	112
S11	7	5	Ep	40.16		24.56	9.81			22.47																	97	108
S11	7	6	Ap				0.49	0.24		46.71	1.44		38.94	0.92	8.23											3.03	100	108
S11	7	7	Feohy		10.34	2.49	83.53	1.92	1.73																		100	100
S11	7	8	Dol						22.62	31.38																	54	56
S11	7	9	"Chr"		1.34	2.77	75.84		2.57								16.69	0.79									100	103
S11	7	10	Grt	39.97		20.70	21.44	8.08	1.25	8.57																	100	115
S11	7	11	Grt	39.82		21.08	32.23	1.12	3.48	2.28																	100	114
S11	7.2	1	Ab	69.18		18.84				0.26	11.72																100	118
S11	7.2	2	Ilm	0.51	50.71		26.33	21.42		1.04																	100	105
S11	7.2	3	Ttn	33.97	34.48	2.19	1.87			27.49																	100	109
S11	7.2	4	Chl	30.12	0.42	16.85	19.06	0.85	16.46	0.71	0.54																85	102
S11	7.3	1	Grt	39.13		20.93	34.24	1.29	2.64	1.77																	100	113
S11	7.3	2	Chl	27.07		20.92	19.25		17.76																		85	98
S11	7.3	3	Qz	99.34			0.66																				100	122
S11	8	1	Ap				0.87			44.15	1.50		38.39	2.36	9.19											3.54	100	107
S11	8	2	? Ilm +	20.20	47.18	10.74	18.22	0.43	2.02	1.21																	100	101
S11	8	3	Grt	39.55		20.98	28.17	5.68	2.48	3.14																	100	110
S11	8	4	Ep	41.62		25.93	2.37	0.39	3.96	22.74																	97	104
S11	8	5	Ep	40.12		23.94	10.49	1.33		21.12																	97	104
S11	8	6	St	28.43	0.40	54.55	12.60	0.38	1.64																		98	109
S11	8	7	Chl	26.17		20.16	26.92		11.75																		85	95
S11	8	8	Spl		0.60	25.92	18.41		15.03								40.04										100	109
S11	8	9	Chr			18.22	19.12		10.97								51.69										100	110



Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	8	10	TiO2		100.00																						100	109
S11	8	11	Ms +	50.76	1.71	28.50	1.38		2.40		0.62	9.63															95	112
S11	8	12	Grt	39.92		21.05	30.58	0.87	5.87	1.71																	100	117
S11	8	13	Ep	39.96		24.12	10.27			22.64																	97	112
S11	8	14	Feohy +	2.39	0.98	3.94	87.59	0.64		0.43			2.22													1.82	100	90
S11	8	15	Grt +	39.13	0.86	25.37	26.67		0.97	0.47	1.58	1.14	1.22													2.59	100	99
S11	8	16	Chl	28.80		18.81	25.92		10.98		0.48																85	90
S11	8	17	"Mag"	3.11			96.43	0.45																			100	77
S11	8	18	Cpx	54.61	0.29	1.80	4.15		17.81	20.85							0.48										100	112
S11	8.2	1	Kln +	51.71	0.40	30.40	10.74		1.13	0.34	0.53	1.22														3.53	100	83
S11	8.2	2	Qz	100.00																							100	102
S11	8.3	1	Chl	26.58		19.45	26.38		12.59																		85	98
S11	8.3	2	Chl	25.41		19.03	28.52	0.25	11.79																		85	98
S11	8.3	3	Chl	26.34		19.89	26.21		12.14		0.42																85	100
S11	8.4	1	Qz	100.00																							100	120
S11	8.4	2	TiO2		99.59		0.41																				100	108
S11	8.4	3	Grt	38.12	0.85	18.41	28.24	0.64	12.24	0.47	0.52	0.50															100	98
S11	9	1	Grt	39.75		20.92	24.95	1.27	0.39	12.72																	100	110
S11	9	2	Grt	39.53		20.98	28.17	0.72	1.53	9.07																	100	112
S11	9	3	Chr			20.98	19.80		10.91							0.37	47.94										100	106
S11	9	4	Ttn	32.65	38.37	0.78	0.42			27.78																	100	109
S11	9	5	Ap							49.58		44.78			5.63												100	123
S11	9	6	Dol						22.58	31.42																	54	57
S11	9	7	Chr			15.37	19.28		11.01							0.39	53.95										100	111
S11	9	8	TiO2		99.47		0.53																				100	110
S11	9	9	Ilm		50.12		47.41	2.48																			100	106
S11	9	10	Spl		0.37	30.06	15.06		15.20								39.32										100	109
S11	9	11	Chr			17.11	18.92		13.29								50.68										100	107
S11	9	12	Spl			31.19	15.58		15.11								38.13										100	109
S11	9	13	Ms	48.60		28.73	6.17		0.98		0.40	10.13															95	103
S11	9	14	Ap							45.82	1.44		36.49	1.45	9.52											5.27	100	108
S11	9	15	Grt	39.31		20.68	29.42	5.94	2.99	1.66																	100	115
S11	9	16	Grt	41.58		20.89	3.32			34.20																	100	115
S11	9	17	Dol						22.62	31.38																	54	58
S11	9	18	Chr			8.93	26.08		7.00								57.99										100	108
S11	9	19	Ep	40.70		25.81	9.13			21.36																	97	111
S11	9	20	Chl	25.44		19.83	28.28		10.98		0.47																85	97
S11	9.2	1	Ol	41.19			6.75		50.48								1.16	0.42									100	120
S11	9.2	2	Chr			20.76	19.24		11.55								48.45										100	109
S11	9.2	3	Mix	38.94		16.10	2.80		38.41								3.75										100	101
S11	9.2	4	Chr		0.39	6.19	29.63		6.46								57.32										100	106
S11	9.2	5	Chr			11.24	28.49		7.71								52.57										100	107
S11	10	1	Grt	39.48		20.94	31.78	3.52	3.01	1.27																	100	111
S11	10	2	Ilm		51.88		46.55	0.81	0.76																		100	103
S11	10	3	Qz	100.00																							100	117
S11	10	4	Grt	39.76		20.95	31.30	2.00	4.64	1.35																	100	109
S11	10	5	?Tur	38.51	0.77	30.68	5.86		8.04	0.50	2.63																87	96
S11	10	6	Ttn	33.20	37.89	0.96				27.95																	100	109
S11	10	7	Grt	41.75		21.40	2.60			34.25																	100	111
S11	10	8	Grt	40.75		21.66	26.61	0.73	9.23	1.02																	100	115

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	10	9	?	40.21		20.27	20.42	2.99		16.10																	100	116
S11	10	10	Ep	40.47		27.23	6.54			22.75																	97	114
S11	10	11	Ap							48.47			44.76		5.19											1.59	100	127
S11	10	12	Chl	26.53	0.65	19.03	31.10		0.61	0.52	0.71	0.74	1.20													3.92	85	91
S11	10	13	Feohy		13.25	2.17	81.00	2.16	1.43																		100	101
S11	10	14	Ilm		54.63		43.82	1.01	0.55																		100	106
S11	10	15	Ilm		49.95		48.74	1.31																			100	105
S11	10	16	"Mag" +	2.45	0.71		92.41			0.52			2.36										1.56				100	87
S11	10	17	Ttn	33.12	36.67	2.19	0.32			27.70																	100	111
S11	10	18	Grt	41.45		22.55				36.00																	100	114
S11	10	19	"Mag" +	4.42		0.90	92.92			0.48			1.28														100	86
S11	10.2	1	Qz	99.61			0.39																				100	119
S11	10.2	2	Grt	39.80		21.33	27.81	2.44	1.56	7.06																	100	112
S11	11	1	TiO2		98.81		1.19																				100	105
S11	11	2	Chr		0.35	24.75	29.12		9.25								36.53										100	106
S11	11	3	Grt	39.75		21.24	29.39	0.56	1.73	7.33																	100	111
S11	11	4	Grt	40.01		21.00	28.26	1.50	3.10	6.14																	100	112
S11	11	5	TiO2		96.17		1.10															2.74					100	106
S11	11	6	Fl							50.65					49.35												100	117
S11	11	7	Feohy		10.57	2.46	83.18	1.96	1.84																		100	99
S11	11	8	Spl			27.48	16.60		11.64								44.28										100	108
S11	11	9	Ep	40.76		27.81	5.86			22.57																	97	111
S11	11	10	Ep	39.87		22.85	11.66			22.62																	97	111
S11	11	11	Spl		0.35	27.68	22.32		11.37								38.27										100	105
S11	11	12	Cpx	51.21	0.62	4.06	8.21	0.44	13.06	21.88	0.52																100	113
S11	11	13	Chl	26.59	0.37	20.24	22.97		14.81																		85	96
S11	11	14	Grt	39.20		20.85	34.97	1.64	2.06	1.29																	100	111
S11	11	15	Feohy		12.23	7.11	74.16	0.46	6.03																		100	100
S11	11	16	Chr			22.48	17.25		13.31								46.96										100	109
S11	11	17	Grt	39.90	1.20	8.15	16.96	0.72		33.07																	100	111
S11	11	18	Chr			5.46	22.01		9.13								63.40										100	111
S11	11	19	Chr			20.61	22.42		10.08								46.90										100	111
S11	11.2	1	Qz+	93.62	0.34	3.42	0.28			0.48	1.86																100	117
S11	11.2	2	Ep	39.98	0.64	24.48	9.63	0.26		22.00																	97	110
S11	11.2	3	"Ilm"	0.50	68.48		24.84	5.63		0.56																	100	102
S11	12	1	Dol						22.63	31.37																	54	57
S11	12	2	Chr			9.97	23.83		9.26								56.95										100	109
S11	12	3	Ilm		51.13		47.33	1.54																			100	107
S11	12	4	Ilm		52.33		46.70	0.96																			100	105
S11	12	5	Ap							47.51	1.49		38.29	1.93	7.98											2.80	100	109
S11	12	6	Grt	39.77		21.32	30.72	1.68	4.15	2.35																	100	113
S11	12	7	Zrn	31.12																		67.54			1.34		100	123
S11	12	8	"Ilm"		69.23		28.85	1.92																			100	99
S11	12	9	Ap							48.95			44.51		5.11											1.44	100	124
S11	12	10	Ap +			0.47	3.73	0.38		41.87	0.74		36.90		8.42											7.49	100	97
S11	12	11	Grt	39.35		21.23	29.48	4.11	4.25	1.58																	100	115
S11	12	12	Ep	39.93		22.40	12.11			22.56																	97	109
S11	12	13	Ep	39.72		19.92	11.16	2.83		23.37																	97	116
S11	12	14	Ilm		50.76		47.11	1.24	0.89																		100	109
S11	12	15	Tur	39.14	0.69	30.98	2.98		9.88	0.57	2.76																87	101

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	12	16	Chr +	7.37	1.62	3.69	31.25	4.23	9.22	0.63			1.21				33.20			1.56						6.03	100	68
S11	12	17	Ttn	32.55	37.41	0.49	0.76			27.68						1.10											100	113
S11	12	18	Grt	40.83	0.59	14.44	9.98			34.16																	100	110
S11	12	19	Zrn	31.20																		68.80					100	116
S11	12	20	Cpx	52.05	0.91	3.48	7.47	0.30	13.89	21.32	0.58																100	112
S11	12.2	1	Qz	99.43			0.22			0.34																	100	120
S11	12.2	2	Ep	40.28		23.94	10.50			22.28																	97	108
S11	12.3	1	TiO2	0.93	97.60	0.48	0.99																				100	103
S11	12.3	2	Qz +	95.31	1.03	2.13	0.30		0.32			0.93															100	120
S11	13	1	Mix	19.29	1.17	8.72	59.39	0.99	5.25	0.68	1.24		0.98													2.27	100	84
S11	13	2	Grt	39.77		21.02	28.00	2.93	5.08	3.19																	100	111
S11	13	3	Spl			31.75	16.11		15.22								36.92										100	108
S11	13	4	Chr			13.90	18.87		10.38							0.41	56.45										100	106
S11	13	5	Ap +				1.40			45.06	1.64		37.53	2.31	8.61											3.45	100	102
S11	13	6	Ap +	1.42			1.27			44.67	1.05		38.47	1.05	7.94						3.57					0.56	100	112
S11	13	7	Chl	26.92		21.39	18.88		17.81																		85	98
S11	13	8	Ap			0.82	0.38			49.06	0.51		41.07	1.11	7.05												100	115
S11	13	9	"Mag" +	3.58	0.61	1.63	90.50	0.46		0.41			2.13				0.67										100	85
S11	13	10	Chr			26.21	13.39		16.64								43.76										100	111
S11	13	11	Grt	41.88		21.38	1.56			35.18																	100	115
S11	13	12	Grt	42.12		21.68	0.97			35.23																	100	114
S11	13	13	Spl			38.68	16.71		16.28								28.33										100	111
S11	13	14	Feohy +	1.97	0.55		78.73	1.41	1.83								15.51										100	101
S11	13	15	Ilm		52.78		44.57	2.65																			100	109
S11	13	16	Chr			14.40	17.88		11.46							0.40	55.87										100	108
S11	13	17	Ep	40.42		28.03	5.51			23.04																	97	111
S11	13	18	Chr		0.39	23.42	26.56		11.07							0.44	38.12										100	109
S11	13	19	Chr			25.16	16.56		14.07							0.36	43.85										100	110
S11	13.2	1	Qz	98.05		0.84	0.86					0.25															100	119
S11	13.2	2	Ap				0.50			48.58			44.74		6.18												100	121
S11	13.2	3	Mix	38.32	13.72		47.60			0.36																	100	113
S11	13.3	1	Ttn	33.48	32.77	4.05	1.42		0.73	26.66					0.89												100	111
S11	13.3	2	Chl	29.26	0.42	18.07	21.69	0.60	14.97																		85	98
S11	13.4	1	Ep	41.05		27.04	3.50		2.27	23.14																	97	105
S11	13.4	2	Ep	40.23		26.42	7.47			22.88																	97	108
S11	13.4	3	Qz	97.59		1.63					0.78																100	119
S11	14	1	Ilm		50.16		45.95	3.89																			100	107
S11	14	2	Qz	100.00																							100	121
S11	14	3	Grt	41.99		21.22	2.71			34.09																	100	115
S11	14	4	Chr			20.16	16.87		10.85							0.51	51.62										100	108
S11	14	5	TiO2		99.61		0.39																				100	109
S11	14	6	Grt	40.24	0.44	21.06	28.95		5.42	3.89																	100	113
S11	14	7	Qz	99.77			0.23																				100	121
S11	14	8	Qz	100.00																							100	120
S11	14	9	Grt	41.74		20.33	3.04			34.89																	100	114
S11	14	10	Feohy		6.54	4.27	85.34	0.89	2.97																		100	98
S11	14	11	Ilm		51.57		46.49	1.93																			100	107
S11	14	12	Opx	58.60		0.58	4.96		35.17	0.41							0.28										100	121
S11	14	13	Grt	39.39		20.87	33.58	1.51	3.30	1.35																	100	116
S11	14	14	Chr			9.20	13.12		12.88								64.80										100	113

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	14	15	Chr		0.52	17.12	27.84		8.72								45.80										100	110
S11	14	16	Ttn	33.44	35.39	2.08	1.19			27.89																	100	113
S11	14	17	Chr			11.46	19.98		10.44								58.13										100	111
S11	14	18	Ap							51.12	0.58		46.21													2.08	100	91
S11	14	19	Bt +	38.32	1.93	15.14	32.72	0.39	4.79	0.63	0.89	4.83						0.37									100	100
S11	14	20	Ep	40.29		26.52	7.87	0.38		21.94																	97	113
S11	14	21	Tur	38.46	0.80	33.43	6.83		5.24	0.40	1.84																87	99
S11	14.2	1	Ep	41.72		29.17	2.68		0.73	22.70																	97	107
S11	14.2	2	Chl	31.25		19.11	9.92	0.31	23.56	0.34	0.51																85	104
S11	14.2	3	Ab	64.15		20.55				4.82	10.48																100	117
S11	14.3	1	Qz	99.61			0.39																				100	124
S11	14.3	2	Mix (Feohy, Chl, Ap)	10.94		7.48	69.48	1.24		0.53	1.06	0.28	2.90													6.09	100	80
S11	15	1	Chr		0.45	7.48	22.77		12.71								56.59										100	106
S11	15	2	Spl			47.40	12.63		18.50								21.47										100	112
S11	15	3	Opx	57.79		1.68	5.69		34.46	0.38																	100	119
S11	15	4	Ep	40.31		23.89	10.69			22.11																	97	107
S11	15	5	Spl			32.99	15.43		15.24								36.34										100	106
S11	15	6	Grt	40.96	1.19	14.14	9.16	0.36		34.20																	100	111
S11	15	7	Ep	40.04		22.23	12.00			22.40							0.33										97	110
S11	15	8	Grt	39.86		20.69	26.49	2.65	1.03	9.28																	100	113
S11	15	9	Grt	39.87		21.19	30.62	1.46	5.89	0.97																	100	115
S11	15	10	Chl	34.85		18.61	21.10	0.48	9.30	0.66																	85	115
S11	15	11	Chr		0.35	22.74	25.07		8.44								43.39										100	107
S11	15	12	Ep	40.07	0.49	23.93	9.58			22.58						0.35											97	109
S11	15	13	Ep	40.40		26.94	6.85			22.81																	97	104
S11	15	14	Ilm		52.96		44.05	2.99																			100	104
S11	15	15	Ilm		55.01		43.45	1.53																			100	103
S11	15	16	Ep	39.37		20.44	13.52	2.01		21.66																	97	118
S11	15	17	Ep	40.24		25.42	8.59			22.74																	97	111
S11	15	18	Grt	39.53		20.91	31.42	0.63	2.12	5.40																	100	113
S11	15	19	Ep	39.74		20.39	15.08			21.79																	97	107
S11	15	20	Ep	40.30		25.44	8.79			22.48																	97	108
S11	15.2	1	Ttn	33.43	36.13	1.30	1.05			27.26						0.83											100	112
S11	15.2	2	Ttn + TiO2 +	16.82	46.45	0.82	16.30	6.84		12.77																	100	108
S11	15.3	1	Qz	99.48	0.52																						100	122
S11	15.3	2	Chl +	25.08	1.62	20.24	26.61	0.38	11.07																		85	100
S11	15.3	3	TiO2		100.00																						100	108
S11	16	1	Grt	39.60		20.68	27.72	3.46	1.74	6.80																	100	110
S11	16	2	Zrn	30.84																		69.16					100	122
S11	16	3	Py				30.92				0.67			67.39												1.02	100	184
S11	16	4	Feohy		10.67	2.50	83.00	1.92	1.90																		100	97
S11	16	5	Ilm		53.75		44.77	1.48																			100	105
S11	16	6	TiO2		99.54		0.46																				100	106
S11	16	7	Ep	40.40		26.96	6.95			22.69																	97	108
S11	16	8	Ap							46.42	1.36		39.01	1.83	8.82											2.56	100	109
S11	16	9	Py	0.91			35.86			0.33	0.35		62.55														100	179
S11	16	10	Tur	38.68		30.89	8.96		5.95		2.52																87	97
S11	16	11	Ep	40.07		24.08	10.49			22.37																	97	109
S11	16	12	Ilm		50.59		47.57	1.84																			100	106
S11	16	13	Chr			19.13	16.21		13.43							0.39	50.84										100	109



Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	16	14	Ttn	32.82	37.14	1.28	0.52			28.24																	100	109
S11	16	15	Grt	39.71		21.23	26.22	0.91	2.74	9.19																	100	114
S11	16	16	Tur	37.00	1.34	33.19	6.79		5.72	1.39	1.57																87	101
S11	16	17	Cpx	51.32	0.79	5.48	4.42		15.08	22.90																	100	116
S11	16	18	Grt	41.73		20.47	3.30	0.32		34.17																	100	114
S11	16	19	Grt	39.58		21.15	31.33	0.63	2.78	4.53																	100	115
S11	16	20	Grt	41.80		20.47	2.92			34.81																	100	114
S11	16	21	Spl			28.01	15.12		15.67								41.20										100	108
S11	16	22	TiO2		99.57		0.43																				100	107
S11	16	23	Ilm		53.91		45.30	0.79																			100	105
S11	16.2	1	Qz	99.44			0.56																				100	119
S11	16.2	2	Ep	40.31		25.19	8.70			22.80																	97	109
S11	17	1	Dol						22.63	31.37																	54	56
S11	17	2	Ttn	33.14	35.58	1.49	2.28			27.51																	100	106
S11	17	3	Chr			19.43	18.48		11.75							0.40	49.94										100	107
S11	17	4	Grt	40.12		20.85	26.77	0.33	1.87	10.06																	100	113
S11	17	5	Grt	41.33	0.56	20.58	3.11			34.42																	100	113
S11	17	6	Grt	39.93		21.14	28.71	1.16	3.15	5.90																	100	111
S11	17	7	Ttn	33.11	36.26	1.33	1.60			27.69																	100	109

Table B6.1: EDS analyses of sample S11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	CuO	ZnO	SrO	ZrO2	Nb2O5	SnO2	HfO2	WO3	Total	Actual Total
S11	17	8	Mag +	3.55		0.77	94.62			0.51									0.54								100	80
S11	17	9	Chr			24.62	21.31		12.76								41.31										100	109
S11	17	10	St	29.85	0.69	54.20	10.18		1.22								0.30			1.56							98	111
S11	17	11	Grt	39.83		21.04	22.76	4.58	0.71	11.09																	100	114
S11	17	12	Chr			20.97	19.80		11.61								47.62										100	111
S11	17	13	Grt	41.42		19.96	4.63	1.82		32.18																	100	116
S11	17	14	Cpx	53.13	0.67	1.99	9.81	0.37	14.91	19.12																	100	117
S11	17	15	Grt	41.10		21.82	25.24	0.47	9.38	1.99																	100	114
S11	17	16	Ep	40.40		23.85	10.31			22.44																	97	107
			Notes																									
			+ = indicates other minerals present																									

Table B6.2: EDS analyses of sample 11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S11	18	1	Feohy + Ap +	4.59			94.21		0.83	0.37															100	76
S11	18	2	Ilm		53.97		44.18	1.85																	100	101
S11	18	3	"Ilm" +	21.39	46.02	11.02	16.39	0.40	2.57	2.22															100	100
S11	18	4	Spl		0.37	30.33	24.26		12.47								32.56								100	107
S11	18	5	Feohy +	2.71		1.51	92.60	0.41		0.65			1.65				0.48								100	88
S11	18	6	Chl	26.09		18.57	32.70		7.19		0.44														85	98
S11	18	7	Feohy +	1.21	0.46	3.20	92.35										0.85						1.93		100	81
S11	18	8	Spl			28.99	18.93		13.65							0.35	38.08								100	106
S11	18	9	Chr			14.95	19.75		12.38								52.91								100	107
S11	18	10	Chr		0.40	18.36	24.69		10.82								45.73								100	106
S11	18	11	Grt	39.98		21.09	26.34		1.36	11.24															100	115
S11	18	12	Ep	40.16		25.78	8.13			22.93															97	110
S11	18	13	Ap				0.48	0.91		47.96			42.80		6.29									1.56	100	119
S11	18	14	Cpx	52.69	0.74	2.43	9.21	0.70	12.21	21.34	0.68														100	115
S11	18	15	Chr			21.54	20.03		12.38								46.06								100	108
S11	18	16	Cld	25.66	0.71	38.49	25.59	0.57	1.98																93	102
S11	18	17	Ep	39.67		21.31	13.51			22.50															97	108
S11	18	18	Chr			29.64	17.09		14.59								38.68								100	109
S11	18	19	Ap	0.42			0.29			48.99	1.25		36.19	2.49	8.74									1.62	100	111
S11	18	20	Qz	100.00																					100	112
S11	18	21	Act/Tr	57.30		2.13	1.63		23.06	11.99	0.38						0.51								97	113
S11	19	1	Feohy +	4.66		2.04	90.98						1.51								0.81				100	76
S11	19	2	Grt	39.65		20.87	30.65	2.58	3.85	2.40															100	111
S11	19	3	Qz	99.74			0.26																		100	118
S11	19	4	Grt	39.43		21.06	30.31	2.65	2.26	4.28															100	112
S11	19	5	Chr			8.24	21.08		9.88								60.79								100	106
S11	19	6	Spl			26.95	14.16		16.28								42.61								100	110
S11	19	7	Ol	41.91			8.29		49.44										0.35						100	117
S11	19	8	Ep	40.41		25.32	9.26			22.01															97	106
S11	19	9	Ep	39.84		24.02	10.20	0.24		22.70															97	110
S11	19	10	Ap				0.39			49.24	0.94		38.90	2.06	8.48										100	114
S11	19	11	Pg	47.58		37.45	0.46				7.76	0.22			1.54										95	112
S11	19	12	Ap			0.44	0.57			46.43	0.78		40.57	1.04	7.76								2.40		100	110
S11	19	13	Ep	40.13		24.54	9.55	0.30		22.47															97	110
S11	19	14	Chr			17.13	39.19		4.78								38.39				0.51				100	105
S11	19	15	Grt	39.34		20.79	26.29	8.19	3.02	2.38															100	110
S11	19	16	Chr			10.44	23.44		8.44							0.43	57.25								100	107
S11	19	17	Grt	39.61		21.11	31.66	1.02	5.24	1.36															100	113
S11	19	18	Grt	38.97		20.46	33.55	2.49	1.54	3.00															100	116
S11	20	1	Cpx	51.69	0.79	4.48	6.02		15.02	21.69	0.32														100	111

Table B6.2: EDS analyses of sample 11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S11	20	2	Ti-Mag		28.46	1.31	67.40	1.54	1.28																100	101
S11	20	3	Chr			20.00	17.80		12.71								49.49								100	106
S11	20	4	Tur	37.14	0.91	32.46	9.03		4.66	0.70	2.09														87	97
S11	20	5	Grt	41.74		20.97	3.44			33.84															100	110
S11	20	6	Chr			12.43	22.29		8.95							0.42	55.91								100	106
S11	20	7	Ttn+	21.26	53.49	3.97	2.31			17.25					1.71										100	108
S11	20	8	Ilm		54.21		41.33	4.46																	100	106
S11	20	9	Ap			0.61	1.31	0.38		43.96	1.46		38.27	1.20	9.10								3.72		100	106
S11	20	10	Grt	39.24		20.87	26.36	7.07	0.64	5.82															100	110
S11	20	11	St	28.91	0.49	54.59	12.00	0.41	1.61																98	110
S11	20	12	Grt	40.60		21.66	27.41	0.70	8.20	1.44															100	113
S11	20	13	Ms	50.45	0.25	29.01	2.50		2.08		0.57	10.15													95	110
S11	20	14	Grt	39.42		20.86	29.44	5.10	3.74	1.43															100	113
S11	20	15	Chr			19.09	19.99		11.77								49.16								100	110
S11	20	16	Ep	40.60		25.13	8.59			22.67															97	112
S11	20	17	Grt	39.71		21.22	24.23	0.87	1.82	12.16															100	117
S11	20	18	Qz +	95.25		1.39	2.52		0.84																100	118
S11	20	19	Ap						0.33	48.45	1.14		38.02	2.34	8.26								1.46		100	116
S11	21	1	Ab	69.72		18.70					11.58														100	116
S11	21	2	Tur	37.96	0.61	29.36	10.29		5.76	0.49	2.53														87	97
S11	21	3	"Ilm" +	23.56	50.58	4.76	5.27		1.74	14.09															100	100
S11	21	4	Dol						22.42	31.58															54	57
S11	21	5	Ep	40.34		22.81	11.38			22.47															97	110
S11	21	6	Ep	40.21		26.17	7.95			22.67															97	113
S11	21	7	Ep	39.86		22.97	11.50			22.67															97	113
S11	21	8	Ep	40.39		24.37	9.98			22.26															97	110
S11	21	9	Chr			17.86	18.96		11.98							0.37	50.83								100	111
S11	21	10	Grt	39.95		21.03	27.79	4.63	5.12	1.49															100	117
S11	21	11	Grt	41.20	0.54	18.29	5.03			34.94															100	115
S11	21	12	"Ilm"		71.00		27.09	1.90																	100	102
S11	21	13	Cpx	50.34	1.13	4.74	8.30	0.35	12.50	22.15	0.50														100	113
S11	21	14	Chl +	27.87	0.68	18.63	30.03		0.84	0.42	0.94	0.99	1.17	0.53									2.90		85	91
S11	21	15	Spl			35.46	17.32		14.76								32.45								100	111
S11	21	16	Ep	40.25		23.97	10.47	0.54		21.76															97	111
S11	21	17	Chl			9.98	18.19		8.03								48.79								85	109
S11	21	18	Tur	37.87	0.88	29.68	7.96		7.18	0.92	2.51														87	102
S11	21	19	Grt	39.28		20.40	31.29	3.82	2.37	2.85															100	117
S11	21	20	Grt	39.61		21.00	28.04	0.87	3.67	6.81															100	119
S11	22	1	Grt	38.52	1.46	20.66	33.22	0.70	1.26	4.17															100	109
S11	22	2	Grt	41.54		21.08	2.42			34.96															100	111



Table B6.2: EDS analyses of sample 11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S11	22	3	Tur	38.61	0.68	31.59	4.02		8.84	0.77	2.50														87	98
S11	22	4	Gln	59.27		11.33	8.32		10.37	0.52	7.18														97	109
S11	22	5	Ep	39.79		22.03	12.63			22.55															97	106
S11	22	6	Ti-Mag +		7.57	5.37	81.67	0.88	3.81							0.71									100	99
S11	22	7	Qz	100.00																					100	119
S11	22	8	Grt	39.36		20.72	30.21	3.58	1.12	5.01															100	110
S11	22	9	Chr		0.41	20.43	28.33		9.01								41.82								100	104
S11	22	10	TiO2		99.59		0.41																		100	109
S11	22	11	Grt	39.33		20.99	30.76	0.36	2.42	6.14															100	114
S11	22	12	Ep	40.58		27.26	6.18			22.98															97	111
S11	22	13	Chr		0.48	16.42	26.82		9.94								46.33								100	110
S11	22	14	Ep	39.55		19.89	15.20			22.36															97	112
S11	22	15	Chr			23.71	16.38		14.49							0.34	45.07								100	113
S11	22	16	Qz	100.00																					100	119
S11	22	17	Grt	41.67		21.24	2.65			34.45															100	113
S11	22	18	Chr			5.23	19.59	0.93	9.61								64.65								100	106
S11	22	19	Ilm		53.52		43.89	2.59																	100	106
S11	23	1	Tur	37.67	0.75	34.01	6.30		5.69	1.16	1.43														87	99
S11	23	2	Chl	26.74		19.76	25.09		13.41																85	96
S11	23	3	Cld	26.31		40.46	22.87	1.24	2.13																93	103
S11	23	4	Zrn	31.00			0.34															67.24	1.42		100	121
S11	23	5	Spl			32.60	16.43		14.95							0.33	35.69								100	109
S11	23	6	Ti-Mag		7.76	3.19	84.93	1.14	2.51							0.47									100	101
S11	23	7	Grt	37.12	4.62	19.76	33.98	0.34	1.96	2.23															100	115
S11	23	8	Ep	40.26		24.62	9.80	0.24		22.08															97	110
S11	23	9	Grt	41.69		21.87	1.47			34.96															100	115
S11	23	10	Ep	40.49		25.90	7.96			22.65															97	109
S11	23	11	Chr			16.08	17.76		8.88								57.28								100	108
S11	23	12	Ti-Mag		10.49	2.45	82.88	1.98	1.70								0.50								100	101
S11	23	13	Mnohy +	1.13		28.78		46.98			2.87				17.39			0.40	0.54	1.90					100	97
S11	23	14	Grt	39.81		20.85	25.91	3.13	2.05	8.25															100	111
S11	23	15	Ep	40.27		24.31	9.90			22.51															97	107
S11	23	16	Spl		0.42	28.75	19.59		13.91								37.32								100	106
S11	23	17	Feohy + Ap +	1.95	0.67	3.31	47.35	0.38		18.99	1.09		17.20	1.05			0.66						7.35		100	71
S11	23	18	Ilm		53.82		46.18																		100	107
S11	23	19	Grt	41.62	0.71	20.83	2.52			34.33															100	117
S11	23	20	Chr			7.96	18.92		8.50								64.63								100	109
S11	23	21	Ap							49.10			44.17		5.31								1.41		100	127
S11	24	1	Mix	61.78		24.28	0.80			13.14															100	113
S11	24	2	Ilm		52.98		43.70	3.32																	100	105

Table B6.2: EDS analyses of sample 11.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S11	24	3	Ep	40.26		25.70	8.36			22.69															97	107
S11	24	4	Grt	39.32		20.42	29.91	1.79	1.30	7.26															100	111
S11	24	5	Ep	40.27		25.86	8.31			22.55															97	110
S11	24	6	Zrn	31.22																		68.78			100	118
S11	24	7	Chr			17.60	18.85		12.69							0.33	50.52								100	111
S11	24	8	Qz	100.00																					100	123
S11	24	9	Ttn	32.60	36.53	2.30	0.29			28.28															100	114
S11	24	10	Mix	20.91		8.06	56.36	1.19	0.90	0.93	1.22	0.79	3.02										6.63		100	84
S11	24	11	Ep	39.80		20.71	14.08	0.48		21.93															97	112
S11	24	12	Ep	40.40		28.25	5.30			23.06															97	112
S11	24	13	Chr			14.57	25.90		7.34							0.45	51.73								100	110
S11	24	14	Ttn	34.76	30.94	3.59	4.27		1.99	24.44															100	108
S11	24	15	Chr			16.74	21.75		9.70								51.80								100	110
S11	24	16	Ap +	7.87		3.80	1.36		0.60	42.55	0.32	0.42	34.60		5.80									2.67	100	113
S11	24	17	Feohy		11.86	3.33	80.39	0.50	2.79							1.12									100	100
S11	24	18	Ep	39.98		22.67	11.67			22.68															97	110
S11	24	19	Grt	39.05	0.27	20.74	30.56	1.45	1.15	6.76															100	111
S11	24	20	Ep	39.99		24.41	10.27			22.32															97	108
S11	24	21	Ilm		52.26		46.19	1.55																	100	107
S11	24	22	Chr			22.34	18.43		11.71							0.46	47.06								100	113
		Notes																								
		" "	= indicates that mineral is altered																							
		+	= indicates other minerals are present																							

B7: SEM-BSE images and EDS  
mineral analyses for sample S12.

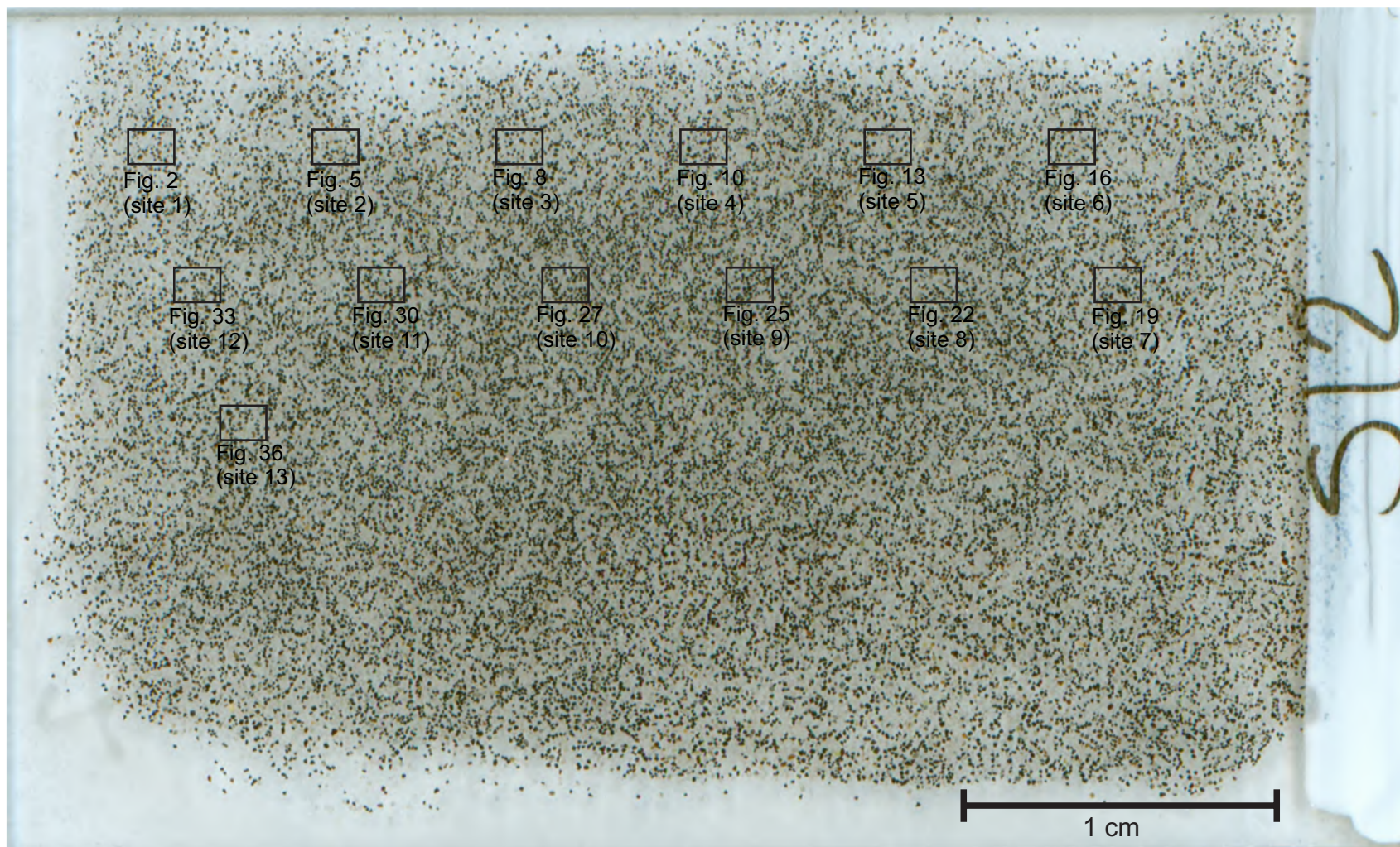


Figure B7.1: Scanned thin section of sample S12 showing the location of analysed sites. This sample comes from a wide sandy beach with scraffy dunes, and consists of fine sands with heavy minerals.



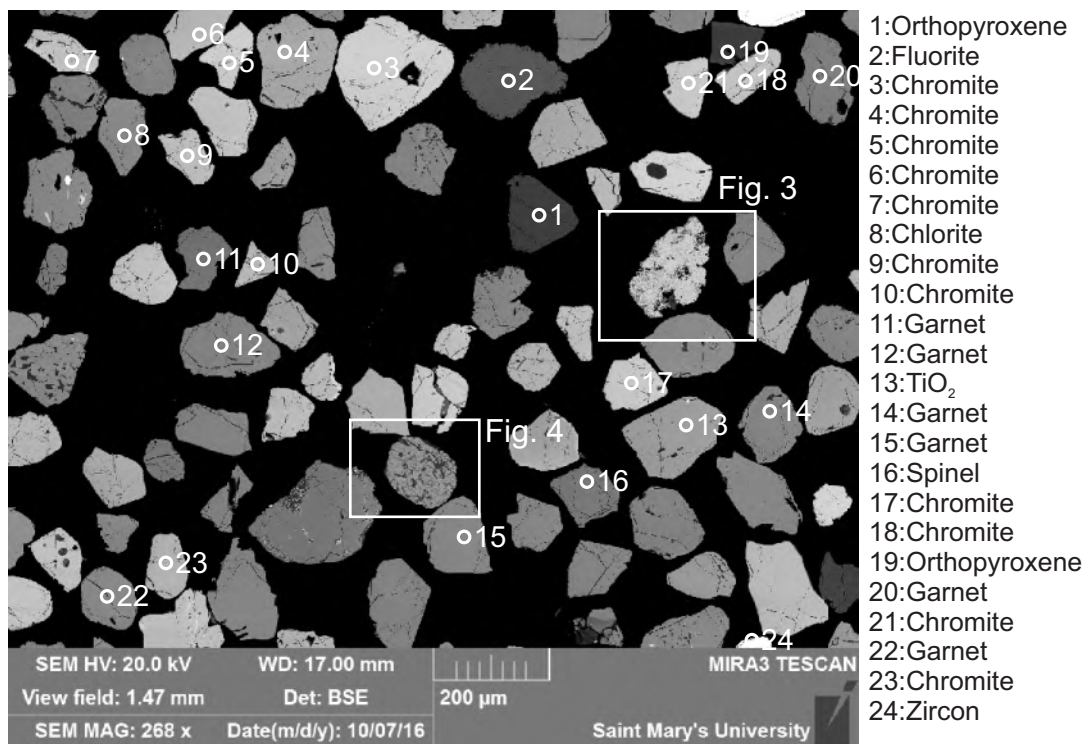


Figure B7.2: Sample S12 site 1 (SEM).

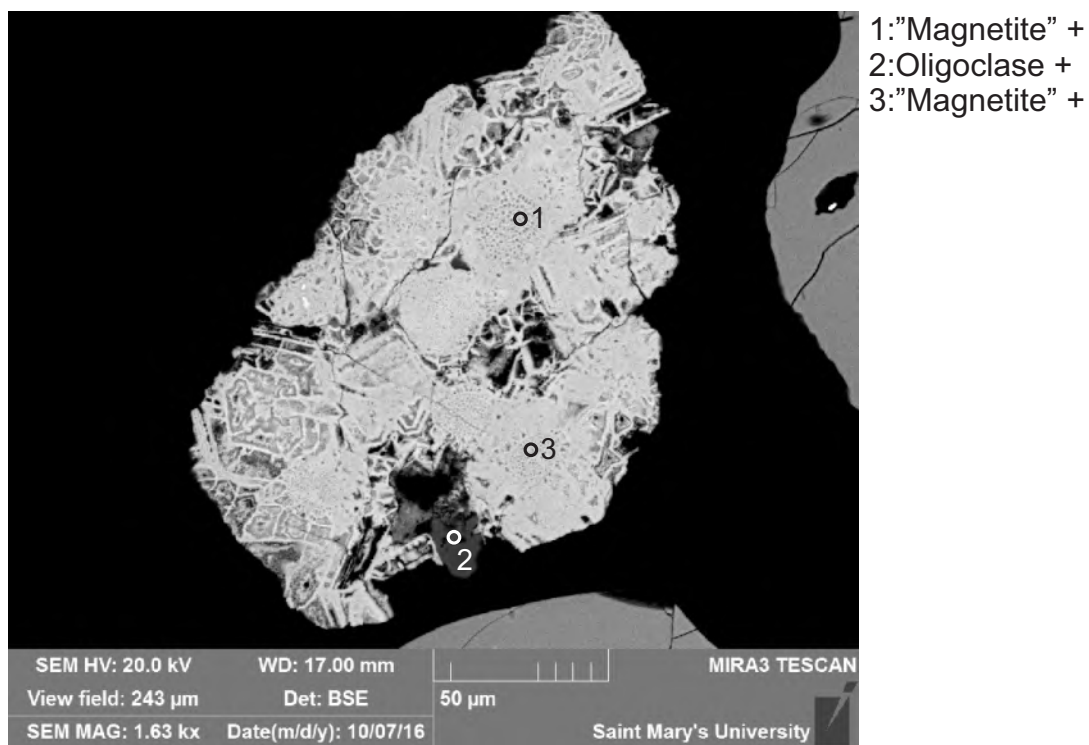
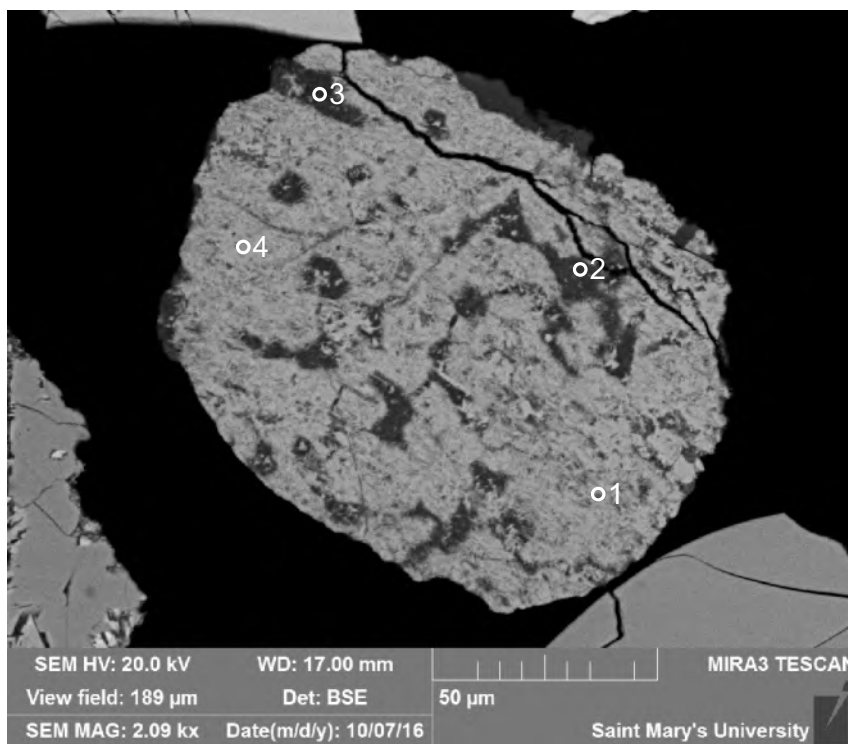


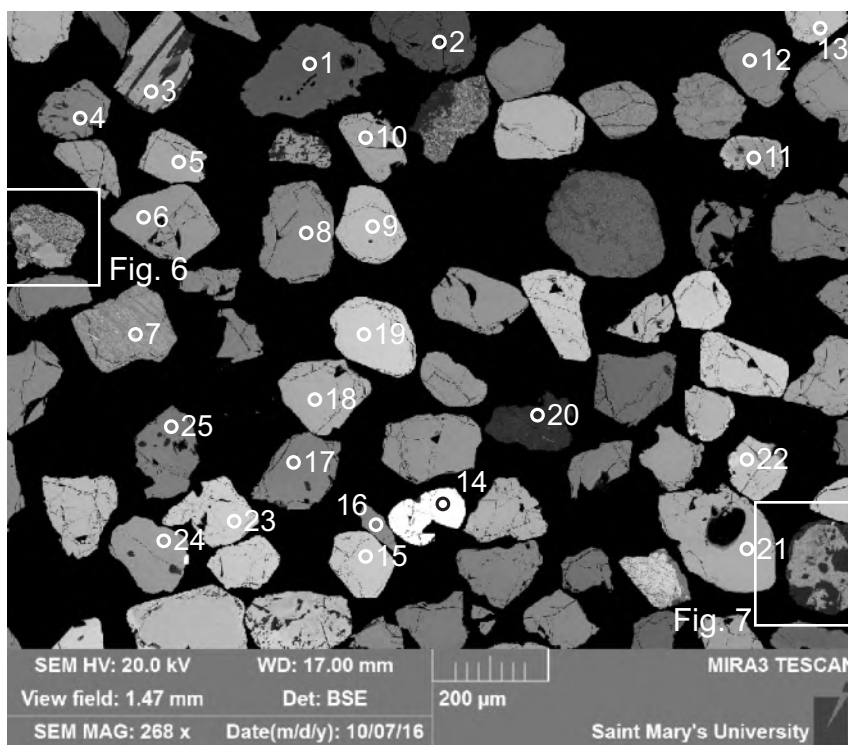
Figure B7.3: Sample S12 site 1.2 (SEM). Lithic clast consisting of oligoclase + magnetite. Igneous.





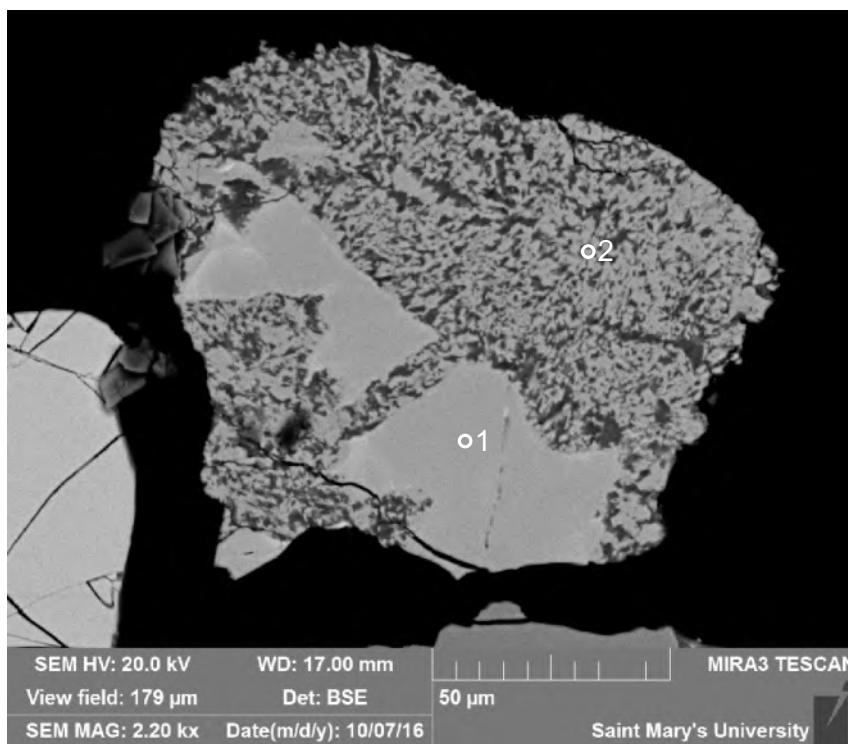
- 1:TiO<sub>2</sub> +
- 2:Quartz +
- 3:Quartz +
- 4:TiO<sub>2</sub> +

Figure B7.4: Sample S12 site 1.3 (SEM). Lithic clast consisting of quartz + titania. Metamorphic.



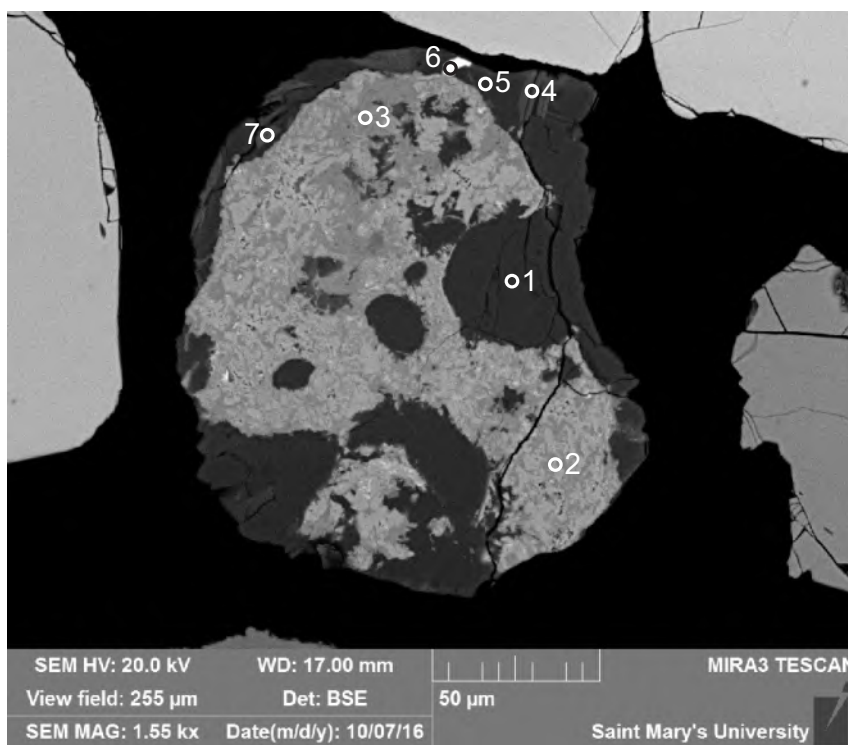
- 1:Fluorite
- 2:Staurolite
- 3:TiO<sub>2</sub>
- 4: ?Garnet
- 5:Chromite
- 6:Spinel
- 7:Titanite +
- 8:Garnet
- 9:Chromite
- 10:Spinel
- 11:Chromite
- 12:Garnet
- 13:Chromite
- 14:Zircon
- 15:Chromite
- 16:Garnet
- 17:Garnet
- 18:Chromite
- 19:Chromite
- 20:Quartz +
- 21:Chromite
- 22:Chromite
- 23:Chromite
- 24:TiO<sub>2</sub>
- 25:Garnet

Figure B7.5: Sample S12 site 2 (SEM).



1:TiO<sub>2</sub>  
2:TiO<sub>2</sub> +

Figure B7.6: Sample S12 site 2.2 (SEM). Clast of partially dissolved titania.



1:Quartz  
2:TiO<sub>2</sub> +  
3:Titanite +  
4:Muscovite  
5:Albite  
6:Zircon  
7:Muscovite +

Figure B7.7: Sample S12 site 2.3 (SEM). Lithic clast consisting of quartz + albite + muscovite + titanite + titania + zircon. Metamorphic.

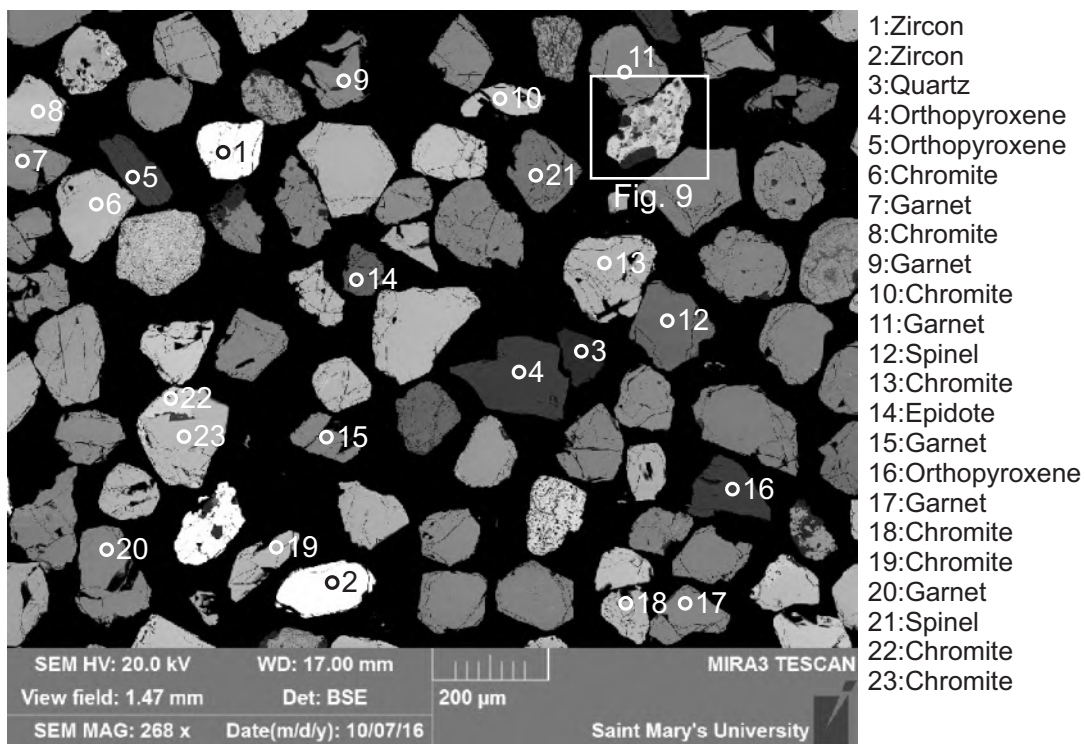


Figure B7.8: Sample S12 site 3 (SEM).

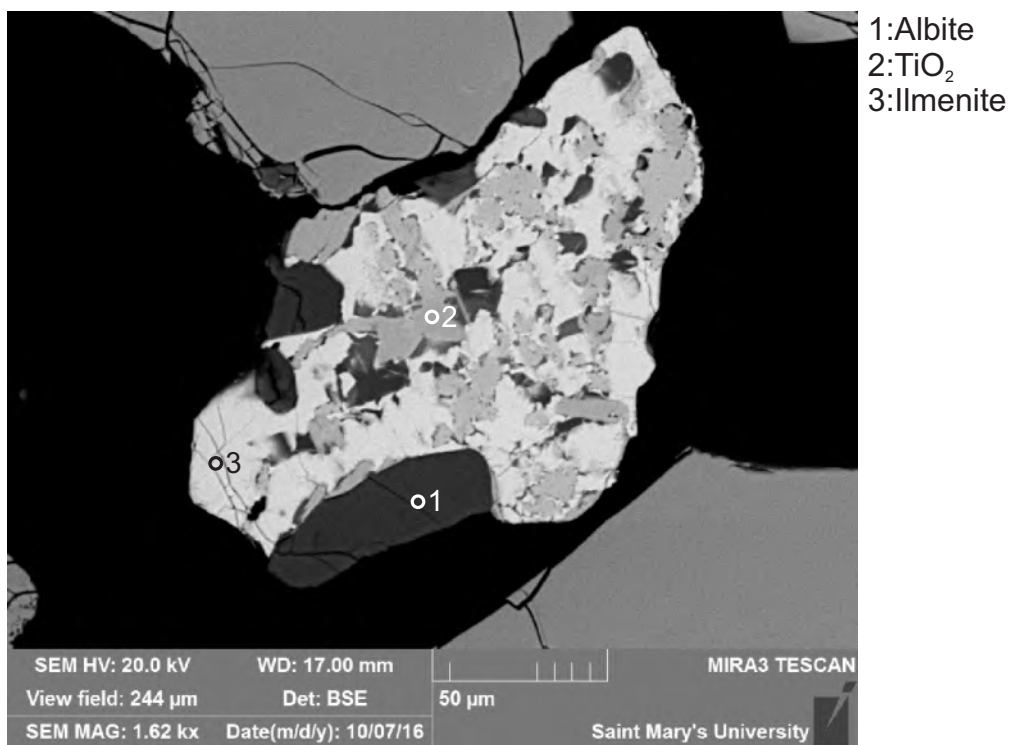


Figure B7.9: Sample S12 site 3.2 (SEM). Lithic clast consisting of albite + ilmenite + titania. Metamorphic.



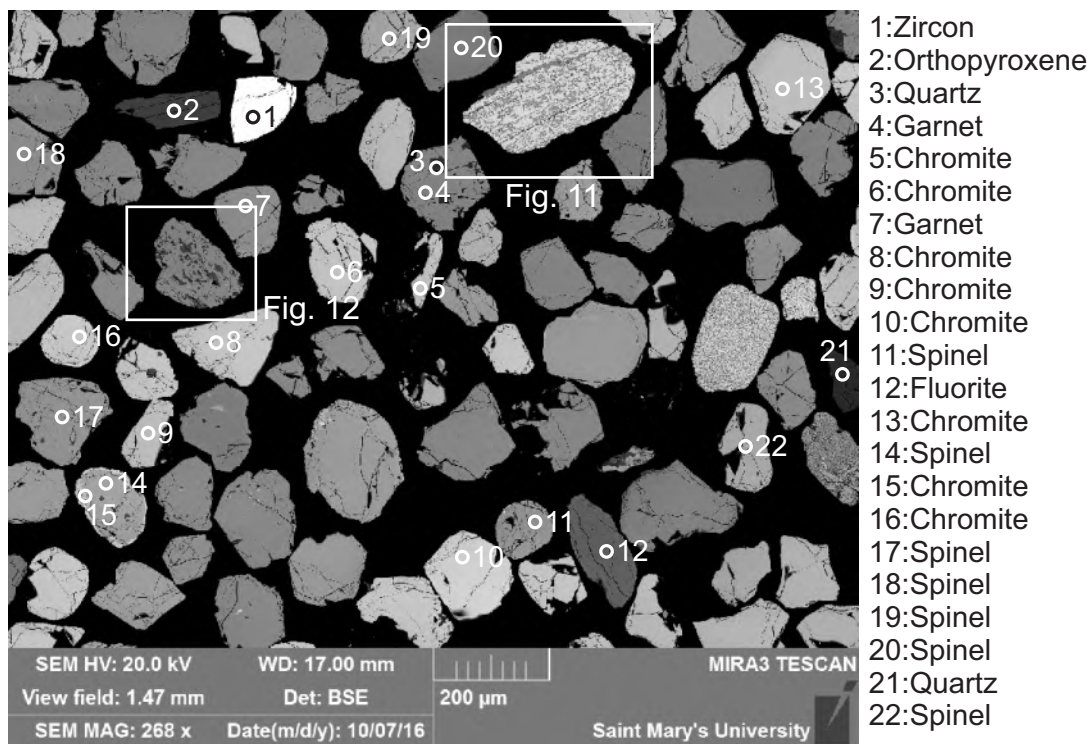


Figure B7.10: Sample S12 site 4 (SEM).

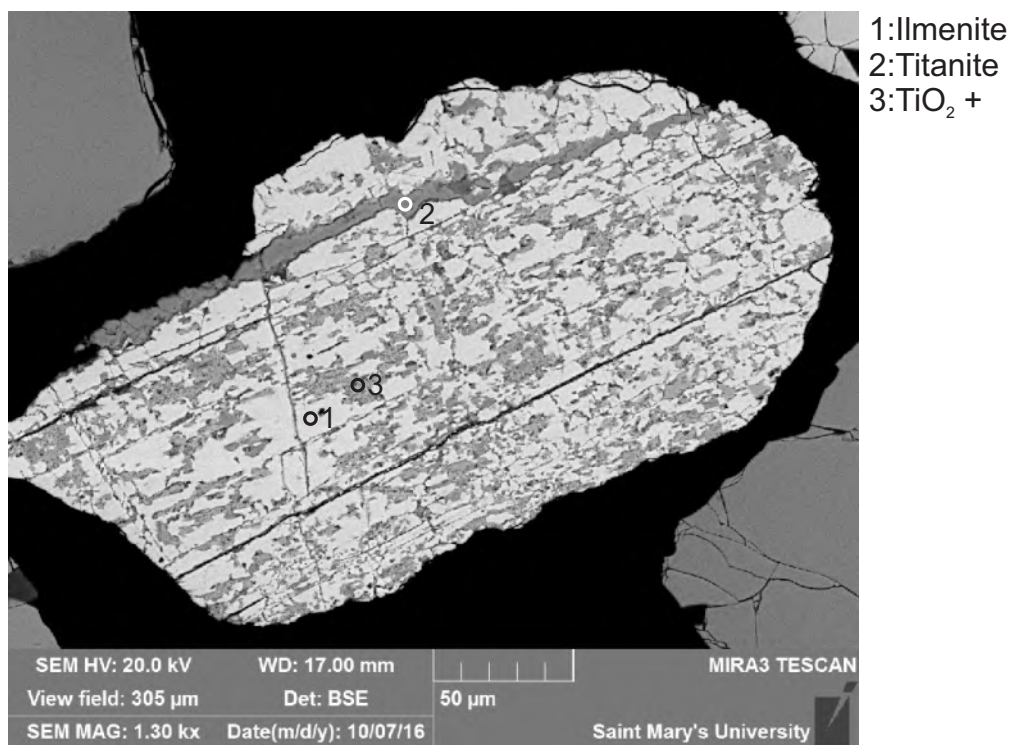
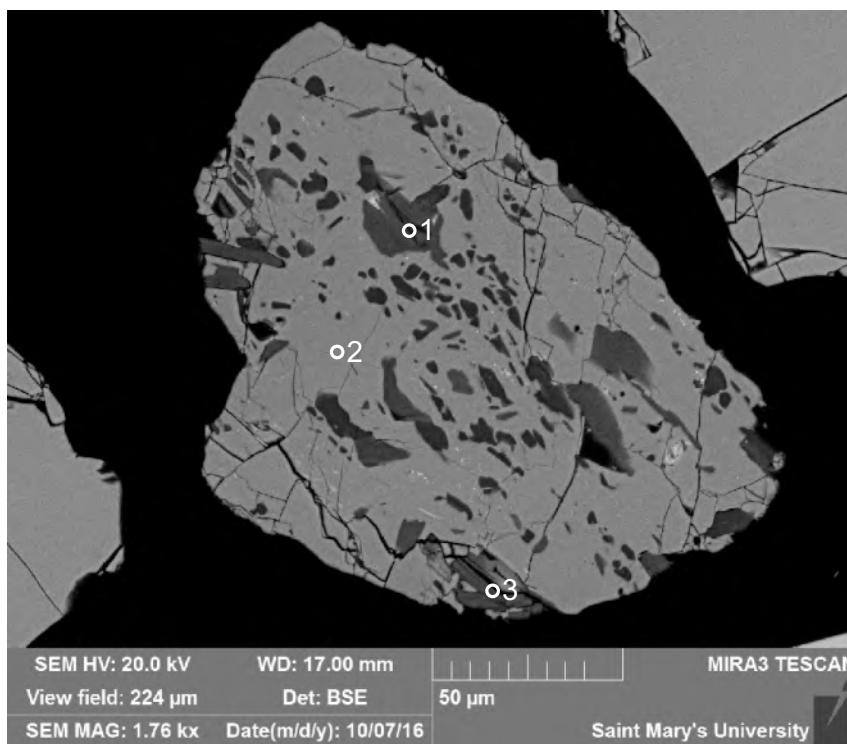
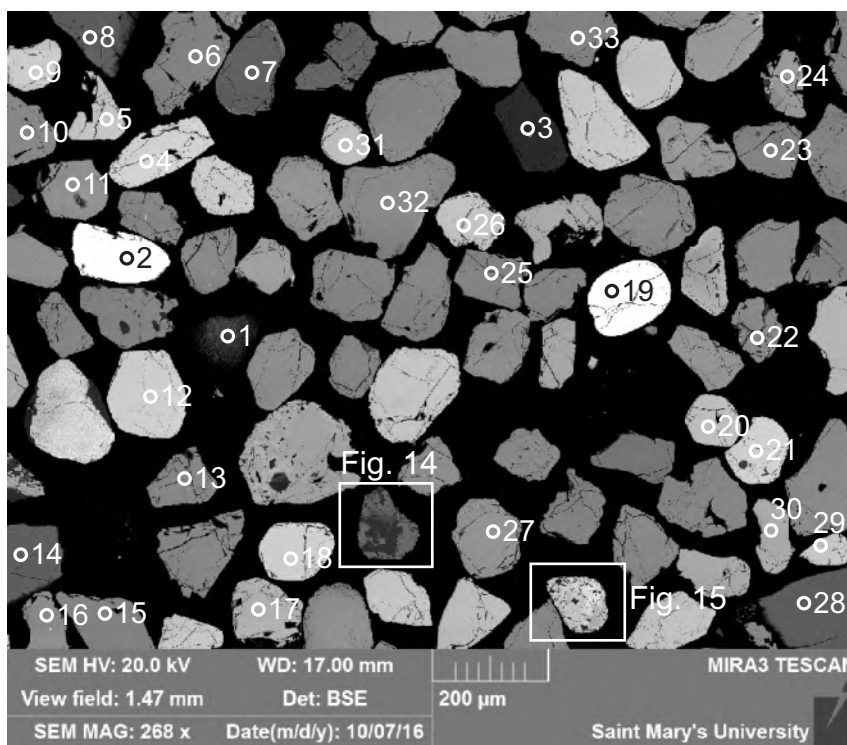


Figure B7.11: Sample S12 site 4.2 (SEM). Detrital ilmenite grain (altered).



- 1:Muscovite +
- 2:Titanite
- 3:Muscovite

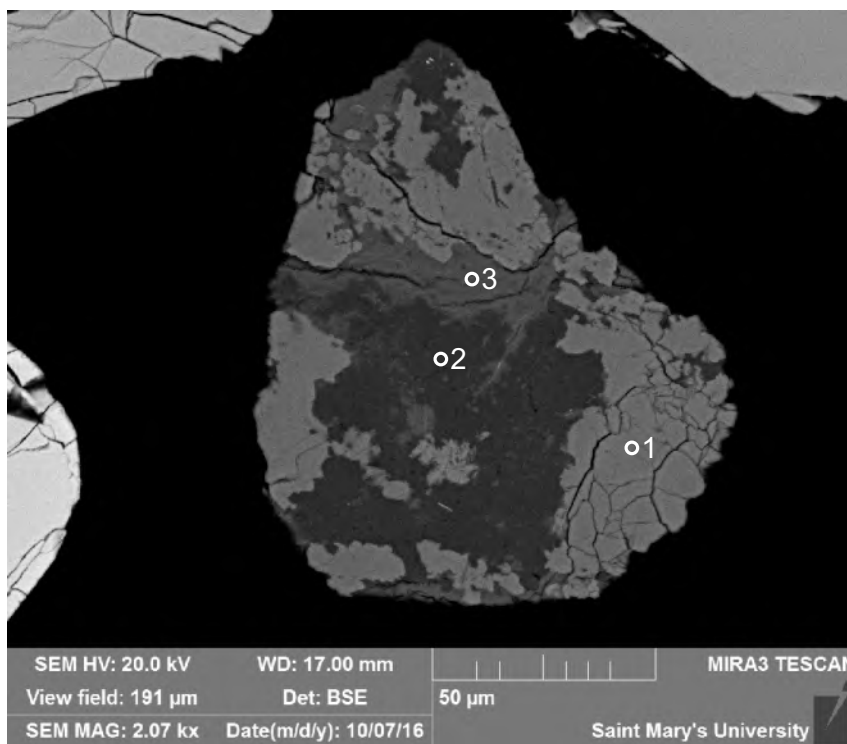
Figure B7.12: Sample S12 site 4.3 (SEM). Lithic clast consisting of titanite + muscovite + K-feldspar. Metamorphic.



- 1:Fluorite
- 2:Zircon
- 3:Quartz
- 4:Chromite
- 5:Chromite
- 6:Garnet
- 7:Spinel
- 8:Fluorite
- 9:Chromite
- 10:Spinel
- 11:Garnet
- 12:Chromite
- 13:Garnet
- 14:Fluorite
- 15:Spinel
- 16:Garnet
- 17:Chromite
- 18:Chromite
- 19:Zircon
- 20:Chromite +
- 21:Chromite
- 22:Garnet
- 23:Garnet
- 24:Spinel
- 25:Garnet
- 26:Chromite
- 27:Garnet
- 28:Fluorite
- 29:Chromite
- 30:Chromite
- 31:Chromite
- 32:Spinel
- 33:Garnet

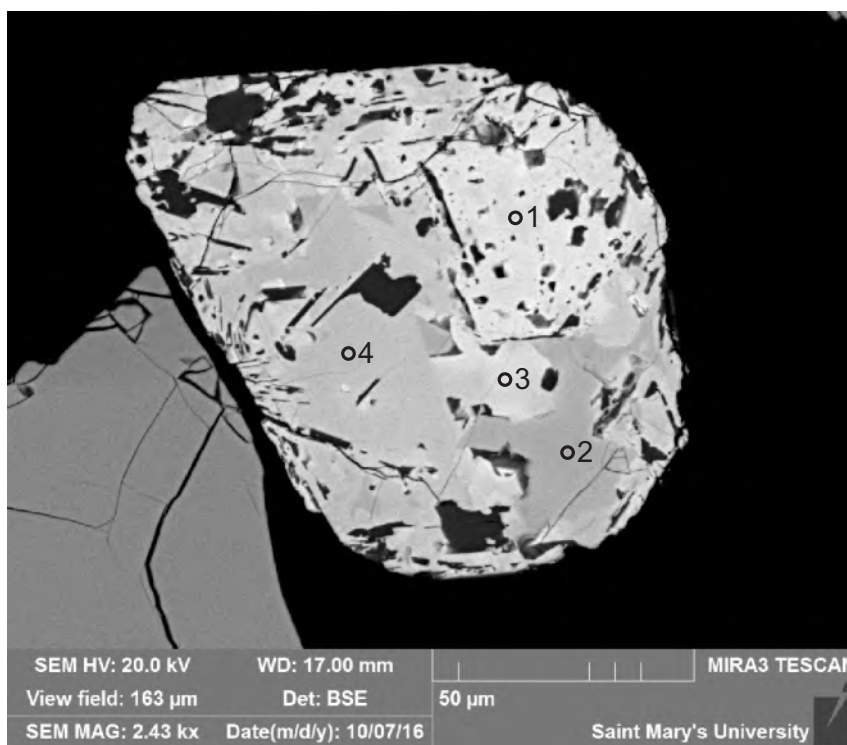
Figure B7.13: Sample S12 site 5 (SEM).





- 1:Epidote
- 2:Quartz +
- 3:Chlorite

Figure B7.14: Sample S12 site 5.2 (SEM). Lithic clast consisting of quartz + chlorite + epidote. Hydrothermal.



- 1:Chromite
- 2:Chromite
- 3:Chromite
- 4:Chromite

Figure B7.15: Sample S12 site 5.3 (SEM). Patchy chromite grain.

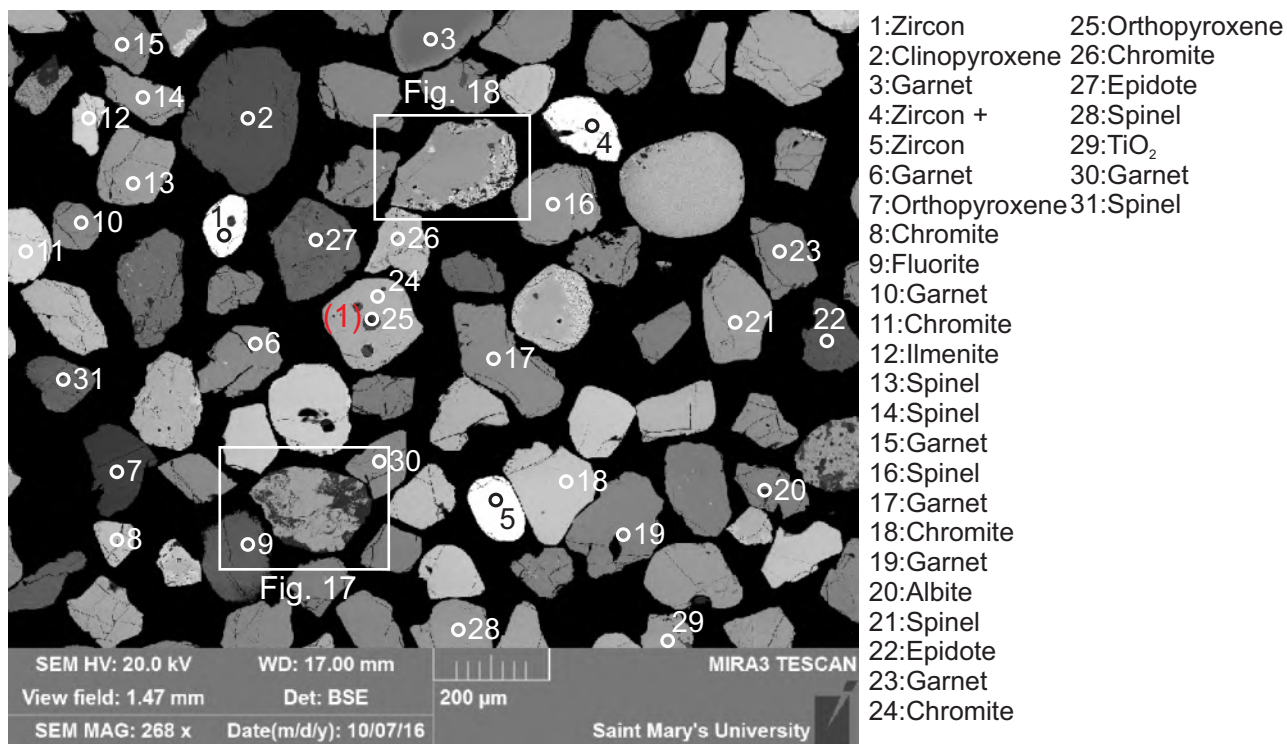


Figure B7.16: Sample S12 site 6 (SEM). 1: Lithic clast (spinel + orthopyroxene, ophiolite or metaophiolite).

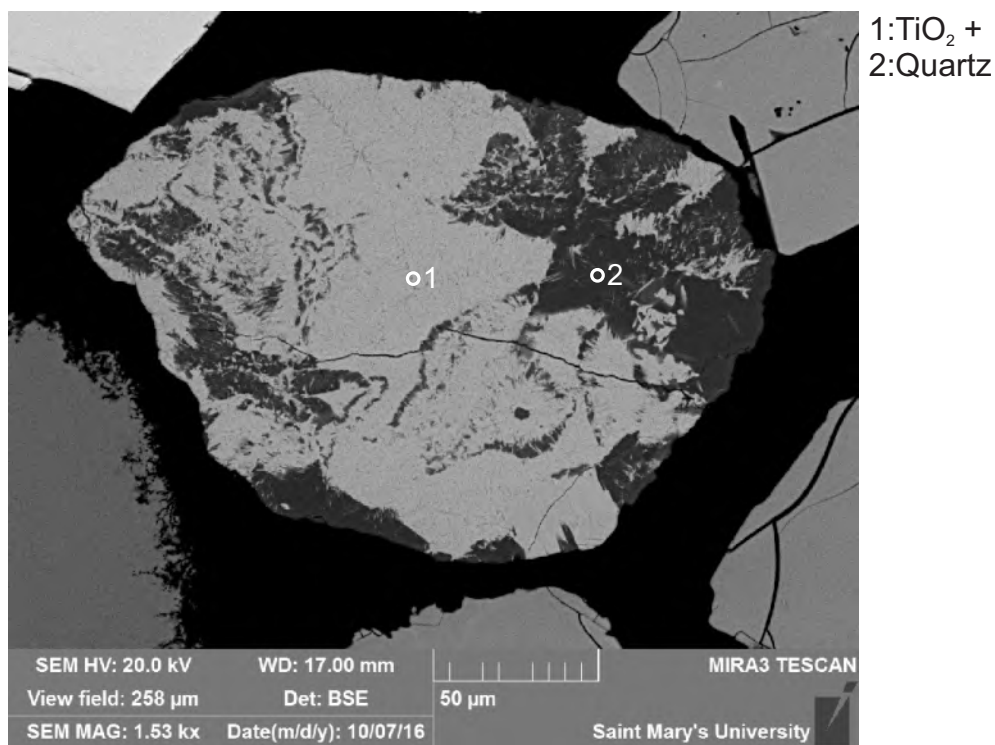
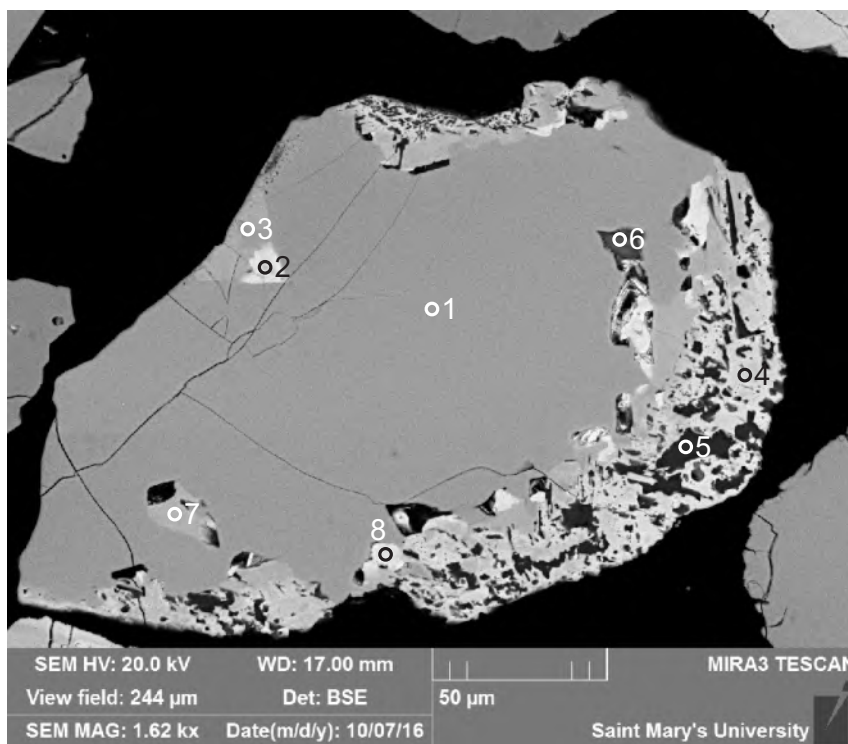
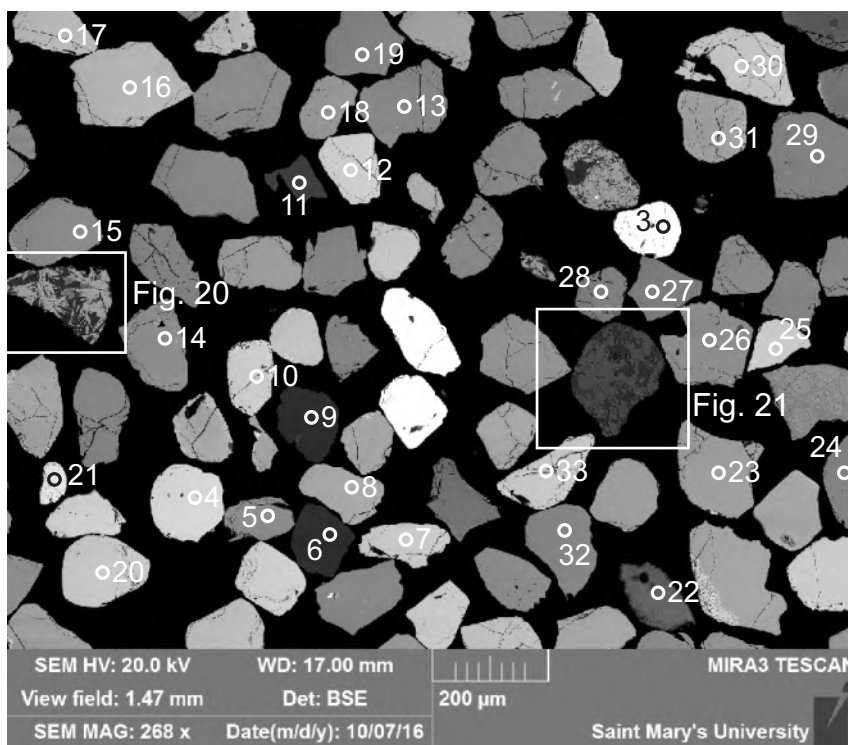


Figure B7.17: Sample S12 site 6.2 (SEM). Lithic clast consisting of quartz + titania. Texture appears hydrothermal.



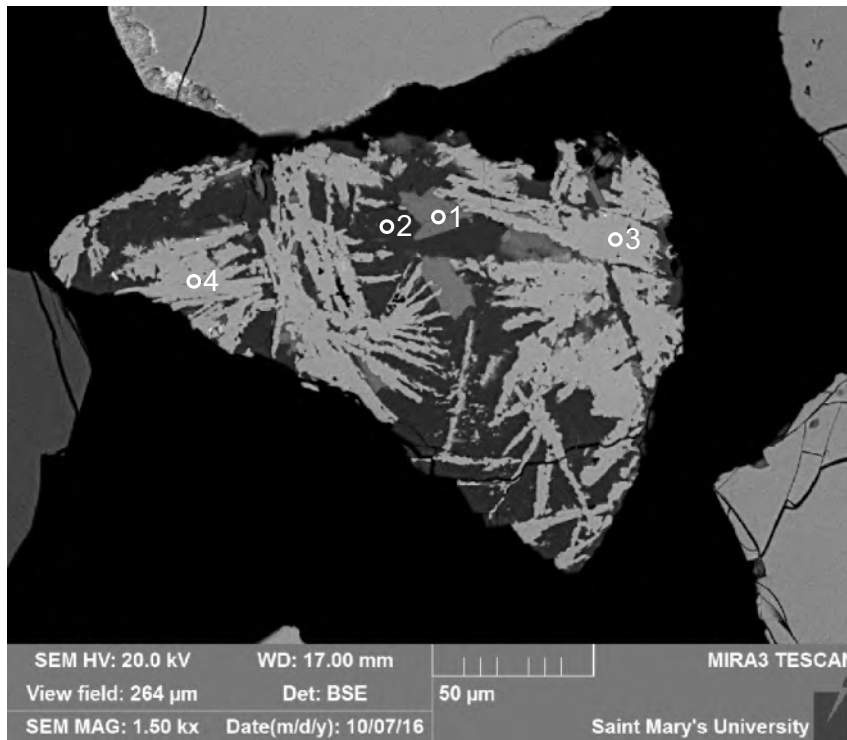
- 1: Spinel
- 2: "Chromite"
- 3: Spinel
- 4: Chromite
- 5: Cr-Chlorite
- 6: Cr-Chlorite
- 7: Chromite
- 8: Spinel

Figure B7.18: Sample S12 site 6.3 (SEM). Lithic clast consisting of spinel + chromite altering to Cr-chlorite. Ophiolite or metaophiolite.



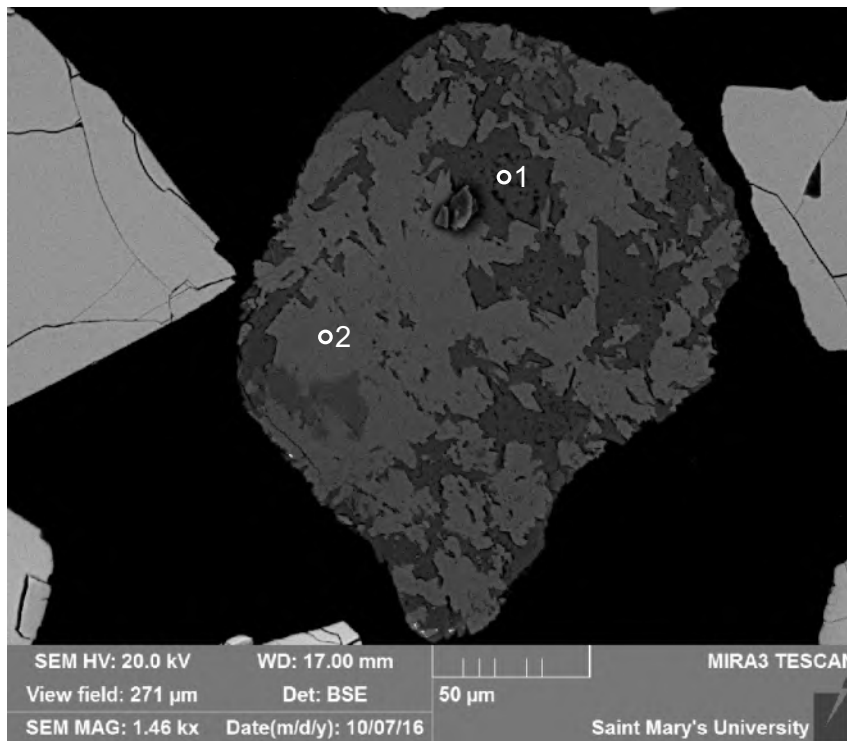
- 1: Zircon
- 2: Zircon
- 3: Zircon
- 4: Ilmenite
- 5: Garnet
- 6: Quartz
- 7: Chromite
- 8:  $\text{TiO}_2 +$
- 9: Quartz
- 10: Chromite
- 11: Orthopyroxene
- 12: Chromite
- 13: Garnet
- 14: Garnet
- 15: Spinel
- 16: Chromite
- 17: Chromite
- 18: Chromite
- 19: Garnet
- 20: Chromite
- 21: Ilmenite
- 22: Fluorite
- 23: Spinel
- 24: Garnet
- 25: Chromite
- 26: Chromite
- 27: Spinel
- 28: ?
- 29: Spinel
- 30: Chromite
- 31: Spinel
- 32: Garnet
- 33: Chromite

Figure B7.19: Sample S12 site 7 (SEM).



- 1: Biotite
- 2: Quartz
- 3:  $\text{TiO}_2$
- 4:  $\text{TiO}_2$  +

Figure B7.20: Sample S12 site 7.2 (SEM). Lithic clast consisting of biotite + quartz + titania as needles. Check significance of texture.



- 1: Albite
- 2: Epidote

Figure B7.21: Sample S12 site 7.3 (SEM). Lithic clast consisting of albite + epidote. Hydrothermal.



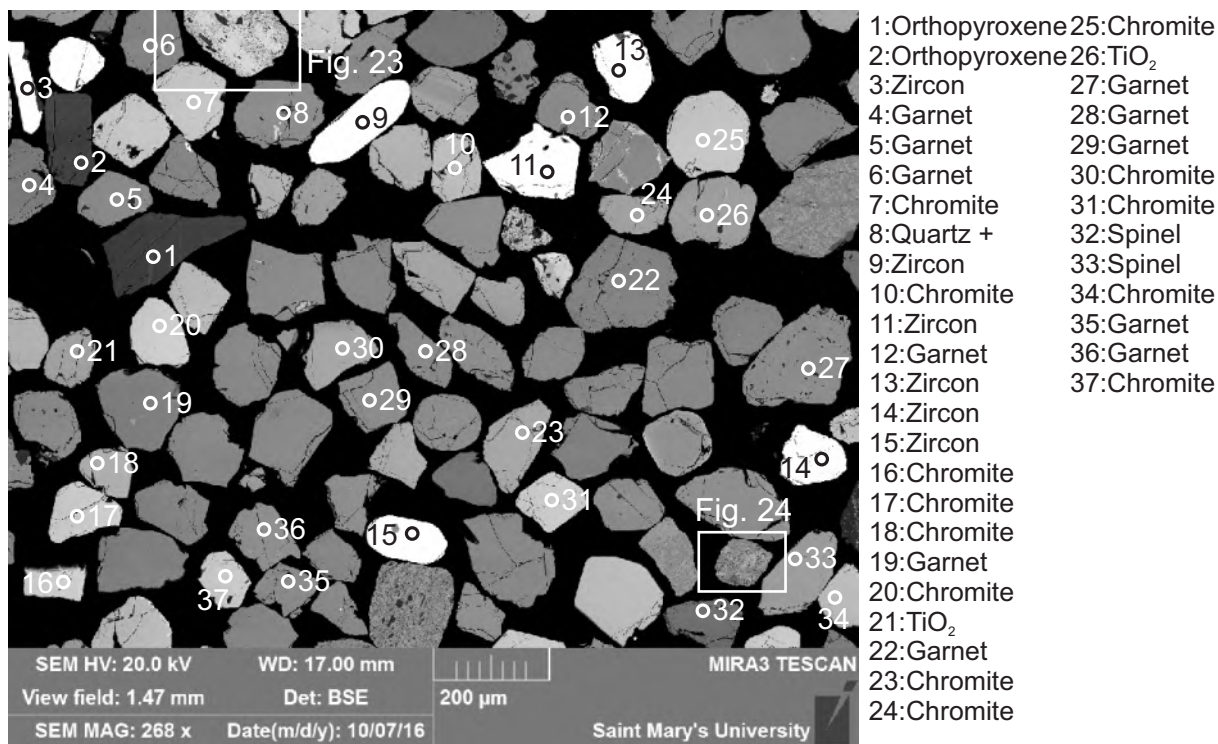


Figure B7.22: Sample S12 site 8 (SEM).

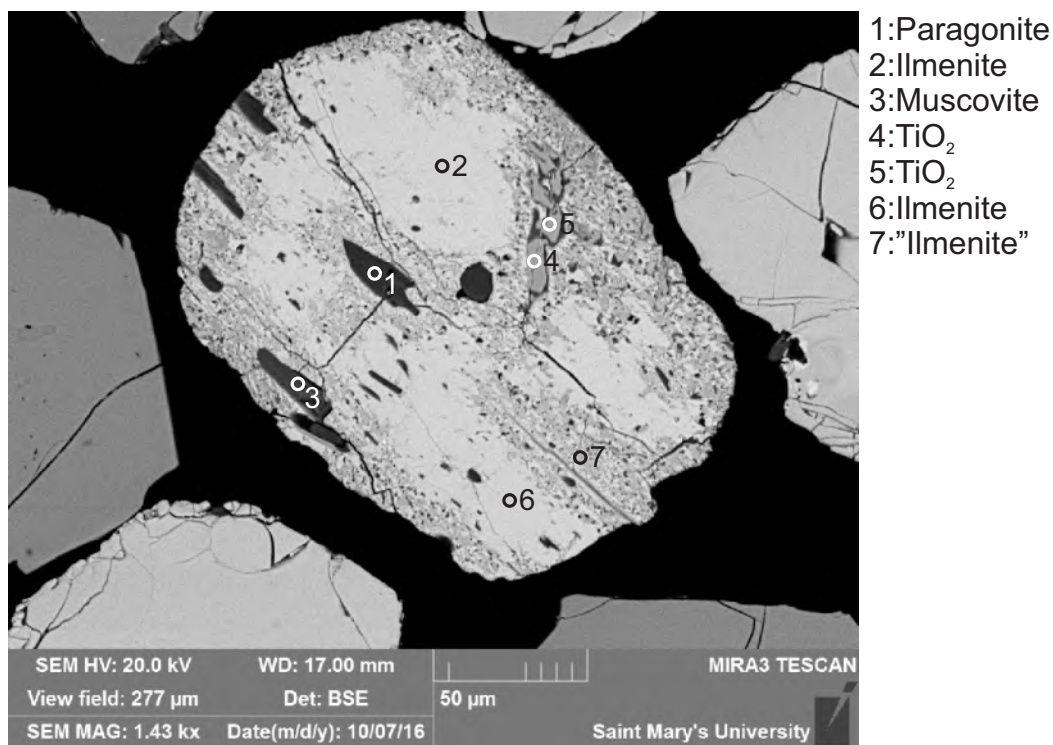
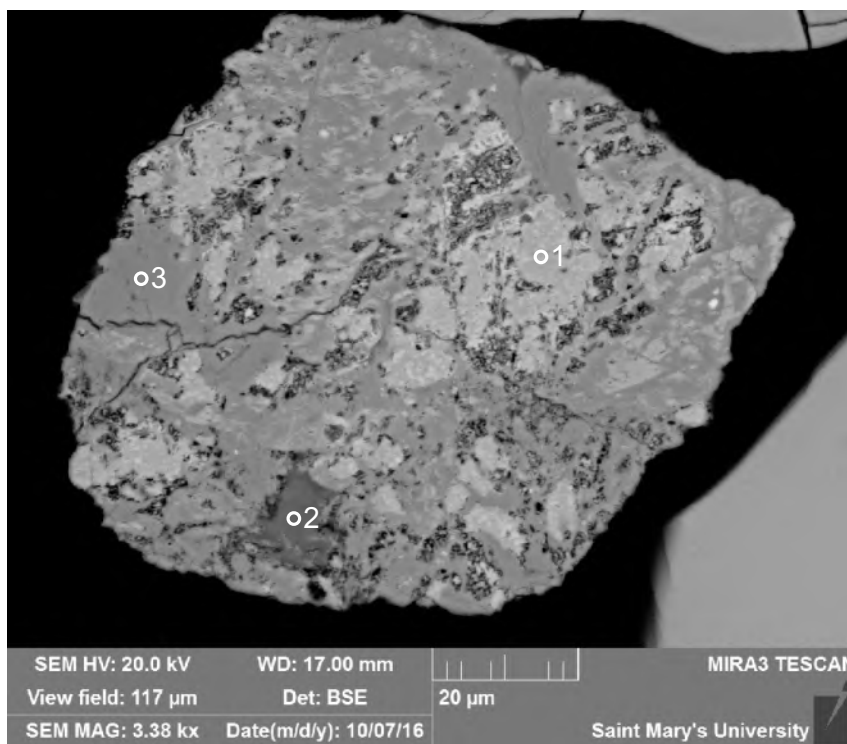
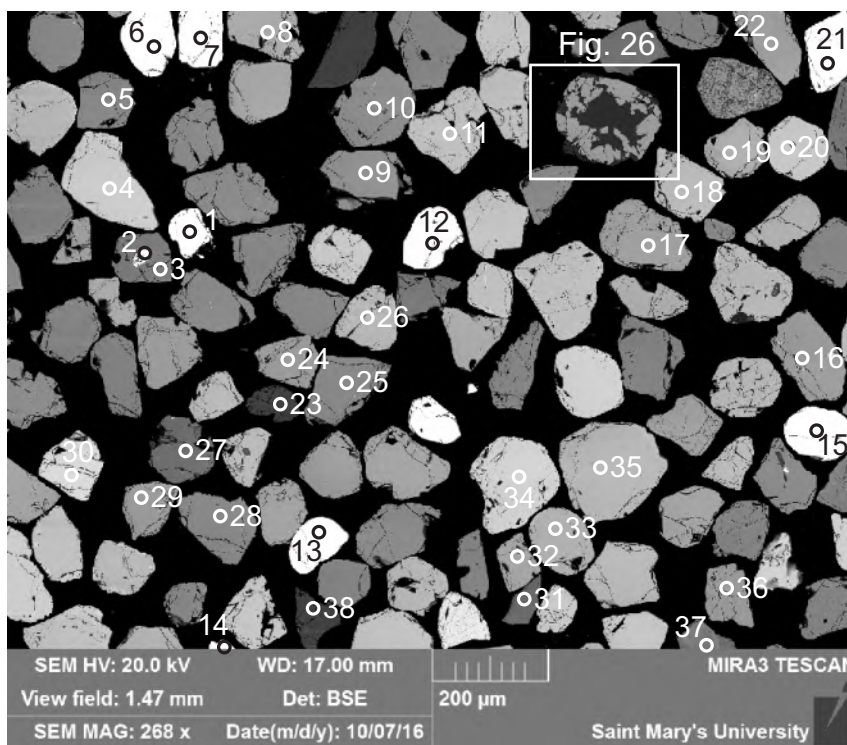


Figure B7.23: Sample S12 site 8.2 (SEM). Lithic clast consisting of altered ilmenite + paragonite + muscovite. Metamorphic.



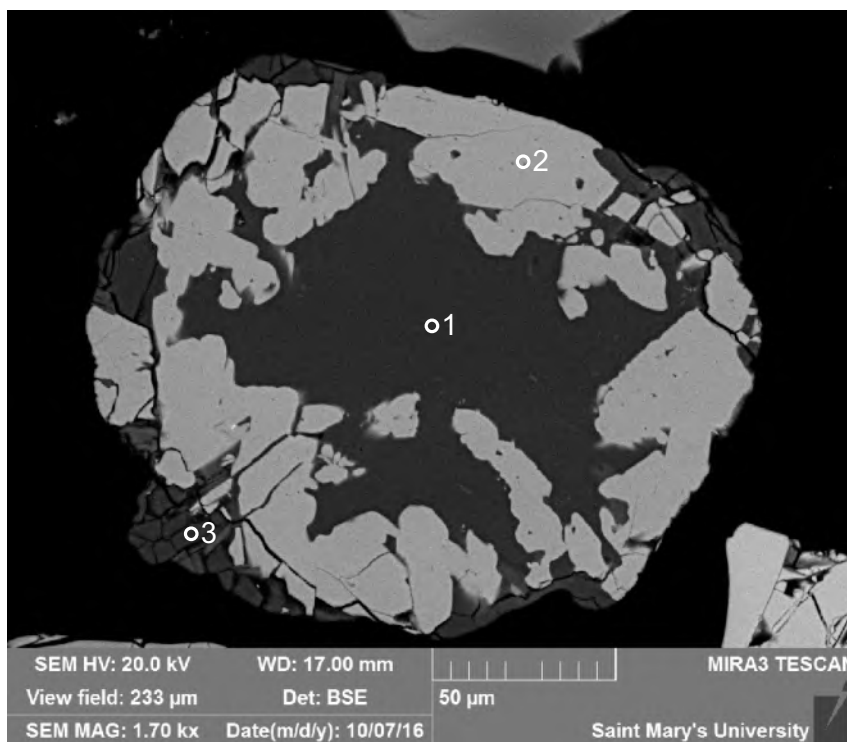
- 1:TiO<sub>2</sub>
- 2:Chlorite +
- 3:Titanite

Figure B7.24: Sample S12 site 8.3 (SEM). Lithic clast consisting of titania + titanite + chlorite. Metamorphic.



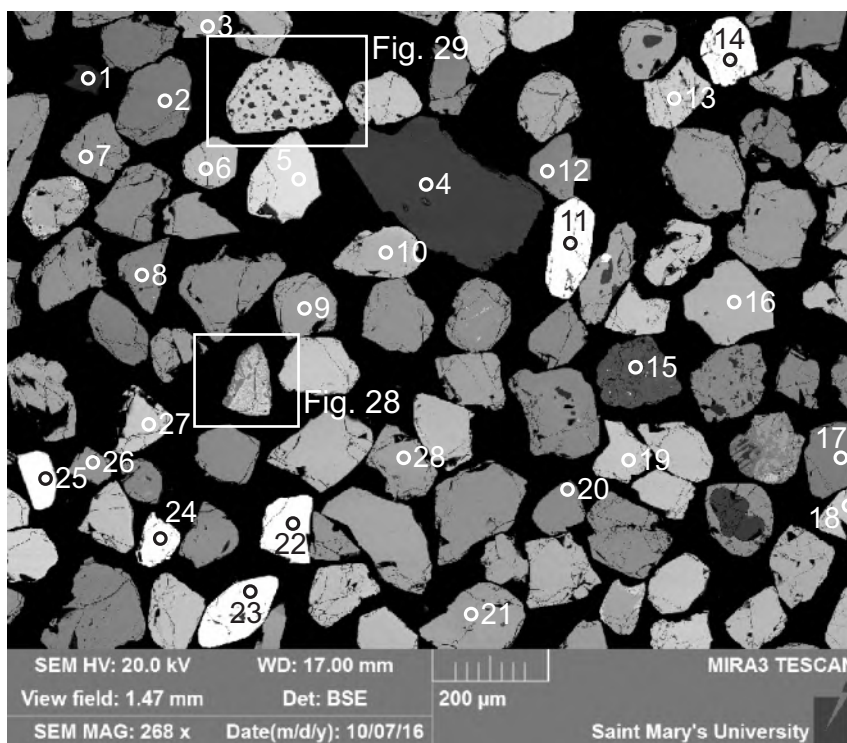
- 1:Zircon
- 2:Pyrrhotite
- 3:Garnet
- 4:Chromite
- 5:Garnet
- 6:Zircon
- 7:Zircon
- 8:Chromite
- 9:Spinel
- 10:Garnet
- 11:Chromite
- 12:Zircon
- 13:Zircon
- 14:Zircon
- 15:Zircon
- 16:TiO<sub>2</sub>
- 17:Spinel
- 18:Chromite
- 19:Chromite
- 20:Mix
- 21:Zircon
- 22:Spinel
- 23:Orthopyroxene
- 24:Spinel
- 25:Garnet
- 26:Chromite
- 27:Garnet
- 28:Garnet
- 29:Spinel
- 30:Ilmenite
- 31:Spinel
- 32:Chromite
- 33:Chromite
- 34:Chromite
- 35:Chromite
- 36:Spinel
- 37:Epidote
- 38:Orthopyroxene

Figure B7.25: Sample S12 site 9 (SEM).



- 1:Quartz
- 2:TiO<sub>2</sub>
- 3:Quartz

Figure B7.26: Sample S12 site 9.2 (SEM). Lithic clast consisting of quartz + titania. Hydrothermal.



- 1:Quartz
- 2:Spinel
- 3:Chromite
- 4:Orthopyroxene
- 5:Chromite
- 6:Spinel
- 7:Garnet
- 8:Garnet
- 9:Spinel
- 10:Chromite
- 11:Zircon
- 12:Spinel
- 13:Chromite
- 14:Zircon
- 15:Amphibole
- 16:Spinel
- 17:Spinel
- 18:Chromite
- 19:Chromite
- 20:Spinel
- 21:Spinel
- 22:Zircon
- 23:Zircon
- 24:Zircon
- 25:Zircon
- 26:Spinel
- 27:Chromite
- 28:Spinel

Figure B7.27: Sample S12 site 10 (SEM).



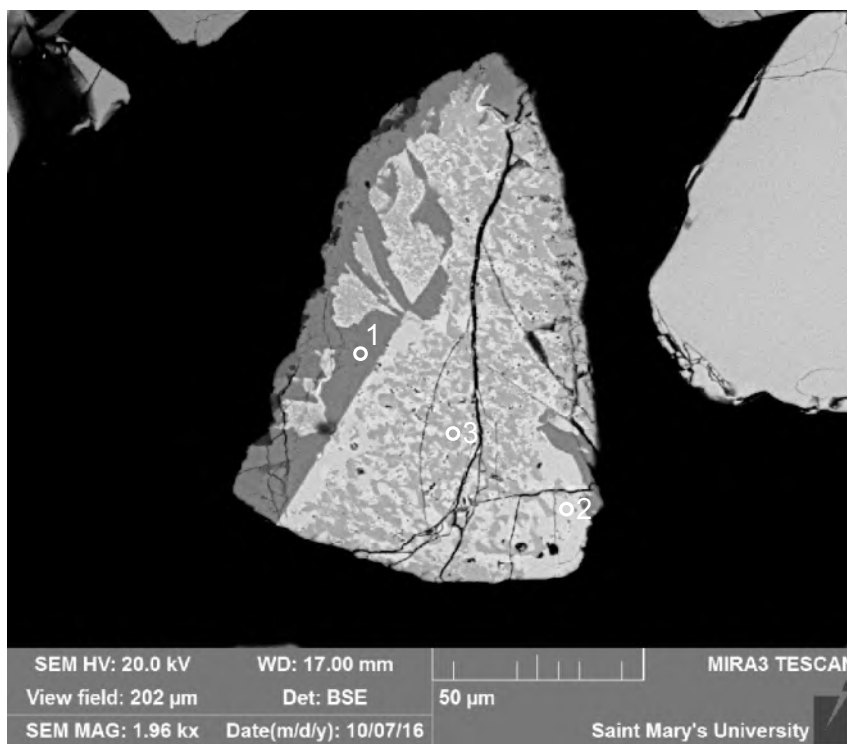


Figure B7.28: Sample S12 site 10.2 (SEM). Lithic clast consisting of titanite + titania + ilmenite. Metamorphic.

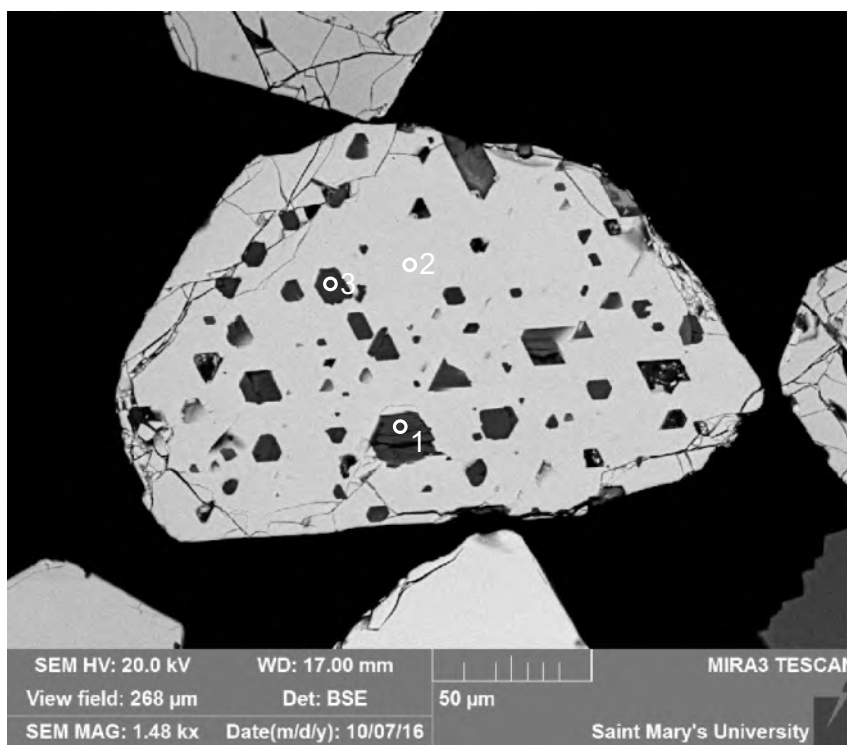


Figure B7.29: Sample S12 site 10.3 (SEM). Lithic clast composed of chromite with inclusions of ?mica.



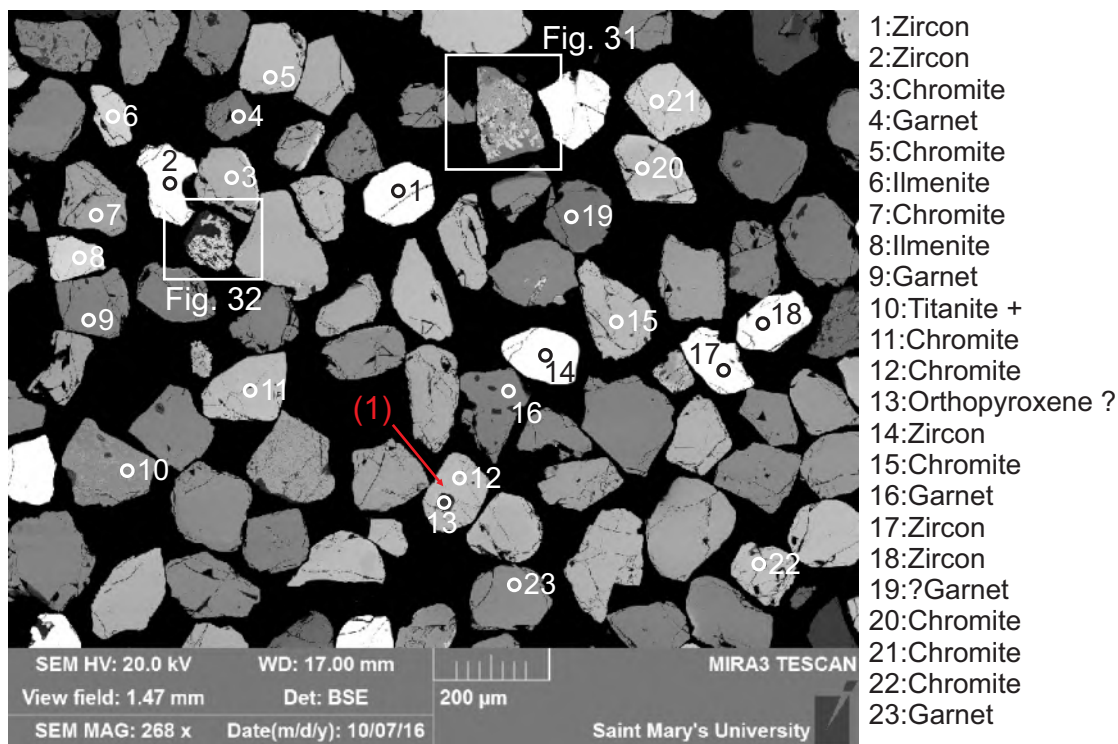


Figure B7.30: Sample S12 site 11 (SEM). 1: Lithic clast (chromite + orthopyroxene, ophiolite).

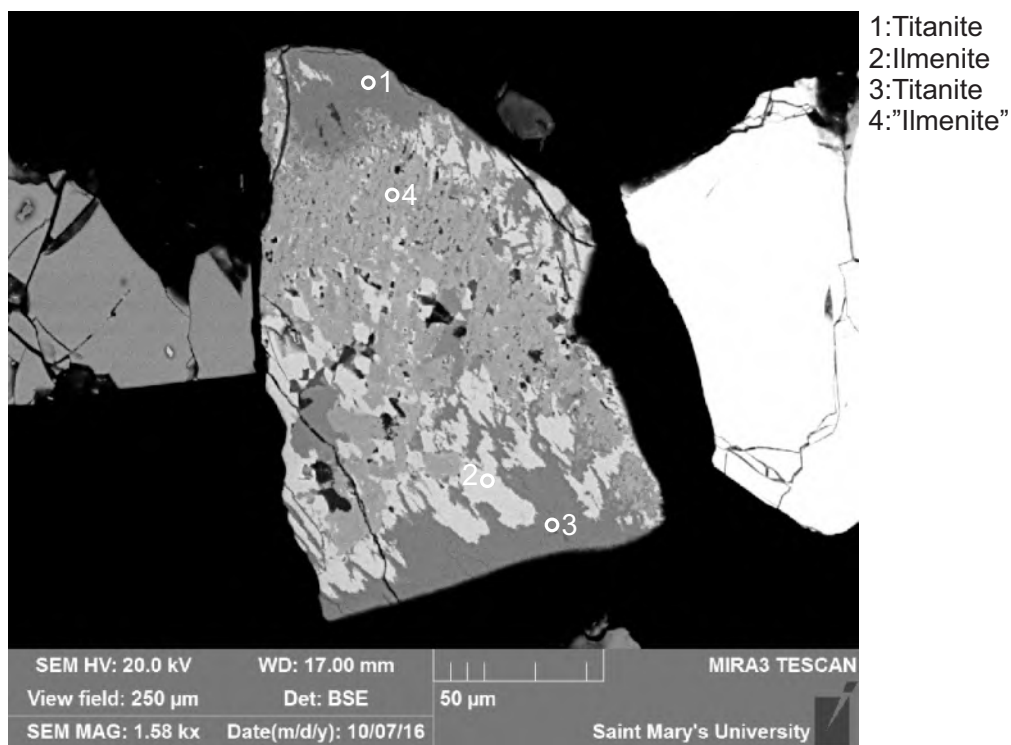


Figure B7.31: Sample S12 site 11.2 (SEM). Clast consisting of titanite + ilmenite. Altered ilmenite grain.

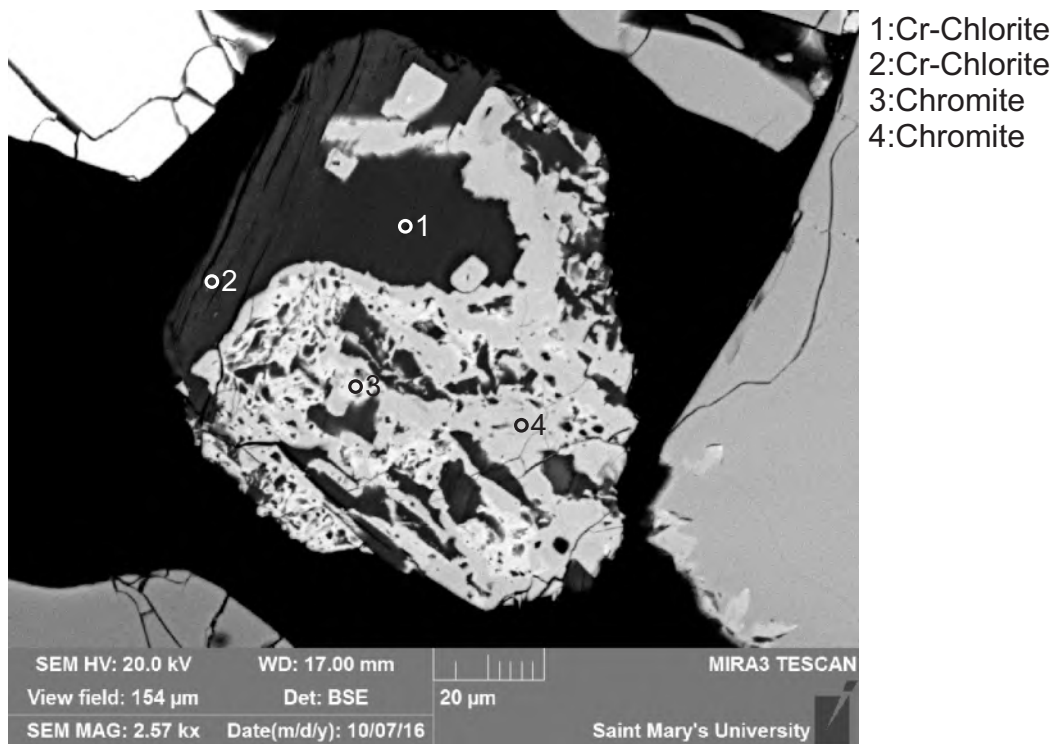


Figure B7.32: Sample S12 site 11.3 (SEM). Lithic clast consisting of Cr-chlorite + chromite. Metaophiolite.

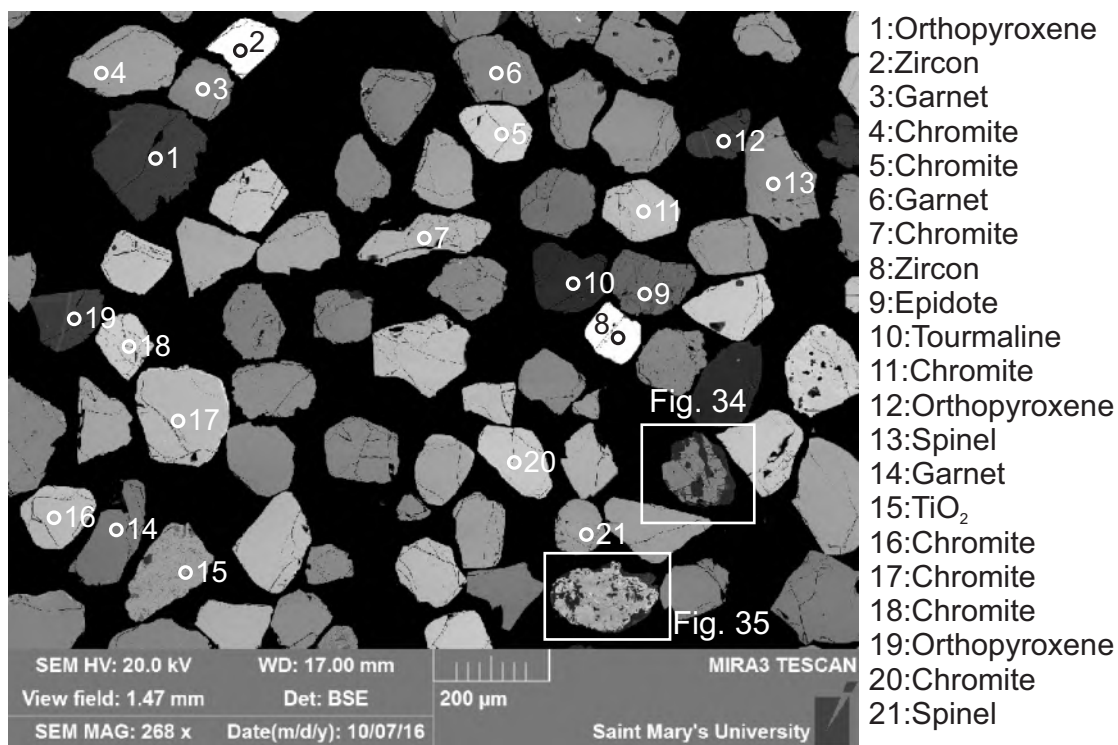
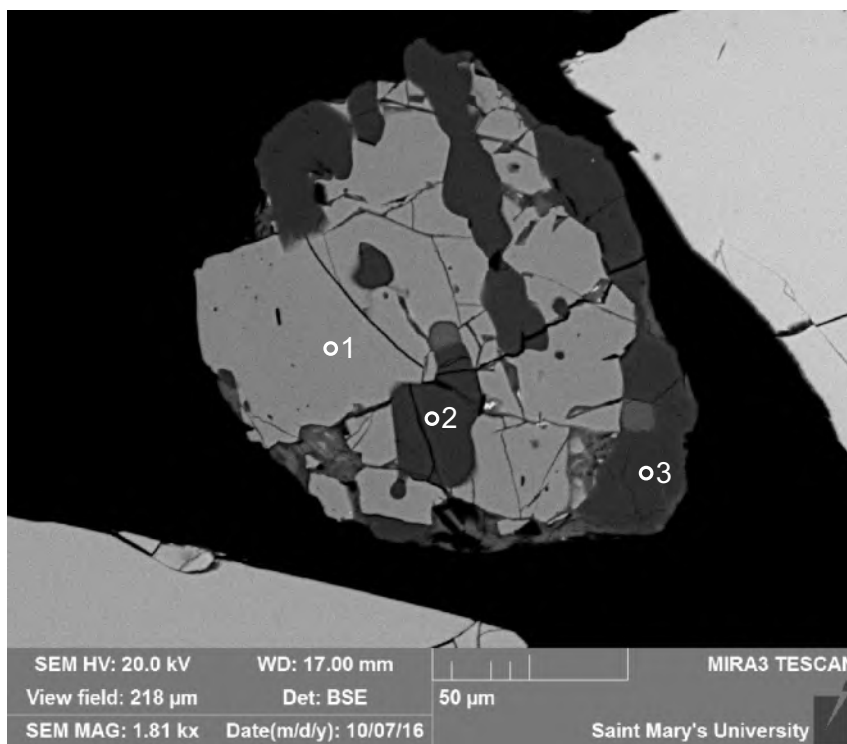
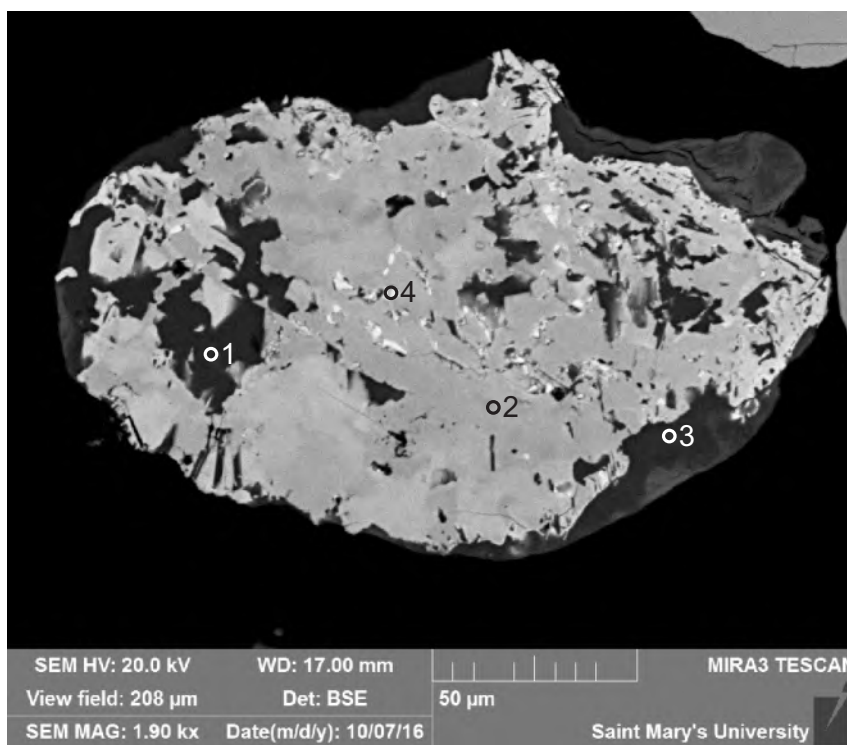


Figure B7.33: Sample S12 site 12 (SEM).



- 1: Garnet
- 2: Quartz
- 3: Quartz

Figure B7.34: Sample S12 site 12.2 (SEM). Lithic clast consisting of garnet + quartz. Metamorphic.



- 1: Cr-Chlorite
- 2: Spinel
- 3: Cr-Chlorite
- 4: Spinel

Figure B7.35: Sample S12 site 12.3 (SEM). Lithic clast consisting of spinel + Cr-chlorite. Metaophiolite.



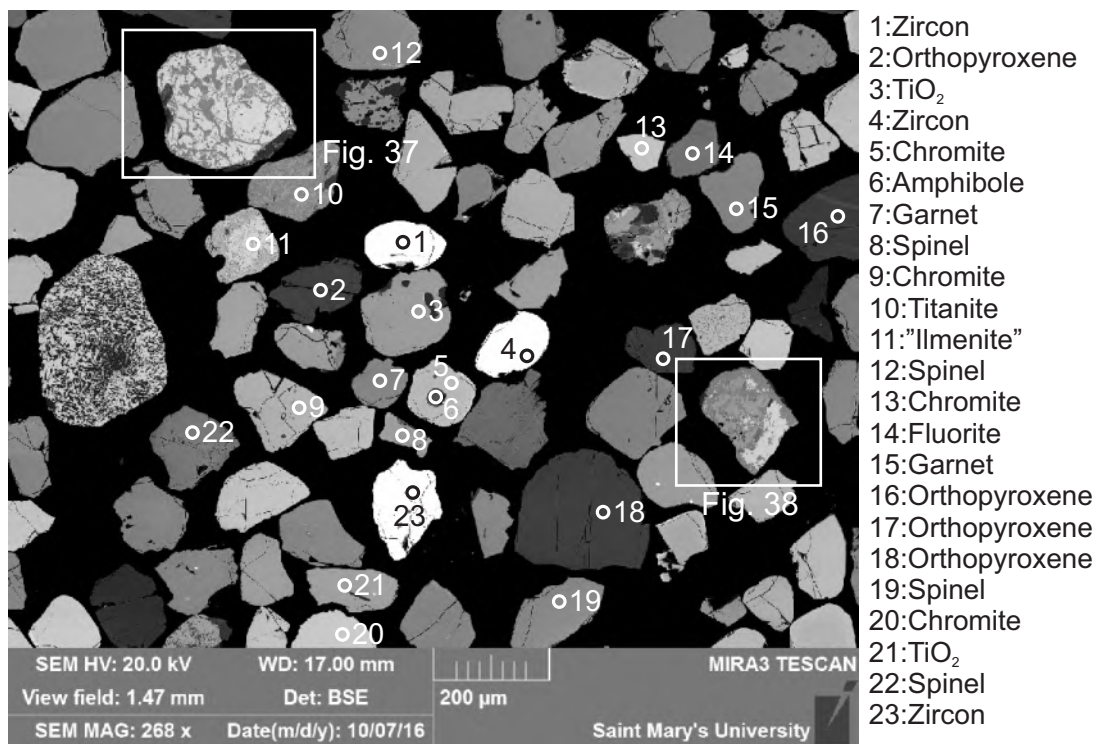


Figure B7.36: Sample S12 site 13 (SEM).

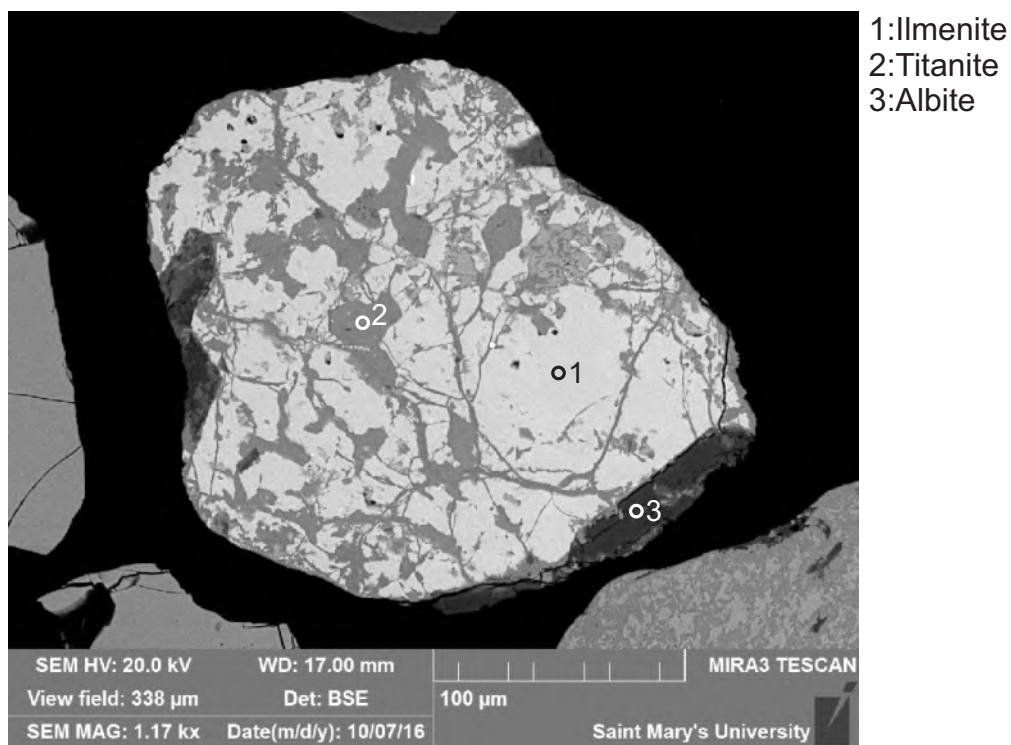


Figure B7.37: Sample S12 site 13.2 (SEM). Lithic clast consisting of albite + titanite + ilmenite. Metamorphic.



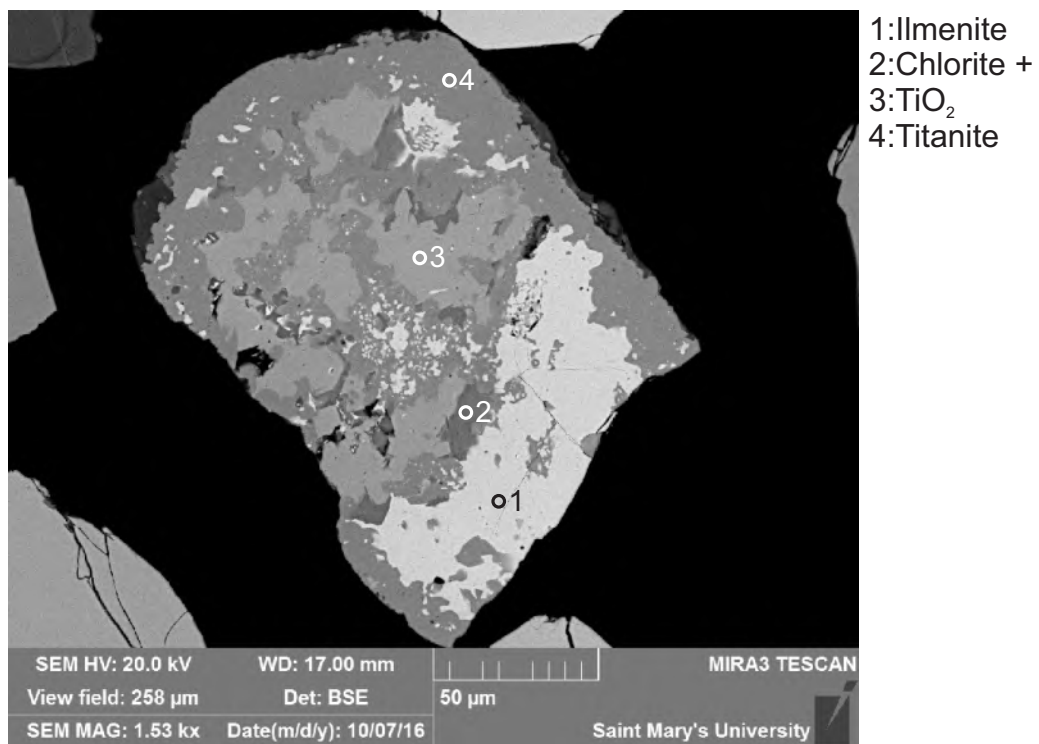


Figure B7.38: Sample S12 site 13.3 (SEM). Lithic clast consisting of titanite + titania + ilmenite + chlorite. Metamorphic.

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	1	1	Opx	56.25		3.58	5.30		32.85	1.39							0.63								100	119	
S12	1	2	Fl						0.92	55.88					43.21										100	102	
S12	1	3	Chr			8.23	24.56		8.02							0.41	58.78								100	106	
S12	1	4	Chr			25.00	20.48		12.44							0.39	41.68								100	106	
S12	1	5	Chr			5.24	21.48		8.69								64.59								100	104	
S12	1	6	Chr			16.13	20.50		10.93								52.44								100	104	
S12	1	7	Chr			11.82	20.02		10.05								58.12								100	102	
S12	1	8	Chl	33.52		18.11	27.60	1.00	3.51	1.26															85	111	
S12	1	9	Chr			9.27	19.87		12.48							0.39	57.99								100	106	
S12	1	10	Chr			14.12	19.78		11.53							0.46	54.12								100	109	
S12	1	11	Grt	41.28		21.83	21.27	0.35	8.08	7.19															100	114	
S12	1	12	Grt	38.39		19.95	28.67	0.59	2.57	9.83															100	92	
S12	1	13	TiO2		99.62		0.38																		100	111	
S12	1	14	Grt	40.21		21.04	28.01	0.98	2.94	6.82															100	118	
S12	1	15	Grt	39.43		21.29	30.44	2.65	4.68	1.51															100	118	
S12	1	16	Spl			44.90	15.80		17.38								21.91								100	116	
S12	1	17	Chr			8.57	22.56		8.35								60.52								100	110	
S12	1	18	Chr			8.48	19.97		9.45								62.10								100	103	
S12	1	19	Opx	55.83		3.67	5.35		32.84	1.47							0.84								100	113	
S12	1	20	Grt	40.17		21.29	28.74	0.78	4.66	4.37															100	110	
S12	1	21	Chr			7.83	25.04		8.18								58.95								100	105	
S12	1	22	Grt	39.80		21.28	31.30	1.43	4.91	1.28															100	114	
S12	1	23	Chr		0.43	15.44	19.41		13.16								51.57								100	111	
S12	1	24	Zrn	31.32																	68.68				100	127	
S12	1.2	1	"Mag" +	3.19			95.92		0.89																100	77	61
S12	1.2	2	Olig +	57.28		22.30	7.92		0.35	5.60	6.33	0.22													100	102	
S12	1.2	3	"Mag" +	3.44			95.58		0.97																100	77	62
S12	1.3	1	TiO2 +	13.63	80.32	4.17	0.50		0.37			1.01													100	111	
S12	1.3	2	Qz +	85.98	3.35	7.64	0.30		0.34			2.39													100	119	
S12	1.3	3	Qz +	90.42	8.57	0.70											0.31								100	119	
S12	1.3	4	TiO2 +	4.07	94.87	1.07																			100	108	
S12	2	1	Fl							55.26	0.61				44.13										100	100	
S12	2	2	St	29.36	0.35	52.90	13.27		1.60										0.52						98	105	
S12	2	3	TiO2		99.59		0.41																		100	101	
S12	2	4	?Grt	46.47		18.93	25.40	1.25	2.82	5.13															100	109	
S12	2	5	Chr			23.86	19.38		12.64								44.12								100	105	
S12	2	6	Spl			30.71	16.16		14.43							0.42	38.28								100	107	
S12	2	7	Ttn +	16.54	55.23	0.84	8.67	0.94		16.80													0.98		100	102	
S12	2	8	Grt	36.77		19.55	30.74	0.82	1.65	7.06			3.41												100	113	
S12	2	9	Chr			10.69	18.60		12.38								58.33								100	106	
S12	2	10	Spl		0.40	25.62	22.93		13.34								37.70								100	106	
S12	2	11	Chr			24.80	15.33		17.32								42.54								100	107	
S12	2	12	Grt	39.80		20.43	27.78	7.02	3.60	1.38															100	109	
S12	2	13	Chr			10.76	24.82		7.88								56.54								100	101	
S12	2	14	Zrn	31.26																	68.74				100	122	
S12	2	15	Chr			10.65	26.04		7.25							0.49	55.57								100	109	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	2	16	Grt	39.34		20.82	32.81	0.65	1.67	4.37							0.35								100	116	
S12	2	17	Grt	40.01		21.01	23.81	4.92	3.49	6.77															100	115	
S12	2	18	Chr			19.25	20.99		11.97								47.79								100	109	
S12	2	19	Chr				7.31	30.18	7.46								55.05								100	105	
S12	2	20	Qz +	87.16		6.41	2.37		1.57			2.50													100	115	
S12	2	21	Chr			18.74	18.23		12.49								50.54								100	113	
S12	2	22	Chr			12.79	27.66		8.53								51.03								100	110	
S12	2	23	Chr			8.55	26.92		9.44								55.09								100	109	
S12	2	24	TiO2		99.54		0.46																		100	108	
S12	2	25	Grt	40.12		21.24	25.54	0.51	3.09	9.49															100	113	
S12	2.2	1	TiO2		99.67		0.33																		100	107	
S12	2.2	2	TiO2 +	6.68	87.02	4.32	0.62					1.36													100	107	
S12	2.3	1	Qz	100.00																					100	120	
S12	2.3	2	TiO2 +	9.63	79.82	1.40	0.84			8.31															100	108	
S12	2.3	3	Ttn +	30.43	40.42	2.93	0.77			24.50					0.95										100	111	
S12	2.3	4	Ms	47.28	0.47	26.92	2.34		2.19		0.98	9.53			4.87		0.43								95	113	
S12	2.3	5	Ab	69.33		18.87					11.80														100	118	
S12	2.3	6	Zrn	31.53	0.37						0.38						0.49				65.91		1.32		100	122	
S12	2.3	7	Ms +	53.39	0.31	23.47	4.22		2.80		0.82	9.98													95	113	
S12	3	1	Zrn	31.23																	68.77				100	115	
S12	3	2	Zrn	31.46																	68.54				100	121	
S12	3	3	Qz	100.00																					100	111	
S12	3	4	Opx	56.52		3.44	5.42		33.45	0.40							0.78								100	120	
S12	3	5	Opx	56.26		3.54	5.48		33.48	0.37							0.86								100	115	
S12	3	6	Chr			14.89	17.65		12.23								55.22								100	105	
S12	3	7	Grt	40.21		21.43	27.01	1.18	3.36	6.81															100	109	
S12	3	8	Chr			15.14	21.32		10.42								53.12								100	103	
S12	3	9	Grt	40.10		20.49	24.79	4.07	1.55	9.00															100	109	
S12	3	10	Chr			11.21	20.71		9.27								58.81								100	104	
S12	3	11	Grt	39.55		21.49	27.84	4.35	4.92	1.86															100	109	
S12	3	12	Spl			49.05	13.90		18.62								18.43								100	112	
S12	3	13	Chr			17.86	19.64		10.90							0.38	51.23								100	109	
S12	3	14	Ep	39.98		25.65	8.89			22.47															97	109	
S12	3	15	Grt	39.70		20.90	31.01	1.52	4.49	2.39															100	114	
S12	3	16	Opx	56.60		3.15	5.67		33.52	0.37							0.70								100	122	
S12	3	17	Grt	39.74		20.91	28.43	0.71	2.51	7.69															100	119	
S12	3	18	Chr		0.76	20.07	27.21		10.38								41.58								100	114	
S12	3	19	Chr			16.72	19.14		10.61							0.39	53.14								100	110	
S12	3	20	Grt	39.79		21.34	32.70	0.48	5.02	0.66															100	112	
S12	3	21	Spl			46.44	14.08		18.25								21.24								100	112	
S12	3	22	Chr		0.40	4.60	29.74		5.84								59.42								100	104	
S12	3	23	Chr			14.74	19.51		11.62								54.13								100	108	
S12	3.2	1	Ab	69.48		18.73	0.29				11.50														100	120	
S12	3.2	2	TiO2	0.41	96.02		3.57																		100	110	
S12	3.2	3	Ilm		51.93		46.21	1.86																	100	108	
S12	4	1	Zrn	31.24																	68.76				100	117	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	4	2	Opx	56.87		3.18	5.55		33.56	0.34							0.50								100	114	
S12	4	3	Qz	99.58			0.42																		100	120	
S12	4	4	Grt	39.85		20.98	28.91	0.81	3.78	5.67															100	114	
S12	4	5	Chr			12.60	23.87		8.87								54.65								100	108	
S12	4	6	Chr			11.11	26.85		8.84								53.20								100	108	
S12	4	7	Grt	39.38		20.75	34.75	1.13	2.66	1.33															100	113	
S12	4	8	Chr			11.76	23.70		9.27							0.38	54.89								100	108	
S12	4	9	Chr			14.04	21.39		10.06							0.53	53.99								100	108	
S12	4	10	Chr			6.77	27.02		7.02								59.18								100	112	
S12	4	11	Spl			32.81	17.96		15.04								34.18								100	114	
S12	4	12	Fl							52.26	0.68				47.06										100	119	
S12	4	13	Chr			13.12	23.91		9.42								53.56								100	105	
S12	4	14	Spl			28.38	22.50		12.59								36.53								100	109	
S12	4	15	Chr	0.83	0.36	15.81	35.03		7.49								40.48								100	103	
S12	4	16	Chr		0.55	15.10	30.27		7.90							0.42	45.75								100	106	
S12	4	17	Spl			31.69	16.30		14.94								37.07								100	110	
S12	4	18	Spl		0.54	36.28	17.40		16.06								29.72								100	107	
S12	4	19	Spl		0.33	25.88	23.25		12.49								38.06								100	105	
S12	4	20	Spl			42.91	15.49		16.43								25.17								100	108	
S12	4	21	Qz	100.00																					100	124	
S12	4	22	Spl		0.76	27.31	26.36		12.19								33.38								100	118	
S12	4.2	1	Ilm		50.68		46.00	3.32																	100	106	
S12	4.2	2	Ttn	33.10	36.36	2.29	1.15			27.10															100	111	
S12	4.2	3	TiO2 +	2.64	91.01	1.33	2.76			2.27															100	105	
S12	4.3	1	Ms +	61.00	0.55	16.50	1.45		3.12	0.37	0.59	7.04			4.38										95	115	
S12	4.3	2	Ttn	32.91	37.97	1.28				27.84															100	112	
S12	4.3	3	Ms	55.17	0.51	25.31	2.96		4.44		0.34	10.93					0.33								100	102	
S12	5	1	Fl							57.97	0.65				41.38										100	88	
S12	5	2	Zrn	31.06																	68.94				100	117	
S12	5	3	Qz	100.00																					100	120	
S12	5	4	Chr	1.62		2.31	26.34		2.71		0.45						66.58								100	85	
S12	5	5	Chr			10.61	21.89		9.31								58.19								100	104	
S12	5	6	Grt	40.23		21.08	28.52	0.83	4.05	5.29															100	111	
S12	5	7	Spl			52.87	11.09		20.40								15.65								100	109	
S12	5	8	Fl							55.41	0.91				42.55				1.13						100	99	
S12	5	9	Chr			9.48	25.00		8.40								57.12								100	103	
S12	5	10	Spl			38.81	16.23		16.03							0.36	28.57								100	107	
S12	5	11	Grt	38.98		20.64	35.31	2.71	1.57	0.78															100	111	
S12	5	12	Chr			7.24	23.20		8.01								61.56								100	105	
S12	5	13	Grt	39.42		21.24	29.53	0.75	1.91	7.15															100	113	
S12	5	14	Fl							55.01	0.95				44.04										100	105	
S12	5	15	Spl			40.53	15.69		16.95								26.83								100	112	
S12	5	16	Grt	39.32		21.21	32.92	0.34	2.28	3.93															100	114	
S12	5	17	Chr		0.33	22.80	26.61		10.50							0.40	39.36								100	111	
S12	5	18	Chr			5.95	24.28		8.47								61.29								100	111	
S12	5	19	Zrn	31.44																	68.56				100	122	



Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	5	20	Chr +		1.84	15.54	32.43		8.44							0.46	41.29								100	113	
S12	5	21	Chr			4.69	23.35		7.51								64.45								100	112	
S12	5	22	Grt	39.40		20.98	31.54	1.17	1.98	4.93															100	116	
S12	5	23	Grt	39.95		21.35	30.49		5.77	2.44															100	112	
S12	5	24	Spl			28.71	20.63		13.17							0.37	37.11								100	106	
S12	5	25	Grt	40.03		21.01	25.99	1.18	3.47	8.31															100	116	
S12	5	26	Chr			13.36	27.35		8.60								50.69								100	107	
S12	5	27	Grt	37.46		20.95	16.02	24.66		0.32			0.59												100	118	
S12	5	28	Fl							55.84					44.16										100	112	
S12	5	29	Chr			9.19	23.94		8.18								58.69								100	114	
S12	5	30	Chr			20.52	18.83		12.34							0.51	47.80								100	117	
S12	5	31	Chr			12.82	24.61		10.20								52.37								100	107	
S12	5	32	Spl			36.99	15.70		16.32								30.99								100	111	
S12	5	33	Grt	39.97		21.28	25.05	0.95	1.82	10.92															100	110	
S12	5.2	1	Ep	40.10		23.49	10.64		0.77	22.00															97	110	
S12	5.2	2	Qz +	95.57		1.47	1.46		1.34			0.16													100	123	
S12	5.2	3	Chl	31.15		17.26	15.19		20.75	0.33	0.31														85	98	
S12	5.3	1	Chr			5.43	33.80		4.21							0.72	55.84								100	107	
S12	5.3	2	Chr			24.10	19.39		11.95							0.43	44.12								100	110	
S12	5.3	3	Chr			9.43	42.71	0.90	3.60							0.42	42.93								100	106	
S12	5.3	4	Chr			16.54	25.30		8.46								49.69								100	109	
S12	6	1	Zrn	31.10																	68.90				100	116	
S12	6	2	Cpx	54.24		3.42	1.98		16.87	22.62							0.86								100	112	
S12	6	3	Grt	41.45		22.17	22.93	0.45	12.36	0.64															100	110	
S12	6	4	Zrn +	24.48						13.04					2.51						59.97				100	113	
S12	6	5	Zrn	31.27																	68.73				100	123	
S12	6	6	Grt	39.67		21.13	30.87	2.42	2.10	3.80															100	114	
S12	6	7	Opx	56.20		3.13	5.28		33.30	1.29							0.80								100	117	
S12	6	8	Chr			10.65	19.62		10.38							0.52	58.84								100	106	
S12	6	9	Fl							50.95	0.76				48.29										100	116	
S12	6	10	Grt	39.90		20.67	25.17	5.57	4.74	3.96															100	109	
S12	6	11	Chr			8.21	32.97		7.29								51.53								100	101	
S12	6	12	Ilm		50.84		47.44	1.72																	100	100	
S12	6	13	Spl			27.69	20.71		13.88								37.72								100	105	
S12	6	14	Spl			29.21	17.26		13.71								39.81								100	104	
S12	6	15	Grt	39.87		21.18	32.54	0.96	5.16	0.29															100	107	
S12	6	16	Spl		0.32	30.47	19.41		14.99								34.80								100	108	
S12	6	17	Grt	39.63		20.71	20.49	13.52	0.75	4.91															100	115	
S12	6	18	Chr			7.93	18.48		10.41								63.18								100	110	
S12	6	19	Grt	39.82		21.08	26.54	0.97	2.07	9.52															100	116	
S12	6	20	Ab	66.59		18.65	0.75	1.20		1.43	11.37														100	125	
S12	6	21	Spl			26.79	16.02		14.73								42.46								100	112	
S12	6	22	Ep	40.17		27.10	6.27			23.46															97	106	
S12	6	23	Grt	39.87		21.16	28.75	1.18	3.07	5.96															100	113	
S12	6	24	Chr			23.81	26.78		10.48							0.65	38.29								100	108	
S12	6	25	Opx	58.36		3.09	4.27		29.61	3.03	0.51						1.13								100	109	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	6	26	Chr			17.17	21.16		10.65							0.44	50.58								100	109	
S12	6	27	Ep	40.22		24.35	10.48			21.96															97	108	
S12	6	28	Spl			29.78	19.02		14.11								37.09								100	112	
S12	6	29	TiO2		99.50		0.50																		100	113	
S12	6	30	Grt	39.50		21.27	30.70	1.22	3.02	4.29															100	117	
S12	6	31	Spl			49.99	13.33		18.91								17.77								100	108	
S12	6.2	1	TiO2 +	2.10	96.37	0.93	0.60																		100	106	
S12	6.2	2	Qz	99.23	0.77																				100	120	
S12	6.3	1	Spl			29.28	18.82		14.12								37.79								100	111	
S12	6.3	2	"Chr"			12.83	45.85		4.32								36.99								100	106	
S12	6.3	3	Spl			28.20	21.89		12.35								37.56								100	115	
S12	6.3	4	Chr			11.21	33.03		5.78								49.98								100	107	
S12	6.3	5	Cr-Chl	32.01		16.63	2.85		31.61								1.91								85	97	
S12	6.3	6	Cr-Chl	29.34		12.38	9.11		22.88	0.65	0.45						5.58						4.62		85	92	
S12	6.3	7	Chr			22.01	25.00		9.69								43.29								100	109	
S12	6.3	8	Spl			7.85	52.05		2.19								37.91								100	103	
S12	7	1	Zrn	30.99																	67.65		1.36		100	125	
S12	7	2	Zrn	30.72																	67.89		1.39		100	125	
S12	7	3	Zrn	30.75																	69.25				100	121	
S12	7	4	Ilm		40.90		54.89	0.52	3.70																100	104	
S12	7	5	Grt	39.67		20.87	24.44	7.20	1.59	6.23															100	117	
S12	7	6	Qz	100.00																					100	124	
S12	7	7	Chr			9.36	22.41		8.16							0.41	59.65								100	113	
S12	7	8	TiO2 +		94.89		1.89															3.21			100	111	
S12	7	9	Qz	100.00																					100	122	
S12	7	10	Chr			9.99	29.29		7.73								53.00								100	108	
S12	7	11	Opx	56.28		3.25	5.67		33.66	0.44							0.70								100	118	
S12	7	12	Chr			4.96	22.44		8.14								64.46								100	107	
S12	7	13	Grt	39.56		21.09	30.87	2.69	4.71	1.08															100	113	
S12	7	14	Grt	39.09		21.11	33.83	1.02	2.58	2.38															100	114	
S12	7	15	Spl			36.97	18.12		15.20								29.71								100	107	
S12	7	16	Chr			17.83	21.02		10.78							0.54	49.82								100	106	
S12	7	17	Chr			13.95	18.09		11.48							0.41	56.07								100	104	
S12	7	18	Chr			28.46	14.41		15.93								41.19								100	108	
S12	7	19	Grt	39.90		21.17	30.20	0.84	4.83	3.06															100	112	
S12	7	20	Chr			9.10	21.96		9.72								59.23								100	108	
S12	7	21	Ilm		25.26		73.76										0.98								100	96	
S12	7	22	Fl							47.72					52.28										100	135	
S12	7	23	Spl			28.22	21.84		14.83								35.10								100	114	
S12	7	24	Grt	39.49		21.49	27.57	2.47	3.65	5.33															100	120	
S12	7	25	Chr			5.21	19.62		10.25								64.92								100	111	
S12	7	26	Chr	39.43		20.60	34.46		2.54	2.97															100	117	
S12	7	27	Spl			40.72	13.94		17.55								27.80								100	113	
S12	7	28	?	40.08		21.17	22.07	1.18	0.64	14.85															100	117	
S12	7	29	Spl			38.40	15.44		16.96								29.20								100	109	
S12	7	30	Chr			9.60	21.10		10.70							0.40	58.21								100	108	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	7	31	Spl			25.83	18.90		14.06								41.22								100	108	
S12	7	32	Grt	39.75		21.15	30.24	1.00	4.76	3.10															100	120	
S12	7	33	Chr			9.63	23.86		8.75								57.76								100	113	
S12	7.2	1	Bi	39.99	3.00	14.80	18.85		10.44	0.50	0.40	8.02													100	96	106
S12	7.2	2	Qz	99.68	0.32																				100	120	
S12	7.2	3	TiO2		100.00																				100	108	
S12	7.2	4	TiO2 +	2.51	94.75	1.06	0.90		0.38			0.40													100	107	
S12	7.3	1	Ab	68.54		19.28				0.95	11.23														100	119	
S12	7.3	2	Ep	41.09		28.94	1.23		2.30	23.43															97	107	
S12	8	1	Opx	57.65		3.18	4.82		29.05	4.61							0.69								100	115	
S12	8	2	Opx	56.62		3.17	5.66		33.58	0.31							0.66								100	115	
S12	8	3	Zrn	31.46																	68.54				100	113	
S12	8	4	Grt	40.57		21.69	20.90	0.43	6.07	10.33															100	111	
S12	8	5	Grt	39.55		20.76	26.95	3.66	0.72	8.36															100	111	
S12	8	6	Grt	39.66	1.28	20.33	18.27	9.63	1.42	9.40															100	111	
S12	8	7	Chr			11.01	22.21		9.46							0.39	56.93								100	105	
S12	8	8	Qz +	95.58		1.88	2.04			0.50															100	196	
S12	8	9	Zrn	30.93																	67.61		1.46		100	121	
S12	8	10	Chr			12.96	17.11		10.88								59.05								100	106	
S12	8	11	Zrn	31.11																	68.89				100	119	
S12	8	12	Grt	39.50		21.01	32.36	2.58	3.42	1.13															100	112	
S12	8	13	Zrn	31.25																	68.75				100	118	
S12	8	14	Zrn	31.11																	68.89				100	123	
S12	8	15	Zrn	31.03																	67.60		1.37		100	127	
S12	8	16	Chr			9.35	27.45		6.13								57.07								100	106	
S12	8	17	Chr			8.97	23.98		8.18								58.86								100	108	
S12	8	18	Chr		0.72	22.25	24.66		11.77								40.61								100	109	
S12	8	19	Grt	40.38		21.38	28.38	0.34	6.93	2.60															100	115	
S12	8	20	Chr			7.29	22.96		8.04								61.70								100	107	
S12	8	21	TiO2		99.58		0.42																		100	106	
S12	8	22	Grt	39.93		20.98	27.79	0.70	2.09	8.51															100	115	
S12	8	23	Chr			23.05	16.70		13.47								46.78								100	113	
S12	8	24	Chr			23.30	16.56		13.66								46.47								100	109	
S12	8	25	Chr		0.36	12.79	24.47		8.65								53.73								100	107	
S12	8	26	TiO2		99.63		0.37																		100	107	
S12	8	27	Grt	40.94	0.28	18.57	8.32	25.15	0.64	4.15					1.96										100	119	
S12	8	28	Grt	39.60		20.82	30.75	0.42	1.89	6.52															100	116	
S12	8	29	Grt	39.60		21.00	34.23		2.61	2.57															100	116	
S12	8	30	Chr			21.90	15.42		14.22								48.46								100	112	
S12	8	31	Chr			8.24	26.05		8.75								56.97								100	112	
S12	8	32	Spl			47.14	13.80		18.38								20.37	0.31							100	119	
S12	8	33	Spl			26.45	16.13		14.72								42.70								100	118	
S12	8	34	Chr			15.23	20.24		9.86								54.67								100	115	
S12	8	35	Grt	39.63		20.46	22.98	6.90	0.80	9.24															100	117	
S12	8	36	Grt	39.55		20.74	31.75	1.80	1.41	4.75															100	116	
S12	8	37	Chr			9.40	23.17		8.40							0.42	58.61								100	110	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	8.2	1	Pg	44.63	0.54	36.62	0.59			0.48	7.23	0.81			4.10										95	117	
S12	8.2	2	Ilm		53.01		45.64	1.35																	100	105	
S12	8.2	3	Ms	47.71	0.99	29.78	2.05		1.70		1.21	8.77			2.79										95	113	
S12	8.2	4	TiO2		98.07		1.93																		100	107	
S12	8.2	5	TiO2		96.81		3.19																		100	107	
S12	8.2	6	Ilm		53.41		45.39	1.20																	100	106	
S12	8.2	7	"Ilm"		73.40		24.92	1.68																	100	99	
S12	8.3	1	TiO2	0.78	91.90		6.59			0.73															100	106	
S12	8.3	2	Chl +	28.85	2.70	14.84	20.53	0.33	15.60	1.90							0.24								85	101	
S12	8.3	3	Ttn	33.90	34.01	2.68	1.75			27.65															100	112	
S12	9	1	Zrn	30.98																	69.02				100	119	
S12	9	2	Po	0.18			42.79							56.82			0.21								100	200	
S12	9	3	Grt	40.47		21.46	26.09	2.76	8.00	1.22															100	112	
S12	9	4	Chr			5.84	21.15		8.46								64.55								100	105	
S12	9	5	Grt	40.11		21.16	31.50	1.04	5.30	0.89															100	110	
S12	9	6	Zrn	31.33																	68.67				100	114	
S12	9	7	Zrn	31.06																	68.94				100	114	
S12	9	8	Chr			22.20	18.28		13.38								46.14								100	105	
S12	9	9	Spl			32.17	19.32		15.18							0.34	32.98								100	109	
S12	9	10	Grt	39.09		20.66	29.51	7.28	2.52	0.94															100	111	
S12	9	11	Chr			11.27	19.83		10.48								58.43								100	107	
S12	9	12	Zrn	31.60		0.48	0.64				0.44				2.64						64.20				100	70	
S12	9	13	Zrn	31.68																	68.32				100	121	
S12	9	14	Zrn	31.02																	67.36	1.62			100	126	
S12	9	15	Zrn	30.65																	67.77	1.58			100	126	
S12	9	16	TiO2		100.00																				100	110	
S12	9	17	Spl			26.31	20.94		13.81								38.94								100	110	
S12	9	18	Chr			10.26	18.21		10.94							0.42	60.18								100	108	
S12	9	19	Chr			20.48	23.87		10.31								45.34								100	107	
S12	9	20	Mix	29.19		13.33	9.39		29.20	1.00	0.57						17.31								100	111	
S12	9	21	Zrn	31.07																	68.93				100	114	
S12	9	22	Spl		0.65	28.55	23.90		12.40								34.51								100	105	
S12	9	23	Opx	55.62		3.69	5.77		33.21	0.74							0.97								100	118	
S12	9	24	Spl		0.50	29.32	19.56		13.98								36.64								100	111	
S12	9	25	Grt	39.58		21.37	31.13	2.61	4.44	0.87															100	116	
S12	9	26	Chr			15.25	18.99		11.57							0.49	53.70								100	110	
S12	9	27	Grt	41.35		21.88	21.95	0.42	10.64	3.77															100	115	
S12	9	28	Grt	39.46		21.13	31.96	1.99	4.38	1.08															100	116	
S12	9	29	Spl			28.16	17.95		15.13								38.75								100	111	
S12	9	30	Ilm		48.91		49.20	1.88																	100	104	
S12	9	31	Spl			49.50	13.67		18.38								18.45								100	117	
S12	9	32	Chr			23.27	18.36		12.80							0.39	45.17								100	115	
S12	9	33	Chr		1.85	22.50	27.29		10.13								38.23								100	113	
S12	9	34	Chr			5.71	28.07		6.72							0.48	59.02								100	111	
S12	9	35	Chr		0.73	18.72	23.82		10.98								45.76								100	113	
S12	9	36	Spl	1.61	0.33	25.84	16.82		14.86								40.54								100	114	



Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	9	37	Ep	39.97		22.51	11.28			22.16							1.09								97	112	
S12	9	38	Opx	55.77		4.13	5.69		32.84	0.66							0.91								100	121	
S12	9.2	1	Qz	99.69	0.31																				100	120	
S12	9.2	2	TiO2	0.42	99.58																				100	108	
S12	9.2	3	Qz	98.50	0.25	1.02						0.23													100	121	
S12	10	1	Qz	99.73			0.27																		100	117	
S12	10	2	Spl			44.22	15.92		16.88								22.99								100	107	
S12	10	3	Chr			24.93	20.80		12.50								41.78								100	104	
S12	10	4	Opx	56.27		3.19	5.65		33.88	0.42							0.59								100	118	
S12	10	5	Chr			3.85	47.95		4.71								43.50								100	101	
S12	10	6	Spl		1.17	19.39	30.08		8.86							0.48	39.47		0.54						100	105	
S12	10	7	Grt	39.69		20.77	30.84	3.95	2.75	2.01															100	110	
S12	10	8	Grt	39.93		21.13	26.57	1.24	2.35	8.78															100	111	
S12	10	9	Spl			27.54	16.31		14.34								41.82								100	110	
S12	10	10	Chr			21.37	23.52		11.56							0.37	42.65		0.52						100	110	
S12	10	11	Zrn	31.28																	68.72				100	117	
S12	10	12	Spl			37.67	16.14		16.23								29.62	0.35							100	110	
S12	10	13	Chr			4.26	21.81		7.90								66.03								100	104	
S12	10	14	Zrn	31.40																	68.60				100	113	
S12	10	15	Amph	52.54	0.54	6.14	4.78		19.32	12.36	0.79						0.52								97	116	
S12	10	16	Spl		0.97	22.24	27.36		10.52							0.37	38.53								100	110	
S12	10	17	Spl			41.43	15.57		17.10								25.90								100	115	
S12	10	18	Chr			9.37	26.66		8.41								55.56								100	112	
S12	10	19	Chr			10.89	24.39		8.89								55.84								100	112	
S12	10	20	Spl			34.43	14.08		17.14								34.35								100	115	
S12	10	21	Spl		0.57	28.47	22.34		14.65								33.98								100	114	
S12	10	22	Zrn	31.13																	67.55		1.32		100	124	
S12	10	23	Zrn	31.28																	68.72				100	121	
S12	10	24	Zrn	31.01																	67.51		1.48		100	120	
S12	10	25	Zrn	31.62																	68.38				100	118	
S12	10	26	Spl			31.43	16.25		15.87							0.42	36.03								100	110	
S12	10	27	Chr			8.28	24.69		8.05								58.98								100	106	
S12	10	28	Spl			28.35	19.38		14.05								38.22								100	113	
S12	10.2	1	Ttn	33.72	29.88	4.28	4.00		0.36	27.76															100	112	
S12	10.2	2	Ilm		51.89		43.06	2.38	1.95								0.72								100	107	
S12	10.2	3	TiO2		82.54		15.45		2.01																100	104	
S12	10.3	1	?Mica or Mix	46.84		12.02	1.56		27.68		3.00	3.09			2.46		3.35								100	100	
S12	10.3	2	Chr			6.65	23.65		7.93								61.77								100	110	
S12	10.3	3	?Mica	47.16		13.16	1.33		28.44		5.19	1.93					2.79								100	115	
S12	11	1	Zrn	31.18																	68.82				100	118	
S12	11	2	Zrn	31.28																	68.72				100	116	
S12	11	3	Chr			19.70	22.68		11.63							0.44	45.56								100	106	
S12	11	4	Grt	40.24		21.12	26.98	0.66	4.27	6.43							0.31								100	109	
S12	11	5	Chr			16.81	25.68		9.10								48.41								100	102	
S12	11	6	Ilm		42.15		53.47	1.13	3.24																100	98	
S12	11	7	Chr			23.67	18.64		13.99								43.70								100	104	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	11	8	Ilm		42.00	0.52	53.13	1.26	3.09																100	98	
S12	11	9	Grt	39.96		21.24	28.82	3.61	5.22	1.15															100	111	
S12	11	10	Ttn +	29.50	42.41		2.83			25.26															100	109	
S12	11	11	Chr			12.50	19.60		10.74								57.15								100	107	
S12	11	12	Chr			14.30	20.22		10.40								55.08								100	111	
S12	11	13	Opx ?	55.18		3.21	3.15		28.00	7.76	0.81						1.88								100	121	
S12	11	14	Zrn	31.25																	68.75				100	120	
S12	11	15	Chr			14.49	20.04		10.96							0.39	54.12								100	109	
S12	11	16	Grt	39.92		21.43	27.09	1.36	4.73	5.46															100	116	
S12	11	17	Zrn	31.04																	68.96				100	121	
S12	11	18	Zrn	30.90																	69.10				100	120	
S12	11	19	?Grt	40.49		21.46	12.55	6.79	2.53	16.18															100	113	
S12	11	20	Chr			7.65	17.11		13.99								61.25								100	106	
S12	11	21	Chr			9.17	27.05	0.95	6.28								56.55								100	103	
S12	11	22	Chr	1.57		11.63	22.35		13.09								51.36								100	114	
S12	11	23	Grt	38.88		20.69	34.83	0.48	1.31	3.81															100	118	
S12	11.2	1	Ttn	34.63	31.48	3.75	2.38		0.86	26.90															100	108	
S12	11.2	2	Ilm		48.92		42.53	7.34		0.67							0.54								100	105	
S12	11.2	3	Ttn	33.83	29.88	3.67	3.91		1.72	25.57				1.41											100	108	
S12	11.2	4	"Ilm"		74.81		18.77		5.65								0.77								100	98	
S12	11.3	1	Cr-Chl	30.84		13.75	3.39		30.79						3.88		2.35								85	102	
S12	11.3	2	Cr-Chl	32.89		10.74	6.15		31.29	0.31	0.51			0.58			1.20						1.33	85	103		
S12	11.3	3	Chr			1.27	58.79	1.59	1.76								36.12		0.48						100	103	
S12	11.3	4	Chr			12.74	31.77		5.05							0.66	49.14		0.63						100	111	
S12	12	1	Opx	56.00		4.00	5.49		33.33	0.36							0.82								100	114	
S12	12	2	Zrn	30.59																	67.85		1.56		100	117	
S12	12	3	Grt	39.36		21.15	28.74	5.94	3.19	1.62															100	108	
S12	12	4	Chr			25.34	16.97		13.89								43.81								100	104	
S12	12	5	Chr			6.56	26.73		7.73								58.98								100	104	
S12	12	6	Grt	39.74		20.91	30.35	4.52	3.75	0.73															100	110	
S12	12	7	Chr			17.97	18.46		12.06								51.51								100	107	
S12	12	8	Zrn	30.83																	67.74		1.42		100	123	
S12	12	9	Ep	40.01		23.72	10.57			22.70															97	110	
S12	12	10	Tur	38.64		32.96	4.12		8.18	0.73	2.38														87	101	
S12	12	11	Chr			14.91	24.59		8.86							0.42	51.21								100	107	
S12	12	12	Opx	55.48		3.98	5.00		31.70	2.84							0.99								100	115	
S12	12	13	Spl			33.06	18.08		14.69								34.17								100	108	
S12	12	14	Grt	40.93		21.43	22.86	2.35	7.66	4.77															100	113	
S12	12	15	TiO2	0.46	99.54																				100	107	
S12	12	16	Chr		0.56	16.67	27.57		10.57							0.45	44.17								100	106	
S12	12	17	Chr		0.49	20.05	26.19		10.47							0.38	42.42								100	108	
S12	12	18	Chr			6.04	25.26		7.98								60.72								100	105	
S12	12	19	Opx	57.33		2.97	5.41		31.29	2.23							0.77								100	115	
S12	12	20	Chr			11.61	27.91		7.73								52.74								100	111	
S12	12	21	Spl		0.42	25.83	18.60		15.51								39.65								100	113	
S12	12.2	1	Grt	39.77	0.54	21.09	14.19	14.07	2.30	8.05															100	117	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	12.2	2	Qz	100.00																					100	123	
S12	12.2	3	Qz	100.00																					100	122	
S12	12.3	1	Cr-Chl	30.08		16.90	4.00		30.69								3.34								85	104	
S12	12.3	2	Spl		0.41	28.43	29.79		10.55								30.82								100	110	
S12	12.3	3	Cr-Chl	32.59		15.57	6.47		29.17								1.20								85	94	
S12	12.3	4	Spl			6.90	57.76	2.69	5.31								27.34								100	104	
S12	13	1	Zrn	31.21																	68.79				100	118	
S12	13	2	Opx	55.51		4.52	5.23		33.23	0.71							0.79								100	126	
S12	13	3	TiO2		100.00																				100	108	
S12	13	4	Zrn	30.82																	67.87		1.31		100	123	
S12	13	5	Chr		0.37	19.90	31.24		8.73								39.76								100	109	
S12	13	6	Amph	46.22	0.89	10.78	4.26		18.66	11.09	2.52						2.58								97	114	
S12	13	7	Grt	40.17		21.06	30.44	0.85	3.82	3.66															100	116	
S12	13	8	Spl	3.66		28.77	18.77		14.64	1.38							32.77								100	111	
S12	13	9	Chr			19.14	21.52		10.89								48.46								100	109	
S12	13	10	Ttn	28.04	46.69	0.80	0.41			24.06															100	108	
S12	13	11	"Ilm"		62.50		33.94	2.21	1.34																100	99	
S12	13	12	Spl		0.49	35.82	17.38		16.13								30.18								100	106	
S12	13	13	Chr			9.89	21.21		8.72								60.18								100	105	
S12	13	14	Fl							43.37	0.47				56.16										100	125	
S12	13	15	Grt	39.39		21.18	31.82	1.61	4.13	1.87															100	112	
S12	13	16	Opx	56.31		3.27	5.60		33.76	0.30							0.76								100	116	
S12	13	17	Opx	56.33		3.41	5.24		33.94	0.46							0.63								100	121	
S12	13	18	Opx	56.28		3.31	5.40		32.16	2.23							0.61								100	123	
S12	13	19	Spl			35.83	17.68		16.03								30.46								100	115	
S12	13	20	Chr			8.02	25.96		9.35								56.66								100	110	
S12	13	21	TiO2		99.56		0.44																		100	110	
S12	13	22	Spl			43.67	15.08		17.04								24.21								100	111	
S12	13	23	Zrn	30.88																	67.75		1.38		100	125	
S12	13.2	1	Ilm		53.25		41.77	4.99																	100	107	

Table B7.1: EDS analyses of sample S12.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	Nb2O5	HfO2	WO3	Total	Actual Total	Calculated Wt% Total
S12	13.2	2	Ttn	32.84	37.51	0.71	0.49			27.51						0.94									100	111	
S12	13.2	3	Ab	69.17	0.27	18.82					11.74														100	118	
S12	13.3	1	Ilm	1.17	53.01		39.93	5.89																	100	108	
S12	13.3	2	Chl +	32.30	5.17	17.72	30.04		11.09	3.07	0.60														100	104	
S12	13.3	3	TiO2		98.32		1.11			0.57															100	108	
S12	13.3	4	Ttn	32.79	37.50	1.29	0.52			27.56							0.35								100	112	
			Notes																								
			+ = indicates other minerals present																								
			" " = indicates partially altered mineral																								

B8: SEM-BSE images and EDS  
mineral analyses for sample S15.



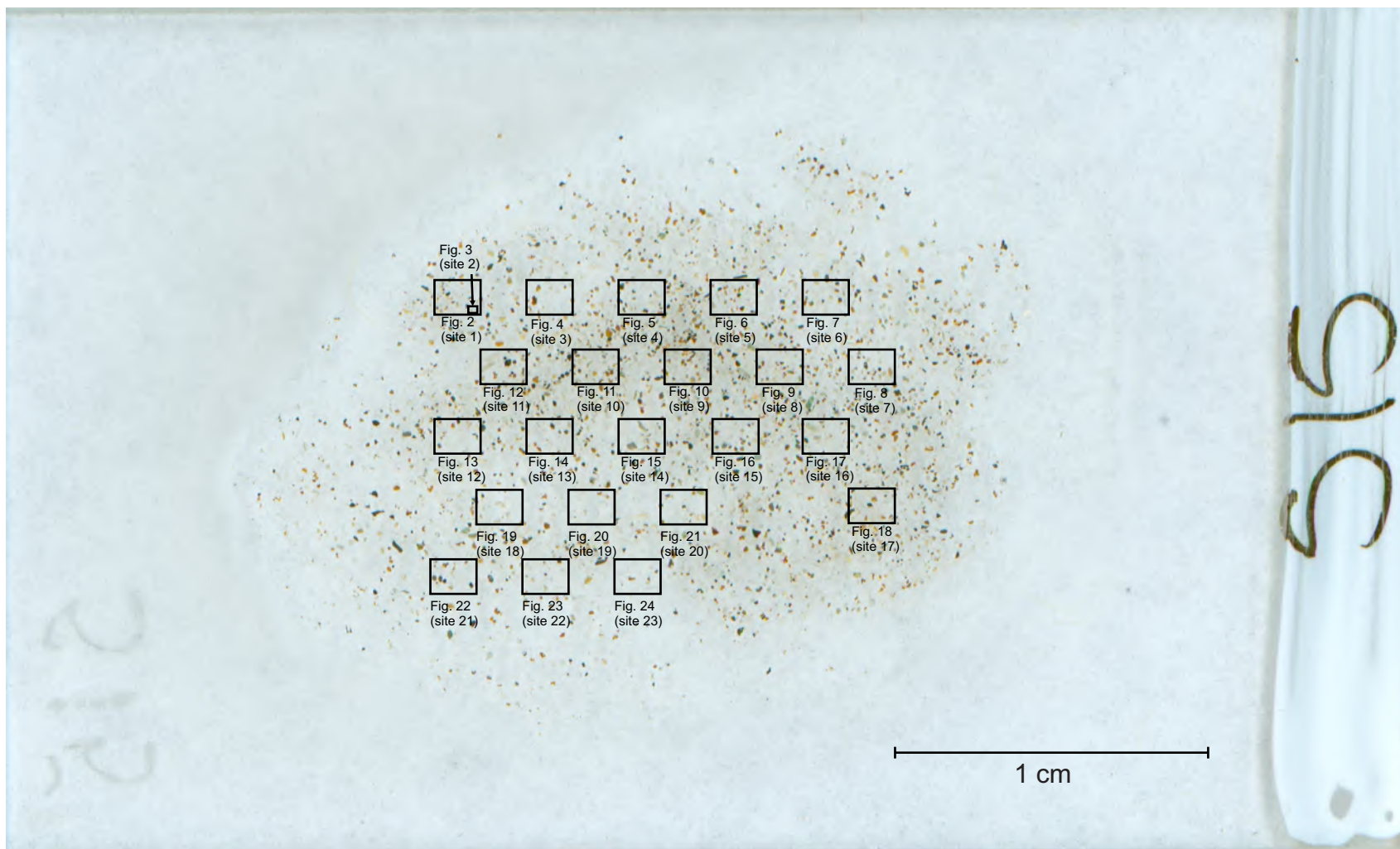


Figure B8.1: Scanned thin section of sample S15 showing the location of analysed sites. This sample is of heavy mineral separates from a sandy matrix of matrix-supported conglomerate ~ 1m below present surface.

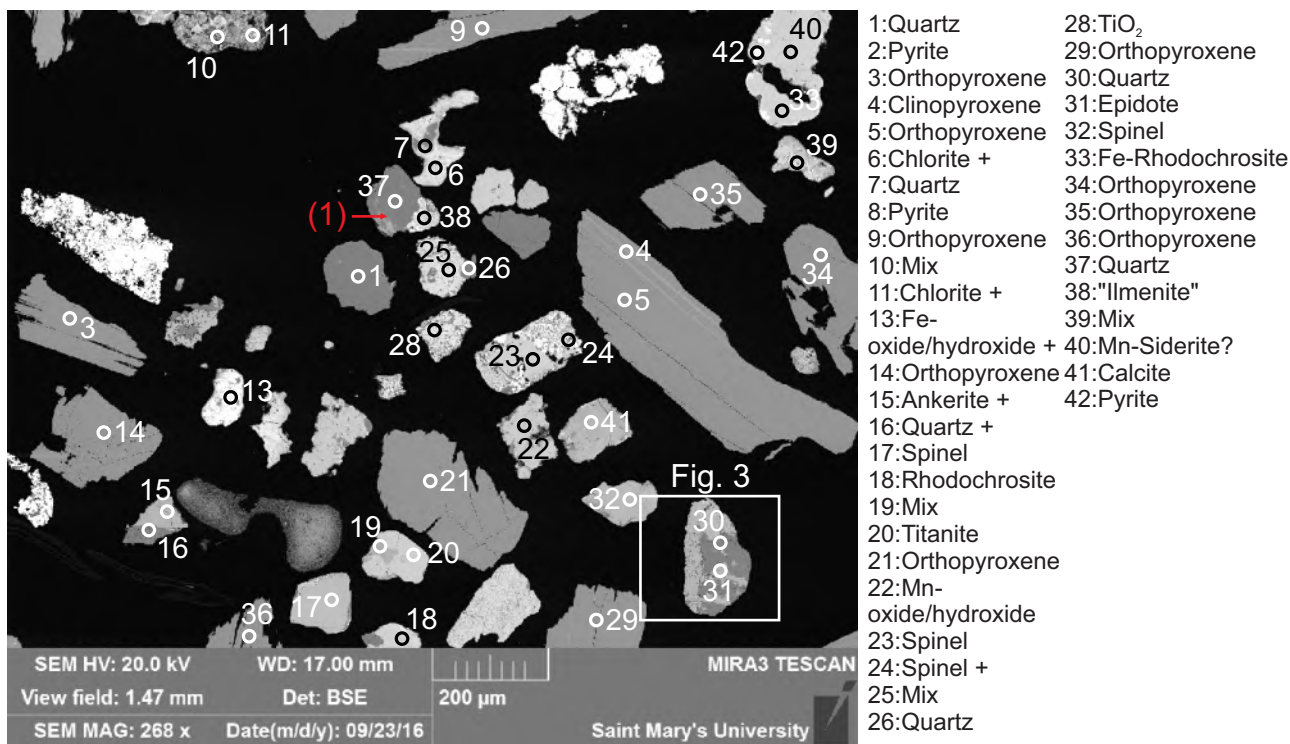


Figure B8.2: Sample S15 site 1 (SEM). 1: Lithic clast (quartz + altered ilmenite). Igneous or metamorphic.

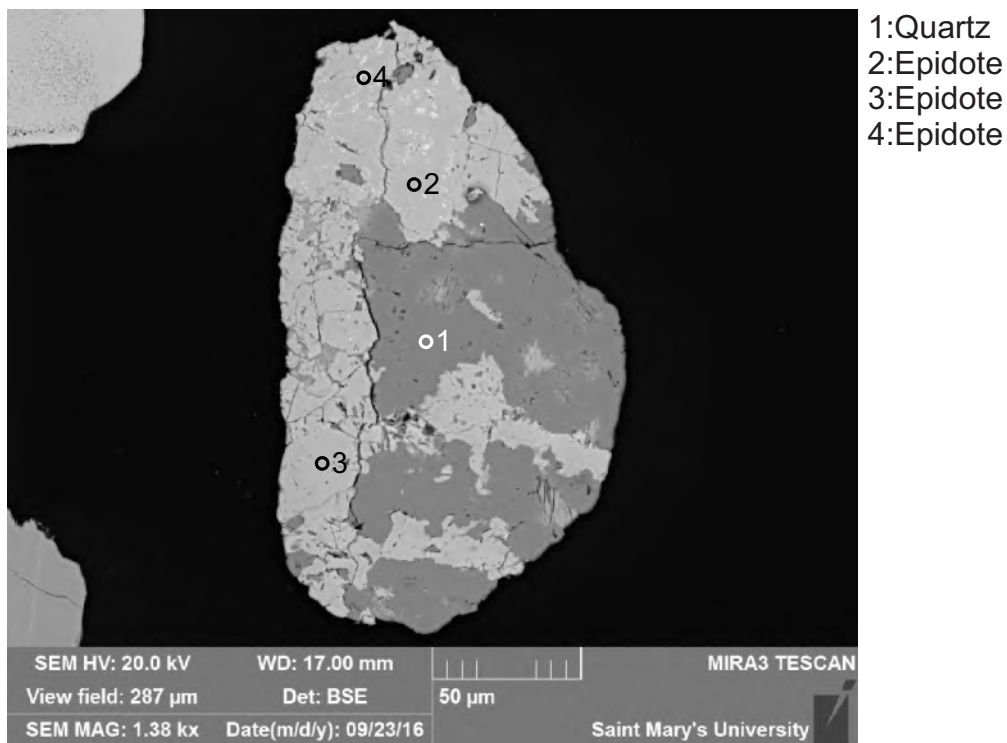


Figure B8.3: Sample S15 site 2 (SEM). Hydrothermal quartz + epidote.

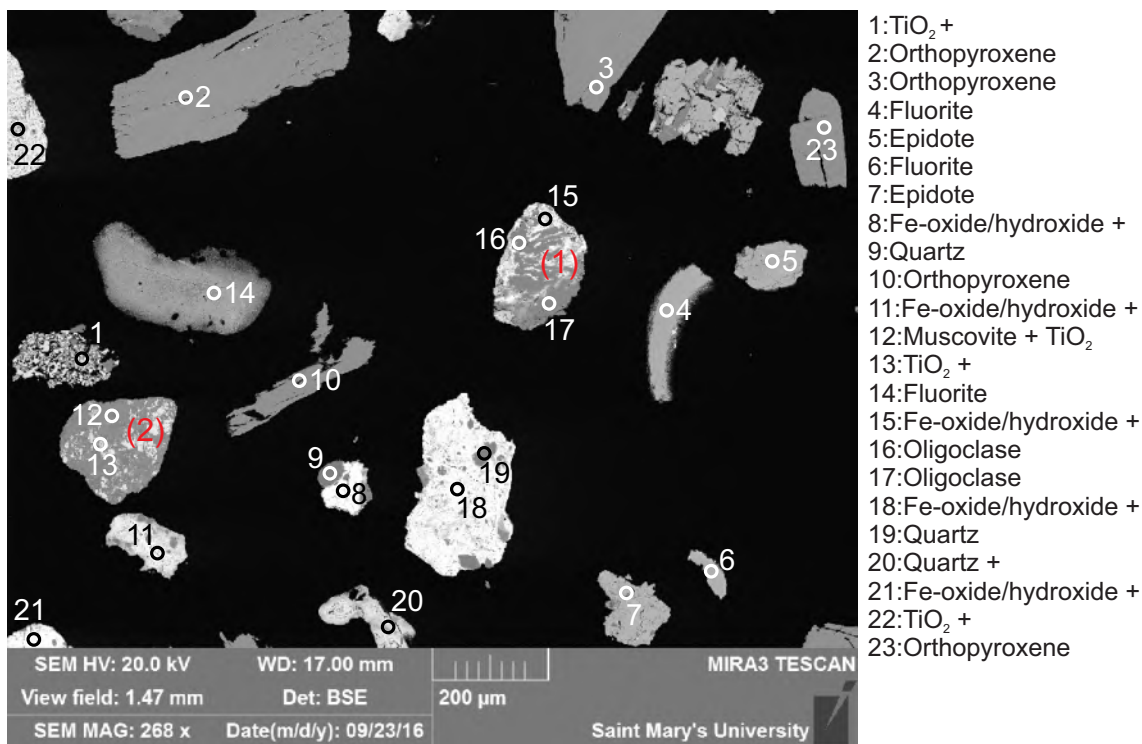


Figure B8.4: Sample S15 site 3 (SEM). 1: Lithic clast (oligoclase + Fe-oxide/hydroxide, igneous or metamorphic). 2: Lithic clast (titania + muscovite, metamorphic).

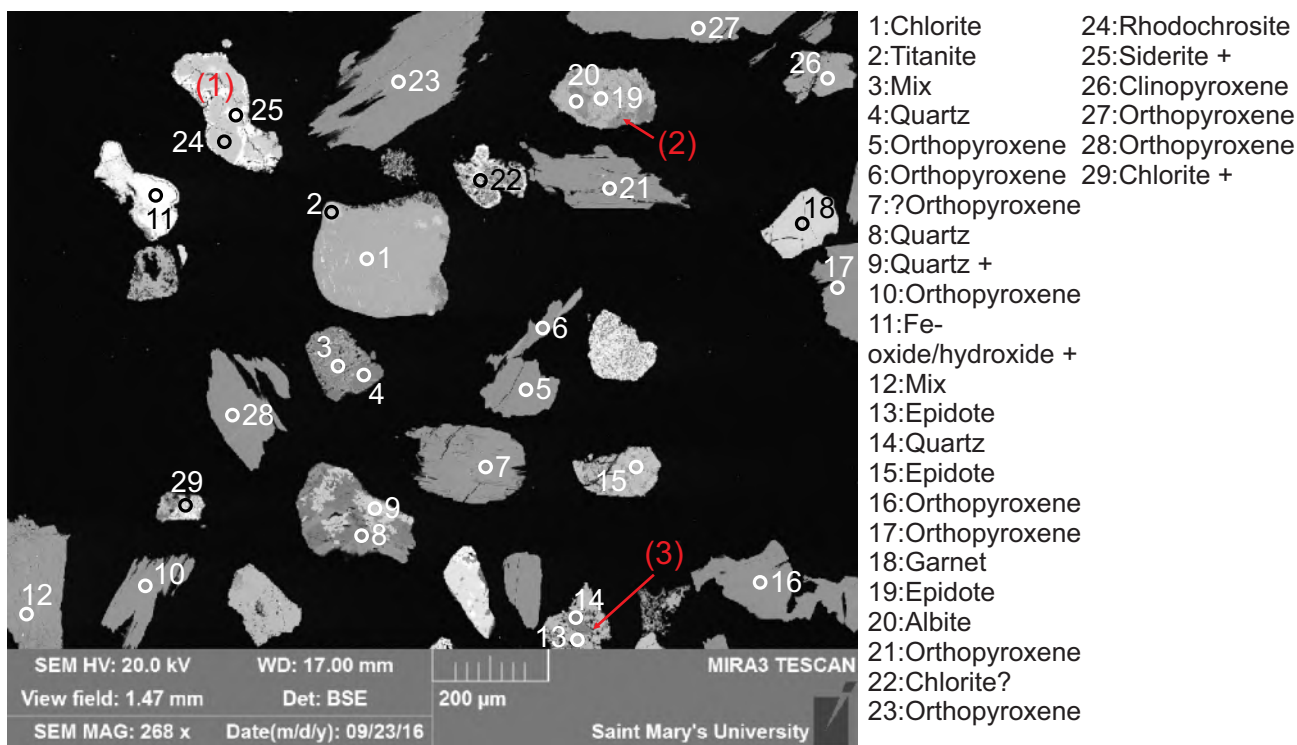


Figure B8.5: Sample S15 site 4 (SEM). 1: Lithic clast (siderite + rhodochrosite, hydrothermal). 2: Lithic clast (epidote + albite, hydrothermal vein). 3: Hydrothermal (epidote + quartz, hydrothermal vein).



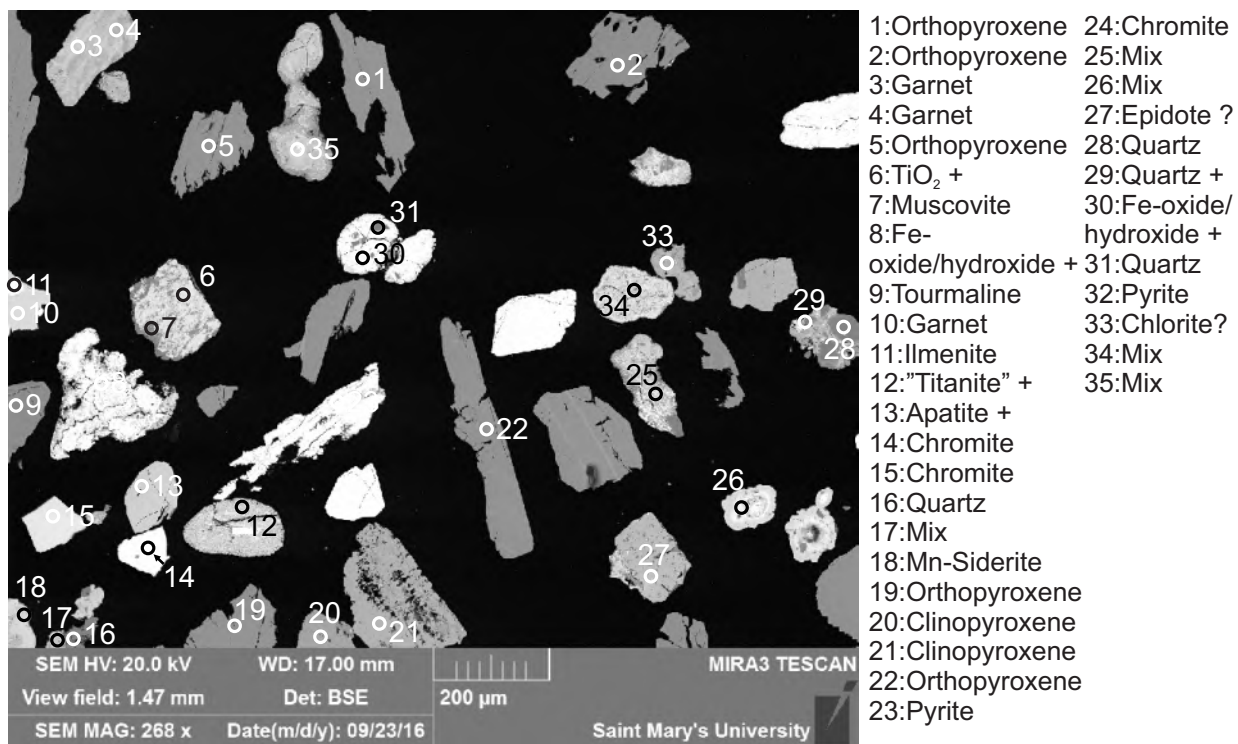


Figure B8.6: Sample S15 site 5 (SEM).

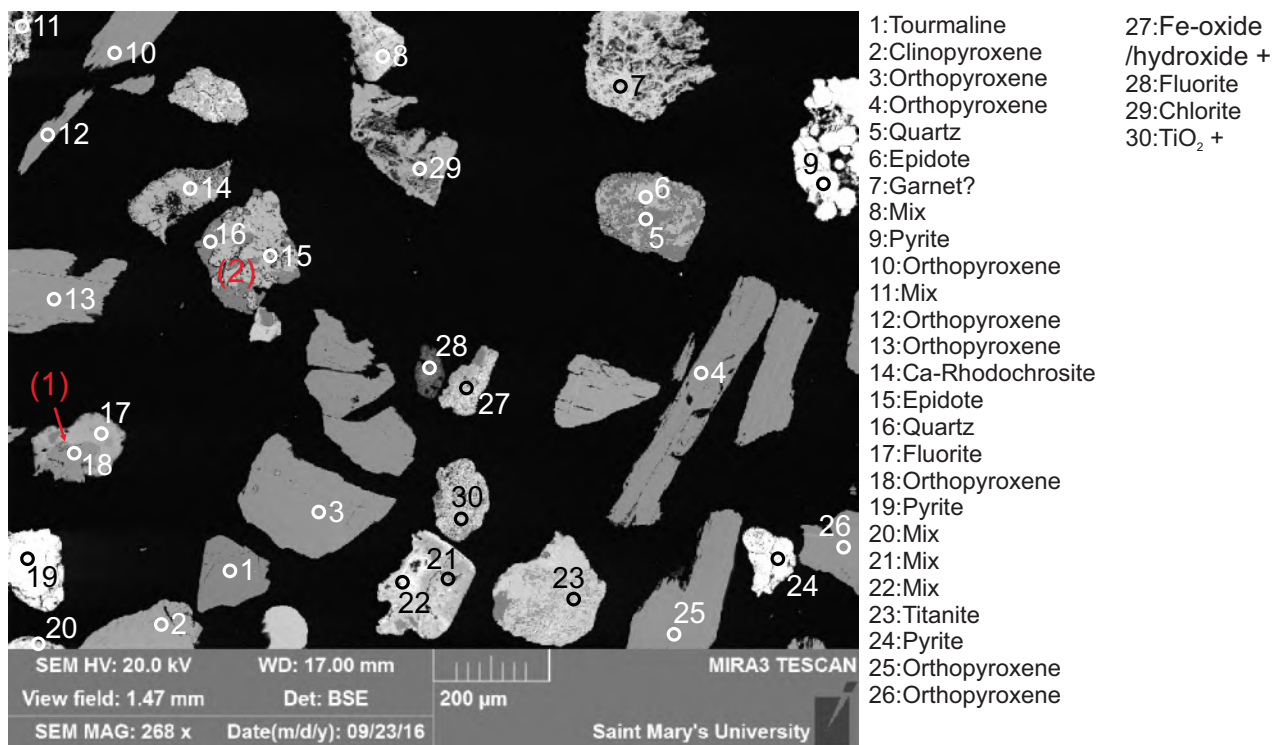


Figure B8.7: Sample S15 site 6 (SEM). 1: Lithic clast (fluorite + orthopyroxene, metaophiolite). 2: Hydrothermal lithic clast (epidote + quartz).

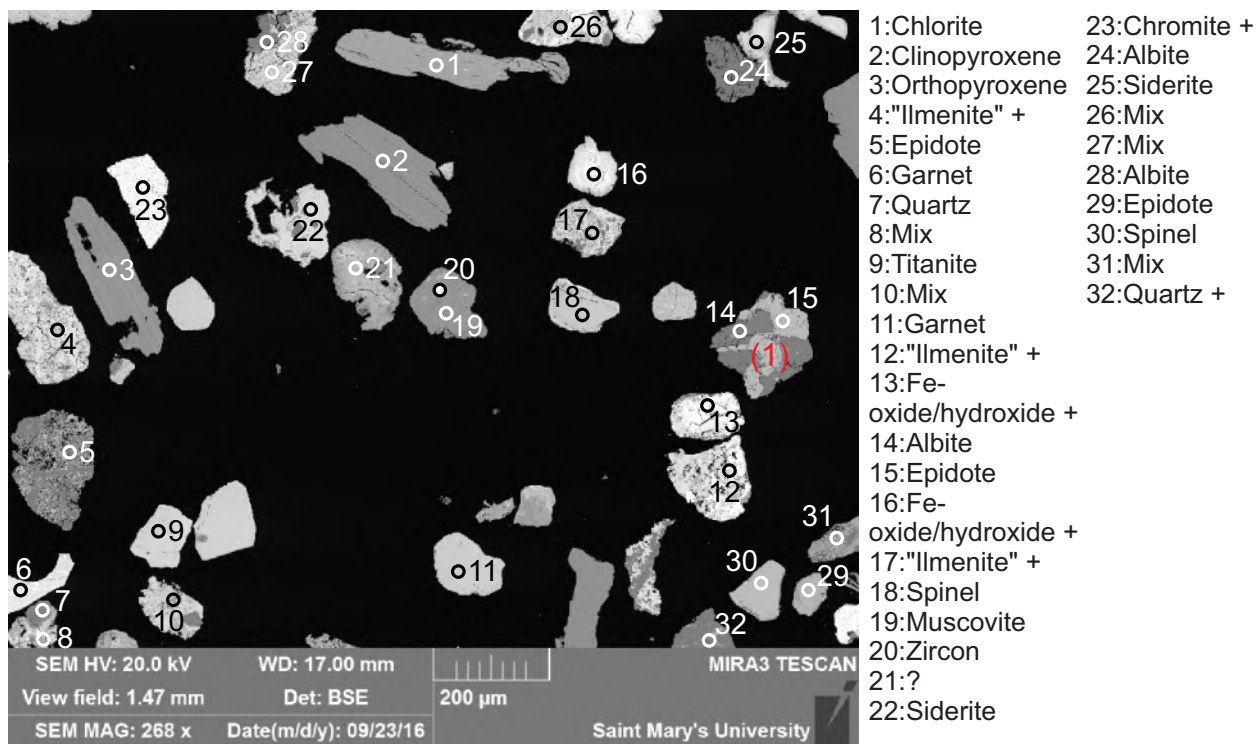


Figure B8.8: Sample S15 site 7 (SEM). 1: Lithic clast (albite + epidote, hydrothermal).

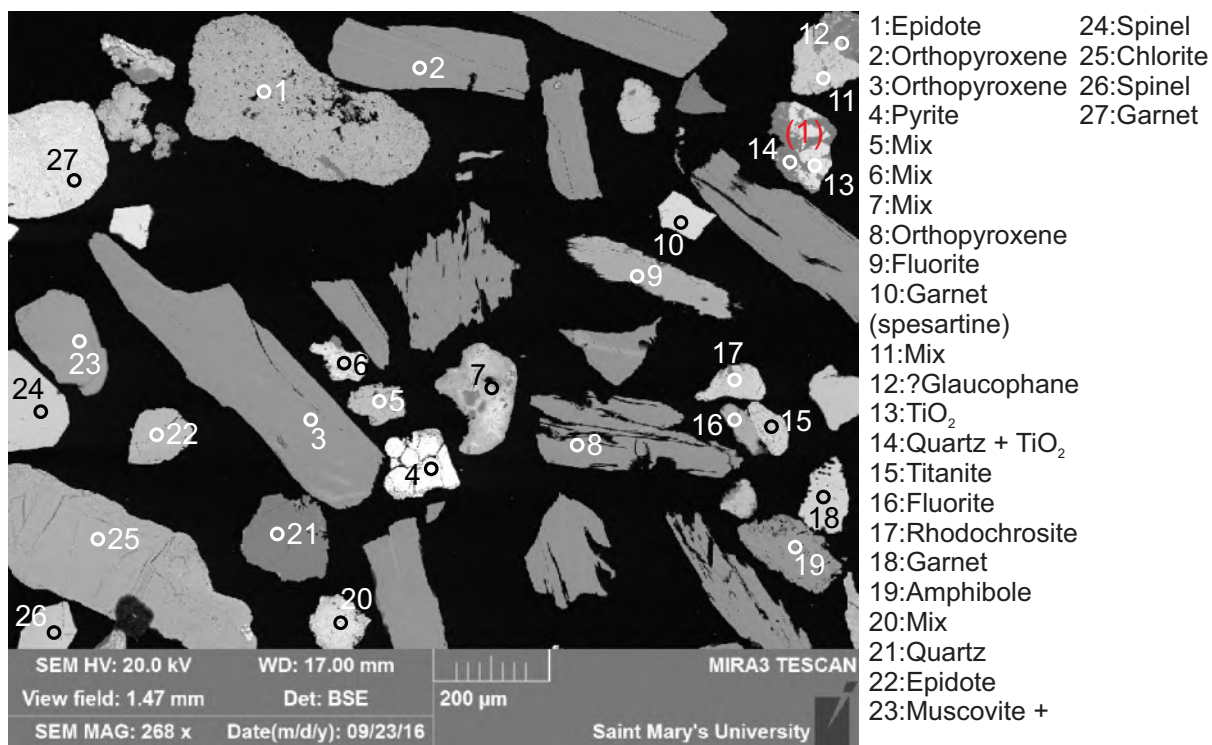


Figure B8.9: Sample S15 site 8 (SEM). 1: Lithic clast (quartz + titania, metamorphic).



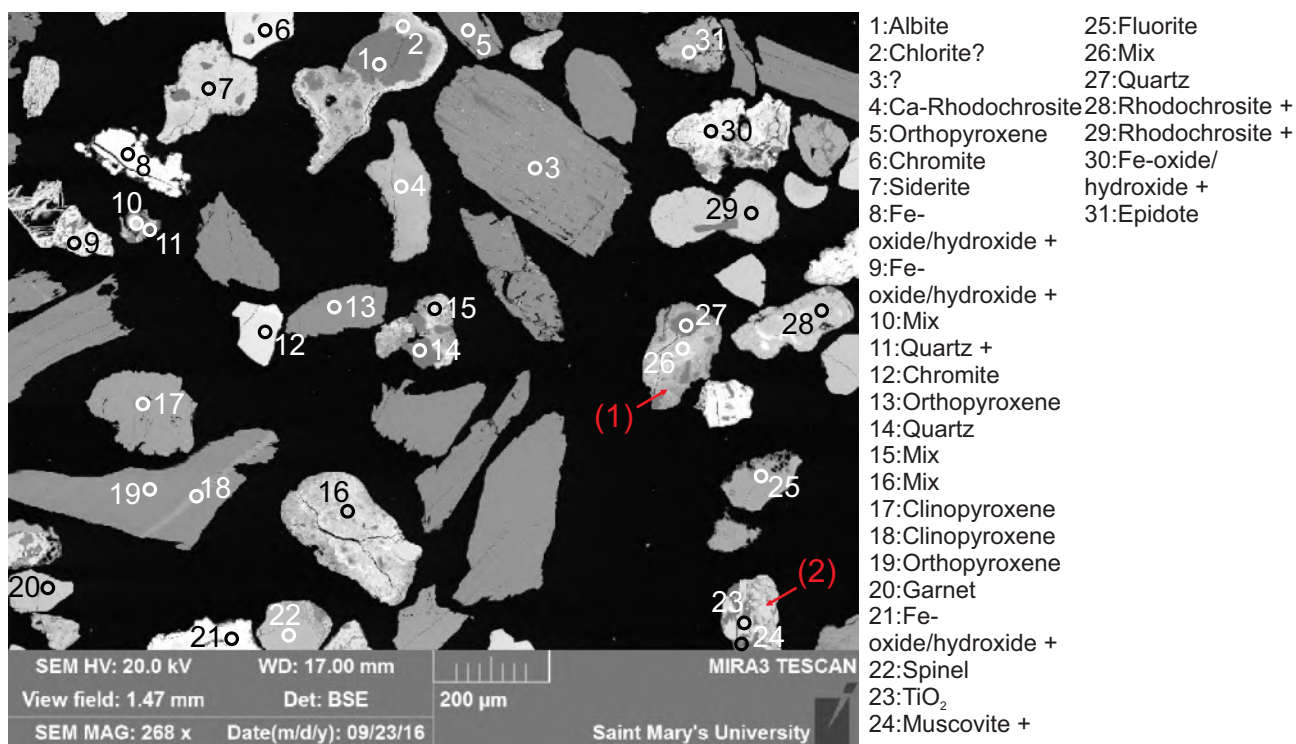


Figure B8.10: Sample S15 site 9 (SEM). 1: Siltstone lithic clast. 2: Lithic clast (titania + muscovite, metamorphic).

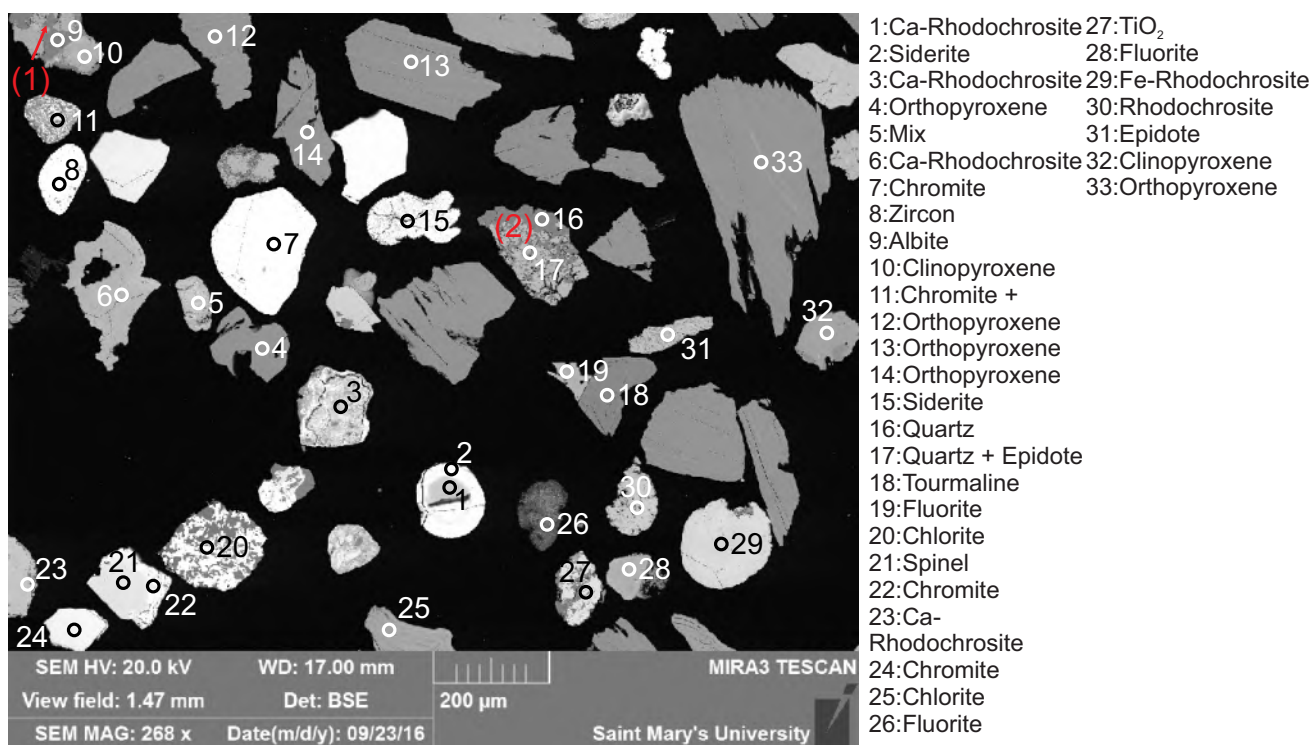
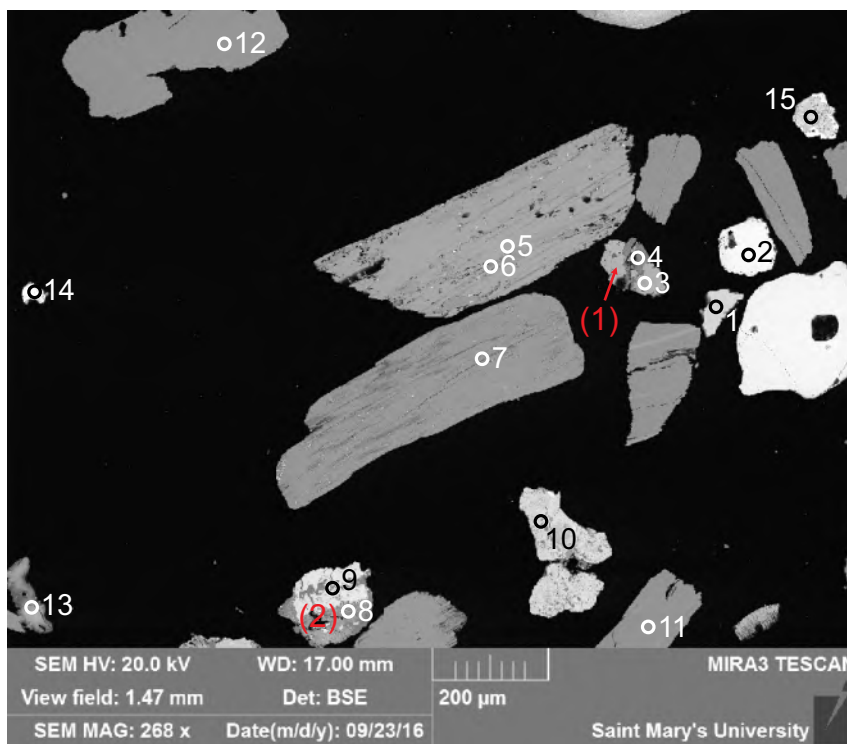
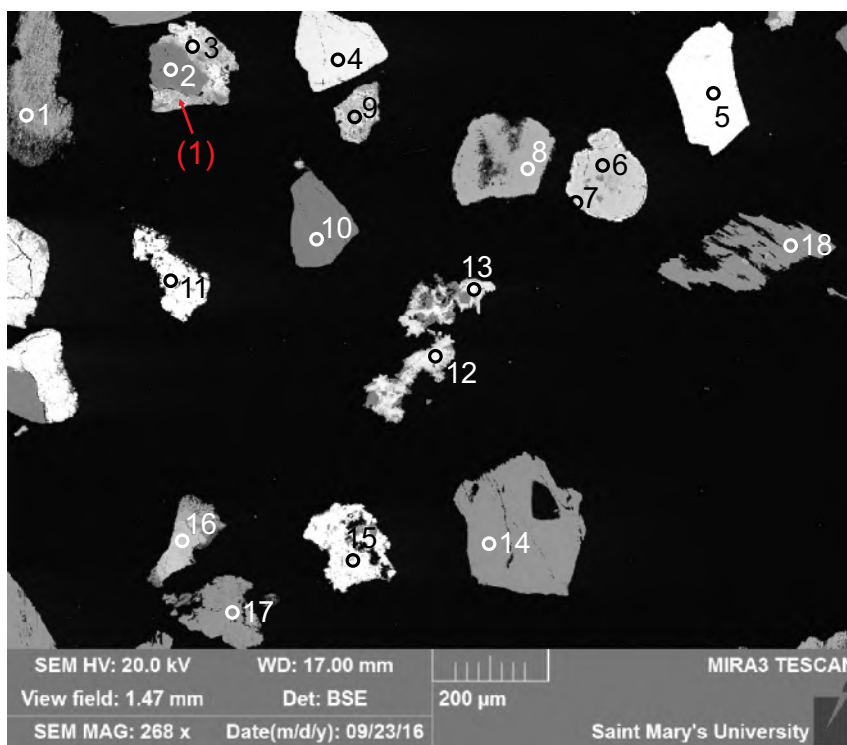


Figure B8.11: Sample S15 site 10 (SEM). 1: Lithic clast (albite + clinopyroxene, metaophiolite). 2: Lithic clast (epidote + quartz, hydrothermal vein).



- 1: Garnet
- 2: Chromite
- 3: Epidote
- 4: Albite
- 5: Orthopyroxene
- 6: Amphibole
- 7: Amphibole
- 8: Quartz + TiO<sub>2</sub>
- 9: TiO<sub>2</sub> +
- 10: Siderite
- 11: Orthopyroxene
- 12: Orthopyroxene
- 13: Fluorite
- 14: Pyrite
- 15: Titanite

Figure B8.12: Sample S15 site 11 (SEM). 1: Lithic clast (albite + epidote, hydrothermal). 2: Lithic clast (quartz + titania, metamorphic).



- 1: Fluorite
- 2: Quartz
- 3: Fe-oxide/hydroxide +
- 4: Chromite
- 5: Chromite
- 6: Rhodochrosite
- 7: Mix
- 8: Fluorite
- 9: Chlorite?
- 10: Quartz
- 11: Pyrite
- 12: Fe-oxide/hydroxide +
- 13: Fe-oxide/hydroxide +
- 14: Orthopyroxene
- 15: Pyrite
- 16: Ca-Rhodochrosite
- 17: Actinolite
- 18: Orthopyroxene

Figure B8.13: Sample S15 site 12 (SEM). 1: ?Sandstone lithic clast.

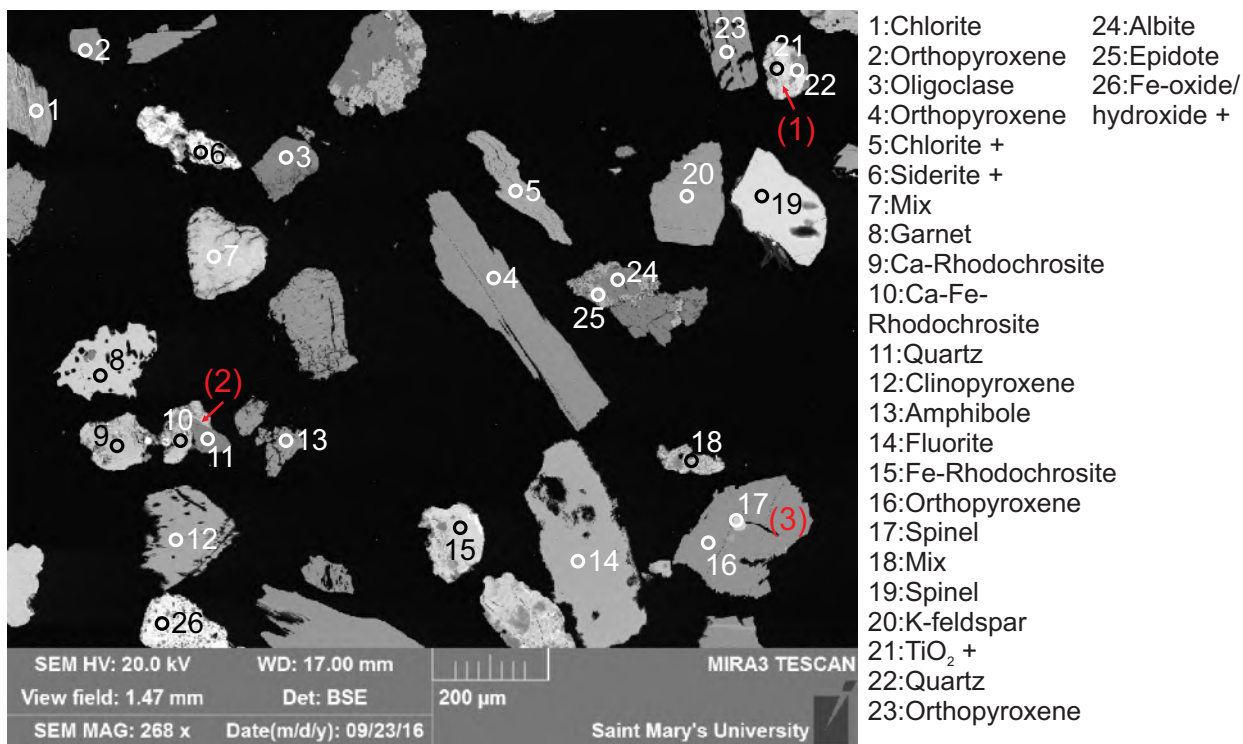


Figure B8.14: Sample S15 site 13 (SEM). 1: Lithic clast (quartz + titania, metamorphic). 2: Lithic clast (rhodochrosite + quartz, hydrothermal). 3: Lithic clast (spinel + orthopyroxene, ophiolite).

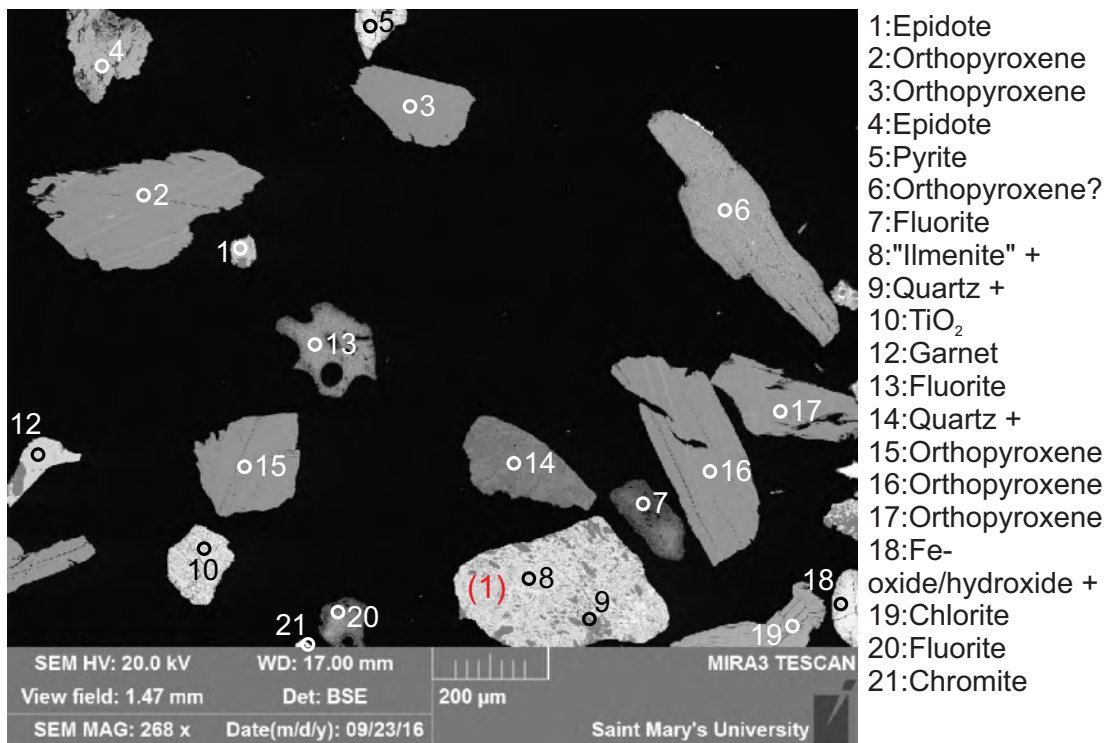


Figure B8.15: Sample S15 site 14 (SEM). 1: Lithic clast (altered ilmenite + quartz inclusions, metamorphic).



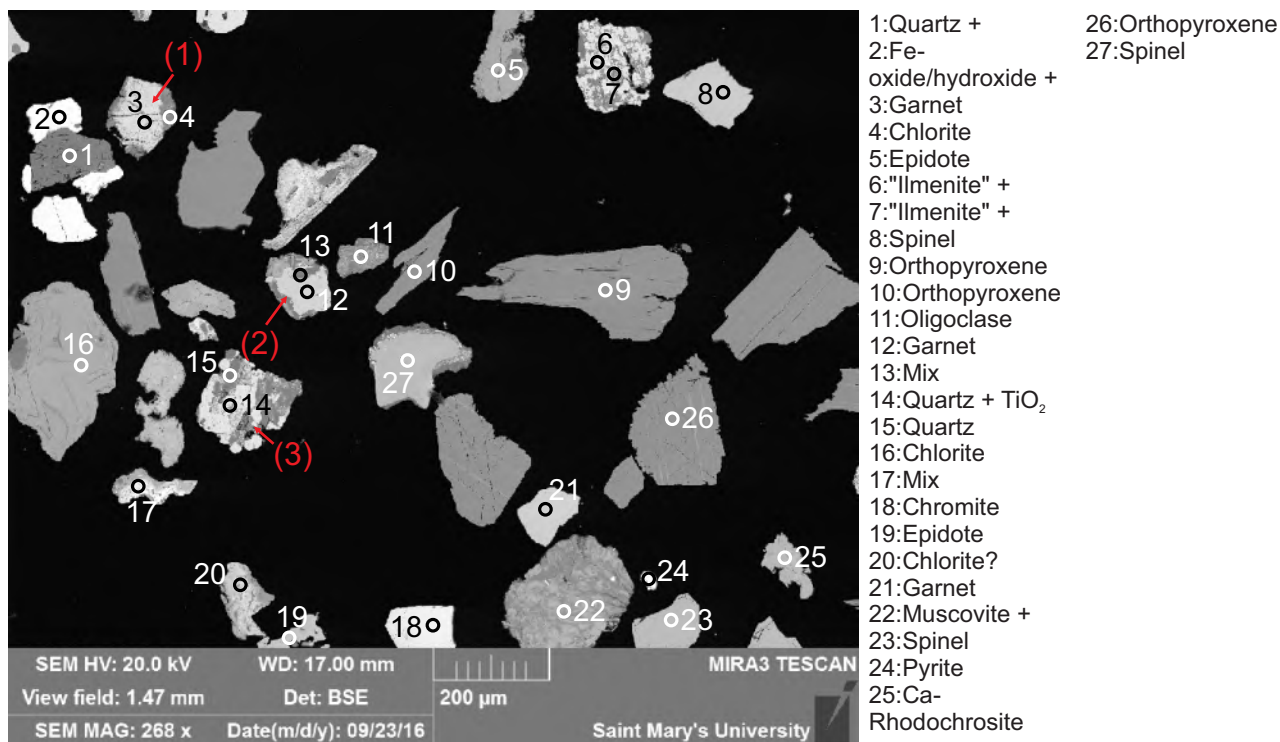


Figure B8.16: Sample S15 site 15 (SEM). 1: Lithic clast (garnet + chlorite, metamorphic). 2: Lithic clast (garnet + albite, metamorphic). 3: Lithic clast (titania + quartz, metamorphic).

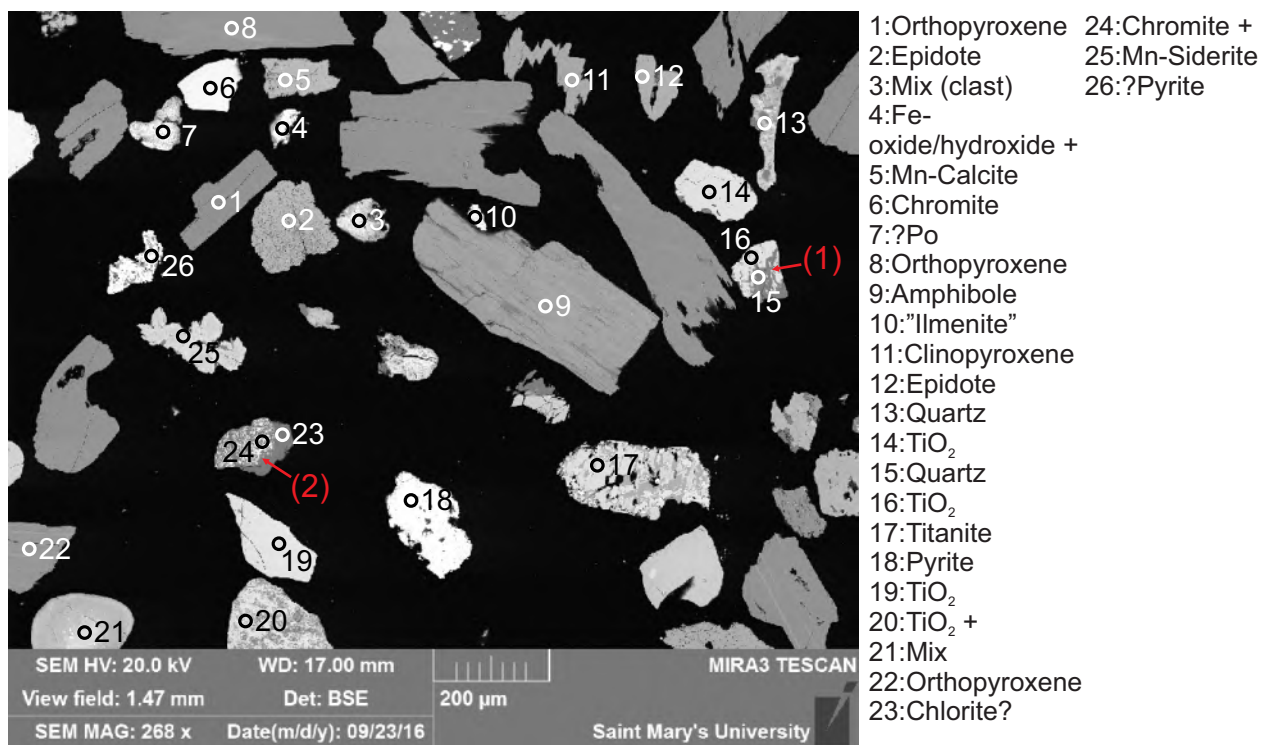


Figure B8.17: Sample S15 site 16 (SEM). 1: Lithic clast (titania + quartz, metamorphic). 2: Lithic clast (chlorite + chromite, metaophiolite).

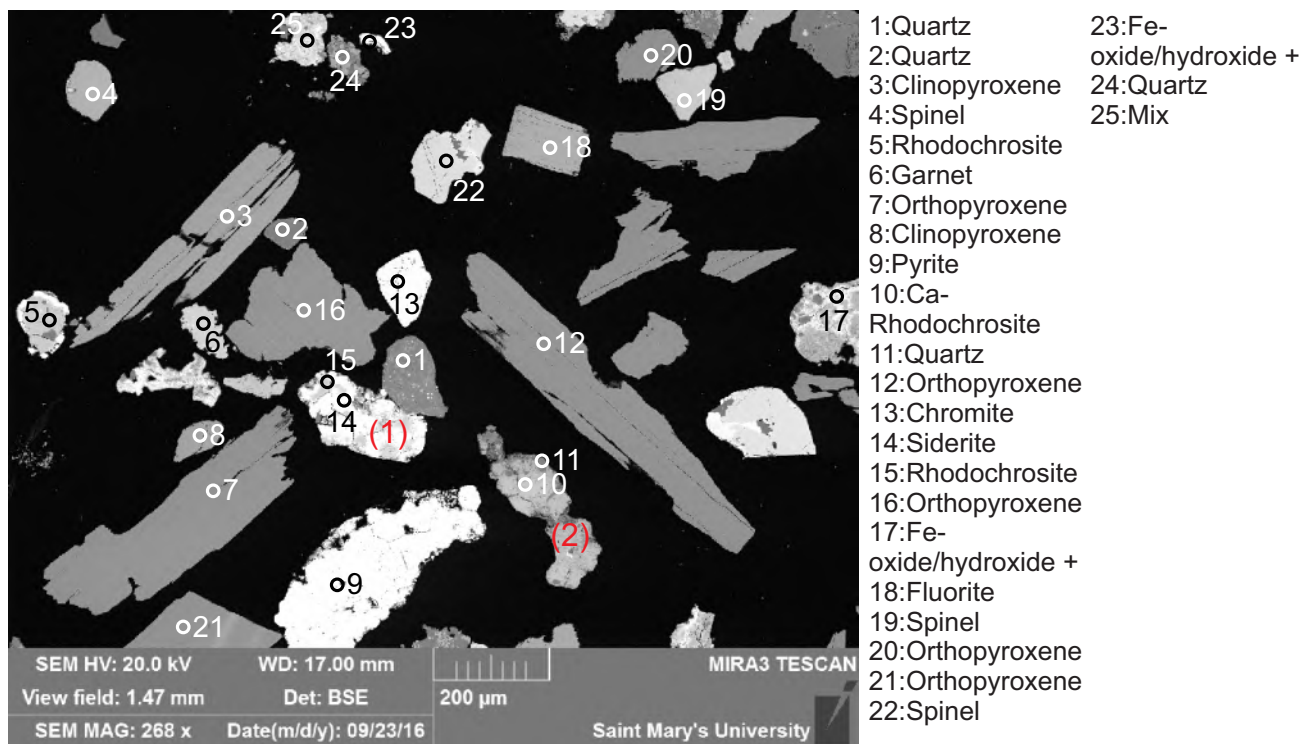


Figure B8.18: Sample S15 site 17 (SEM). 1: Lithic clast (rhodochrosite + siderite, hydrothermal). 2: Lithic clast (quartz + rhodochrosite, hydrothermal).

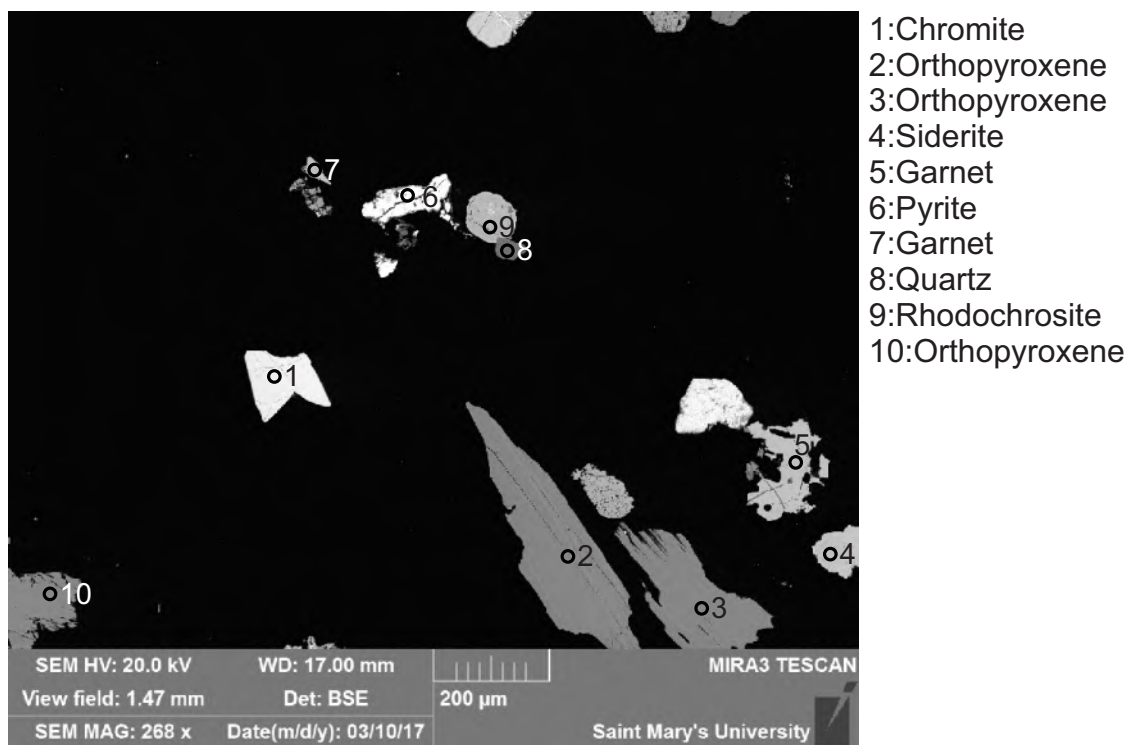


Figure B8.19: Sample S15 site 18 (SEM).



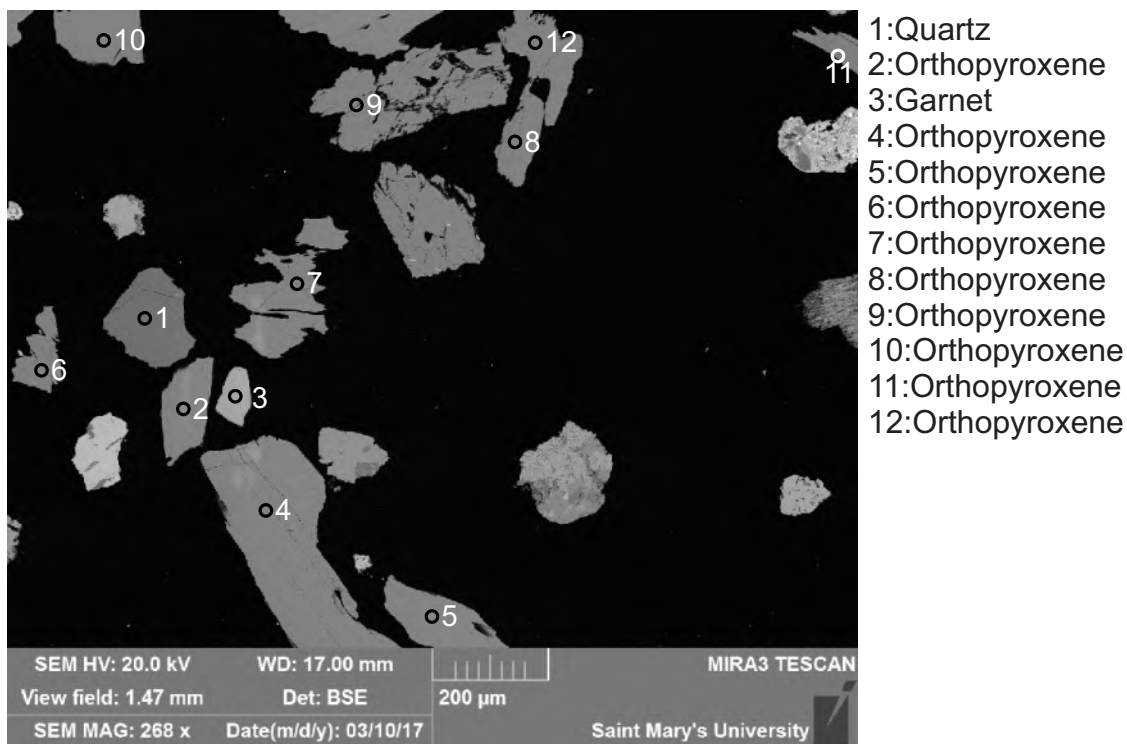


Figure B8.20: Sample S15 site 19 (SEM).

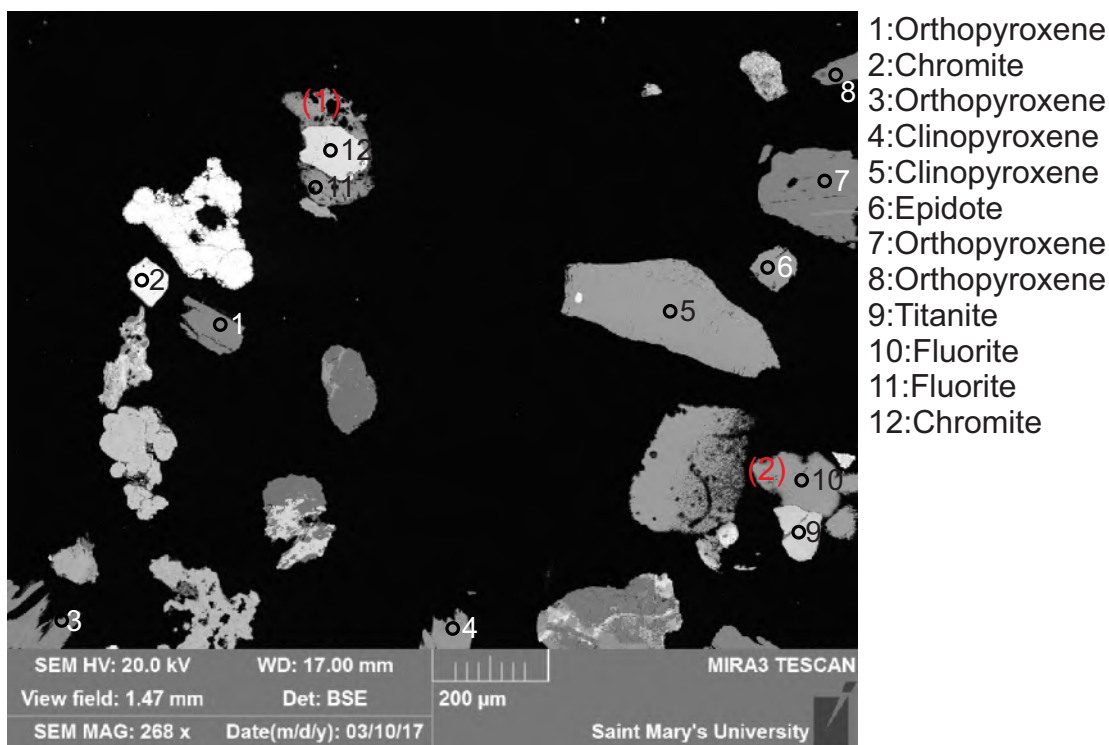


Figure B8.21: Sample S15 site 20 (SEM). 1: Lithic clast (fluorite + chromite, metaophiolite). 2: Lithic clast (titanite + fluorite, metamorphic).

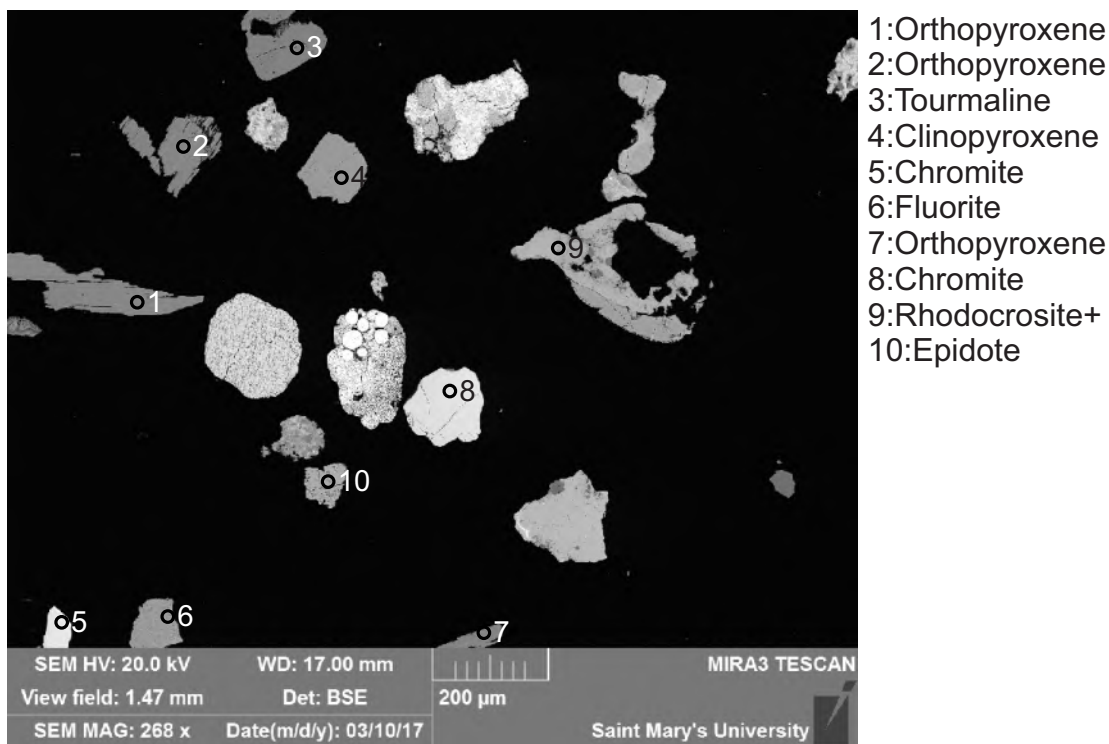


Figure B8.22: Sample S15 site 21 (SEM).

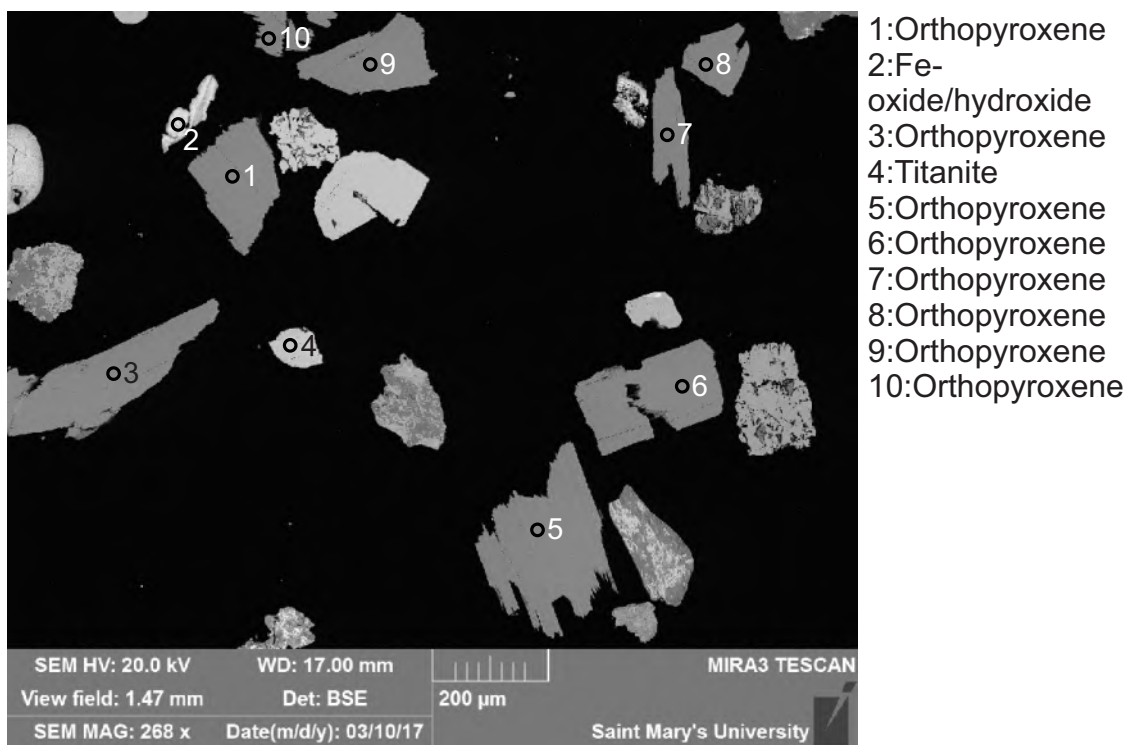


Figure B8.23: Sample S15 site 22 (SEM).

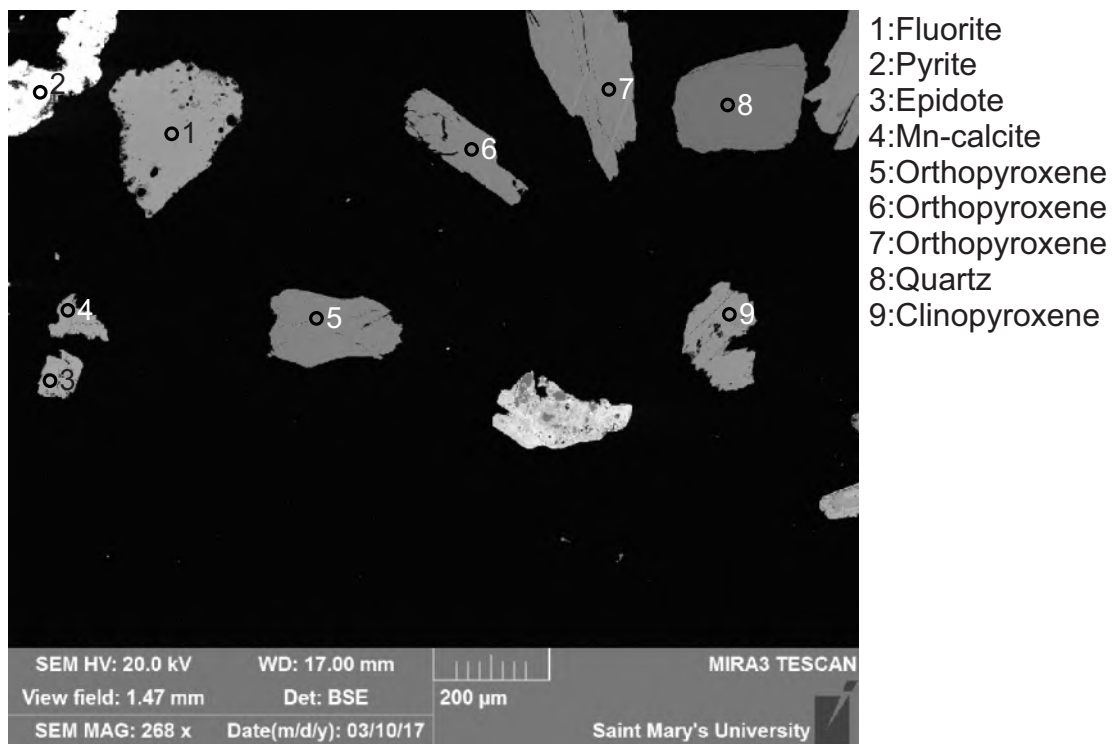


Figure B8.24: Sample S15 site 23 (SEM).

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	1	1	Qz	100.00																							100	119
S15	1	2	Py				29.14				0.26			70.59													100	208
S15	1	3	Opx	56.73		3.37	5.58		33.48	0.32								0.53									100	114
S15	1	4	Cpx	54.19		3.45	1.91		17.27	22.35								0.83									100	116
S15	1	5	Opx	56.23		3.73	5.73		33.34	0.32								0.64									100	117
S15	1	6	Chl +	20.22	0.37	11.67	44.40	0.53	1.05	0.41	0.60	0.81													4.95		85	86
S15	1	7	Qz	99.58			0.42																				100	118
S15	1	8	Py	0.57			37.92			0.24	0.82			59.13											1.32		100	165
S15	1	9	Opx	56.58		3.45	5.36		33.45	0.43								0.72									100	111
S15	1	10	Mix	43.78	1.60	6.13	21.70	15.24	0.55	1.73	0.96	1.02			3.16										4.13		100	36
S15	1	11	Chl +	28.27	0.46	14.61	25.00	6.69	1.44	1.24	0.90	1.65													4.74		85	79
S15	1	13	Feohy +	6.25		0.96	73.64	0.76	1.14	1.07	0.77														15.41		100	75
S15	1	14	Opx	56.81		2.81	5.42		33.63	0.83								0.50									100	114
S15	1	15	Ank +	2.36		1.18	3.37	16.14	3.91	23.41					5.63												56	68
S15	1	16	Qz +	93.94		3.50	1.07		0.76			0.74															100	114
S15	1	17	Spl			47.33	13.71		17.98									20.98									100	111
S15	1	18	Rds	0.46			2.01	47.31		6.21																	56	61
S15	1	19	Mix	31.85	4.43	18.28	25.35	0.45	15.94	3.70																	100	102
S15	1	20	Ttn	32.64	32.97	3.50	0.51			27.84					2.53												100	115
S15	1	21	Opx	56.46		3.15	5.80		33.73	0.32								0.52									100	120
S15	1	22	Mnohy				8.21	64.92	1.46	19.45					5.96												100	62
S15	1	23	Spl			39.15	19.69		15.17									25.99									100	108
S15	1	24	Spl +	6.17		25.82	26.50	0.72	11.09									28.34		1.37							100	103
S15	1	25	Mix	20.31		12.65	48.58	3.16	2.31	7.37		2.24													3.38		100	82
S15	1	26	Qz	99.77			0.23																				100	120
S15	1	28	TiO2	0.88	95.93	0.39	2.40			0.40																	100	107
S15	1	29	Opx	56.66		2.91	5.38		33.86	0.41								0.79									100	123
S15	1	30	Qz	98.81		0.55	0.30			0.34																	100	125
S15	1	31	Ep	42.94		21.85	11.22			20.98																	97	111
S15	1	32	Spl			48.16	12.75		17.96									21.12									100	110
S15	1	33	Fe-Rds				21.03	26.57	0.57	7.82																	56	57
S15	1	34	Opx	57.75		1.72	5.17		34.31	0.37								0.68									100	116
S15	1	35	Opx	56.03		3.23	5.11		32.05	3.02								0.56									100	115
S15	1	36	Opx	56.42		4.03	5.15		32.49	1.22								0.70									100	117
S15	1	37	Qz	100.00																							100	119
S15	1	38	"Ilm"	18.53	57.51		8.66	0.97		14.33																	100	105
S15	1	39	Mix	28.69	0.74	19.50	38.17		1.34	1.09		1.18	1.32												7.96		100	90
S15	1	40	Mn-Sd?	0.67			25.09	21.75	0.96	7.54																	56	57
S15	1	41	Cal				1.14	11.84	2.04	36.36					4.63												56	64
S15	1	42	Py	0.35			31.44	8.38	0.48	3.52				55.83													100	139
S15	2	1	Qz	99.38		0.36					0.27																100	121
S15	2	2	Ep	39.96		23.52	11.45	0.33		21.74																	97	109
S15	2	3	Ep	40.41		23.68	10.37			22.54																	97	111
S15	2	4	Ep	36.88		21.16	17.75			20.84							0.38										97	105

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	3	1	TiO2 +	15.93	81.98	1.09	0.78			0.22																100	109	
S15	3	2	Opx	56.70		2.87	6.31		33.15	0.31								0.66								100	110	
S15	3	3	Opx	56.41		3.58	5.61		33.42	0.38								0.60								100	111	
S15	3	4	Fl							55.28	0.51				44.21											100	106	
S15	3	5	Ep	40.64		26.56	6.69			23.11																97	108	
S15	3	6	Fl							49.48	0.58				49.94											100	127	
S15	3	7	Ep	39.81		20.09	14.67			22.44																97	113	
S15	3	8	Feohy +	4.63			81.03	0.36	0.52					7.60											5.86	100	88	
S15	3	9	Qz	99.74			0.26																			100	121	
S15	3	10	Opx	58.35		1.75	4.67		34.34	0.54								0.35								100	96	
S15	3	11	Feohy +	9.90		7.23	71.99	0.92	1.32	0.88		0.35	1.37												6.03	100	80	
S15	3	12	Ms + TiO2	48.01	4.39	34.99	0.98				1.69	8.34			1.61											100	110	
S15	3	13	TiO2 +	16.36	72.11	9.89	0.86		0.43			0.35														100	104	
S15	3	14	Fl							63.98	0.81				35.21											100	82	
S15	3	15	Feohy +	18.28		13.31	57.72	0.56	1.06	0.73	0.78	2.44													5.13	100	81	
S15	3	16	Olig	64.40		22.11	0.34			3.57	9.57															100	116	
S15	3	17	Olig	65.45		21.62				3.06	9.67	0.20														100	116	
S15	3	18	Feohy +	7.02		5.42	73.98	0.86	1.51	0.87		0.45	1.67												8.21	100	82	
S15	3	19	Qz	99.45			0.55																			100	122	
S15	3	20	Qz +	92.07		1.85	6.08																			100	111	
S15	3	21	Feohy +	4.77		1.28	81.45	1.15	0.59	0.86															9.92	100	77	
S15	3	22	TiO2 +	6.24	83.25	3.84	6.07		0.60																	100	96	
S15	3	23	Opx	56.84		3.09	5.60		33.53	0.34								0.59								100	112	
S15	4	1	Chl	30.33		15.18	21.99	0.38	14.81	0.33	0.50	0.51		0.96												85	97	
S15	4	2	Ttn	35.03	25.90	6.61	3.15		0.58	26.77							0.66								1.31	100	106	
S15	4	3	Mix	51.82	0.72	17.76	20.12	2.63	1.24	0.49	0.72	1.63													2.88	100	108	
S15	4	4	Qz	100.00																						100	121	
S15	4	5	Opx	55.56		4.55	5.58		33.12	0.33								0.86								100	119	
S15	4	6	Opx	55.51		4.45	5.50		33.23	0.41								0.90								100	118	
S15	4	7	?Opx	60.52		1.34	2.99		24.98	10.17																100	115	
S15	4	8	Qz	100.00																						100	118	
S15	4	9	Qz +	90.69	1.71	2.99			0.36	2.07		1.54	0.65													100	110	
S15	4	10	Opx	56.62		3.51	5.37		32.96	0.75								0.78								100	117	
S15	4	11	Feohy +	2.22		0.97	75.93	6.14	2.26	1.03															11.43	100	76	
S15	4	12	Mix	61.09			2.26		24.15	12.50																100	111	
S15	4	13	Ep	39.88		22.58	12.12			22.43																97	114	
S15	4	14	Qz	97.80			0.26																			100	124	
S15	4	15	Ep	39.61		21.66	12.88			22.85																97	112	
S15	4	16	Opx	57.06		2.63	5.69		33.79	0.32								0.52								100	122	
S15	4	17	Opx	56.36		3.50	5.49		32.94	1.00								0.72								100	116	
S15	4	18	Grt	38.64		21.04	32.10	4.78	2.26	1.19																100	111	
S15	4	19	Ep	40.47		26.03	7.41		1.66	21.43																97	105	
S15	4	20	Ab	68.05		18.79				0.45	10.07	2.64														100	116	
S15	4	21	Opx	56.73		3.15	5.57		33.65	0.25								0.66								100	116	



Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	4	22	Chl?	24.77		14.45	35.07	1.04	1.69	0.95		0.95													6.07		85	80
S15	4	23	Opx	56.95		3.16	5.38		32.78	1.11								0.62									100	114
S15	4	24	Rds				0.83	36.84	1.11	12.02					5.20												56	64
S15	4	25	Sd +	3.74		1.43	35.04	1.87	0.41	1.54	0.88	0.20	1.10												9.79		56	84
S15	4	26	Cpx	55.04		2.39	1.83		17.39	22.94								0.41									100	110
S15	4	27	Opx	56.36		3.76	5.77		33.11	0.36								0.64									100	110
S15	4	28	Opx	56.44		3.50	5.34		33.51	0.44								0.77									100	118
S15	4	29	Chl +	27.56		13.35	30.65	0.31	0.99	0.77	0.36	0.82	1.41												8.80		85	94
S15	5	1	Opx	55.26		3.44	7.57		30.31	2.49								0.93									100	77
S15	5	2	Opx	58.34		0.99	4.92		34.97	0.35								0.43									100	112
S15	5	3	Grt	37.73		2.67	25.22			34.38																	100	91
S15	5	4	Grt	38.35		3.17	24.94		0.45	33.08																	100	84
S15	5	5	Opx	55.68		3.96	5.59		33.39	0.72								0.67									100	113
S15	5	6	TiO2 +	2.24	96.48	0.71	0.31					0.27															100	105
S15	5	7	Ms	51.71	0.62	30.21	1.77		0.87		0.95	8.87															95	112
S15	5	8	Feohy +	2.52			72.34	0.48		1.34	1.55			3.45							2.92				15.39		100	75
S15	5	9	Tur	38.52	0.43	32.30	7.60		6.00		2.15																87	95
S15	5	10	Grt	38.97		20.91	34.00	0.37	1.73	4.03																	100	108
S15	5	11	Ilm		50.39		49.61																				100	100
S15	5	12	"Ttn" +	24.10	53.37	2.76	1.25			18.52																	100	108
S15	5	13	Ap +	2.09						50.11			39.40		5.16	1.41									1.82		100	37
S15	5	14	Chr			11.66	21.07		9.72									57.55									100	107
S15	5	15	Chr			24.29	16.32		13.70									45.70									100	107
S15	5	16	Qz	99.06		0.42	0.20				0.33																100	118
S15	5	17	Mix	12.28		5.69	31.14	31.48	2.34	13.70		0.48													2.89		100	62
S15	5	18	Mn-Sd				29.59	20.69	1.19	4.52																	56	58
S15	5	19	Opx	56.59		3.58	5.83		32.98	0.35								0.67									100	113
S15	5	20	Cpx	54.89		2.54	1.84		17.64	22.39								0.70									100	118
S15	5	21	Cpx	53.58	0.80	2.11	8.36		15.01	19.69	0.45																100	117
S15	5	22	Opx	56.24		3.43	5.45		33.28	1.00								0.59									100	118
S15	5	23	Py				29.09						70.27								0.64						100	204
S15	5	24	Chr			11.32	17.96		10.59									60.13									100	109
S15	5	25	Mix	43.92		5.51	41.85		1.33	0.95	0.78	0.66		0.82											4.18		100	91
S15	5	26	Mix	4.25		1.77	65.21	0.93	1.23	7.93	1.12														17.57		100	73
S15	5	27	Ep ?	44.09		20.26	11.89			18.04	2.72																97	116
S15	5	28	Qz	100.00																							100	119
S15	5	29	Qz +	91.53		2.51	5.66		0.30																		100	108
S15	5	30	Feohy +	6.42		0.82	74.05	1.00	0.59	1.14	0.78														15.21		100	81
S15	5	31	Qz	99.57			0.43																				100	119
S15	5	32	Py				32.69						67.31														100	182
S15	5	33	Chl?	27.98	1.50	15.08	33.33		1.19	0.70	0.38	1.78													3.07		85	84
S15	5	34	Mix	17.15		8.59	55.52	1.67	1.81	3.50	1.05	1.02													9.68		100	69
S15	5	35	Mix	5.52		3.65	27.89	31.97	1.50	11.59															17.88		100	72
S15	6	1	Tur	38.44	0.56	30.36	6.92		7.64	0.23	2.85																87	99

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	6	2	Cpx	53.72		3.58	1.71		17.57	22.41								1.01									100	113
S15	6	3	Opx	56.44		3.31	5.65	0.24	33.29	0.53								0.54									100	118
S15	6	4	Opx	56.39		3.68	5.47		33.33	0.41								0.72									100	118
S15	6	5	Qz	100.00																							100	118
S15	6	6	Ep	40.51		23.85	10.09			22.55																	97	106
S15	6	7	Grt?	35.67		4.55	24.32		3.20	30.06														2.20			100	93
S15	6	8	Mix	25.83	0.80	12.24	53.75	0.48	1.37	0.41	0.65	0.68												3.77			100	85
S15	6	9	Py				29.89				0.36			69.39							0.36						100	193
S15	6	10	Opx	57.00		3.48	5.00		30.81	3.03								0.68									100	110
S15	6	11	Mix	11.38		12.23	60.41	0.40	1.13	1.10	0.58	0.65	1.13											11.00			100	76
S15	6	12	Opx	56.25		3.93	5.02		30.77	3.43								0.59									100	111
S15	6	13	Opx	55.99		4.37	5.40		33.04	0.45								0.75									100	111
S15	6	14	Ca-Rds					20.00	1.11	31.34					3.55												56	59
S15	6	15	Ep	41.67		23.60	10.36			21.37																	97	102
S15	6	16	Qz	100.00																							100	115
S15	6	17	Fl				0.25	0.30	5.75	47.75				0.76	45.19												100	108
S15	6	18	Opx	56.27		3.48	5.53		33.58	0.48								0.66									100	113
S15	6	19	Py	1.26			50.65			0.50	0.71			37.74							1.05				8.09		100	119
S15	6	20	Mix	14.14		6.64	39.89	12.13	1.65	4.14	0.65	0.63	1.45	0.88										17.78			100	87
S15	6	21	Mix	27.29	0.57	20.84	39.36		1.05	0.57	1.39	1.35	1.18											6.40			100	91
S15	6	22	Mix	6.04		11.05	68.76		1.07	0.85	1.49		2.20											8.55			100	82
S15	6	23	Ttn	32.95	30.43	4.36	6.22	0.40	2.99	22.21	0.45																100	110
S15	6	24	Py				37.75			0.58				54.35							0.93				4.87	1.53	100	169
S15	6	25	Opx	55.52		3.83	5.18		32.24	2.33								0.91									100	122
S15	6	26	Opx	56.20		3.73	5.52		33.37	0.36								0.82									100	121
S15	6	27	Feohy +	10.29		6.93	72.09	0.89	1.30	0.82		0.47	0.91											6.30			100	76
S15	6	28	Fl							61.15					37.33							1.52					100	68
S15	6	29	Chl	33.69		16.28	16.93	0.29	15.81	1.04	0.97																85	92
S15	6	30	TiO2 +	3.90	90.57	1.74	3.12			0.66																	100	94
S15	7	1	Chl	26.94		20.27	20.56		16.86		0.37																85	93
S15	7	2	Cpx	55.63		2.63	2.70		22.11	16.24								0.69									100	112
S15	7	3	Opx	56.12		3.82	5.49		33.29	0.53								0.75									100	113
S15	7	4	"Ilm" +	3.73	76.55	9.01	4.83		0.54	1.00	0.49		1.98	0.85				1.02									100	94
S15	7	5	Ep	42.41		24.60	9.39	0.26		20.33																	97	110
S15	7	6	Grt	43.67	0.33	7.38	34.77	0.40	5.80	5.46		0.50		0.70				0.98									100	107
S15	7	7	Qz	98.76		0.50	0.59					0.15															100	115
S15	7	8	Mix	15.34	0.84	10.30	55.94	0.61	1.34	1.22		0.81	1.74											11.85			100	74
S15	7	9	Ttn	33.00	36.61	1.31	1.58			27.51																	100	107
S15	7	10	Mix	19.97		9.31	50.33	6.79	3.14	5.60	0.70	1.00												3.17			100	67
S15	7	11	Grt	39.58		20.95	26.76	2.21	1.79	8.70																	100	115
S15	7	12	"Ilm" +	9.95	48.40	1.64	31.67	2.54		5.80																	100	114
S15	7	13	Feohy +	1.90		0.79	80.95	0.55	1.33	0.89	0.89			1.64					1.90					9.16			100	74
S15	7	14	Ab	68.78	0.71	18.63					11.88																100	124
S15	7	15	Ep	39.46		20.91	14.22			22.41																	97	108

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	7	16	Feohy +	4.28		1.59	75.34	1.41	3.39	2.44			1.49												10.06		100	75
S15	7	17	"Ilm" +	18.62	42.49	14.07	17.45	0.31	6.83			0.22															100	103
S15	7	18	Spl			42.11	17.92		16.20									23.22		0.55							100	108
S15	7	19	Ms	46.85		31.21	1.94		1.77		1.18	8.51			3.54												95	111
S15	7	20	Zrn	31.39																			68.61				100	118
S15	7	21	?	52.94	0.46	11.95	27.97	0.44	1.35	0.49	0.42	1.24													2.74		100	94
S15	7	22	Sd				48.87	3.70		3.43																	56	58
S15	7	23	Chr +	7.73	1.64	3.68	33.60	0.87	8.38								0.58	42.99		0.52							100	97
S15	7	24	Ab	67.87		20.12				0.41	11.17	0.44															100	110
S15	7	25	Sd				47.36	1.42	0.57	4.93															1.72		56	57
S15	7	26	Mix	33.86	0.39	12.00	47.18	0.47	1.22	0.52		1.11													3.25		100	83
S15	7	27	Mix	5.76	73.15	7.12	5.56		0.85	1.08	0.61	0.27	1.17				1.52	0.82							2.09		100	88
S15	7	28	Ab	69.59		18.56					11.85																100	113
S15	7	29	Ep	40.18		23.64	10.51			22.68																	97	113
S15	7	30	Spl			46.65	13.71		18.04									21.61									100	113
S15	7	31	Mix	50.54		24.80	4.18		0.88	15.09	4.50																100	115
S15	7	32	Qz +	71.00		16.48	2.88		1.82	0.33	4.96	2.53															100	116
S15	8	1	Ep	39.98		20.23	13.01		1.33	22.46																	97	97
S15	8	2	Opx	56.70		2.84	5.24		33.05	1.46								0.71									100	113
S15	8	3	Opx	56.32		3.86	5.43		33.12	0.62								0.64									100	117
S15	8	4	Py	0.91			37.07			0.18	0.50			55.92											3.90	1.51	100	173
S15	8	5	Mix	3.51		2.18	9.99	26.44	2.94	46.83					8.11												100	68
S15	8	6	Mix	24.43	0.54	15.21	48.18	1.00	1.19	1.19	0.59	1.08	1.08												5.51		100	92
S15	8	7	Mix	25.01	0.53	16.29	45.54	0.97	2.57	0.56	0.49	1.81	1.02												5.22		100	85
S15	8	8	Opx	56.53		3.12	5.86		33.68	0.35								0.47									100	120
S15	8	9	Fl							55.20	0.67				44.12												100	106
S15	8	10	Garnet (Spes)	38.54		20.13	15.80	25.30		0.22																	100	109
S15	8	11	Mix	33.66	12.62	8.01	19.51		10.90	11.66	1.40														2.24		100	86
S15	8	12	?Gln	67.73		12.65	8.46		3.61	0.73	6.66	0.16															100	104
S15	8	13	TiO2	0.64	98.78		0.58																				100	104
S15	8	14	Qz + TiO2	87.32	11.41	0.48				0.79																	100	116
S15	8	15	Ttn	27.94	39.78	1.80	4.90	1.20		23.53							0.86										100	112
S15	8	16	Fl				0.77		6.51	47.97	0.48			0.85	43.42												100	112
S15	8	17	Rds	1.48				40.76	0.46	8.56					4.74												56	67
S15	8	18	Grt	39.28		20.81	25.02	6.77	0.60	7.52																	100	116
S15	8	19	Amph	57.54		1.49	2.89		22.12	12.25	0.31							0.40									97	117
S15	8	20	Mix	6.98	0.64	5.67	62.13	8.47	2.35	4.80		0.38	0.96												7.63		100	74
S15	8	21	Qz	100.00																							100	121
S15	8	22	Ep	39.92		23.23	11.10			22.75																	97	108
S15	8	23	Ms +	50.03	0.98	25.85	4.60		2.62			10.92															95	105
S15	8	24	Spl			40.83	14.66		17.21								0.33	26.97									100	104
S15	8	25	Chl	26.15		21.05	22.23		15.57																		85	95
S15	8	26	Spl			42.05	17.83		16.71									23.41									100	106
S15	8	27	Grt	38.01		0.95	26.63		0.51	33.89																	100	97

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total	
S15	9	1	Ab	69.67		18.78					11.56																100	112	
S15	9	2	Chl?	26.96	0.33	18.00	29.20		1.14	0.43	0.88	1.32	1.09												5.66		85	84	
S15	9	3	?	47.34		11.66	3.48		32.08	3.31								2.14									100	93	
S15	9	4	Ca-Rds					33.75	0.75	21.50																	56	57	
S15	9	5	Opx	56.76		2.97	5.50		33.38	0.85								0.54									100	110	
S15	9	6	Chr		1.45	19.87	25.33		12.21								0.47	40.66									100	101	
S15	9	7	Sd	0.62			40.93	4.21	0.71	6.59				0.88											2.06		56	60	
S15	9	8	Feohy +	7.17			80.79			0.95	0.77	0.61	1.87	2.88							1.31				3.65		100	81	
S15	9	9	Feohy +	8.34	3.58	4.74	78.05			0.55	0.99							0.39							3.36		100	82	
S15	9	10	Mix	12.81		6.79	60.81	4.60	1.28	9.21		2.08													2.41		100	65	
S15	9	11	Qz +	94.86		2.54	2.40					0.19															100	88	
S15	9	12	Chr		1.67	21.42	20.95		14.69								0.42	40.85									100	106	
S15	9	13	Opx	56.44		3.29	5.67		33.54	0.45								0.61									100	116	
S15	9	14	Qz	99.74			0.26																				100	121	
S15	9	15	Mix	13.62		6.80	67.94	1.50	1.08	0.84		0.50	0.96												6.77		100	74	
S15	9	16	Mix	18.08	1.76	10.23	60.50	2.16	1.48	0.64	0.78	0.93													3.45		100	78	
S15	9	17	Cpx	54.50		3.00	1.43		17.10	23.18								0.79									100	112	
S15	9	18	Cpx	53.82		3.59	1.88		16.83	22.89								0.98									100	113	
S15	9	19	Opx	55.85		3.86	5.49		32.89	1.10								0.82									100	115	
S15	9	20	Grt	39.79		21.39	27.74	0.68	4.59	5.81																	100	109	
S15	9	21	Feohy +	1.33			69.89			1.16	0.73			14.25							1.23				11.41		100	85	
S15	9	22	Spl			47.22	16.29		17.22									19.27									100	110	
S15	9	23	TiO2	0.47	99.20		0.33																				100	113	
S15	9	24	Ms +	71.58	0.29	16.45	3.09		2.44			6.15															100	119	
S15	9	25	Fl							55.02	0.68				44.30												100	110	
S15	9	26	Mix	22.71	0.39	15.69	50.56	1.02	1.60	0.74		1.12	0.91												5.26		100	84	
S15	9	27	Qz	99.59			0.41																				100	118	
S15	9	28	Rds +	3.72		1.57	19.96	21.63	0.82	6.74															1.56		56	65	
S15	9	29	Rds +	0.94		0.65	9.78	41.20		3.43																	56	60	
S15	9	30	Feohy +	3.33		0.92	72.38	0.97	1.01	2.74	1.67		2.00												14.98		100	72	
S15	9	31	Ep	40.13		26.36	8.05	0.38		22.08																	97	104	
S15	10	1	Ca-Rds				1.36	37.89	1.45	15.30																	56	59	
S15	10	2	Sd	1.80		0.49	33.76	3.99	0.77	3.02	0.54		0.89	0.59											10.14		56	86	
S15	10	3	Ca-Rds					33.96	0.69	15.88					3.79											1.69		56	68
S15	10	4	Opx	56.84		2.79	5.62		33.79	0.49								0.46									100	116	
S15	10	5	Mix	20.41	0.94	8.76	55.34	0.39	10.58	0.46	0.49								0.44						2.20		100	82	
S15	10	6	Ca-Rds					19.17	3.15	29.30	0.43			0.60	3.35												56	61	
S15	10	7	Chr			10.41	22.44		9.34									57.81									100	106	
S15	10	8	Zrn	31.57																			66.98	1.45			100	110	
S15	10	9	Ab	68.73		19.30				0.41	11.37	0.18															100	111	
S15	10	10	Cpx	53.01	0.89	3.58	6.56		15.74	19.83	0.39																100	109	
S15	10	11	Chr +	4.76		20.72	29.62	0.76	8.92									34.13		1.10							100	104	
S15	10	12	Opx	55.92		4.42	5.65		32.76	0.51								0.73									100	112	
S15	10	13	Opx	56.52		3.38	5.54		33.47	0.43								0.67									100	114	

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	10	14	Opx	56.18		3.71	5.45		33.34	0.48								0.84									100	114
S15	10	15	Sd	0.76		0.19	48.97	0.29	0.24	1.09				0.34											4.14		56	67
S15	10	16	Qz	100.00																							100	120
S15	10	17	Qz + Ep	74.62		9.75	5.98			9.64																	100	107
S15	10	18	Tur	38.45	0.44	30.70	6.28		8.09	0.21	2.84																87	100
S15	10	19	Fl						0.65	48.74					50.61												100	125
S15	10	20	Chl	28.10		15.26	7.39		26.98									7.28									85	92
S15	10	21	Spl		0.46	31.30	23.36	0.65	12.97									31.25									100	109
S15	10	22	Chr		0.85	2.84	67.15	0.70	1.75									26.71									100	100
S15	10	23	Ca-Rds	2.12		1.28	1.26	25.20	0.82	20.05					5.26												56	65
S15	10	24	Chr	0.63		16.40	20.50		8.13									54.34									100	99
S15	10	25	Chl	26.76		21.22	21.43		15.59																		85	99
S15	10	26	Fl							52.81					45.71							1.48					100	69
S15	10	27	TiO2	0.71	98.61	0.38	0.31																				100	106
S15	10	28	Fl						0.59	52.12	0.40				46.90												100	119
S15	10	29	Fe-Rds	0.41			24.40	24.76		6.43																	56	64
S15	10	30	Rds				1.24	42.05	1.22	11.49																	56	62
S15	10	31	Ep	39.77		18.70	16.53			22.00																	97	105
S15	10	32	Cpx	54.97		2.21	1.76		17.48	23.03								0.54									100	116
S15	10	33	Opx	55.28		5.13	5.42		31.61	1.84								0.72									100	113
S15	11	1	Grt	39.15		20.86	29.11	7.22	1.98	1.68																	100	115
S15	11	2	Chr			18.80	22.25		9.95								0.36	48.64									100	108
S15	11	3	Ep	40.10		26.01	7.79			23.10																	97	110
S15	11	4	Ab	69.20		18.94				0.32	11.54																100	118
S15	11	5	Opx	55.53		1.36	2.58		17.48	22.22								0.83									100	115
S15	11	6	Amph	57.21		1.61	2.68		22.51	12.14	0.37							0.48									97	114
S15	11	7	Amph	57.29		2.56	2.56		23.62	9.82	0.51							0.64									97	115
S15	11	8	Qz + TiO2	80.52	19.25		0.23																				100	123
S15	11	9	TiO2 +	7.54	91.21		1.25																				100	113
S15	11	10	Sd	1.61		1.13	42.34	3.99	0.89	6.05																	56	65
S15	11	11	Opx	56.51		3.32	5.81		33.39	0.37								0.59									100	122
S15	11	12	Opx	56.70		3.19	5.38		33.76	0.35								0.62									100	112
S15	11	13	Fl						5.74	46.55	0.35			0.59	46.77												100	110
S15	11	14	Py	0.67			38.46			0.21				57.38										1.31		1.97	100	165
S15	11	15	Ttn	30.60	42.25	0.34	1.08			25.73																	100	106
S15	12	1	Fl							56.11	0.68				43.21												100	86
S15	12	2	Qz	100.00																							100	114
S15	12	3	Feohy +	3.35		6.41	76.93	1.68	1.58	1.12			1.41												7.52		100	72
S15	12	4	Chr			20.27	18.29		11.43								0.38	49.63									100	103
S15	12	5	Chr			5.69	19.37		9.45									65.49									100	103
S15	12	6	Rds	1.40		0.83	0.72	43.49	0.49	9.07																	56	60
S15	12	7	Mix	48.13		2.62	37.59	0.84	0.66	4.03	0.52	0.28													5.32		100	84
S15	12	8	Fl							55.66	0.64				43.71												100	102
S15	12	9	Chl?	28.67	0.66	19.84	26.00		1.16	0.73	0.42	1.16	0.88												5.48		85	86



Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	12	10	Qz	100.00																							100	117
S15	12	11	Py				28.93				0.25			70.83													100	217
S15	12	12	Feohy +	1.84		0.97	72.48	1.06	0.91	6.71			1.77												14.27		100	72
S15	12	13	Feohy +	4.02		1.57	70.48	0.73	0.84	5.44			1.96												14.96		100	77
S15	12	14	Opx	-2.00		3.59	5.71		32.60	1.00								0.50									100	120
S15	12	15	Py	0.89		0.41	31.11							65.70							1.89						100	204
S15	12	16	Ca-Rds	2.51		1.49	11.34	22.55	2.40	13.38					2.33												56	65
S15	12	17	Act	56.89		2.58	2.56		21.94	12.62								0.41									97	113
S15	12	18	Opx	56.01		4.02	5.49		33.27	0.40								0.80									100	115
S15	13	1	Chl	25.53		14.43	23.02	0.27	14.92	0.23				6.60													85	93
S15	13	2	Opx	55.71		3.09	4.84		30.25	5.37								0.75									100	111
S15	13	3	Olig	66.92		20.64				3.06	9.38																100	117
S15	13	4	Opx	55.98		3.87	5.73		33.30	0.39								0.74									100	117
S15	13	5	Chl +	26.67		20.90	21.74		15.69																		85	92
S15	13	6	Sd +	1.33		1.80	42.77	0.67	0.74	0.54	0.49		0.70	0.78											6.17		56	59
S15	13	7	Mix	22.66	0.61	9.10	46.91		12.24	0.56	1.51		1.14												5.28		100	87
S15	13	8	Grt	39.80		20.98	26.18	1.32	2.15	9.58																	100	111
S15	13	9	Ca-Rds	3.62		2.69	2.26	23.75	0.83	17.22		0.23		1.78	3.62												56	72
S15	13	10	Ca-Fe-Rds	6.38		3.99	5.91	21.35	0.78	11.43		0.22													5.93		56	73
S15	13	11	Qz	100.00																							100	120
S15	13	12	Cpx	53.94		3.77	1.82		16.65	22.77								1.05									100	116
S15	13	13	Amph	55.58		3.95	2.31		21.84	11.74	0.67							0.91									97	114
S15	13	14	Fl							63.44	0.78			0.50	35.27												100	94
S15	13	15	Fe-Rds	0.77		0.58	13.65	34.06		5.79					1.16												56	64
S15	13	16	Opx	57.15		2.37	5.10		33.16	1.75								0.47									100	123
S15	13	17	Spl			36.50	15.27		16.63									31.60									100	114
S15	13	18	Mix	46.03	0.60	13.17	28.37	0.95	1.80	1.22		1.02													6.83		100	79
S15	13	19	Spl			28.31	14.18		15.41								0.36	41.73									100	110
S15	13	20	Kfs	65.96		17.76					0.53	15.75															100	115
S15	13	21	TiO2 +	3.80	90.27	2.16	1.79		1.98																		100	102
S15	13	22	Qz	99.61	0.39																						100	114
S15	13	23	Opx	56.49		4.99	5.73		31.22	0.48		0.23						0.85									100	94
S15	13	24	Ab	69.62		18.76					11.62																100	117
S15	13	25	Ep	40.12		24.05	10.27			22.55																	97	110
S15	13	26	Feohy +	10.69		9.44	71.56	0.55	1.20	0.50		0.27	0.95												4.85		100	82
S15	14	1	Ep	40.07		21.17	13.67			22.10																	97	108
S15	14	2	Opx	56.41		2.82	5.05		32.88	1.93								0.90									100	116
S15	14	3	Opx	56.71		2.84	5.78		33.73	0.46								0.47									100	115
S15	14	4	Ep	40.09		24.71	9.05			22.49							0.66										97	105
S15	14	5	Py			1.03	50.57		0.89	0.77	0.68		1.08	37.05											7.94		100	110
S15	14	6	Opx?	54.34		4.88	14.10		19.42	5.43	0.50							1.33									100	102
S15	14	7	Fl							57.18					40.84										1.97		100	52
S15	14	8	"Ilm" +	16.97	42.23	13.57	20.82	0.33	5.48				0.60														100	103
S15	14	9	Qz +	98.76	1.24																						100	126

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	14	10	TiO2	1.03	91.49	3.23	2.18			0.58			0.94					0.56									100	102
S15	14	12	Grt	39.63		20.88	27.18	2.35	1.29	8.68																	100	111
S15	14	13	Fl							51.67	0.49				46.48						1.36						100	99
S15	14	14	Qz +	95.90		2.56	0.47		0.37		0.33	0.37															100	109
S15	14	15	Opx	57.06		2.64	5.21		33.92	0.43								0.73									100	116
S15	14	16	Opx	56.14		3.70	5.35		31.47	2.55								0.78									100	121
S15	14	17	Opx	55.64		4.28	4.96		29.49	4.85								0.78									100	119
S15	14	18	Feohy +	7.90		7.11	71.81	1.10	1.46	0.77		0.42													9.42		100	81
S15	14	19	Chl	25.97		21.26	22.88		14.89																		85	101
S15	14	20	Fl							47.90	0.36				50.59						1.14						100	115
S15	14	21	Chr			18.55	21.22		9.51									50.71									100	112
S15	15	1	Qz +	96.14		2.12	0.43				1.30																100	115
S15	15	2	Feohy +	4.89		1.26	77.29	1.41	2.51	0.64	0.58														11.41		100	74
S15	15	3	Grt	38.09		8.54	18.19			35.18																	100	102
S15	15	4	Chl	29.77		18.02	11.87		25.35																		85	76
S15	15	5	Ep	40.74		21.45	10.27		2.03	22.16							0.35										97	99
S15	15	6	"Ilm" +	5.73	79.24	1.53	9.07		4.43																		100	98
S15	15	7	"Ilm" +	29.25	27.64	7.69	11.96		21.72	0.47	1.28																100	99
S15	15	8	Spl			37.17	13.19		17.34									32.30									100	105
S15	15	9	Opx	56.20		3.19	5.23		31.93	2.79								0.66									100	117
S15	15	10	Opx	56.39		3.27	5.56		33.77	0.37								0.64									100	116
S15	15	11	Olig	62.97		21.69	0.56		0.38	5.44	8.97																100	113
S15	15	12	Grt	38.21	1.95	20.31	33.55	0.74	3.78	1.47																	100	113
S15	15	13	Mix	51.62		39.41	0.79				7.39	0.79															100	109
S15	15	14	Qz + TiO2	69.08	30.64		0.28																				100	117
S15	15	15	Qz	99.33	0.44		0.23																				100	120
S15	15	16	Chl	26.35		21.43	21.44		15.41		0.37																85	97
S15	15	17	Mix	10.14		12.96	64.17	0.82	0.76	0.90	0.68	0.38	2.06												7.15		100	79
S15	15	18	Chr			20.82	18.72		12.59								0.35	47.53									100	112
S15	15	19	Ep	39.39		20.78	16.58	1.11		19.16																	97	116
S15	15	20	Chl?	31.19	0.33	10.23	36.50	0.60	0.93	0.41		0.81	0.56												3.44		85	95
S15	15	21	Grt	39.35		21.13	31.59	2.33	4.05	1.55																	100	116
S15	15	22	Ms +	47.94	0.34	29.89	6.47		3.02		0.48	6.85															95	106
S15	15	23	Spl			48.14	13.99		18.39									19.48									100	115
S15	15	24	Py	0.14			28.36	0.37						71.13													100	236
S15	15	25	Ca-Rds	1.92		1.10	0.48	24.04	2.68	20.80					4.98												56	69
S15	15	26	Opx	55.67		4.37	5.54		32.91	0.79								0.72									100	120
S15	15	27	Spl			48.31	13.73		17.96									20.00									100	112
S15	16	1	Opx	56.32		3.63	5.51		33.44	0.46								0.63									100	114
S15	16	2	Ep	39.88	0.39	22.67	11.44	0.59		22.04																	97	106
S15	16	3	Mix (clast)	14.27		9.49	54.09	0.40	1.74	1.37		0.40													18.24		100	77
S15	16	4	Feohy +	2.31		1.01	73.05	1.54	2.65	0.91			1.66												16.88		100	76
S15	16	5	Mn-Cal					20.17	3.43	27.72				0.53	4.14												56	61
S15	16	6	Chr			17.42	20.25		11.05									51.29									100	104

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	16	7	?Po	1.06		0.88	51.08		0.86	0.78	0.56		0.99	37.14											6.65		100	111
S15	16	8	Opx	55.73		3.80	5.29		32.41	1.89								0.88									100	111
S15	16	9	Amph	52.98	0.28	5.76	5.56		19.47	11.76	0.83							0.35									97	114
S15	16	10	"Ilm"		62.73	0.56	33.09	2.07	1.03	0.52																	100	95
S15	16	11	Cpx	53.45	0.72	3.30	5.55		16.89	19.26	0.38							0.45									100	111
S15	16	12	Ep	40.45		25.34	8.56	0.34		22.30																	97	107
S15	16	13	Qz	99.57			0.43																				100	115
S15	16	14	TiO2		99.70		0.30																				100	105
S15	16	15	Qz	99.31	0.34	0.35																					100	119
S15	16	16	TiO2		100.00																						100	106
S15	16	17	Ttn	33.02	36.56	1.31	1.94			27.16																	100	108
S15	16	18	Py				29.08							70.92													100	216
S15	16	19	TiO2		100.00																						100	109
S15	16	20	TiO2 +	1.80	94.91	0.53	0.56			0.43							1.78										100	107
S15	16	21	Mix	19.91	5.66	16.08	37.07	0.35	9.00	0.66	1.31			2.12				0.65							7.20		100	86
S15	16	22	Opx	55.91		3.80	5.29		31.44	2.72								0.85									100	112
S15	16	23	Chl?	31.98		17.30	2.88		32.01									0.83									85	98
S15	16	24	Chr +	11.75	0.34	11.37	21.78		18.11								0.46	36.19									100	116
S15	16	25	Mn-Sd	3.36		1.90	30.63	10.48	2.77	6.68		0.17															56	62
S15	16	26	?Py	7.50		2.69	36.42				0.38	0.40		49.37											1.86	1.38	100	151
S15	17	1	Qz	96.07		1.69	1.53		0.30			0.41															100	118
S15	17	2	Qz	100.00																							100	118
S15	17	3	Cpx	53.94		3.27	1.93		18.30	21.78								0.78									100	113
S15	17	4	Spl			52.10	13.68		18.52									15.70									100	105
S15	17	5	Rds					41.20	0.64	14.16																	56	57
S15	17	6	Grt	39.34	0.62	20.26	29.91	2.27	2.23	5.37																	100	110
S15	17	7	Opx	56.40		3.67	5.47		32.34	1.46								0.66									100	118
S15	17	8	Cpx	54.46		3.23	1.81		17.18	22.50								0.82									100	115
S15	17	9	Py				29.18							70.46							0.36						100	227
S15	17	10	Ca-Rds	2.52		1.25		35.42	0.79	12.08					3.94												56	68
S15	17	11	Qz	100.00																							100	122

Table B8.1: EDS analyses of sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	As2O3	SrO	ZrO2	HfO2	WO3	PtO2	Total	Actual Total
S15	17	12	Opx	56.59		3.51	5.62		33.22	0.41								0.66								100	117	
S15	17	13	Chr			11.16	17.59		12.40									58.85								100	108	
S15	17	14	Sd	3.19		1.23	32.79	3.73	0.49	1.44	0.75		0.73												11.64	56	72	
S15	17	15	Rds				4.80	43.05	0.59	7.55																56	60	
S15	17	16	Opx	56.10		3.93	5.57		33.19	0.46								0.76								100	116	
S15	17	17	Feohy +	5.21		5.21	71.02	5.89	1.07	5.76	0.51														5.33	100	75	
S15	17	18	Fl							59.76					40.24												100	93
S15	17	19	Spl			40.00	15.98		16.14									27.88								100	105	
S15	17	20	Opx	56.32		3.60	5.46		33.46	0.38								0.78								100	113	
S15	17	21	Opx	55.92		4.25	5.57		32.94	0.43								0.89								100	117	
S15	17	22	Spl			31.27	18.04		13.85									36.84								100	107	
S15	17	23	Feohy +	9.16		2.65	66.75	1.29		1.07	0.94		0.99												17.15	100	79	
S15	17	24	Qz	100.00																						100	114	
S15	17	25	Mix	24.48		11.04	51.24	1.17	1.21	1.12		1.21													8.54	100	82	
			Notes																									
			+ = indicates other minerals present																									
			" " = indicates partially altered mineral																									

Table B8.2 EDS analyses from sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	SO3	F	V2O5	Cr2O3	ZnO	WO3	Total	Actual Total
S15	18	1	Chr			11.55	20.62		9.48						0.40	57.95			100	108
S15	18	2	Opx	56.11		3.73	5.69		33.30	0.32						0.85			100	122
S15	18	3	Opx	55.51		3.95	4.34		29.00	6.26						0.94			100	122
S15	18	4	Sd				29.64	18.78	1.01	6.19	0.38								56	64
S15	18	5	Grt	39.36		20.62	31.50	0.32	1.31	6.89									100	116
S15	18	6	Py				29.43			0.19	0.40		68.99					1.00	100	204
S15	18	7	Grt	39.89		21.02	32.76	0.73	4.01	1.59									100	110
S15	18	8	Qz	100.00															100	120
S15	18	9	Rds	0.44		0.37	5.81	29.58	0.78	14.08			0.60	4.34					56	65
S15	18	10	Opx	57.34		2.47	5.62		33.67	0.48						0.43			100	116
S15	19	1	Qz	100.00															100	116
S15	19	2	Opx	56.81		3.44	4.82		34.07	0.34						0.52			100	112
S15	19	3	Grt	41.98		22.41	14.53	0.30	10.70	10.07									100	113
S15	19	4	Opx	57.55		1.92	5.31		34.03	0.54						0.65			100	117
S15	19	5	Opx	56.25		3.72	5.65		33.28	0.35						0.74			100	120
S15	19	6	Opx	57.80		1.60	5.20		34.45	0.47						0.48			100	113
S15	19	7	Opx	57.34		2.06	5.26		34.07	0.69						0.58			100	116
S15	19	8	Opx	56.80		3.42	5.40		33.51	0.31						0.56			100	115
S15	19	9	Opx	56.39		3.62	5.62		33.23	0.41						0.72			100	110
S15	19	10	Opx	57.27		2.66	4.89		34.19	0.38						0.61			100	110
S15	19	11	Opx	57.83		1.49	4.96		34.66	0.46						0.61			100	110
S15	19	12	Opx	56.67		3.13	5.73		33.74	0.31						0.42			100	112
S15	20	1	Opx	56.53		3.41	5.54		33.42	0.39						0.71			100	118
S15	20	2	Chr			7.22	21.54		9.08							62.17			100	106
S15	20	3	Opx	55.96		3.87	5.62		33.21	0.45						0.89			100	117
S15	20	4	Cpx	54.86		2.62	1.72		17.05	22.98						0.77			100	122
S15	20	5	Cpx	54.71		2.26	5.48		17.26	19.73						0.56			100	117



Table B8.2 EDS analyses from sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	SO3	F	V2O5	Cr2O3	ZnO	WO3	Total	Actual Total
S15	20	6	Ep	40.52		27.93	5.63			22.93									97	112
S15	20	7	Opx	57.55		2.10	5.03		34.29	0.46						0.57			100	116
S15	20	8	Opx	57.91		1.28	5.31		34.63	0.44						0.44			100	114
S15	20	9	Ttn	32.80	37.13	1.43	1.73			26.91									100	110
S15	20	10	Fl						6.96	53.84			0.80	38.40					100	102
S15	20	11	Fl	2.46		0.57	0.34		6.87	42.91	0.46	0.12	0.57	45.70					100	108
S15	20	12	Chr			23.19	19.66		11.79							44.92	0.45		100	108
S15	21	1	Opx	56.04		3.97	5.17		32.57	1.44						0.81			100	114
S15	21	2	Opx	55.98		4.25	5.47		33.04	0.38						0.88			100	114
S15	21	3	Tur	31.17	2.40	26.44	19.26		4.09	1.93	1.71								87	41
S15	21	4	Cpx	53.32	0.55	3.43	4.51		16.62	20.28	0.36					0.93			100	112
S15	21	5	Chr		0.36	18.24	26.15		9.68							45.57			100	107
S15	21	6	Fl	3.78		1.14	0.30		0.31	49.86	0.53	0.30		43.77					100	111
S15	21	7	Opx	55.85		4.51	5.34		31.96	1.60						0.74			100	120
S15	21	8	Chr			20.89	18.57		12.52							48.02			100	111
S15	21	9	Rds+	15.94		5.98	1.28	42.07	1.99	24.48		0.41		7.85					100	73
S15	21	10	Ep	39.83		20.45	14.64			22.09									97	110
S15	22	1	Opx	55.97		3.90	5.38		33.32	0.55						0.87			100	116
S15	22	2	Feohy	16.63		8.39	61.27	1.38	2.54	1.58	0.54	0.59						7.07	100	80
S15	22	3	Opx	56.50		3.42	5.36		33.04	0.98						0.70			100	113
S15	22	4	Ttn	33.60	32.99	2.75	3.30		1.85	24.71			0.82						100	107
S15	22	5	Opx	56.46		3.19	4.94		34.13	0.42						0.86			100	123
S15	22	6	Opx	56.48		3.06	5.60		32.56	1.57						0.74			100	119
S15	22	7	Opx	56.49		3.33	5.57	0.20	33.54	0.37						0.50			100	115
S15	22	8	Opx	56.56		3.35	5.37		32.88	1.15						0.68			100	113
S15	22	9	Opx	57.77		1.41	5.24		34.50	0.55						0.53			100	114
S15	22	10	Opx	56.95		2.85	5.34		33.80	0.55						0.52			100	113

Table B8.2 EDS analyses from sample S15.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	SO3	F	V2O5	Cr2O3	ZnO	WO3	Total	Actual Total
S15	23	1	Fl							62.07	0.77			37.15					100	89
S15	23	2	Py	0.12			29.05						70.82						100	212
S15	23	3	Ep	39.86		22.65	11.69			22.80									97	107
S15	23	4	Ank					15.50	3.05	31.56			0.68	5.21					56	62
S15	23	5	Opx	57.59		1.85	5.21		34.31	0.39						0.64			100	118
S15	23	6	Opx	57.02		3.18	5.40		33.33	0.49						0.58			100	115
S15	23	7	Opx	56.36		3.54	5.73		33.32	0.40						0.66			100	114
S15	23	8	Qz	100.00															100	116
S15	23	9	Cpx	56.43			2.47		18.12	22.97									100	116
	Notes																			
	+ = indicates that other minerals are present																			

B9: SEM-BSE images and EDS  
mineral analyses for sample S17.

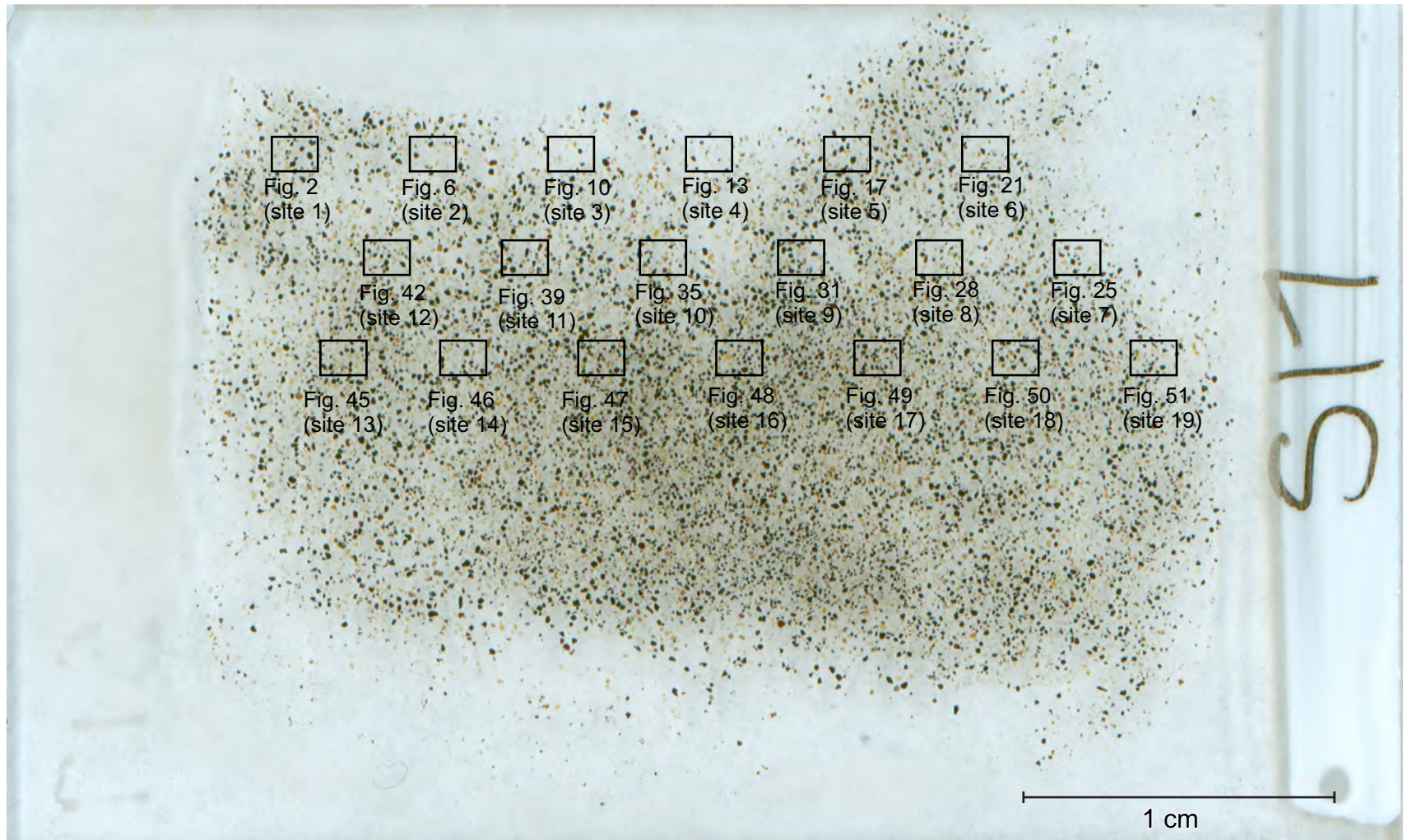


Figure B9.1: Scanned thin section of sample S17 showing the location of analysed sites. This sample comes from a large gravel pit, with cross-bedding mud - **coarse grain?** sandstone bed. Impression is that most sediment is 2-3cm sorted gravel, subrounded, predominantly limestone. With shallow channel like structures. Suggesting paleoflow was to the SW.

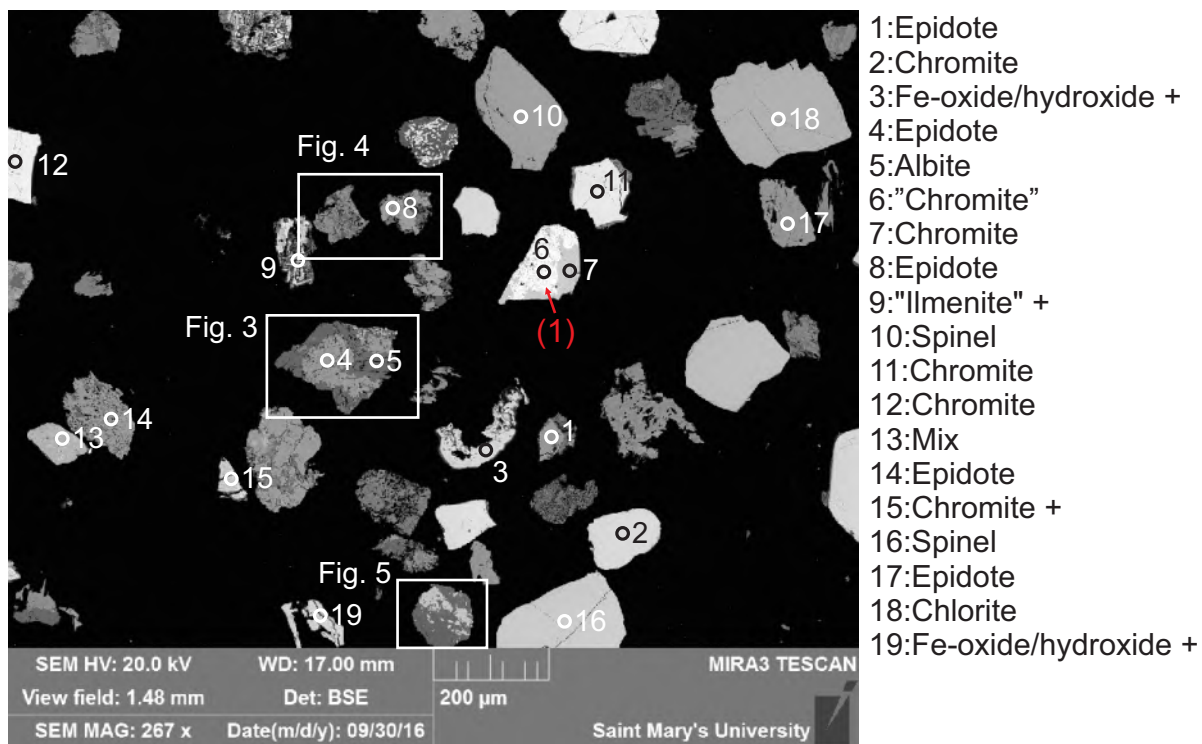


Figure B9.2: Sample S17 site 1 (SEM). 1: Lithic clast (Fe-oxide/hydroxide + chromite, ophiolite).

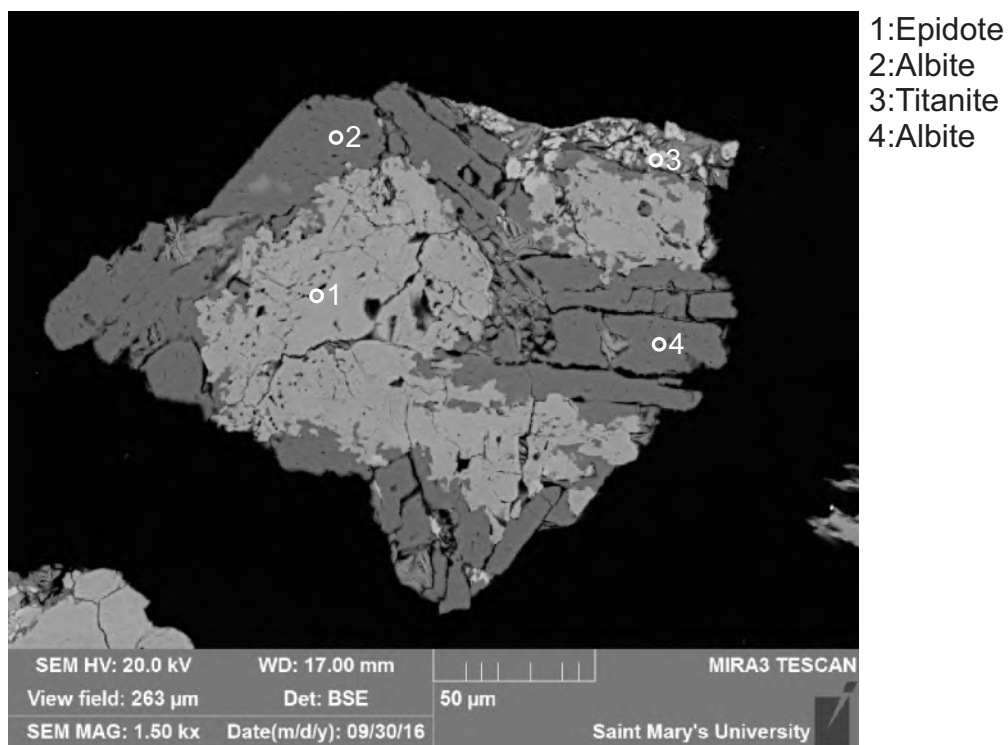
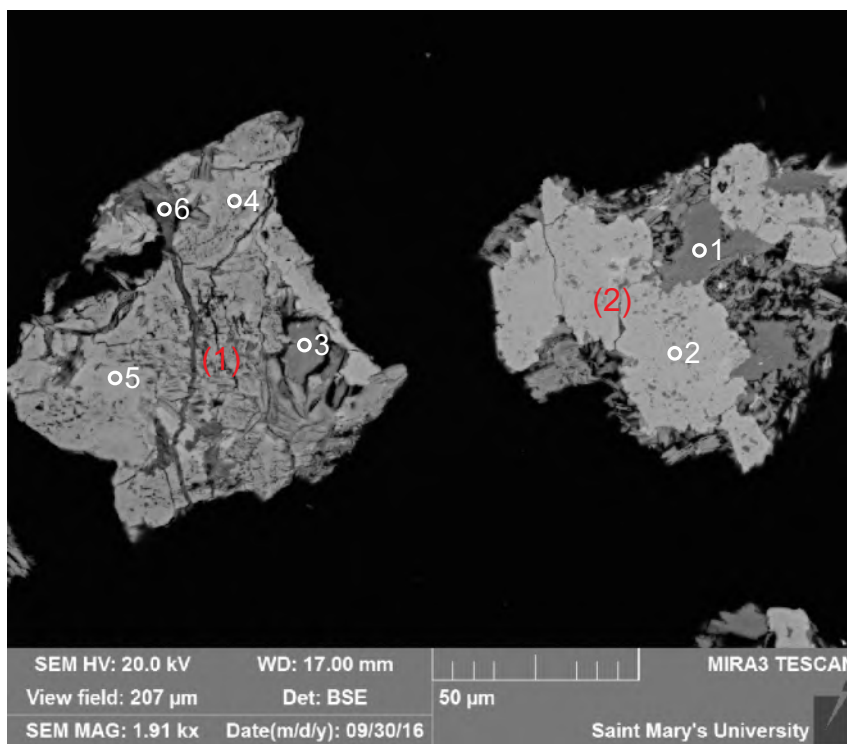


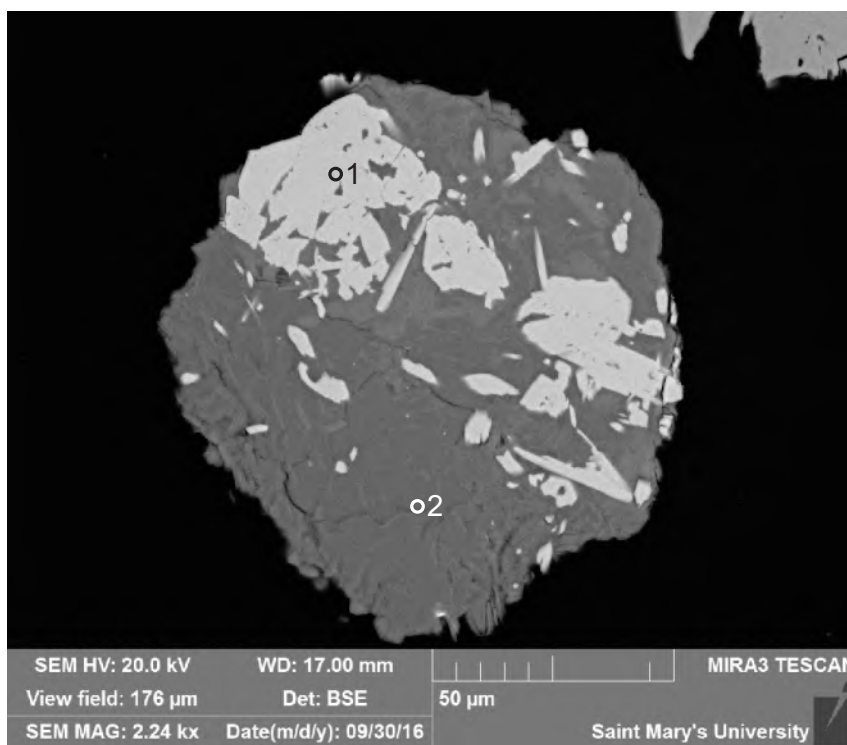
Figure B9.3: Sample S17 site 1.2 (SEM). Lithic clast (epidote + albite + titanite, hydrothermal vein).





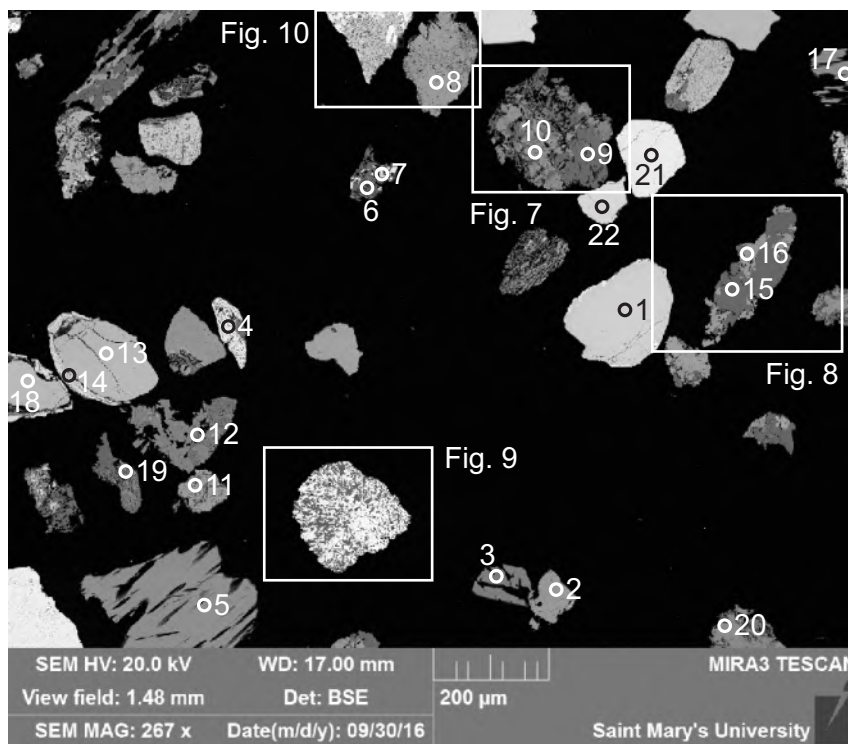
- 1: Quartz
- 2: Epidote
- 3: ?Clay
- 4: Epidote
- 5: Epidote
- 6: ?Clay

Figure B9.4: Sample S17 site 1.3 (SEM). 1: Altered epidote.  
2: Hydrothermal (quartz + epidote).



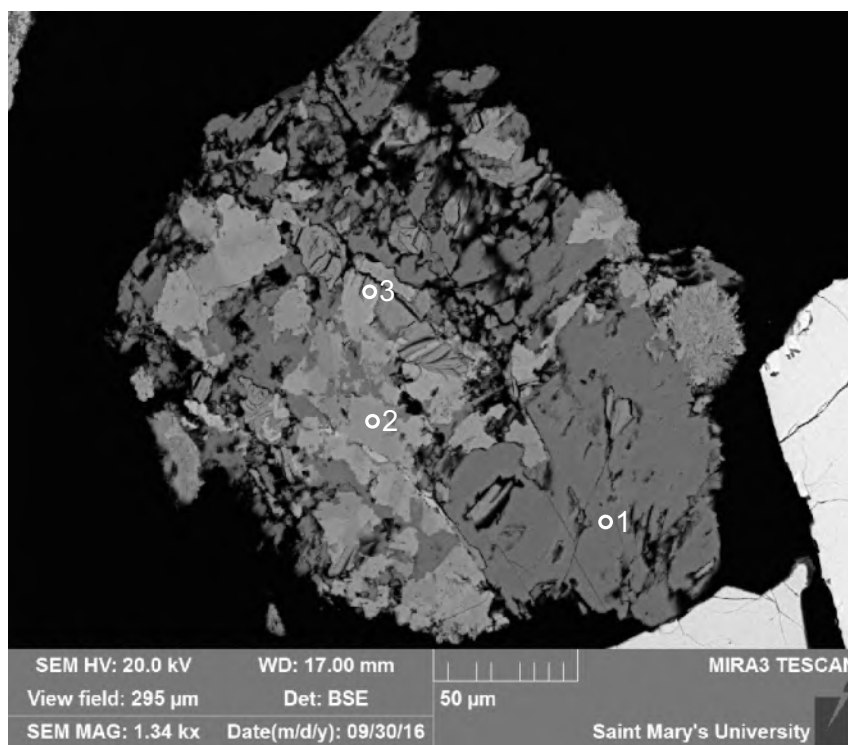
- 1:  $\text{TiO}_2$
- 2: Quartz

Figure B9.5: Sample S17 site 1.4 (SEM). Lithic clast (titania + quartz, metamorphic).



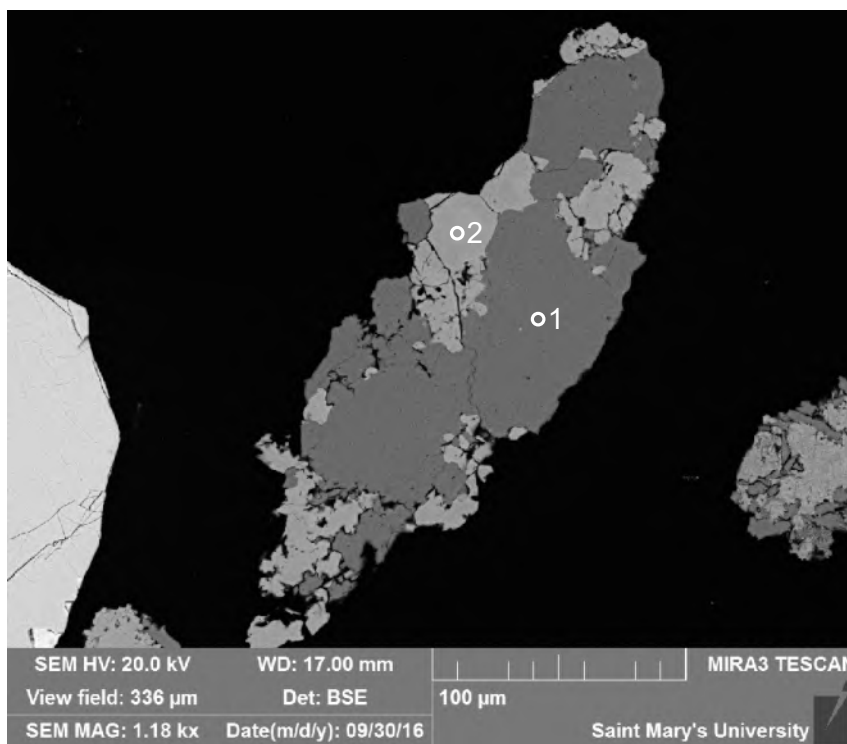
- 1:Chromite
- 2:Epidote
- 3:Hornblende
- 4:"Ilmenite"
- 5:Clinopyroxene
- 6:Albite + Chlorite
- 7:Ilmenite +
- 8:Epidote
- 9:Albite
- 10:Epidote
- 11:Epidote
- 12:Chlorite +
- 13:Garnet
- 14:Fe-oxide/hydroxide +
- 15:Quartz
- 16:Epidote
- 17:Clinopyroxene
- 18:Garnet
- 19:Andensine
- 20:Epidote
- 21:Chromite
- 22:Chromite

Figure B9.6: Sample S17 site 2 (SEM).



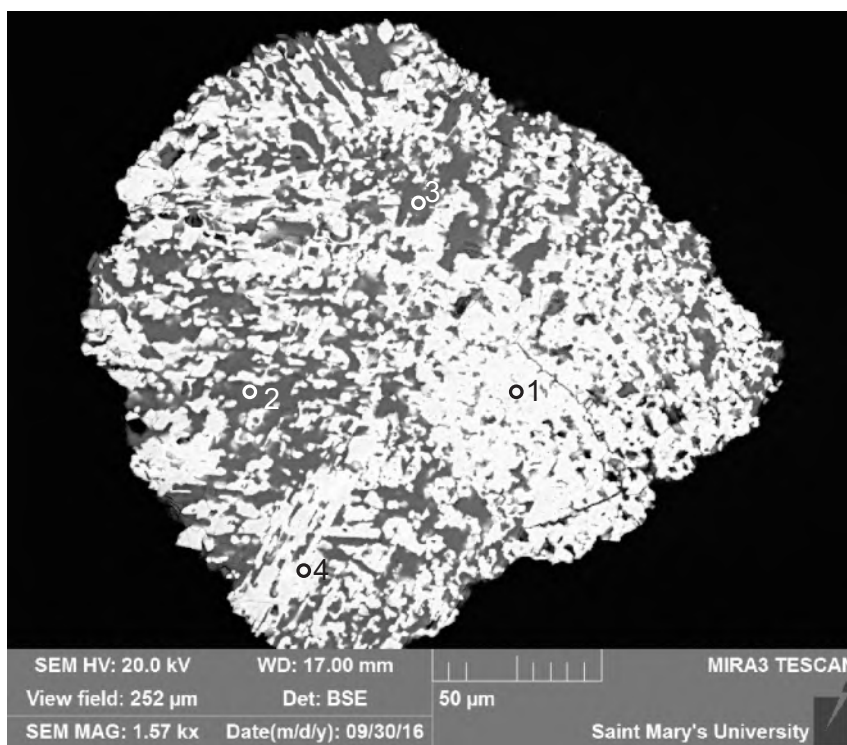
- 1:Albite
- 2:Epidote
- 3:Epidote

Figure B9.7: Sample S17 site 2.2 (SEM). Lithic clast (albite + epidote, hydrothermal vein).



1:Quartz  
2:Epidote

Figure B9.8: Sample S17 site 2.3 (SEM). Hydrothermal quartz + epidote.



1:Chromite  
2:Cr-Chlorite  
3:Cr-Chlorite  
4:Chromite

Figure B9.9: Sample S17 site 2.4 (SEM). Lithic clast (Cr-chlorite + chromite, metaophiolite).

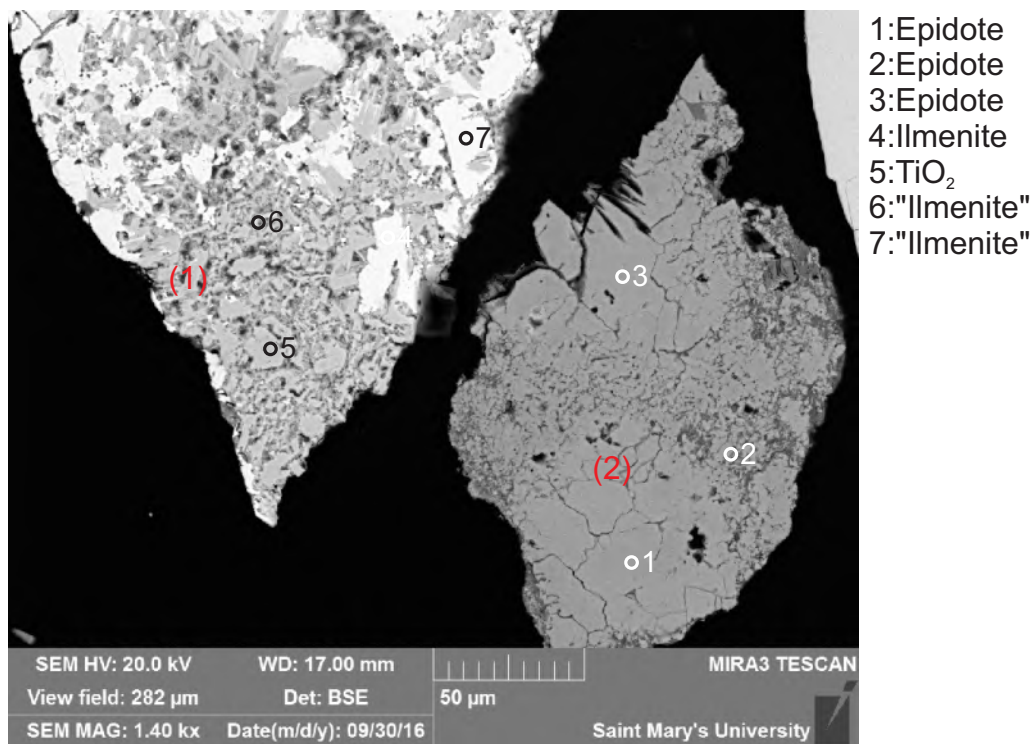


Figure B9.10: Sample S17 site 2.5 (SEM). 1: Altered ilmenite grain. 2: Epidote grain.

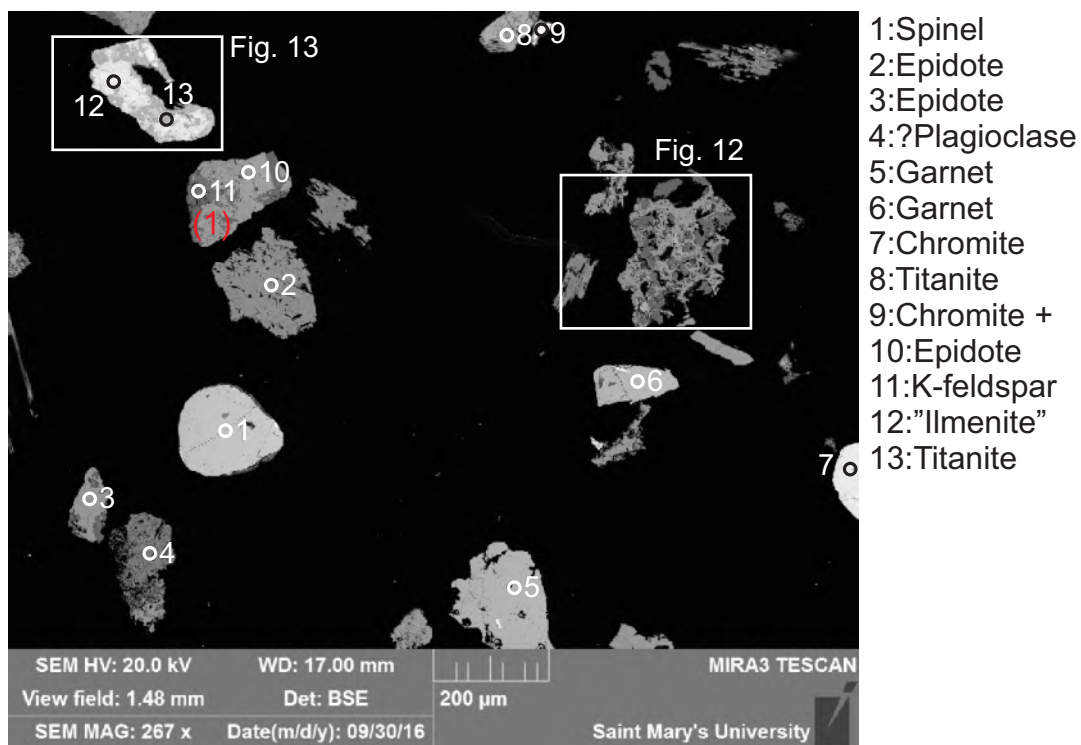
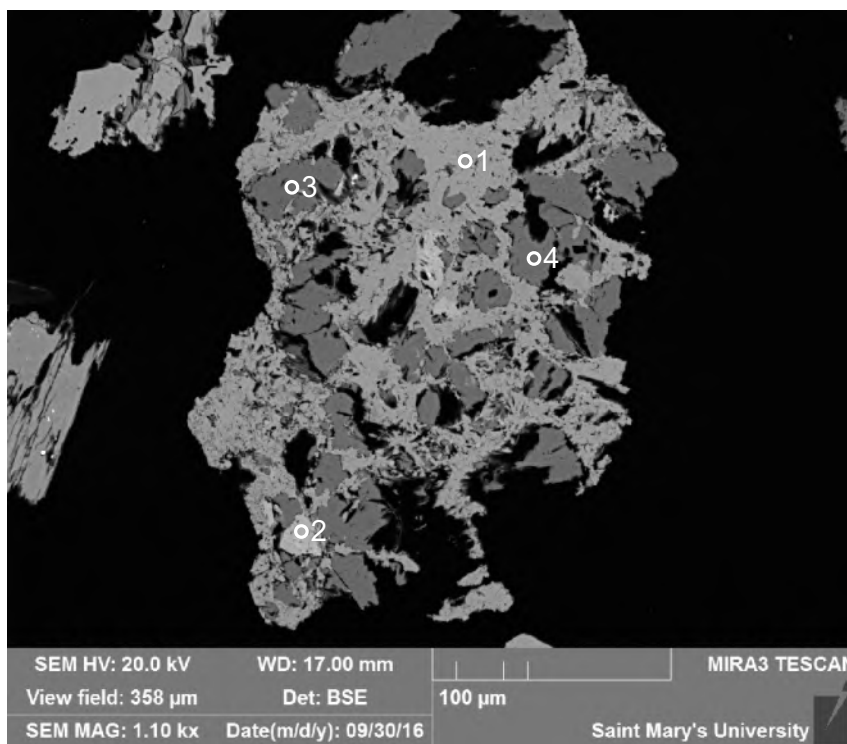


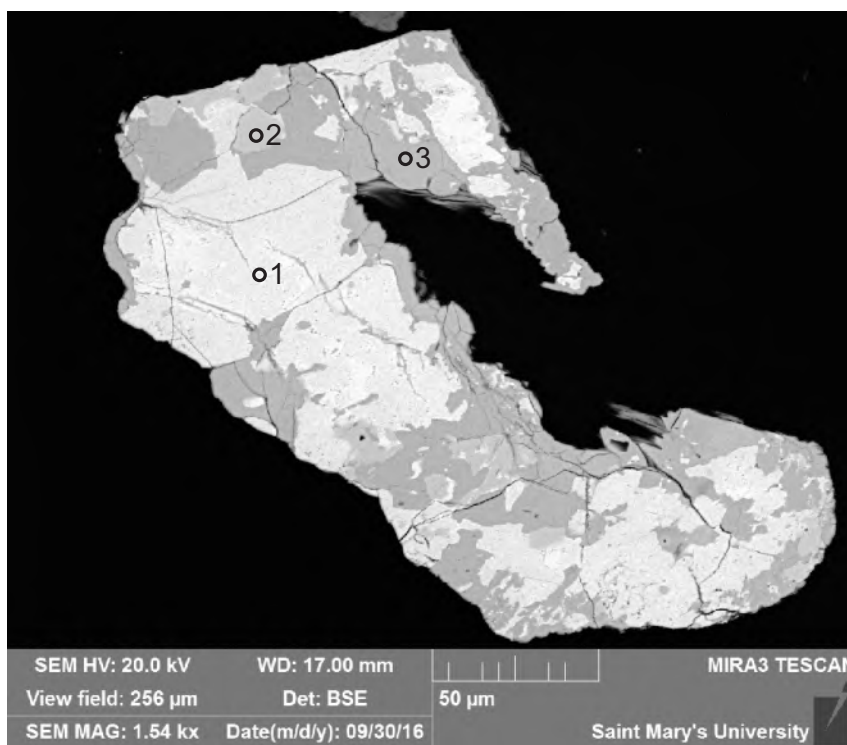
Figure B9.11: Sample S17 site 3 (SEM). 1: Lithic clast (K-feldspar + epidote, hydrothermal vein).





- 1:Epidote
- 2: Titanite
- 3: Albite
- 4: Albite

Figure B9.12: Sample S17 site 3.2 (SEM). Lithic clast (albite + titanite + epidote, hydrothermal).



- 1: Ilmenite
- 2:  $\text{TiO}_2$
- 3: Titanite

Figure B9.13: Sample S17 site 3.3 (SEM). Lithic clast (ilmenite + titanite + titania, metamorphic).



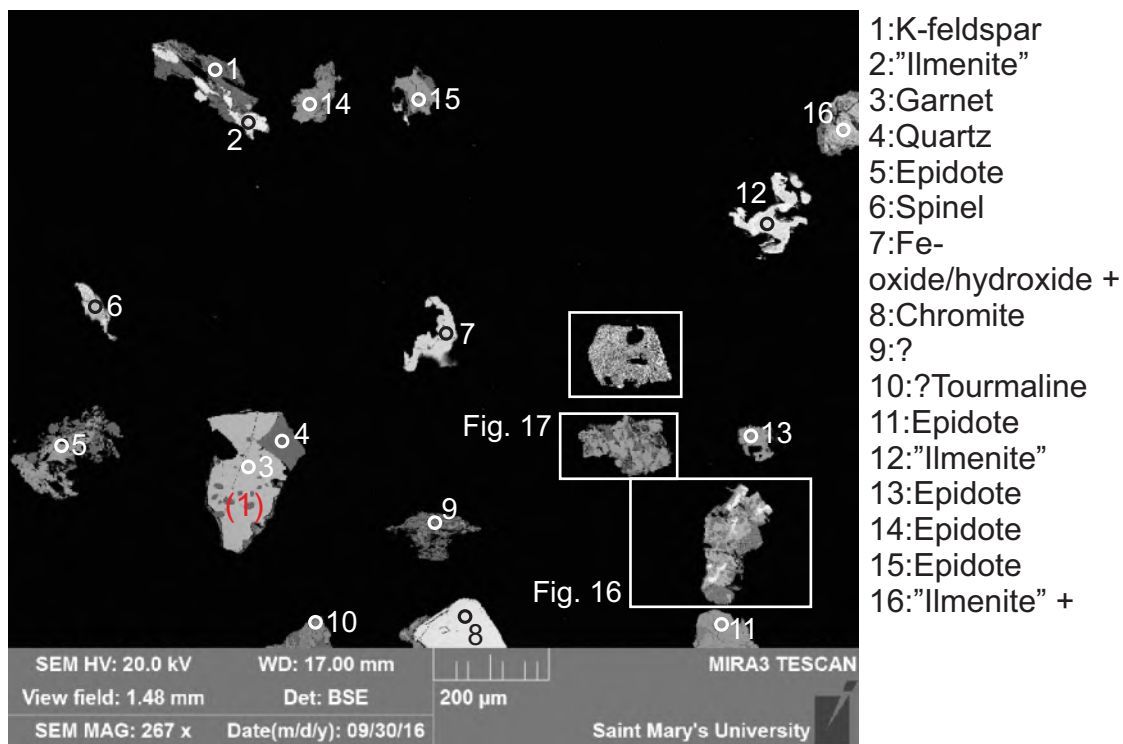


Figure B9.14: Sample S17 site 4 (SEM). 1: Lithic clast (garnet + quartz, metamorphic).

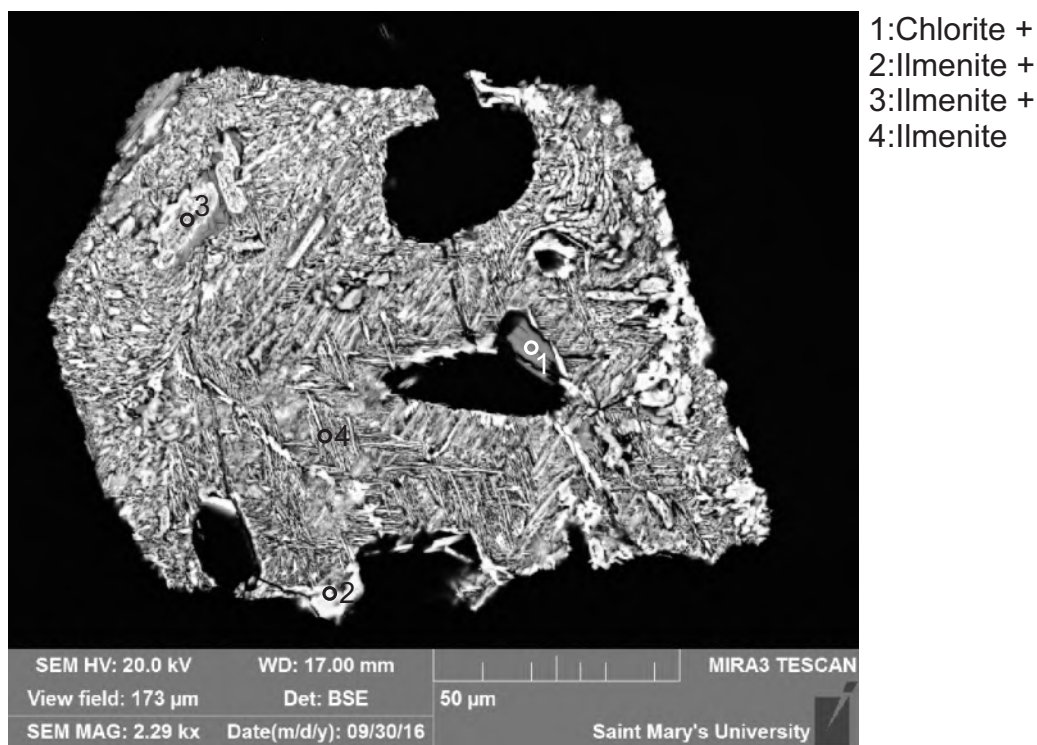
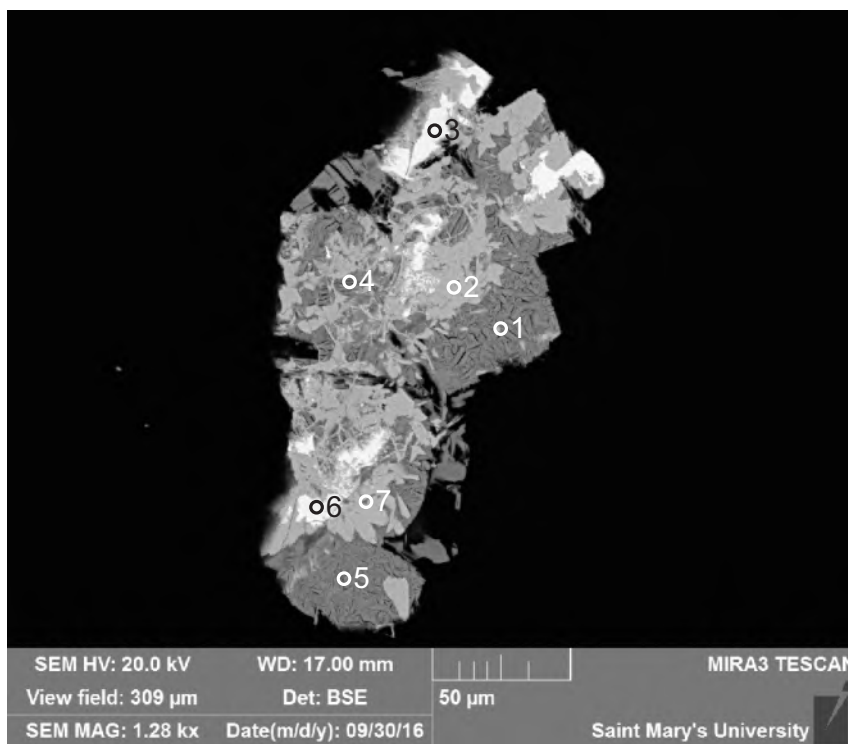
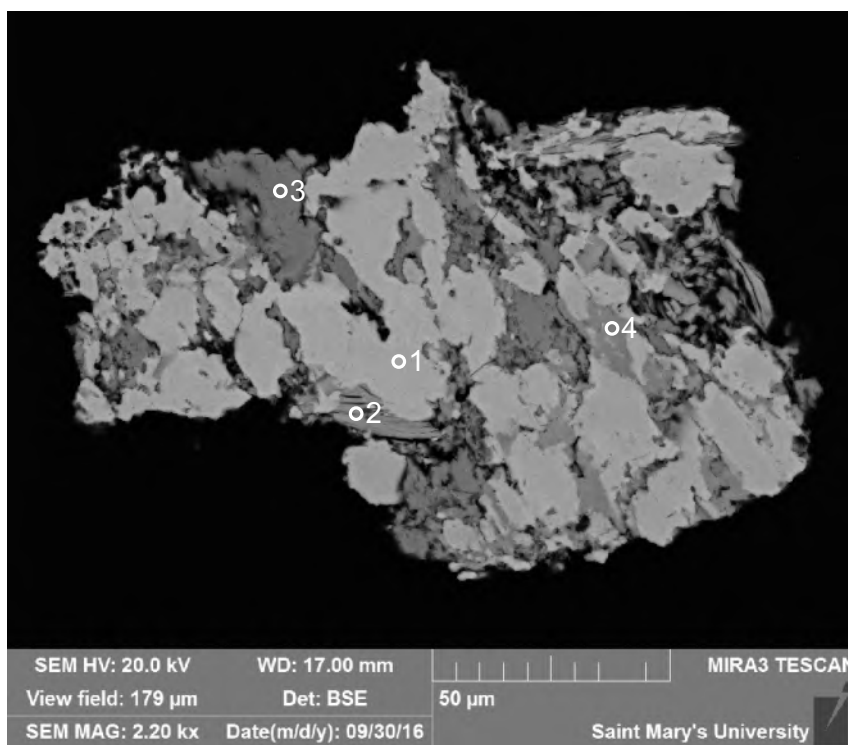


Figure B9.15: Sample S17 site 4.2 (SEM). Altered ilmenite grain.



- 1:Chl +
- 2:Titanite
- 3:Ilmenite
- 4:Chlorite +
- 5:Chlorite +
- 6:Ilmenite
- 7:Titanite

Figure B9.16: Sample S17 site 4.3 (SEM). Lithic clast (ilmenite + titanite + chlorite, metamorphic).



- 1:Epidote
- 2: ?Chlorite +
- 3:Albite
- 4:Muscovite

Figure B9.17: Sample S17 site 4.4 (SEM). Lithic clast (albite + epidote + muscovite, metamorphic).

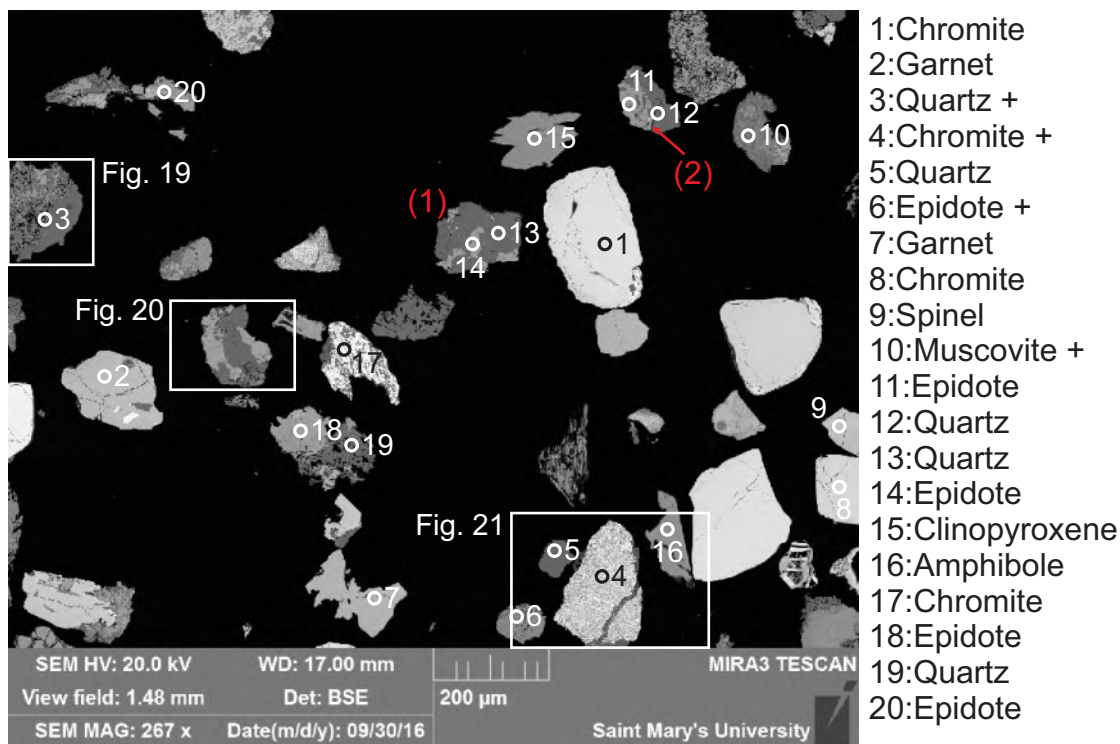


Figure B9.18: Sample S17 site 5 (SEM). 1: Hydrothermal epidote + quartz. 2: Hydrothermal epidote + quartz.

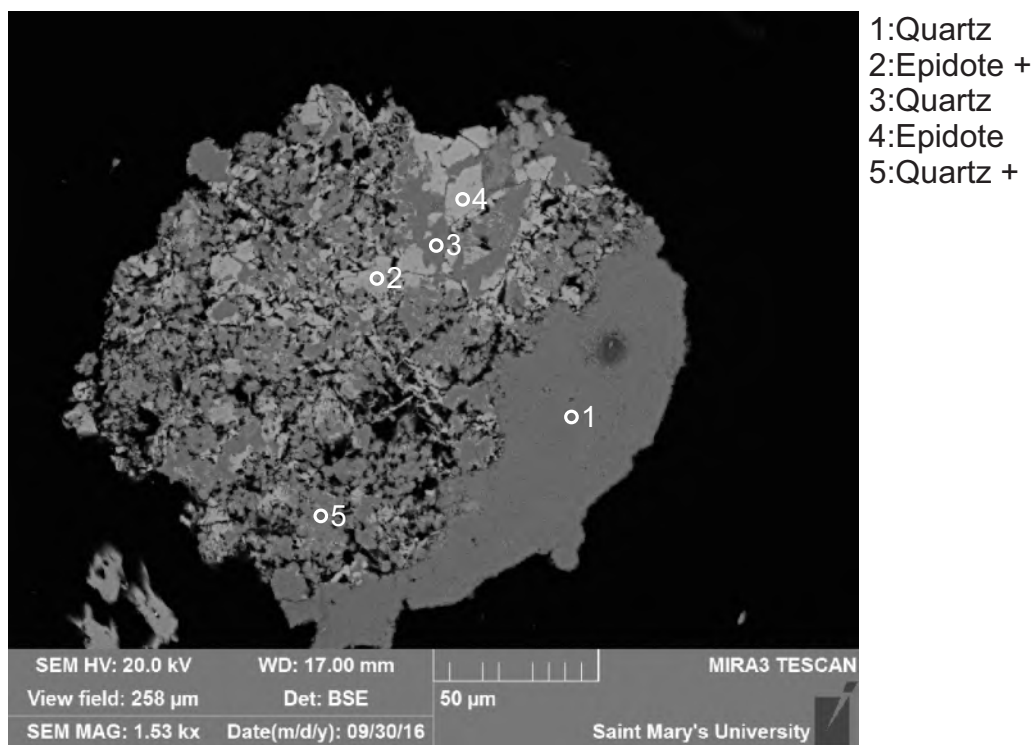
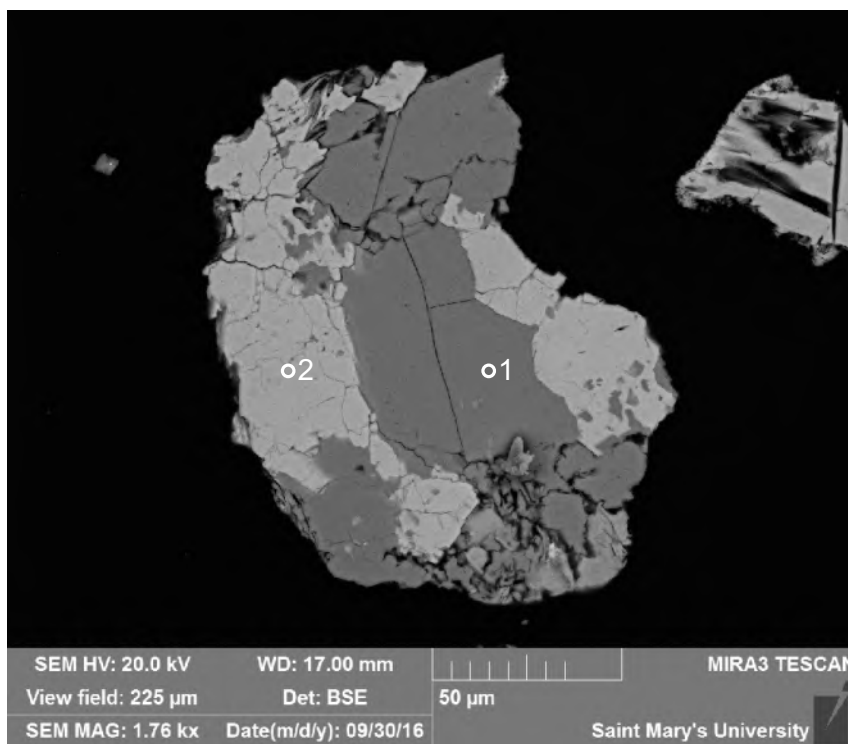
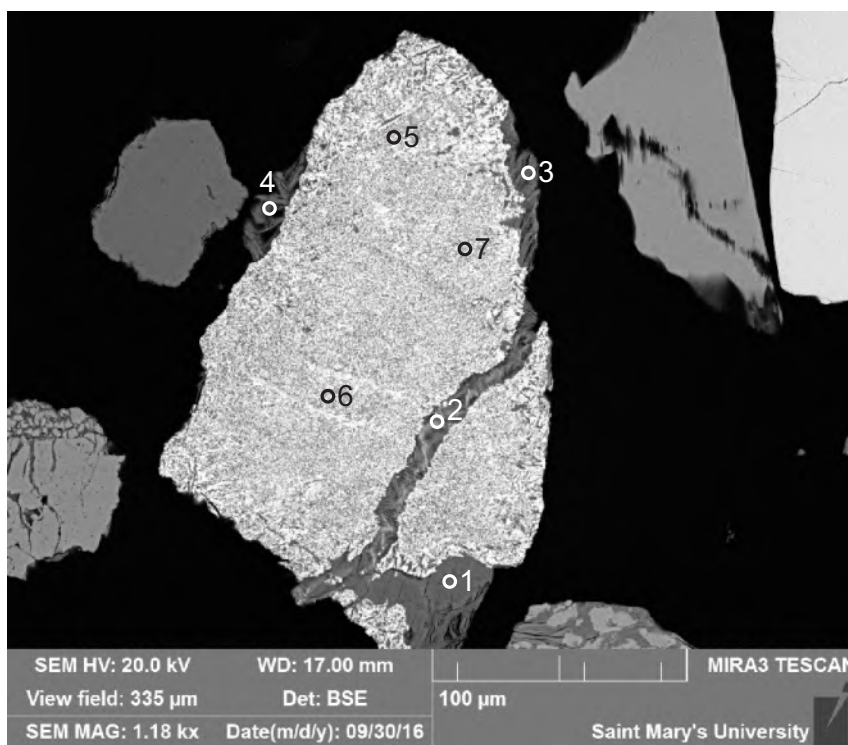


Figure B9.19: Sample S17 site 5.2 (SEM). Partially dissolved quartz + epidote clast, hydrothermal.



- 1:Quartz
- 2:Epidote

Figure B9.20: Sample S17 site 5.3 (SEM). Lithic clast of hydrothermal quartz + epidote.



- 1:Cr-Chlorite
- 2:Cr-Chlorite
- 3:Cr-Chlorite
- 4:Cr-Chlorite
- 5:Chromite +
- 6:Chromite +
- 7:Chromite +

Figure B9.21: Sample S17 site 5.4 (SEM). Lithic clast of Cr-chlorite, metaophiolite. Chromite probably has disseminated Cr-chlorite.



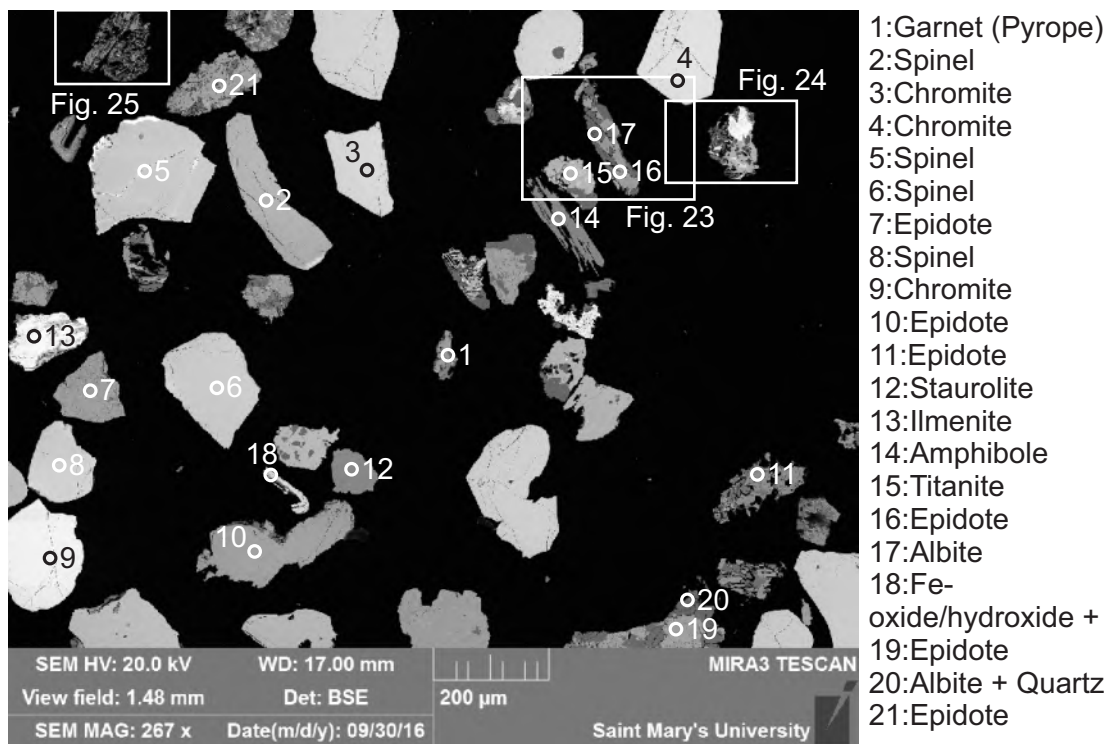


Figure B9.22: Sample S17 site 6 (SEM).

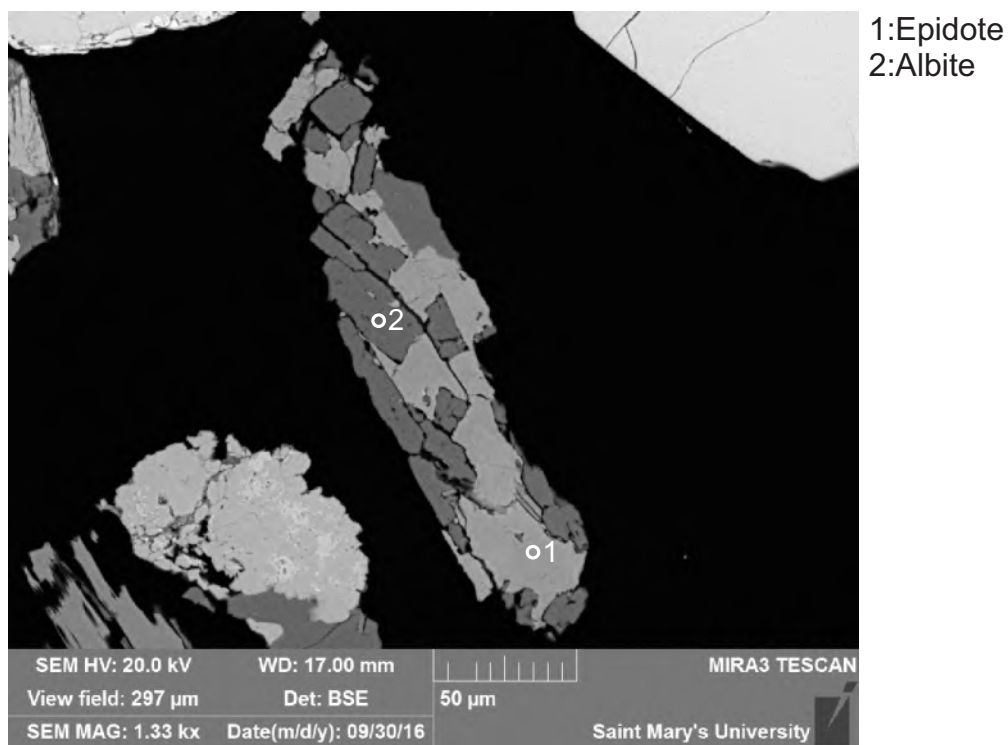
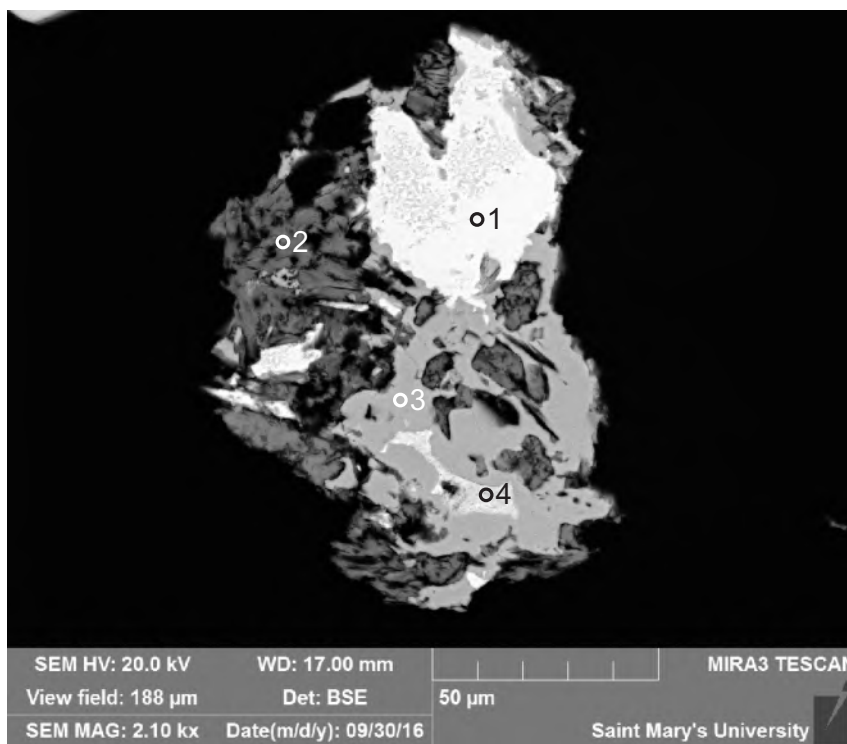


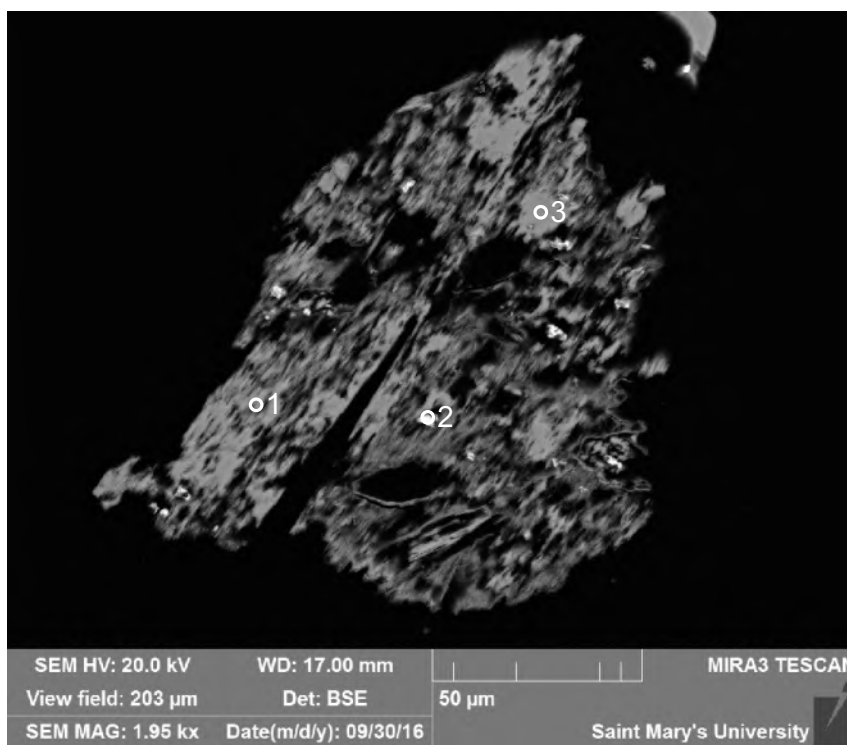
Figure B9.23: Sample S17 site 6.2 (SEM). Lithic clast of hydrothermal epidote + quartz.





- 1:Ilmenite
- 2:Clay
- 3:Titanite
- 4:"Ilmenite"

Figure B9.24: Sample S17 site 6.3 (SEM). Lithic clast (ilmenite + titanite + unknown mineral (2) or mixture of chlorite + kaolinite).



- 1:Amphibole
- 2:Spinel +
- 3:Amphibole

Figure B9.25: Sample S17 site 6.4 (SEM). Lithic clast (amphibole + spinel, metamorphic).

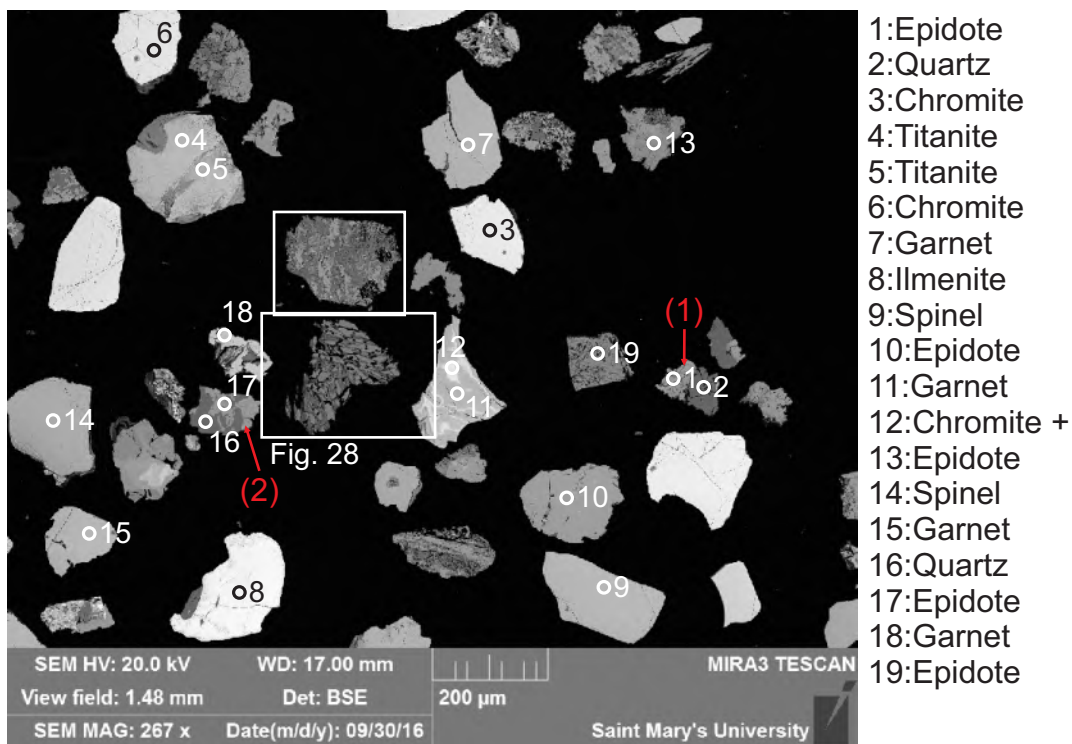


Figure B9.26: Sample S17 site 7 (SEM). Lithic clasts (1,2) of hydrothermal epidote + quartz.

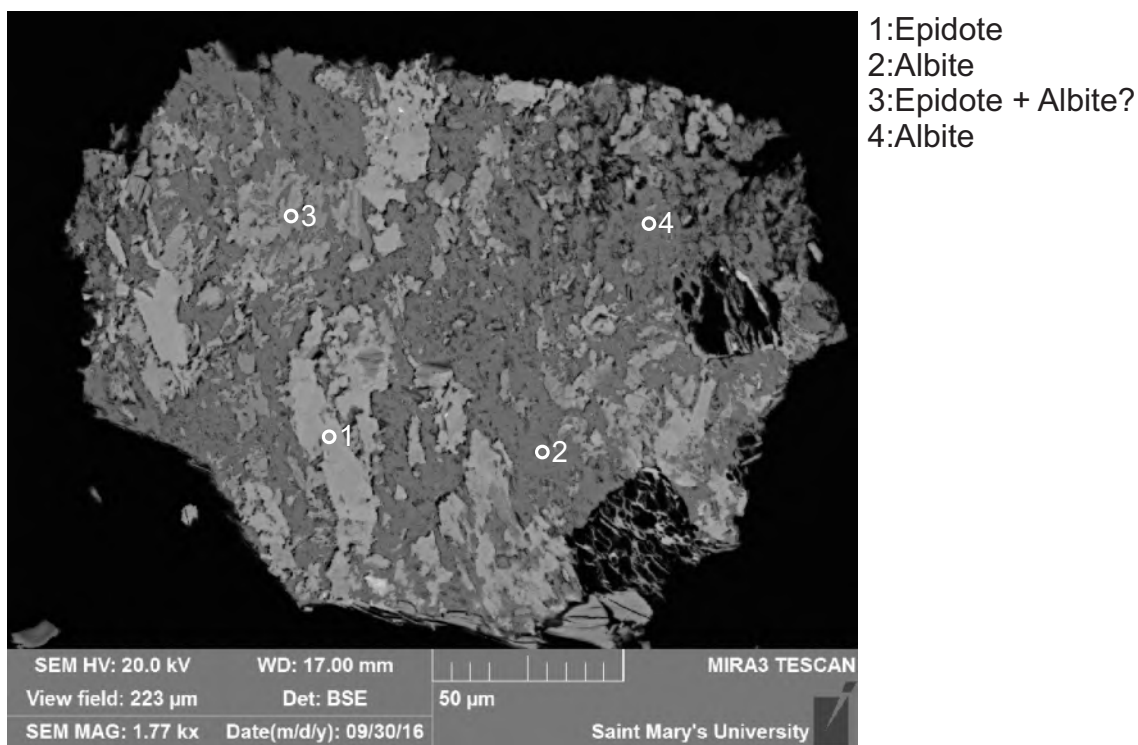
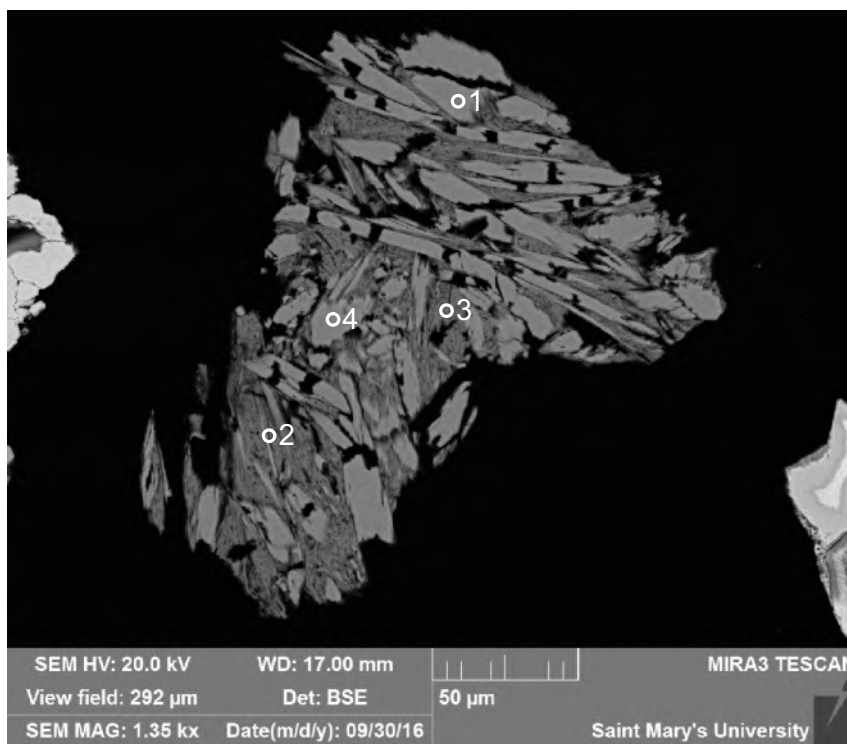
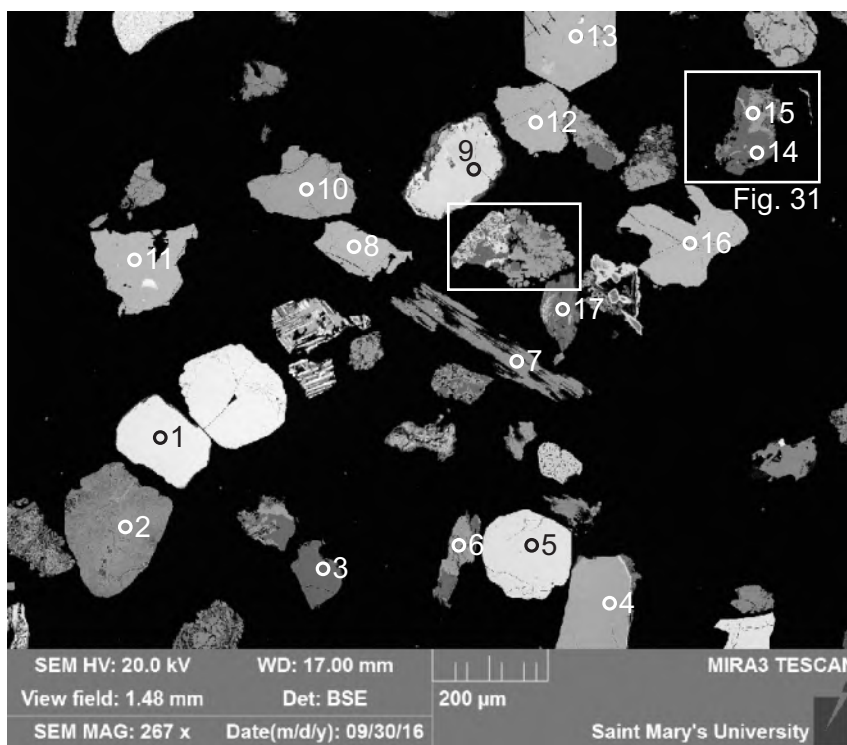


Figure B9.27: Sample S17 site 7.2 (SEM). Lithic clast (epidote + albite, hydrothermal).



- 1:Talc
- 2:Talc
- 3:Talc
- 4:Amphibole

Figure B9.28: Sample S17 site 7.3 (SEM). Lithic clast of foliated talc + amphibole, metaophiolite.



- 1:Chromite
- 2:Epidote
- 3:Quartz
- 4:Spinel
- 5:Chromite
- 6:Epidote +
- 7:Amphibole
- 8:Garnet
- 9:Chromite
- 10:Garnet +
- 11:Garnet
- 12: ?Epidote
- 13:Garnet
- 14:Quartz
- 15:Epidote
- 16:Garnet
- 17:Quartz

Figure B9.29: Sample S17 site 8 (SEM).

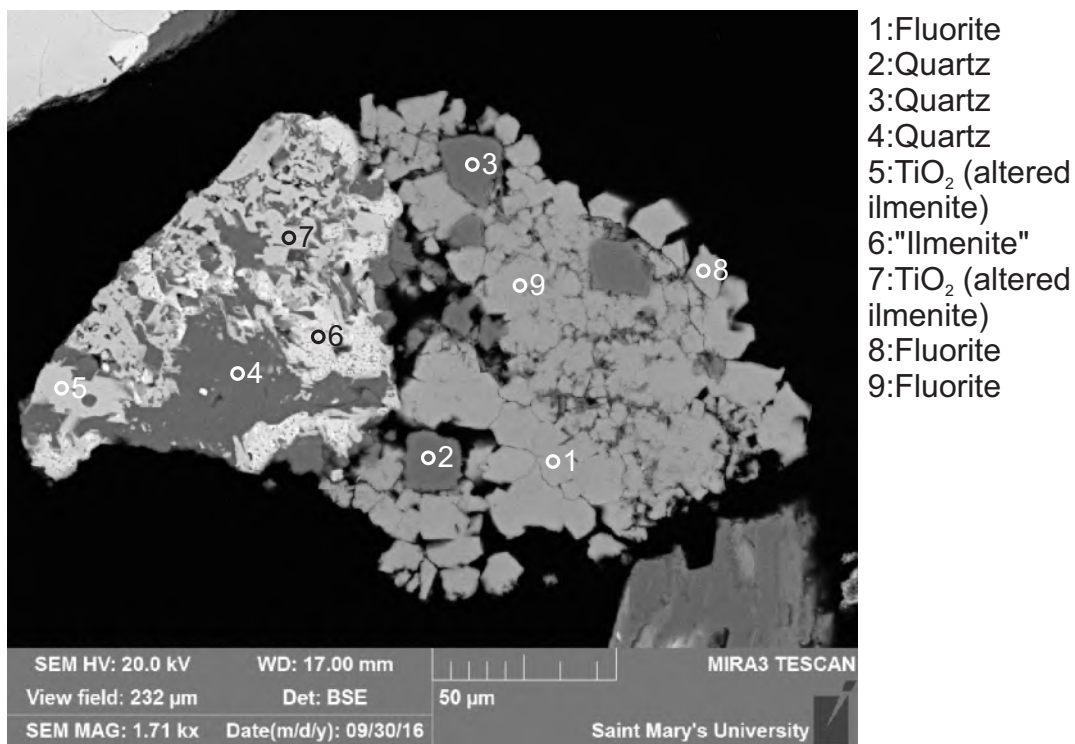


Figure B9.30: Sample S17 site 8.2 (SEM). Lithic clast (fluorite + quartz + titania + ilmenite, hydrothermal).

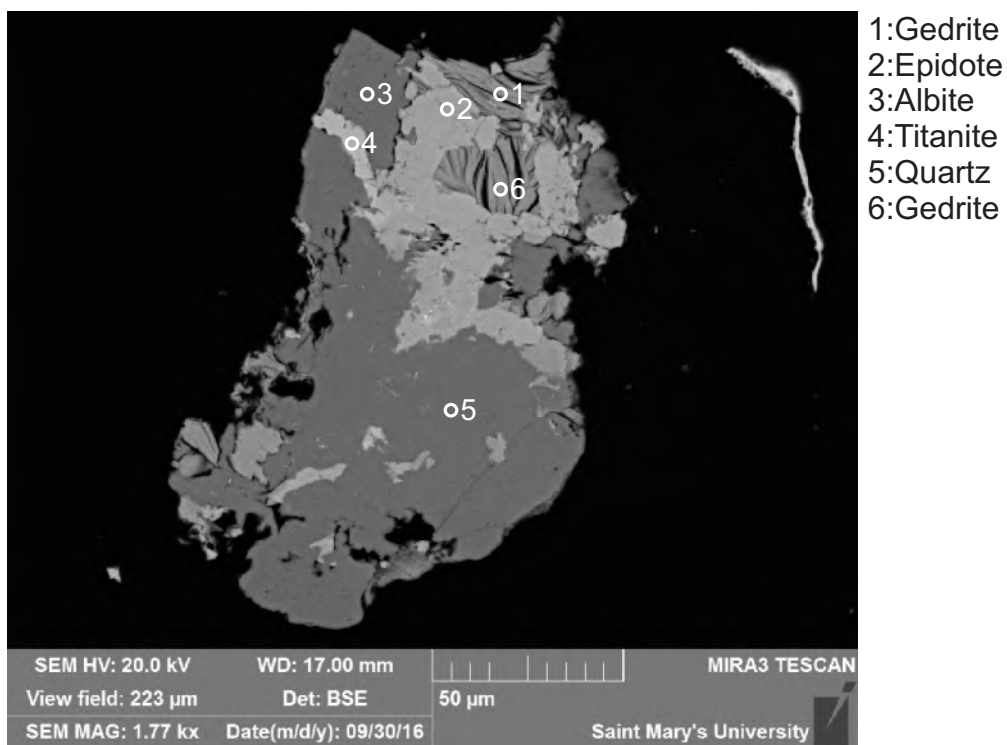


Figure B9.31: Sample S17 site 8.3 (SEM). Lithic clast (quartz + epidote + albite + titanite + gedrite, metamorphic).



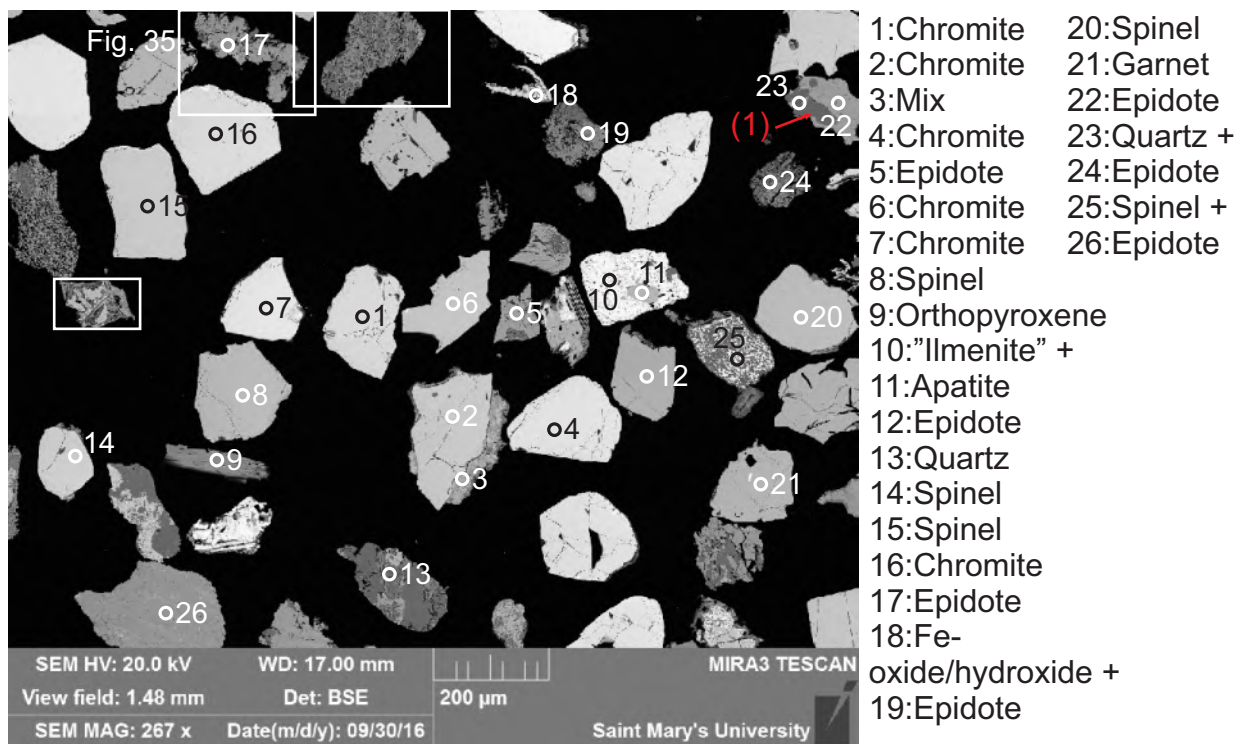


Figure B9.32: Sample S17 site 9 (SEM). 1: Hydrothermal quartz + epidote.

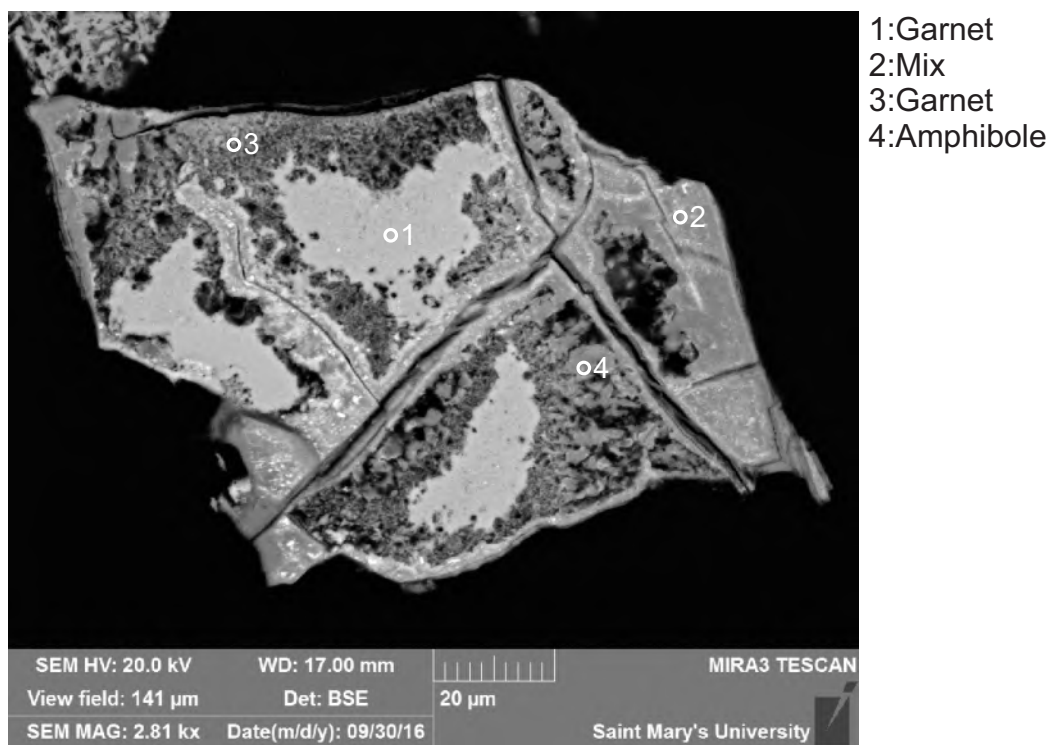
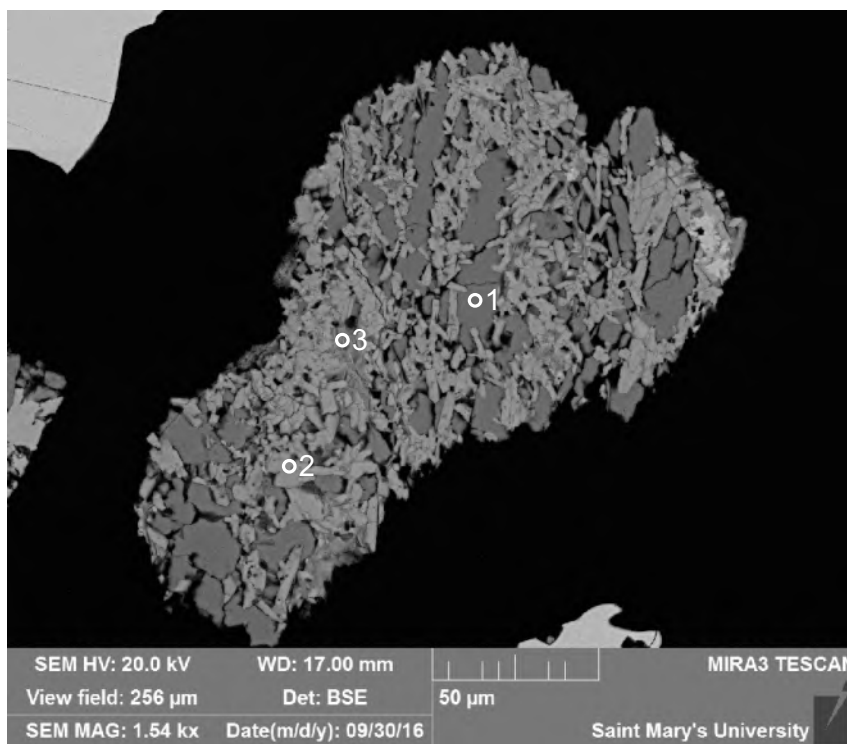


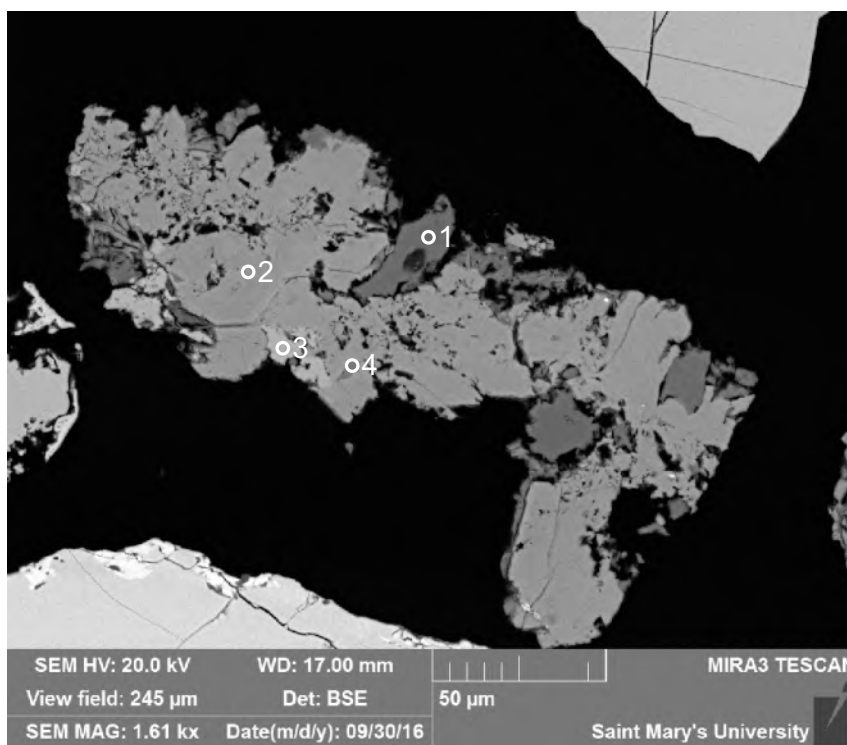
Figure B9.33: Sample S17 site 9.2 (SEM). Garnet crystal partially replaced by amphibole (actinolite).





- 1:Albite
- 2:Epidote +
- 3:Gedrite +

Figure B9.34: Sample S17 site 9.3 (SEM). Lithic clast (albite + gedrite + epidote, metamorphic).



- 1:Albite
- 2:Epidote
- 3:Titanite
- 4:K-feldspar +

Figure B9.35: Sample S17 site 9.4 (SEM). Lithic clast (albite + epidote + K-feldspar + titanite, metamorphic or hydrothermal).

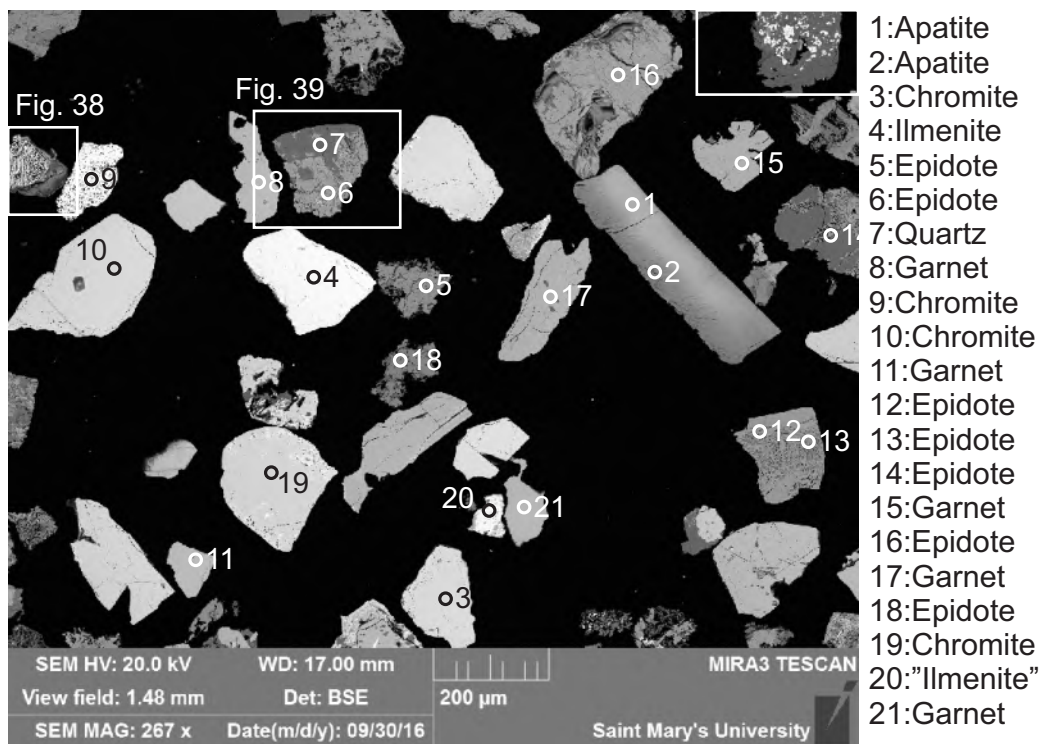


Figure B9.36: Sample S17 site 10 (SEM).

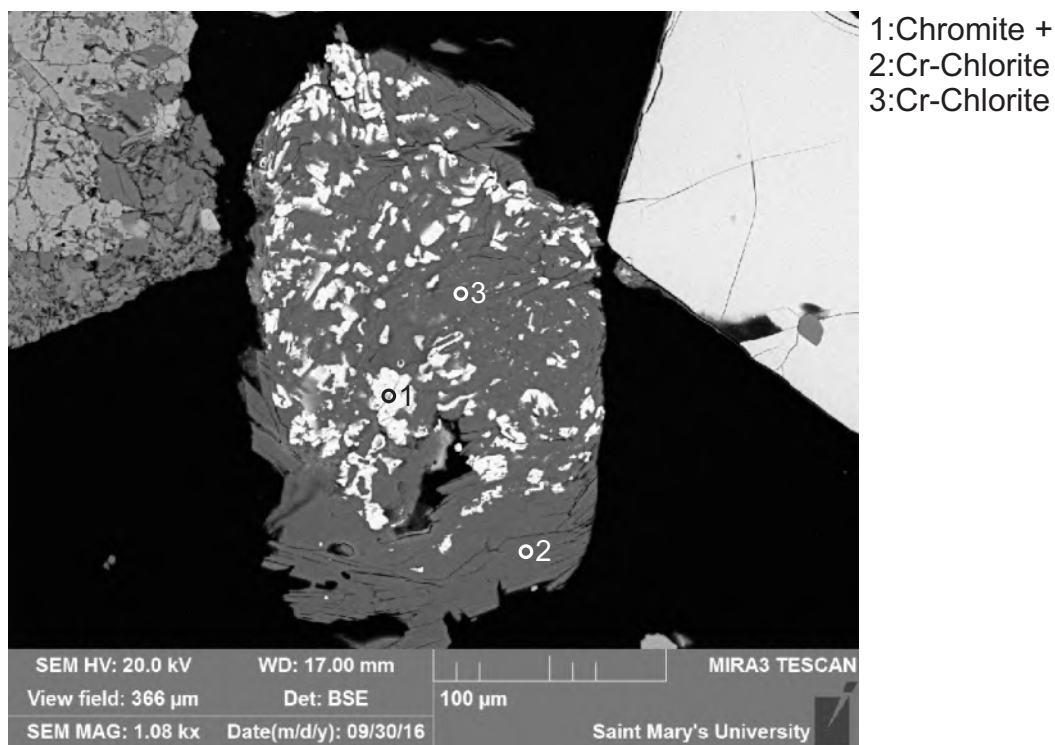
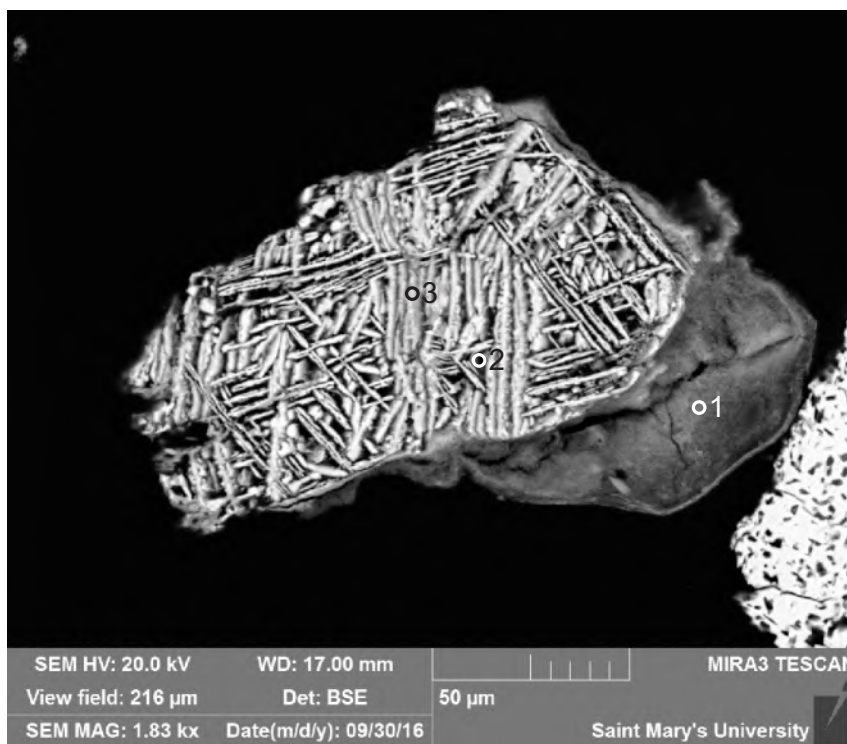
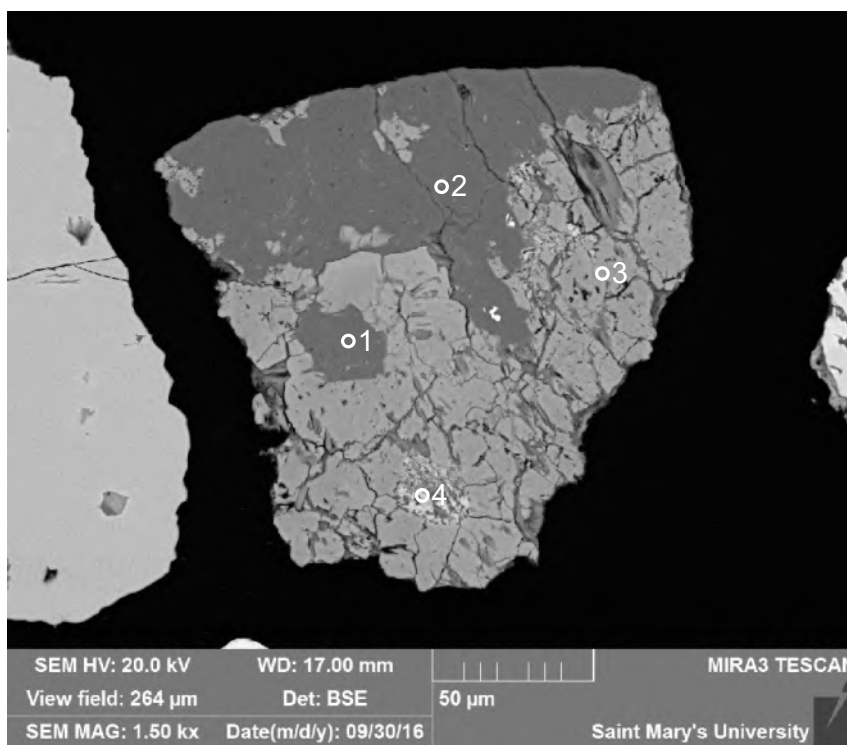


Figure B9.37: Sample S17 site 10.2 (SEM). Chromite grain partially replaced by Cr-chlorite, metaophiolite.



- 1:Mn-oxide/hydroxide +
- 2:Ilmenite +
- 3: Titanite + ?

Figure B9.38: Sample S17 site 10.3 (SEM). Altered ilmenite grain + Mn-oxide/hydroxide around edges of grain.



- 1:Quartz
- 2:Quartz
- 3:Epidote
- 4:TiO<sub>2</sub> +

Figure B9.39: Sample S17 site 10.4 (SEM). Lithic clast (quartz + epidote + titania, metamorphic).

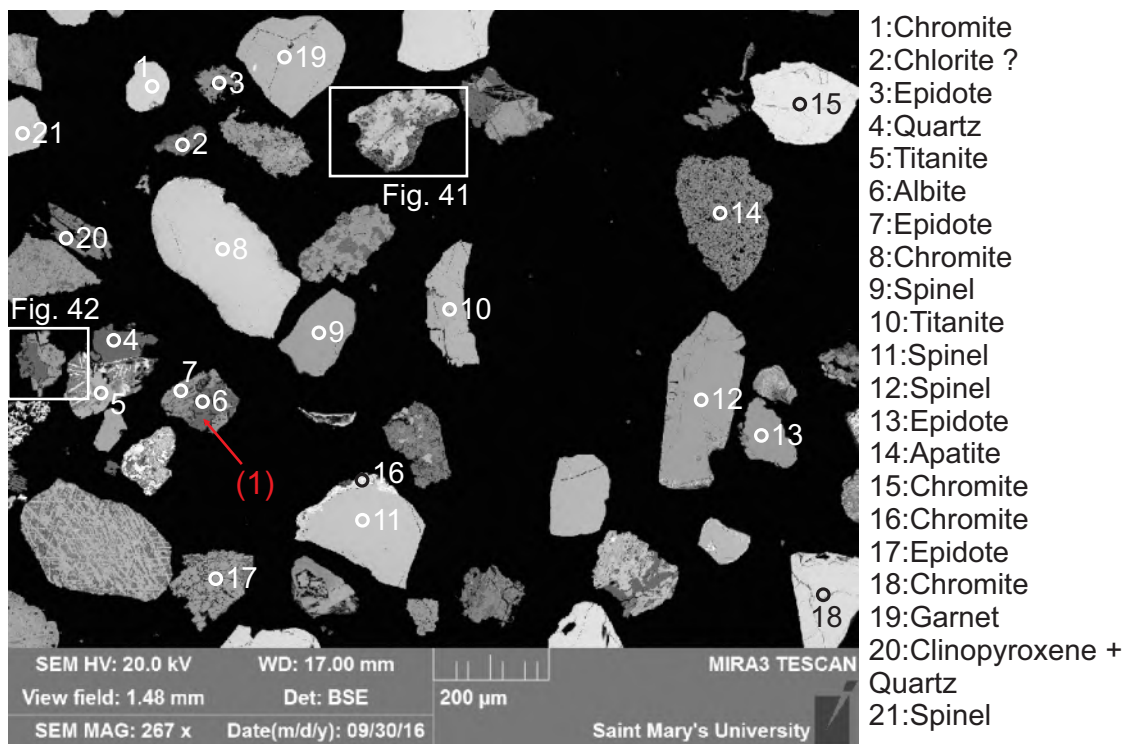


Figure B9.40: Sample S17 site 11 (SEM). 1: Lithic clast (albite + epidote, hydrothermal).

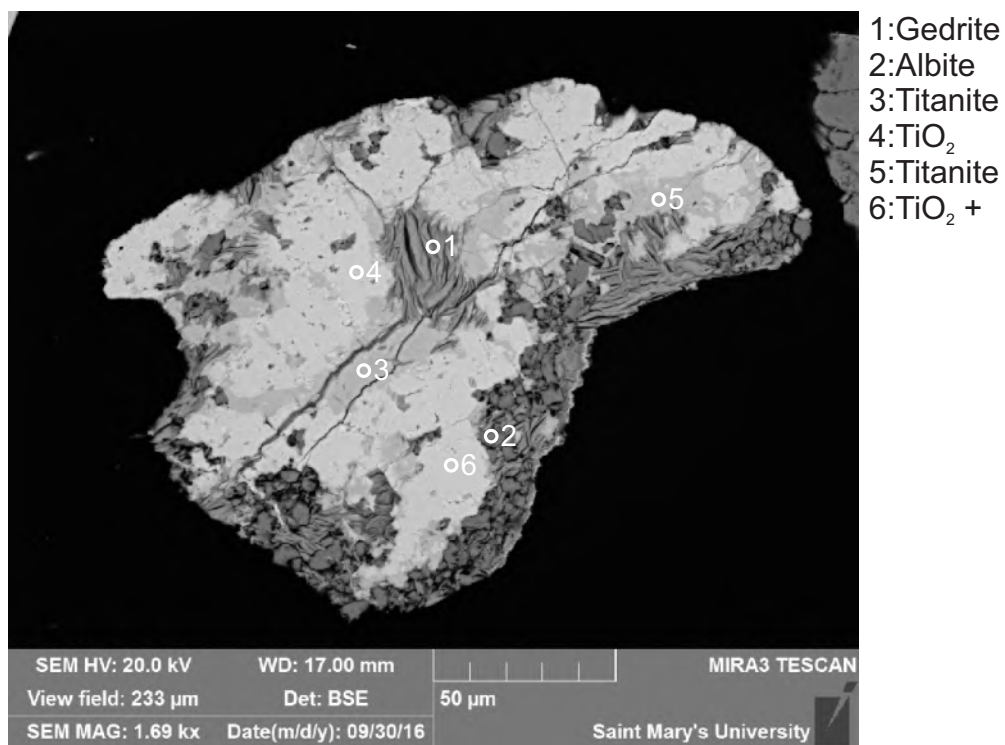
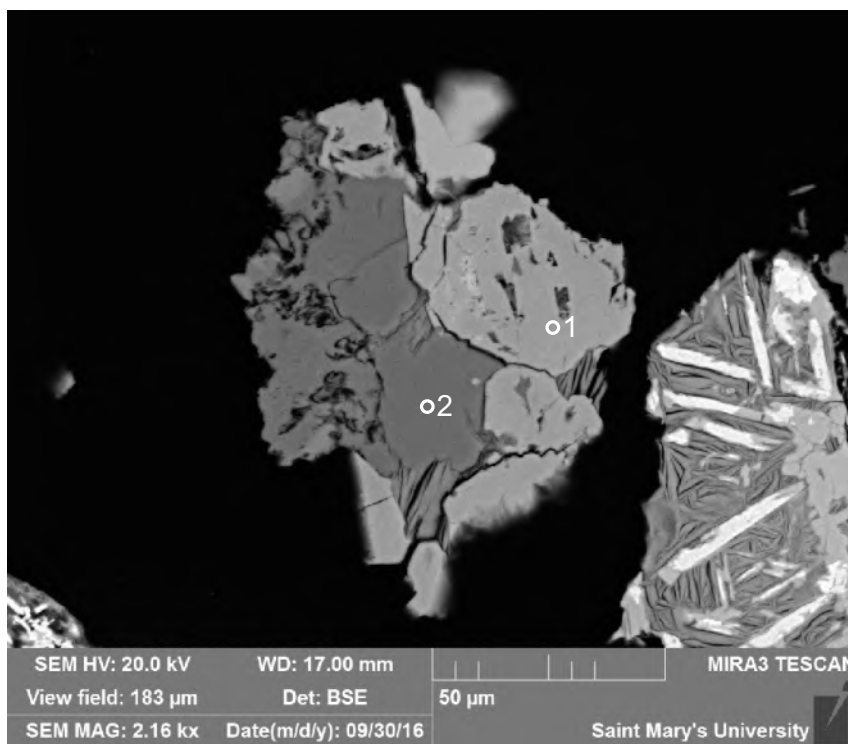


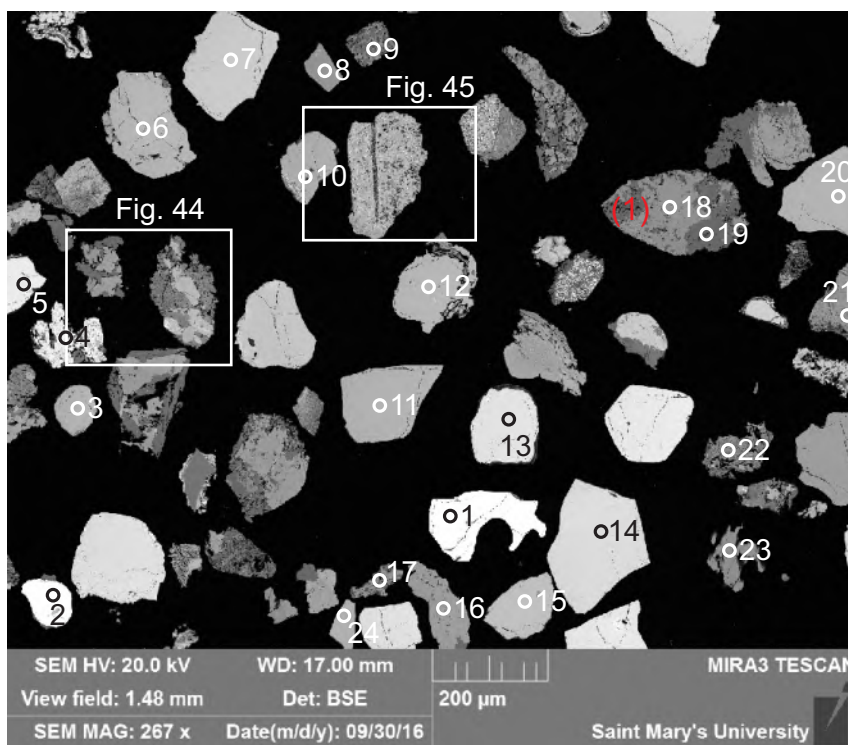
Figure B9.41: Sample S17 site 11.2 (SEM). Lithic clast (albite + titanite + titania + gedrite, retrograde metamorphic).





- 1:Epidote
- 2:Quartz

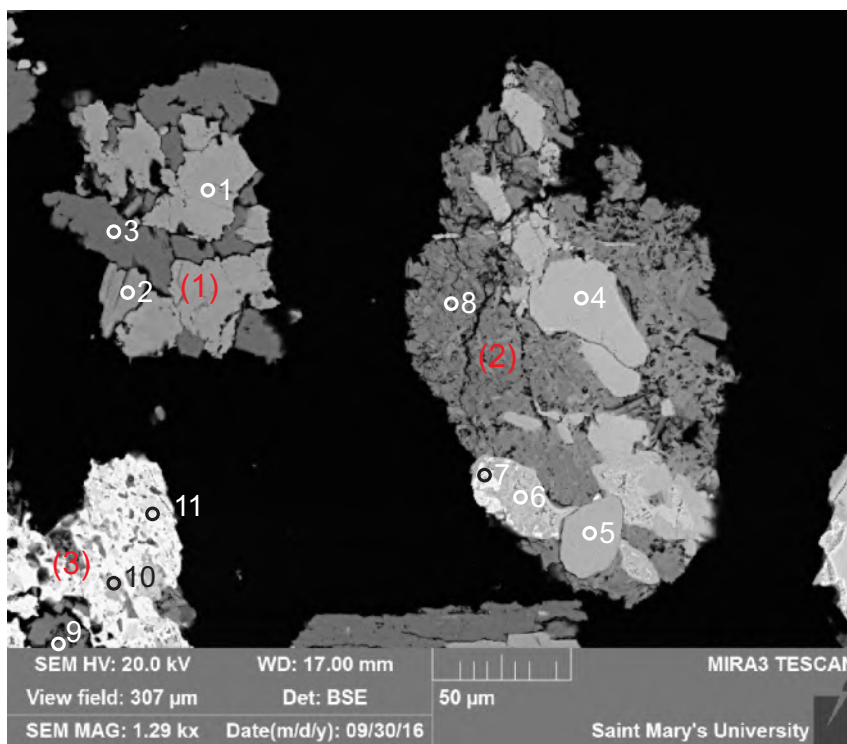
Figure B9.42: Sample S17 site 11.3 (SEM). Lithic clast (quartz + epidote, hydrothermal).



- 1:Zircon
- 2:Zircon
- 3:Spinel
- 4:Ilmenite
- 5:Chromite
- 6:Garnet
- 7:Chromite
- 8:Epidote
- 9:Epdiote + Albite
- 10:Spinel
- 11:Spinel
- 12:Garnet
- 13:Chromite
- 14:Chromite
- 15:Spinel
- 16:Epidote
- 17:Epidote
- 18:Epidote
- 19:Quartz
- 20:Garnet
- 21:Epidote
- 22:Mix
- 23:Amphibole
- 24:Spinel

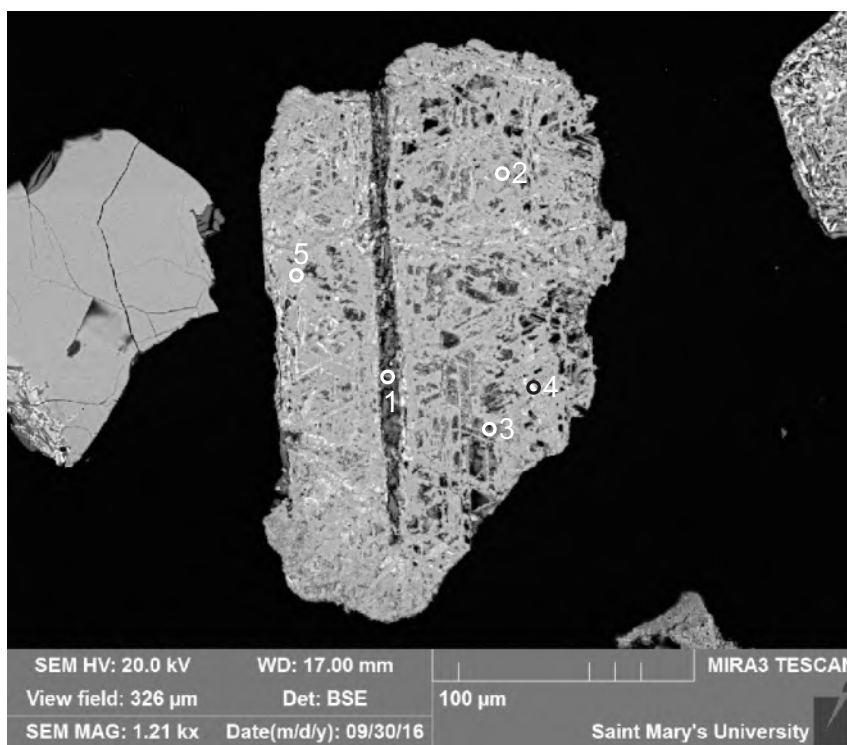
Figure B9.43: Sample S17 site 12 (SEM). 1: Lithic clast (quartz + epidote, hydrothermal).





- 1:Epidote
- 2:Gedrite
- 3:Albite
- 4:Titanite
- 5:Apatite
- 6:Titanite +  $\text{TiO}_2$
- 7:"Ilmenite"
- 8:Muscovite +
- 9:Oligoclase
- 10:Titanite +  $\text{TiO}_2$
- 11:Ilmenite

Figure B9.44: Sample S17 site 12.2 (SEM). 1: Lithic clast (epidote + albite + gedrite). 2: Lithic clast (titanite + apatite + ilmenite + muscovite). 3: Lithic clast (oligoclase + altered ilmenite).



- 1:Amphibole +
- 2:Titanite +
- 3:Titanite +  $\text{TiO}_2$  +
- 4:Ilmenite +
- 5:Titanite

Figure B9.45: Sample S17 site 12.3 (SEM). Altered ilmenite grain. Metamorphic.

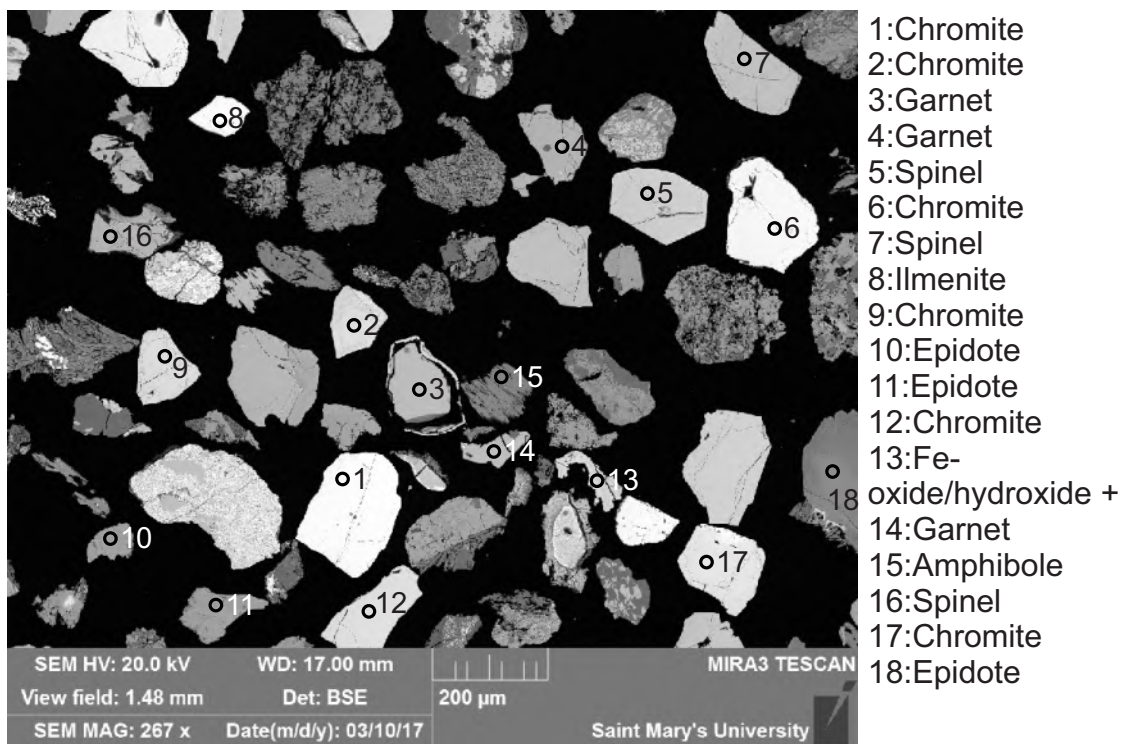


Figure B9.46: Sample S17 site 13 (SEM).

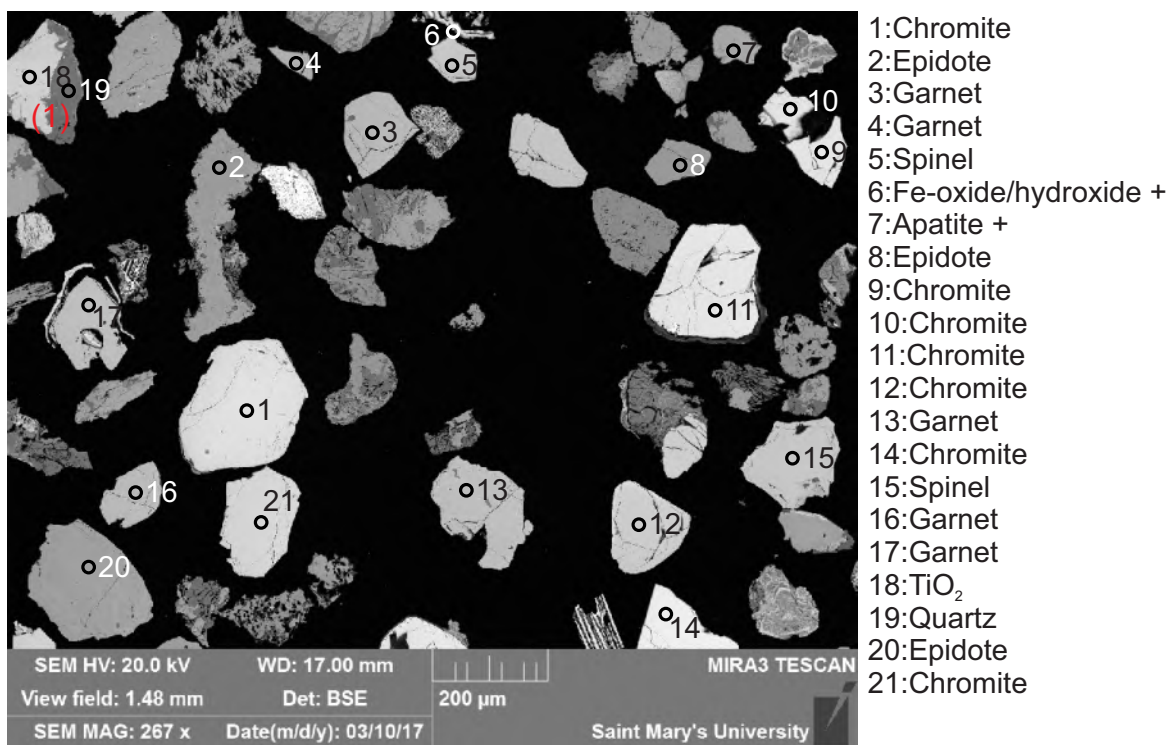


Figure B9.47: Sample S17 site 14 (SEM). 1: Lithic clast (titania + quartz, metamorphic).

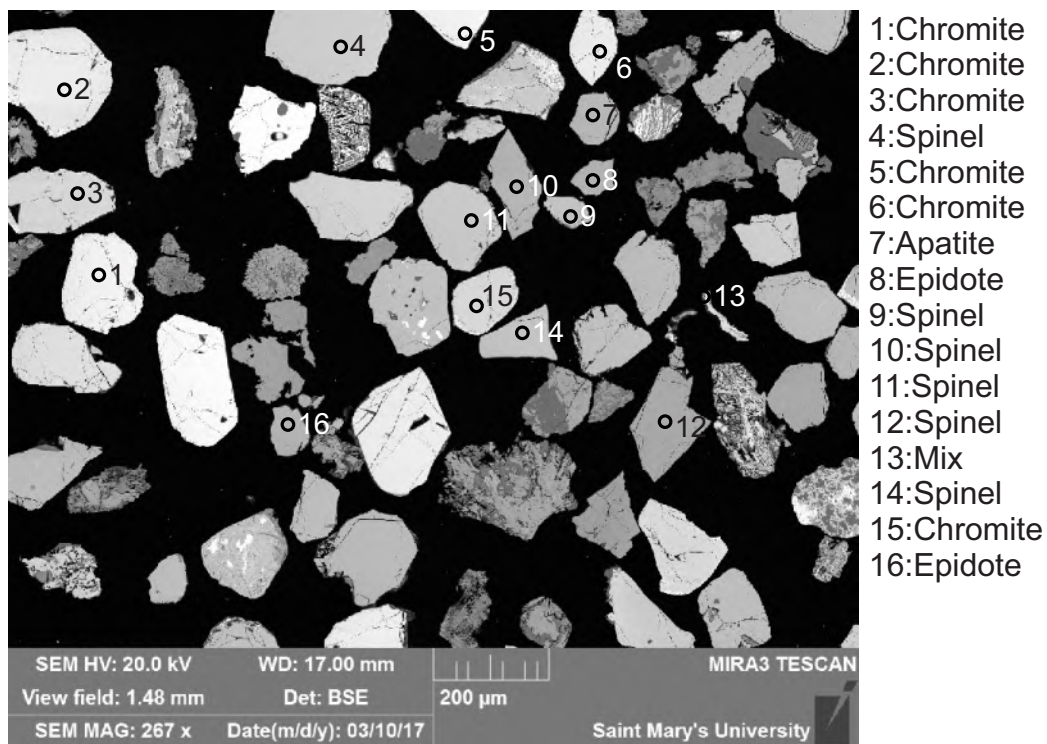


Figure B9.48: Sample S17 site 15 (SEM).

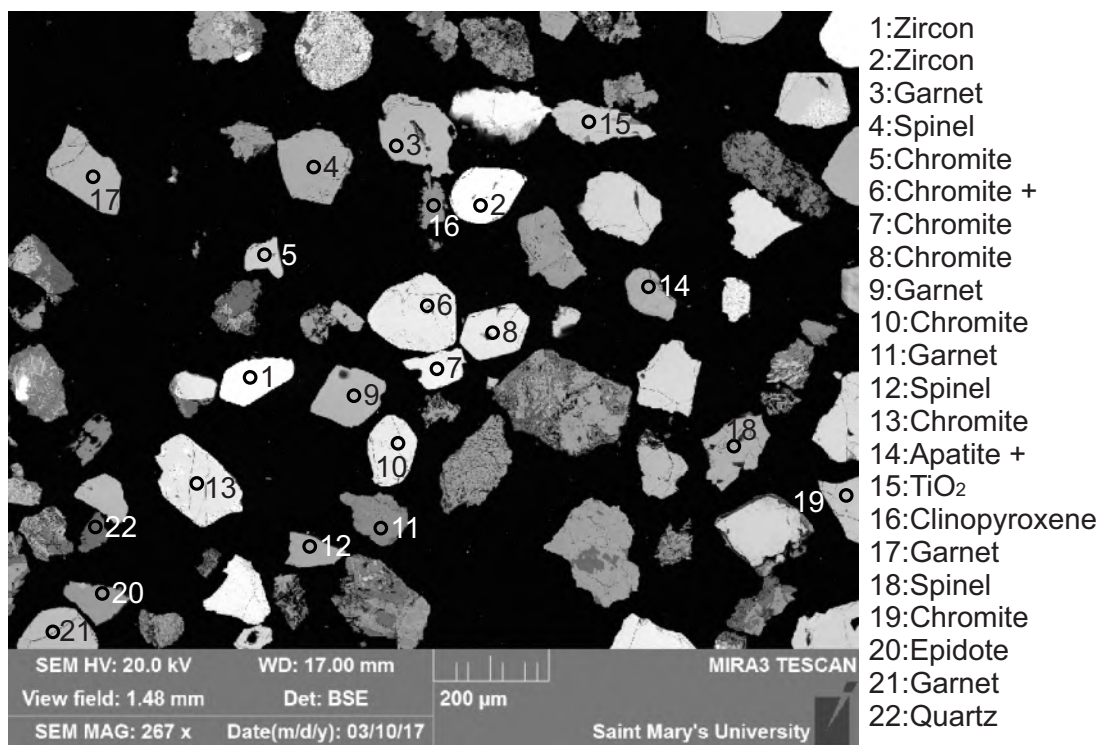


Figure B9.49: Sample S17 site 16 (SEM).



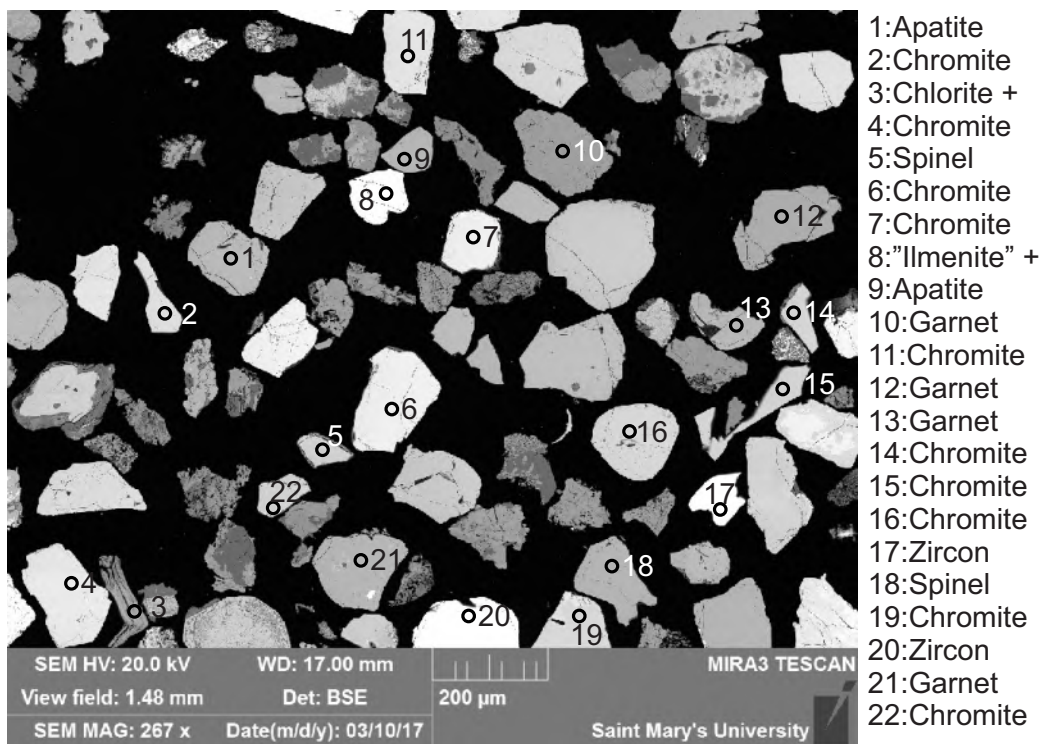


Figure B9.50: Sample S17 site 17 (SEM).

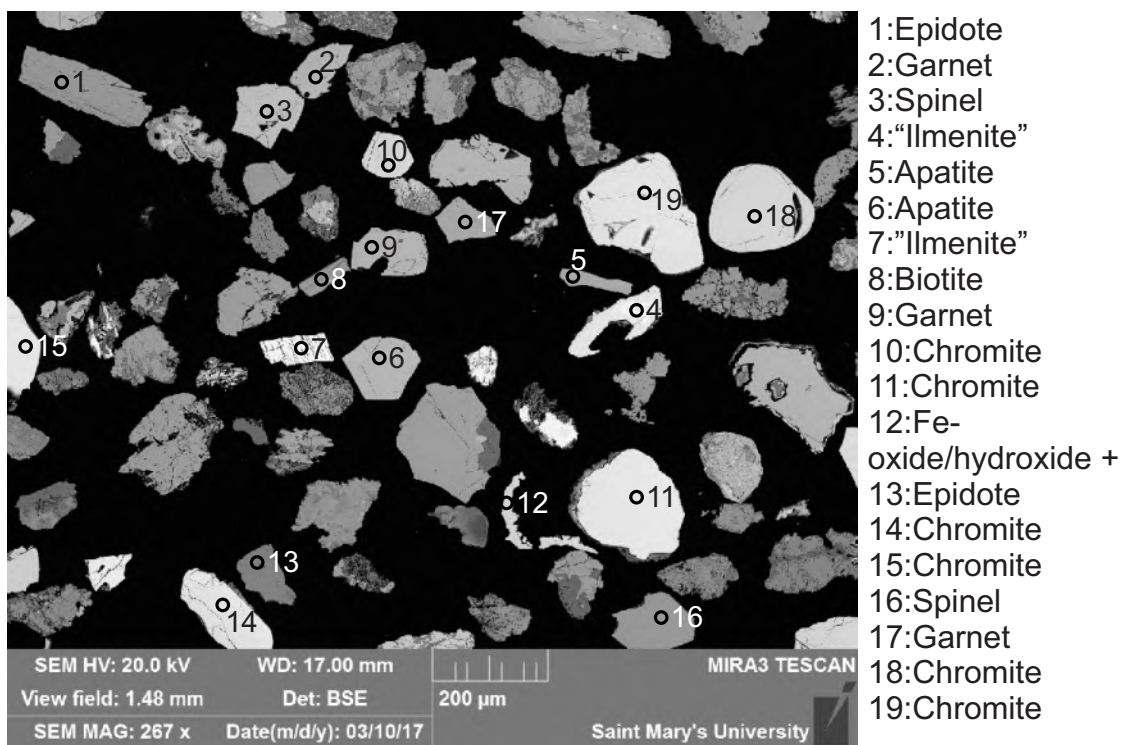


Figure B9.51: Sample S17 site 18 (SEM).

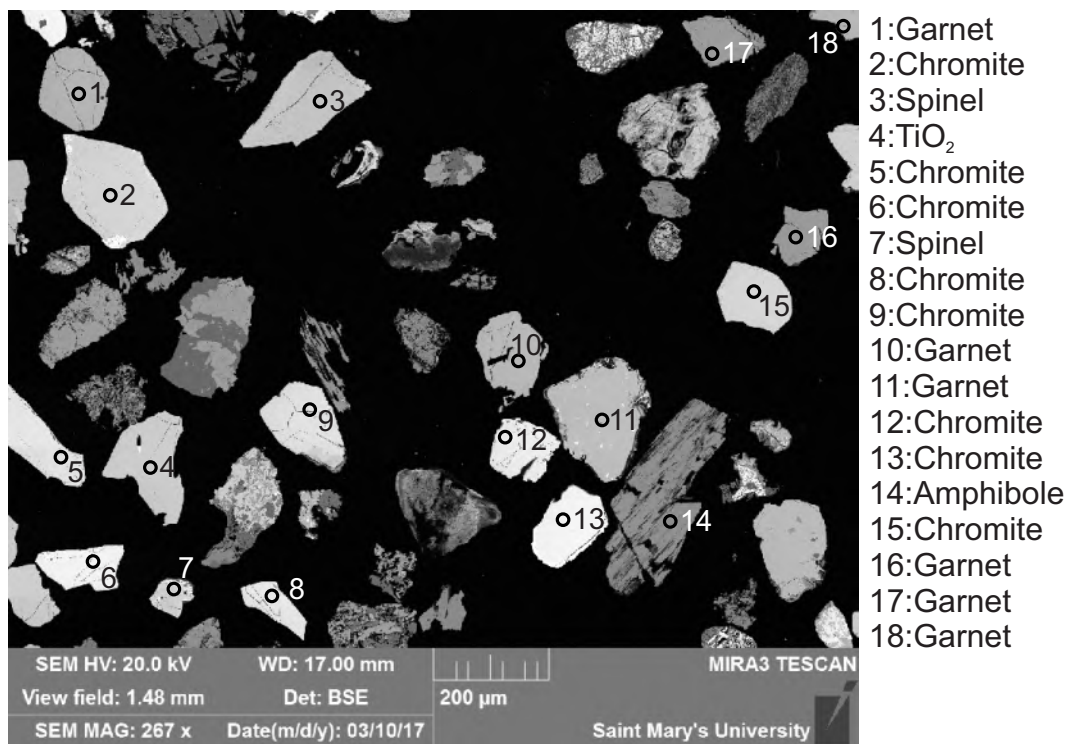


Figure B9.52: Sample S17 site 19 (SEM).



Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	1	1	Ep	40.43		25.46	8.42			22.69															97	112
S17	1	2	Chr			15.50	17.40		10.71								0.45	55.94							100	112
S17	1	3	Feohy +	8.02		11.55	75.01	0.49	0.80	0.84			2.86					0.42							100	82
S17	1	4	Ep	40.26		24.37	9.53	0.28		22.57															97	109
S17	1	5	Ab	69.29		18.59	0.23			0.18	11.71														100	120
S17	1	6	"Chr"			1.29	47.92	1.08	6.17									43.54							100	99
S17	1	7	Chr			26.27	20.07		12.19									41.48							100	105
S17	1	8	Ep	40.99		21.66	12.13			21.83	0.39														97	106
S17	1	9	"Ilm" +	6.44	70.94	3.63	14.29	2.93	1.00	0.77															100	95
S17	1	10	Spl			47.40	12.74		18.83									21.02							100	107
S17	1	11	Chr			7.50	20.15		8.47									63.38		0.50					100	105
S17	1	12	Chr			8.01	21.28		8.78									61.93							100	101
S17	1	13	Mix	19.01	62.56	1.27	0.59			16.57															100	105
S17	1	14	Ep	40.81		25.58	8.38			22.22															97	106
S17	1	15	Chr +	18.59	0.30	3.73	34.88	2.81	15.62	0.38	0.54							22.39		0.76					100	101
S17	1	16	Spl		0.62	26.44	20.74		12.87								0.38	38.96							100	114
S17	1	17	Ep	40.24		25.34	8.85			22.57															97	108
S17	1	18	Chl	33.47		17.92	23.48	4.61	4.71	0.82															85	108
S17	1	19	Feohy +	8.59		9.46	77.60		0.80	0.93			2.61												100	81
S17	1.2	1	Ep	40.62		25.35	8.63			22.40															97	112
S17	1.2	2	Ab	69.48		18.86					11.66														100	120
S17	1.2	3	Ttn	32.27	32.38	3.60	4.44		1.04	25.90	0.37														100	94
S17	1.2	4	Ab	69.62		18.95				0.23	11.20														100	117
S17	1.3	1	Qz	100.00																					100	121
S17	1.3	2	Ep	40.46		21.43	12.66			22.08	0.37														97	110
S17	1.3	3	?Clay	55.75		19.09	12.57		8.05	1.32	2.67	0.56													100	95
S17	1.3	4	Ep	40.13		29.33	2.99			24.55															97	101
S17	1.3	5	Ep	40.67		28.49	4.81	0.28		22.75															97	110
S17	1.3	6	?Clay	51.74		23.85	6.63		10.80	5.30	1.39	0.28													100	67
S17	1.4	1	TiO2		99.59		0.41																		100	107
S17	1.4	2	Qz	99.67		0.33																			100	116
S17	2	1	Chr			24.57	23.23		12.72									39.48							100	109
S17	2	2	Ep	40.41		25.84	7.60			22.89								0.26							97	114
S17	2	3	Hbl	49.72	0.57	10.33	2.58		19.86	11.40	1.62							0.92							97	116
S17	2	4	"Ilm"		62.61		34.04	3.35																	100	94
S17	2	5	Cpx	53.39		4.17	2.27		16.47	22.80								0.91							100	116
S17	2	6	Ab + Chl	59.24		20.94	7.54	0.78	5.23	0.87	4.83	0.57													100	72
S17	2	7	Ilm +	1.93	50.07	0.53	24.98	21.57		0.91															100	96
S17	2	8	Ep	39.83		20.43	12.19		2.51	21.43	0.61														97	93
S17	2	9	Ab	68.47		19.68				1.01	10.83														100	101
S17	2	10	Ep	41.22		31.32	1.63			22.83															97	107

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	2	11	Ep	39.96		24.39	10.14			22.51															97	109
S17	2	12	Chl +	35.10		21.79	10.51		15.27	0.61	1.25	0.48													85	82
S17	2	13	Grt	39.59		20.92	32.00	1.03	4.67	1.81															100	111
S17	2	14	Feohy +	9.38		9.99	72.43	2.36		0.96			1.81											3.06	100	76
S17	2	15	Qz	100.00																					100	120
S17	2	16	Ep	40.29	0.47	22.30	11.45			22.49															97	111
S17	2	17	Cpx	53.68		3.98	2.02		16.55	22.85								0.93							100	109
S17	2	18	Grt	39.57		20.90	31.44	1.17	3.77	3.15															100	109
S17	2	19	Ads	58.69		24.51	0.97			9.69	6.14														100	102
S17	2	20	Ep	40.68		22.33	8.41		2.59	22.99															97	107
S17	2	21	Chr			10.71	25.99		7.97									55.34							100	105
S17	2	22	Chr		0.54	21.85	23.75		9.39								0.39	44.08							100	106
S17	2.2	1	Ab	69.22		18.98				0.44	11.35														100	120
S17	2.2	2	Ep	40.96		31.17	1.72			23.15															97	113
S17	2.2	3	Ep	40.31		27.19	6.31		0.49	22.70															97	108
S17	2.3	1	Qz	100.00																					100	120
S17	2.3	2	Ep	39.98	0.54	22.11	11.90			22.47															97	112
S17	2.4	1	Chr			7.57	34.24		1.94								0.76	54.74		0.75					100	101
S17	2.4	2	Cr-Chl	31.80		14.31	3.12		31.93									3.84							85	106
S17	2.4	3	Cr-Chl	30.41		13.80	3.99		31.04									5.76							85	104
S17	2.4	4	Chr			3.79	45.99		1.78								0.49	47.94							100	102
S17	2.5	1	Ep	40.07		24.65	9.39			22.89															97	111
S17	2.5	2	Ep	42.39		22.53	10.72		1.86	18.77	0.73														97	100
S17	2.5	3	Ep	40.04		23.05	11.17		1.17	21.57															97	110
S17	2.5	4	Ilm		52.07		45.45	2.49																	100	106
S17	2.5	5	TiO2		99.59		0.41																		100	109
S17	2.5	6	"Ilm"	2.53	88.85	3.03	3.60			0.63	0.32		1.04												100	99
S17	2.5	7	"Ilm"		53.25		43.87	2.88																	100	106
S17	3	1	Spl			29.86	19.69		14.31									36.14							100	109
S17	3	2	Ep	40.25		29.37	4.00			23.39															97	109
S17	3	3	Ep	40.00		19.17	13.52		1.85	22.46															97	101
S17	3	4	?Plag	65.45		16.86	1.85		1.70	14.14															100	112
S17	3	5	Grt	39.64		20.92	28.99	0.53	2.38	7.53															100	117
S17	3	6	Grt	39.14		20.42	19.93	13.61	0.64	6.25															100	114
S17	3	7	Chr			5.71	23.00		7.59									63.71							100	111
S17	3	8	Ttn	34.92	28.88	4.89	4.04		3.88	21.65	0.88	0.20					0.66								100	101
S17	3	9	Chr +	5.70	0.55	4.50	45.61	1.57	3.25	0.36							0.71	37.30	0.45						100	87
S17	3	10	Ep	39.98		24.11	10.06			22.84															97	106
S17	3	11	Kfs	62.79		17.61	1.47		1.88	0.91	2.47	12.14	0.73												100	107
S17	3	12	"Ilm"	0.70	58.47		38.35	1.80		0.68															100	94
S17	3	13	Ttn	33.05	37.50	0.95	0.93			27.57															100	103

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	3.2	1	Ep	38.43		22.97	12.50			22.69	0.41														97	96
S17	3.2	2	Ttn	33.61	36.79	1.07	0.77			27.77															100	110
S17	3.2	3	Ab	68.51		19.46				0.84	11.19														100	117
S17	3.2	4	Ab	68.82		19.11				0.69	11.38														100	117
S17	3.3	1	Ilm		55.74		41.92	2.34																	100	102
S17	3.3	2	TiO2		98.78		0.49			0.73															100	110
S17	3.3	3	Ttn	32.79	38.18	0.74	0.88			27.42															100	110
S17	4	1	Kfs	60.32		26.05	0.83			0.84	5.96	4.96			1.04										100	96
S17	4	2	"Ilm"		65.52		31.19	2.45		0.85															100	96
S17	4	3	Grt	41.57		20.17	26.02	2.21	1.45	8.57															100	112
S17	4	4	Qz	98.06		1.48	0.47																		100	118
S17	4	5	Ep	41.65		23.04	10.11			22.20															97	106
S17	4	6	Spl		0.48	36.67	17.82		13.69									31.34							100	105
S17	4	7	Feohy +	8.77		11.78	74.88		0.84	1.05			2.69												100	81
S17	4	8	Chr			12.67	22.33		10.32								0.38	54.30							100	112
S17	4	9	?	30.45		32.14	16.09		20.94		0.39														100	93
S17	4	10	?Tur	52.18		28.02	0.52			15.24	1.83	2.21													100	111
S17	4	11	Ep	40.30		24.17	9.61			22.92															97	115
S17	4	12	"Ilm"		67.16		32.24	0.61																	100	97
S17	4	13	Ep	40.30		23.63	10.62			22.45															97	112
S17	4	14	Ep	40.68		27.50	5.93			22.90															97	107
S17	4	15	Ep	41.50		24.94	8.10	0.41	1.97	19.44	0.34	0.31													97	103
S17	4	16	"Ilm" +	1.85	76.95	1.80	17.07	0.36		0.52	0.67		0.77												100	94
S17	4.2	1	Chl +	38.36	1.19	14.18	16.99		13.35	0.28	0.48	0.17													85	93
S17	4.2	2	Ilm +	4.27	49.15	1.08	36.73	7.48	0.99	0.30															100	94
S17	4.2	3	Ilm +	2.82	67.47	1.07	19.39	3.77		5.49															100	87
S17	4.2	4	Ilm	0.95	55.38	0.74	41.12	1.80																	100	81
S17	4.3	1	Chl +	34.24		16.73	16.11		14.64	0.67	1.61	0.32	0.66												85	93
S17	4.3	2	Ttn	32.30	33.84	2.28	2.87		0.81	26.91			0.99												100	109
S17	4.3	3	Ilm		50.63		45.90	2.84		0.62															100	103
S17	4.3	4	Chl +	36.31	1.67	14.12	15.39		13.74	1.33	1.30	1.16													85	90
S17	4.3	5	Chl +	35.48		16.51	15.96		14.41	0.31	1.56	0.77													85	94
S17	4.3	6	Ilm		50.99		43.88	3.82		1.30															100	105
S17	4.3	7	Ttn	33.40	35.07	2.33	1.56		0.58	27.06															100	112
S17	4.4	1	Ep	40.38		22.35	11.84			22.43															97	110
S17	4.4	2	?Chl +	38.72		20.45	15.54		19.95		1.20	1.13													97	98
S17	4.4	3	Ab	67.27		19.97	0.24			1.78	10.73														100	118
S17	4.4	4	Ms	49.23		32.50	1.70		0.96			10.61													95	108
S17	5	1	Chr			15.66	22.62		10.06								0.43	51.24							100	108
S17	5	2	Grt	39.32		20.60	29.12	3.02	1.08	6.86															100	112
S17	5	3	Qz +	75.21		12.72	2.60			9.47															100	112

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	5	4	Chr +	9.05	0.67	5.48	28.16		9.82								0.44	45.55		0.84					100	109
S17	5	5	Qz	100.00																					100	126
S17	5	6	Ep +	44.82		26.03	4.51		2.66	17.20	1.46							0.33							97	92
S17	5	7	Grt	39.45		20.80	29.86	0.85	3.42	5.62															100	116
S17	5	8	Chr			19.04	19.59		11.57									49.80							100	112
S17	5	9	Spl			30.30	16.91		14.93									37.86							100	115
S17	5	10	Ms +	47.91	0.26	29.21	6.88		1.81		0.93	8.01													95	103
S17	5	11	Ep	41.55		25.16	8.48	0.53	1.07	19.89	0.32														97	110
S17	5	12	Qz	100.00																					100	117
S17	5	13	Qz	98.92		0.69					0.38														100	120
S17	5	14	Ep	40.05		22.91	11.28			22.76															97	108
S17	5	15	Cpx	50.58		2.02	3.42		15.03	22.13					5.91			0.91							100	105
S17	5	16	Amph	52.23	0.74	5.31	11.10		16.44	10.58	0.60														97	118
S17	5	17	Chr	0.60		6.68	32.24		2.60								0.46	57.41							100	103
S17	5	18	Ep	39.88		22.21	12.24			22.67															97	107
S17	5	19	Qz	100.00																					100	102
S17	5	20	Ep	40.85	0.31	23.09	10.24		1.33	20.84	0.34														97	102
S17	5.2	1	Qz	100.00																					100	119
S17	5.2	2	Ep +	45.97		23.25	7.46			20.32															97	110
S17	5.2	3	Qz	96.28		1.62	0.55			1.55															100	120
S17	5.2	4	Ep	40.33		24.88	9.20			22.59															97	110
S17	5.2	5	Qz +	91.51		4.18	0.82			3.50															100	116
S17	5.3	1	Qz	100.00																					100	121
S17	5.3	2	Ep	39.73	0.41	21.97	12.58			22.31															97	111
S17	5.4	1	Cr-Chl	30.85		17.17	2.95		29.56		0.35				3.77			0.35							85	102
S17	5.4	2	Cr-Chl	35.05		9.10	13.77		23.58		0.43							3.08							85	91
S17	5.4	3	Cr-Chl	35.45		16.51	2.62		28.54		0.77							1.11							85	96
S17	5.4	4	Cr-Chl	39.67		7.96	3.47		31.12		0.43							2.35							85	66
S17	5.4	5	Chr +	13.75	0.61	6.26	24.02		13.76		0.37							40.69		0.55					100	102
S17	5.4	6	Chr +	9.99	0.70	6.12	26.35		11.23								0.53	44.46		0.64					100	105
S17	5.4	7	Chr +	13.60	0.58	6.54	23.74		14.50								0.45	39.95		0.64					100	103
S17	6	1	Grt (Pyr)	39.50		21.30	17.46		14.28	5.84	0.96	0.65													100	101
S17	6	2	Spl			40.52	16.21		16.18									27.09							100	107
S17	6	3	Chr		0.60	21.80	22.44		10.03									45.13							100	106
S17	6	4	Chr			13.55	20.74		10.12								0.50	55.09							100	104
S17	6	5	Spl			27.75	26.31		10.64									35.30							100	107
S17	6	6	Spl		0.66	29.94	21.63		13.19								0.44	34.14							100	109
S17	6	7	Ep	40.29		22.44	12.13	0.37		21.77															97	107
S17	6	8	Spl		0.58	28.17	25.21		12.57									33.47							100	107
S17	6	9	Chr			8.12	22.24		8.48									61.16							100	106
S17	6	10	Ep	40.12		22.11	12.30			22.47															97	111

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	6	11	Ep	40.51		29.04	4.75		0.61	22.08															97	116
S17	6	12	St	29.62	0.69	54.05	13.90		1.75																100	112
S17	6	13	Ilm		51.47		45.28	3.25																	100	103
S17	6	14	Amph	51.01	0.54	6.83	5.93		18.47	11.84	1.56							0.81							97	112
S17	6	15	Ttn	32.46	38.29	0.90	0.76			27.59															100	111
S17	6	16	Ep	39.71		21.54	13.04			22.71															97	105
S17	6	17	Ab	68.62		18.88	1.30				11.20														100	110
S17	6	18	Feohy +	9.52		9.56	77.09	0.59		0.84			2.40												100	82
S17	6	19	Ep	40.09		22.85	11.32			22.74															97	116
S17	6	20	Ab + Qz	81.54		10.47	0.46			0.19	7.33														100	129
S17	6	21	Ep	41.43		21.09	13.26			21.22															97	101
S17	6.2	1	Ep	39.89		25.39	8.76	0.75		22.21															97	109
S17	6.2	2	Ab	69.52		18.76					11.72														100	117
S17	6.3	1	Ilm		48.75		48.89	2.04		0.32															100	105
S17	6.3	2	Clay	53.04		19.63	10.64		12.94	2.36	0.89	0.51													100	82
S17	6.3	3	Ttn	32.69	36.82	1.56	0.68			27.67			0.59												100	112
S17	6.3	4	"Ilm"	0.59	65.61		32.43	0.53		0.84															100	99
S17	6.4	1	Amph	54.77		3.60	12.50	0.43	17.62	7.17	0.59							0.32							97	97
S17	6.4	2	Spl +	14.86	0.41	7.42	43.54	0.75	5.77	1.04							0.77	24.22		1.23					100	91
S17	6.4	3	Amph	54.99		3.21	9.16		18.25	10.60	0.54							0.25							97	111
S17	7	1	Ep	40.17		23.33	10.64			22.86															97	109
S17	7	2	Qz	98.81											1.19										100	107
S17	7	3	Chr			11.68	25.72		7.34								0.41	54.86							100	106
S17	7	4	Ttn	31.61	36.63	3.76	3.29			24.71															100	105
S17	7	5	Ttn	34.90	30.09	4.65	4.20		0.54	25.00		0.62													100	103
S17	7	6	Chr			12.59	23.94		9.50									53.98							100	102
S17	7	7	Grt	39.85		21.22	26.27	0.97	1.72	9.96															100	111
S17	7	8	Ilm		54.06		44.00	1.94																	100	107
S17	7	9	Spl			33.66	13.78		16.30									36.25							100	114
S17	7	10	Ep	40.00		21.82	12.38			22.48							0.32								97	113
S17	7	11	Grt	32.03		3.63	10.24		6.37	27.28				0.70				19.74							100	104
S17	7	12	Chr +	11.21		4.84	55.48	1.57	5.94	1.46								18.27	0.50	0.73					100	96
S17	7	13	Ep	40.49		29.66	4.00	0.33		22.52															97	107
S17	7	14	Spl			43.58	15.87		17.12									23.44							100	107
S17	7	15	Grt	39.71		20.51	25.84	3.90	1.22	8.82															100	110
S17	7	16	Qz	100.00																					100	116
S17	7	17	Ep	41.96		24.96	8.38		1.41	19.87	0.43														97	99
S17	7	18	Grt	38.45		1.21	25.75		0.50	34.09															100	105
S17	7	19	Ep	42.74	0.46	22.64	6.59		3.80	20.20	0.57														97	106
S17	7.2	1	Ep	40.58		26.06	7.67			22.69															97	110
S17	7.2	2	Ab	67.12		20.53				2.29	10.07														100	115



Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	7.2	3	Ep + Ab?	49.96		27.09	1.15		1.46	17.35	3.00														100	105
S17	7.2	4	Ab	67.21		20.48				1.50	10.59	0.21													100	114
S17	7.3	1	Tlc	61.33		0.46	7.02	0.23	27.11	3.84															100	111
S17	7.3	2	Tlc	65.39		1.24	4.63		26.92	1.43	0.39														100	77
S17	7.3	3	Tlc	66.78		0.88	3.05		29.29																100	94
S17	7.3	4	Amph	57.27		2.17	2.46		23.03	11.07	0.66							0.34							97	113
S17	8	1	Chr			7.54	19.53		8.89								0.42	63.62							100	108
S17	8	2	Ep	40.36		16.99	14.57		2.72	22.37															97	95
S17	8	3	Qz	100.00																					100	124
S17	8	4	Spl			44.00	13.81		18.51									23.69							100	116
S17	8	5	Chr		0.33	16.24	22.49		10.44									50.51							100	113
S17	8	6	Ep +	44.18		19.45	15.23		4.70	15.17	0.79	0.47													100	82
S17	8	7	Amph	55.09	0.31	2.35	10.29		17.07	11.45	0.45														97	115
S17	8	8	Grt	39.62		20.69	26.10	3.58	1.01	9.00															100	112
S17	8	9	Chr			22.66	21.52		11.04								0.42	44.37							100	107
S17	8	10	Grt +	40.51	1.31	17.66	3.71		1.65	35.16															100	108
S17	8	11	Grt	39.48		20.81	30.19	0.92	2.29	6.31															100	112
S17	8	12	?Ep	39.84		20.48	22.50	0.81	0.36	16.01															100	111
S17	8	13	Grt	38.96		20.88	30.24	5.53	2.64	1.75															100	110
S17	8	14	Qz	100.00																					100	115
S17	8	15	Ep	40.28		22.70	11.76	0.27	0.64	21.36															97	108
S17	8	16	Grt	39.35		20.45	26.30	5.61	1.02	7.28															100	112
S17	8	17	Qz	96.33	0.38	1.86	0.69		0.25			0.48													100	119
S17	8.2	1	Fl							47.00					53.00										100	131
S17	8.2	2	Qz	99.68						0.32															100	120
S17	8.2	3	Qz	100.00																					100	120
S17	8.2	4	Qz	100.00																					100	119
S17	8.2	5	TiO2 ("Ilm")	0.61	99.02		0.37																		100	108
S17	8.2	6	"Ilm"	4.56	64.60		29.47	0.77		0.60															100	98
S17	8.2	7	TiO2 ("Ilm")	3.29	96.20		0.51																		100	107
S17	8.2	8	Fl						0.31	45.78					53.91										100	134
S17	8.2	9	Fl	2.92		1.50	0.21		0.33	44.79	0.50	0.11			49.64										100	131
S17	8.3	1	Amph (Ged)	43.23		18.34	19.22	0.44	13.76	0.56	1.05	0.41													97	96
S17	8.3	2	Ep	40.37		22.88	11.20			22.54															97	109
S17	8.3	3	Ab	69.22		18.76				0.32	11.70														100	120
S17	8.3	4	Ttn	33.82	32.79	3.57	1.78			28.04															100	110
S17	8.3	5	Qz	100.00																					100	121
S17	8.3	6	Amph (Ged)	44.56		16.32	19.20	0.35	14.18	0.77	1.33	0.30													97	97
S17	9	1	Chr			18.89	21.05		11.73									48.33							100	109
S17	9	2	Chr			26.33	15.40		12.42									45.85							100	108
S17	9	3	Mix	32.73		19.91	5.97	22.56	1.51	2.24	1.88	1.26			7.41			0.38	1.47					2.67	100	99

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	9	4	Chr			15.82	23.81		10.10									50.27							100	110
S17	9	5	Ep	39.51	2.48	21.75	10.23			23.03															97	108
S17	9	6	Chr			28.07	14.83		15.35									41.75							100	110
S17	9	7	Chr			11.43	20.39		9.26								0.38	58.54							100	108
S17	9	8	Spl			36.62	19.48		14.99								0.38	28.53							100	108
S17	9	9	Opx	59.76		0.55	13.52	0.46	24.69	1.02															100	109
S17	9	10	"Ilm" +	15.11	52.87	0.89	20.38	0.73		10.01															100	110
S17	9	11	Ap				0.30			48.92			44.30		4.93									1.55	100	123
S17	9	12	Ep	39.05		19.87	13.49	3.89	0.37	20.33															97	114
S17	9	13	Qz	99.21		0.35	0.45																		100	124
S17	9	14	Spl			28.13	23.77		12.56									35.53							100	106
S17	9	15	Spl		0.40	27.58	20.21		14.18									37.63							100	106
S17	9	16	Chr			20.78	26.42		10.67									42.13							100	104
S17	9	17	Ep	40.36		26.37	7.45	0.38		22.45															97	104
S17	9	18	Feohy +	5.96		8.51	82.03		0.55	0.79			2.15												100	69
S17	9	19	Ep	45.80		28.32	1.99			20.88															97	109
S17	9	20	Spl			31.75	15.70		15.66									36.88							100	109
S17	9	21	Grt	39.56		20.66	26.81	2.35	1.27	9.35															100	117
S17	9	22	Ep	39.99		21.99	12.66			22.36															97	103
S17	9	23	Qz +	93.23						3.09			3.68												100	116
S17	9	24	Ep	40.73		27.78	1.78			24.72	0.97				1.02										97	70
S17	9	25	Spl +	24.26		15.31	12.29		28.89		0.43							18.42		0.40					100	110
S17	9	26	Ep	40.78		28.01	5.39	0.33		22.48															97	105
S17	9.2	1	Grt	28.59		2.16	8.74		1.58	37.25				1.64				20.04							100	99
S17	9.2	2	Mix	32.72		6.35	15.15	0.81	27.31	0.33	0.64					0.38		15.71	0.60						100	95
S17	9.2	3	Grt	32.46		3.28	21.78		4.62	27.70								10.16							100	62
S17	9.2	4	Amph	35.49		4.34	12.21		19.81	12.36						0.74		12.06							97	79
S17	9.3	1	Ab	69.67		18.64				0.33	11.37														100	116
S17	9.3	2	Ep +	46.78		23.15	4.46		3.07	18.56	0.97														97	100
S17	9.3	3	Amph (Ged) +	41.29		18.54	12.04		13.84	8.05	2.32	0.92													97	94
S17	9.4	1	Ab	69.84		18.50				0.30	11.36														100	116
S17	9.4	2	Ep	40.34		27.47	6.40	0.24		22.54															97	110
S17	9.4	3	Ttn	32.56	35.04	2.90				27.77					1.73										100	111
S17	9.4	4	Kfs +	60.10		19.80	1.99			6.71	0.29	11.11													100	102
S17	10	1	Ap	1.37						47.39	1.14		43.26		3.53						3.13			0.18	100	108
S17	10	2	Ap							46.81	1.04		41.96		4.74									5.44	100	81
S17	10	3	Chr			16.90	19.76		11.39								0.37	51.58							100	112
S17	10	4	Ilm		51.71		47.19	1.10																	100	106
S17	10	5	Ep	41.59		28.90	4.64	0.27		2.22	18.98	0.40													97	112
S17	10	6	Ep	40.29		23.90	10.03			22.78															97	107
S17	10	7	Qz	100.00																					100	117

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	10	8	Grt	39.42		20.65	32.99	2.58	2.04	2.33															100	110
S17	10	9	Chr	0.67	0.58	4.02	29.56		2.89								0.80	61.49							100	99
S17	10	10	Chr		0.88	22.78	25.22		10.55								0.51	40.06							100	106
S17	10	11	Grt	39.19		20.56	27.41	4.25	1.48	7.12															100	113
S17	10	12	Ep	40.47		25.41	8.66			22.46															97	104
S17	10	13	Ep	37.84		23.01	11.37			24.78															97	71
S17	10	14	Ep	41.46		21.72	10.60			22.59	0.63														97	43
S17	10	15	Grt	40.12		21.07	28.06	0.31	4.35	6.09															100	110
S17	10	16	Ep	40.08		20.75	13.98			22.19															97	103
S17	10	17	Grt	39.96		20.99	30.16	0.77	5.10	3.02															100	113
S17	10	18	Ep	41.48		27.94	1.87		2.63	23.08															97	108
S17	10	19	Chr			21.06	20.81		13.42								0.45	44.26							100	110
S17	10	20	"Ilm"		58.30		40.35	1.35																	100	99
S17	10	21	Grt	39.67		21.05	31.05	1.69	2.88	3.65															100	117
S17	10.2	1	Chr +	3.37	0.60	7.71	28.76	1.06	6.42		1.14						0.62	50.31							100	106
S17	10.2	2	Cr-Chl	33.06		14.88	2.74		32.04		0.33							1.95							85	101
S17	10.2	3	Cr-Chl	32.10		13.74	3.82		30.73		0.33							4.29							85	98
S17	10.3	1	Mnohy	7.63	0.61	7.19	7.04	38.54	0.82	3.27	3.45	0.32			27.78			0.79	2.56						100	44
S17	10.3	2	Ilm +	9.18	50.55	1.41	27.99	2.76		8.11															100	57
S17	10.3	3	Ttn + ?	21.93	42.97	1.69	11.60	5.62		15.35							0.84								100	104
S17	10.4	1	Qz	100.00																					100	121
S17	10.4	2	Qz	98.05		0.70	0.48		0.30					0.46											100	118
S17	10.4	3	Ep	39.63		23.32	11.28			22.77															97	108
S17	10.4	4	TiO2 +	10.57	75.90	3.90	2.49		2.05	1.81	0.55	0.18			2.54										100	103
S17	11	1	Chr			24.98	23.41		10.06									41.55							100	102
S17	11	2	Chl ?	24.85	0.53	15.82	38.82	0.73	1.14	0.53	0.75	0.58	0.93					0.33							85	67
S17	11	3	Ep	40.51		29.23	4.44			22.82															97	106
S17	11	4	Qz	100.00																					100	117
S17	11	5	Ttn	32.71	33.68	3.76	2.56			27.28															100	107
S17	11	6	Ab	68.08		19.67				0.84	11.16	0.25													100	116
S17	11	7	Ep	40.68		24.74	8.64			22.93															97	108
S17	11	8	Chr			25.20	21.11		12.26									41.42							100	107
S17	11	9	Spl			46.40	13.36		18.64									21.60							100	109
S17	11	10	Ttn	33.96	32.68	4.38	0.55			26.88					1.55										100	106
S17	11	11	Spl		0.36	29.46	19.17		14.32									36.69							100	111
S17	11	12	Spl			46.00	14.54		17.76								0.30	21.39							100	113
S17	11	13	Ep	40.02		23.70	10.58			22.70															97	111
S17	11	14	Ap	1.92		0.91	0.51			46.89	1.26	0.25	34.16	2.93	9.47									1.69	100	79
S17	11	15	Chr			9.30	24.29		8.75								0.49	57.17							100	103
S17	11	16	Chr	3.29	0.39	3.93	50.79		4.44								0.38	36.77							100	102
S17	11	17	Ep	40.92		23.77	10.34			21.51	0.45														97	102

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	11	18	Chr			16.21	22.75		9.94									51.10							100	113
S17	11	19	Grt	39.93		21.14	31.42	0.62	3.78	3.10															100	109
S17	11	20	Cpx + Qz	61.01			2.78		23.78	12.43															100	110
S17	11	21	Spl		0.63	33.61	16.04		14.90									34.82							100	103
S17	11.2	1	Ged	44.40	1.10	17.55	19.31		11.22	0.57	1.93	0.91													97	88
S17	11.2	2	Ab	68.47	0.30	19.30				0.67	10.97	0.29													100	115
S17	11.2	3	Ttn	32.67	31.59	5.29				27.52					2.92										100	115
S17	11.2	4	TiO2	0.76	98.56					0.68															100	109
S17	11.2	5	Ttn	32.67	32.94	4.86				27.57					1.97										100	113
S17	11.2	6	TiO2 +	1.23	97.77	0.35				0.65															100	109
S17	11.3	1	Ep	39.98		25.22	8.92			22.87															97	111
S17	11.3	2	Qz	100.00																					100	122
S17	12	1	Zrn	30.83																		67.69	1.48		100	127
S17	12	2	Zrn	30.94																		69.06			100	117
S17	12	3	Spl			39.23	16.09		15.81									28.86							100	107
S17	12	4	Ilm		54.85		35.70	9.45																	100	105
S17	12	5	Chr			13.24	24.37		8.40								0.36	53.64							100	103
S17	12	6	Grt	39.70		20.63	28.11	1.82	1.47	8.27															100	110
S17	12	7	Chr			26.99	17.76		12.98								0.38	41.89							100	103
S17	12	8	Ep	40.19		27.59	6.19			23.04															97	106
S17	12	9	Ep + Ab	48.89		27.97	1.19			17.15	3.65				1.15										100	95
S17	12	10	Spl			41.75	16.36		16.46									25.43							100	106
S17	12	11	Spl			38.04	14.94		17.52									29.49							100	111
S17	12	12	Grt	39.62		20.85	25.74	4.09	1.20	8.51															100	112
S17	12	13	Chr			14.19	23.91		9.79									52.11							100	111
S17	12	14	Chr			19.63	23.71		10.89								0.48	45.30							100	113
S17	12	15	Spl			30.46	14.66		15.52									39.36							100	114
S17	12	16	Ep	39.80		22.64	11.64			22.92															97	112
S17	12	17	Ep	41.07		24.79	7.43	0.53	3.45	19.30	0.42														97	101
S17	12	18	Ep	40.68		25.95	7.86			22.51															97	110
S17	12	19	Qz	97.31		1.60					1.10														100	116
S17	12	20	Grt	39.68		21.03	32.10		4.35	2.85															100	111
S17	12	21	Ep	40.09		24.33	9.79			22.80															97	105
S17	12	22	Mix	40.86		19.30	23.62		14.23		1.63	0.36													100	96
S17	12	23	Amph	53.39	0.35	4.00	10.96	0.35	16.57	10.67	0.71														97	118
S17	12	24	Spl			39.46	17.12		16.21									27.21							100	113
S17	12.2	1	Ep	39.89		22.65	11.59			22.87															97	108
S17	12.2	2	Amph (Ged)	40.16		20.66	22.46	0.37	11.90		0.54	0.90													97	95
S17	12.2	3	Ab	69.75		18.80					11.45														100	117
S17	12.2	4	Ttn	32.80	37.11	1.38	0.93			27.78															100	112
S17	12.2	5	Ap							49.82			44.62		4.11									1.45	100	123

Table B9.1: EDS analyses of sample S17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	SrO	ZrO2	HfO2	WO3	Total	Actual Total
S17	12.2	6	Ttn + TiO2	12.93	74.33		1.42			11.33															100	110
S17	12.2	7	"Ilm"		65.01		28.74	5.15		1.10															100	101
S17	12.2	8	Ms +	49.84		24.04	8.82		6.85	3.11	0.65	6.68													100	93
S17	12.2	9	Olig	63.54		23.02				4.72	8.71														100	118
S17	12.2	10	Ttn + TiO2	19.30	56.32	1.06	6.98	1.31		15.04															100	111
S17	12.2	11	Ilm		68.60		26.19	4.69		0.52															100	100
S17	12.3	1	Amph +	42.34	7.81	12.03	13.00		7.09	10.50	2.15	0.73	4.35												100	70
S17	12.3	2	Ttn +	26.99	46.54	2.37	3.43			20.66															100	93
S17	12.3	3	Ttn + TiO2 +	22.68	52.84	8.71	10.26	0.59	1.02	2.92	0.98														100	77
S17	12.3	4	Ilm +	12.86	44.27	0.95	20.86	9.66		11.39															100	109
S17	12.3	5	Ttn	32.09	32.61	3.89	1.81	0.41		26.73					1.75		0.72								100	111
			Notes																							
			" " = indicates that mineral is altered																							
			+ = indicates other minerals present																							



Table B9.2: EDS analyses of sample 17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S17	13	1	Chr			7.25	32.67		5.92									54.16						100	108
S17	13	2	Chr	14.60	0.92	4.92	39.12	2.74	9.38	0.85	1.00							25.82		0.65				100	98
S17	13	3	Grt	39.64		21.06	32.57		3.14	3.60														100	114
S17	13	4	Grt	34.80		17.47	29.19	1.20	2.31	14.66	0.36													100	72
S17	13	5	Spl			26.37	16.23		14.49									42.91						100	108
S17	13	6	Chr			5.47	23.48		8.39									62.66						100	105
S17	13	7	Spl		0.65	34.25	18.88		15.64									30.57						100	104
S17	13	8	Ilm		51.24		46.82	1.21	0.74															100	102
S17	13	9	Chr			20.91	15.65		9.30									54.14						100	104
S17	13	10	Ep	40.52		23.88	10.27			22.33														97	108
S17	13	11	Ep	39.92		24.87	9.30	0.71		22.20														97	109
S17	13	12	Chr			16.43	16.09		11.78									55.70						100	111
S17	13	13	Feohy +	9.28		14.46	70.60	0.44	0.73	1.09			3.02					0.39						100	83
S17	13	14	Grt	39.50		20.94	30.80	1.47	2.04	5.26														100	115
S17	13	15	Amph	58.37		1.02	2.43		23.63	11.14	0.42													97	115
S17	13	16	Spl			42.97	15.19		15.03									26.81						100	105
S17	13	17	Chr			15.17	24.57		10.34									49.92						100	112
S17	13	18	Ep	43.62		20.84	9.68		2.46	18.71	0.41	1.28												97	102
S17	14	1	Chr			18.20	19.76		11.37									50.66						100	108
S17	14	2	Ep	39.98		23.97	10.83			22.22														97	106
S17	14	3	Grt	39.83		21.14	32.15	0.65	5.12	1.12														100	110
S17	14	4	Grt	40.65		21.65	26.12	0.50	7.89	3.18														100	108
S17	14	5	Spl		0.50	31.40	19.67		14.18									34.25						100	104
S17	14	6	Feohy +	7.36	0.51	13.01	71.19		0.76	0.79			2.33					0.84					3.20	100	63
S17	14	7	Ap +	7.39		3.29	0.48		0.64	42.70	0.93	0.87	32.50	1.55	9.66									100	110
S17	14	8	Ep	40.26		26.20	7.77			22.77														97	106
S17	14	9	Chr			12.89	19.89		10.09								0.39	56.74						100	104
S17	14	10	Chr			13.61	19.27		10.30								0.36	56.47						100	103
S17	14	11	Chr			14.96	22.35		10.14									52.55						100	108
S17	14	12	Chr		1.11	26.98	20.77		15.28									35.86						100	112
S17	14	13	Grt	39.17		20.51	23.68	9.93	1.00	5.70														100	116
S17	14	14	Chr			8.52	19.16		8.80								0.34	63.17						100	113
S17	14	15	Spl			30.44	16.05		14.00									39.51						100	112
S17	14	16	Grt	39.49		21.04	30.74	1.92	3.77	3.03														100	112
S17	14	17	Grt	39.21		21.03	31.43	1.56	1.50	5.27														100	109
S17	14	18	TiO2		99.61		0.39																	100	100

Table B9.2: EDS analyses of sample 17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S17	14	19	Qz	96.28		2.09	0.83		0.36			0.44												100	112
S17	14	20	Ep	40.07		23.08	11.35			22.50														97	108
S17	14	21	Chr		0.39	25.22	23.99		11.88								0.42	38.11						100	108
S17	15	1	Chr			11.85	24.41		8.90									54.84						100	106
S17	15	2	Chr			17.59	24.93		10.14									47.34						100	104
S17	15	3	Chr			26.38	18.03		14.16									41.43						100	107
S17	15	4	Spl			29.07	18.05		14.93									37.95						100	106
S17	15	5	Chr			9.22	21.40		8.76									60.62						100	102
S17	15	6	Chr		0.68	16.05	31.72		8.64									42.90						100	103
S17	15	7	Ap							50.15			45.16		4.69									100	117
S17	15	8	Ep	39.05		20.40	14.22	4.93	0.80	17.61														97	113
S17	15	9	Spl			37.60	17.36		15.12									29.91						100	110
S17	15	10	Spl			40.88	13.91		17.47									27.74						100	110
S17	15	11	Spl			32.88	17.11		14.63									35.38						100	110
S17	15	12	Spl			46.71	14.86		18.14									19.95	0.33					100	114
S17	15	13	Mix	9.09		12.24	73.61		0.86	0.81			2.75					0.65						100	83
S17	15	14	Spl			34.20	15.82		15.57									34.41						100	112
S17	15	15	Chr			26.38	19.59		11.52								0.41	42.09						100	111
S17	15	16	Ep	39.38		19.88	14.44	2.36		20.94														97	115
S17	16	1	Zrn	31.09																	68.91			100	119
S17	16	2	Zrn	31.18																	67.47	1.35		100	118
S17	16	3	Grt	39.59		21.06	33.39	0.34	4.49	1.13														100	109
S17	16	4	Spl			44.09	15.23		17.13									23.55						100	105
S17	16	5	Chr			24.57	15.04		14.13									46.26						100	106
S17	16	6	Chr +	18.30	1.35	7.96	13.82		4.09	1.25	1.39	0.26		0.95	17.94			32.68						100	76
S17	16	7	Chr			8.98	30.60		6.83								0.41	53.18						100	105
S17	16	8	Chr			13.87	24.53		9.37									52.24						100	105
S17	16	9	Grt	40.20		21.28	29.27	0.59	5.49	3.17														100	112
S17	16	10	Chr			10.71	21.71		8.49									59.09						100	106
S17	16	11	Grt	42.59		23.87	7.19		3.39	22.97														100	101
S17	16	12	Spl			45.39	13.84		18.29									22.48						100	110
S17	16	13	Chr		1.41	19.88	31.84		8.35								0.59	37.94						100	105
S17	16	14	Ap +	1.79		0.69				44.30	0.79		37.27	0.97	9.99								4.20	100	108
S17	16	15	TiO2		100.00																			100	102
S17	16	16	Cpx	53.52	0.56	2.30	7.57	0.33	17.33	18.07	0.31													100	112
S17	16	17	Grt	39.99		21.45	30.67	0.96	6.07	0.86														100	107

Table B9.2: EDS analyses of sample 17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total	
S17	16	18	Spl			42.02	14.19		17.48									26.31						100	111	
S17	16	19	Chr			26.61	14.11		15.35									43.93						100	112	
S17	16	20	Ep	40.26		26.39	7.49			22.85														97	105	
S17	16	21	Grt	39.55		20.82	30.51	4.26	3.16	1.70														100	109	
S17	16	22	Qz	100.00																				100	116	
S17	17	1	Ap							48.73			44.78		6.49										100	118
S17	17	2	Chr			17.02	20.09		11.06								0.39	51.44							100	106
S17	17	3	Chl +	29.27	0.47	17.36	27.25	0.28	6.00	0.71	0.61	3.06												85	97	
S17	17	4	Chr			13.40	21.27		9.46								0.37	55.51							100	105
S17	17	5	Spl		1.14	28.47	28.11		11.16								0.40	30.72							100	108
S17	17	6	Chr	1.09		9.11	26.30		8.93	0.32								54.24							100	108
S17	17	7	Chr			9.37	25.40		7.91									57.32							100	105
S17	17	8	"Ilm" +		30.13	0.62	67.76		1.50																100	98
S17	17	9	Ap				0.56			49.08			44.91		5.45										100	117
S17	17	10	Grt	41.36		21.85	2.22	0.28		34.28															100	110
S17	17	11	Chr			12.24	19.09		11.15								0.46	57.06							100	104
S17	17	12	Grt	40.44		21.45	27.57	1.03	8.35	1.16															100	112
S17	17	13	Grt	39.83		20.88	30.55	1.66	4.62	2.45															100	113
S17	17	14	Chr			21.56	18.05		11.25									49.14							100	108
S17	17	15	Chr			22.07	19.56		12.10									46.27							100	110
S17	17	16	Chr		0.74	23.92	25.98		10.80									38.55							100	108
S17	17	17	Zrn	31.26																	68.74				100	122
S17	17	18	Spl			37.02	14.20		16.81									31.97							100	114
S17	17	19	Chr		0.34	26.71	25.10		10.68									37.18							100	113
S17	17	20	Zrn	30.99																	69.01				100	124
S17	17	21	Grt	38.60	3.30	21.06	23.58	2.70	3.20	7.57															100	115
S17	17	22	Chr		0.61	27.10	23.86		12.53									35.89							100	109
S17	18	1	Ep	40.84		26.59	7.02	0.33		22.22															97	101
S17	18	2	Grt	39.61		21.25	28.73	1.84	3.81	4.76															100	107
S17	18	3	Spl			31.53	13.90		16.29									38.28							100	103
S17	18	4	"Ilm"		64.03		35.97																		100	97
S17	18	5	Ap							48.23	0.95		43.01	0.91	6.91										100	115
S17	18	6	Ap				0.26		0.39	49.06			45.27		2.13	1.31							1.58		100	117
S17	18	7	"Ilm"		58.60	0.89	38.50	0.68	1.33																100	74
S17	18	8	Bt	38.60	1.75	18.14	17.06		10.44		0.46	7.74		1.42					0.39						96	96
S17	18	9	Grt	40.03		21.41	30.59	0.79	5.04	2.14															100	110

Table B9.2: EDS analyses of sample 17.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S17	18	10	Chr		0.85	23.61	23.80		11.12								0.38	40.23						100	103
S17	18	11	Chr			13.72	23.14		8.36									54.79						100	109
S17	18	12	Feohy +	8.42		9.37	77.43		0.81	0.96			2.72			0.29								100	80
S17	18	13	Ep	40.63		27.53	0.37	0.57	3.59	22.24	0.28				1.78									97	107
S17	18	14	Chr			12.71	21.61		10.58									55.10						100	106
S17	18	15	Chr			9.52	15.72		13.15									61.61						100	102
S17	18	16	Spl			50.83	12.27		19.55									17.35						100	114
S17	18	17	Grt	41.06		21.45	25.56	0.31	8.66	2.96														100	110
S17	18	18	Chr		0.41	21.29	22.14		12.23									43.93						100	104
S17	18	19	Chr			12.16	21.55		10.32									55.97						100	103
S17	19	1	Grt	39.98		21.35	27.97	0.67	3.59	6.44														100	107
S17	19	2	Chr			23.55	18.28		12.05									46.12						100	103
S17	19	3	Spl		0.36	33.87	22.16		14.72									28.89						100	105
S17	19	4	TiO2		100.00																			100	106
S17	19	5	Chr			14.62	19.92		10.11									55.35						100	105
S17	19	6	Chr			9.01	25.94		7.77									57.28						100	103
S17	19	7	Spl			30.49	22.20		12.47								0.37	34.47						100	111
S17	19	8	Chr			11.81	19.72		9.56									58.92						100	108
S17	19	9	Chr			16.90	20.24		10.04									52.81						100	108
S17	19	10	Grt	39.91		21.01	28.61	0.36	1.26	8.85														100	114
S17	19	11	Grt	39.30		20.60	27.73	5.52	0.90	5.95														100	107
S17	19	12	Chr			11.65	25.45		8.33									54.58						100	110
S17	19	13	Chr		1.13	15.97	44.75	0.66	4.14								0.40	32.96						100	108
S17	19	14	Amph	53.24	0.29	5.45	7.52		17.63	11.27	1.09							0.50						97	111
S17	19	15	Chr		0.65	23.24	25.23		11.18								0.38	39.32						100	108
S17	19	16	Grt	41.76		21.71	1.91			34.62														100	112
S17	19	17	Grt	41.42		23.93	11.57			23.07														100	103
S17	19	18	Grt	39.32		20.57	21.00	11.56	0.39	7.16														100	104
	Notes																								
	" " = indicates mineral is altered																								
	+ = indicates that other minerals are present																								

B10: SEM-BSE images and EDS mineral analyses for sample S18.



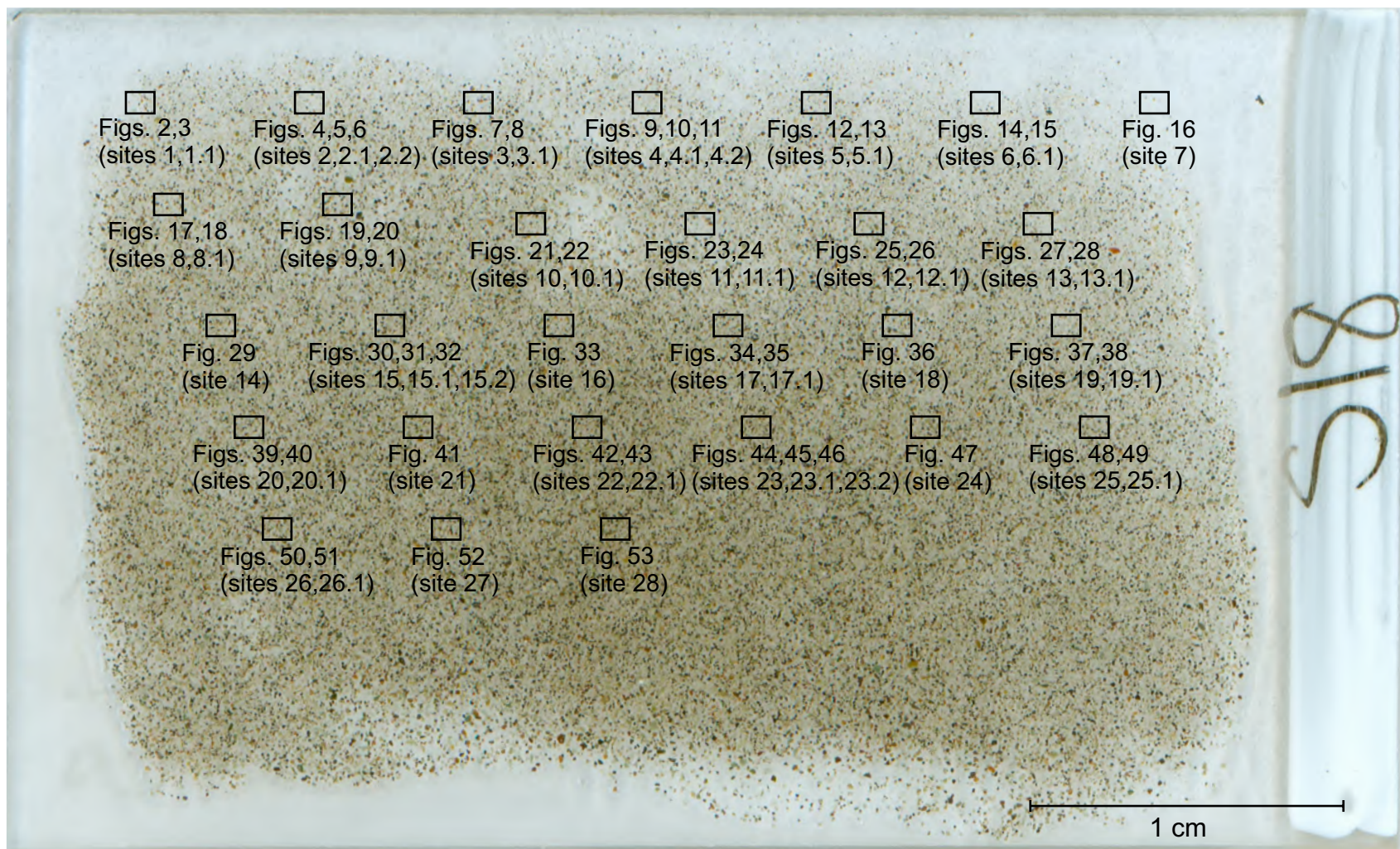


Figure B10.1: Scanned thin section of sample S18 showing the location of analysed sites.

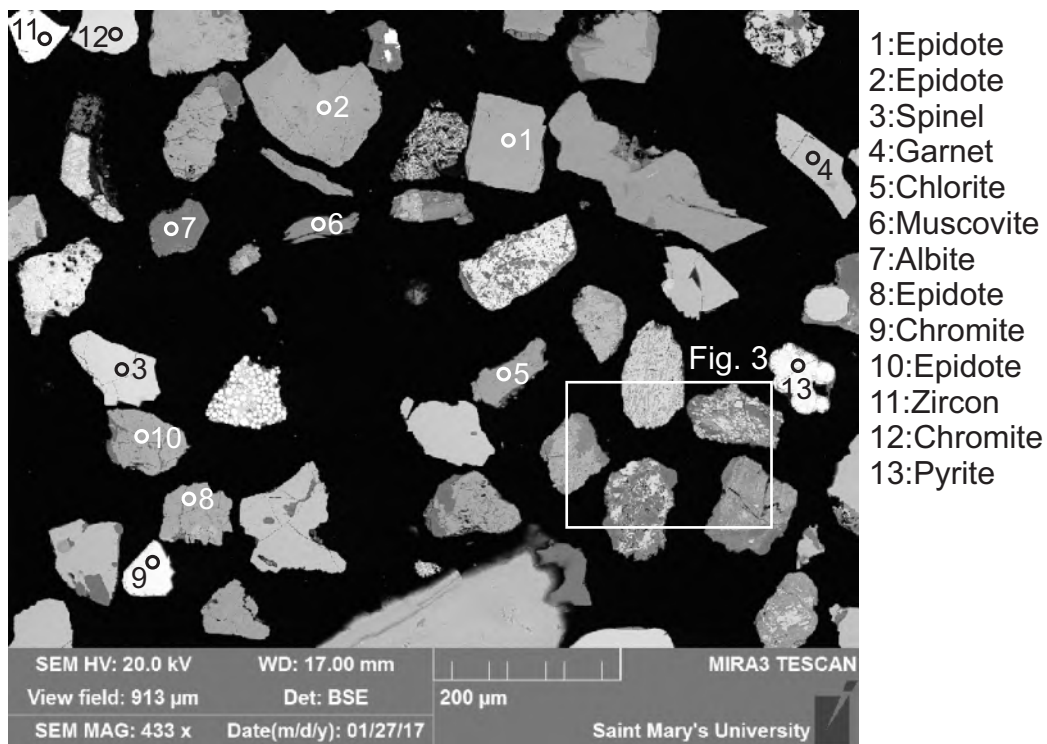


Figure B10.2: Sample S18 site 1 (SEM).

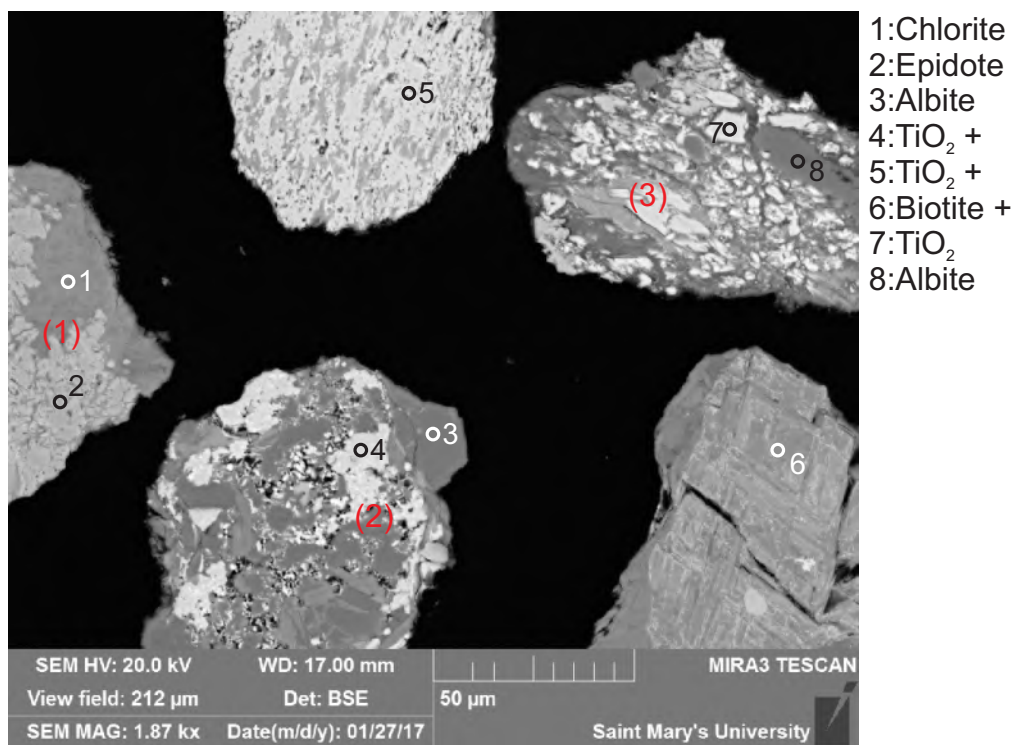


Figure B10.3: Sample S18 site 1.1 (SEM). 1: Lithic clast (chlorite + epidote, hydrothermal). 2: Lithic clast (albite + titania, metamorphic). 3: Lithic clast (albite + titania, metamorphic). Also altered biotite grain and altered ilmenite grain.



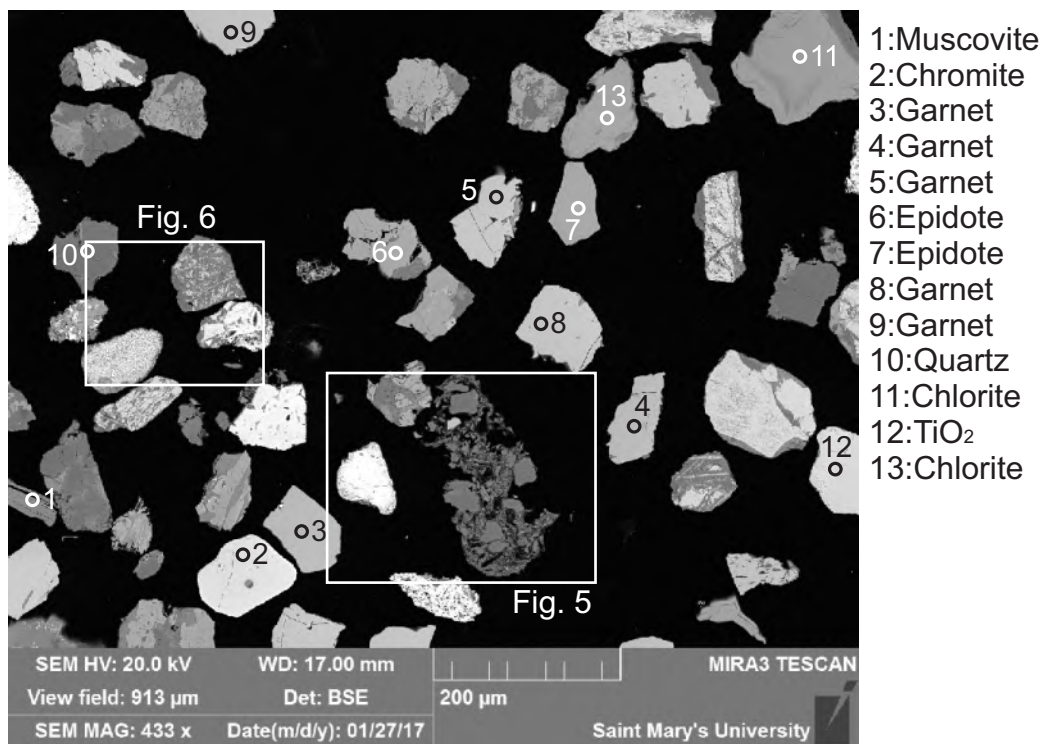


Figure B10.4: Sample S18 site 2 (SEM).

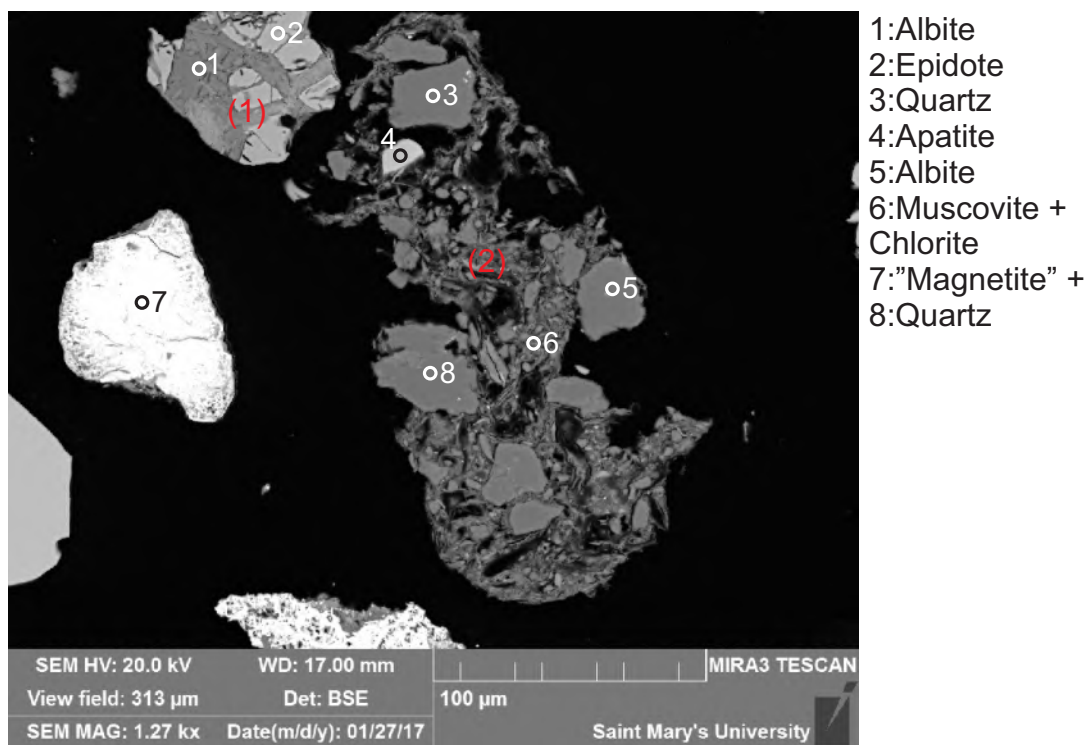
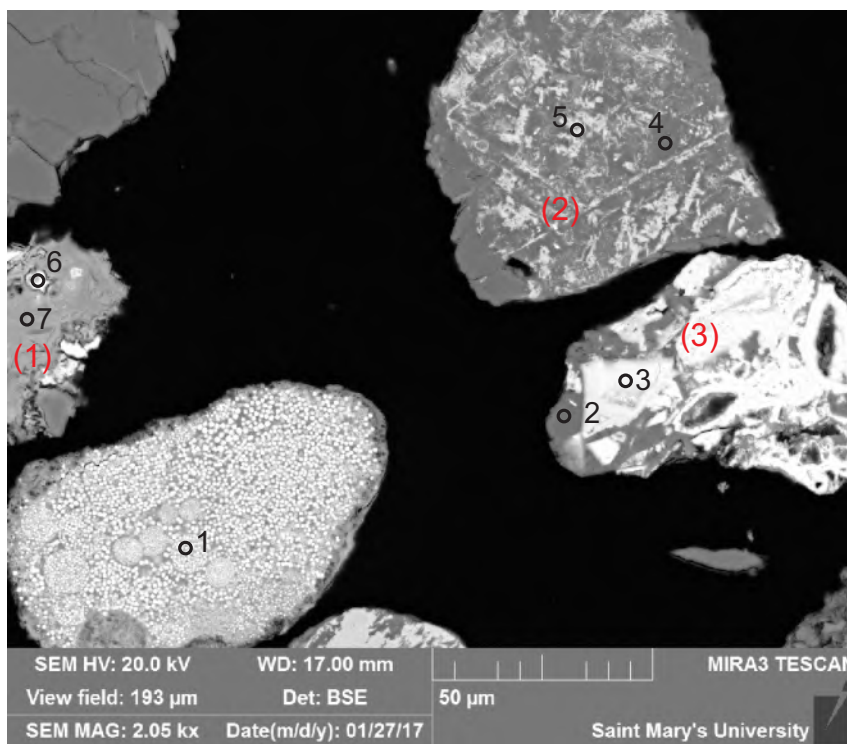
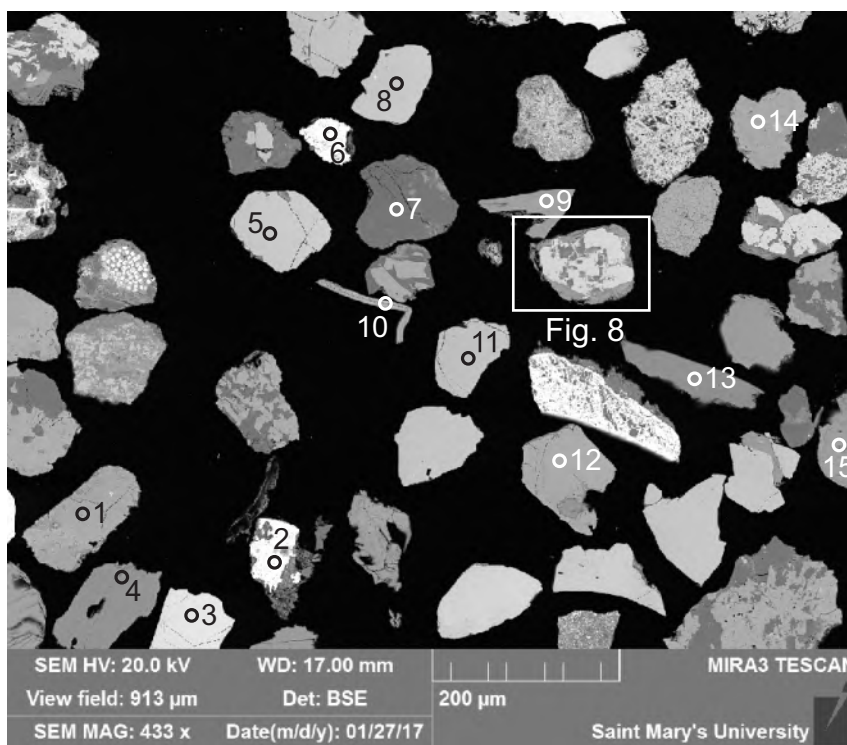


Figure B10.5: Sample S18 site 2.1 (SEM). Lithic clast (albite + epidote, hydrothermal). 2: Lithic clast of quartz + apatite + albite cemented by muscovite + chlorite. Sedimentary. Also altered magnetite grain.



- 1:Pyrite +
- 2:Quartz
- 3:Fe-oxide/hydroxide +
- 4:Quartz
- 5:TiO<sub>2</sub> +
- 6:Pyrite +
- 7:Chlorite +

Figure B10.6: Sample S18 site 2.2 (SEM). 1: Lithic clast (chlorite + pyrite, pyrite nodule in mudstone). 2: Lithic clast (quartz + titania, ?volcanic). 3: Lithic clast (quartz + Fe-oxide/hydroxide, hydrothermal).



- 1:Epidote
- 2:Fe-oxide/hydroxide
- 3:Chromite
- 4:Epidote
- 5:Garnet
- 6:Fe-oxide/hydroxide +
- 7:Quartz
- 8:Garnet
- 9:Clinopyroxene
- 10:Biotite
- 11:Apatite
- 12:Spinel
- 13:Muscovite
- 14:Epidote
- 15:Chlorite +

Figure B10.7: Sample S18 site 3 (SEM).

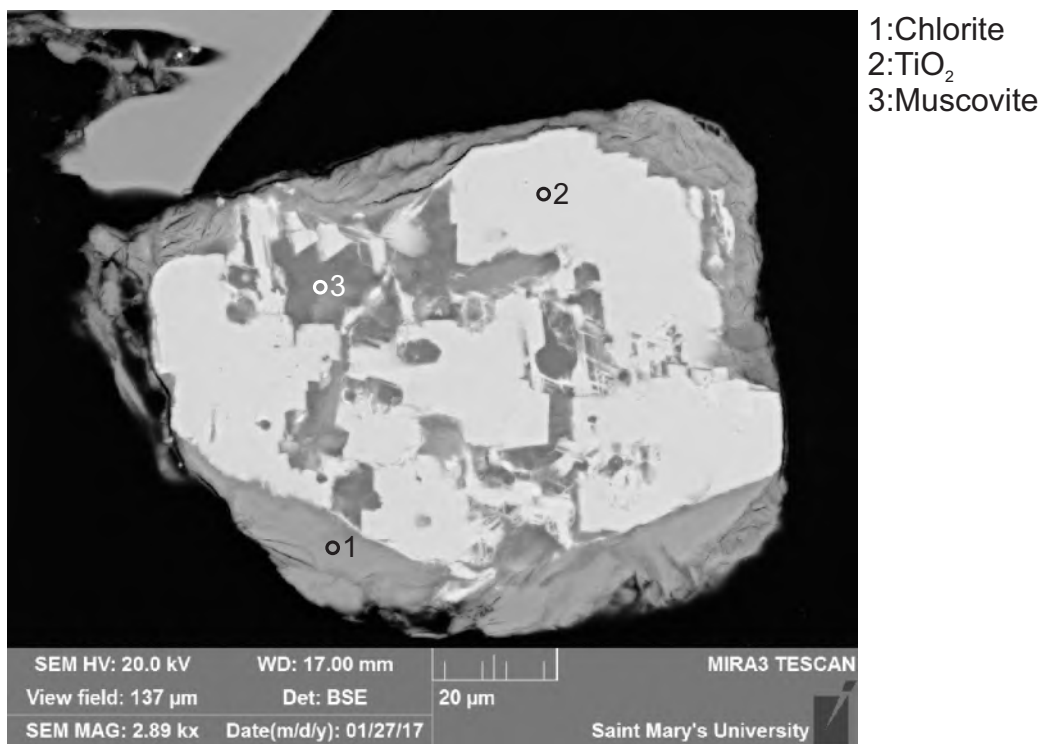


Figure B10.8: Sample S18 site 3.1 (SEM). Lithic clast consists of chlorite + muscovite + titania. Metamorphic.

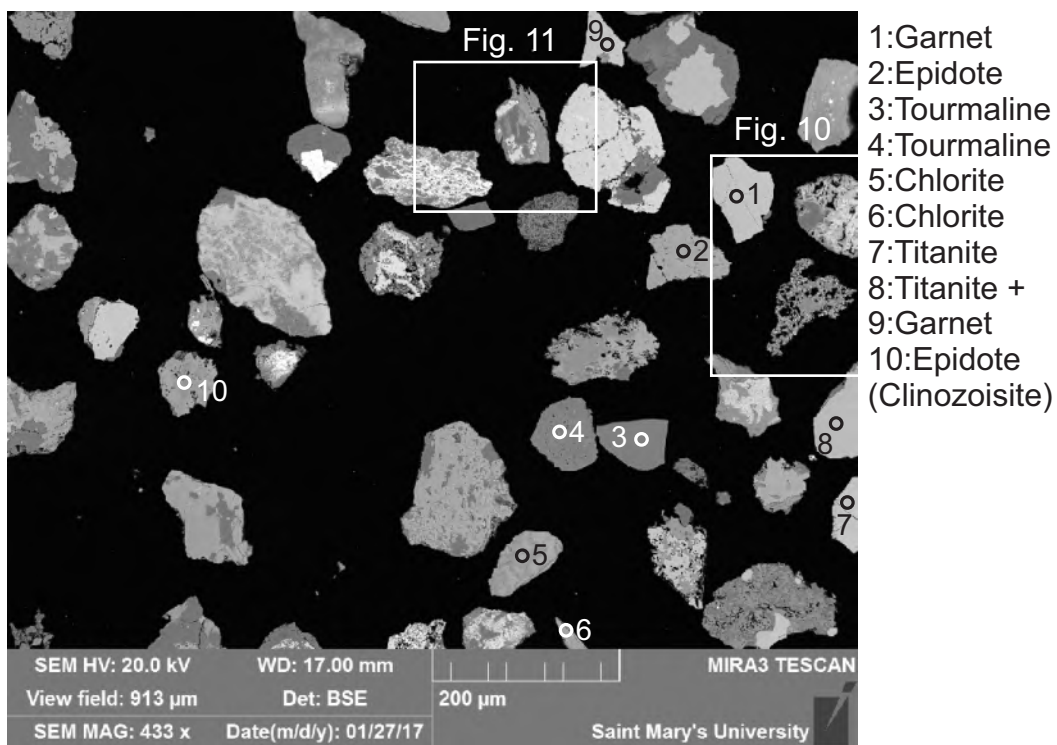
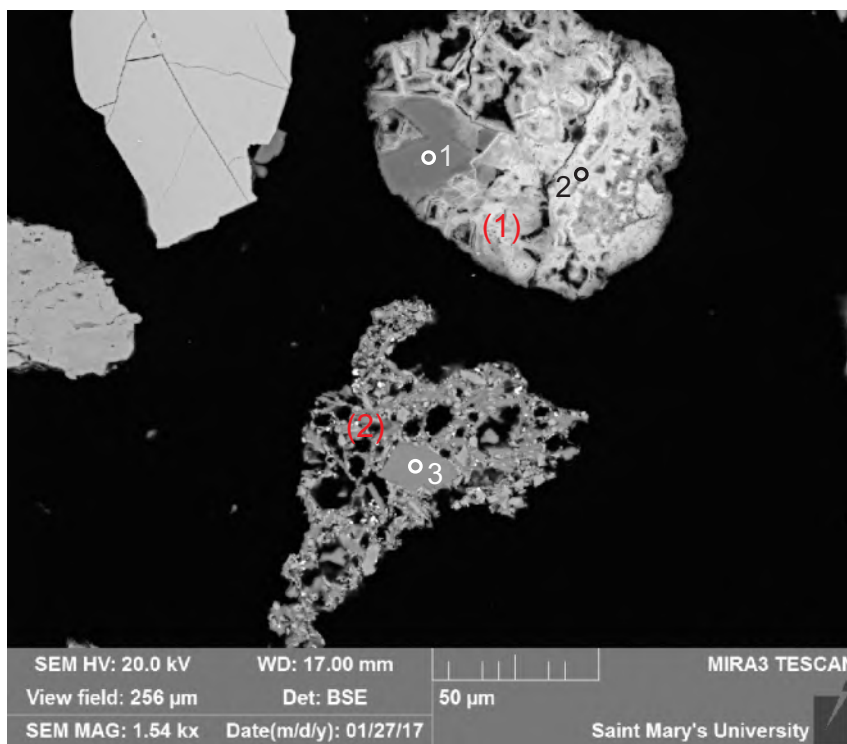


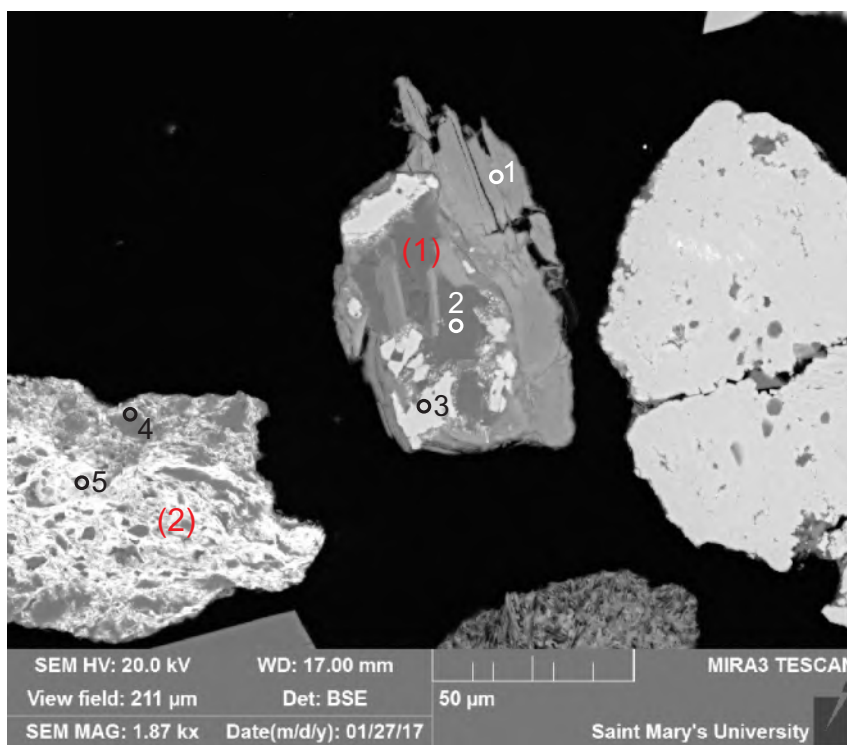
Figure B10.9: Sample S18 site 4 (SEM).





1:Quartz  
2:Fe-  
oxide/hydroxide +  
3:?Plagioclase

Figure B10.10: Sample S18 site 4.1 (SEM). 1: Pedogenic aggregate. 2: Dissolved grain.



1:Chlorite  
2:Quartz  
3:TiO<sub>2</sub>  
4:Quartz +  
5:Mix

Figure B10.11: Sample S18 site 4.2 (SEM). 1: Lithic clast (chlorite + quartz + titania, metamorphic). 2: Lithic clast (quartz + ?Fe-chlorite, probably silty mudstone).

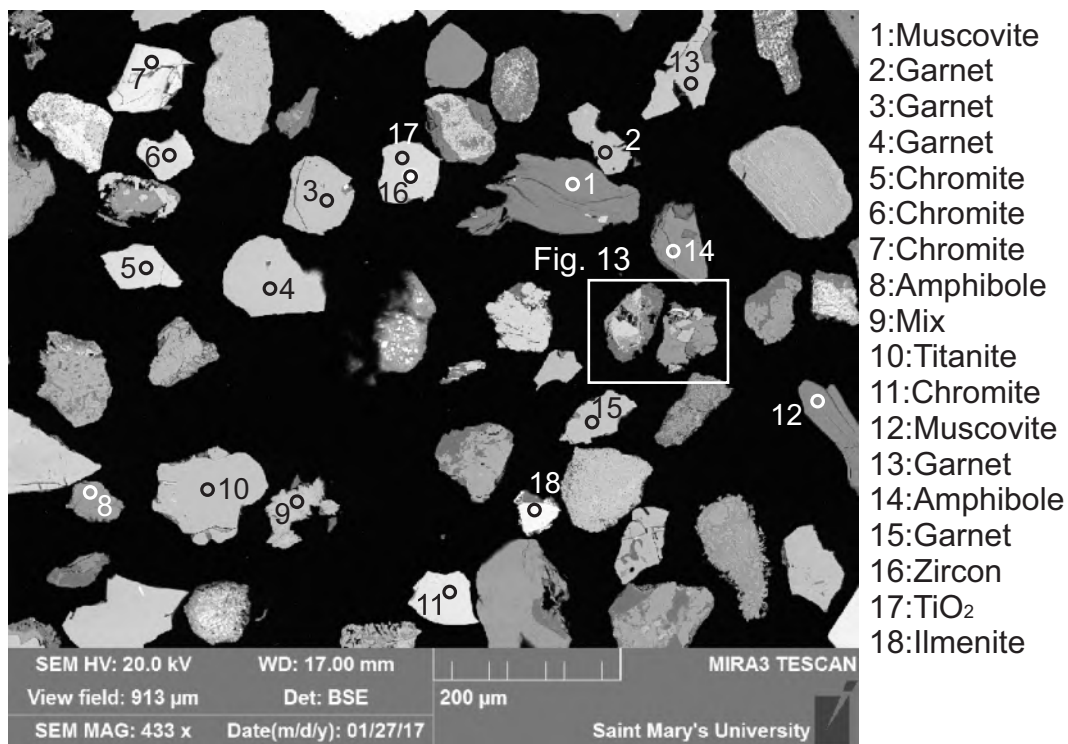


Figure B10.12: Sample S18 site 5 (SEM). This site contains a titania (17) grain with a zircon (16) inclusion.

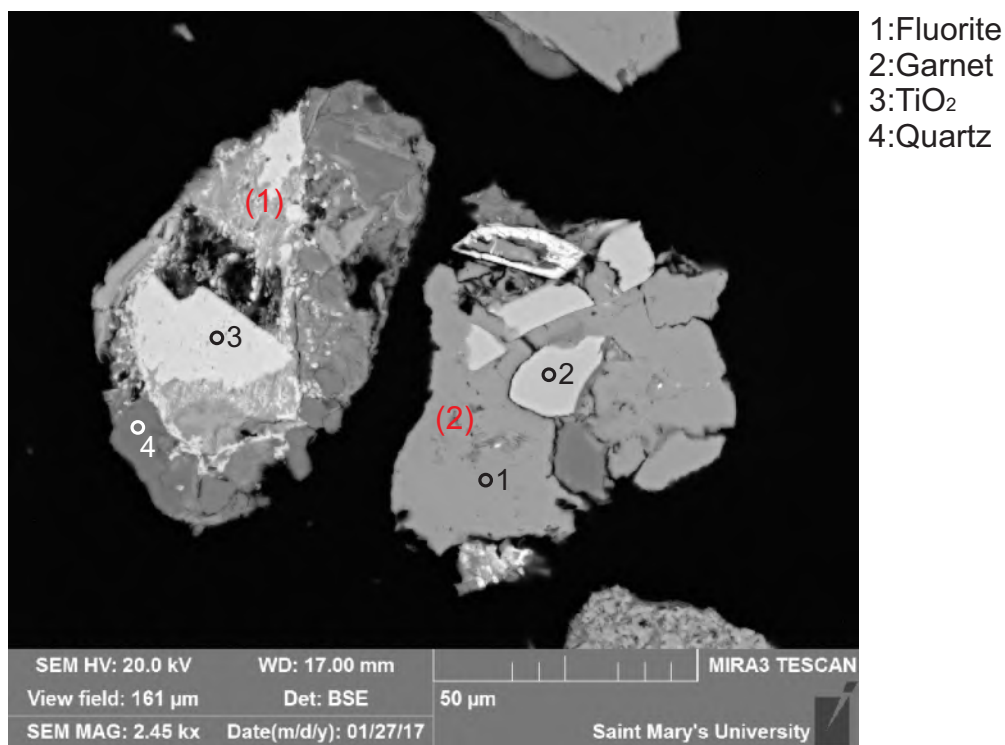


Figure B10.13: Sample S18 site 5.1 (SEM). 1: Altered lithic clast (titania + quartz, metamorphic). 2: Lithic clast (garnet + fluorite, metamorphic).

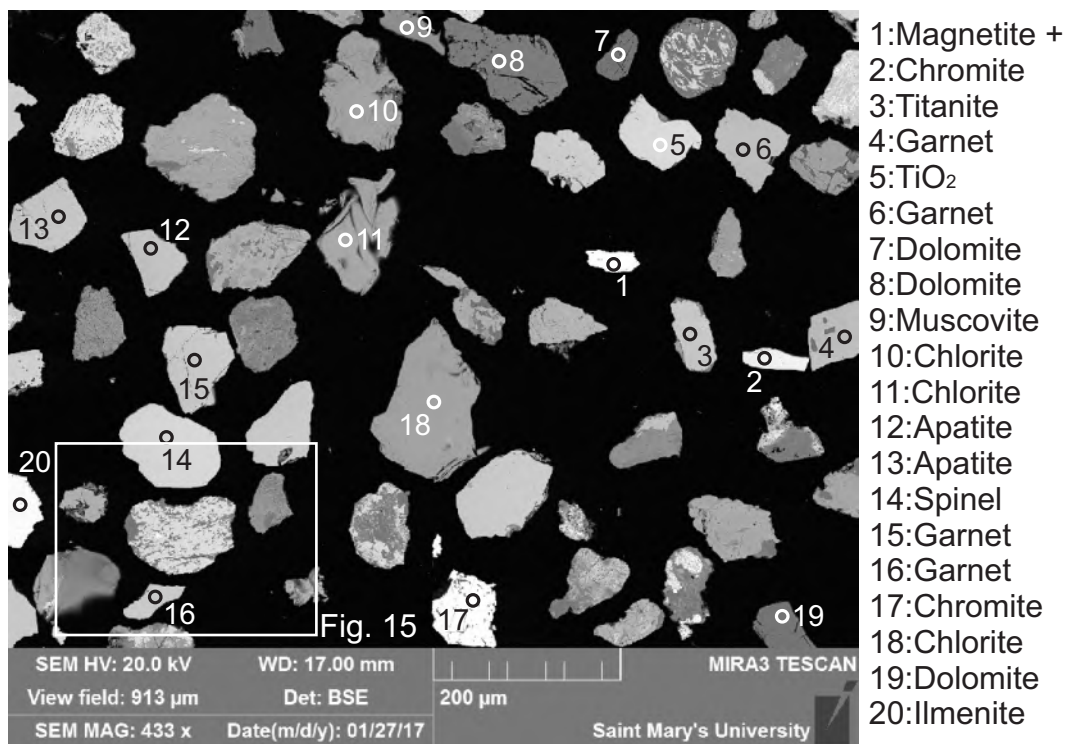


Figure B10.14: Sample S18 site 6 (SEM).

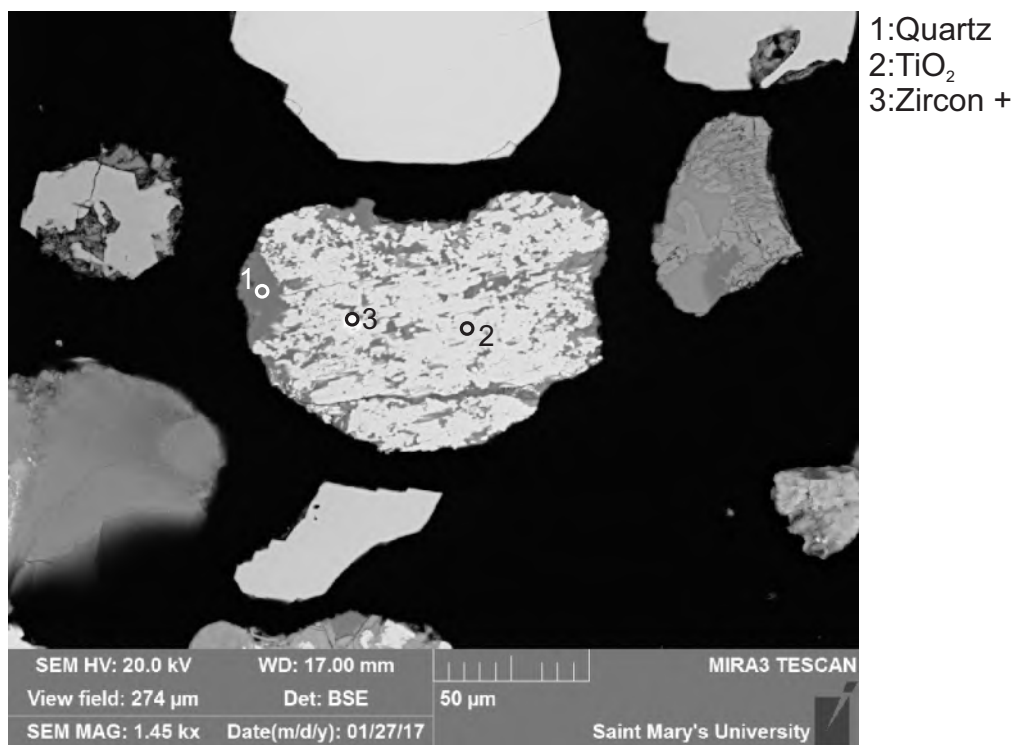


Figure B10.15: Sample S18 site 6.1 This lithic clast consists of quartz + titania, with zircon inclusion. Metamorphic.

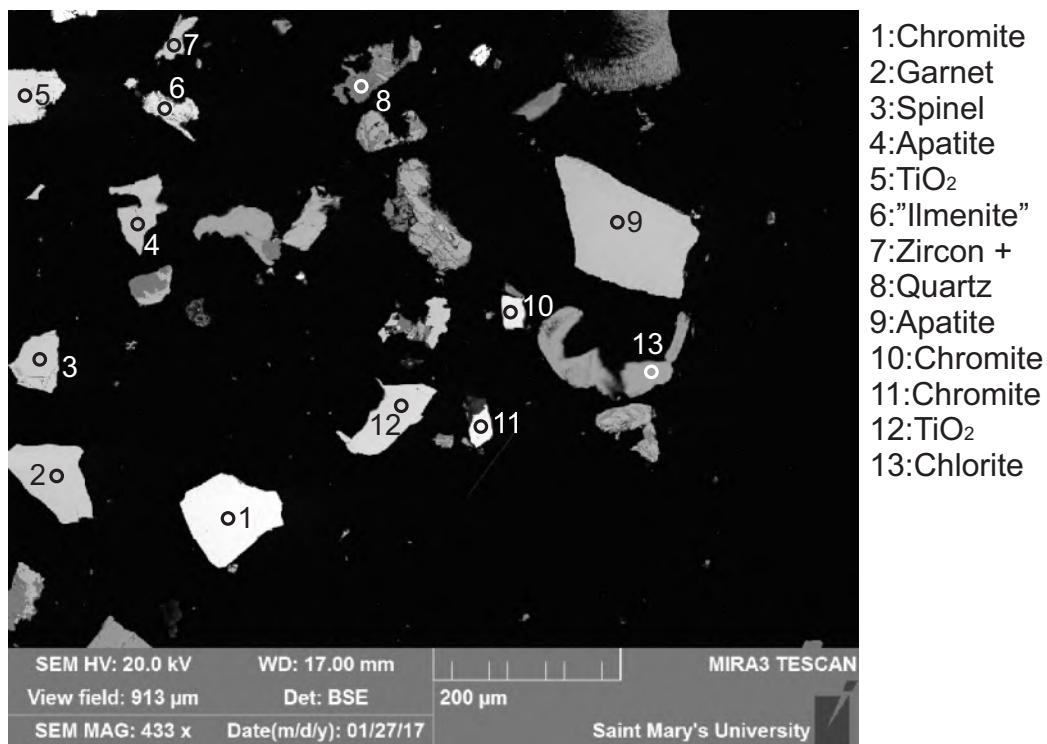


Figure B10.16: Sample S18 site 7 (SEM).

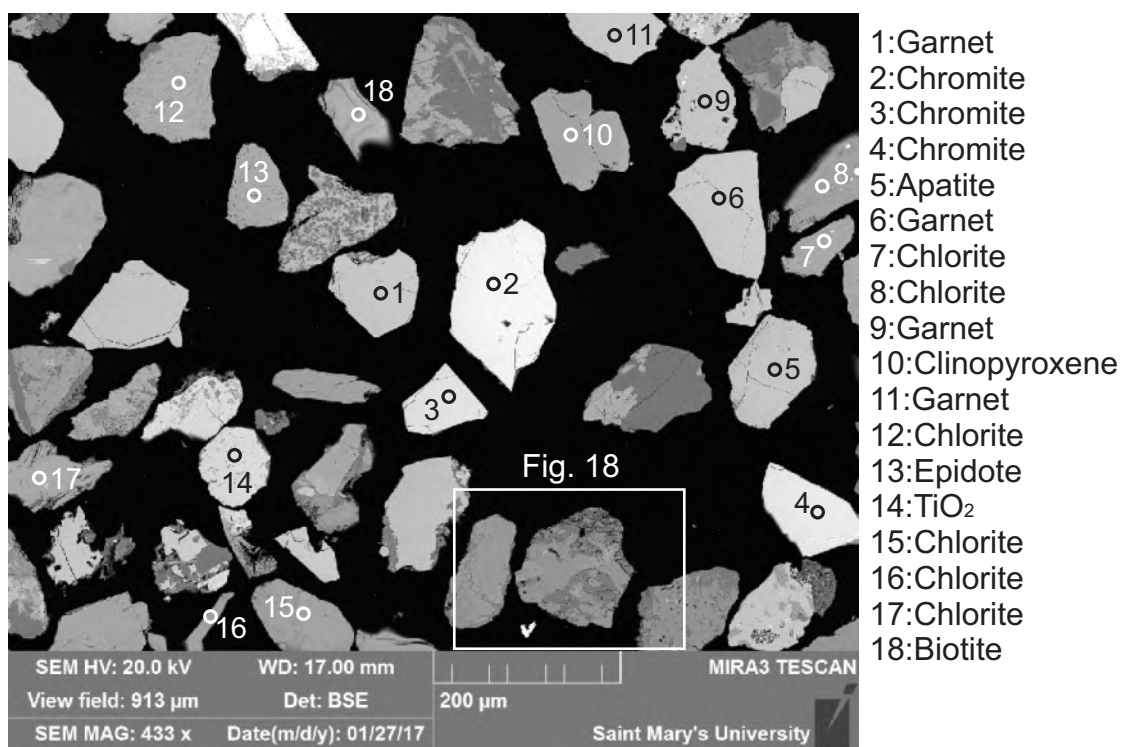
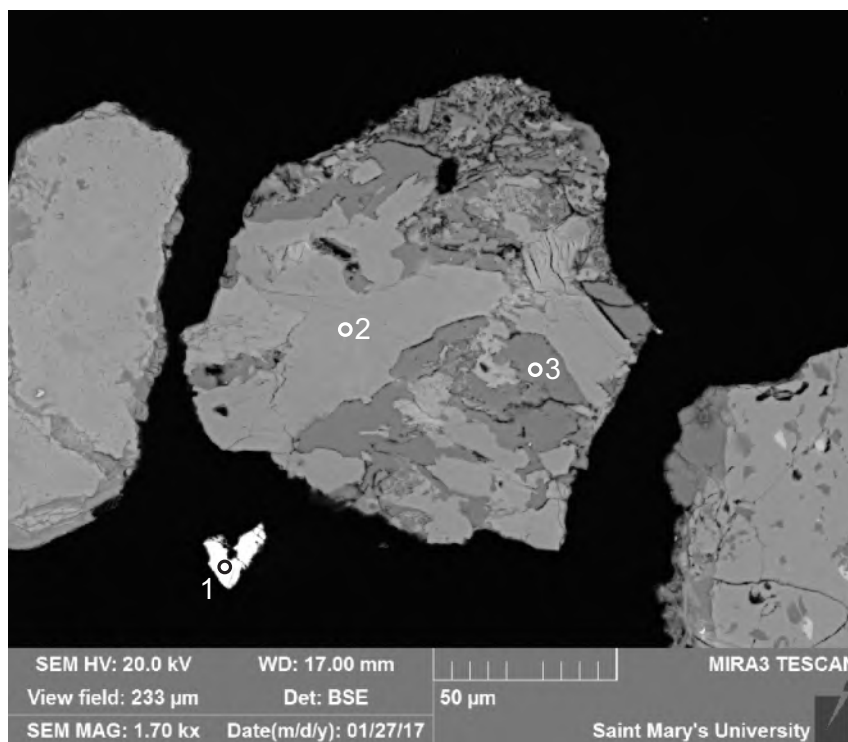


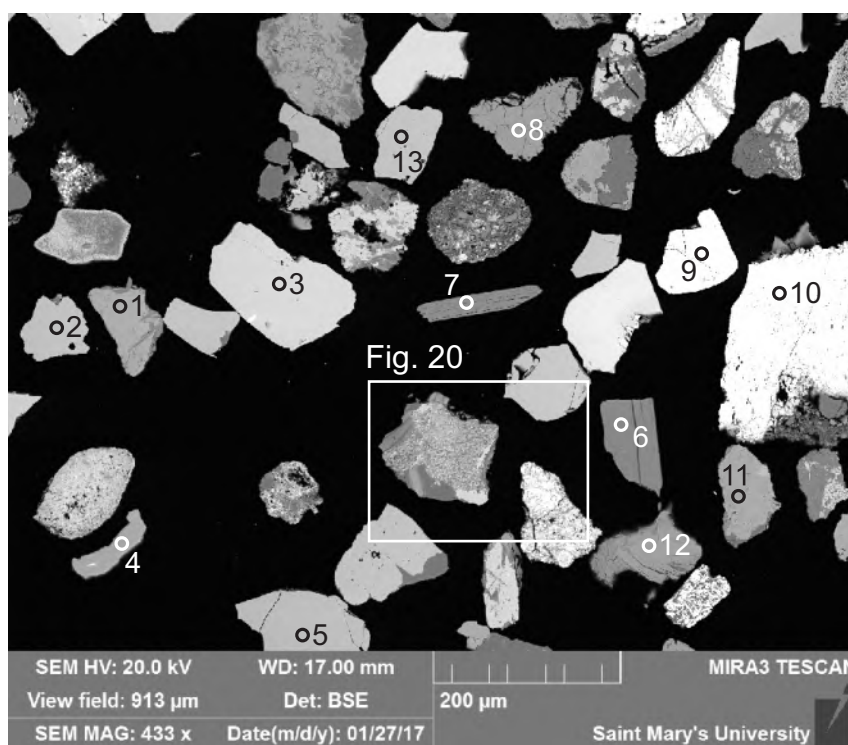
Figure B10.17: Sample S18 site 8 (SEM).





- 1:Sphalerite
- 2:Epidote
- 3:Albite

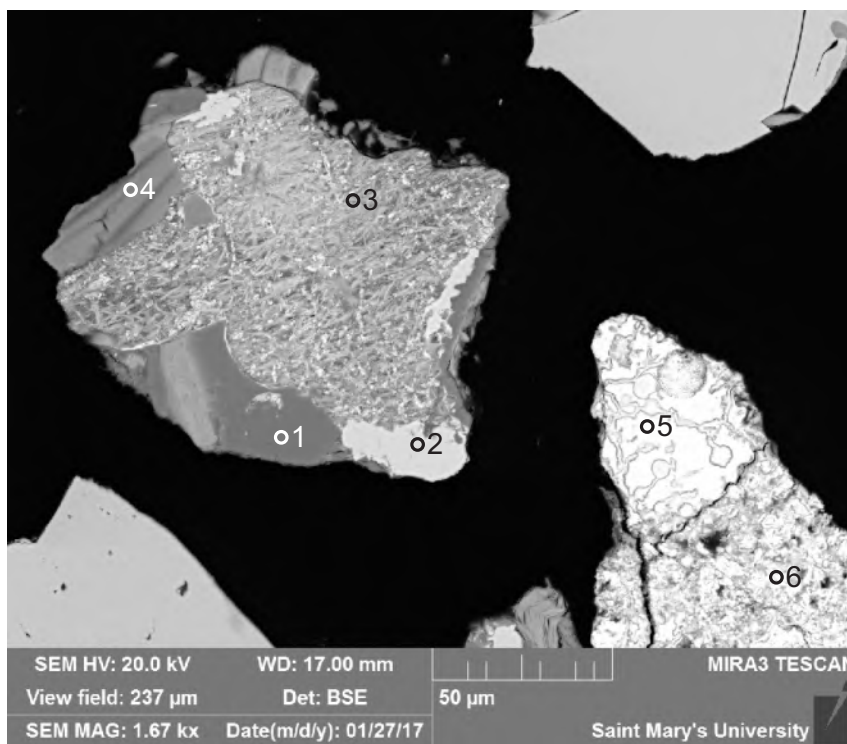
Figure B10.18: Sample S18 site 8.1 (SEM). This lithic clast consists of epidote + albite, hydrothermal.



- 1:Chlorite
- 2:?
- 3:TiO<sub>2</sub>
- 4:Chlorite
- 5:Garnet
- 6:Muscovite
- 7:Muscovite
- 8:Fluorite
- 9:Zircon
- 10:Magnetite
- 11:Epidote
- 12:Chlorite
- 13:Garnet

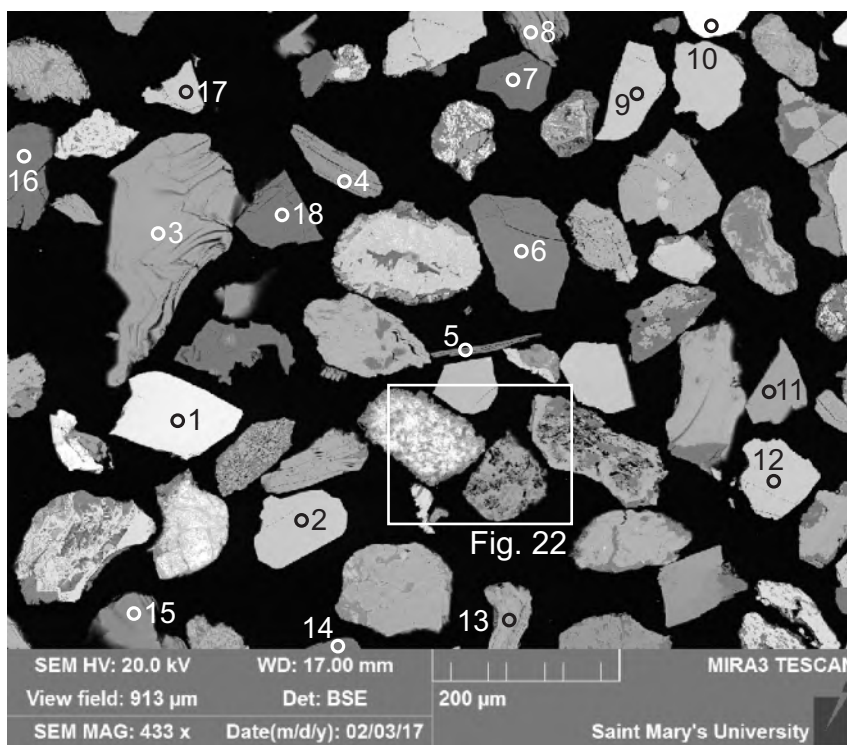
Figure B10.19: Sample S18 site 9 (SEM).





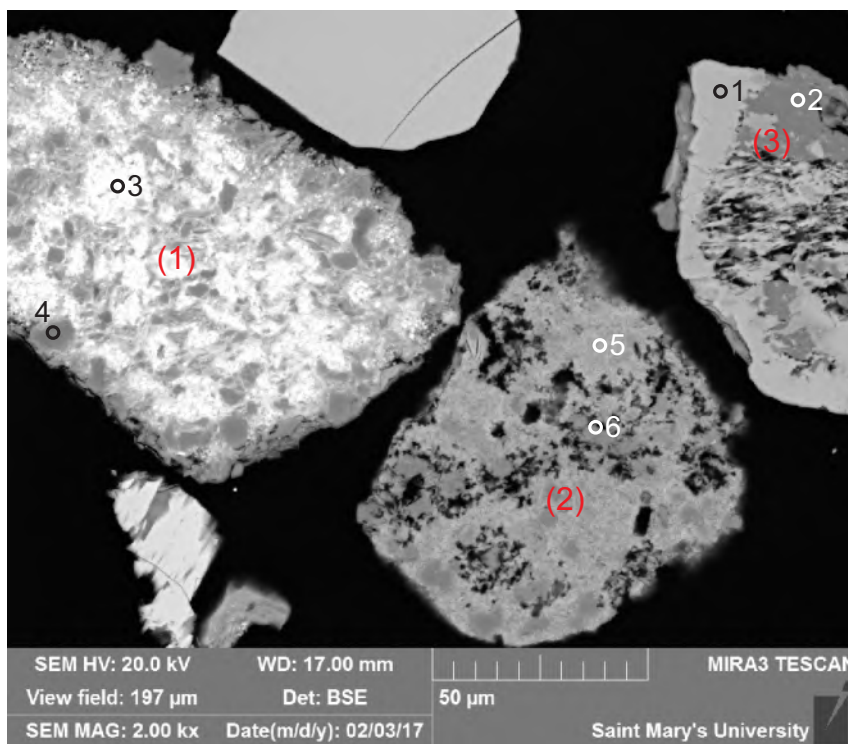
- 1:Quartz
- 2:TiO<sub>2</sub>
- 3:TiO<sub>2</sub> + Chlorite
- 4:Muscovite
- 5:"Magnetite" +
- 6:Fe-oxide/hydroxide +

Figure B10.20: Sample S18 site 9.1 (SEM). This lithic clast consists of quartz + muscovite + titania + chlorite, retrograde metamorphic.



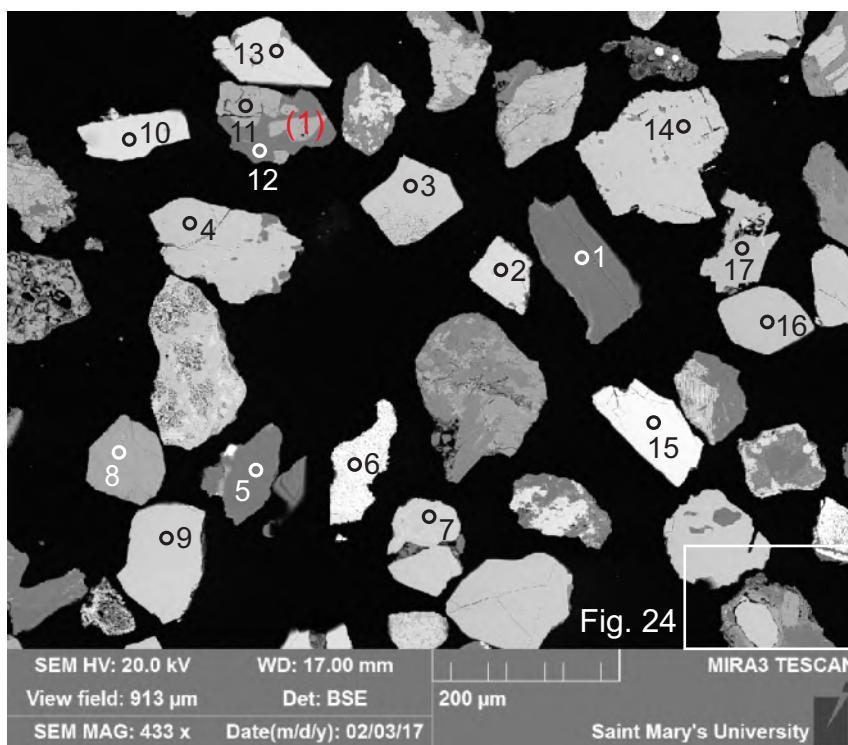
- 1:Chromite
- 2:Garnet
- 3:Chlorite
- 4:Muscovite
- 5:Muscovite
- 6:Tourmaline
- 7:Dolomite
- 8:Chlorite
- 9:Garnet
- 10:Zircon
- 11:Amphibole
- 12:Garnet
- 13:Chlorite
- 14:Paragonite
- 15:Muscovite
- 16:Dolomite
- 17:Garnet
- 18:Dolomite

Figure B10.21: Sample S18 site 10 (SEM).



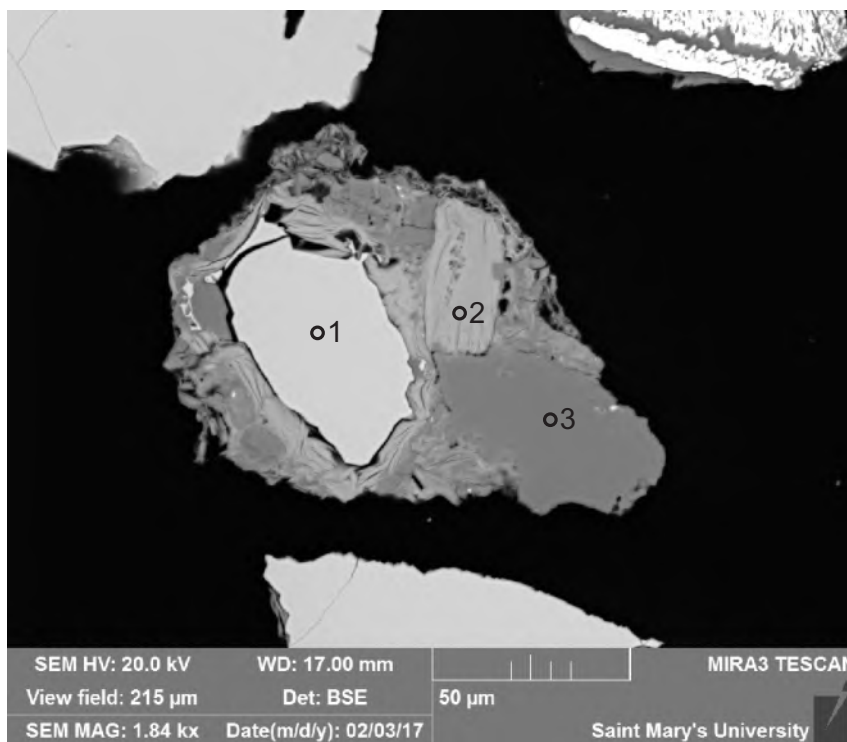
- 1:Epidote
- 2:Albite
- 3:"Magnetite" +
- 4:Kaolinite +
- 5:Apatite +
- 6:Quartz + Chlorite + Apatite

Figure B10.22: Sample S18 site 10.1 (SEM). 1: Lithic clast (kaolinite + magnetite, cf. Fig. B3.13, probably pedogenic). 2: Lithic clast (apatite + quartz, probably sedimentary). 3: Dissolved lithic clast (epidote + albite, hydrothermal).



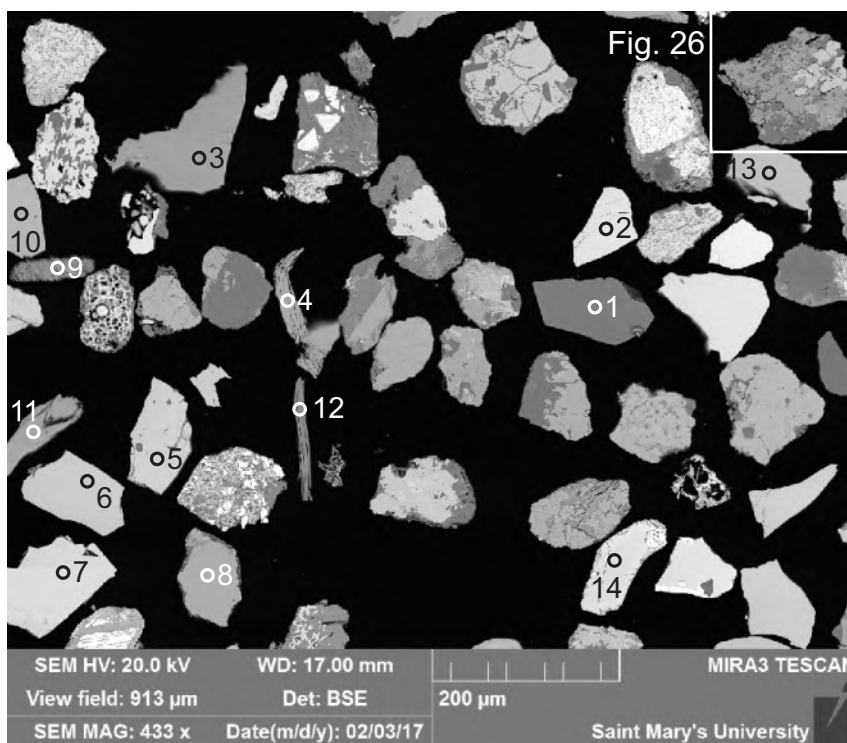
- 1:Paragonite
- 2:TiO<sub>2</sub>
- 3:Garnet
- 4:Titanite
- 5:Quartz
- 6:Chromite +
- 7:Apatite
- 8:Epidote
- 9:Garnet
- 10:TiO<sub>2</sub>
- 11:Epidote
- 12:Quartz
- 13:TiO<sub>2</sub> +
- 14:Garnet
- 15:Chromite
- 16:Apatite
- 17:Titanite

Figure B10.23: Sample S18 site 11 (SEM). 1: Lithic clast (epidote + quartz, hydrothermal).



- 1:Garnet
- 2:Chlorite
- 3:Quartz

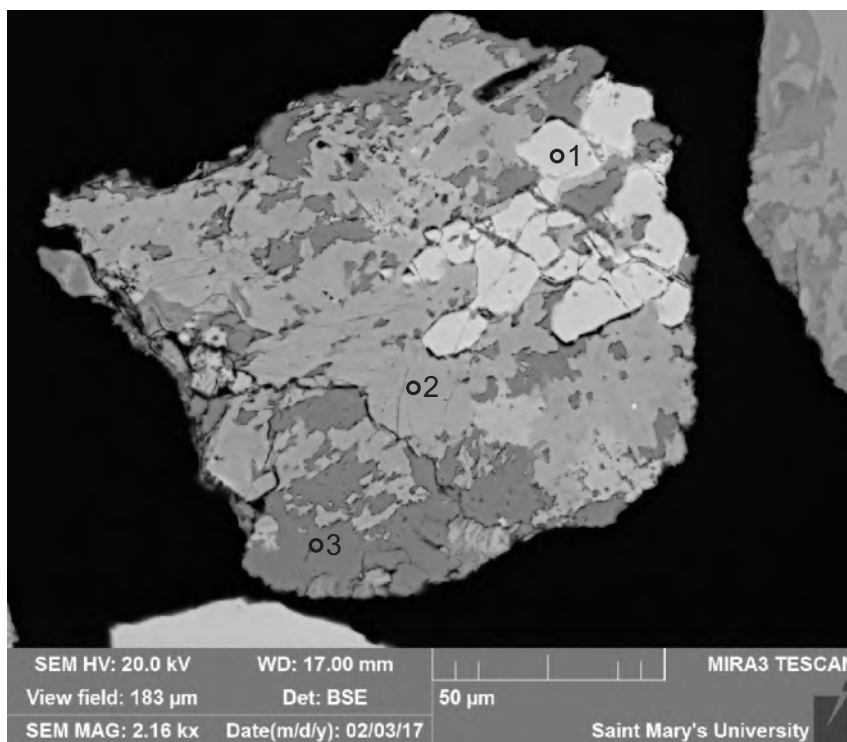
Figure B10.24: Sample S18 site 11.1 (SEM). This lithic clast consists of garnet + chlorite + quartz that are cemented together probably by ?micas/clays. Metamorphic.



- 1:Tourmaline
- 2:Chromite
- 3:Chlorite
- 4:Chlorite
- 5:Garnet
- 6:Garnet
- 7:Spinel
- 8:Amphibole
- 9:Fluorite
- 10:Epidote
- 11:Chlorite
- 12:Muscovite
- 13:Garnet
- 14:Chromite

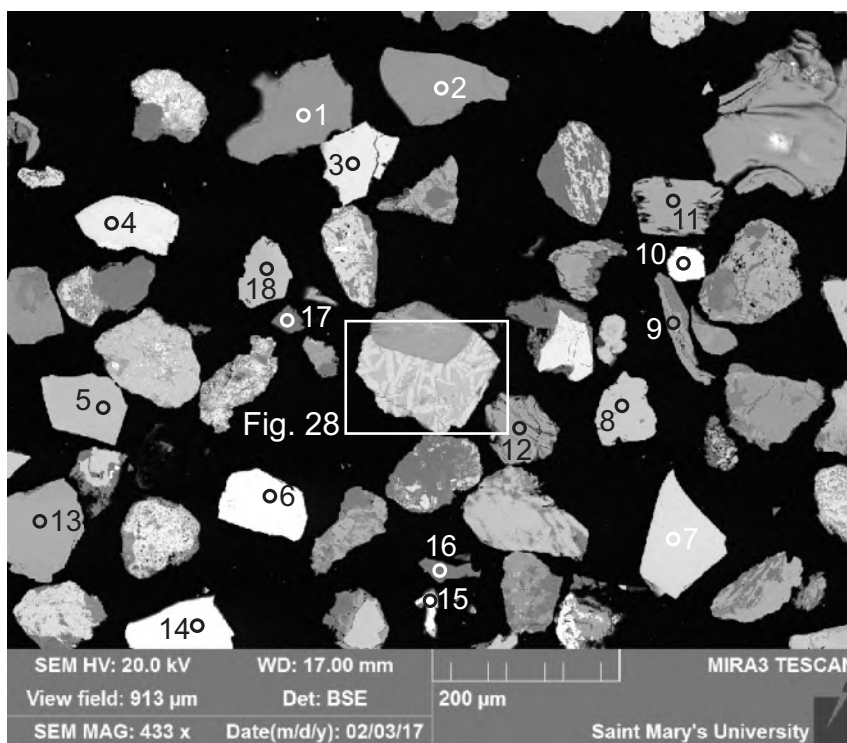
Figure B10.25: Sample S18 site 12 (SEM).





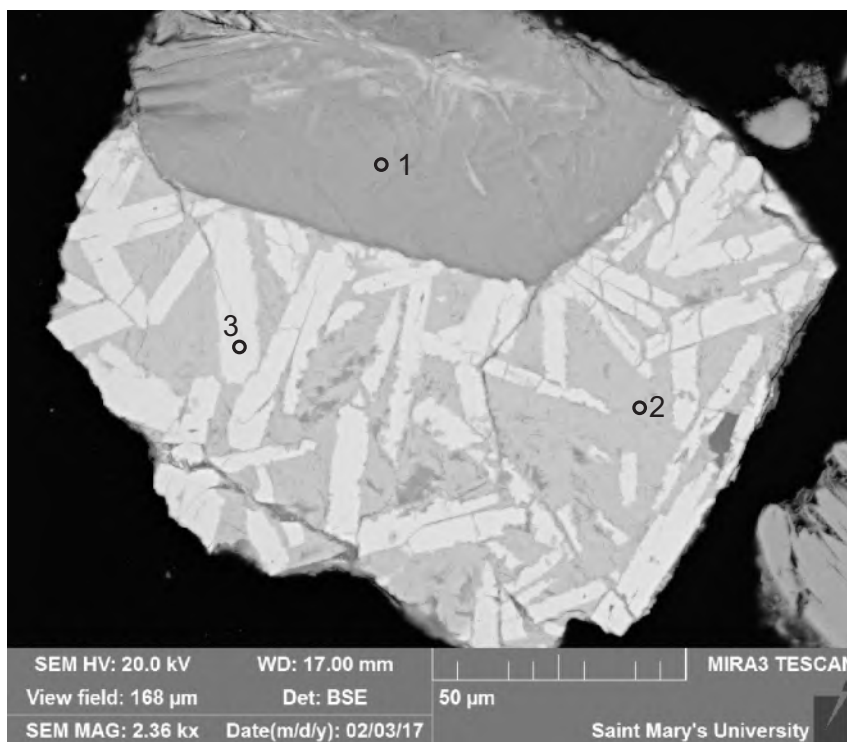
- 1: Titanite
- 2: Epidote
- 3: Albite

Figure B10.26: Sample S18 site 12.1 (SEM). This lithic clast consists of titanite + epidote + albite, hydrothermal.



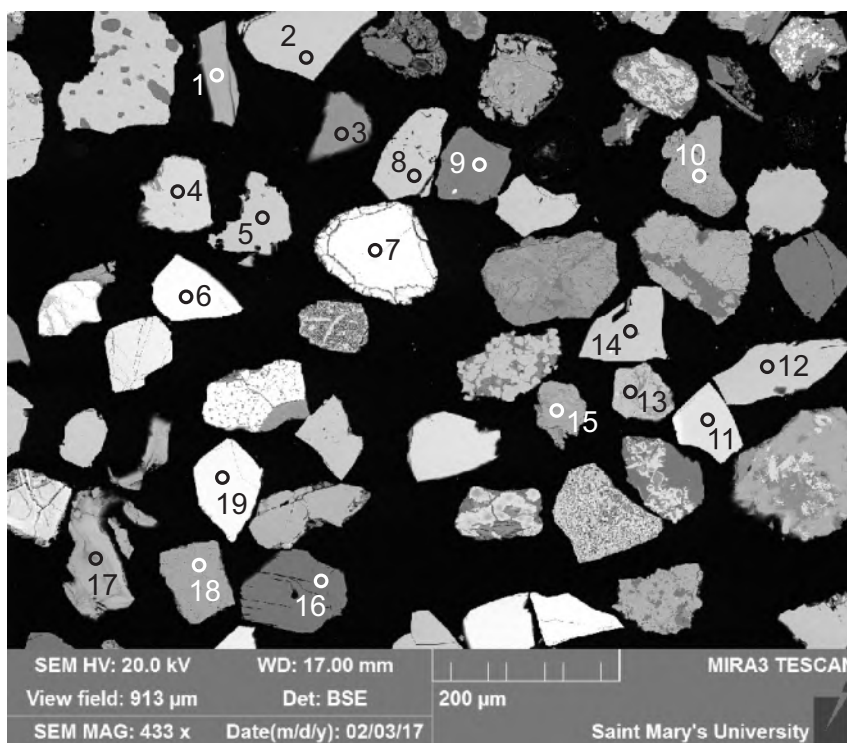
- 1: Muscovite
- 2: Muscovite
- 3: Chromite
- 4: Chromite
- 5: Apatite +
- 6: Zircon
- 7: Chromite
- 8: Garnet
- 9: Chlorite
- 10: Zircon
- 11: Amphibole
- 12: Chlorite
- 13: Epidote
- 14: Fe-oxide/hydroxide
- 15: Chromite
- 16: Tourmaline
- 17: Dolomite
- 18: Garnet

Figure B10.27: Sample S18 site 13 (SEM).



- 1:Chlorite
- 2:Titanite
- 3:TiO<sub>2</sub>

Figure B10.28: Sample S18 site 13.1 (SEM). This lithic clast consists of titanite with titania laths and a chlorite grain, metamorphic.



- 1:Chlorite
- 2:Garnet
- 3:Muscovite
- 4:TiO<sub>2</sub>
- 5:Garnet
- 6:Chromite
- 7:Pyrite
- 8:Garnet
- 9:Tourmaline
- 10:Epidote
- 11:Chromite
- 12:Garnet
- 13:Titanite
- 14:Garnet
- 15:Chlorite
- 16:Dolomite
- 17:Chlorite
- 18:Epidote
- 19:Chromite

Figure B10.29: Sample S18 site 14 (SEM).



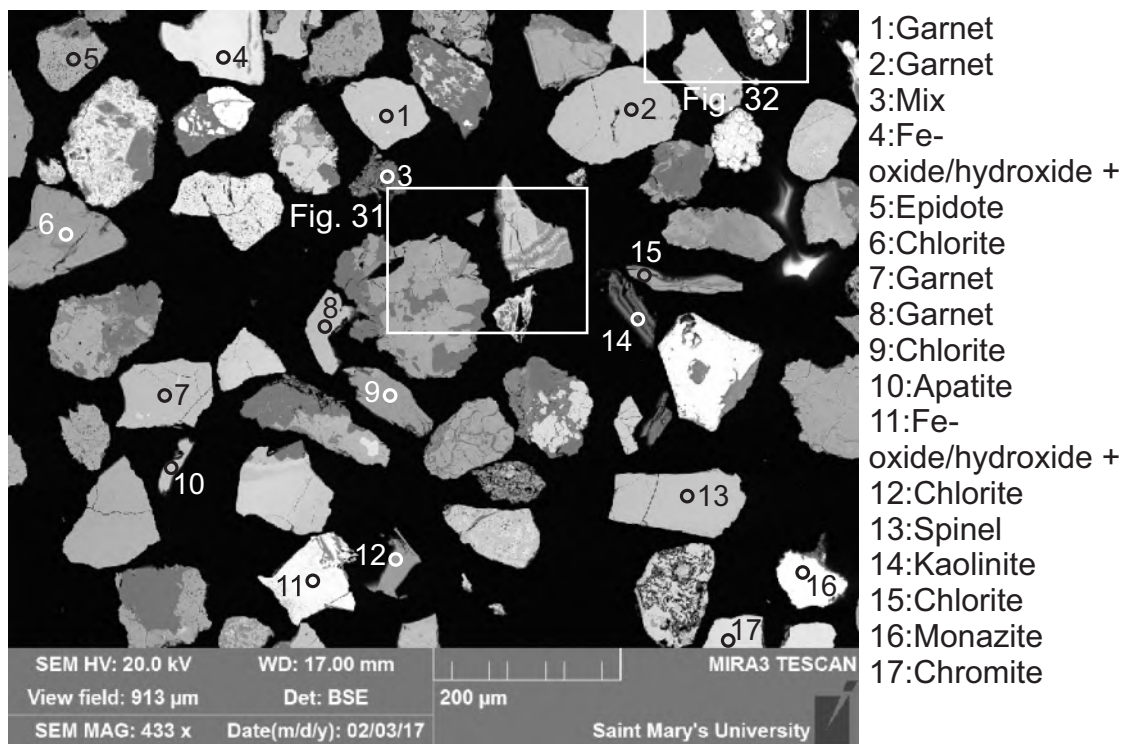


Figure B10.30: Sample S18 site 15 (SEM).

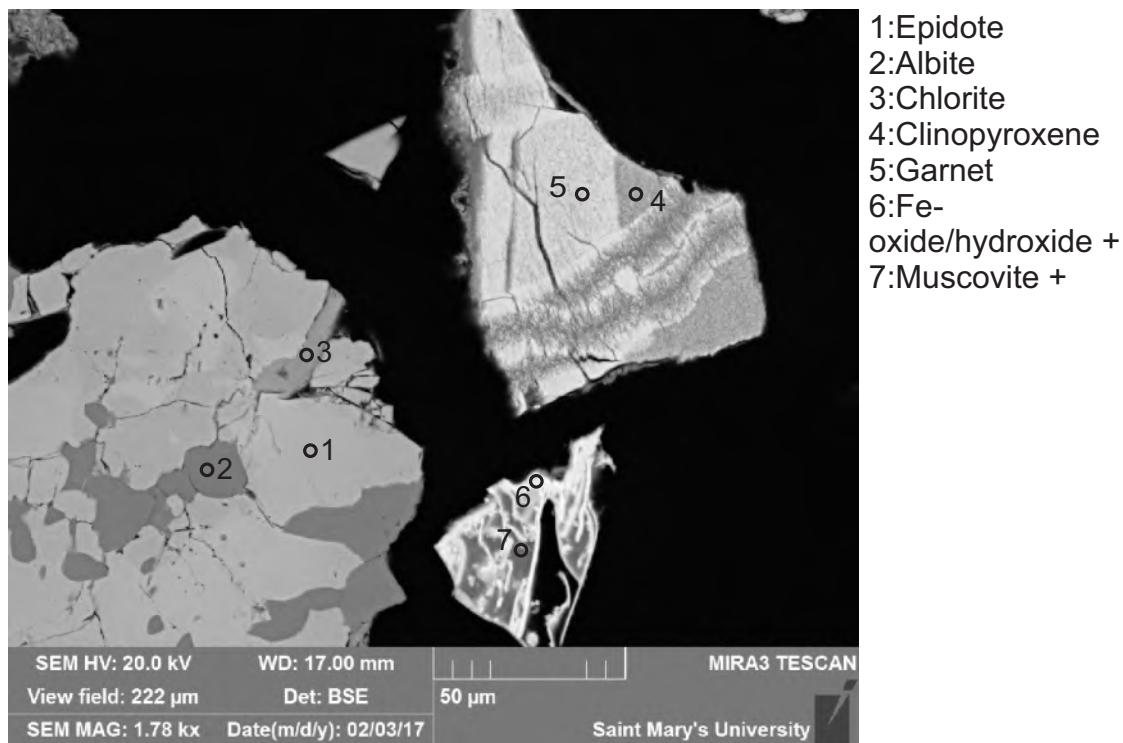
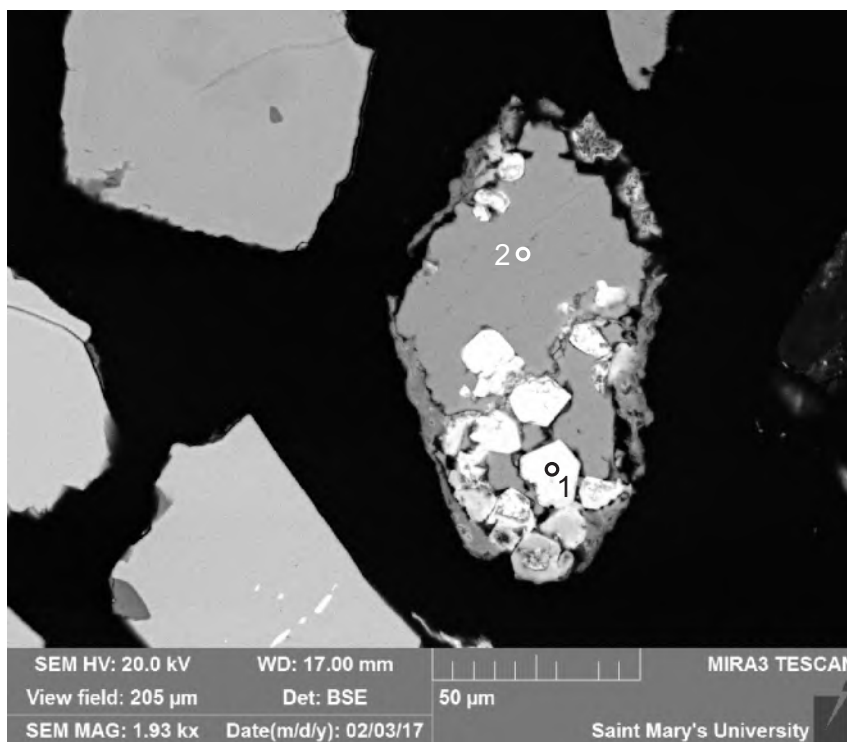
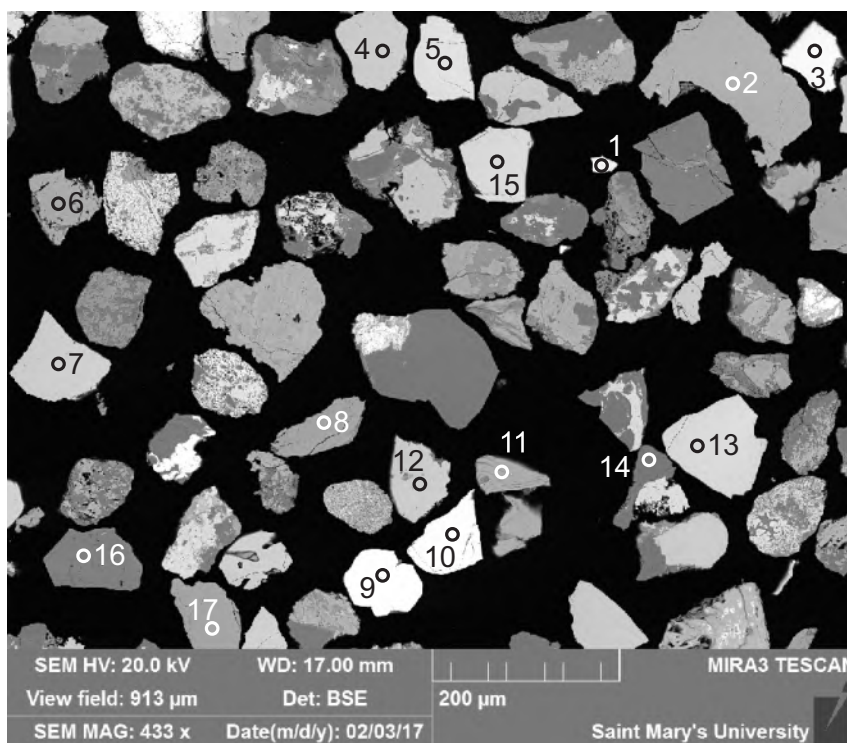


Figure B10.31: Sample S18 site 15.1 (SEM). This lithic clast consists of epidote + albite + chlorite, hydrothermal. There is also a lithic clast of garnet + clinopyroxene, cut by a late vein (not analyzed), metaophiolite.



- 1:"Magnetite: +
- 2:Fluorite

Figure B10.32: Sample S18 site 15.2 (SEM). This lithic clast consists of fluorite with late magnetite grains filling porosity. Hydrothermal.



- 1:Chromite
- 2:Garnet
- 3:Chromite
- 4:Garnet
- 5:Chromite
- 6:Epidote
- 7:Garnet
- 8:Chlorite
- 9:Magnetite +
- 10:Chromite
- 11:Chlorite
- 12:Garnet
- 13:Chromite
- 14:Quartz
- 15:Chromite
- 16:Tourmaline
- 17:Amphibole

Figure B10.33: Sample S18 site 16 (SEM).

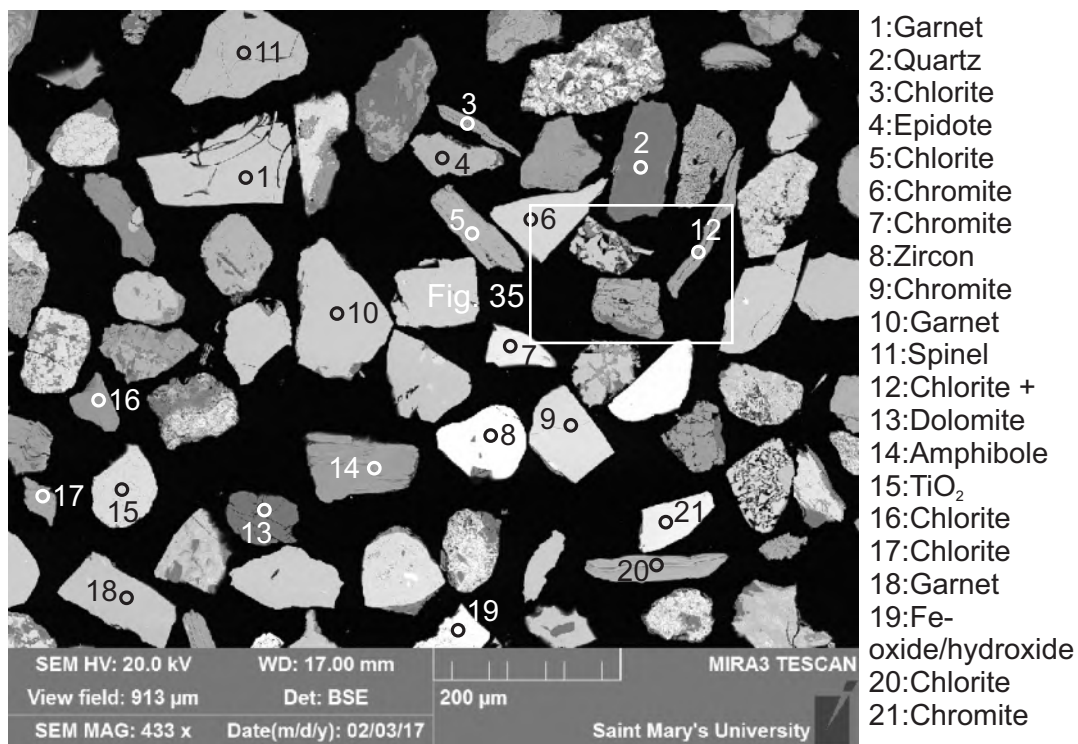


Figure B10.34: Sample S18 site 17 (SEM).

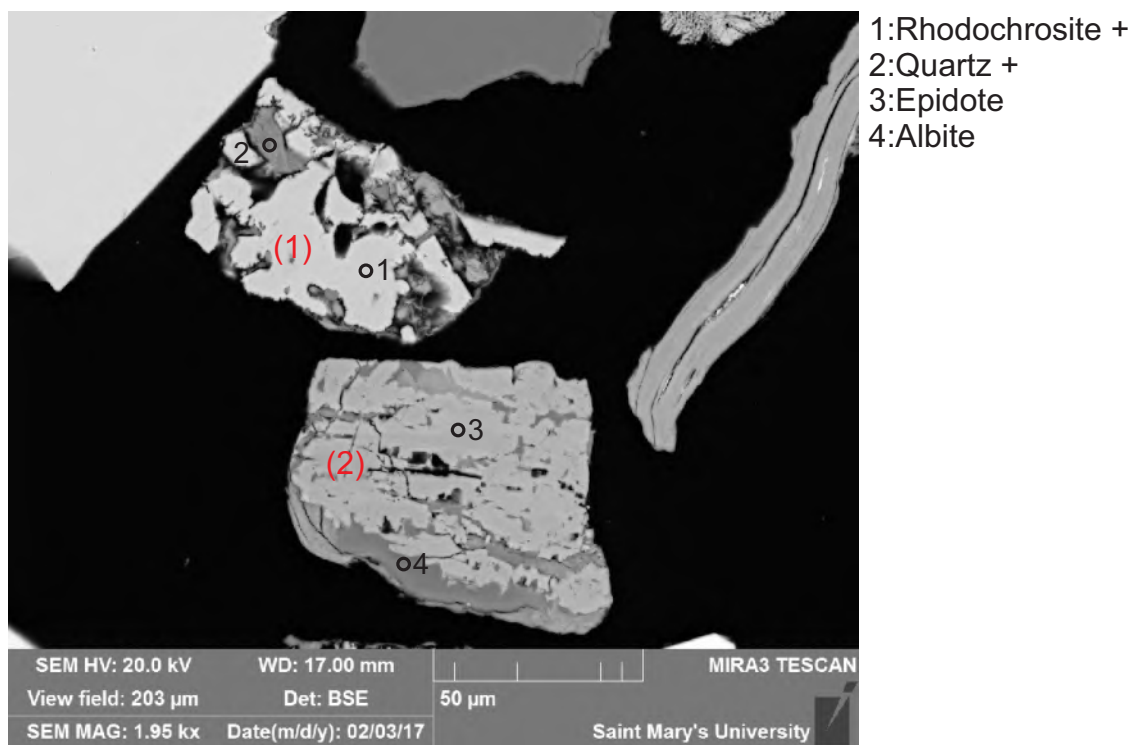


Figure B10.35: Sample S18 site 17.1 (SEM). 1: Lithic clast (rhodochrosite + quartz, probably rhodochrosite cemented siltstone). 2: Lithic clast (epidote + albite, hydrothermal).



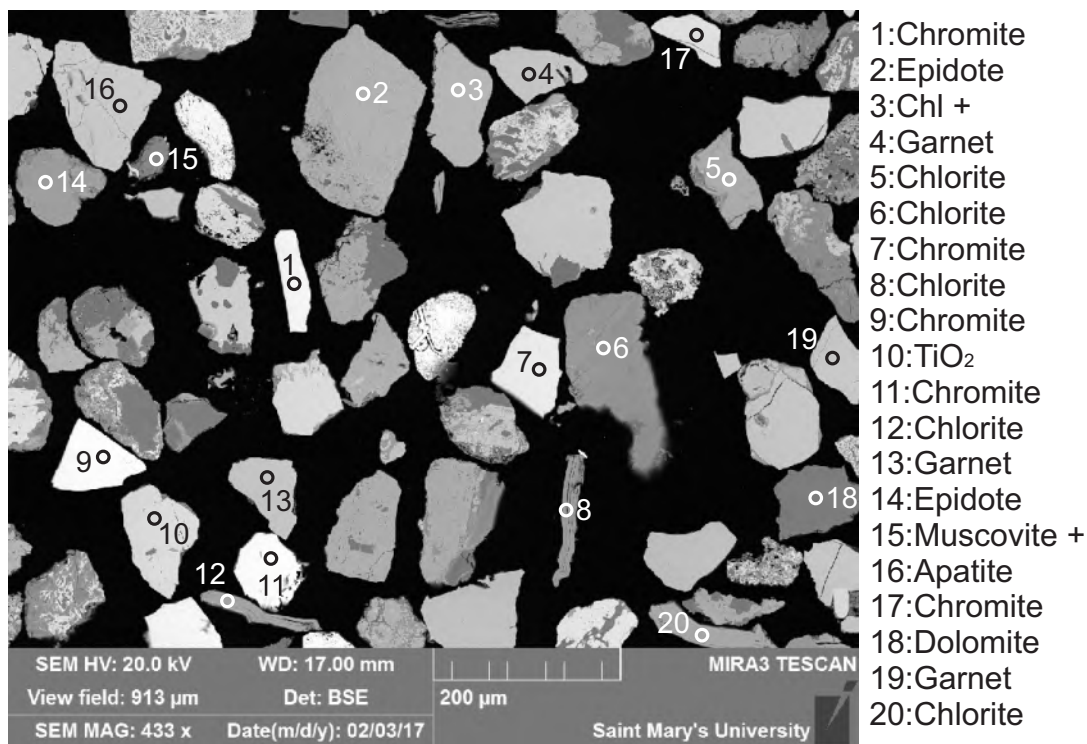


Figure B10.36: Sample S18 site 18 (SEM).

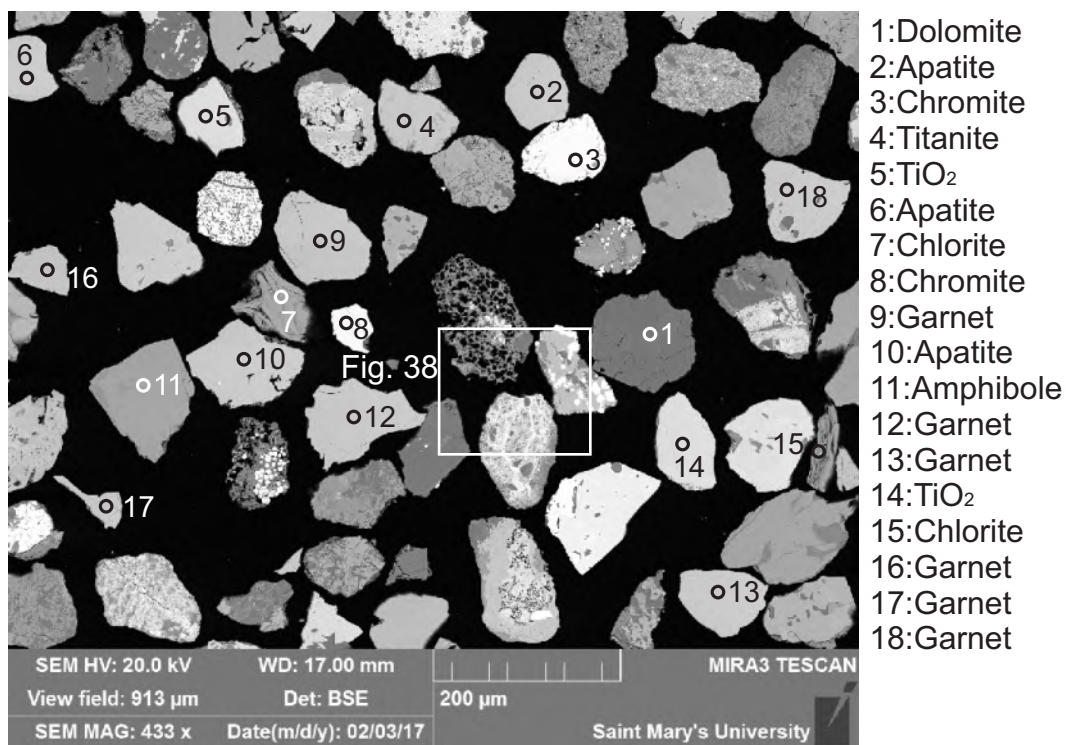
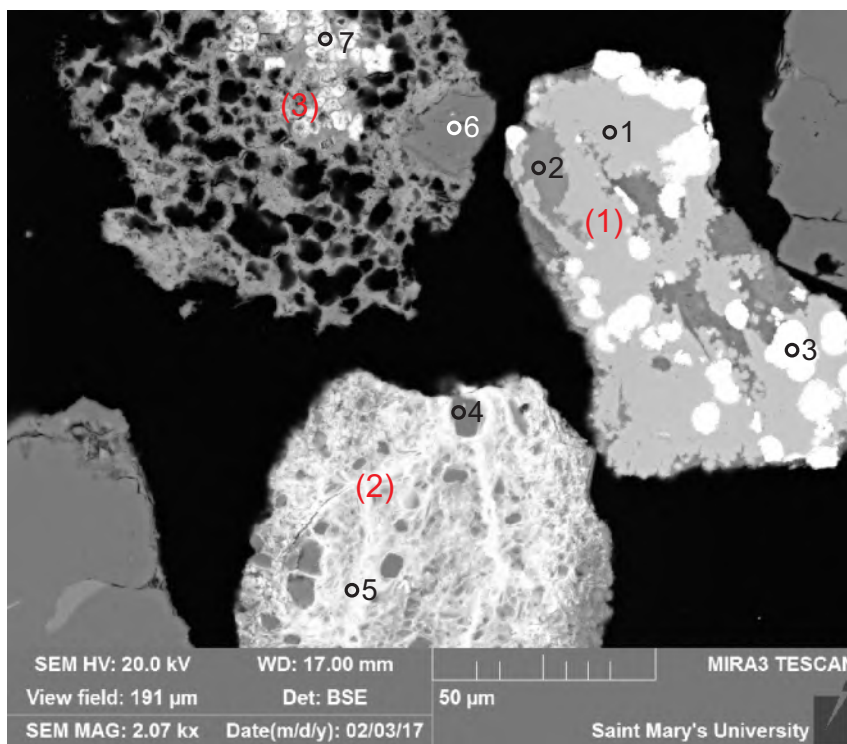
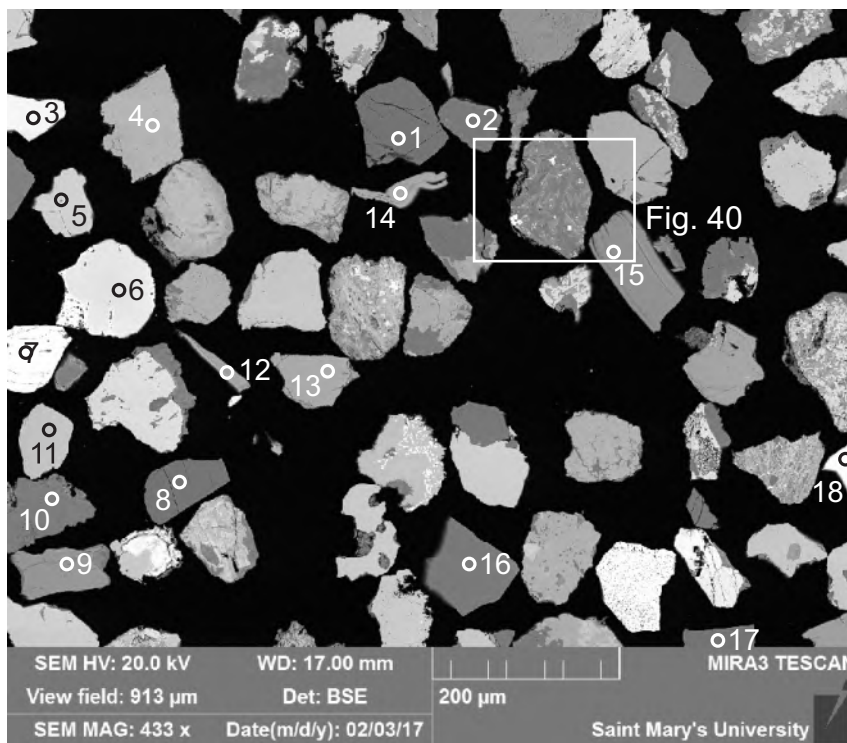


Figure B10.37: Sample S18 site 19 (SEM).



- 1: Titanite
- 2: K-feldspar
- 3: Fe-oxide/hydroxide +
- 4: Quartz
- 5: Fe-oxide/hydroxide +
- 6: Albite
- 7: Fe-oxide/hydroxide +

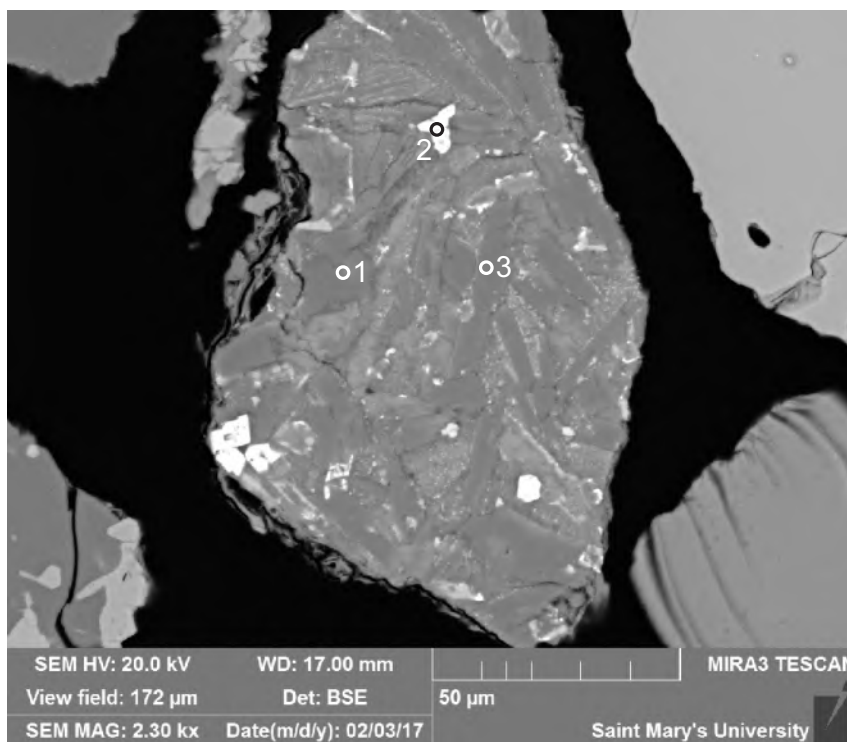
Figure B10.38: Sample S18 site 19.1 (SEM). 1: Lithic clast (titanite + K-feldspar + Fe-oxide/hydroxide, probably hydrothermally altered rock). 2: Lithic clast (albite + Fe-oxide/hydroxide, hydrothermal). 3: Dissolved lithic clast (albite + Fe-oxide/hydroxide, similar to (2)).



- 1: Dolomite
- 2: Quartz
- 3: Chromite
- 4: Epidote
- 5: Apatite +
- 6: Chromite
- 7: Chromite
- 8: Dolomite
- 9: Amphibole
- 10: Albite
- 11: Apatite
- 12: Chlorite
- 13: Clinopyroxene
- 14: Chlorite
- 15: Muscovite
- 16: Tourmaline
- 17: Dolomite
- 18: Chromite

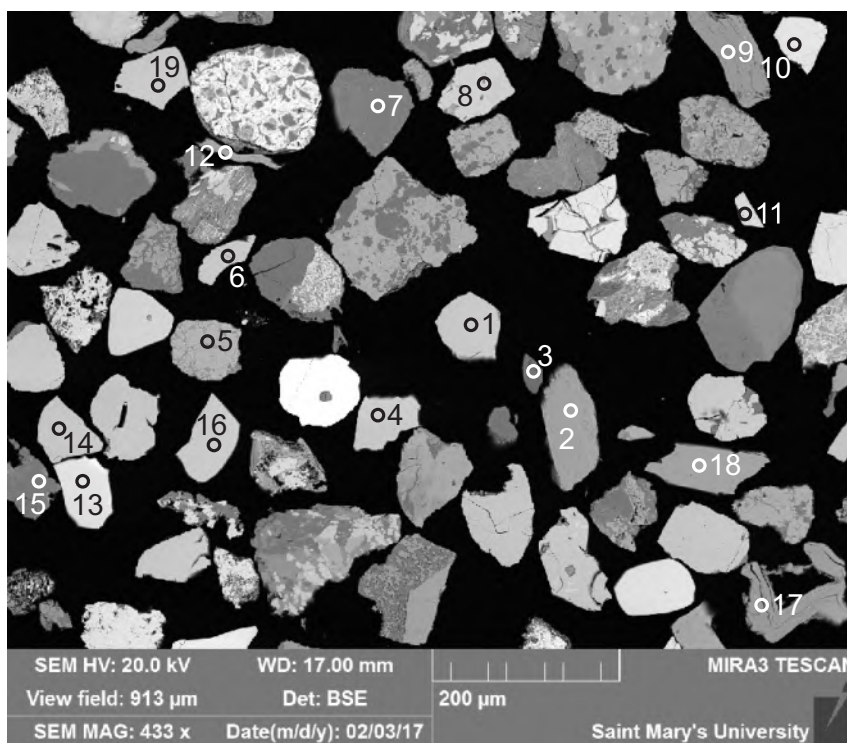
Figure B10.39: Sample S18 site 20 (SEM).





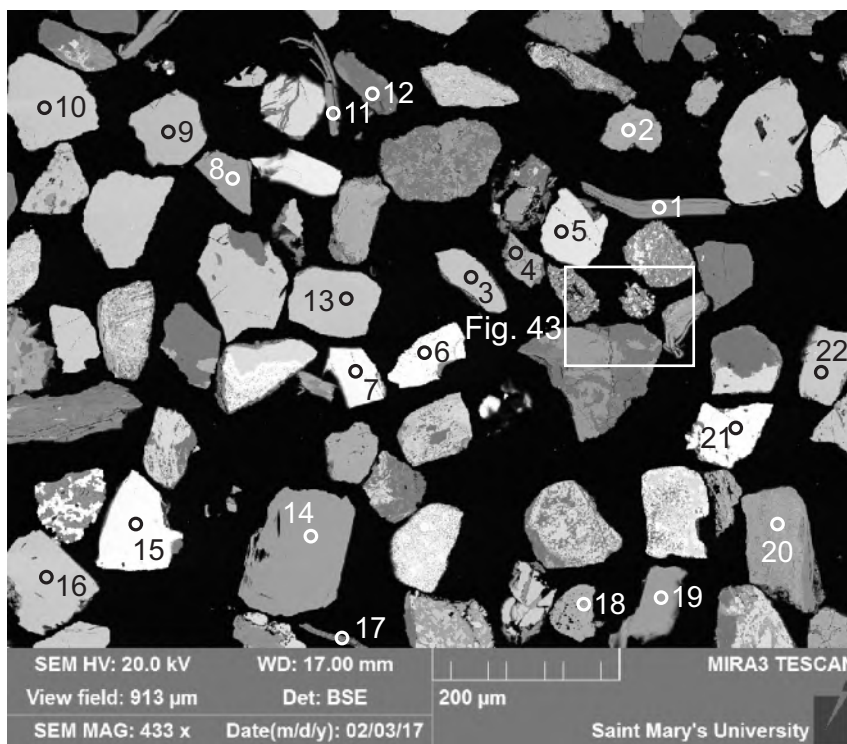
- 1:K-feldspar
- 2:Fe-oxide/hydroxide +
- 3:Albite

Figure B10.40: Sample S18 site 20.1 (SEM). This rhyolitic lithic clast consists of K-feldspar + albite + Fe-oxide/hydroxide.



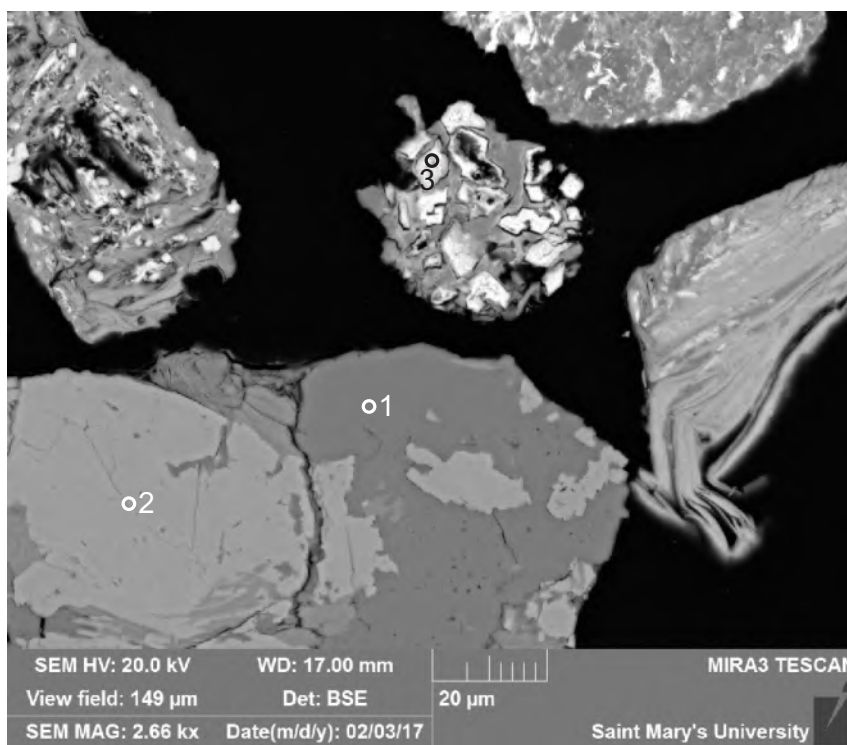
- 1:Garnet
- 2:Amphibole
- 3:Paragonite
- 4:Garnet
- 5:Epidote
- 6:Garnet
- 7:Tourmaline
- 8:Garnet
- 9:Chlorite
- 10:Chromite
- 11:Chromite
- 12:Chlorite
- 13:Chromite
- 14:Titanite
- 15:Quartz
- 16:Garnet
- 17:Chlorite
- 18:Amphibole
- 19:Garnet

Figure B10.41: Sample S18 site 21 (SEM).



- 1: Muscovite +
- 2: Epidote
- 3: Garnet
- 4: Epidote
- 5: Chromite
- 6: Fe-oxide/hydroxide +
- 7: Chromite
- 8: Amphibole
- 9: Garnet
- 10: Garnet
- 11: Muscovite
- 12: Quartz
- 13: Titanite
- 14: Clinopyroxene
- 15: Chromite
- 16: Garnet
- 17: Hole
- 18: Epidote
- 19: Chlorite
- 20: Epidote
- 21: Ilmenite
- 22: Garnet

Figure B10.42: Sample S18 site 22 (SEM).



- 1: Albite
- 2: Epidote
- 3: Fe-oxide/hydroxide +

Figure B10.43: Sample S18 site 22.1 (SEM). This lithic clast consists of albite + epidote, hydrothermal.

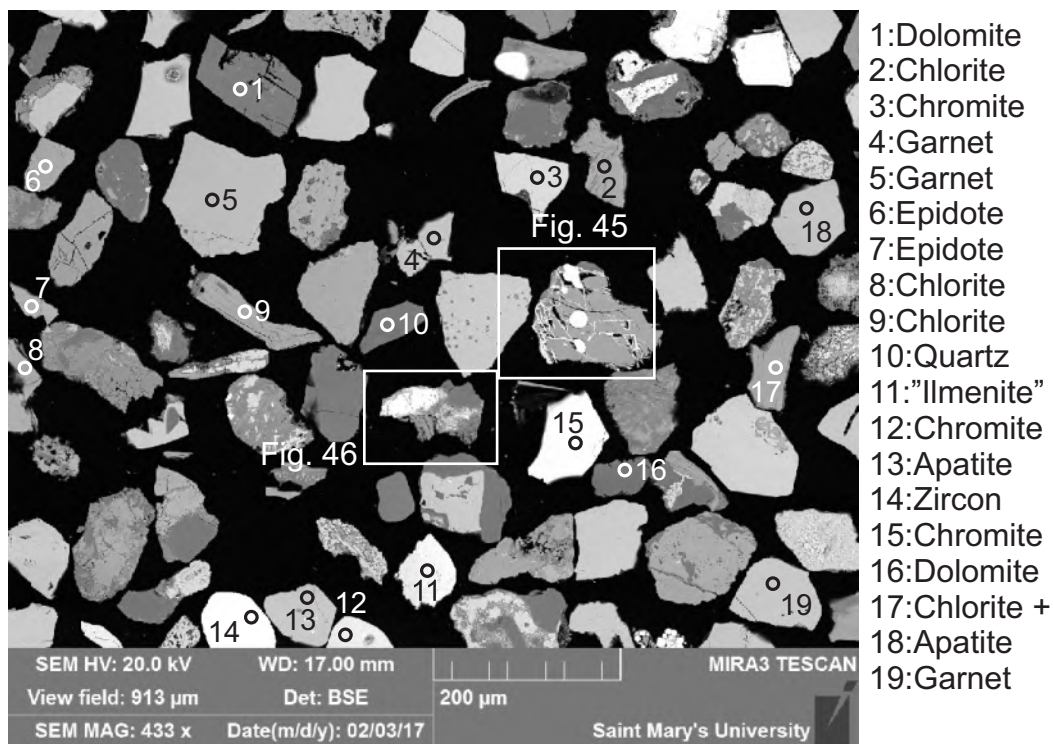


Figure B10.44: Sample S18 site 23 (SEM).

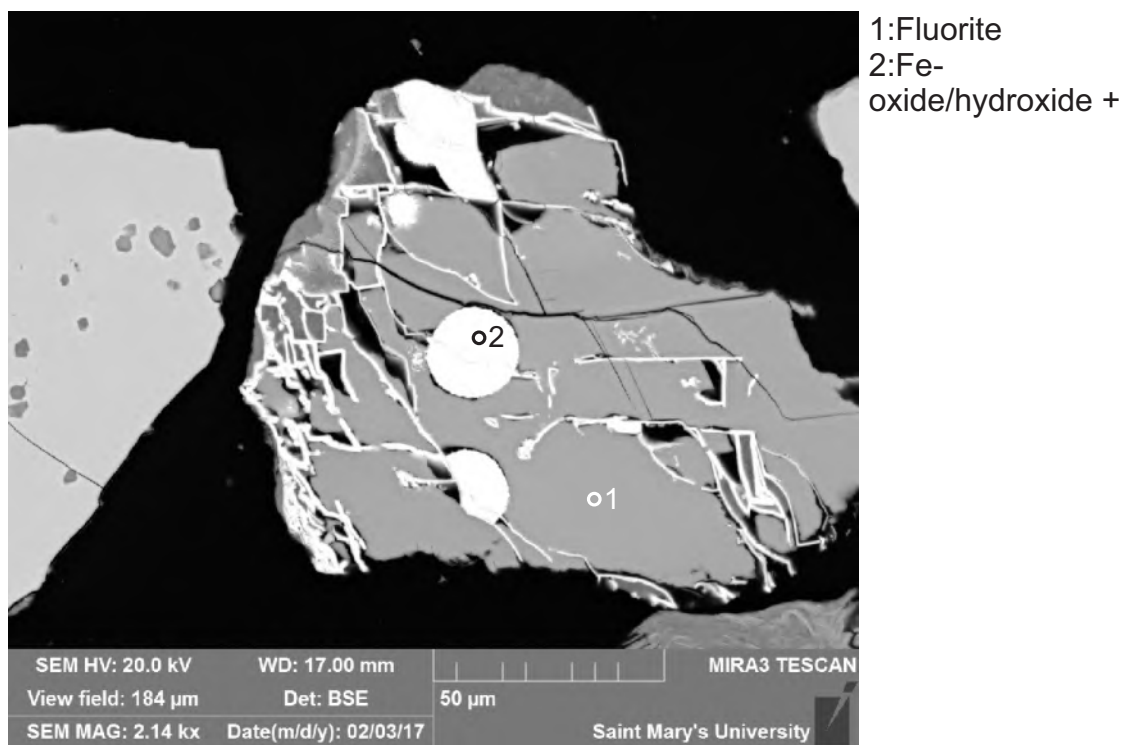
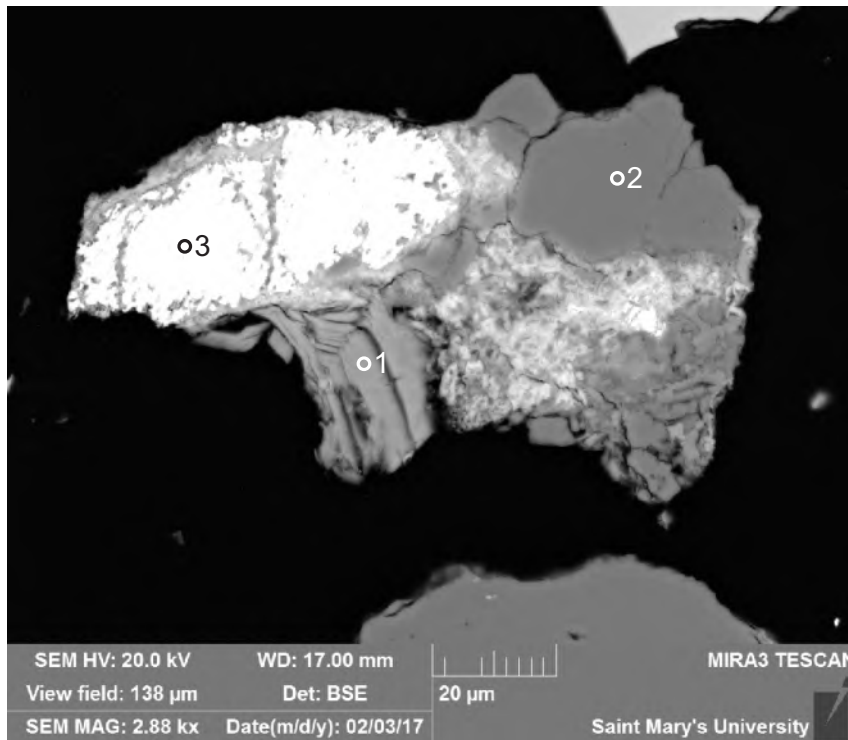


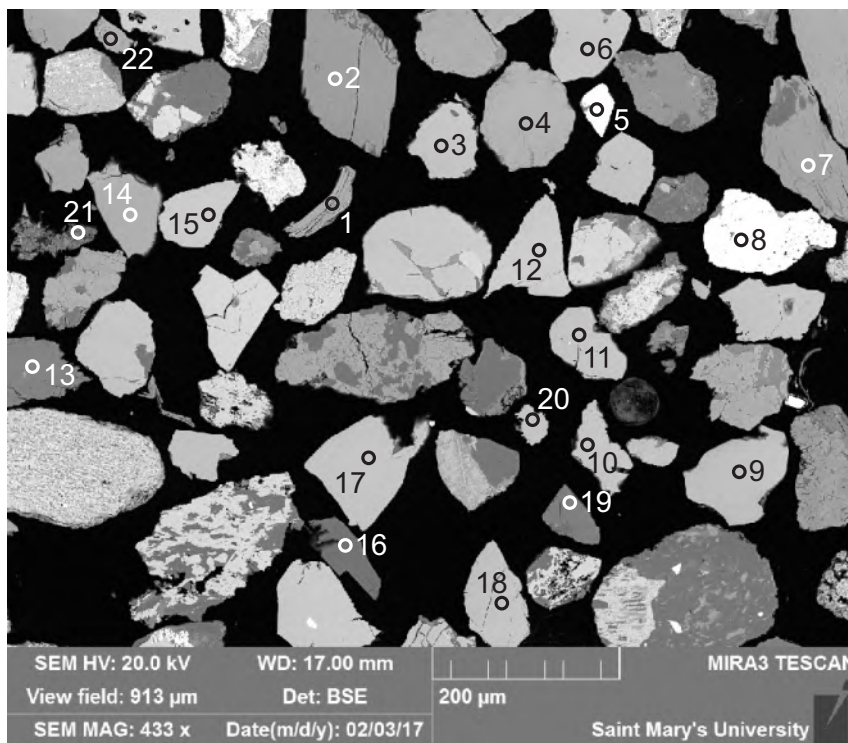
Figure B10.45: Sample S18 site 23.1 (SEM). This lithic clast consists of fluorite + Fe-oxide/hydroxide fillings fractures.





- 1:Chlorite
- 2:Quartz
- 3:Ilmenite

Figure B10.46: Sample S18 site 23.2 (SEM). This lithic clast consists of chlorite + quartz + ilmenite, probably metamorphic.



- 1:Chlorite +
- 2:Amphibole
- 3:Garnet
- 4:Chlorite
- 5:Zircon
- 6:Titanite
- 7:Chlorite
- 8:Zircon
- 9:Spinel
- 10:Garnet
- 11:Garnet
- 12:Garnet
- 13: ?Margarite (mica) +
- 14:Garnet
- 15:Garnet
- 16:Dolomite
- 17:Titanite
- 18:Apatite
- 19:Tourmaline
- 20:Garnet
- 21:K-feldspar
- 22:Epidote

Figure B10.47: Sample S18 site 24 (SEM).

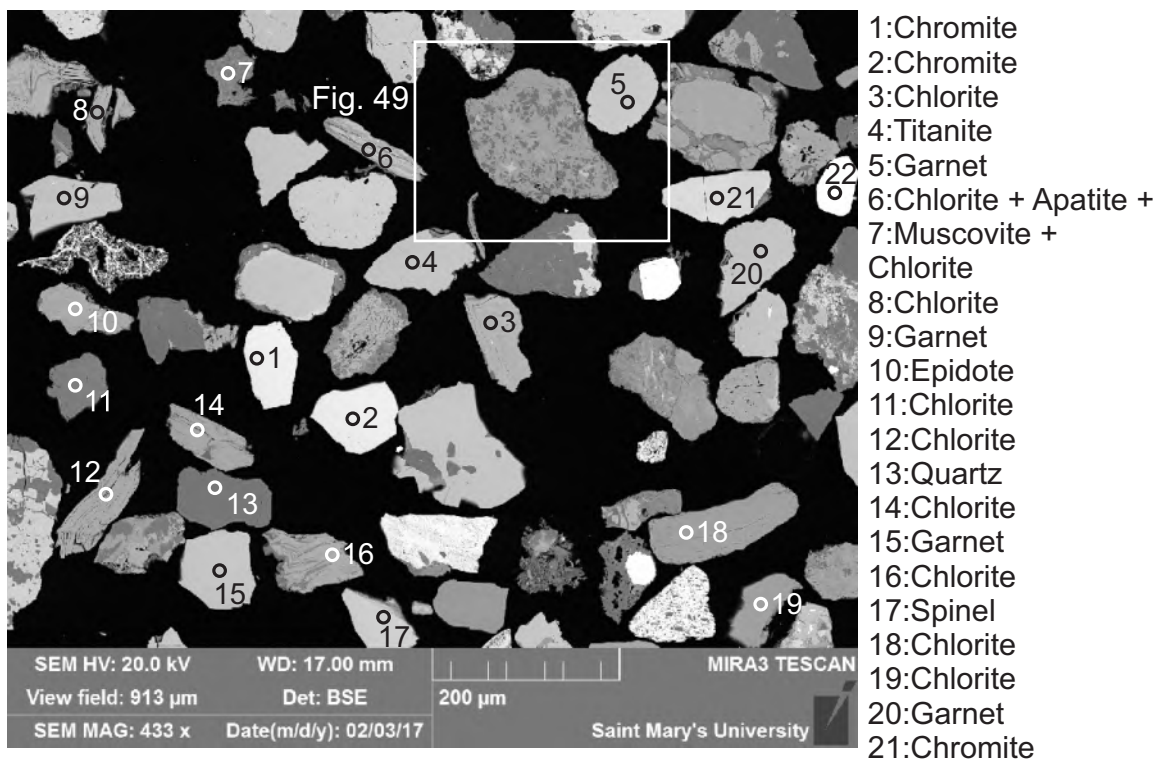


Figure B10.48: Sample S18 site 25 (SEM).

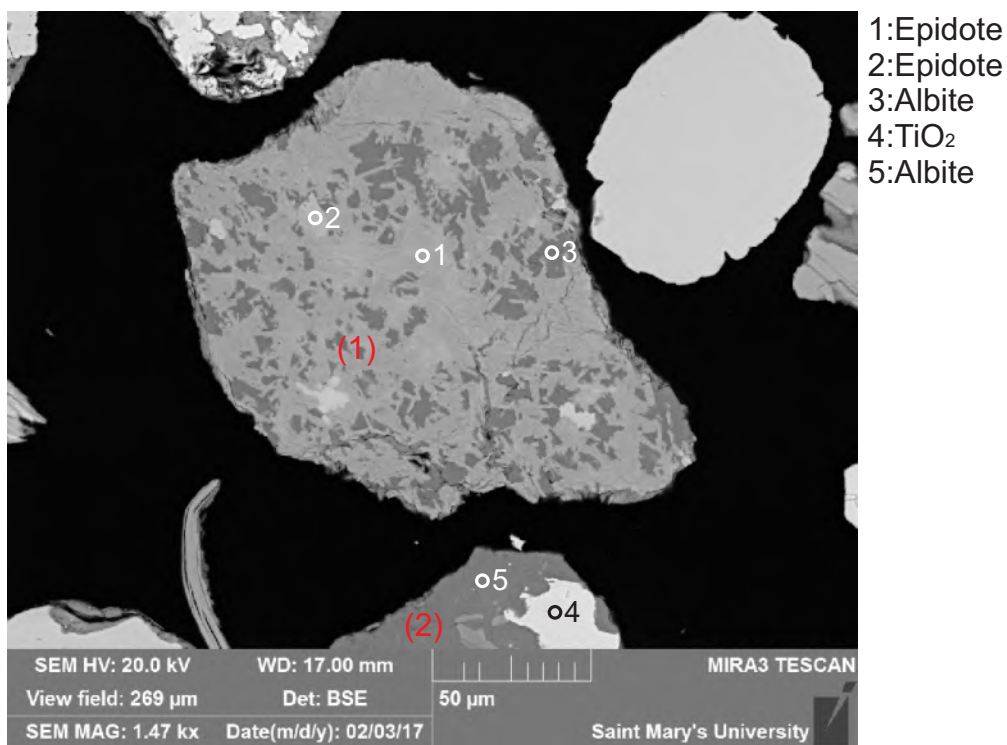


Figure B10.49: Sample S18 site 25.1 (SEM). 1: Lithic clast (epidote + albite, hydrothermal). 2: Lithic clast (albite + titania, metamorphic).



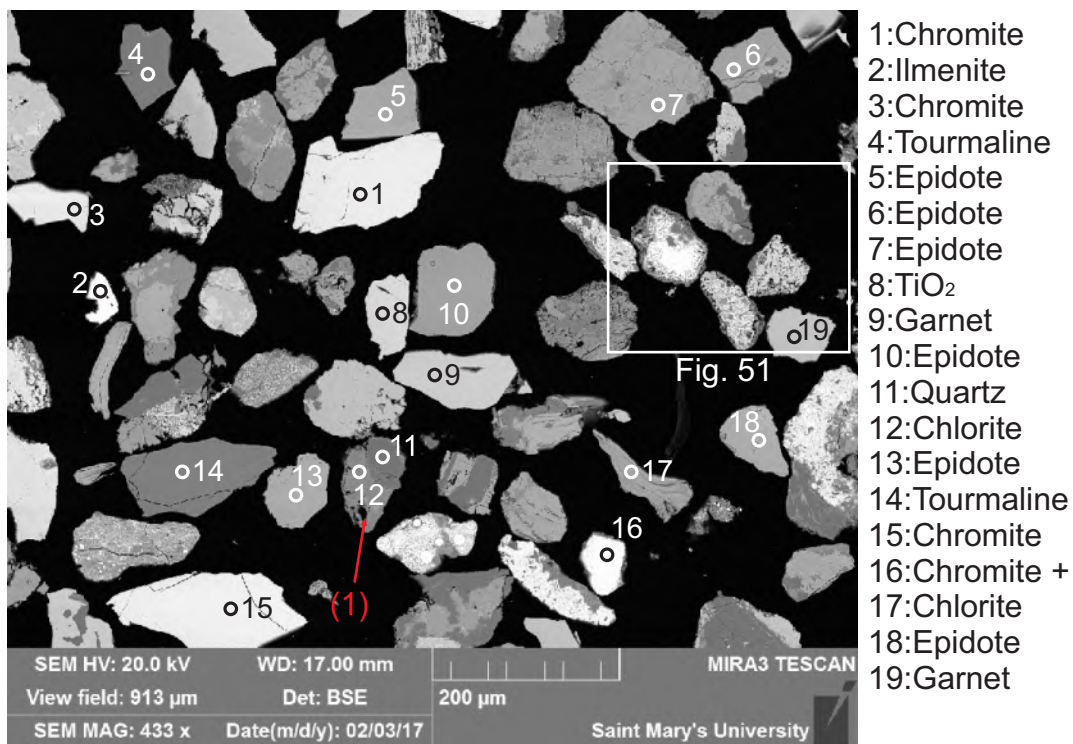


Figure B10.50: Sample S18 site 26 (SEM). 1: Lithic clast (quartz + chlorite).

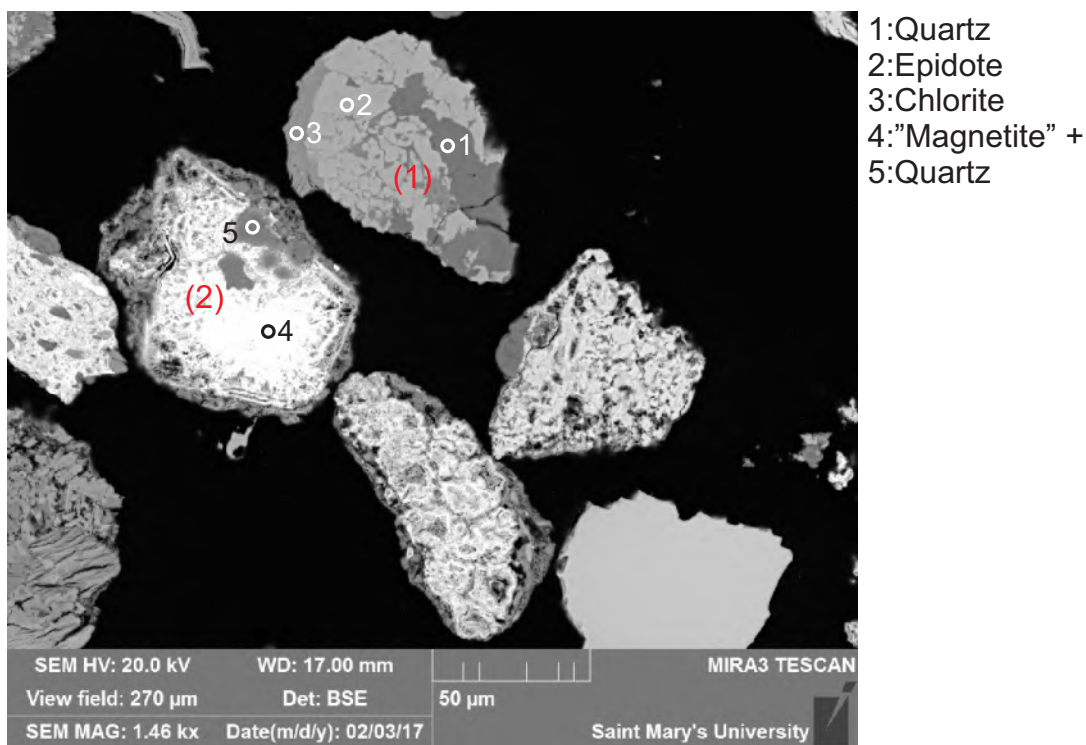


Figure B10.51: Sample S18 site 26.1 (SEM). 1: Lithic clast (quartz + chlorite + epidote, hydrothermal). 2: Lithic clast (quartz + magnetite, hydrothermal).

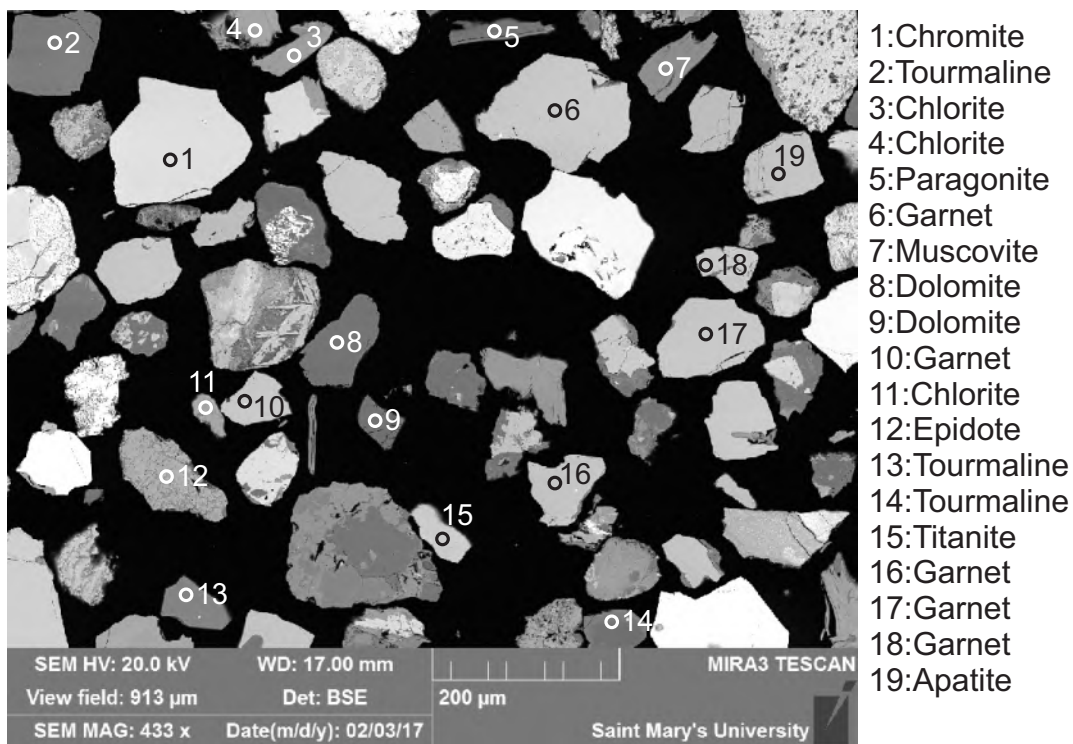


Figure B10.52: Sample S18 site 27 (SEM).

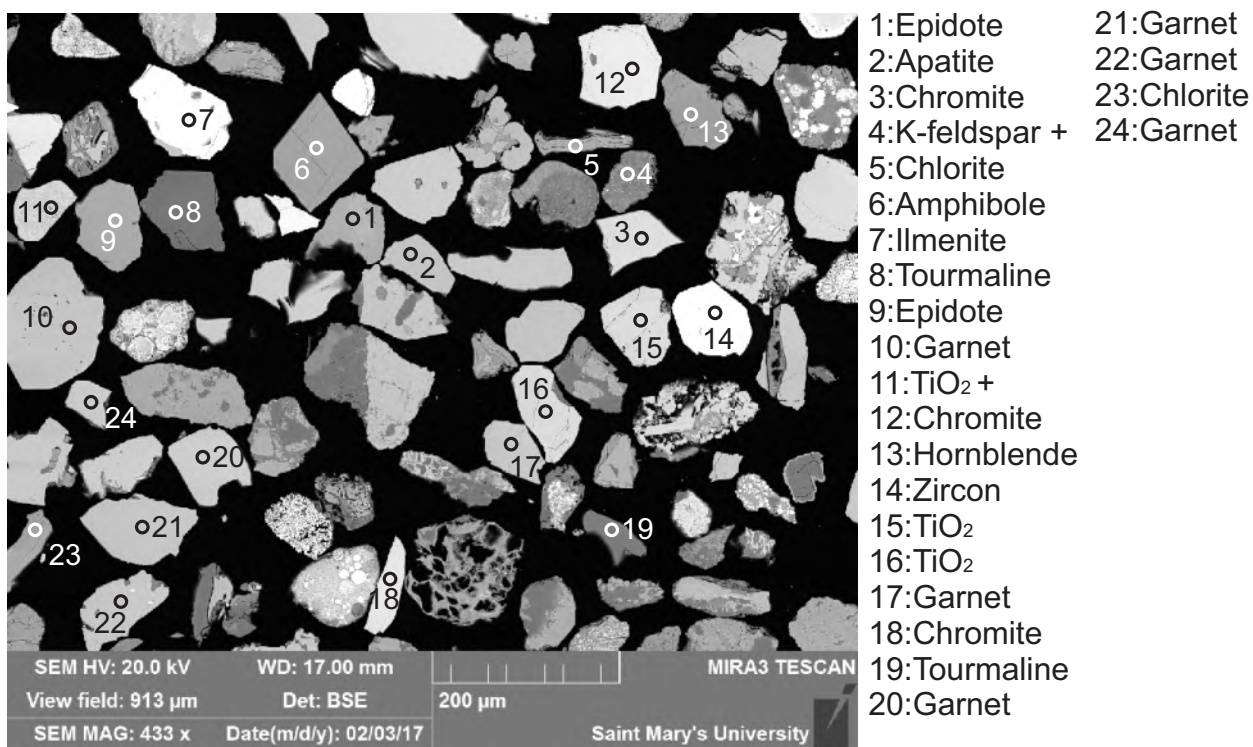


Figure B10.53: Sample S18 site 28 (SEM).

Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	1	1	Ep	40.58		25.48	8.86	0.36		21.72													97	109
S18	1	2	Ep	40.63		22.95	11.20			22.21													97	109
S18	1	3	Spl			26.25	22.50		12.48									38.76					100	109
S18	1	4	Grt	39.54		21.13	29.89	3.50	3.12	2.82													100	113
S18	1	5	Chl	25.40		21.99	24.88		12.37		0.37												85	102
S18	1	6	Ms	48.39	0.81	27.70	5.67		1.54		0.34	10.55											95	109
S18	1	7	Ab	66.00		20.96				2.71	10.33												100	119
S18	1	8	Ep	41.19		22.56	11.84		0.89	20.52													97	108
S18	1	9	Chr			10.03	23.63		9.08									57.26					100	109
S18	1	10	Ep	40.61		24.38	9.35	0.34		22.32													97	110
S18	1	11	Zrn	31.03																67.38	1.59		100	119
S18	1	12	Chr			22.06	16.23		14.14									47.57					100	106
S18	1	13	Py	4.98			65.81			0.32	0.54			28.36									100	108
S18	1.1	1	Chl	33.77		15.10	14.00		21.29	0.48	0.37												85	98
S18	1.1	2	Ep	40.70		23.42	11.44		1.45	20.00													97	108
S18	1.1	3	Ab	69.58		18.83					11.58												100	118
S18	1.1	4	TiO2 +	14.20	80.08	3.18	1.84				0.70												100	98
S18	1.1	5	TiO2 +	3.87	88.29	2.20	4.45		0.66	0.52													100	106
S18	1.1	6	Bt +	49.76	4.37	24.01	4.64		2.99			10.24											96	111
S18	1.1	7	TiO2	0.72	97.79		1.17			0.32													100	107
S18	1.1	8	Ab	69.59	0.30	18.60					11.50												100	116
S18	2	1	Ms	51.10	0.43	24.86	4.40		3.63		0.34	10.24											95	107
S18	2	2	Chr		0.58	23.60	19.46		14.22								0.38	41.75					100	112
S18	2	3	Grt	40.61		21.57	25.30	0.95	6.53	5.04													100	116
S18	2	4	Grt	40.42		21.30	25.03	0.82	4.29	8.15													100	117
S18	2	5	Grt	39.60		20.89	32.75	0.55	1.83	4.37													100	114
S18	2	6	Ep	40.20	0.42	23.09	10.78			22.52													97	110
S18	2	7	Ep	40.45		24.32	10.00			22.23													97	111
S18	2	8	Grt	39.85		21.01	27.84	4.00	2.75	4.56													100	116
S18	2	9	Grt	39.94		21.09	28.27	2.56	3.51	4.63													100	111
S18	2	10	Qz	100.00																			100	120
S18	2	11	Chl	26.21		22.31	20.92		15.56														85	104
S18	2	12	TiO2	3.67	94.06	1.08	0.67											0.53					100	109
S18	2	13	Chl	26.24		21.00	24.95	0.39	12.42														85	98
S18	2.1	1	Ab	66.72		21.29	0.31			0.78	9.84	1.05											100	116
S18	2.1	2	Ep	40.10		19.26	7.01		2.09	28.53													97	99

Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	2.1	3	Qz	100.00																			100	121
S18	2.1	4	Ap							48.94			44.46		4.98							1.63	100	122
S18	2.1	5	Ab	69.48		18.72				0.17	11.62												100	121
S18	2.1	6	Ms + Chl	56.29		20.47	11.08		7.97	0.89	0.60	2.71											100	83
S18	2.1	7	"Mag" +	4.90			95.10																100	83
S18	2.1	8	Qz	100.00																			100	122
S18	2.2	1	Py +	11.05		4.23	61.52		4.17	0.84	0.61		0.86	13.50								3.22	100	95
S18	2.2	2	Qz	99.79			0.21																100	124
S18	2.2	3	Feohy +	7.15		4.77	80.09	0.45		1.13			1.97									4.44	100	79
S18	2.2	4	Qz	98.18	1.29		0.32					0.20											100	120
S18	2.2	5	TiO2 +	27.78	71.70		0.52																100	111
S18	2.2	6	Py +	3.76		1.44	44.77		0.47	0.64	0.60			41.91								6.42	100	130
S18	2.2	7	Chl +	40.78		18.86	27.02		11.54		1.29	0.51											100	96
S18	3	1	Ep	40.22		25.26	9.47		0.42	21.64													97	111
S18	3	2	Feohy	0.86	4.04	5.39	86.73	1.28	1.70														100	96
S18	3	3	Chr			21.40	16.63		13.14									48.82					100	112
S18	3	4	Ep	41.28		27.05	1.91		3.85	22.90													97	109
S18	3	5	Grt	39.69		20.96	28.77	5.66	2.99	1.93													100	115
S18	3	6	Feohy +	6.60	3.05	3.16	85.46	0.51		0.30	0.55	0.36											100	91
S18	3	7	Qz	100.00																			100	120
S18	3	8	Grt	39.79		21.09	29.32	0.79	2.25	6.76													100	113
S18	3	9	Cpx	53.84	0.53	3.46	4.63		16.67	20.87													100	117
S18	3	10	Bt	33.53	2.51	16.60	28.48		7.00		0.37	7.51											96	89
S18	3	11	Ap							49.93			44.80		5.27								100	123
S18	3	12	Spl			51.38	13.58		18.98								0.29	15.76					100	116
S18	3	13	Ms	49.80	0.74	26.50	4.94		2.54		0.72	9.77											95	112
S18	3	14	Ep	40.44		24.12	9.93			22.51													97	111
S18	3	15	Chl +	36.00		12.61	17.59		17.41	1.16						0.24							85	94
S18	3.1	1	Chl	28.06	0.56	19.29	22.14		14.95														85	98
S18	3.1	2	TiO2		100.00																		100	108
S18	3.1	3	Ms	50.13	0.71	31.36	2.75		2.59		0.28	7.18											95	115
S18	4	1	Grt	40.24		20.98	28.81	1.18	3.90	4.89													100	113
S18	4	2	Ep	40.43		23.77	9.94			22.86													97	110
S18	4	3	Tur	38.05	0.53	31.12	7.16		7.21	0.80	2.13												87	103
S18	4	4	Tur	36.55	0.70	31.12	9.22		5.95	1.41	1.89	0.17											87	103
S18	4	5	Chl	29.74		14.91	26.37		13.28		0.37	0.34											85	99

Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	4	6	Chl	26.51	3.03	18.38	23.30	0.34	13.43														85	104
S18	4	7	Ttn	33.07	36.16	2.47	0.68			27.63													100	114
S18	4	8	Ttn +	32.90	26.02	7.91				27.39					5.78								100	119
S18	4	9	Grt	39.73		21.09	31.75		2.15	5.28													100	111
S18	4	10	Ep (Czo)	42.21		33.30	0.63			23.87													100	113
S18	4.1	1	Qz	99.70			0.30																100	121
S18	4.1	2	Feohy +	8.36		12.75	66.03	0.61		1.16	1.22	0.56	1.79								7.52		100	75
S18	4.1	3	?Plag	48.09		33.38	0.59			16.19	1.51	0.24											100	117
S18	4.2	1	Chl	28.36	0.26	20.13	18.04		17.93		0.29												85	100
S18	4.2	2	Qz	100.00																			100	122
S18	4.2	3	TiO2		99.49		0.51																100	108
S18	4.2	4	Qz +	94.26	0.24	1.08	4.02					0.40											100	118
S18	4.2	5	Mix	29.76	1.32	11.46	51.94		2.17		0.71	2.64											100	105
S18	5	1	Ms	47.61	1.03	32.21	2.39		1.01		0.34	10.40											95	110
S18	5	2	Grt	40.38		21.04	25.00	4.61	2.07	6.90													100	114
S18	5	3	Grt	39.75		20.80	28.76	0.85	0.91	8.93													100	114
S18	5	4	Grt	39.52		20.81	34.65	0.42	2.27	2.32													100	114
S18	5	5	Chr			21.11	17.47		13.69									47.73					100	109
S18	5	6	Chr			24.70	17.43		13.76									44.12					100	107
S18	5	7	Chr			13.83	17.57		11.98									56.62					100	106
S18	5	8	Amph	55.53		2.43	9.69		17.56	11.80													97	115
S18	5	9	Mix	11.37		5.12	49.53	10.80	2.50	15.62	0.61	1.26									3.20		100	69
S18	5	10	Ttn	33.32	36.95	1.96				27.76													100	115
S18	5	11	Chr			19.15	18.50		11.83									50.51					100	113
S18	5	12	Ms	52.20	0.50	23.06	4.52		3.71			11.01											95	113
S18	5	13	Grt	39.18		20.96	34.44	0.51	1.93	2.98													100	112
S18	5	14	Amph	46.90	0.74	13.46	6.95		16.25	10.65	2.05												97	114
S18	5	15	Grt	40.25		21.11	30.93	0.85	3.98	2.89													100	117
S18	5	16	Zrn	30.88	0.69															68.43			100	121
S18	5	17	TiO2		100.00																		100	107
S18	5	18	Ilm		52.53	0.51	41.65	3.08	2.23														100	99
S18	5.1	1	Fl				0.55	0.68	0.98	69.39					28.40								100	82
S18	5.1	2	Grt	40.06		21.39	30.11	0.60	5.61	2.23													100	116
S18	5.1	3	TiO2	1.35	97.68		0.64			0.34													100	106
S18	5.1	4	Qz	100.00																			100	123
S18	6	1	Mag +	3.25		1.83	94.61			0.31													100	93



Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	6	2	Chr			15.42	18.79		11.66									54.13					100	111
S18	6	3	Ttn	32.54	38.63	0.72	0.71			27.41													100	113
S18	6	4	Grt	40.66		21.49	21.49	0.99	4.38	11.00													100	117
S18	6	5	TiO2		99.71		0.29																100	109
S18	6	6	Grt	40.77		21.46	26.77	0.40	7.22	3.38													100	115
S18	6	7	Dol						22.25	31.75													54	55
S18	6	8	Dol				3.21	0.53	20.74	29.52													54	57
S18	6	9	Ms	48.68	0.54	28.91	4.41		1.75		0.28	10.44											95	109
S18	6	10	Chl	26.39		21.87	21.67	0.31	14.76														85	99
S18	6	11	Chl	26.20		21.56	23.32	0.26	13.67														85	100
S18	6	12	Ap							48.37			44.14		5.98							1.51	100	125
S18	6	13	Ap				0.38		0.46	48.66			44.40	0.64	2.67	1.20						1.60	100	120
S18	6	14	Spl			29.15	14.91		15.66									40.29					100	113
S18	6	15	Grt	40.01		21.26	30.25	0.66	3.24	4.59													100	116
S18	6	16	Grt	39.77	0.40	21.01	24.58	4.80	0.74	8.70													100	117
S18	6	17	Chr			9.10	25.29		7.24									57.84	0.53				100	112
S18	6	18	Chl	27.59		19.70	22.52		15.19														85	100
S18	6	19	Dol						22.61	31.39													54	60
S18	6	20	Ilm		59.41		37.52	1.43	1.64														100	102
S18	6.1	1	Qz	99.44	0.56																		100	125
S18	6.1	2	TiO2	0.84	98.12		0.62		0.41														100	109
S18	6.1	3	Zrn +	25.00	26.34	0.91	0.63			0.47										46.65			100	110
S18	7	1	Chr			9.96	21.49		10.72									57.83					100	111
S18	7	2	Grt	39.75		20.83	22.87	8.90	1.08	6.57													100	115
S18	7	3	Spl			34.96	14.06		16.02									34.95					100	111
S18	7	4	Ap							49.57			44.61		5.82								100	121
S18	7	5	TiO2		100.00																		100	106
S18	7	6	"Ilm"		77.78		21.93			0.28													100	95
S18	7	7	Zrn +	36.17		12.67	18.88	1.79	2.04	1.35										27.09			100	114
S18	7	8	Qz	100.00																			100	121
S18	7	9	Ap							47.20	0.70		43.82		6.57							1.72	100	121
S18	7	10	Chr			18.03	20.37		9.92								0.53	50.68	0.46				100	111
S18	7	11	Chr			13.92	23.94		8.85									53.29					100	109
S18	7	12	TiO2		99.40		0.34			0.26													100	110
S18	7	13	Chl	26.58		20.91	22.36	0.26	14.89														85	100
S18	8	1	Grt	39.71		20.94	19.59	12.22	2.64	4.89													100	115

Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	8	2	Chr			13.81	20.09		11.02									55.08					100	110
S18	8	3	Chr			22.42	16.18		13.69									47.71					100	112
S18	8	4	Chr			18.91	21.30		12.40									47.39					100	113
S18	8	5	Ap				0.28			48.11			44.51		5.56							1.54	100	127
S18	8	6	Grt	39.58		20.95	33.07	0.49	1.99	3.92													100	115
S18	8	7	Chl	25.76		20.30	26.36	0.26	12.00		0.31												85	101
S18	8	8	Chl	26.80		21.19	22.97		14.04														85	104
S18	8	9	Grt	39.99		21.04	27.73	1.59	2.13	7.51													100	114
S18	8	10	Cpx	52.22	0.98	4.38	6.38		15.07	20.42								0.55					100	116
S18	8	11	Grt	39.29		21.09	33.64	1.26	3.78	0.94													100	113
S18	8	12	Chl	29.72		16.80	23.94	0.48	13.22	0.45	0.39												85	100
S18	8	13	Ep	39.84		24.11	10.73			22.32													97	107
S18	8	14	TiO2		100.00																		100	110
S18	8	15	Chl	28.75		19.28	21.56	0.34	15.08														85	104
S18	8	16	Chl	25.74		21.90	22.25	0.27	14.83														85	100
S18	8	17	Chl	26.07		20.94	24.86	0.31	12.83														85	99
S18	8	18	Bt	39.60	3.76	17.31	18.52		9.30	0.96		6.56											96	99
S18	8.1	1	Sp	0.20			0.46							50.14					49.20				100	181
S18	8.1	2	Ep	41.63		27.31	2.57		2.33	23.17													97	108
S18	8.1	3	Ab	67.68		19.98				1.44	10.90												100	121
S18	9	1	Chl	25.24		21.95	28.46		9.00		0.35												85	98
S18	9	2	?	40.13		21.03	22.39	3.22	1.28	11.95													100	114
S18	9	3	TiO2		99.64		0.36																100	109
S18	9	4	Chl	29.40	1.45	18.73	24.40		10.84			0.20											85	101
S18	9	5	Grt	40.44		21.37	24.57	0.50	5.20	7.92													100	118
S18	9	6	Ms	48.46	0.47	31.36	2.57		1.04		0.45	10.66											95	113
S18	9	7	Ms	50.52	0.47	24.70	4.74		3.69			10.89											95	105
S18	9	8	Fl	0.45					0.38	55.51					43.66								100	105
S18	9	9	Zrn	30.93																67.68	1.39		100	125
S18	9	10	Mag				98.77	1.23															100	103
S18	9	11	Ep	39.78		24.00	10.69	0.34		22.19													97	115
S18	9	12	Chl	26.85		21.84	20.89		15.42														85	107
S18	9	13	Grt	39.98		21.23	30.00	1.79	4.75	2.24													100	114
S18	9.1	1	Qz	100.00																			100	123
S18	9.1	2	TiO2	0.56	99.07		0.36																100	110
S18	9.1	3	TiO2 + Chl	15.63	50.66	11.60	17.96		3.74	0.41													100	86

Table B10.1: EDS analyses of sample S18.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	ZnO	ZrO2	HfO2	WO3	Total	Actual Total
S18	9.1	4	Ms	49.83	0.64	31.66	3.41		1.31		0.45	7.70											95	107
S18	9.1	5	"Mag" +	4.97			93.70		0.94	0.39													100	80
S18	9.1	6	Feohy +	9.25		3.37	75.46	0.41		1.17	0.98		0.92									8.45	100	83
	Notes																							
	" " = indicates that mineral is altered																							
	+ = indicates that other minerals are present																							

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	10	1	Chr			17.19	17.46		12.21								0.33	52.82											100	110
S18	10	2	Grt	39.72		21.01		19.87	4.52	2.57																			100	116
S18	10	3	Chl	26.78		20.54	22.31		15.37																				85	99
S18	10	4	Ms	50.12	0.31	23.80	7.21		2.59			10.96																	95	106
S18	10	5	Ms	48.31	0.76	32.67	1.54		1.17		0.84	9.72																	95	109
S18	10	6	Tur	38.01	0.97	33.79	6.14		5.66	0.39	2.04																		87	99
S18	10	7	Dol						22.39	31.61																			54	56
S18	10	8	Chl	26.72		21.11	19.67	0.38	17.12																				85	97
S18	10	9	Grt	39.36		20.97	33.57	0.75	3.89	1.45																			100	113
S18	10	10	Zrn	31.23																	68.77								100	118
S18	10	11	Amph	44.85	2.83	10.26	10.68	0.25	14.70	10.55	2.46	0.41																	97	115
S18	10	12	Grt	39.54		21.14	29.66	0.81	1.44	7.42																			100	116
S18	10	13	Chl	28.46		19.85	25.21	0.27	9.91	0.30	0.52							0.48											85	100
S18	10	14	Pg	46.21		38.82	0.48			0.51	6.92	0.87			1.19														95	111
S18	10	15	Ms	47.50	0.58	32.13	2.87		1.10		1.04	9.79																	95	111
S18	10	16	Dol						22.47	31.53																			54	55
S18	10	17	Grt	39.56		20.80	29.63	1.38	2.32	6.31																			100	112
S18	10	18	Dol						22.66	31.34																			54	56
S18	10.1	1	Ep	40.10		22.78	11.31			22.20							0.61												97	111
S18	10.1	2	Ab	67.98		19.12	0.42			1.21	11.27																		100	119
S18	10.1	3	"Mag" +	4.70		0.80	92.98	0.95		0.56																			100	75
S18	10.1	4	Kln +	51.41		35.20	11.78		0.35	0.41	0.57	0.28																	100	93
S18	10.1	5	Ap +	1.89		0.97	0.56			46.85		0.21	41.42		5.98												2.12		100	106
S18	10.1	6	Qz +Chl + Ap	89.33		2.08	2.94		0.41	2.13		0.65	2.45																100	110
S18	11	1	Pg	47.60		37.66	0.35				7.53	0.64			1.23														95	112
S18	11	2	TiO2	0.45	99.20		0.36																						100	110
S18	11	3	Grt	39.50		21.11	31.82	1.82	3.53	2.22																			100	114
S18	11	4	Ttn	32.96	37.35	1.47	0.30			27.93																			100	111
S18	11	5	Qz	100.00																									100	123
S18	11	6	Chr +	5.36	0.75	4.36	33.51	1.44	6.25								47.80			0.54					0.83		1.92		100	104
S18	11	7	Ap				0.62			46.78	0.60		40.32	1.22	7.71			0.30											97	103
S18	11	8	Ep	39.41	0.58	20.14	11.73	0.24	3.98	20.62																			100	115
S18	11	9	Grt	39.25		20.78	32.67	0.50	2.08	4.72																			100	115
S18	11	10	TiO2		99.66		0.34																						100	106
S18	11	11	Ep	40.15		24.30	9.83			22.72																			97	109
S18	11	12	Qz	99.80			0.20																						100	119
S18	11	13	TiO2 +	5.89	84.95	3.36	3.28		2.16	0.35																			100	107
S18	11	14	Grt	39.66		21.00	30.95	1.61	3.91	2.86																			100	113
S18	11	15	Chr			14.83	22.53		10.37								52.27												100	111
S18	11	16	Ap							49.92			44.65		5.43														100	123
S18	11	17	Ttn	32.56	26.62	8.06				27.17					5.59														100	117
S18	11.1	1	Grt	39.44		20.84	31.34	0.51	1.61	6.27																			100	115
S18	11.1	2	Chl	29.35		16.28	25.22	0.41	12.46	0.41	0.88																		85	96
S18	11.1	3	Qz	100.00																									100	122
S18	12	1	Tur	39.01	0.54	31.24	4.31		8.90	0.54	2.46																		87	100
S18	12	2	Chr			23.38	17.50		13.46								0.35	45.31											100	110
S18	12	3	Chl	27.65		19.25	20.78	0.65	16.67																				85	95
S18	12	4	Chl	26.47		20.22	25.48		12.83																				85	94

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	12	5	Grt	39.19		20.70	30.19	6.00	2.63	1.30																			100	113
S18	12	6	Grt	39.83		20.96			2.31	7.47																			100	113
S18	12	7	Spl			32.50	16.21		11.85									39.44											100	108
S18	12	8	Amph	48.14	1.18	7.28	14.54	0.45	12.56	11.16	0.98	0.72																	97	113
S18	12	9	Fl							53.37					46.63														100	93
S18	12	10	Ep	39.80		22.76	12.19			22.25																			97	106
S18	12	11	Chl	28.79		17.91	22.71	0.41	15.19																				85	97
S18	12	12	Ms	48.28	0.30	32.22	3.09		0.58		0.36	10.17																	95	104
S18	12	13	Grt	40.83		14.16	10.85	0.61		33.55																			100	111
S18	12	14	Chr			26.08	16.67		14.43									42.82											100	113
S18	12.1	1	Ttn	35.45	32.38	4.50	0.80			26.37	0.50																		100	108
S18	12.1	2	Ep	40.99		25.85	5.94		1.38	22.84																			97	105
S18	12.1	3	Ab	69.40		19.04				0.24	11.32																		100	120
S18	13	1	Ms	50.52	0.40	25.55	5.05		2.83			10.66																	95	107
S18	13	2	Ms	51.39	0.25	23.04	6.47		3.00			10.86																	95	107
S18	13	3	Chr			20.56	19.16		11.86								0.39	48.04											100	109
S18	13	4	Chr			17.95	18.19		12.22								0.36	51.27											100	107
S18	13	5	Ap +	15.35		7.44	9.76	0.34	2.07	30.94			30.68		3.43														100	117
S18	13	6	Zrn	31.59																		68.41							100	121
S18	13	7	Chr			25.41	17.27		14.10									43.22											100	112
S18	13	8	Grt	39.70		20.85	32.24	0.62	4.23	2.37																			100	115
S18	13	9	Chl	32.78		16.12	19.32		15.84	0.67		0.26																	85	93
S18	13	10	Zrn	31.32																		68.68							100	119
S18	13	11	Amph	49.30	1.60	6.13	12.56	0.26	13.52	11.94	1.28	0.41																	97	111
S18	13	12	Chl	26.85		19.41	24.04		14.27		0.43																		85	98
S18	13	13	Ep	40.44		26.09	7.64			22.83																			97	109
S18	13	14	Feohy		12.30	0.73	86.97																						100	96
S18	13	15	Chr		0.39	7.05	22.95		7.18								0.44	61.99											100	109
S18	13	16	Tur	38.49	0.68	32.69	5.27		7.41	0.68	1.78																		87	100
S18	13	17	Dol				0.29		22.12	31.58																			54	56
S18	13	18	Grt	40.42		21.47	24.96	0.87	5.39	6.89																			100	112
S18	13.1	1	Chl	29.03	0.76	16.57	21.80	0.52	15.60	0.48		0.25																	85	99
S18	13.1	2	Ttn	33.99	30.04	5.54	3.10		2.28	25.06																			100	109
S18	13.1	3	TiO2	0.43	98.40					1.17																			100	109
S18	14	1	Chl	24.82		21.50	28.21	0.35	10.12																				85	95
S18	14	2	Grt	39.25		20.89	35.05	0.46	3.91	0.45																			100	110
S18	14	3	Ms	52.06	0.47	22.09	6.36		3.12			10.90																	95	107
S18	14	4	TiO2		99.57		0.43																						100	106
S18	14	5	Grt	39.30		20.87	31.89	1.48	1.96	4.51																			100	112
S18	14	6	Chr			8.39	22.03		8.85									60.73											100	107
S18	14	7	Py				29.07							70.93															100	227
S18	14	8	Grt	39.14		20.82	33.23	0.79	1.25	4.77																			100	110
S18	14	9	Tur	38.96	0.38	32.54	6.29		6.44	0.38	1.83	0.18																	87	97
S18	14	10	Ep	40.29		23.81	10.39			22.50																			97	108
S18	14	11	Chr			27.01	22.03		12.42									38.54											100	111
S18	14	12	Grt	39.36		20.65	31.63	2.64	1.76	3.96																			100	114
S18	14	13	Ttn	33.55	32.82	3.05	2.86		1.32	25.69							0.72												100	109
S18	14	14	Grt	39.09		20.79	35.12	0.43	2.46	2.10																			100	114



Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	14	15	Chl	28.22		17.82	24.34	0.57	14.04																				85	99
S18	14	16	Dol						22.46	31.54																			54	57
S18	14	17	Chl	25.97		22.32	26.95	0.57	9.20																				85	98
S18	14	18	Ep	40.96		27.10	6.58			22.36																			97	115
S18	14	19	Chr			10.85	20.76		9.64									58.76											100	109
S18	15	1	Grt	39.98		20.75	31.29	1.26	3.05	3.67																			100	110
S18	15	2	Grt	39.64		21.17	30.61	0.71	4.29	3.57																			100	111
S18	15	3	Mix	57.22	1.15	23.66	7.55		3.43	0.98	0.86	5.16																	100	85
S18	15	4	Feohy +	12.61	0.73	11.19	71.54	0.68	2.78	0.48																			100	80
S18	15	5	Ep	40.82		23.97	10.62		0.54	21.05																			97	100
S18	15	6	Chl	27.26		20.10	21.67	0.33	15.64																				85	96
S18	15	7	Grt	40.21		21.21	26.34	1.18	5.02	6.04																			100	113
S18	15	8	Grt	40.26		21.32	25.09	1.04	4.22	8.07																			100	112
S18	15	9	Chl	27.57		20.14	22.14		15.15																				85	97
S18	15	10	Ap							49.42			44.40		6.18														100	121
S18	15	11	Feohy +	9.84	0.50	3.71	79.86		4.79	0.59		0.25					0.45												100	96
S18	15	12	Chl	26.14		21.63	20.51	0.22	16.16		0.34																		85	99
S18	15	13	Spl			34.77	12.07		18.21									34.94											100	111
S18	15	14	Pg	50.27		36.14	0.79				6.96	0.84																	95	85
S18	15	15	Chl	28.58		22.04	25.04		8.42		0.35	0.57																	85	97
S18	15	16	Mnz							0.95			36.69		0.08							2.33	17.83	31.11	11.00				100	104
S18	15	17	Chr			23.79	19.21		13.04									43.95											100	112
S18	15.1	1	Ep	40.19		24.95	9.35			22.51																			97	109
S18	15.1	2	Ab	69.79		18.62					11.59																		100	118
S18	15.1	3	Chl	29.45		18.56	16.71	0.61	19.30	0.37																			85	95
S18	15.1	4	Cpx	45.17	0.51	4.07	18.36		12.47	18.45	0.96																		100	98
S18	15.1	5	Grt	39.83	1.16	1.58	23.55		2.99	30.88																			100	105
S18	15.1	6	Feohy +	6.87	3.61	6.15	80.85		1.29	0.66							0.58												100	75
S18	15.1	7	Ms +	57.20	0.46	24.18	8.92		3.52	0.78	0.86	4.07																	100	93
S18	15.2	1	"Mag" +	4.31		0.70	90.11			1.62										0.66							2.60		100	81
S18	15.2	2	Fl	0.98		0.42	0.34			51.11		0.11			47.04														100	113
S18	16	1	Chr			17.19	22.45		9.23									50.61			0.52								100	106
S18	16	2	Grt	41.56		21.65	2.10			34.69																			100	113
S18	16	3	Chr			11.06	19.71		10.63									58.60											100	106
S18	16	4	Grt	39.91		20.58	28.10	1.38	1.46	8.56																			100	110
S18	16	5	Chr			25.94	18.19		13.26									42.62											100	107
S18	16	6	Ep	40.44		25.56	8.41			22.59																			97	108
S18	16	7	Grt	39.18		20.92	34.28		2.44	3.17																			100	112
S18	16	8	Chl	31.10		19.64	21.99		10.60	0.49	0.60	0.58																	85	97
S18	16	9	Mag +	2.50	0.97		95.41		0.76									0.36											100	93
S18	16	10	Chr		1.75	13.91	37.62		6.30								0.68	39.75											100	108
S18	16	11	Chl	24.89		21.49	25.83	0.40	12.39																				85	98
S18	16	12	Grt	39.81		20.99	24.00	2.97	2.05	10.19																			100	115
S18	16	13	Chr			29.58	18.77		13.94									37.71											100	112
S18	16	14	Qz	100.00																									100	123
S18	16	15	Chr			29.14	16.63		14.66									39.57											100	109
S18	16	16	Tur	38.50	0.76	30.76	6.45		7.50	0.58	2.45																		87	100
S18	16	17	Amph	44.53	2.88	10.15	11.03	0.29	14.82	10.48	2.43	0.39																	97	114

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	17	1	Grt	39.49		21.08	33.84	0.88	4.08	0.63																			100	111
S18	17	2	Qz	100.00																									100	119
S18	17	3	Chl	27.11		19.69	24.33	0.35	13.52																				85	97
S18	17	4	Ep	38.86	3.02	20.01	13.76			21.35																			97	107
S18	17	5	Chl	24.92		20.96	30.01	0.46	8.42								0.23												85	98
S18	17	6	Chr			28.04	14.14		16.45								41.38												100	110
S18	17	7	Chr	0.67		17.01	19.02		10.74								52.57												100	107
S18	17	8	Zrn	31.12			0.37														68.51								100	119
S18	17	9	Chr	0.77		27.88	21.19		13.81								36.35												100	111
S18	17	10	Grt	39.51		20.95	29.00	1.02	2.19	7.32																			100	113
S18	17	11	Spl			42.22	14.18		17.68								25.92												100	107
S18	17	12	Chl +	32.51	1.40	20.33	24.73		14.99	0.23		0.83		4.97															100	107
S18	17	13	Dol						22.63	31.37																			54	57
S18	17	14	Amph	54.95		3.21	9.90	0.44	17.45	10.67	0.38																		97	107
S18	17	15	TiO2	2.75	96.64	0.61																							100	105
S18	17	16	Chl	27.34	0.32	21.27	18.02		17.72		0.33																		85	97
S18	17	17	Chl	26.99		20.93	24.75	0.32	12.00																				85	98
S18	17	18	Grt	39.93		21.10	28.86	0.98	5.20	3.92																			100	114
S18	17	19	Feohy		10.66	4.26	79.80	1.08	3.59								0.61												100	100
S18	17	20	Chl	24.74		21.48	28.60	0.87	9.03								0.29												85	100
S18	17	21	Chr			15.85	22.36		9.94								0.44	51.41											100	110
S18	17.1	1	Rds +	1.62				93.16	2.66	2.55																			100	60
S18	17.1	2	Qz +	89.11		5.72	2.03	0.48	1.20			1.20					0.26												100	113
S18	17.1	3	Ep	39.88		23.28	11.19			22.65																			97	110
S18	17.1	4	Ab	68.52		19.07	0.42			0.58	11.41																		100	118
S18	18	1	Chr			11.75	16.49		9.95								61.81												100	104
S18	18	2	Ep	39.92		22.29	12.32		0.38	22.09																			97	104
S18	18	3	Chl +	35.14		18.65	20.45	0.37	9.52	0.87																			85	111
S18	18	4	Grt	39.98		21.13	27.07	1.86	4.11	5.85																			100	110
S18	18	5	Chl	26.08		19.91	26.78	0.35	11.89																				85	96
S18	18	6	Chl	27.17		22.29	17.03		18.51																				85	97
S18	18	7	Chr			18.21	18.21		11.57								0.38	51.63											100	108
S18	18	8	Chl	25.55		20.55	22.99		15.58		0.33																		85	86
S18	18	9	Chr			9.79	21.99		9.59									58.62											100	105
S18	18	10	TiO2		99.44		0.56																						100	106
S18	18	11	Chr			10.42	23.04		8.90									57.64											100	107
S18	18	12	Chl	26.18		20.72	22.52		14.96									0.62											85	99
S18	18	13	Grt	39.91		21.13	27.04	0.39	1.93	9.60																			100	113
S18	18	14	Ep	40.62		23.97	6.89		2.67	22.85																			97	101
S18	18	15	Ms +	51.30	0.56	25.49	2.30		4.70		0.76	6.86			7.67		0.34												100	110
S18	18	16	Ap							49.15			45.09		2.78	1.54												1.44	100	115
S18	18	17	Chr			23.98	16.92		13.92								0.41	44.78											100	106
S18	18	18	Dol				0.57		20.33	33.09																			54	56
S18	18	19	Grt	39.87		20.86	31.56	2.05	3.89	1.77																			100	113
S18	18	20	Chl	25.63		21.96	23.86		13.55																				85	100
S18	19	1	Dol						22.53	31.47																			54	57
S18	19	2	Ap						48.15				43.52		6.91													1.43	100	120
S18	19	3	Chr		1.41	17.21	31.22		8.65								0.52	40.98											100	106

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	19	4	Ttn	33.32	36.07	2.01	0.57			28.04																			100	109
S18	19	5	TiO2		100.00																								100	105
S18	19	6	Ap							50.64			45.95		3.13	0.28													100	112
S18	19	7	Chl	25.75		21.42	24.63		13.20																				85	95
S18	19	8	Chr		0.36	17.81	29.59		9.41									42.83											100	106
S18	19	9	Grt	39.71		21.20	24.71	2.36	2.77	9.25																			100	112
S18	19	10	Ap				0.39	0.41		49.22			45.13		3.98	0.87													100	119
S18	19	11	Amph	52.98	0.29	5.12	10.47	0.23	17.29	9.72	0.54							0.36											97	112
S18	19	12	Grt	39.66		20.58	22.91	5.56	2.69	8.60																			100	114
S18	19	13	Grt	39.39		20.58	17.98	12.21	0.53	9.32																			100	116
S18	19	14	TiO2		99.13		0.87																						100	109
S18	19	15	Chl	20.92	0.82	17.38			8.70	0.69																	2.74		85	64
S18	19	16	Grt	39.96		21.04	25.06	0.97	3.18	9.80																			100	111
S18	19	17	Grt	39.74		21.31	30.07	1.09	3.80	3.98																			100	113
S18	19	18	Grt	39.43		20.86	29.06	3.07	3.05	4.53																			100	112
S18	19.1	1	Ttn	34.08	27.99	6.56	1.39			26.44					3.54														100	114
S18	19.1	2	Kfs	65.40	0.58	17.87	0.49					15.66																	100	117
S18	19.1	3	Feohy +	7.24	3.45	3.07	85.20			1.05																			100	93
S18	19.1	4	Qz	98.97	0.26		0.77																						100	122
S18	19.1	5	Feohy +	16.52		4.72	76.30	0.43	1.14	0.53		0.37																	100	84
S18	19.1	6	Ab	69.02		18.99	0.42			0.54	11.03																		100	119
S18	19.1	7	Feohy +	5.68		2.93	84.17		1.91	0.72			1.18														3.41		100	72
S18	20	1	Dol						22.43	31.57																			54	55
S18	20	2	Qz	99.56		0.44																							100	117
S18	20	3	Chr			16.93	20.22		10.91									51.94											100	105
S18	20	4	Ep	39.86		24.38	10.44			22.33																			97	106
S18	20	5	Ap +	1.70		0.54	1.05			48.11			41.69		5.32												1.59		100	112
S18	20	6	Chr			24.69	18.46		13.11								0.36	43.38											100	108
S18	20	7	Chr	0.99		9.64	22.50		9.04									57.83											100	106
S18	20	8	Dol						22.43	31.57																			54	56
S18	20	9	Amph	49.98	0.28	9.98	6.14		18.26	10.72	1.64																		97	112
S18	20	10	Ab	68.70		19.58				0.57	11.15																		100	116
S18	20	11	Ap							48.73			44.16		5.59												1.52		100	123
S18	20	12	Chl	27.29		20.47	23.59		13.41	0.24																			85	97
S18	20	13	Cpx	50.18	2.37	4.79	6.68		13.59	21.99	0.40																		100	115
S18	20	14	Chl	25.03		22.02	25.17		12.78																				85	95
S18	20	15	Ms	50.55	0.63	24.74	4.39		3.67			11.02																	95	109
S18	20	16	Tur	38.88	0.50	31.75	3.81		9.00	0.75	2.32																		87	102
S18	20	17	Dol						22.57	31.43																			54	58
S18	20	18	Chr			8.10	21.10		8.98								0.53	61.29											100	111
S18	20.1	1	Kfs	63.76		18.03	1.48		0.49	1.46	5.10	8.97	0.70																100	117
S18	20.1	2	Feohy +	11.66	14.45	4.83	60.50	5.21			1.26	0.34									1.75								100	99
S18	20.1	3	Ab	68.40		19.28	0.34			0.42	11.18	0.39																	100	118
S18	21	1	Grt	38.93		20.78	25.77	8.18	1.46	4.87																			100	112
S18	21	2	Amph	54.51	0.26	2.81	12.60	0.32	16.63	9.41	0.46																		97	112
S18	21	3	Pg	48.15		38.03	0.59			0.26	7.51	0.47																	95	107
S18	21	4	Grt	39.65		20.30	21.33	10.51	2.13	6.08																			100	113
S18	21	5	Ep	39.47		20.09	15.00	0.34	5.72	16.38																			97	100

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	21	6	Grt	40.05		21.38	31.98	1.09	3.59	1.91																			100	111
S18	21	7	Tur	38.37	0.66	33.54	5.31		6.71	0.41	2.00																		87	97
S18	21	8	Grt	39.48		22.84	27.54	0.61	0.68	8.78											0.08								100	112
S18	21	9	Chl	26.51		21.34	20.02		17.13																				85	95
S18	21	10	Chr		2.21	20.71	23.35		13.38									40.35											100	103
S18	21	11	Chr		0.40	25.24	17.01		13.77									43.57											100	107
S18	21	12	Chl	25.30		21.56	24.89	0.37	12.43		0.46																		85	94
S18	21	13	Chr		0.49	26.21	22.23		12.13									38.95											100	107
S18	21	14	Ttn	32.93	37.53	1.10	0.69			27.75																			100	108
S18	21	15	Qz	99.50		0.50																							100	118
S18	21	16	Grt	39.34		20.67	31.92	3.22	3.32	1.53																			100	112
S18	21	17	Chl	27.34		20.86	20.30		15.89		0.62																		85	94
S18	21	18	Amph	49.03	1.06	8.23	11.54	0.31	14.06	11.26	1.07	0.45																	97	113
S18	21	19	Grt	39.31		20.93	31.72	1.51	1.74	4.80																			100	109
S18	22	1	Ms +	47.85	1.48	29.20	4.41		1.44		0.48	10.14																	95	108
S18	22	2	Ep	40.33		25.65	8.56			22.45																			97	104
S18	22	3	Grt	40.04	0.33	20.83	30.50		3.81	4.49																			100	112
S18	22	4	Ep	39.80		23.18	11.39	0.38		22.25																			97	109
S18	22	5	Chr			22.03	19.71		12.75									45.51											100	108
S18	22	6	Feohy +	5.40	10.04	4.76	73.90	3.69	0.97	0.26		0.26					0.73												100	98
S18	22	7	Chr			8.93	20.41		10.50									60.16											100	107
S18	22	8	Amph	46.73	0.82	11.56	9.27		15.21	10.85	2.16							0.40											97	108
S18	22	9	Grt	40.54		21.30	22.73	0.75	6.09	8.60																			100	111
S18	22	10	Grt	39.80		20.70	29.01	0.89	1.70	7.89																			100	110
S18	22	11	Ms	49.66	1.10	27.14	3.99		2.46		0.29	10.35																	95	102
S18	22	12	Qz	96.78		0.76	1.32		1.14																				100	113
S18	22	13	Ttn	33.10	35.90	2.52	0.33			28.16																			100	110
S18	22	14	Cpx	54.22	0.46	2.67	3.30		16.78	22.27								0.29											100	116
S18	22	15	Chr			10.22	24.46		9.48									55.85											100	107
S18	22	16	Grt	39.57		20.98	29.67	0.30	2.33	7.15																			100	113
S18	22	17	Hole	44.13		21.30	2.20		3.06			8.40			19.68	1.24													100	10
S18	22	18	Ep	40.13		23.79	10.41			22.67																			97	111
S18	22	19	Chl	26.77		21.50	19.88	0.25	16.60																				85	93
S18	22	20	Ep	39.17		22.26	11.38		6.50	15.40	0.45																1.84	97	107	
S18	22	21	Ilm		57.32		39.72	1.76	1.20																				100	103
S18	22	22	Grt	39.36		20.93	26.76	2.85	0.71	9.39																			100	114
S18	22.1	1	Ab	69.48		18.79				0.23	11.50																		100	118
S18	22.1	2	Ep	41.22		31.23	1.94			22.61																			97	109
S18	22.1	3	Feohy +	6.28		2.45	89.94	0.77		0.57																			100	68
S18	23	1	Dol					0.84	20.66	32.50																			54	54
S18	23	2	Chl	25.43		21.05	27.30		11.21																				85	93
S18	23	3	Chr			25.02	15.77		14.11									45.11											100	107
S18	23	4	Grt	39.60		21.29	30.28	0.77	4.64	3.41																			100	113
S18	23	5	Grt	40.34		21.50	27.07	0.81	9.36	0.92																			100	111
S18	23	6	Ep	40.44		24.63	9.44			22.49																			97	106
S18	23	7	Ep	39.95		21.79	12.98			22.28																			97	106
S18	23	8	Chl	25.62		19.96	26.70		12.09		0.64																		85	95
S18	23	9	Chl	26.08		20.33	26.04	1.16	11.40																				85	98

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	23	10	Qz	99.74			0.26																						100	117
S18	23	11	"Ilm"		62.10		35.33	2.56																					100	98
S18	23	12	Chr		0.76	25.72	27.17		10.19									36.17											100	110
S18	23	13	Ap							48.37			43.93		6.20													1.50	100	126
S18	23	14	Zrn	31.08																		68.92							100	119
S18	23	15	Chr			7.45	23.90		8.03									60.62											100	108
S18	23	16	Dol						22.70	31.30																			54	56
S18	23	17	Chl +	33.28	1.86	21.06	29.00		13.46	0.28	0.62	0.44																	100	99
S18	23	18	Ap						48.86				44.58		5.07													1.49	100	120
S18	23	19	Grt	39.47		21.05	31.76	1.08	4.26	2.38																			100	116
S18	23.1	1	Fl	1.04			0.39	0.73	0.98	50.26																			100	114
S18	23.1	2	Feohy +	6.18	1.58	2.49	86.82	0.38		1.91							0.64												100	92
S18	23.2	1	Chl	31.51		17.58	20.30	0.48	14.53		0.43	0.17																	85	93
S18	23.2	2	Qz	100.00																									100	119
S18	23.2	3	Ilm		52.46		40.83	6.27	0.43																				100	104
S18	24	1	Chl +	32.08	2.34	19.53	34.41	0.37	9.38	0.79	0.53	0.58																	100	83
S18	24	2	Amph	51.65	1.13	5.93	9.10		17.51	10.69	1.00																		97	108
S18	24	3	Grt	39.67		20.86	25.37	3.31	1.31	9.47																			100	110
S18	24	4	Chl	24.35		21.52	30.64	0.25	8.24																				85	94
S18	24	5	Zrn	30.99																		67.66					1.35		100	117
S18	24	6	Ttn	32.74	37.02	1.66	0.81			27.77																			100	106
S18	24	7	Chl	25.71		21.30	26.21		11.23		0.55																		85	95
S18	24	8	Zrn	31.41			0.38															66.73					1.48		100	118
S18	24	9	Spl			38.69	14.43		16.46									30.42											100	110
S18	24	10	Grt	39.23		21.03	29.92	3.73	3.44	2.64																			100	113
S18	24	11	Grt	39.44		20.69	27.32	2.62	0.98	8.95																			100	112
S18	24	12	Grt	39.34		20.60	34.06	0.49	1.66	3.85																			100	110
S18	24	13	?Margarite (mica) +	36.19		44.72	0.46			6.81	1.83	3.60			1.40														95	104
S18	24	14	Grt	41.39	0.66	18.14	5.46		0.44	33.91																			100	109
S18	24	15	Grt	39.01		20.75	31.92	4.54	2.49	1.29																			100	109
S18	24	16	Dol						22.53	31.47																			54	56
S18	24	17	Ttn	32.76	38.09	0.83	0.44			27.88																			100	109
S18	24	18	Ap					0.44		49.02			44.59		5.95														100	121
S18	24	19	Tur	38.11	1.11	30.52	8.38		5.99	0.49	2.41																		87	100
S18	24	20	Grt	39.51		20.99	29.11	1.54	1.59	7.26																			100	113
S18	24	21	Kfs	57.42		27.45	2.01		0.75	0.55	4.69	7.13																	100	114
S18	24	22	Ep	40.86		23.03	10.96			21.85	0.30																		97	104
S18	25	1	Chr			15.30	18.80		11.39								0.45	54.05											100	107
S18	25	2	Chr		3.19	17.53	25.82		12.41									41.06											100	108
S18	25	3	Chl	24.95		21.24	30.55		8.26																				85	97
S18	25	4	Ttn	32.96	37.34	1.69				28.01																			100	110
S18	25	5	Grt	39.16		20.51	28.23	6.76	3.50	1.84																			100	109
S18	25	6	Chl + Ap +	27.28		16.02	22.22		5.31	14.42		0.77	13.98																100	99
S18	25	7	Ms + Chl	56.36		24.18	6.89		5.64	0.59	0.54	5.80																	100	100
S18	25	8	Chl	25.30		20.60	29.56		9.54																				85	94
S18	25	9	Grt	39.92		21.05	28.16	0.99	3.53	6.36																			100	109
S18	25	10	Ep	39.79	0.34	22.83	11.01			22.35							0.68												97	107
S18	25	11	Chl	31.00		18.28	9.97		25.44	0.31																			85	95



Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	25	12	Chl	25.25		21.29	25.21	0.40	12.85																				85	97
S18	25	13	Qz	99.80			0.20																						100	120
S18	25	14	Chl	28.99	1.39	19.88	24.31		10.04		0.39																		85	96
S18	25	15	Grt	39.80		20.79	27.45	1.65	2.42	7.90																			100	112
S18	25	16	Chl	25.71		21.53	26.83	0.30	10.63																				85	99
S18	25	17	Spl			30.83	14.78		15.44									38.95											100	111
S18	25	18	Chl	26.62		21.78	21.54		15.06																				85	100
S18	25	19	Chl	27.42		18.92	22.14	0.27	15.91		0.34																		85	100
S18	25	20	Grt	39.37		20.94	31.41	2.35	4.55	1.38																			100	111
S18	25	21	Chr			26.86	17.10		14.09									41.95											100	108
S18	25	22	Zrn	31.32																		68.68							100	115
S18	25.1	1	Ep	38.85		20.90	13.74	0.32	4.33	18.87																			97	102
S18	25.1	2	Ep	39.78		20.98	13.73			22.51																			97	108
S18	25.1	3	Ab	67.45		18.59	0.79			1.78	11.39																		100	116
S18	25.1	4	TiO2		99.44		0.56																						100	107
S18	25.1	5	Ab	66.38		21.10	0.27			1.75	10.01	0.49																	100	118
S18	26	1	Chr			16.57	17.90		11.97									53.57											100	115
S18	26	2	Ilm		45.25		47.93	1.05	5.77																				100	108
S18	26	3	Chr			18.29	18.62		12.43								0.40	50.25											100	114
S18	26	4	Tur	38.25	0.69	30.71	5.86		8.15	1.17	2.17																		87	104
S18	26	5	Ep	40.26		25.67	8.52			22.55																			97	116
S18	26	6	Ep	40.52		25.47	8.07			22.63								0.31											97	116
S18	26	7	Ep	40.19		24.98	9.16			22.68																			97	115
S18	26	8	TiO2		99.65		0.35																						100	116
S18	26	9	Grt	39.22		20.66	36.75		2.76	0.60																			100	123
S18	26	10	Ep	40.50		27.88	5.78			22.84																			97	119
S18	26	11	Qz	99.75			0.25																						100	130
S18	26	12	Chl	29.38		19.83	13.85		21.10	0.44	0.40																		85	107
S18	26	13	Ep	39.78		23.40	11.24			22.57																			97	118
S18	26	14	Tur	38.28	0.82	30.26	7.10		7.46	0.40	2.69																		87	107
S18	26	15	Chr			14.99	18.50		11.80									54.72											100	117
S18	26	16	Chr +	4.39	0.82	5.04	43.52	4.32	3.87	0.31								35.95			1.77								100	109
S18	26	17	Chl	25.97		20.94	26.14		11.96																				85	107
S18	26	18	Ep	39.51		21.60	12.50			22.51								0.87											97	119
S18	26	19	Grt	39.76		20.75	29.26		1.79	8.45																			100	121
S18	26.1	1	Qz	99.73			0.27																						100	129
S18	26.1	2	Ep	40.27		24.04	10.33			22.36																			97	117
S18	26.1	3	Chl	28.73		18.63	17.22	0.46	19.71	0.25																			85	107
S18	26.1	4	"Mag" +	4.00			95.00						1.01																100	88
S18	26.1	5	Qz	97.51	0.21	0.99	1.29																						100	129
S18	27	1	Chr			26.24	19.40		12.77									41.59											100	115
S18	27	2	Tur	38.47	0.95	33.47	5.53		6.25	0.39	1.95																		87	103
S18	27	3	Chl	27.75	0.25	22.09	21.73	0.30	12.58		0.31																		85	105
S18	27	4	Chl	26.84	0.22	19.20	24.21	0.27	14.26																				85	105
S18	27	5	Pg	50.73		40.27	0.54				8.07	0.40																	100	116
S18	27	6	Grt	39.29		20.99	33.33	0.67	3.24	2.48																			100	121
S18	27	7	Ms	51.92	0.42	24.16	4.49			3.38		10.63																	95	114
S18	27	8	Dol						22.35	31.65																			54	60

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	27	9	Dol						22.42	31.58																			54	61
S18	27	10	Grt	39.62		21.00	33.63	1.09	3.75	0.91																			100	122
S18	27	11	Chl	26.07		20.75	25.88		11.95		0.35																		85	103
S18	27	12	Ep	41.08		22.94	11.63		1.62	19.74																			97	117
S18	27	13	Tur	36.43	1.37	33.15	7.80		5.06	1.62	1.26							0.31											87	107
S18	27	14	Tur	38.06		29.96	1.71		11.56		3.11				2.60														87	115
S18	27	15	Ttn	33.15	36.18	1.36	1.63			27.68																			100	118
S18	27	16	Grt	39.75		20.98	28.14	1.29	2.69	7.15																			100	124
S18	27	17	Grt	39.55		20.83	32.43	1.05	3.99	2.15																			100	124
S18	27	18	Grt	39.44		21.11	33.58	1.05	3.78	1.04																			100	121
S18	27	19	Ap	0.61						48.91			43.08	1.05	4.78													1.58	100	129
S18	28	1	Ep	40.77	0.45	18.86	15.08			21.83																			97	113
S18	28	2	Ap							48.31			44.01		6.04													1.64	100	135
S18	28	3	Chr			23.69	16.87		14.29									45.15											100	118
S18	28	4	Kfs +	69.25	0.43	16.15	4.48		1.77	0.34	2.82	4.54						0.23											100	121
S18	28	5	Chl	25.47		21.20	26.25	0.24	11.84																				85	105
S18	28	6	Amph	44.31	2.84	10.58	11.12		14.72	10.63	2.40	0.39																	97	121
S18	28	7	Ilm		45.33		50.24	1.57	2.86																				100	108
S18	28	8	Tur	39.39		32.01	3.74		9.13		2.73																		87	107
S18	28	9	Ep	39.97		25.33	8.82	0.45		22.44																			97	117
S18	28	10	Grt	40.51		21.16	24.76	0.45	4.64	8.49																			100	121
S18	28	11	TiO2 +	4.38	89.96	2.59	2.37		0.47	0.24																			100	106
S18	28	12	Chr		0.50	19.30	23.13		11.57									45.50											100	115
S18	28	13	Hbl	48.90	0.99	9.39	9.93	0.24	14.71	10.80	1.72	0.32																	97	122
S18	28	14	Zrn	31.35																		68.65							100	127
S18	28	15	TiO2		99.53		0.47																						100	118
S18	28	16	TiO2		99.63		0.37																						100	119
S18	28	17	Grt	39.48	0.34	20.92	28.77	1.20	2.32	6.97																			100	125
S18	28	18	Chr			21.28	19.41		12.65									46.66											100	120
S18	28	19	Tur	37.92	0.90	32.93	5.84		6.83	0.44	2.14																		87	110
S18	28	20	Grt	39.04		20.89	34.32	0.30	2.72	2.74																			100	123
S18	28	21	Grt	39.57		21.33	26.55	1.58	2.99	7.97																			100	124

Table B10.2: EDS analyses of sample S18

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S18	28	22	Grt	39.51		21.14	30.59	2.26	3.80	2.71																			100	123
S18	28	23	Chl	27.04		18.82	24.60	0.71	13.83																				85	106
S18	28	24	Grt	38.99		20.74	6.21	28.16		5.91																			100	121
		Notes																												
		+ = indicates that other minerals are present																												

B11: SEM-BSE images and EDS  
mineral analyses for sample S22.

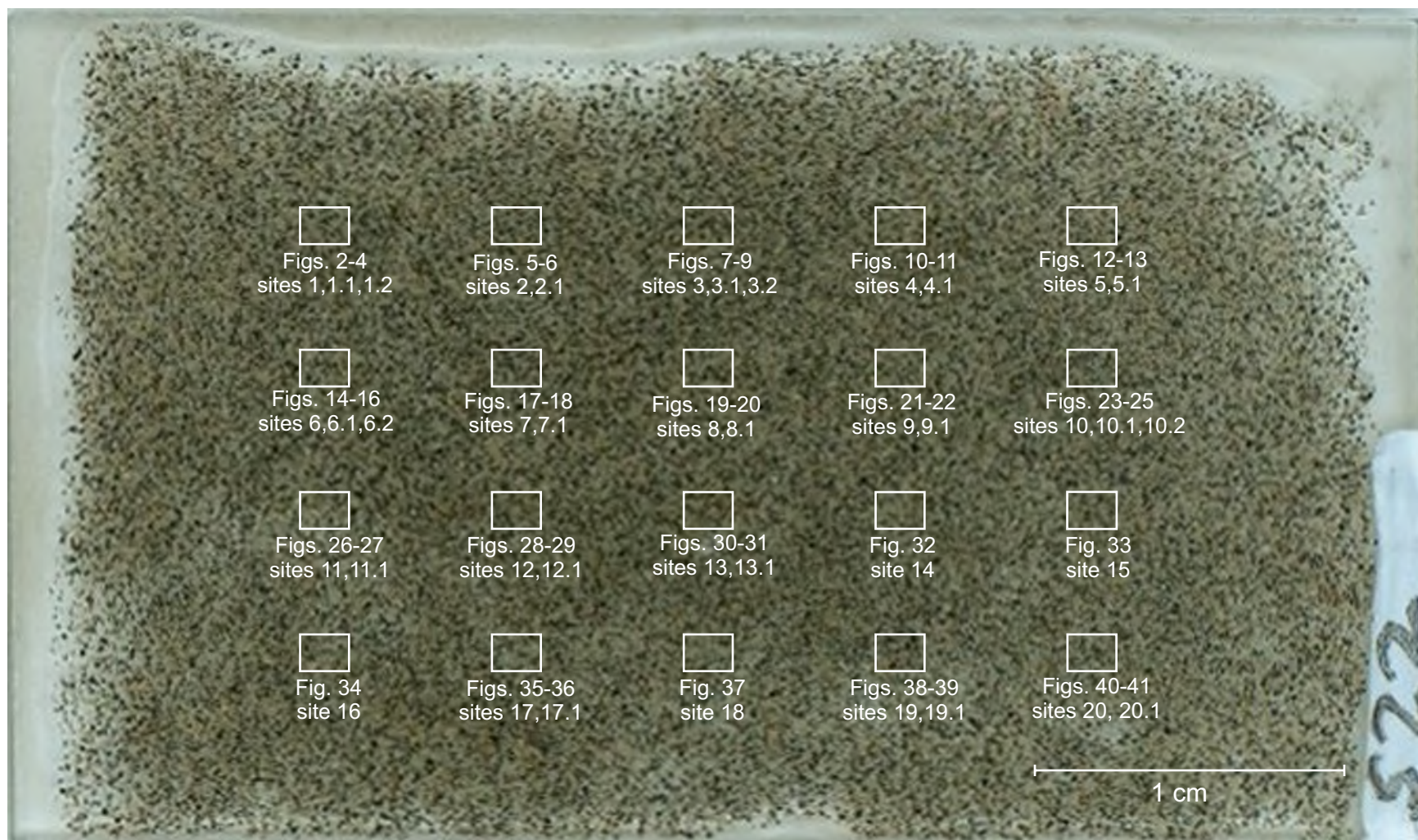


Figure B11.1: Sample S22



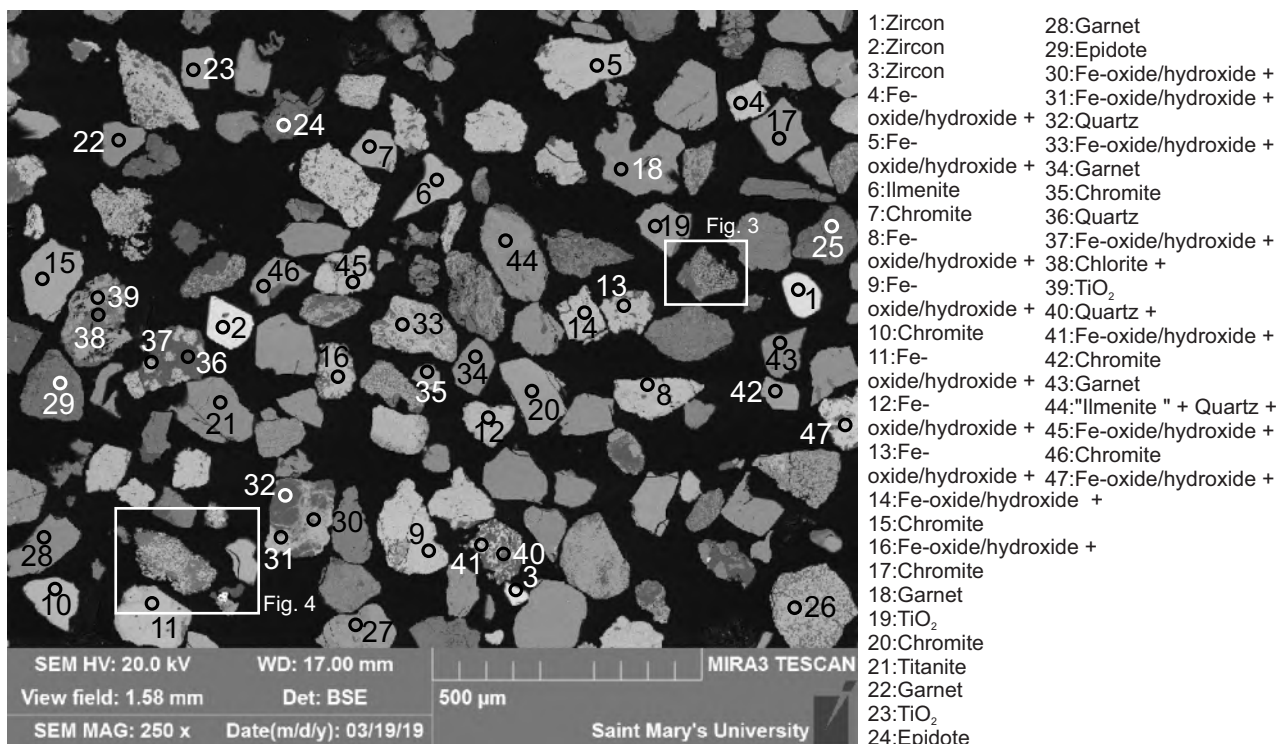


Figure B11.2: Sample S22 site 1 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, TiO<sub>2</sub>, Chr, Grt, Ep, Ttn, Zrn, Mnz, Pl (Byt), Ab, Ms, Qz, Cal, Chl and Py.

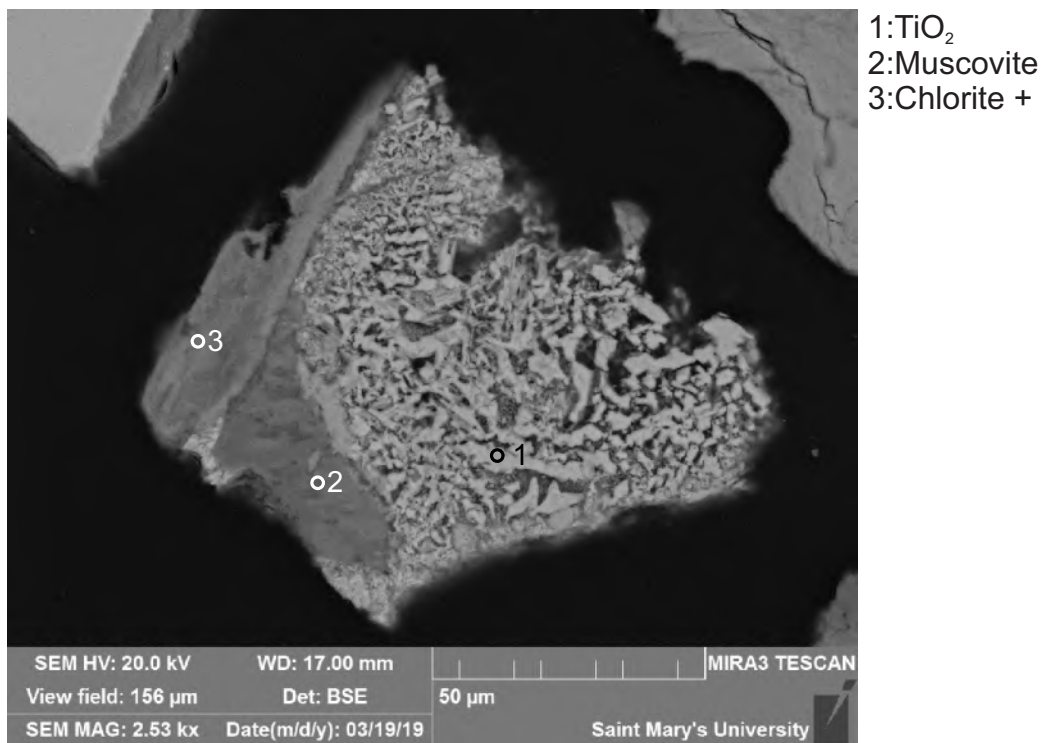
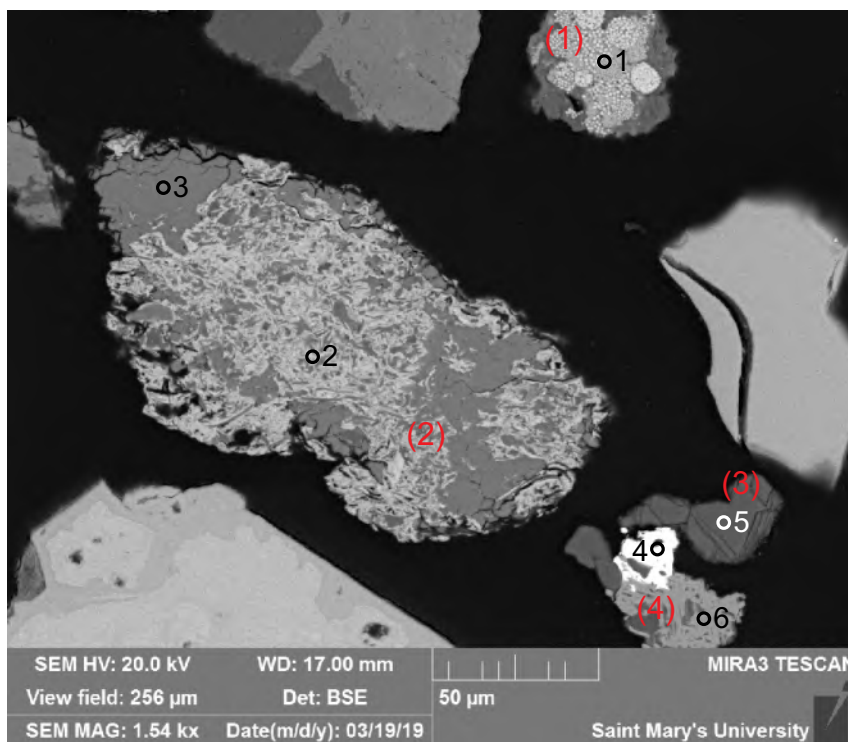
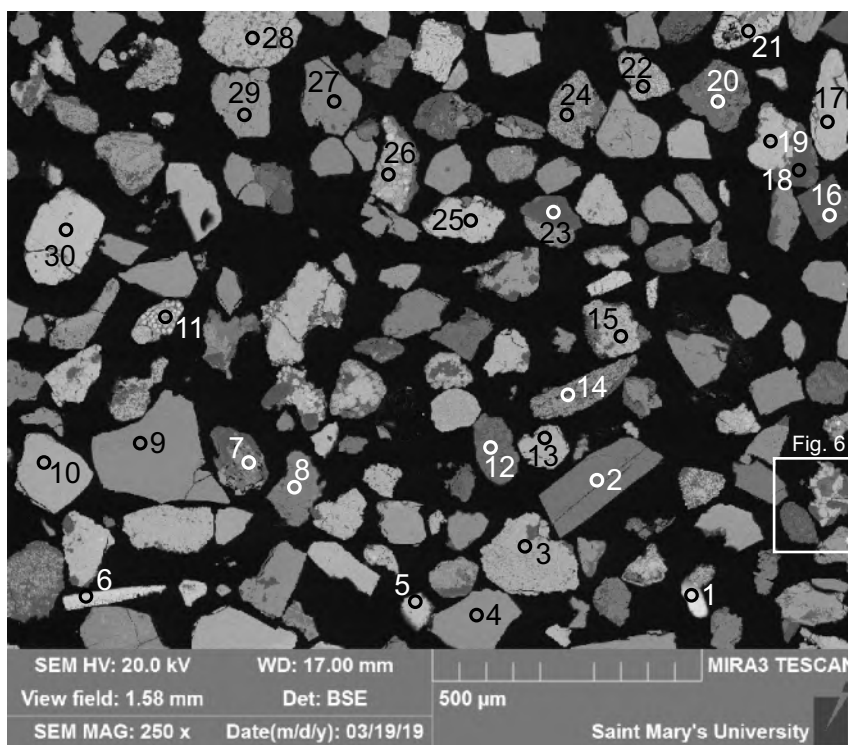


Figure B11.3: Sample S22 site 1.1 (SEM). Probably a lithic clast made up of muscovite + chlorite + spongy TiO<sub>2</sub>, cf. Fig. B10.20. Retrograde metamorphic.



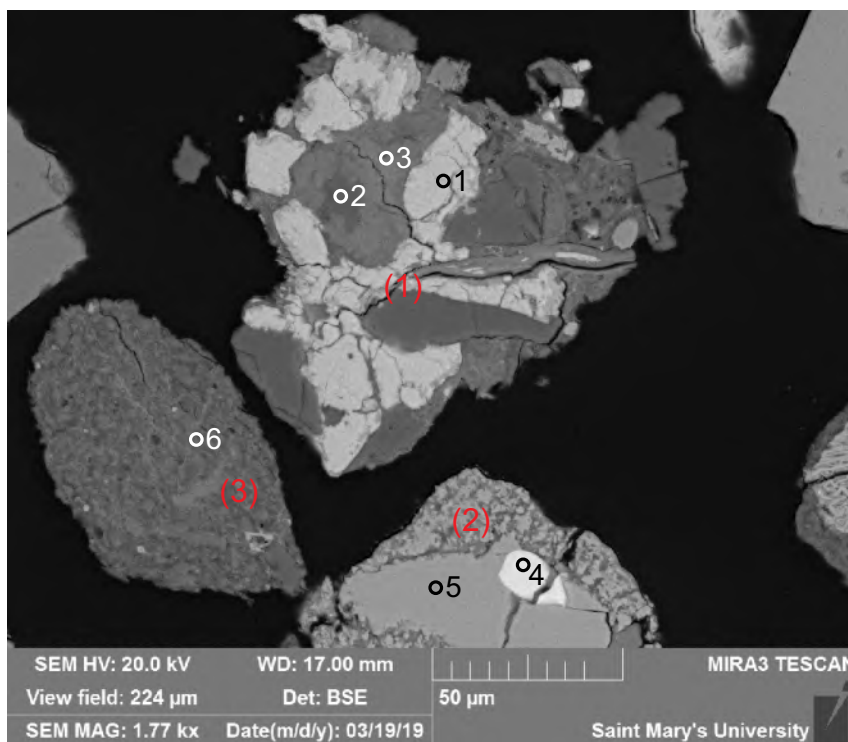
- 1:Pyrite + Chlorite
- 2:Fe-oxide/hydroxide +
- 3:Calcite
- 4:Monazite
- 5:Albite
- 6:TiO<sub>2</sub> +

Figure B11.4: Sample S22 site 1.2 (SEM). 1: Pyrite framboids, probably diagenetic. 2: Lithic clast (calcite + Fe-oxide/hydroxide, sedimentary). 3: Detrital albite. 4: Lithic clast (monazite + TiO<sub>2</sub>, not interpreted).



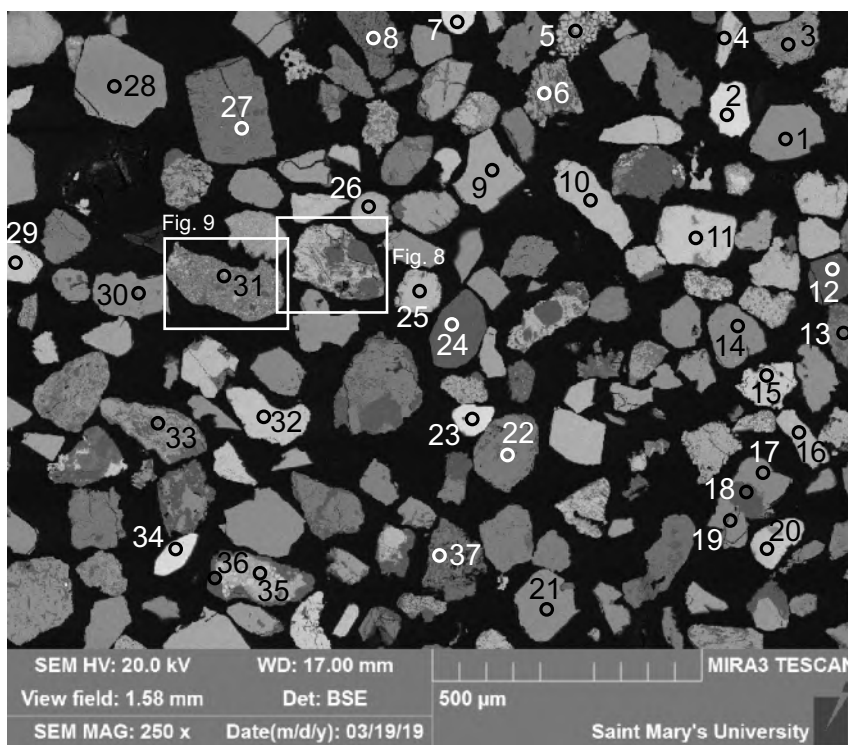
- 1:Zircon
- 2:Mix
- 3:Fe-oxide/hydroxide +
- 4:Garnet
- 5:Fe-Chromite
- 6:Fe-oxide/hydroxide
- 7:Titanite
- 8:Epidote
- 9:Garnet
- 10:Chromite
- 11:Pyrite + Chlorite
- 12:Epidote +
- 13:Chromite
- 14:TiO<sub>2</sub> + Chlorite
- 15:Mix
- 16:Tourmaline
- 17:Fe-oxide/hydroxide +
- 18:Quartz
- 19:Fe-oxide/hydroxide +
- 20:Epidote
- 21:Fe-oxide/hydroxide +
- 22:Chlorite + Fe-oxide/hydroxide
- 23:Quartz
- 24:Chlorite + Fe-oxide/hydroxide
- 25:Fe-oxide/hydroxide +
- 26:Fe-oxide/hydroxide +
- 27:Mix
- 28:Fe-oxide/hydroxide +
- 29:TiO<sub>2</sub>
- 30:Fe-oxide/hydroxide +

Figure B11.5: Sample S22 site 2 (SEM). The detrital minerals include: Fe-oxide/hydroxide, TiO<sub>2</sub>, Chr, Fe-Chr, Grt, Tur, Ep, Ttn, Zrn, Ab, Kfs, Ms, Qz, Chl and Py.



- 1:Fe-oxide/hydroxide +
- 2:Albite
- 3:K-Feldspar
- 4:Zircon
- 5:TiO<sub>2</sub>
- 6:Quartz + Muscovite +

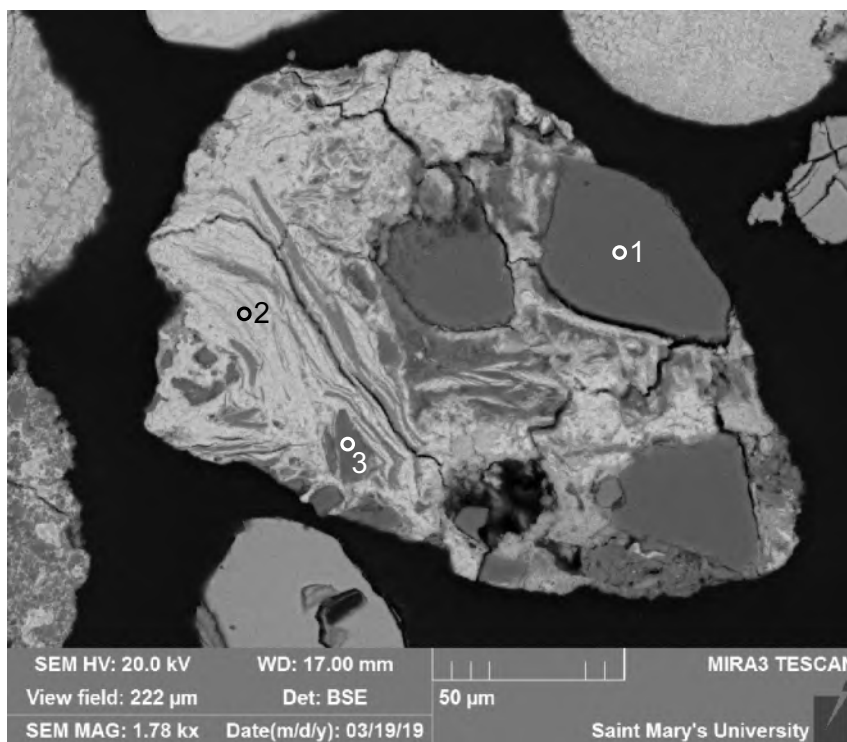
Figure B11.6: Sample S22 site 2.1 (SEM). 1: Lithic clast (K-feldspar + albite + Fe-oxide/hydroxide, igneous). 2: Lithic clast (TiO<sub>2</sub> + zircon inclusion, igneous). 3: Lithic clast (quartz + muscovite, siltstone).



- 1:Garnet
- 2:Zircon
- 3:TiO<sub>2</sub> +
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:TiO<sub>2</sub> +
- 7:Zircon
- 8:Plagioclase (Labradorite)
- 9:Chromite
- 10:Fe-oxide/hydroxide +
- 11:Fe-oxide/hydroxide +
- 12:Tourmaline
- 13:Mix
- 14:Garnet
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Garnet
- 18:Quartz
- 19:Garnet
- 20:Fe-oxide/hydroxide +
- 21:Garnet
- 22:Garnet
- 23:Zircon
- 24:Tourmaline
- 25:Fe-oxide/hydroxide +
- 26:Fe-oxide/hydroxide +
- 27:Clinopyroxene
- 28:Spinel
- 29:Fe-oxide/hydroxide +
- 30:Epidote
- 31:Quartz + Fe-oxide/hydroxide
- 32:Fe-oxide/hydroxide +
- 33:TiO<sub>2</sub> + Chlorite
- 34:Zircon
- 35:Fe-oxide/hydroxide +
- 36:Albite
- 37:Mix

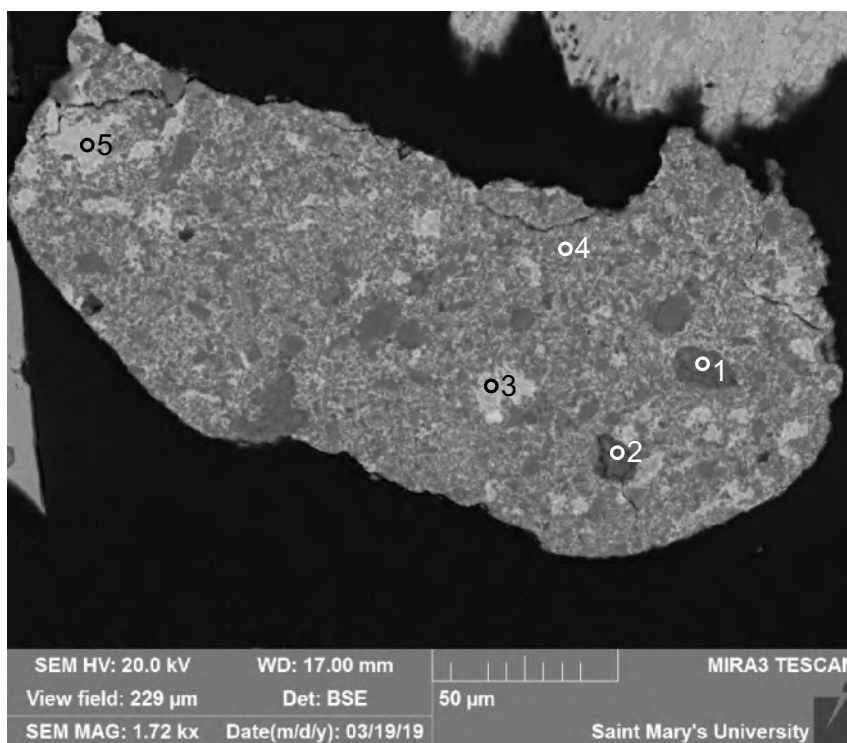
Figure B11.7: Sample S22 site 3 (SEM). The detrital minerals include: Fe-oxide/hydroxide, TiO<sub>2</sub>, Spl, Grt, Tur, Ep, Zrn, Cpx, Ab, PI (Lab), Ms, Qz.





- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Quartz

Figure B11.8: Sample S22 site 3.1 (SEM). Pedogenic aggregate of quartz + Fe-oxide/hydroxide.



- 1:Muscovite +
- 2:Mix
- 3:Fe-oxide/hydroxide +
- 4:Quartz + Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +

Figure B11.9: Sample S22 site 3.2 (SEM). Siltstone or altered volcanic lithic clast.

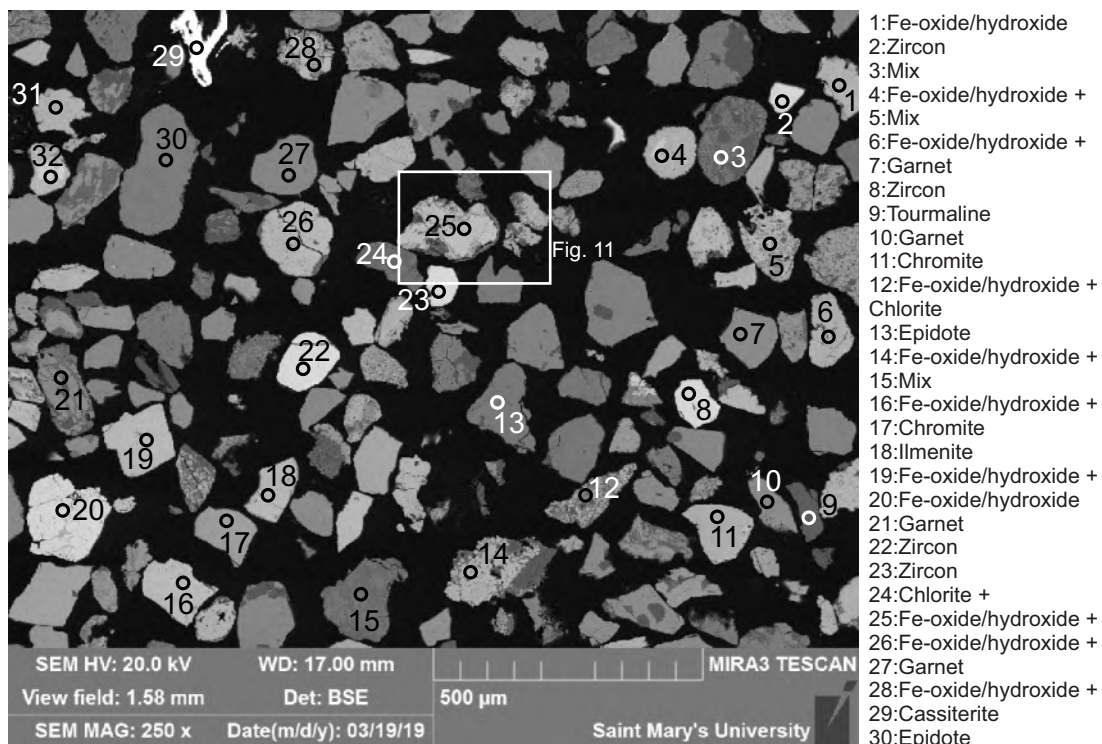


Figure B11.10: Sample S22 site 4 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, Chr, Grt, Tur, Ep, Zrn, Qz, Cal, Chl, Py.

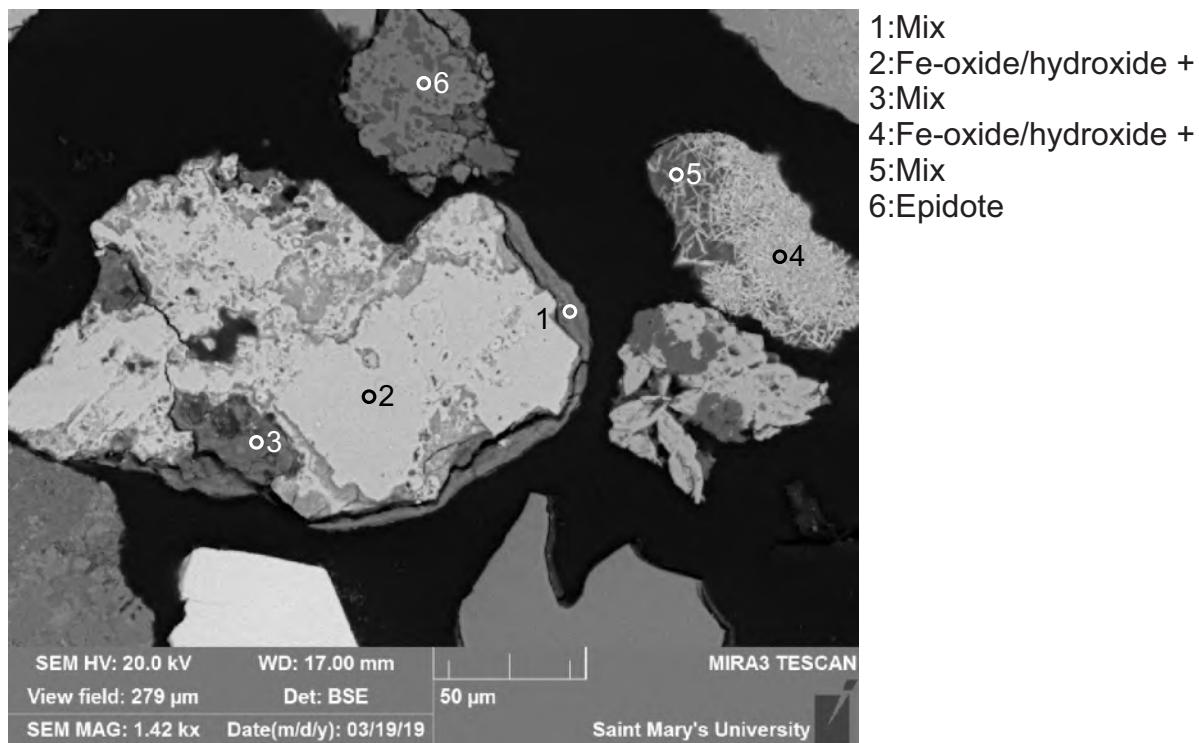


Figure B11.11: Sample S22 site 4.1 (SEM). Pedogenic aggregate.



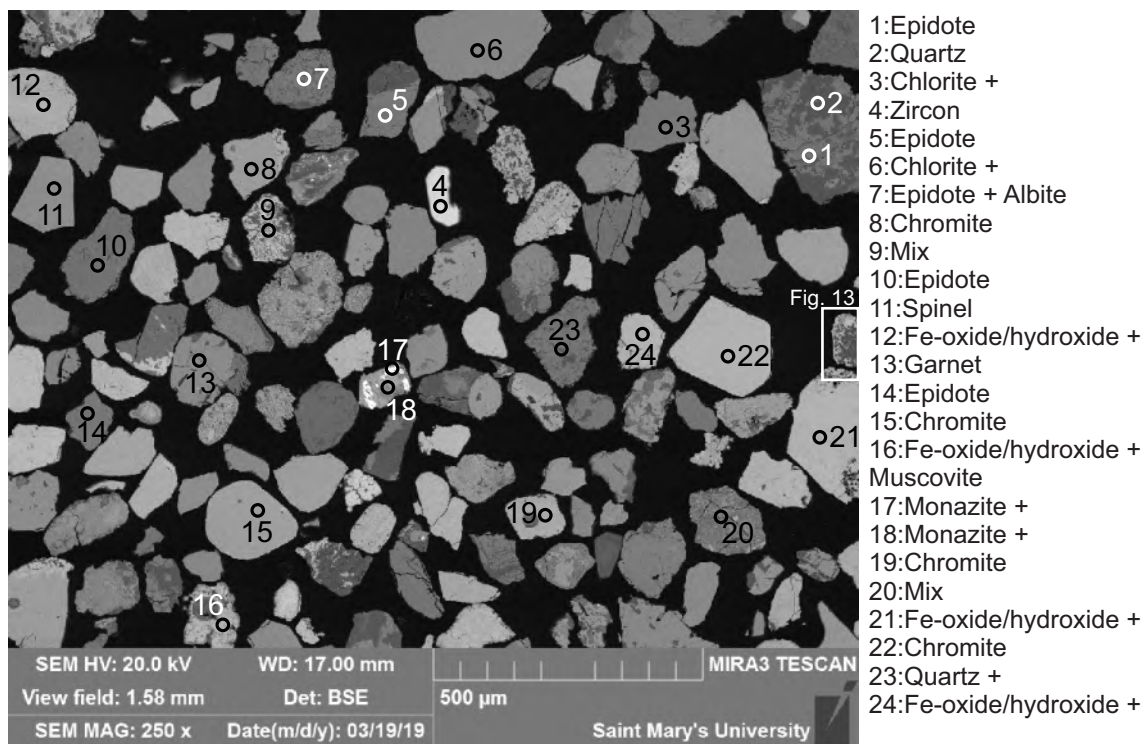


Figure B11.12: Sample S22 site 5 (SEM). The detrital minerals include: Fe-oxide/hydroxide,  $\text{TiO}_2$ , Chr, Spl, Grt, Ep, Zrn, Mnz, Pl (Byt), Qz, Ms.

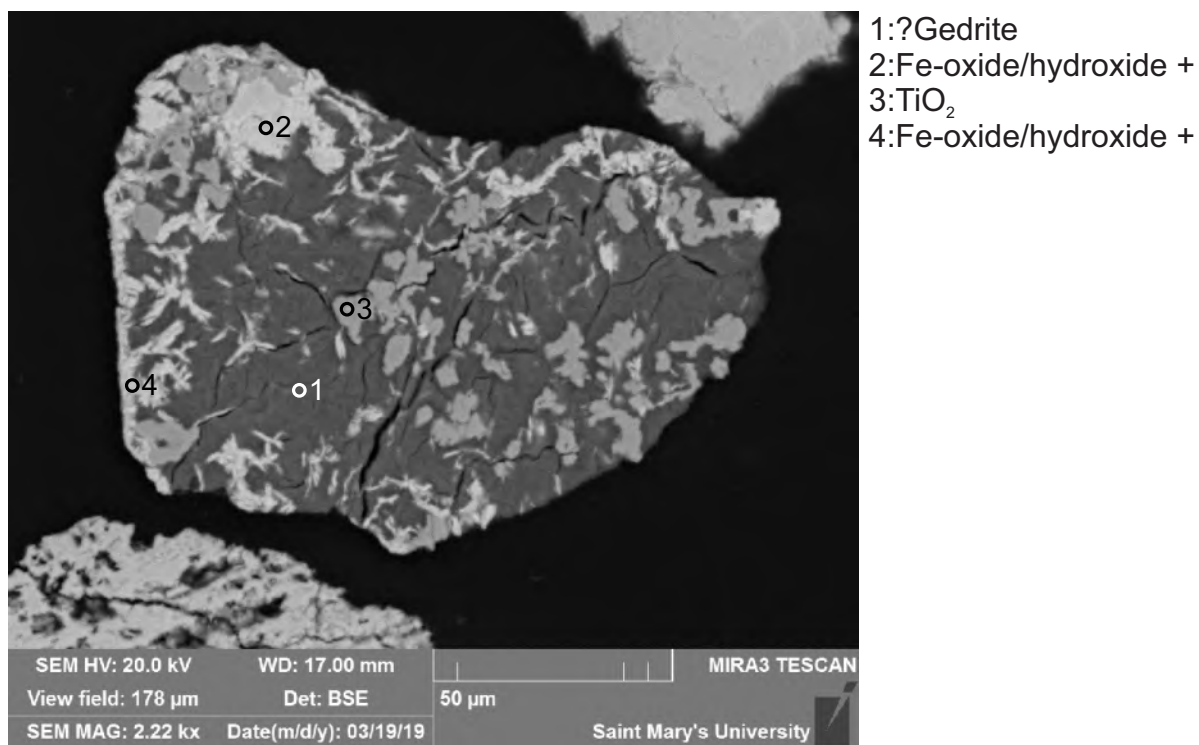


Figure B11.13: Sample S22 site 5.1 (SEM). Lithic clast ( $\text{TiO}_2$  + Fe-oxide/hydroxide and probably gedrite, metamorphic).

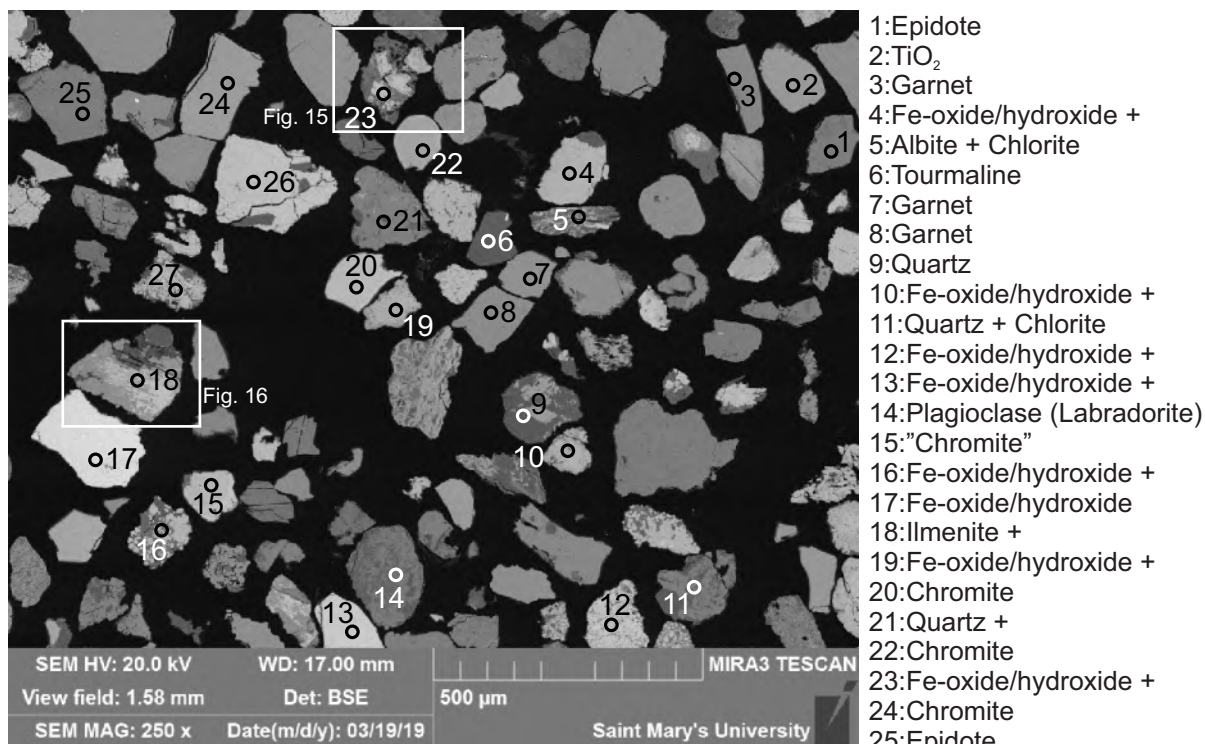


Figure B11.14: Sample S22 site 6 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm,  $\text{TiO}_2$ , Chr, Fe-Chr, Grt, Tur, Ep, Ttn, Ab, Pl (Lab), Ms, Qz, Chl.

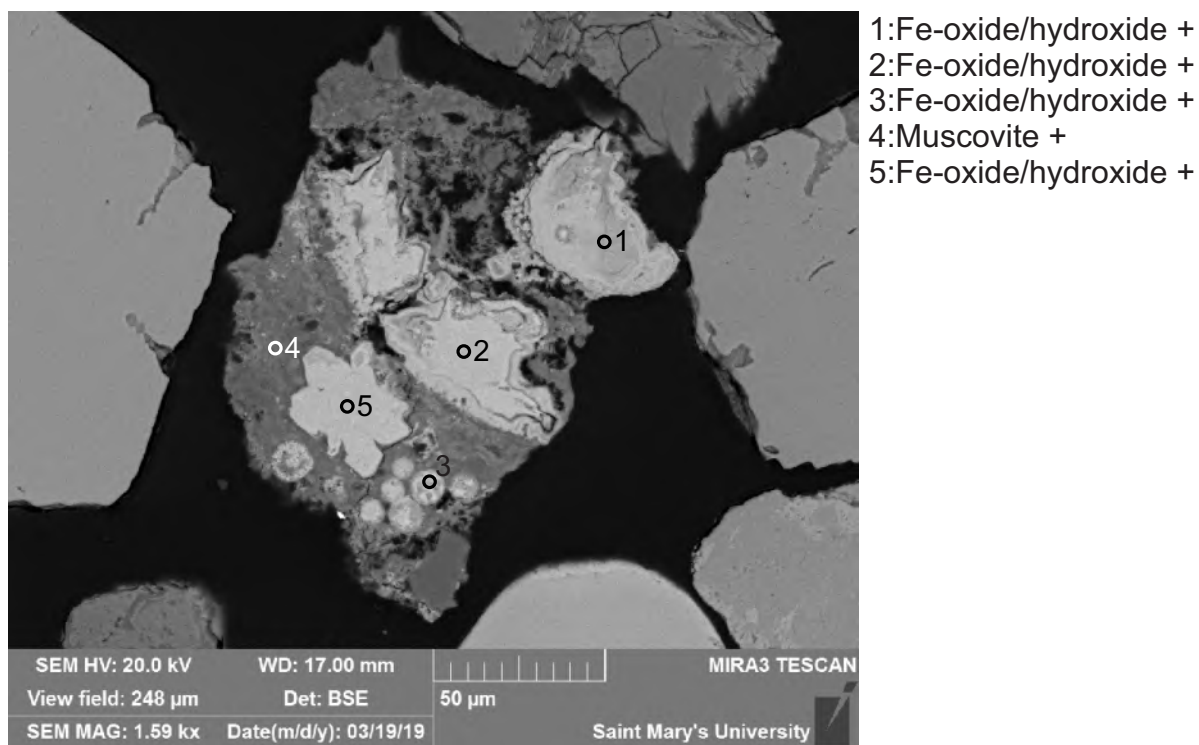
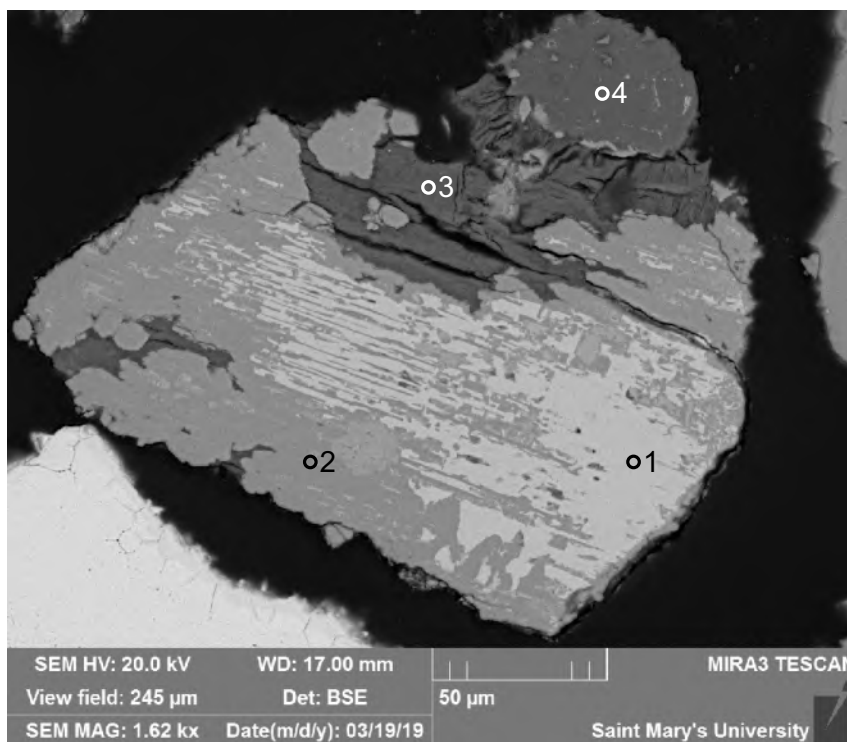
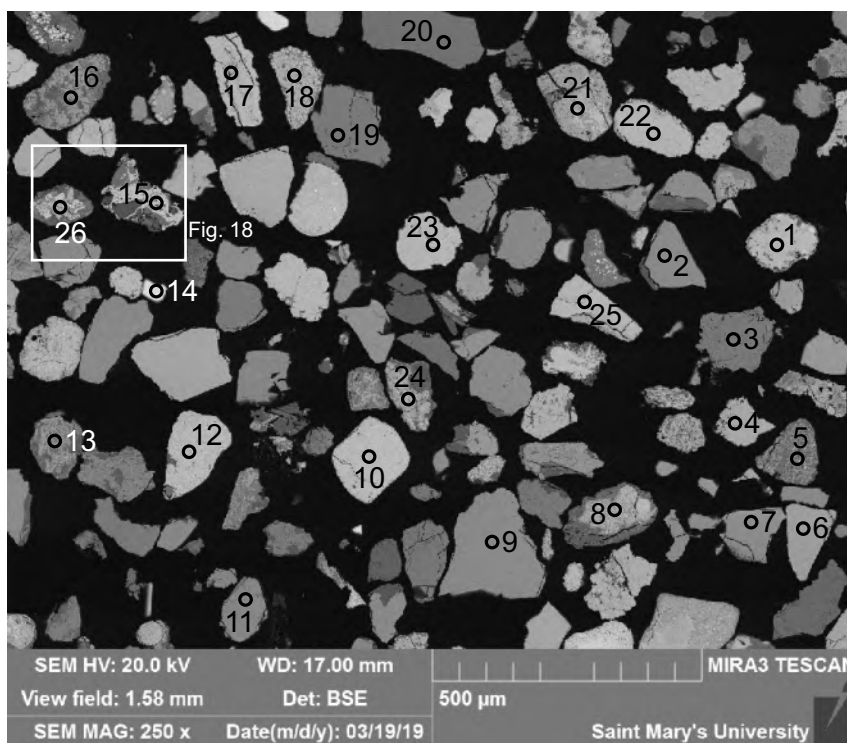


Figure B11.15: Sample S22 site 6.1 (SEM). Pedogenic aggregate.



- 1:Ilmenite
- 2:Titanite
- 3:Unknown  
?metamorphic  
mineral
- 4:Albite +

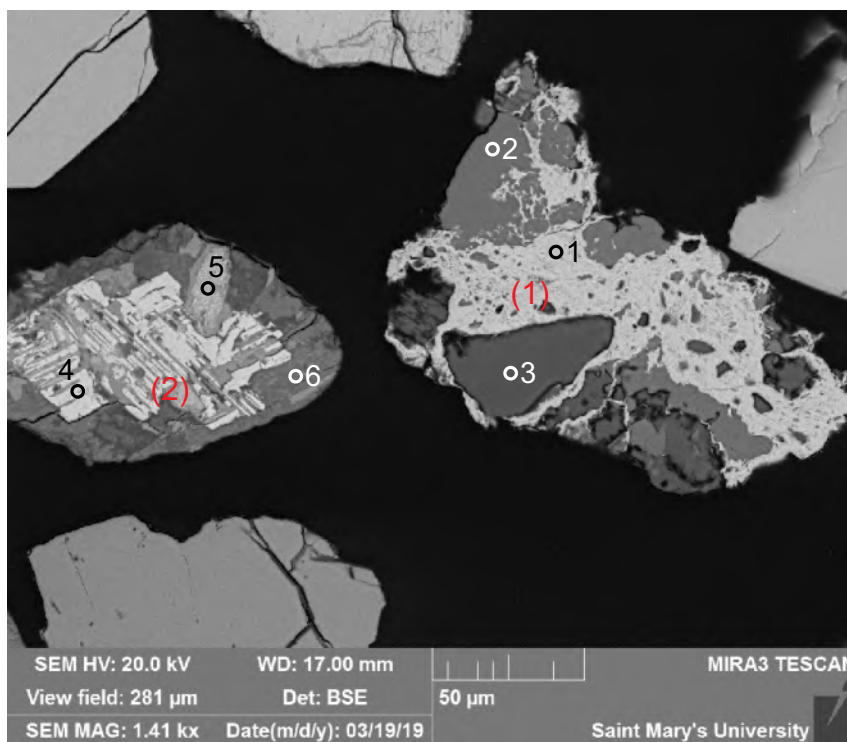
Figure B11.16: Sample S22 site 6.2 (SEM). Lithic clast (albite + unknown mineral + ilmenite probably altered to titanite, metamorphic).



- 1:Fe-oxide/hydroxide +
- 2:Garnet
- 3:Epidote
- 4:Fe-oxide/hydroxide +
- 5:TiO<sub>2</sub> +
- 6:Chromite
- 7:Spinel
- 8:Fe-oxide/hydroxide + Chlorite
- 9:Garnet
- 10:Fe-oxide/hydroxide +
- 11:Titanite
- 12:Fe-oxide/hydroxide +
- 13:TiO<sub>2</sub> +
- 14:Zircon
- 15:Fe-oxide/hydroxide +
- 16:TiO<sub>2</sub> +
- 17:Fe-oxide/hydroxide + Chlorite
- 18:Fe-oxide/hydroxide + Chlorite
- 19:Epidote
- 20:Amphibole
- 21:Fe-oxide/hydroxide +
- 22:Fe-oxide/hydroxide +
- 23:Fe-oxide/hydroxide +
- 24:Fe-oxide/hydroxide +
- 25:Fe-oxide/hydroxide +
- 26:Chlorite +

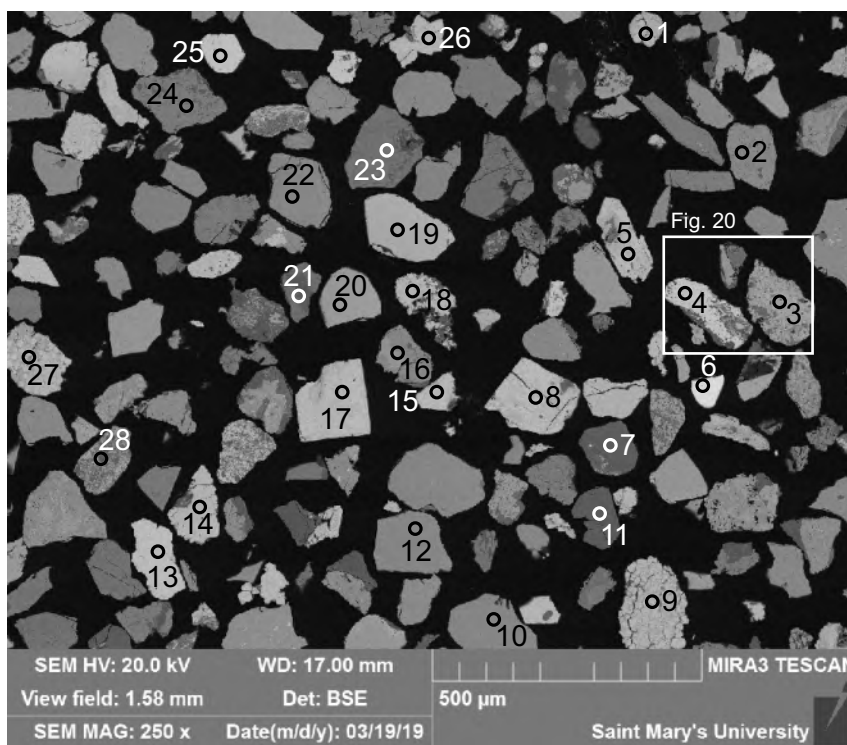
Figure B11.17: Sample S22 site 7 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Ttn, Zrn, Amph, Ab, Qz, Cal, Chl.





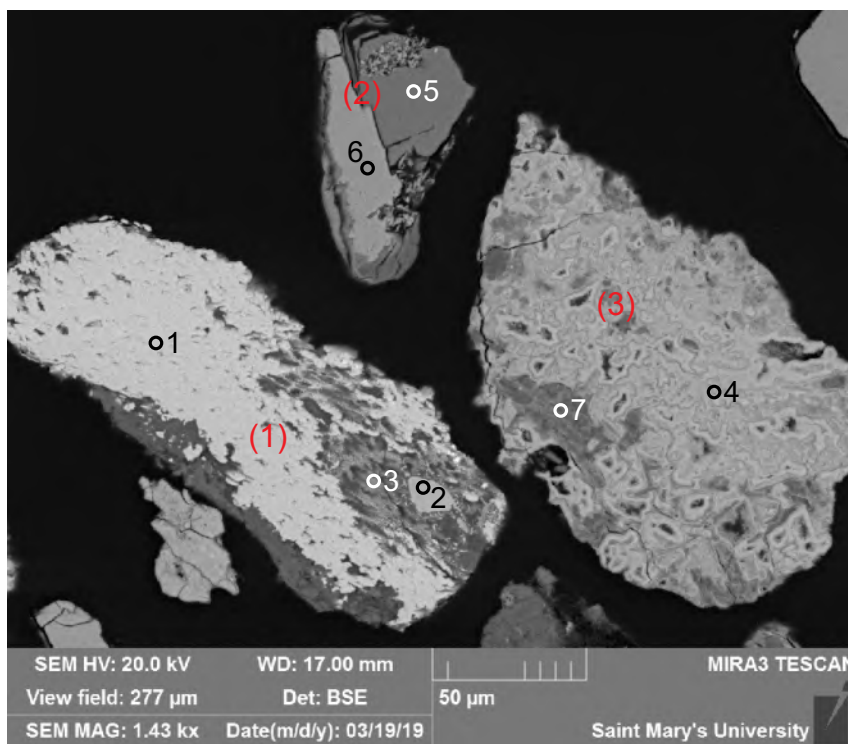
- 1:Fe-oxide/hydroxide +
- 2:Calcite
- 3:Albite
- 4:Fe-oxide/hydroxide +
- 5:"Ilmenite"
- 6:Mix?

Figure B11.18: Sample S22 site 7.1 (SEM). 1: Lithic clast (albite + calcite + Fe-oxide/hydroxide, altered sandstone). 2: Lithic clast (altered silicate minerals + a mixture of ilmenite and Fe-oxide/hydroxide).



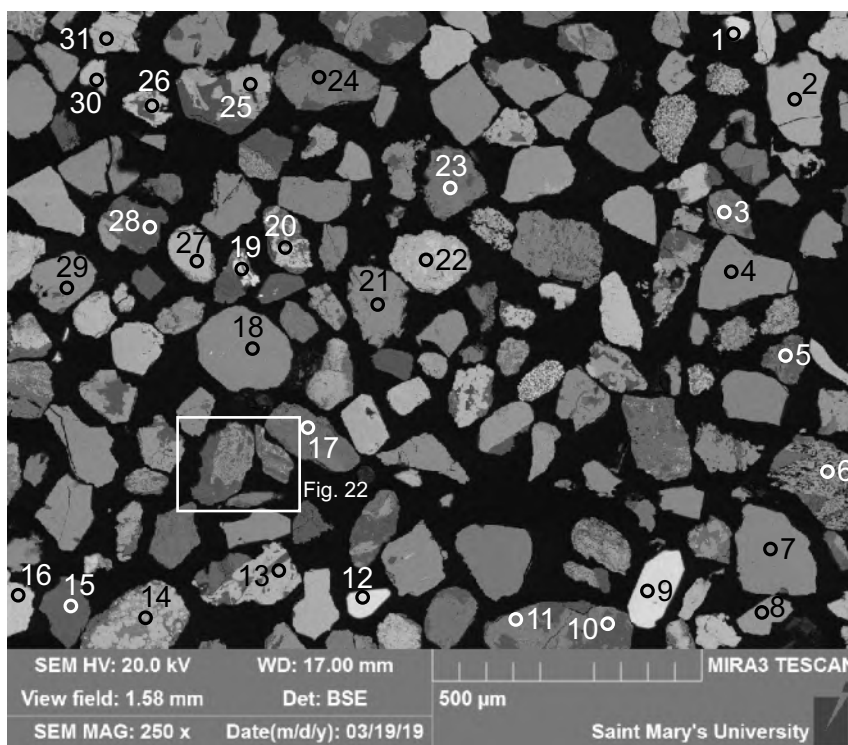
- 1:Fe-oxide/hydroxide +
- 2:Garnet
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:Zircon
- 7:Tourmaline
- 8:Fe-oxide/hydroxide +
- 9:Fe-oxide/hydroxide +
- 10:Garnet ?
- 11:Tourmaline
- 12:Garnet
- 13:Fe-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:TiO<sub>2</sub> + Quartz
- 17:Fe-oxide/hydroxide +
- 18:Fe-oxide/hydroxide +
- 19:Chromite
- 20:Chromite
- 21:Albite
- 22:Apatite
- 23:Epidote
- 24:Epidote
- 25:Fe-oxide/hydroxide +
- 26:Fe-oxide/hydroxide +
- 27:Fe-oxide/hydroxide +
- 28:Fe-oxide/hydroxide +

Figure B11.19: Sample S22 site 8 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, TiO<sub>2</sub>, Chr, Grt, Tur, Ep, Zrn, Ab, Qz, Ap, Cal.



- 1: Fe-oxide/hydroxide +
- 2: Ilmenite +
- 3: Quartz + Fe-oxide/hydroxide
- 4: Fe-oxide/hydroxide +
- 5: Calcite
- 6:  $\text{TiO}_2$  +
- 7: Quartz +

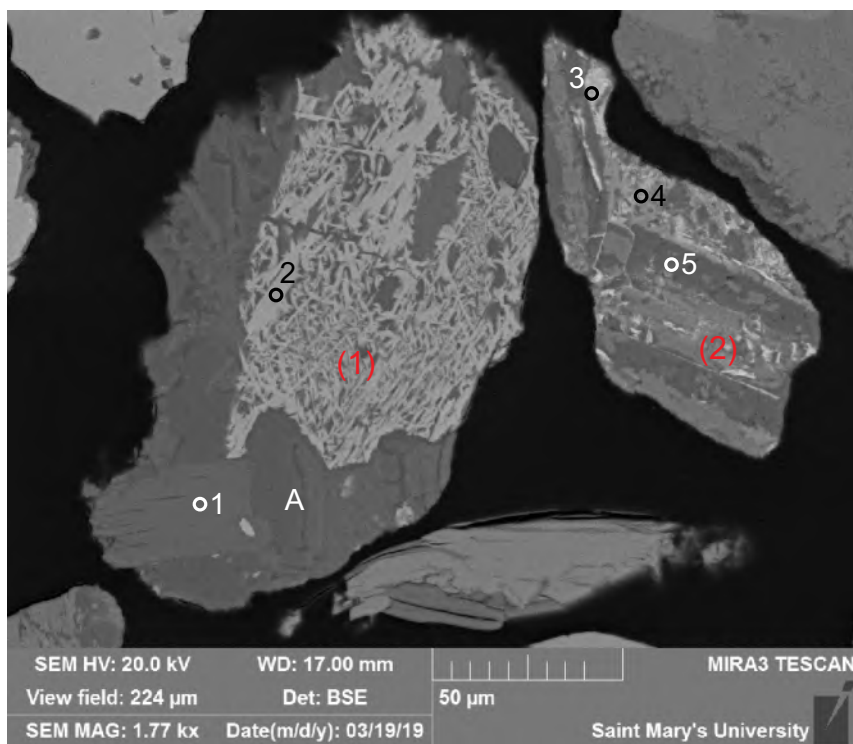
Figure B11.20: Sample S22 site 8.1 (SEM). 1: Lithic clast (siltstone cemented by limonite). 2: Lithic clast (calcite +  $\text{TiO}_2$ , metamorphic). 3: Pedogenic aggregate.



- 1: Zircon
- 2: Chromite
- 3: Chlorite +
- 4: Garnet
- 5: Plagioclase (Oligoclase)
- 6:  $\text{TiO}_2$  +
- 7: Garnet
- 8:  $\text{TiO}_2$
- 9: Zircon
- 10: Quartz
- 11: Epidote
- 12: Zircon
- 13: Fe-oxide/hydroxide +
- 14: Mix
- 15: Tourmaline
- 16: Fe-oxide/hydroxide +
- 17: Epidote
- 18: Garnet
- 19: Zircon +
- 20: Fe-oxide/hydroxide +
- 21: Titanite
- 22: Fe-oxide/hydroxide +
- 23: Epidote
- 24: Chlorite
- 25: Chromite
- 26: Fe-oxide/hydroxide +
- 27: Fe-oxide/hydroxide +
- 28: Quartz
- 29: Garnet
- 30: Fe-oxide/hydroxide
- 31: Fe-oxide/hydroxide

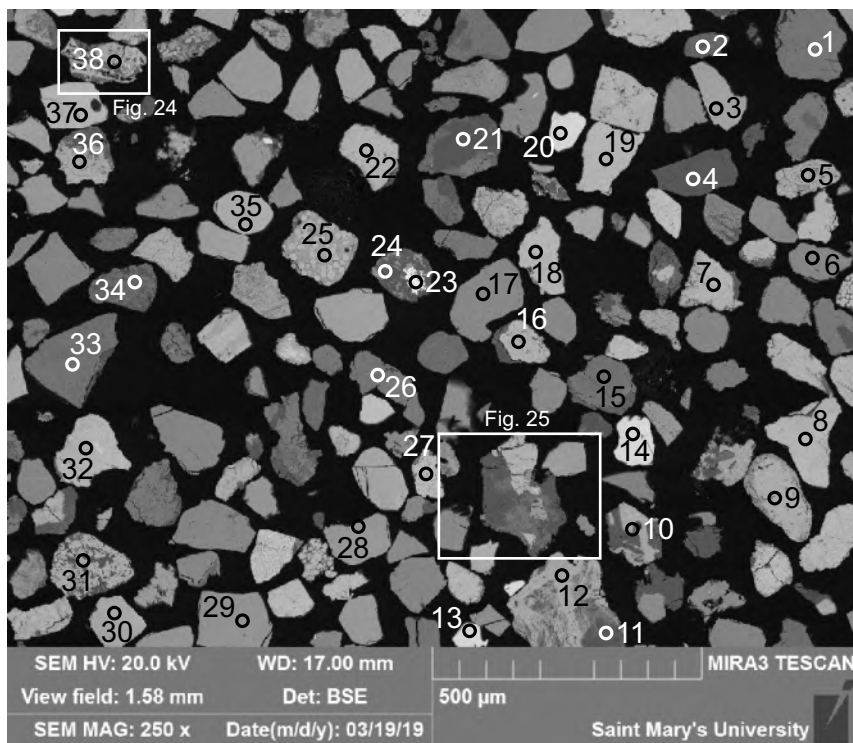
Figure B11.21: Sample S22 site 9 (SEM). The detrital minerals include: Fe-oxide/hydroxide,  $\text{TiO}_2$ , Chr, Grt, Tur, Ep, Ttn, Zrn, Ab, Pl (Olig), Ms, Qz, Chl.





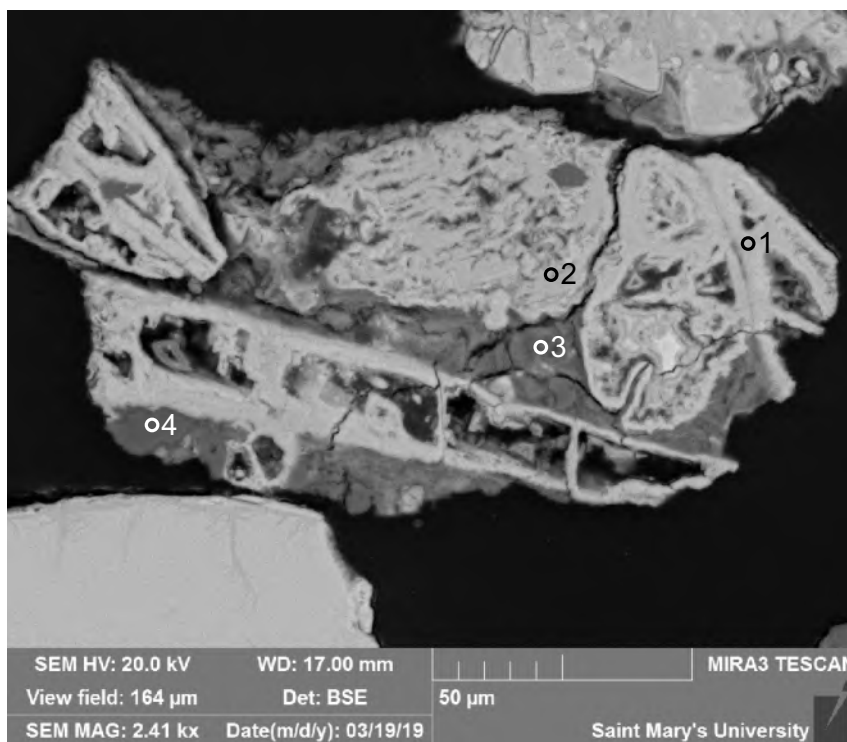
- 1: Muscovite
- 2:  $\text{TiO}_2$  +
- 3: Fe-oxide/hydroxide +
- 4: Mix
- 5: Albite

Figure B11.22: Sample S22 site 9.1 (SEM). 1: Lithic clast (muscovite + another sheet silicate (position A) +  $\text{TiO}_2$  with trellis structure (altered ilmenite), metamorphic). 2: Lithic clast (albite + Fe-oxide/hydroxide + possibly altered chlorite, metamorphic).



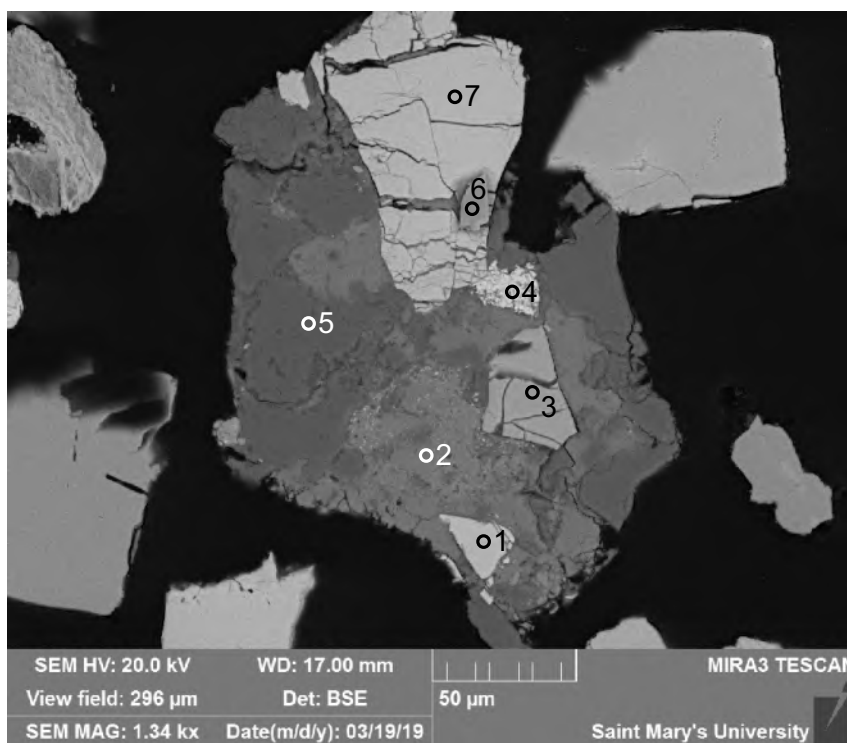
- 1: Epidote
- 2: Epidote
- 3: Chromite
- 4: Tourmaline
- 5: Fe-oxide/hydroxide +
- 6: Garnet
- 7: Fe-oxide/hydroxide +
- 8: Fe-oxide/hydroxide +
- 9: Fe-oxide/hydroxide +
- 10: Quartz +
- 11: Quartz
- 12: Fe-oxide/hydroxide +
- 13: Zircon
- 14: Zircon
- 15: Clinopyroxene
- 16: Fe-oxide/hydroxide +
- 17: Garnet
- 18: Fe-oxide/hydroxide +
- 19: Fe-oxide/hydroxide +
- 20: Zircon
- 21: Albite +
- 22: Fe-oxide/hydroxide +
- 23:
- 24: Muscovite
- 25: Fe-oxide/hydroxide +
- 26: Epidote
- 27: Fe-oxide/hydroxide +
- 28: Chromite
- 29: Chromite
- 30: Chromite
- 31: Chromite
- 32: Fe-oxide/hydroxide +
- 33: Epidote
- 34: Epidote
- 35: Chromite
- 36: Fe-oxide/hydroxide +
- 37: Ilmenite
- 38: Fe-oxide/hydroxide +

Figure B11.23: Sample S22 site 10 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, Chr, Spl, Grt, Tur, Ep, Zrn, Cpx, Ab, Ms, Qz, Chl, Cal.



- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Chlorite + Muscovite +
- 4:Quartz

Figure B11.24: Sample S22 site 10.1 (SEM). Pedogenic aggregate.



- 1:Chromite
- 2:Calcite +
- 3:Chromite
- 4:Fe-oxide/hydroxide
- 5:Albite
- 6:Spinel
- 7:Ilmenite

Figure B11.25: Sample S22 site 10.2 (SEM). Lithic clast made up of albite + chromite + ilmenite with spinel inclusion + calcite. Calcite appears to have partially replaced albite. ?Metaophiolite.

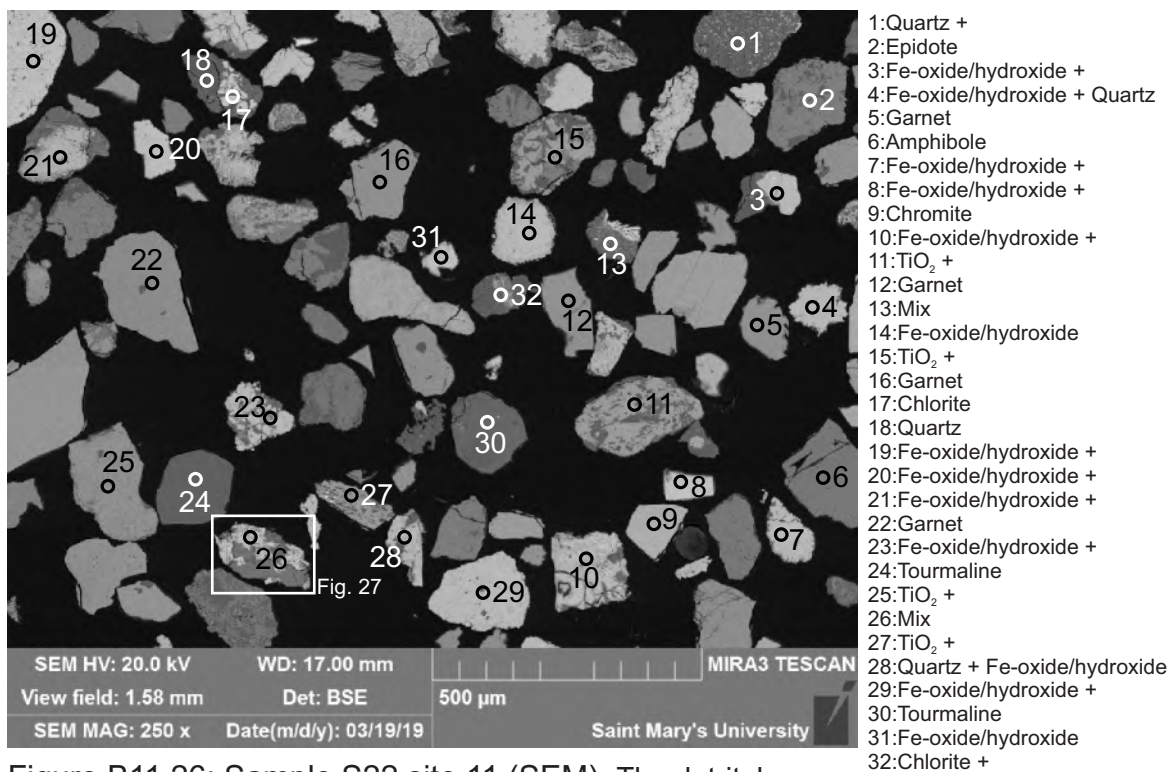


Figure B11.26: Sample S22 site 11 (SEM). The detrital minerals include: Fe-oxide/hydroxide, TiO<sub>2</sub>, Chr, Grt, Tur, Ep, Amph, Ms, Qz, Chl, Cal.

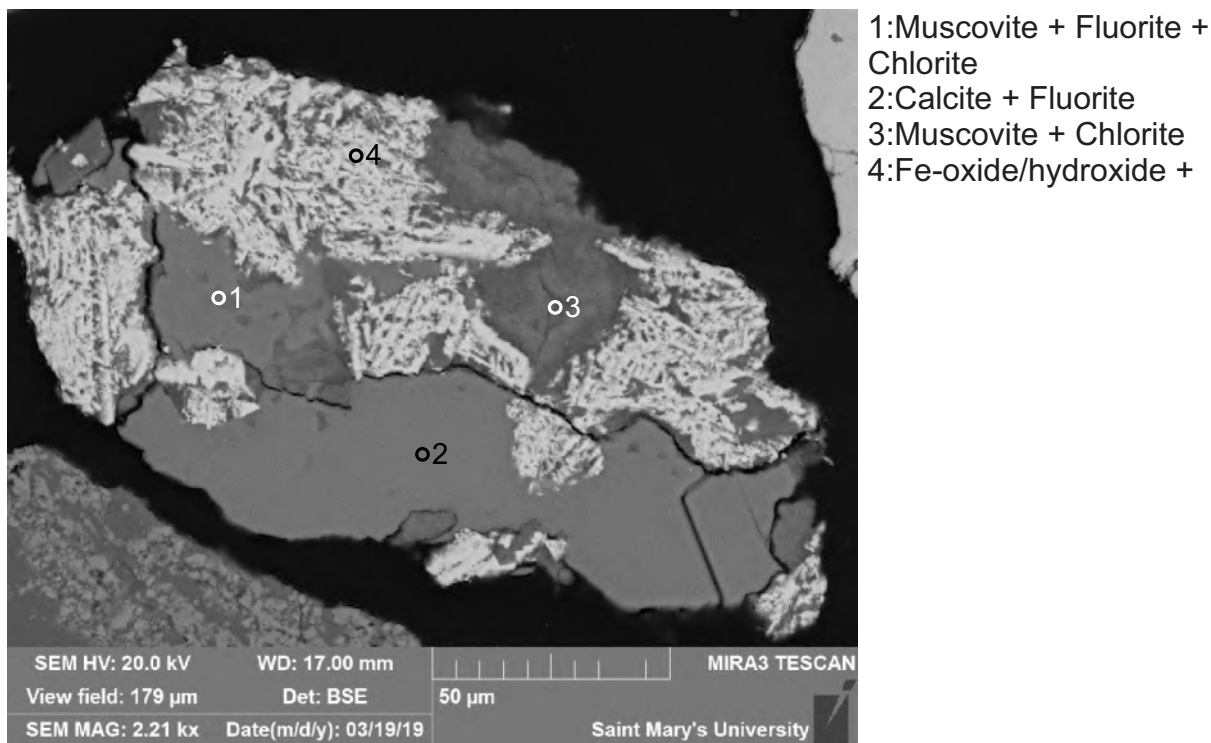
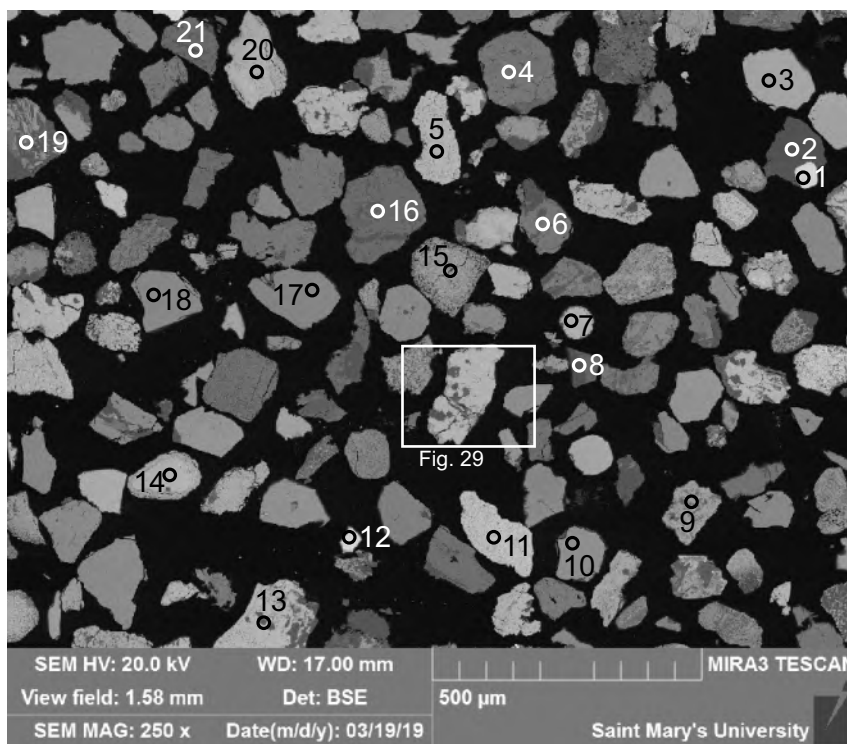


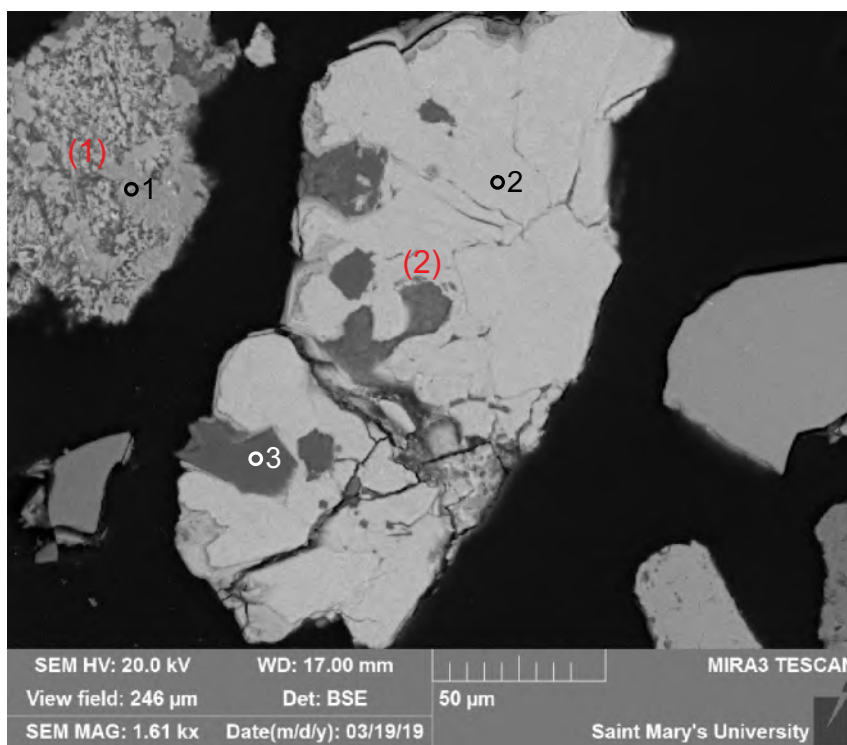
Figure B11.27: Sample S22 site 11.1 (SEM). Lithic clast made up of muscovite + altered silicate minerals + calcite + Fe-oxide/hydroxide, originally magnetite. Altered metamorphic or hydrothermal.





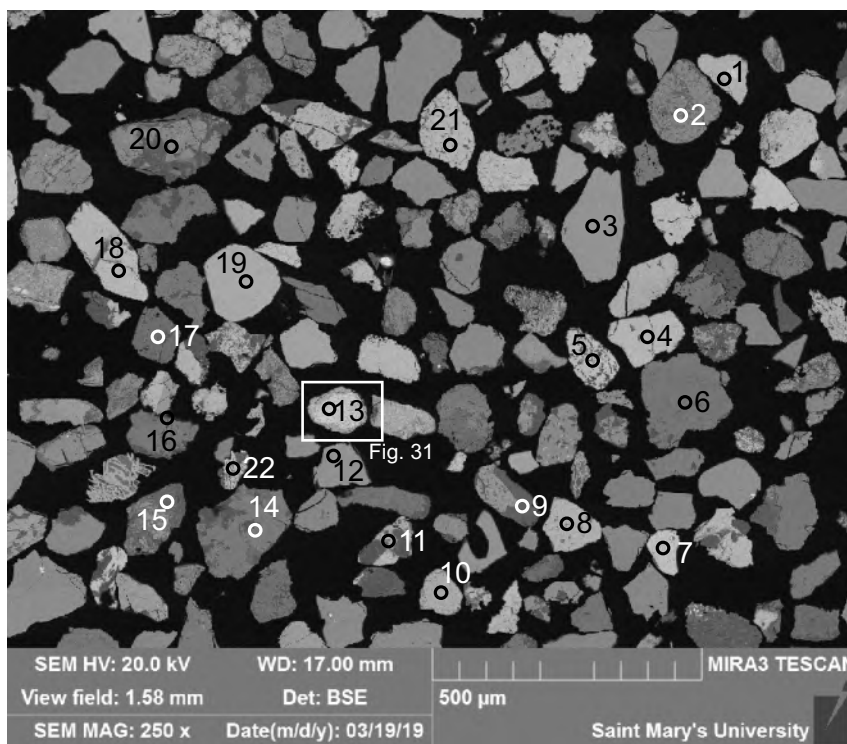
- 1:Zircon
- 2:Quartz
- 3:Chromite
- 4:Epidote
- 5:Fe-oxide/hydroxide +
- 6:Epidote
- 7:Fe-oxide/hydroxide +
- 8:Tourmaline
- 9:Mix
- 10:Spinel
- 11:Fe-oxide/hydroxide +
- 12:Zircon
- 13:Mn-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:Epidote
- 17:Garnet
- 18:Spinel
- 19:Mix
- 20:Fe-oxide/hydroxide +
- 21:Epidote

Figure B11.28: Sample S22 site 12 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, Chr, Spl, Grt, Tur, Ep, Zrn, Qz. Mn-ohy may be either detrital or due to pedogenesis.



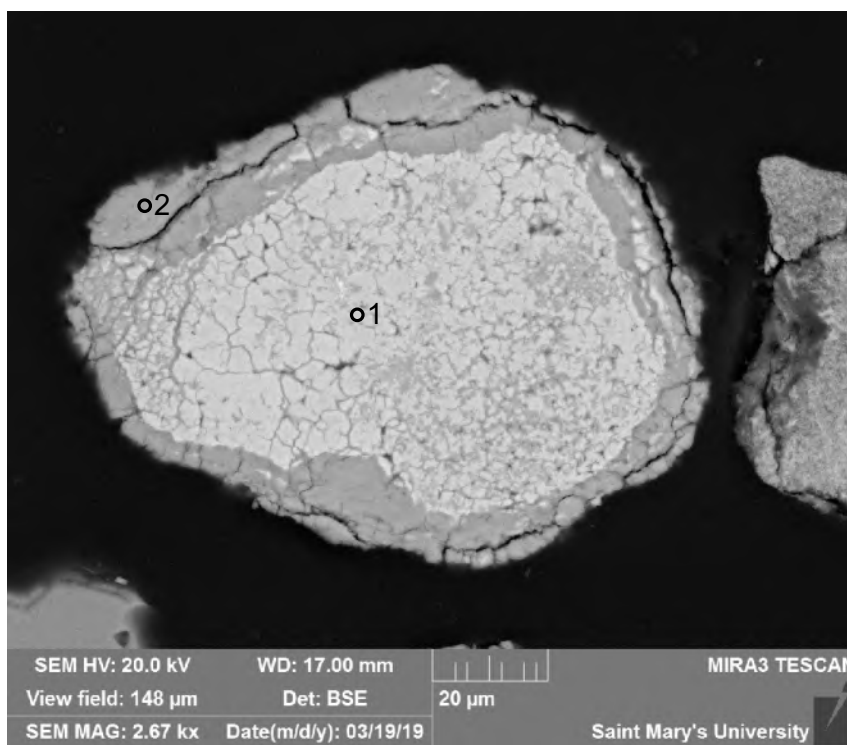
- 1:Ilmenite
- 2:Fe-oxide/hydroxide +
- 3:Quartz +

Figure B11.29: Sample S22 site 12.1 (SEM). 1: Partly altered detrital ilmenite grain. 2: Pedogenic aggregate cementing silt-sized quartz.



- 1:Fe-oxide/hydroxide +
- 2:Mix
- 3:TiO<sub>2</sub>
- 4:Fe-oxide/hydroxide +
- 5:"Chromite"
- 6:Epidote
- 7:Fe-oxide/hydroxide +
- Chlorite
- 8:Fe-oxide/hydroxide +
- 9:Muscovite
- 10:Fe-oxide/hydroxide +
- 11:Fe-oxide/hydroxide +
- 12:Chromite
- 13:Pyrite +
- 14:Epidote +
- 15:Quartz + Chlorite
- 16:Epidote
- 17:Amphibole
- 18:Fe-oxide/hydroxide +
- 19:Chromite
- 20:Titanite
- 21:Fe-oxide/hydroxide +
- 22:Mix

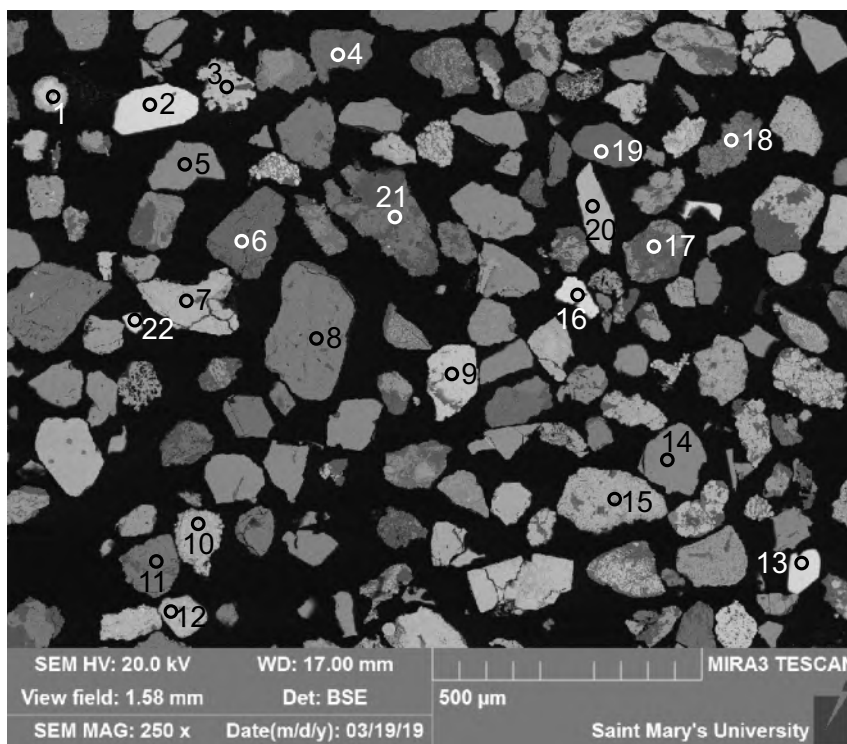
Figure B11.30: Sample S22 site 13 (SEM). The detrital minerals include: Fe-oxide/hydroxide, TiO<sub>2</sub>, Chr, Fe-Chr, Grt, Tur, Ep, Ttn, Amph, Ms, Qz, Chl, Py.



- 1:Pyrite +
- 2:Fe-oxide/hydroxide +

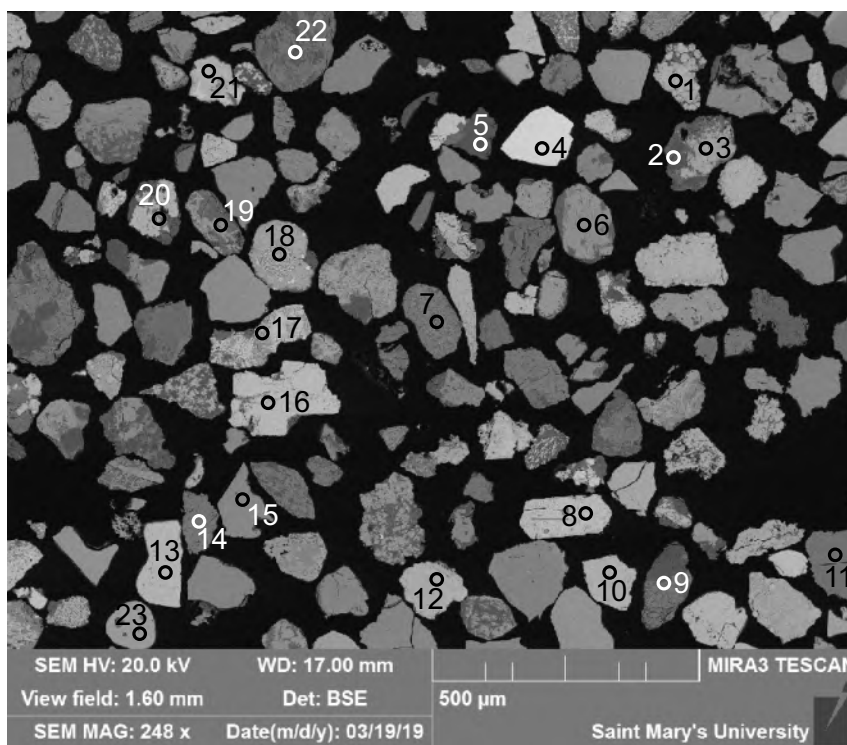
Figure B11.31: Sample S22 site 13.1 (SEM). Detrital pyrite nodule with Fe-oxide/hydroxide rim forming from the oxidation of pyrite.





- 1:Pyrite +
- 2:Zircon
- 3:Fe-oxide/hydroxide +
- 4:Epidote + Albite
- 5:Garnet
- 6:Epidote
- 7:Fe-oxide/hydroxide +
- 8:Epidote
- 9:Fe-oxide/hydroxide +
- 10:Fe-oxide/hydroxide +
- 11:Mix
- 12:Fe-oxide/hydroxide +
- 13:Zircon
- 14:Garnet
- 15:Fe-oxide/hydroxide +
- 16:Zircon
- 17:Quartz +
- 18:Epidote
- 19:Epidote
- 20:Fe-oxide/hydroxide +
- 21:Epidote
- 22:Zircon

Figure B11.32: Sample S22 site 14 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Grt, Ep, Zrn, Qz, Py.



- 1:Fe-oxide/hydroxide +
- 2:Quartz +
- 3:Fe-oxide/hydroxide +
- 4:Zircon
- 5:Albite
- 6:TiO<sub>2</sub> +
- 7:Mix
- 8:Fe-oxide/hydroxide +
- 9:Epidote
- 10:Fe-oxide/hydroxide +
- 11:Epidote
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Epidote
- 15:Garnet
- 16:Fe-oxide/hydroxide +
- 17:Mix
- 18:Fe-oxide/hydroxide +
- 19:"Ilmenite" +
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Albite
- 23:Chromite

Figure B11.33: Sample S22 site 15 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, TiO<sub>2</sub>, Chr, Grt, Ep, Zrn, Ab, Qz.

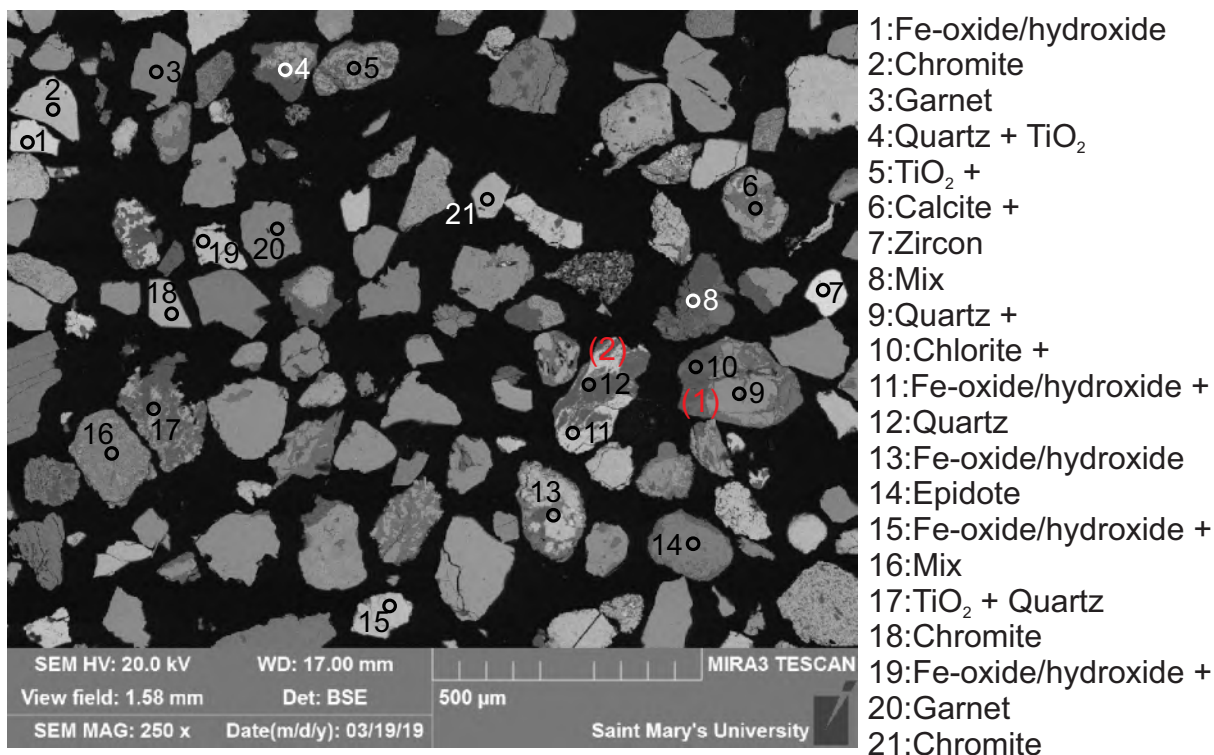


Figure B11.34: Sample S22 site 16 (SEM). The detrital minerals include: Fe-oxide/hydroxide, TiO<sub>2</sub>, Chr, Grt, Ep, Qz, Cal, Chl. 1: Lithic clast (quartz + chlorite, hydrothermal). 2: Lithic clast (quartz + Fe-oxide/hydroxide, hydrothermal).

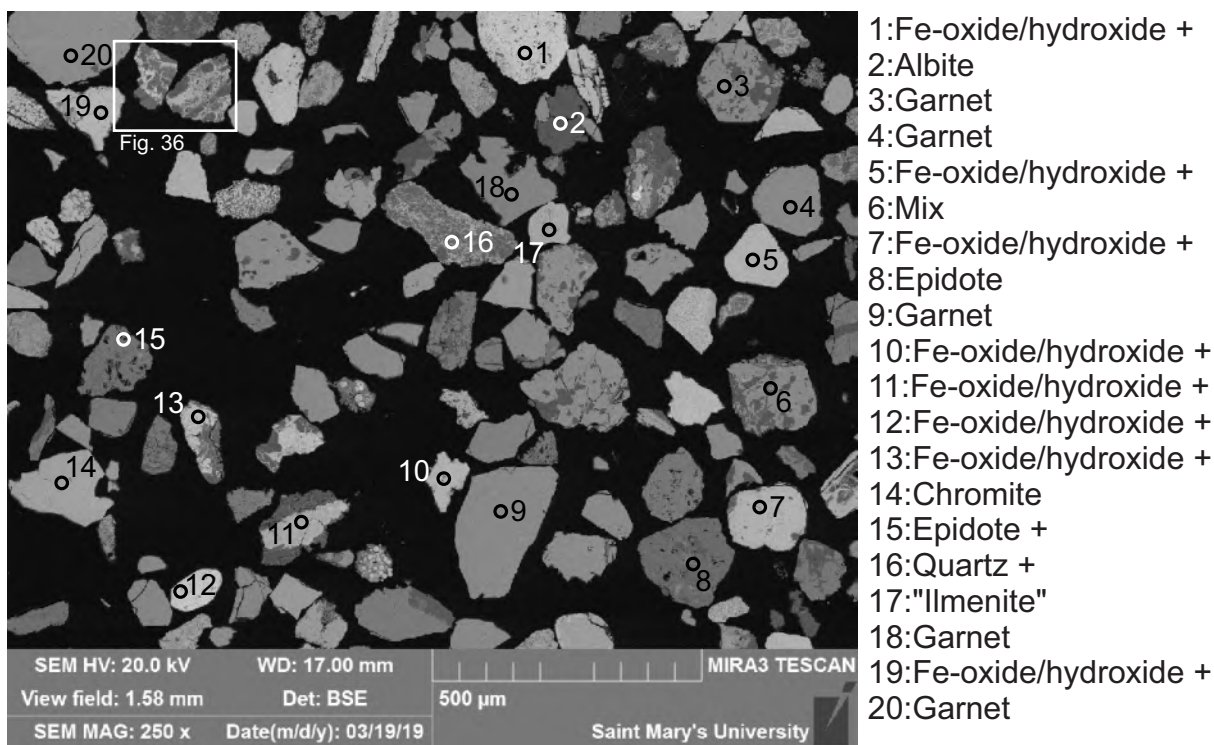
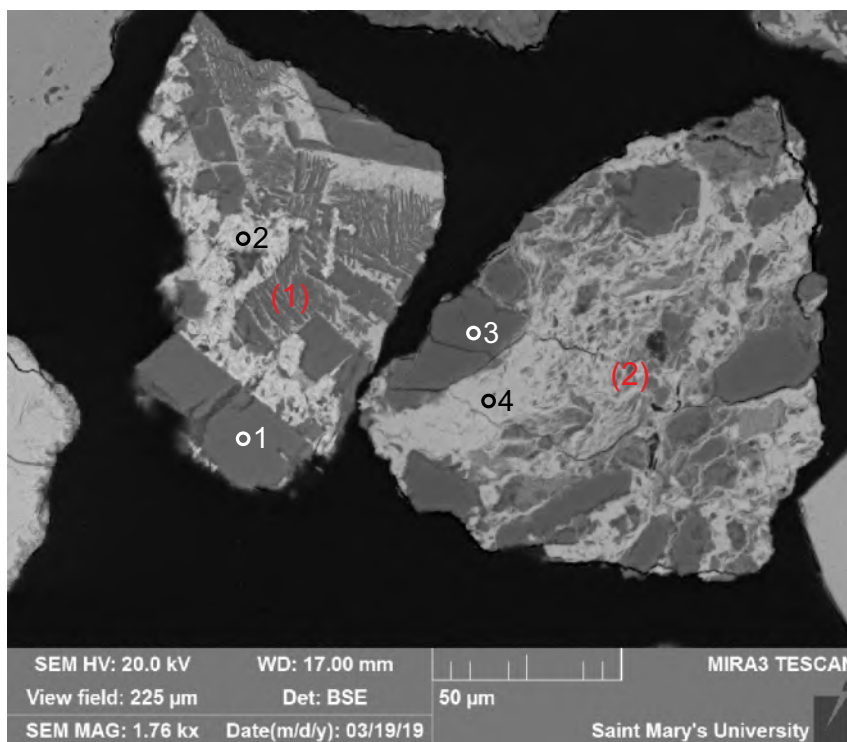


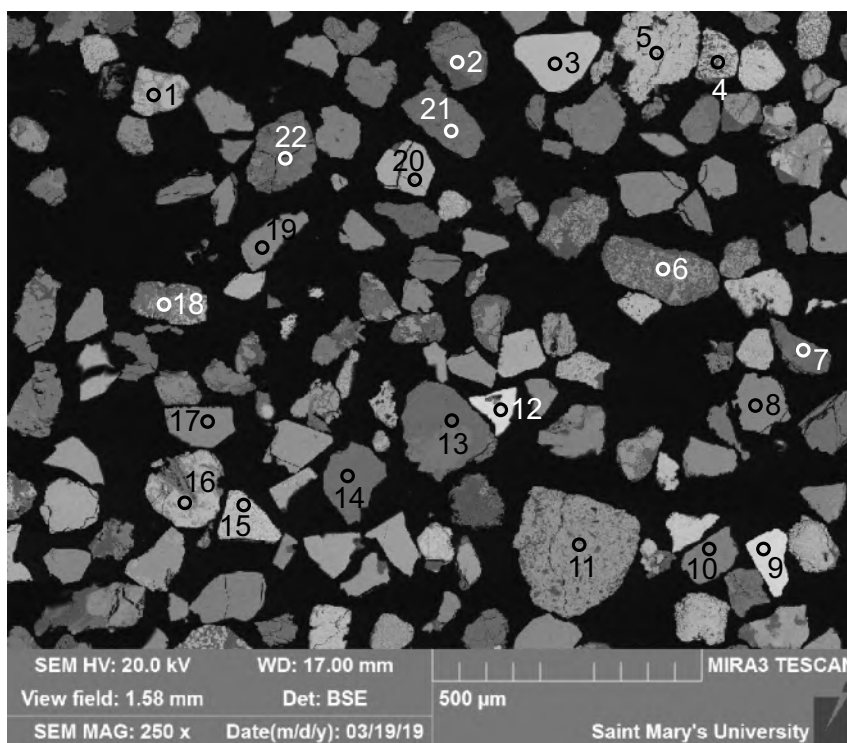
Figure B11.35: Sample S22 site 17 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, Chr, Grt, Ep, Ab, Pl (Lab), Qz.





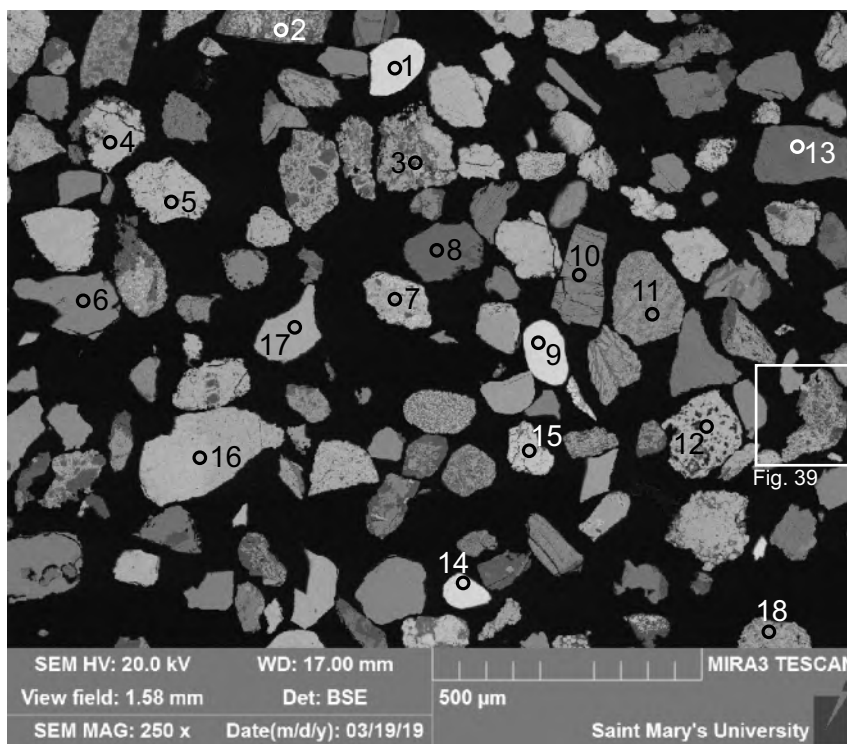
- 1:Plagioclase  
(Labradorite)
- 2:Fe-oxide/hydroxide +
- 3:Quartz
- 4:Fe-oxide/hydroxide +

Figure B11.36: Sample S22 site 17.1 (SEM). 1: Lithic clast (plagioclase + Fe-oxide/hydroxide, altered igneous). 2: Lithic clast (quartz + Fe-oxide/hydroxide, probably limonite cemented sandstone).



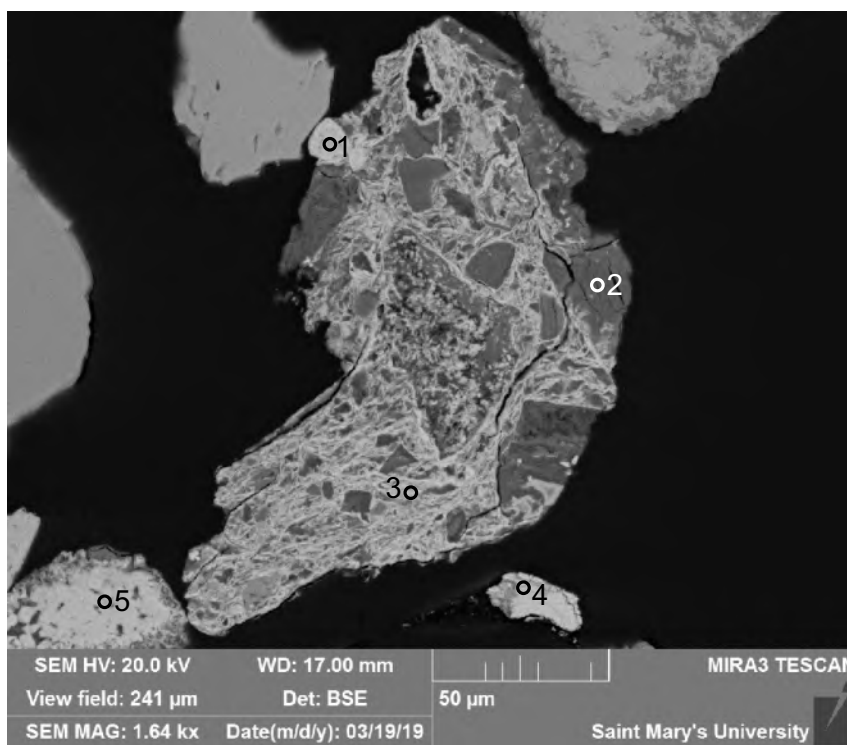
- 1:Ilmenite
- 2:Epidote
- 3:Chromite
- 4:Chromite
- 5:Fe-oxide/hydroxide +
- 6:Quartz +  $TiO_2$
- 7:Epidote
- 8:Garnet +
- 9:Zircon
- 10:Garnet
- 11:Mix
- 12:Zircon
- 13:Epidote
- 14:Epidote
- 15:Fe-oxide/hydroxide +
- 16:Titanite
- 17:Garnet
- 18:Fe-oxide/hydroxide +
- 19:Garnet
- 20:Chromite
- 21:Epidote
- 22:Garnet

Figure B11.37: Sample S22 site 18 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Ilm, Chr, Grt, Ep, Ttn, Zrn, Qz.



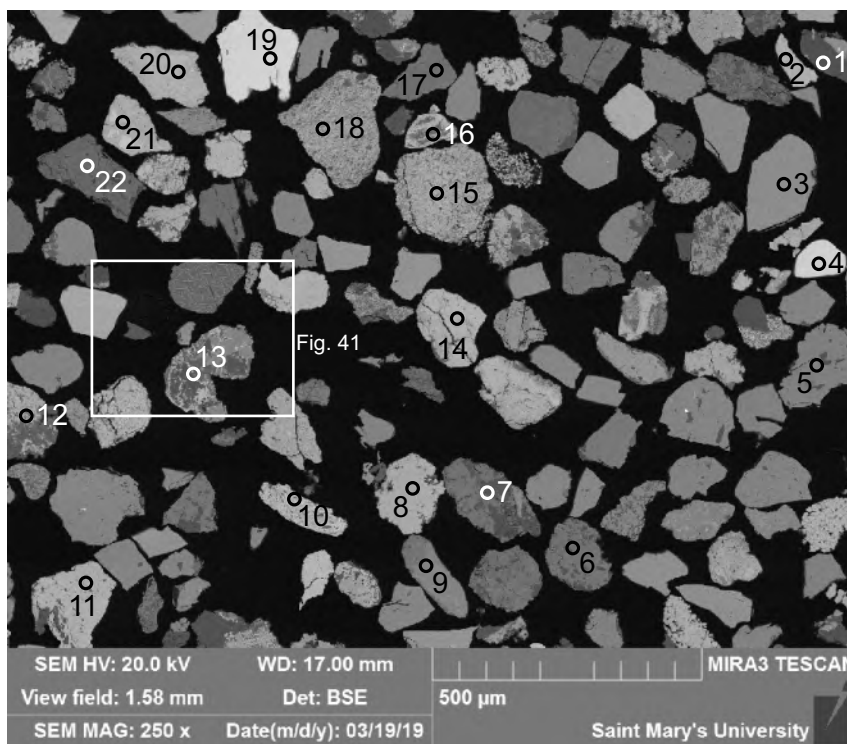
- 1:Zircon
- 2:Fe-oxide/hydroxide +
- 3:Mix
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:Garnet
- 7:Fe-oxide/hydroxide +
- 8:Epidote
- 9:Zircon
- 10:Apatite +
- 11:Titanite +
- 12:Fe-oxide/hydroxide +
- 13:Epidote
- 14:Zircon
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Chromite
- 18:Fe-oxide/hydroxide +

Figure B11.38: Sample S22 site 19 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Chr, Grt, Ep, Ttn, Zrn, Ms, Qz, Ap, Chl.



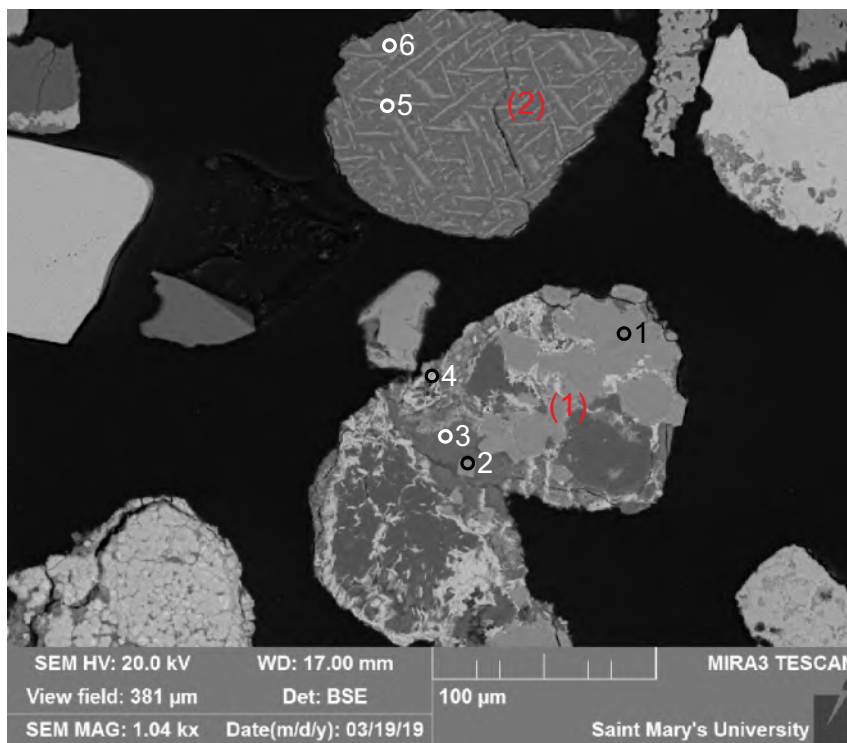
- 1:Fe-oxide/hydroxide +
- 2:Chlorite + Muscovite +
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +

Figure B11.39: Sample S22 site 19.1 (SEM). Pedogenic aggregate, or siltstone.



- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Spinel
- 4:Zircon
- 5:Garnet
- 6:Epidote
- 7:Epidote
- 8:Fe-oxide/hydroxide +
- 9:Titanite
- 10:Mn-oxide/hydroxide +
- 11:Fe-oxide/hydroxide +
- 12:Fe-oxide/hydroxide +
- 13:Quartz
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:Quartz +
- 17:Epidote
- 18:Fe-oxide/hydroxide + Chlorite
- 19:Zircon
- 20:Fe-oxide/hydroxide +
- 21:Quartz +
- 22:Quartz +

Figure B11.40: Sample S22 site 20 (SEM). The detrital minerals include: Fe-oxide/hydroxide, Spl, Grt, Ep, Ttn, Zrn, Ms, Qz, Ap, Chl. The Mnohy may be either detrital or pedogenic.



- 1:Apatite +
- 2:Apatite
- 3:Quartz + Muscovite
- 4:Fe-oxide/hydroxide +
- 5:Titanite +
- 6:Chlorite

Figure B11.41: Sample S22 site 20.1 (SEM). 1: Lithic clast (apatite cementing quartz + muscovite, sedimentary). 2: Detrital chlorite cross cut by titanite lamellae, probably retrograde metamorphic.



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Table B11.1: Mineral chemical analyses from sample S22.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	Y2O3	ZrO2	Ag2O	SnO2	BaO	La2O3	Ce2O3	Nd2O3	Gd2O3	Dy2O3	Yb2O3	HfO2	Ta2O5	WO3	OsO2	IrO2	Total	Actual	Total
S22	2	11	Py + Chl	16.53		7.14	52.87		6.41	1.26				15.33			0.45																						100	92	
S22	2	12	Ep +	45.46		29.36	4.45		2.90	16.01	1.82																												100	117	
S22	2	13	Chr			11.92	24.64		8.32								55.12																						100	107	
S22	2	14	TiO2 + Chl	14.65	72.55	8.75	1.26					2.78																											100	106	
S22	2	15	Mix	30.35	0.62	10.02	44.10		2.26	2.61		2.35																							7.70			100	86		
S22	2	16	Tur	38.08	0.65	32.69	6.14		6.71	0.64	2.09																											87	100		
S22	2	17	Feohy +	5.23			93.49			0.53							0.75																						100	81	
S22	2	18	Qz	99.60			0.40																															100	119		
S22	2	19	Feohy +	6.13			93.28			0.59																													100	78	
S22	2	20	Ep	40.30		26.35	8.23			22.13																													97	106	
S22	2	21	Feohy +		10.67	4.61	79.20	0.84	4.21	0.47																													100	89	
S22	2	22	Chl + Feohy	27.74	0.46	9.33	42.57		14.19	1.05	0.66			4.00																									100	86	
S22	2	23	Qz	100.00																																			100	117	
S22	2	24	Chl + Feohy		1.10	3.81	55.84		4.53	0.58		0.29																											100	96	
S22	2	25	Feohy +	5.96		1.47	91.90			0.66																													100	75	
S22	2	26	Feohy +	15.20		7.33	66.61		7.42	0.97				2.48																									100	81	
S22	2	27	Mix	50.71		17.46	21.61	0.78	3.93	5.51																													100	113	
S22	2	28	Feohy +	5.49		2.52	91.45			0.55																													100	66	
S22	2	29	TiO2		100.00																																		100	95	
S22	2	30	Feohy +	4.73			88.18			0.52				3.19				3.38																					100	73	
S22	2.1	1	Feohy +	8.60		2.85	85.77	0.98	0.93	0.88																													100	79	
S22	2.1	2	Ab	68.94		18.77	0.44				11.68	0.18																											100	121	
S22	2.1	3	Kfs	64.73		18.15	0.67				0.76	13.54															2.14												100	121	
S22	2.1	4	Zrn	31.08	1.15																			66.10									1.67						100	123	
S22	2.1	5	TiO2		99.27		0.73																																100	104	
S22	2.1	6	Qz + Ms +	69.60		17.10	7.13		1.90		0.50	3.78																											100	106	
S22	3	1	Grt	39.88		21.26	32.06	1.17	3.73	1.90																													100	109	
S22	3	2	Zrn	30.81			0.42																	68.77															100	117	
S22	3	3	TiO2 +	1.41	95.79		0.88			1.92																													100	101	
S22	3	4	Feohy +	3.45	11.00	4.03	77.75	3.77																															100	89	
S22	3	5	Feohy +	5.07			92.07			2.86																													100	73	
S22	3	6	TiO2 +	2.27	94.22	0.66	2.20		0.65																														100	97	
S22	3	7	Zrn	31.43																				68.57															100	109	
S22	3	8	Pl (Lab)	51.97		26.23	3.10			13.03	5.67																												100	93	
S22	3	9	Chr			16.16	17.44		12.47								53.93																						100	103	
S22	3	10	Feohy +	5.54			93.82			0.64																													100	78	
S22	3	11	Feohy +	5.41	2.68	1.57	89.82	0.51																															100	88	
S22	3	12	Tur	38.50	0.61	32.97	4.15		7.99	0.97	1.81																												87	101	
S22	3	13	Mix	57.07		18.51	7.14			17.27																													100	113	
S22	3	14	Grt	40.41		21.10	25.61	1.27	2.53	9.08																													100	115	
S22	3	15	Feohy +		6.92	4.03	85.41	0.63	2.29							0.72																							100	99	
S22	3	16	Feohy +	4.38			95.02			0.60																													100	80	
S22	3	17	Grt	40.82		21.18	27.02	0.36	4.68	5.95																													100	120	
S22	3	18	Qz	99.36			0.64																																100	126	
S22	3	19	Grt	40.82		21.13	26.72	0.61	4.57	6.15																													100	118	
S22	3	20	Feohy +	2.14	3.89	1.17	92.15	0.65																															100	95	
S22	3	21	Grt	39.91		21.04	20.35	11.92	2.67	4.10																													100	117	
S22	3	22	Grt	42.15		24.77	10.37			22.71																													100	110	
S22	3	23	Zrn	30.92			0.45																	68.63															100	120	
S22	3	24	Tur	37.90	0.50	33.74	5.64		6.49	0.71	2.03																											87	99		
S22	3	25	Feohy +	5.05			94.95																																100	76	
S22	3	26	Feohy +	2.54			93.45			0.53							0.53																						100	73	
S22	3	27	Cpx	56.28		0.93	3.24		18.61	20.57							0.37																						100	105	
S22	3	28	Spl			38.53	14.51		17.21								29.75																						100	98	
S22	3	29	Feohy +		9.34	8.40	78.29	2.29								1.68																						100	84		
S22	3	30	Ep	33.08		22.81	19.42		21.24	0.45																												97	94		
S22	3	31	Qz + Feohy	47.18	0.93	4.06</																																			

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Table B11.1: Mineral chemical analyses from sample S22.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	Y2O3	ZrO2	Ag2O	SnO2	BaO	La2O3	Ce2O3	Nd2O3	Gd2O3	Dy2O3	Yb2O3	HfO2	Ta2O5	WO3	OsO2	IrO2	Total	Actual	Total		
S22	5.1	2	Feohy +	2.48	7.01		89.84	0.67																															100	87			
S22	5.1	3	TiO2	0.88	96.24		2.87																																	100	100		
S22	5.1	4	Feohy +	4.65	3.98	2.03	88.33		1.02																															100	87		
S22	6	1	Ep	40.21		22.18	12.50			22.10																														97	113		
S22	6	2	TiO2		100.00																																			100	106		
S22	6	3	Grt	40.84		21.23	28.09	0.77	6.19	2.88																														100	116		
S22	6	4	Feohy +	5.11		1.68	92.72			0.49																														100	78		
S22	6	5	Ab + Chl	58.85	0.65	17.04	9.84		2.24	0.79	10.39	0.22																												100	121		
S22	6	6	Tur	38.65	0.54	32.22	4.69		8.09	0.71	2.10																												87	104			
S22	6	7	Grt	40.19		21.28	32.78	0.78	2.67	2.30																														100	117		
S22	6	8	Grt	40.80		21.43	26.06		2.96	8.74																														100	117		
S22	6	9	Qz	99.55	0.45																																			100	128		
S22	6	10	Feohy +	9.74		2.98	84.62	0.54	1.17			0.93																												100	83		
S22	6	11	Qz + Chl	72.39		11.28	5.71			10.62																															100	120	
S22	6	12	Feohy +	3.80		1.03	91.92																																	100	90		
S22	6	13	Feohy +		10.07	4.17	79.42	5.52								0.82																								100	100		
S22	6	14	Pl (Lab)	56.09		24.79	1.52			11.61	5.98																														100	120	
S22	6	15	"Chr"			10.44	34.19		5.20							0.53	49.64																							100	105		
S22	6	16	Feohy +	8.63		4.10	83.61		1.98	0.62	1.07																														100	79	
S22	6	17	Feohy				100.00																																	100	96		
S22	6	18	Ilm +	7.44	50.61		32.09	4.60	0.82	4.44																														100	105		
S22	6	19	Feohy +	4.50		2.99	85.57		1.10	0.52							1.75																							100	73		
S22	6	20	Chr			6.42	22.61		7.53								63.45																							100	107		
S22	6	21	Qz +	93.04		2.15	3.58		1.22																															100	122		
S22	6	22	Chr		1.23	23.06	26.08		12.44								37.20																							100	108		
S22	6	23	Feohy +	5.23			94.77																																	100	76		
S22	6	24	Chr			25.57	15.48		15.41								43.54																							100	106		
S22	6	25	Ep	40.40		24.38	9.84	0.45		21.94																														97	103		
S22	6	26	Feohy +	4.93			94.42			0.66																														100	79		
S22	6	27	Feohy +	11.37		2.66	85.37			0.61																														100	76		
S22	6.1	1	Feohy +	10.14		2.63	71.17			1.25	1.48																													100	70		
S22	6.1	2	Feohy +	6.82			93.18																																	100	79		
S22	6.1	3	Feohy +	6.28		1.54	84.11			0.69							0.84																							100	72		
S22	6.1	4	Ms +	61.29	1.31	16.31	11.82		3.26		0.67	5.33																												100	105		
S22	6.1	5	Feohy +	5.95			94.05																																	100	77		
S22	6.2	1	Ilm		50.59		48.02	1.38																																100	102		
S22	6.2	2	Tin	33.60	36.05	1.94	1.28			27.13																														100	109		
S22	6.2	3	Unknown ?Met	54.67		8.27	10.22		23.52	1.68	1.38	0.26																												100	88		
S22	6.2	4	Ab +	70.12		18.31					11.57																														100	116	
S22	7	1	Feohy +	4.73			93.30			0.58												1.39																			100	79	
S22	7	2	Grt	39.83		21.13	26.19	6.37	2.62	3.86																														100	113		
S22	7	3	Ep	40.56		23.21	11.07			22.16																														97	110		
S22	7	4	Feohy +	1.80				98.20																																100	79		
S22	7	5	TiO2 +	33.50	58.89	2.28	1.79		1.50	0.42		0.38	1.24																											100	109		
S22	7	6	Chr			21.43	18.31		13.25								47.01																							100	113		
S22	7	7	Spl			36.82	18.54		15.94								28.70																							100	114		
S22	7	8	Feohy + Chl	19.17		8.07	63.38		6.74	0.86	1.30	0.48																												100	93		
S22	7	9	Grt	40.62		21.32	29.58	1.43	4.14	2.91																														100	115		
S22	7	10	Feohy +	5.17			94.83																																	100	78		
S22	7	11	Tin	30.35	38.26	3.46	0.71			24.85						2.37																								100	108		
S22	7	12	Feohy +	6.90	1.78	3.34	87.38			0.59																														100	84		
S22	7	13	TiO2 +	3.61	85.82	2.69	6.85		1.03																															100	93		
S22	7	14	Zrn	30.92			0.48																																	100	112		
S22	7	15	Feohy +	6.22	0.88	2.81	89.29					0.38					0.42																							100	83		
S22	7	16	TiO2 +	3.74	93.89	0.79</																																					

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Table B11.1: Mineral chemical analyses from sample S22.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	Y2O3	ZrO2	Ag2O	SnO2	BaO	La2O3	Ce2O3	Nd2O3	Gd2O3	Dy2O3	Yb2O3	HfO2	Ta2O5	WO3	OsO2	IrO2	Total	Actual Total
S22	9	29	Grt	38.87		20.03	12.35	22.33		4.01					2.42																								100	102
S22	9	30	Feohy +	6.85			92.65			0.50																													100	70
S22	9	31	Feohy +	8.84		4.05	87.11																															100	64	
S22	9.1	1	Ms	47.92	0.35	34.30	1.21		0.69		1.42	9.11																											95	109
S22	9.1	2	TiO2 +	1.66	96.02	0.86	0.98		0.47																														100	105
S22	9.1	3	Feohy +	10.28	1.33	4.58	79.83		3.13	0.85																													100	86
S22	9.1	4	Mix	28.79	3.64	10.57	40.83		8.04	7.18		0.95																											100	99
S22	9.1	5	Ab	66.93		19.67	0.79			1.68	10.93																												100	118
S22	10	1	Ep	45.87		23.54	7.04			20.54																													97	106
S22	10	2	Ep	41.32		27.51	3.15		3.01	22.01																													97	98
S22	10	3	Chr			15.62	18.81		11.73								53.85																						100	101
S22	10	4	Tur	38.32	0.66	33.20	5.53		6.60	0.67	2.02																												87	96
S22	10	5	Feohy +	4.54		1.07	93.46										0.93																						100	72
S22	10	6	Grt	40.05		21.10	30.12	0.53	2.70	5.50																													100	111
S22	10	7	Feohy +	5.88		1.36	92.76																																100	78
S22	10	8	Feohy +	4.87			94.02			0.65							0.45																						100	84
S22	10	9	Feohy +	5.92			92.87		1.21																														100	78
S22	10	10	Qz +	89.73		4.63	3.03		1.37	0.32	0.46	0.46																											100	118
S22	10	11	Qz	99.11			0.89																																100	122
S22	10	12	Feohy +	7.50		4.36	86.24	0.63					1.27																										100	76
S22	10	13	Zrn	31.30																				68.70															100	117
S22	10	14	Zrn	31.25																				68.75															100	111
S22	10	15	Cpx	53.19	0.64	3.85	6.10		17.02	19.20																													100	114
S22	10	16	Feohy +	5.94			93.50			0.56																													100	73
S22	10	17	Grt	39.88		21.15	26.40	3.00	0.89	8.69																													100	108
S22	10	18	Feohy +	3.10			96.38			0.52																													100	75
S22	10	19	Feohy +	5.59			93.85			0.56																													100	77
S22	10	20	Zrn	31.27																				68.73															100	113
S22	10	21	Ab +	78.34		12.52					9.13																												100	110
S22	10	22	Feohy +	5.23			93.59	0.66		0.52																													100	73
S22	10	23	?		1.04												1.65						-7.08																100	109
S22	10	24	Ms	48.55	0.51	30.52	1.44		1.22		0.83	8.64			3.30																								95	111
S22	10	25	Feohy +	13.58		5.70	75.54		3.45	0.59		0.44					0.70																						100	77
S22	10	26	Ep	40.51		23.65	10.80		22.05																														97	104
S22	10	27	Feohy +	4.63		3.20	85.02		0.81								0.56																						100	79
S22	10	28	Chr			26.49	17.74		14.21								41.57																						100	105
S22	10	29	Chr			29.53	16.77		14.71								38.99																						100	103
S22	10	30	Chr			15.26	23.47		8.96								52.31																						100	96
S22	10	31	Chr	5.10		11.09	28.86		10.05								44.90																						100	90
S22	10	32	Feohy +	6.84		1.01	91.66			0.49																													100	69
S22	10	33	Ep	40.54		27.73	6.27		22.47																														97	99
S22	10	34	Ep	44.56		29.26	1.62		19.72	1.84																													97	102
S22	10	35	Chr			10.47	21.15		9.19								59.18																						100	96
S22	10	36	Feohy +	10.80		3.21	84.12		0.87								1.00																						100	67
S22	10	37	Ilm		41.95		53.24	1.61	3.20																														100	86
S22	10	38	Feohy +	7.44		3.28	87.66		0.98	0.64																													100	64
S22	10.1	1	Feohy +	5.59			93.92		0.49																														100	73
S22	10.1	2	Feohy +	6.63		4.03	88.71			0.64																													100	72
S22	10.1	3	Chl + Ms +	45.34	0.84	19.13	22.09		2.55	0.59	1.60	4.77		3.09																									100	83
S22	10.1	4	Qz	99.27			0.73																																100	117
S22	10.2	1	Chr			5.65	31.13		6.11	0.69							56.42																						100	100
S22	10.2	2	Cal +	1.12	1.21		0.93	11.77		1.18	60.23				23.57																								100	74
S22	10.2	3	Chr			25.56	15.78		14.94	0.46							43.25																						100	105
S22	10.2	4	Feohy		1.38		89.98	1.05		6.68							0.91																						100	80
S22	10.2	5	Ab	67.29		18.96	0.89		2.10		10.76																												100	112
S22	10.2	6	Spl		1.30	30.76	19.18		13.73								35.03																						100	114
S22	10.2	7	Ilm		58.33																																			

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Table B11.1: Mineral chemical analyses from sample S22.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	As2O3	Y2O3	ZrO2	Ag2O	SnO2	BaO	La2O3	Ce2O3	Nd2O3	Gd2O3	Dy2O3	Yb2O3	HfO2	Ta2O5	WO3	OsO2	IrO2	Total	Actual Total		
S22	19	18	Feohy +	7.12		3.57	78.66		1.22	0.91							0.72																							100	70	
S22	19.1	1	Feohy +	13.05	4.18	5.15	75.45		1.23			0.94																												100	86	
S22	19.1	2	Chl + Ms +	47.01		16.18	8.85		26.12		1.84																													100	96	
S22	19.1	3	Feohy +	13.45	1.97	5.41	73.53		0.78	1.24	1.25	0.90	1.47																											100	90	
S22	19.1	4	Feohy +	2.66	9.52	4.62	78.60	2.60	1.06							0.94																								100	89	
S22	19.1	5	Feohy +	6.95			92.58			0.47																														100	75	
S22	20	1	Qz	99.61			0.39																																100	106		
S22	20	2	Feohy +	5.79			93.65			0.56																														100	75	
S22	20	3	Spl			30.69	17.76		14.19								37.37																							100	102	
S22	20	4	Zrn	31.35																				68.65																100	114	
S22	20	5	Grt	40.84	0.36	20.80	23.63	1.85	2.83	9.69																													100	111		
S22	20	6	Ep	40.52		23.60	10.88			22.00																														97	106	
S22	20	7	Ep	40.64		26.01	8.32			22.03																														97	106	
S22	20	8	Feohy +	7.88			91.60			0.52																														100	74	
S22	20	9	Ttn	33.48	36.89	1.27	0.60			27.77																														100	105	
S22	20	10	Mnohy +	11.54		5.36	2.69	55.47	1.02	0.82	0.83	0.87			5.91												15.48													100	84	
S22	20	11	Feohy +	8.13		1.58	89.20		1.09																															100	70	
S22	20	12	Feohy +	22.10		11.94	53.82		8.71	0.64	2.80																													100	83	
S22	20	13	Qz	98.96			1.04																																	100	107	
S22	20	14	Feohy +	7.53			89.89			0.61				0.98						0.99																				100	75	
S22	20	15	Feohy +	6.71		1.31	89.13			0.77	0.91						1.15																							100	71	
S22	20	16	Qz +	84.16	1.66	1.70	11.36	0.58	0.54																															100	98	
S22	20	17	Ep	40.56		27.29	6.59			22.57																														97	98	
S22	20	18	Feohy +	27.46	6.90	7.75	46.11		2.45	5.71	0.82	2.81																												100	87	
S22	20	19	Zrn	31.09																				68.91																100	105	
S22	20	20	Feohy +	5.13			94.87																																	100	69	
S22	20	21	Qz +	51.44		5.24	40.93		1.54			0.86																												100	91	
S22	20	22	Qz +	51.63	1.15	8.53	9.22		16.98	11.15	1.35																													100	100	
S22	20.1	1	Ap +				0.44			46.32	1.58		38.99	3.39	9.29																									100	112	
S22	20.1	2	Ap				1.07			46.88			42.57		7.70																										100	111
S22	20.1	3	Qz + Ms	58.34		13.92	14.55		4.84		0.55	7.80																												100	91	
S22	20.1	4	Feohy +	5.31	1.41	2.07	86.28	1.45	1.31								2.17																							100	85	
S22	20.1	5	Ttn +	28.14	37.82	7.31	7.50		6.76	12.47																														100	95	
S22	20.1	6	Chl	28.60	0.48	18.79	17.00		19.37	0.29	0.47																													85	91	
			Notes																																							
			+ = indicates more than one mineral present																																							
			* * = indicates that mineral is altered																																							



B12: SEM-BSE images and EDS mineral analyses for sample S24.

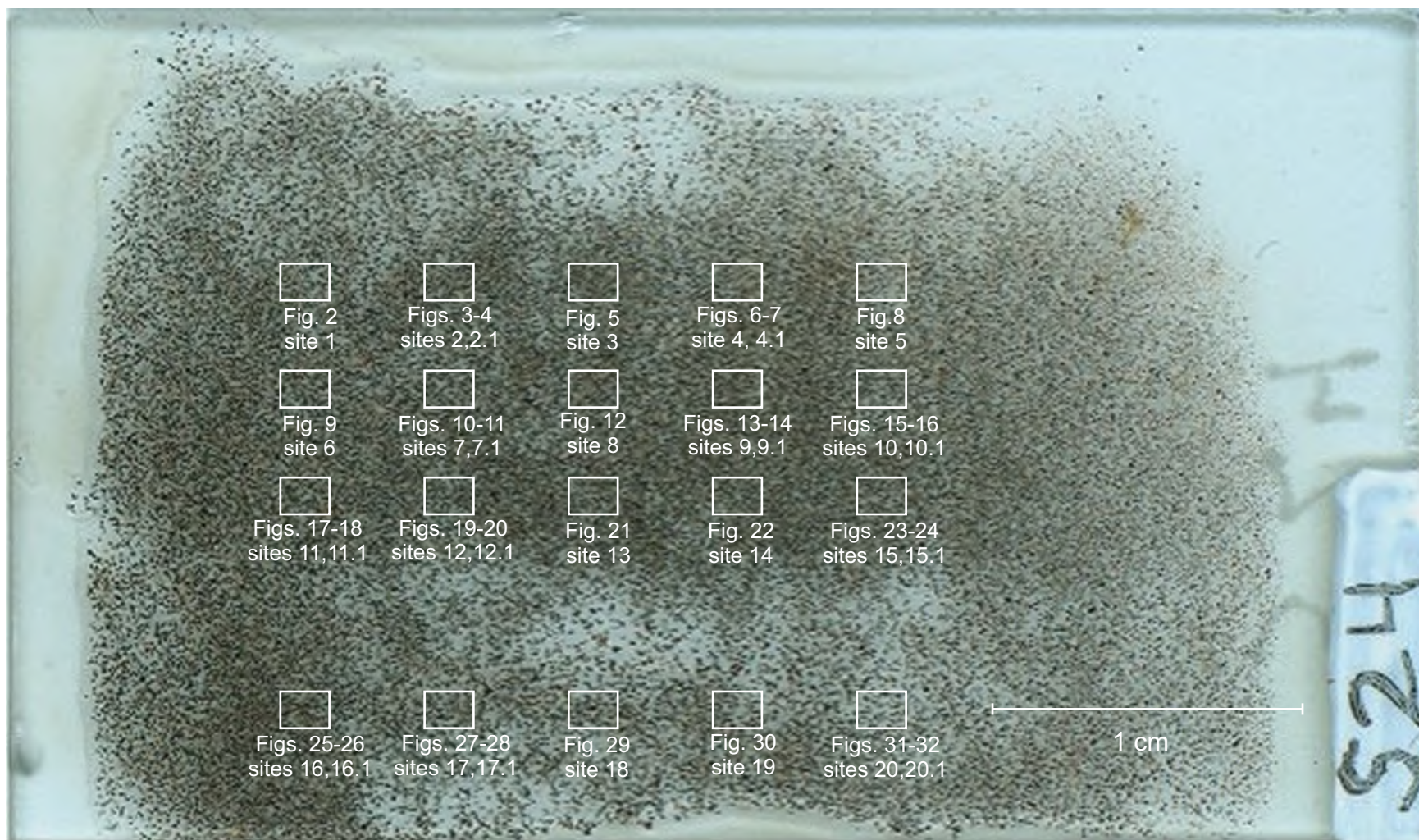
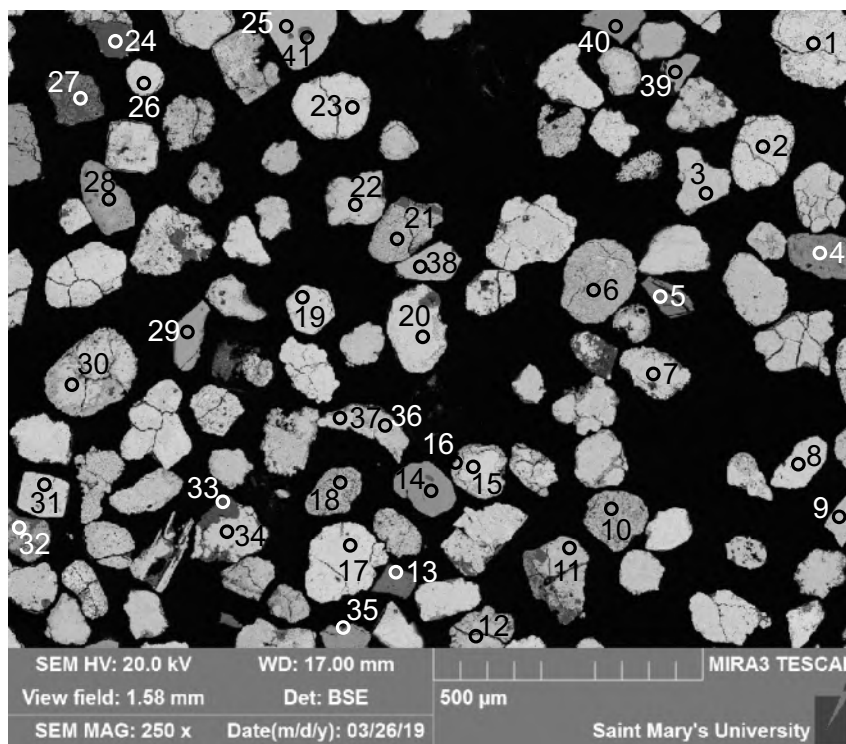


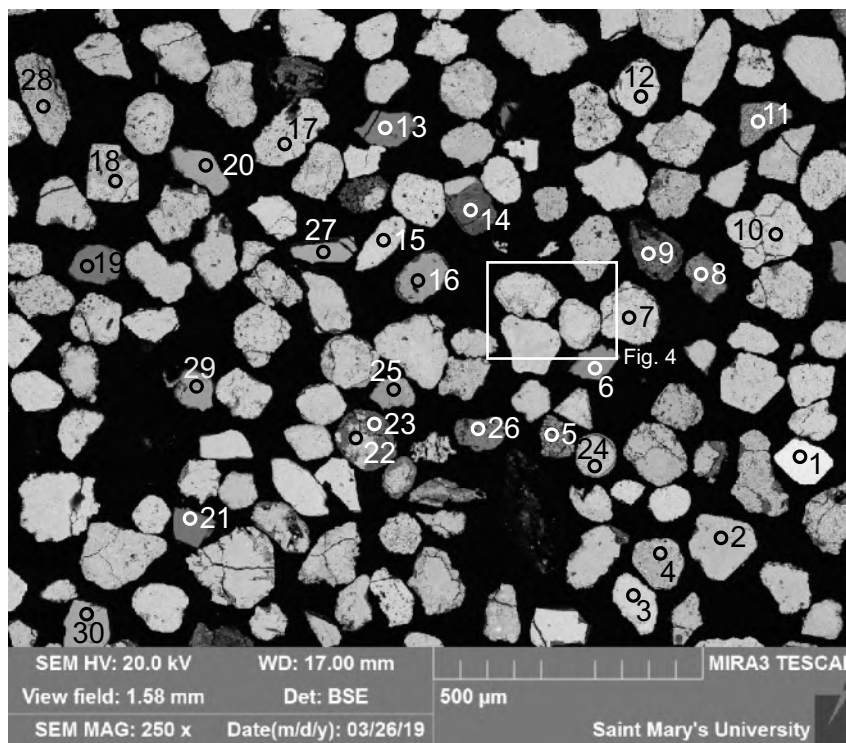
Figure B12.1: Sample S24





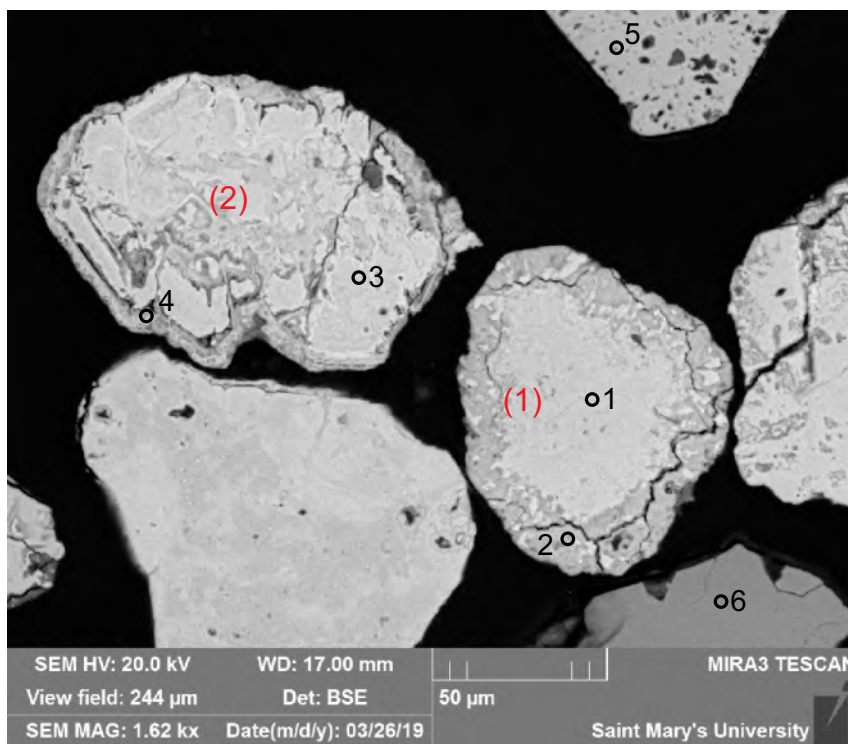
- 1: Fe-oxide/hydroxide + 35: Spinel
- 2: Fe-oxide/hydroxide + 36: Fe-oxide/hydroxide +
- 3: Fe-oxide/hydroxide + 37: Fe-oxide/hydroxide +
- 4: Mn-oxide/hydroxide + 38: Chromite
- 5: Amphibole 39:  $\text{TiO}_2$
- 6: Fe-oxide/hydroxide + 40: Garnet
- 7: Fe-oxide/hydroxide + 41: Quartz +
- 8: Fe-oxide/hydroxide +
- 9: Fe-oxide/hydroxide +
- 10: Fe-oxide/hydroxide +
- 11: Fe-oxide/hydroxide +
- 12: Fe-oxide/hydroxide +
- 13: Apatite
- 14: Garnet
- 15: Fe-oxide/hydroxide +
- 16: Fe-oxide/hydroxide +
- 17: Fe-oxide/hydroxide +
- 18: Fe-oxide/hydroxide
- 19: Fe-oxide/hydroxide +
- 20: Fe-oxide/hydroxide +
- 21: Fe-oxide/hydroxide +
- 22: Fe-oxide/hydroxide +
- 23: Fe-oxide/hydroxide +
- 24: Quartz
- 25: Chromite
- 26: Fe-oxide/hydroxide +
- 27: Quartz +
- 28: Mix
- 29:  $\text{TiO}_2$
- 30: Fe-oxide/hydroxide +
- 31: Fe-oxide/hydroxide +
- 32:  $\text{TiO}_2$  + Quartz
- 33: Quartz
- 34: Fe-oxide/hydroxide +

Figure B12.2: Sample S24 site 1 (SEM). Pedogenic spherules (e.g. 15) and fragments (e.g. 18). Detrital mineral grains: Ap, Grt, Chr, Spl,  $\text{TiO}_2$ , Qz



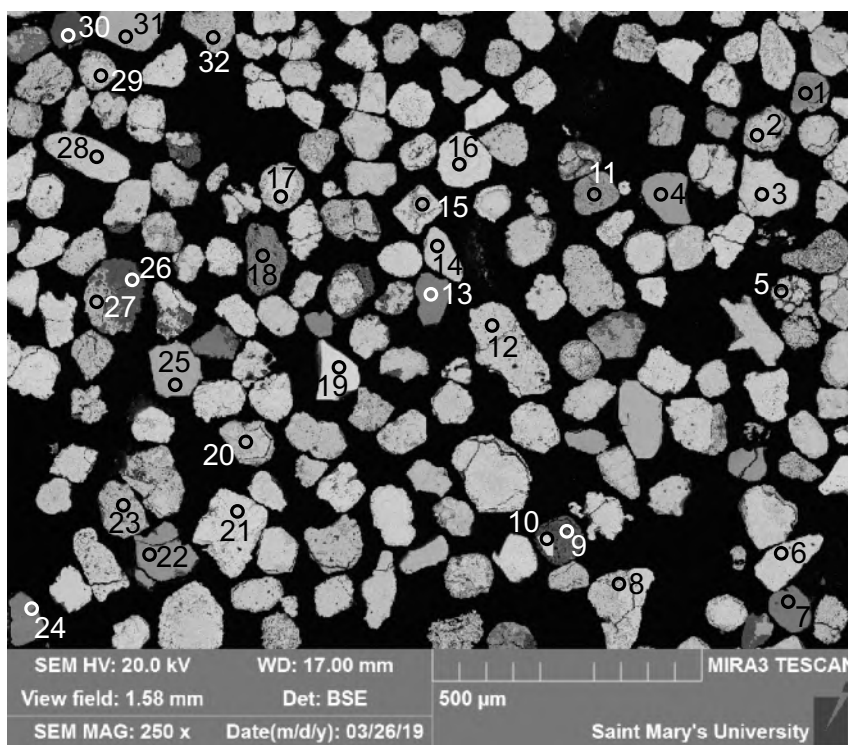
- 1: Zircon
- 2: Fe-oxide/hydroxide +
- 3: Fe-oxide/hydroxide +
- 4: Fe-oxide/hydroxide +
- 5:  $\text{TiO}_2$  +
- 6: Spinel
- 7: Fe-oxide/hydroxide +
- 8: Garnet + Muscovite?
- 9: Muscovite + Chlorite
- 10: Fe-oxide/hydroxide +
- 11:  $\text{TiO}_2$  + Quartz
- 12: Fe-oxide/hydroxide +
- 13: Garnet
- 14: Mix
- 15: Fe-oxide/hydroxide +
- 16: Spinel
- 17: Fe-oxide/hydroxide +
- 18: Fe-oxide/hydroxide +
- 19: Epidote
- 20: Chromite
- 21: Amphibole
- 22: Fe-oxide/hydroxide +
- 23: Mix
- 24: Fe-oxide/hydroxide +
- 25: Spinel
- 26: Apatite
- 27: Chromite
- 28: Fe-oxide/hydroxide +
- 29:  $\text{TiO}_2$
- 30: Chromite

Figure B12.3: Sample S24 site 2 (SEM). Similar to Fig. 2. Detrital mineral grains: Grt, Chr,  $\text{TiO}_2$ , Spl, Zrn, Ep, Ap



- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:Spinel

Figure B12.4: Sample S24 site 2.1 (SEM). 1-2: Pedogenic hematite pisoliths.



- 1:Mix
- 2:Fe-oxide/hydroxide +
- 3:Ilmenite
- 4:Chromite
- 5:Fe-oxide/hydroxide +
- 6:Fe-oxide/hydroxide +
- 7:Garnet
- 8:Fe-oxide/hydroxide +
- 9:Feldspar + Chlorite
- 10:Fe-oxide/hydroxide +
- 11:Mix
- 12:Fe-oxide/hydroxide +
- 13:Epidote
- 14:Ilmenite
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Fe-oxide/hydroxide +
- 18:Mix
- 19:Fe-oxide/hydroxide +
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Spinel
- 23:Fe-oxide/hydroxide +
- 24:Garnet +
- 25:Chromite
- 26:Quartz
- 27:Fe-oxide/hydroxide +
- 28:Fe-oxide/hydroxide +
- 29:Fe-oxide/hydroxide +
- 30:Quartz
- 31:Chromite
- 32:Fe-oxide/hydroxide +

Figure B12.5: Sample S24 site 3 (SEM). Similar to Fig. 2. Detrital mineral grains: Ilm, Chr, Grt, Ep, Spl.



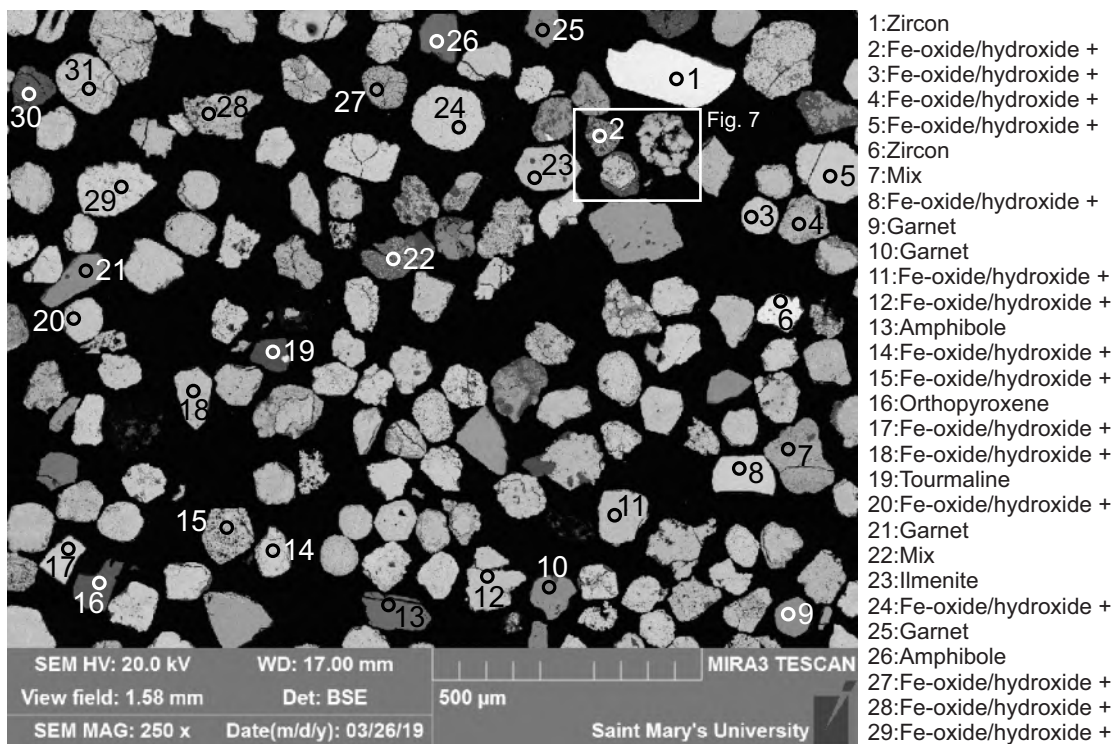


Figure B12.6: Sample S24 site 4 (SEM). Similar to Fig. 2. Detrital mineral grains: Zrn, Grt, Tur, Ilm, Amph, Act, Pl (An), Fe-oxide.

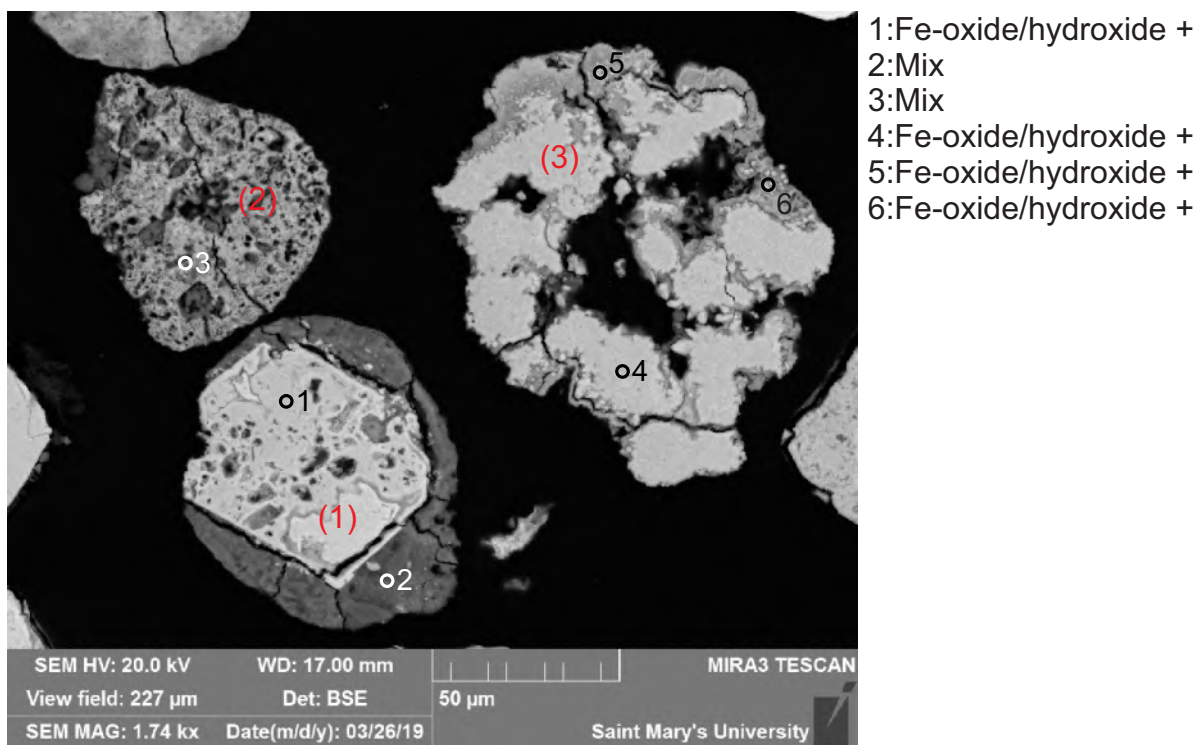


Figure B12.7: Sample S24 site 4.1 (SEM). 1: Altered Fe-oxide detrital grain rimmed by a pedogenic mixture of mineral particles. 2-3: Two other pedogenic mineral fragments.



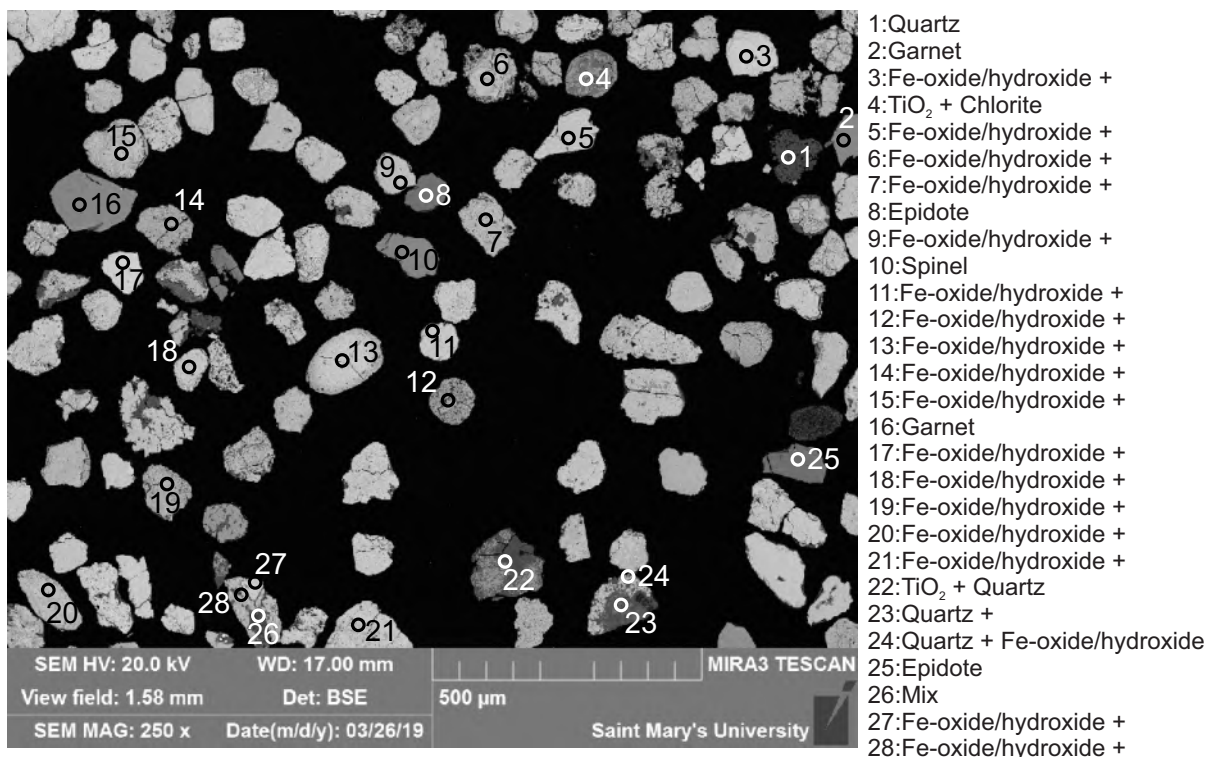


Figure B12.8: Sample S24 site 5 (SEM). Pedogenic spherules (e.g. 13, 20), and fragments. Detrital grains of FeO, Grt, Ep, Spl, TiO<sub>2</sub>.

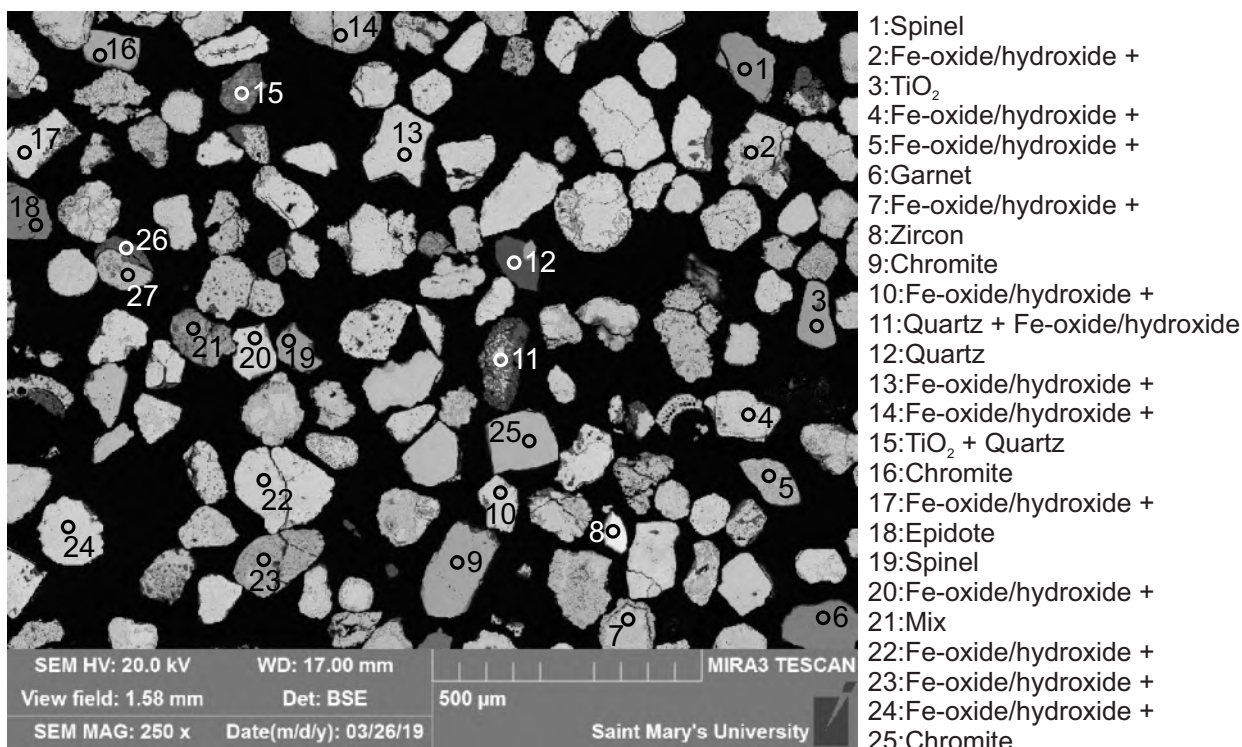
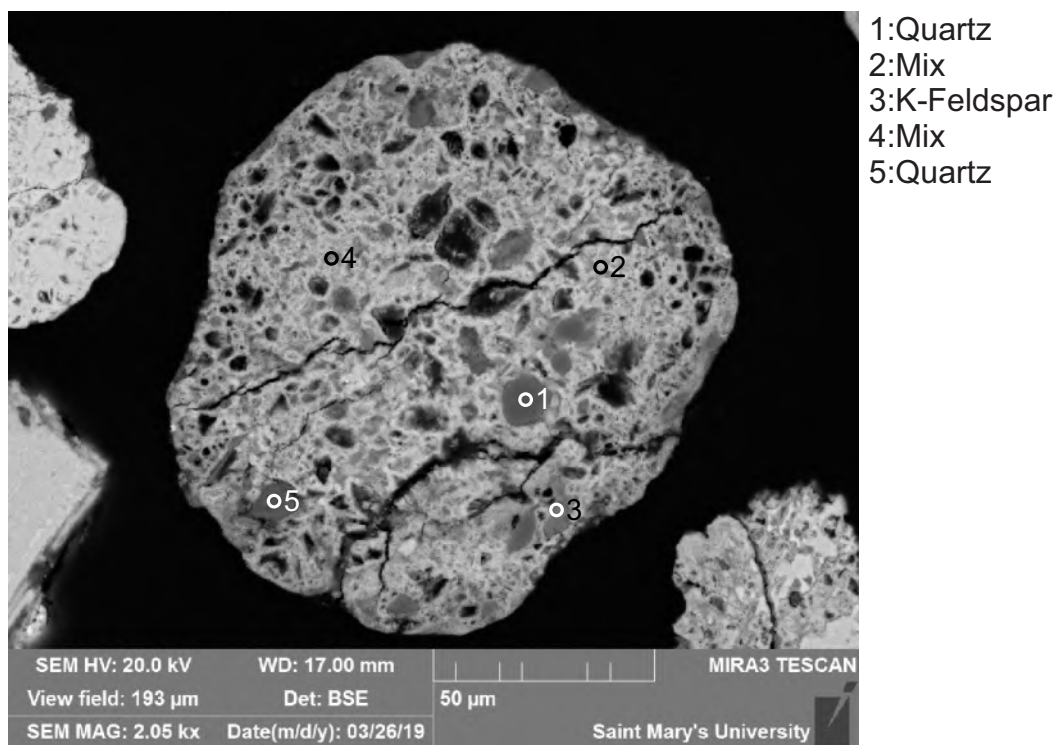
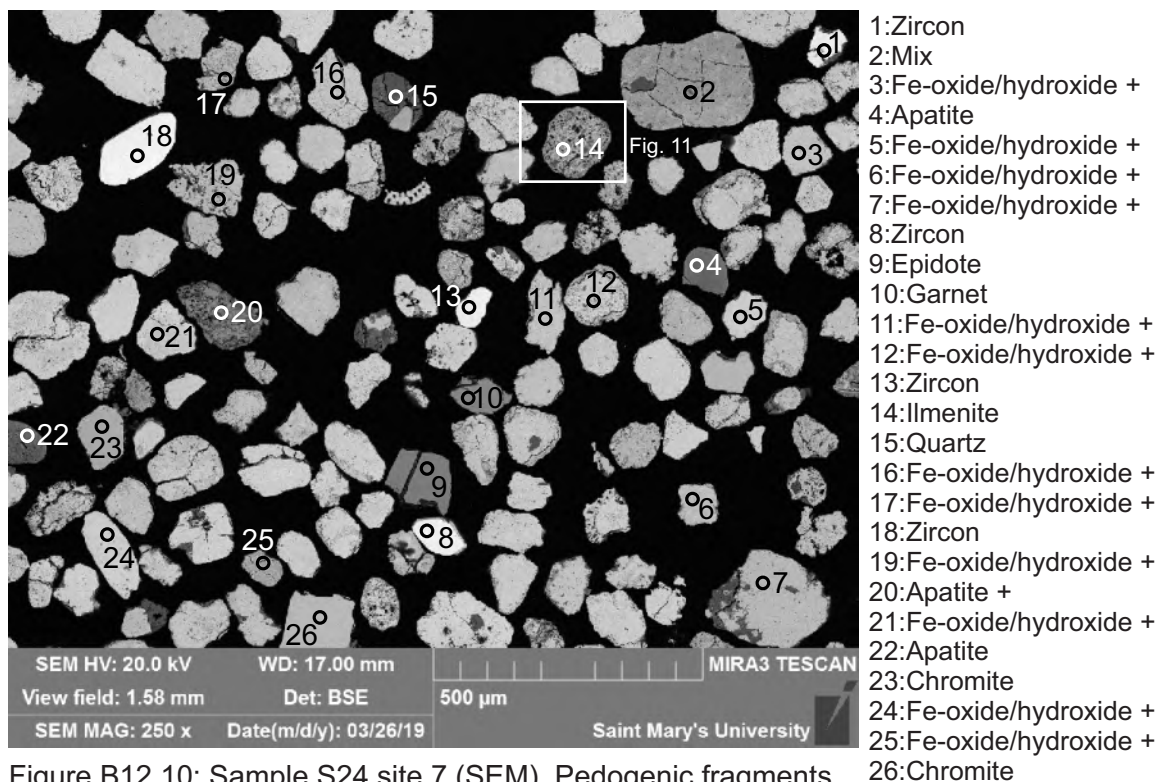
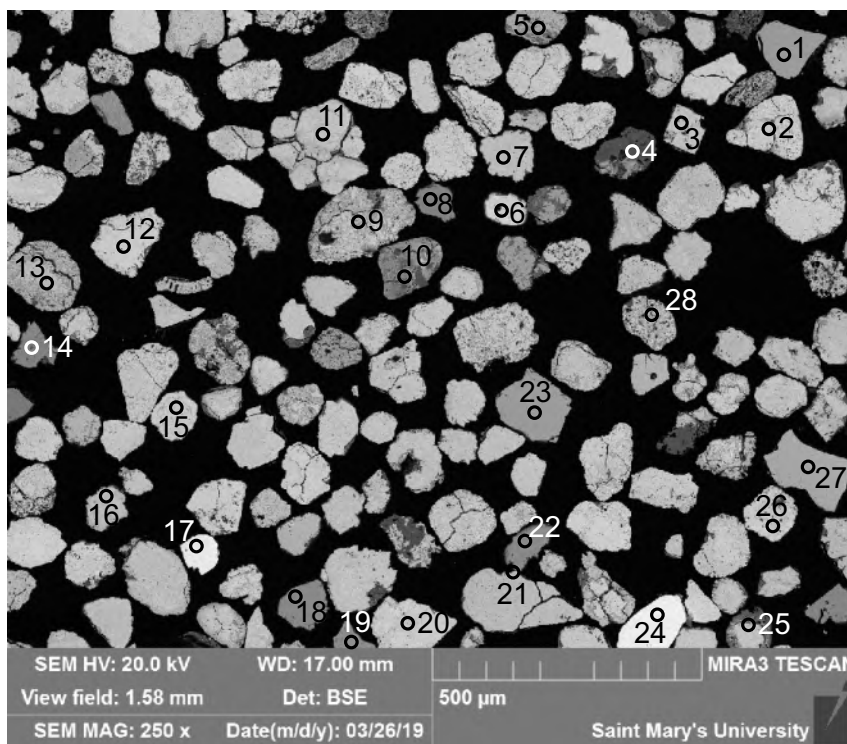


Figure B12.9: Sample S24 site 6 (SEM). Pedogenic spherules and fragments. Detrital mineral grains: Spl, TiO<sub>2</sub>, Grt, Zrn, Chr, Qz, Ep, Spl.

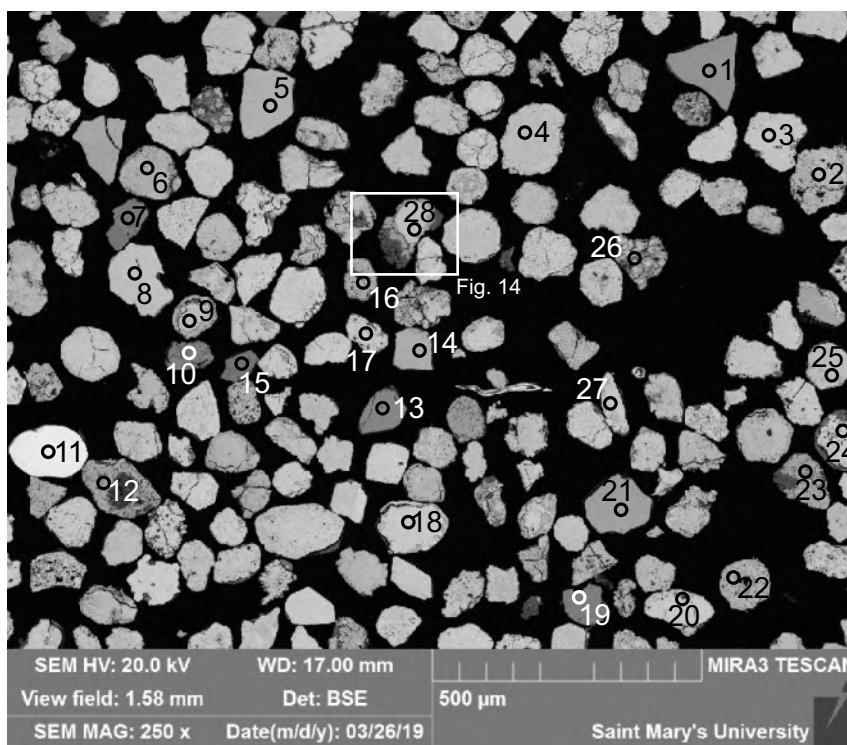






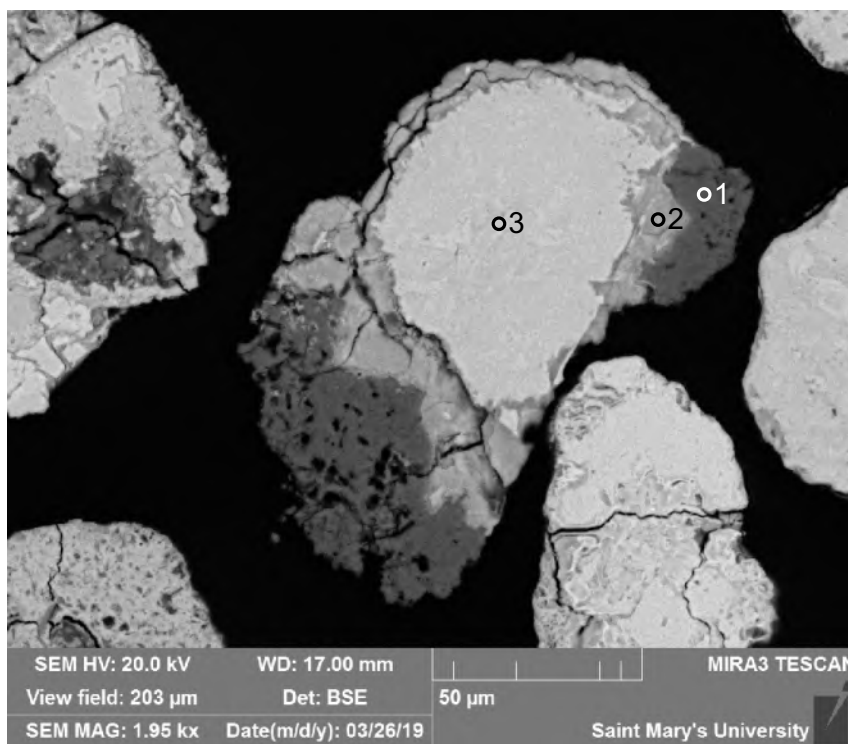
- 1:Chromite
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Quartz
- 5:Fe-oxide/hydroxide +
- 6:Fe-oxide/hydroxide +
- 7:Fe-oxide/hydroxide +
- 8:Epidote
- 9:Fe-oxide/hydroxide +
- 10:Mix
- 11:Fe-oxide/hydroxide +
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Garnet
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Zircon
- 18:Spinel
- 19:Spinel
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Garnet
- 23:Chromite
- 24:Zircon
- 25:Fe-oxide/hydroxide +
- 26:Fe-oxide/hydroxide +
- 27:Chromite
- 28:Fe-oxide/hydroxide +

Figure B12.12: Sample S24 site 8 (SEM). Similar to Fig. 2. Detrital mineral grains: Chr, Qz, Ep, Grt, Spl.



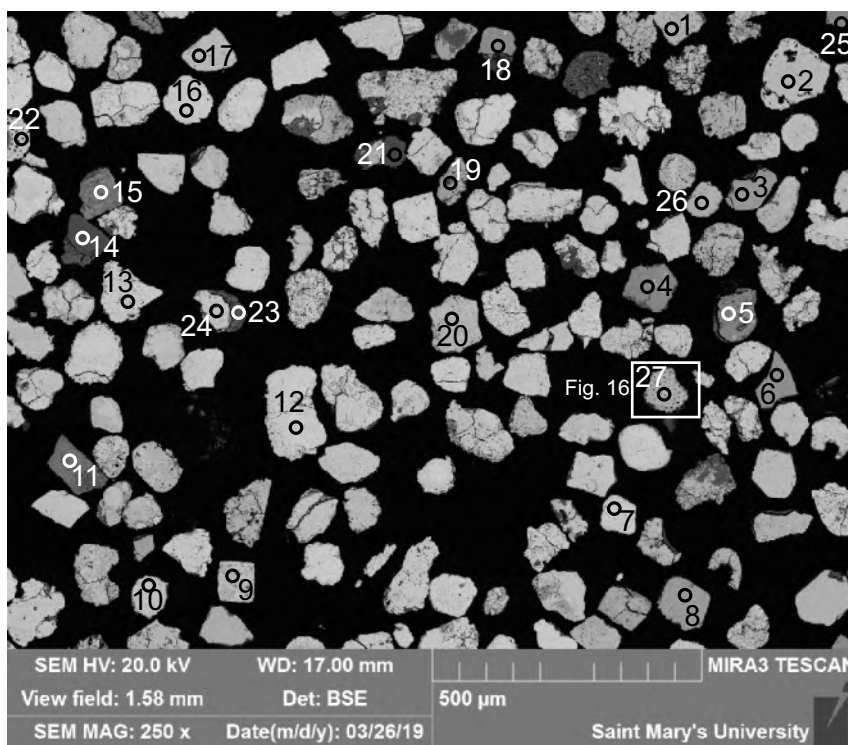
- 1:Chromite
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Chromite
- 6:Fe-oxide/hydroxide +
- 7:Epidote
- 8:Ilmenite
- 9:Fe-oxide/hydroxide +
- 10:Mn-oxide/hydroxide +
- 11:Zircon
- 12:Fe-oxide/hydroxide +
- 13:Garnet
- 14:Chromite
- 15:Epidote
- 16:Fe-oxide/hydroxide +
- 17:Fe-oxide/hydroxide +
- 18:Fe-oxide/hydroxide +
- 19:Epidote
- 20:Fe-oxide/hydroxide +
- 21:Chromite
- 22:Fe-oxide/hydroxide +
- 23:Fe-oxide/hydroxide +
- 24:Fe-oxide/hydroxide +
- 25:Fe-oxide/hydroxide +
- 26:Fe-oxide/hydroxide +
- 27:Fe-oxide/hydroxide +
- 28:Fe-oxide/hydroxide +

Figure B12.13: Sample S24 site 9 (SEM). Similar to Fig. 2. Detrital mineral grains: Chr, Ep, Ilm, Zrn, Grt, Qz, Fe-oxide.



- 1:Quartz
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +

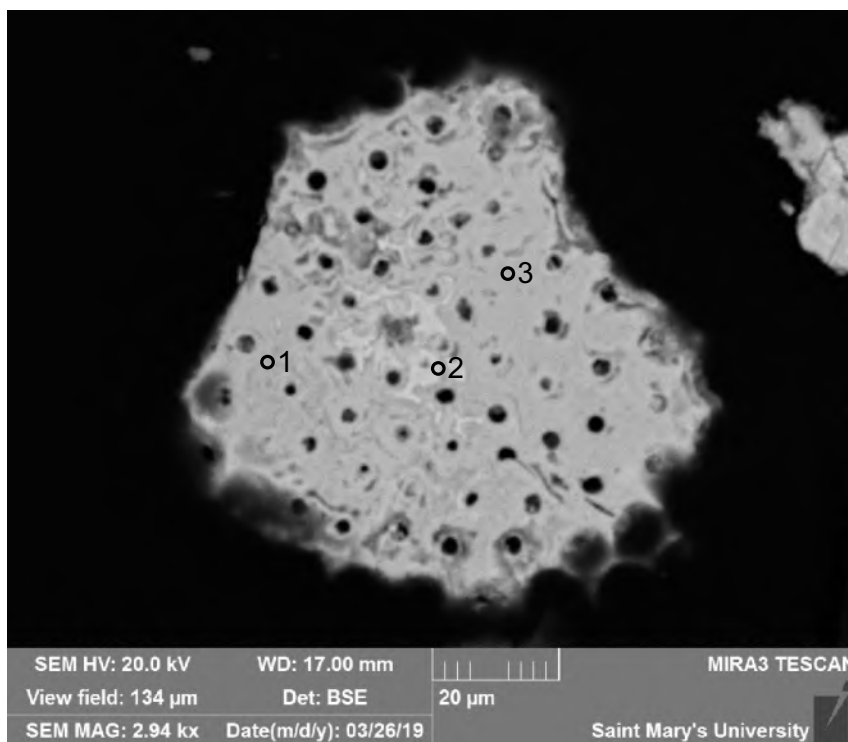
Figure B12.14: Sample S24 site 9.1 (SEM). Probably an original detrital Fe-oxide grain enveloped by silcrete.



- 1:Fe-oxide/hydroxide +
- 2:Chromite
- 3:Chromite
- 4:Titanite
- 5:Mix
- 6:Spinel
- 7:Fe-oxide/hydroxide +
- 8:Chromite
- 9:Fe-oxide/hydroxide +
- 10:Fe-oxide/hydroxide +
- 11:Apatite
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Quartz
- 15:Mix
- 16:Fe-oxide/hydroxide +
- 17:Fe-oxide/hydroxide +
- 18:Garnet
- 19:Mix
- 20:Fe-oxide/hydroxide +
- 21:Quartz
- 22:Fe-oxide/hydroxide +
- 23:Quartz +
- 24:Fe-oxide/hydroxide +
- 25:Garnet
- 26:Fe-oxide/hydroxide +
- 27:Fe-oxide/hydroxide +

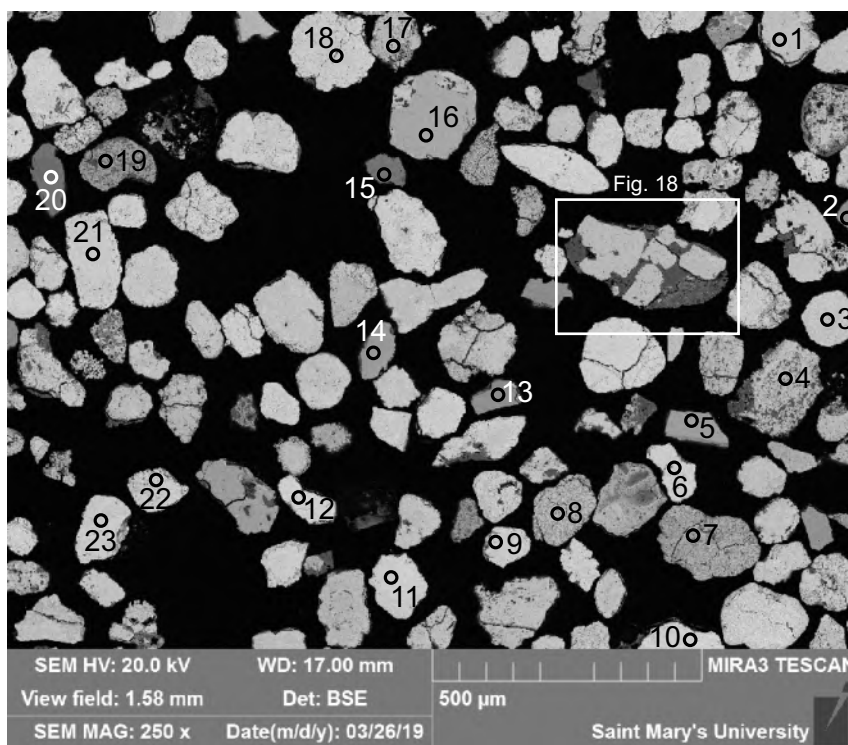
Figure B12.15: Sample S24 site 10 (SEM). Similar to Fig. 2. Detrital mineral grains: Chr, Ttn, Spl, Ap, Qz, Grt.





- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +

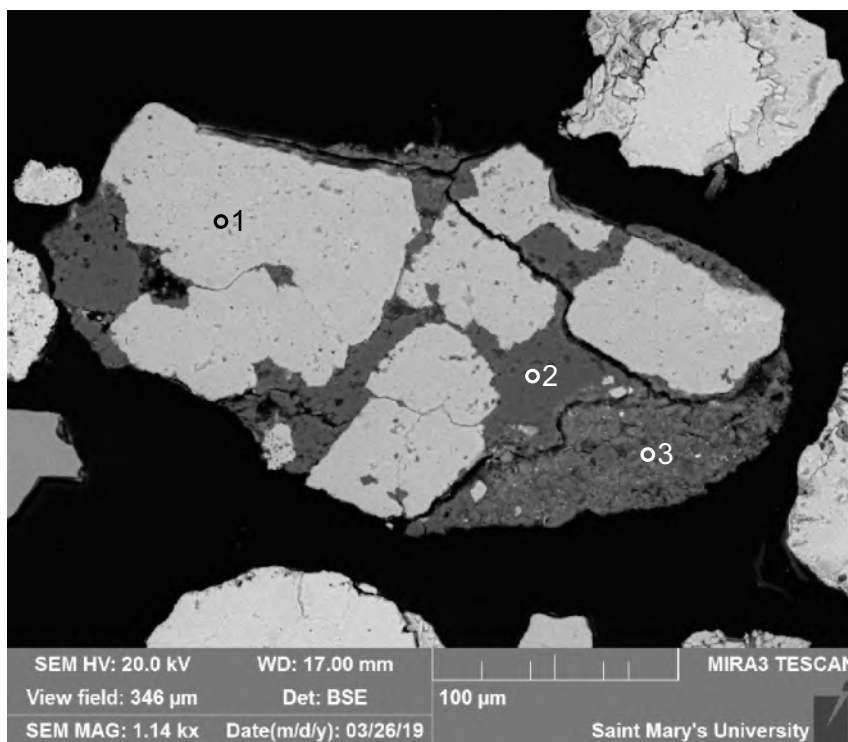
Figure B12.16: Sample S24 site 10.1 (SEM). Pedogenic mineral fragment, or possibly a fossil.



- 1:Fe-oxide/hydroxide +
- 2:Garnet
- 3:Fe-oxide/hydroxide +
- 4:Quartz + Fe-oxide/hydroxide
- 5:Chromite
- 6:Fe-oxide/hydroxide +
- 7:Mix
- 8:Fe-oxide/hydroxide +
- 9:Fe-oxide/hydroxide +
- 10:Fe-oxide/hydroxide +
- 11:Fe-oxide/hydroxide +
- 12:Fe-oxide/hydroxide +
- 13:Spinel
- 14:Spinel
- 15:Epidote
- 16:Chromite
- 17:Fe-oxide/hydroxide +
- 18:Fe-oxide/hydroxide +
- 19:TiO<sub>2</sub> + Quartz
- 20:Amphibole
- 21:Fe-oxide/hydroxide +
- 22:Fe-oxide/hydroxide +
- 23:Fe-oxide/hydroxide +

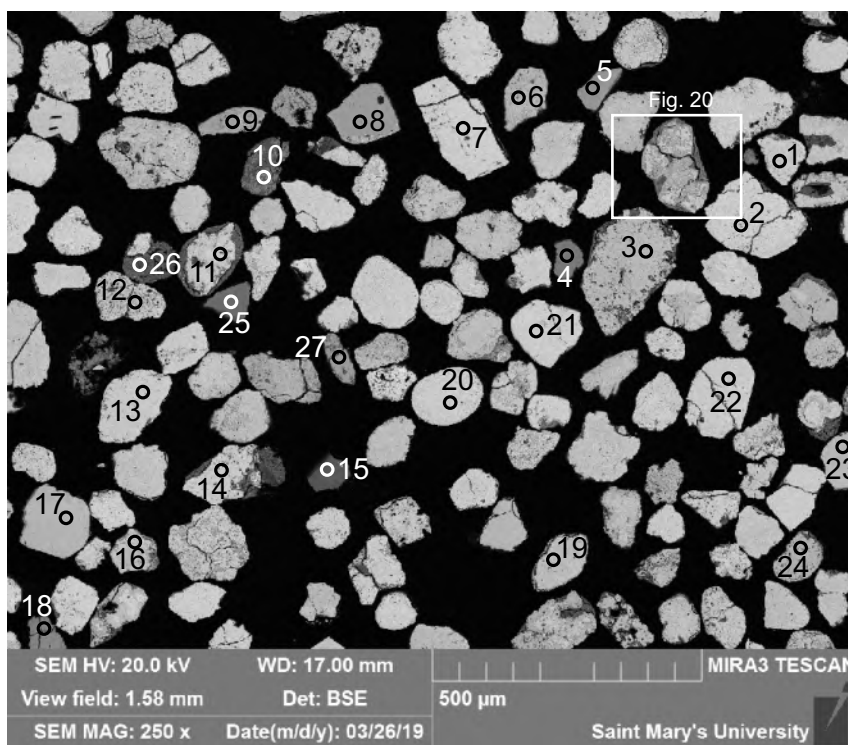
Figure B12.17: Sample S24 site 11 (SEM). Similar to Fig. 2. Detrital mineral grains: Grt, Chr, Spl, Ep, TiO<sub>2</sub>, Qz, Amph, Chl?, Fe-oxide.





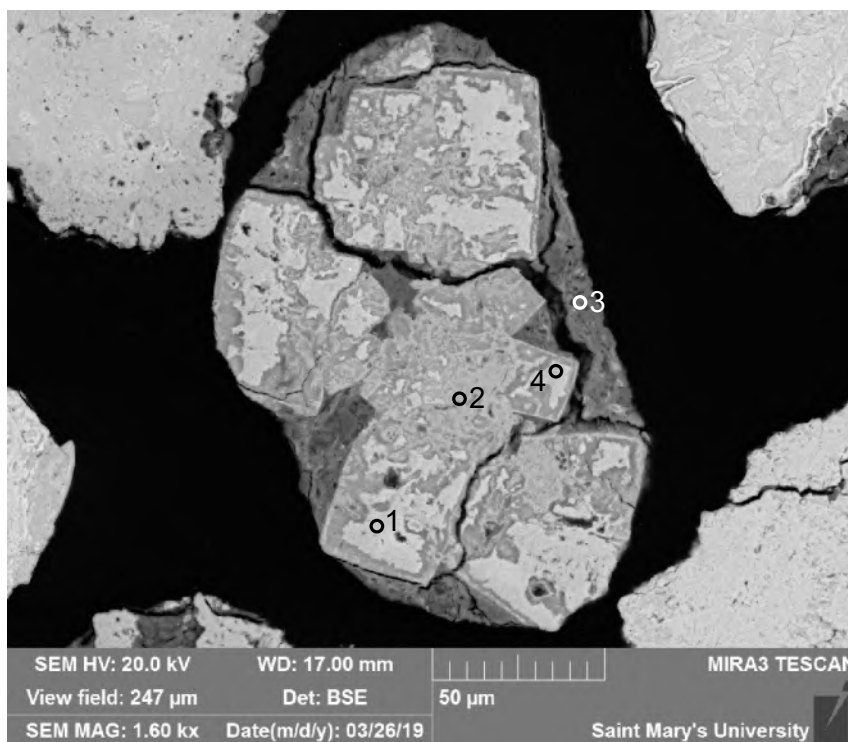
- 1:Fe-oxide/hydroxide +
- 2:Quartz
- 3:Chlorite +

Figure B12.18: Sample S24 site 11.1 (SEM). An original lithic clast made up of Fe-oxide grains (Mag) + quartz + probably chlorite, all pedogenically altered. Originally hydrothermal lithic clast.



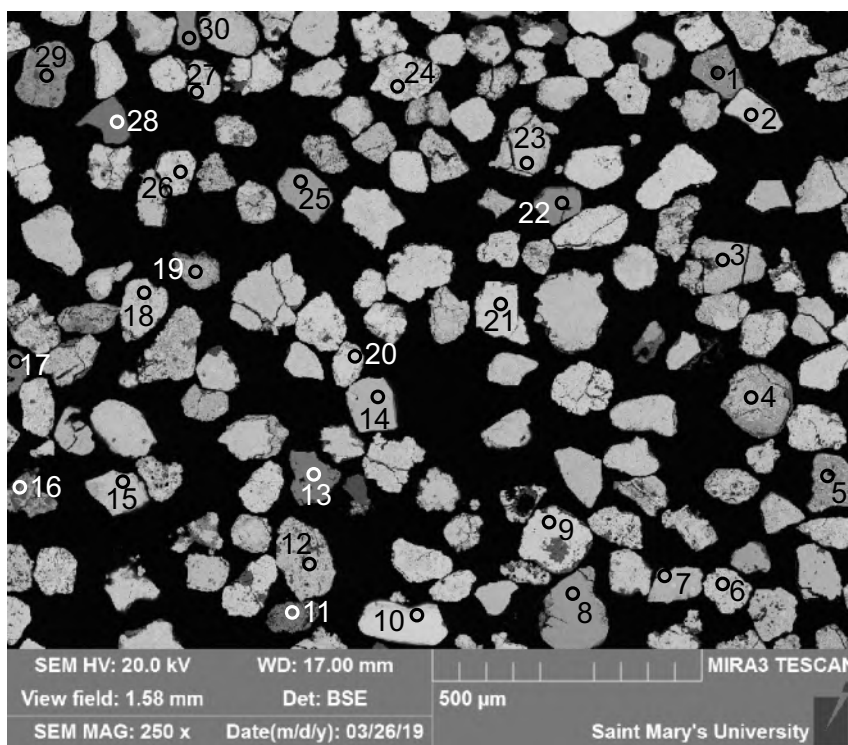
- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Epidote
- 5:Spinel
- 6:Fe-oxide/hydroxide +
- 7:Fe-oxide/hydroxide +
- 8:Chromite
- 9:Fe-oxide/hydroxide +
- 10:Epidote +
- 11:Fe-oxide/hydroxide +
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Tourmaline
- 16:Fe-oxide/hydroxide +
- 17:Chromite
- 18:Apatite
- 19:Fe-oxide/hydroxide +
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Fe-oxide/hydroxide +
- 23:Chromite
- 24:Fe-oxide/hydroxide +
- 25:Clinopyroxene
- 26:K-feldspar + Chlorite
- 27:TiO<sub>2</sub>

Figure B12.19: Sample S24 site 12 (SEM). Similar to Fig. 2. Detrital mineral grains: Ep, Spl, Chr, Tur, Ap, Cpx, Fe-oxide.



- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Chlorite + Muscovite
- 4:Fe-oxide/hydroxide +

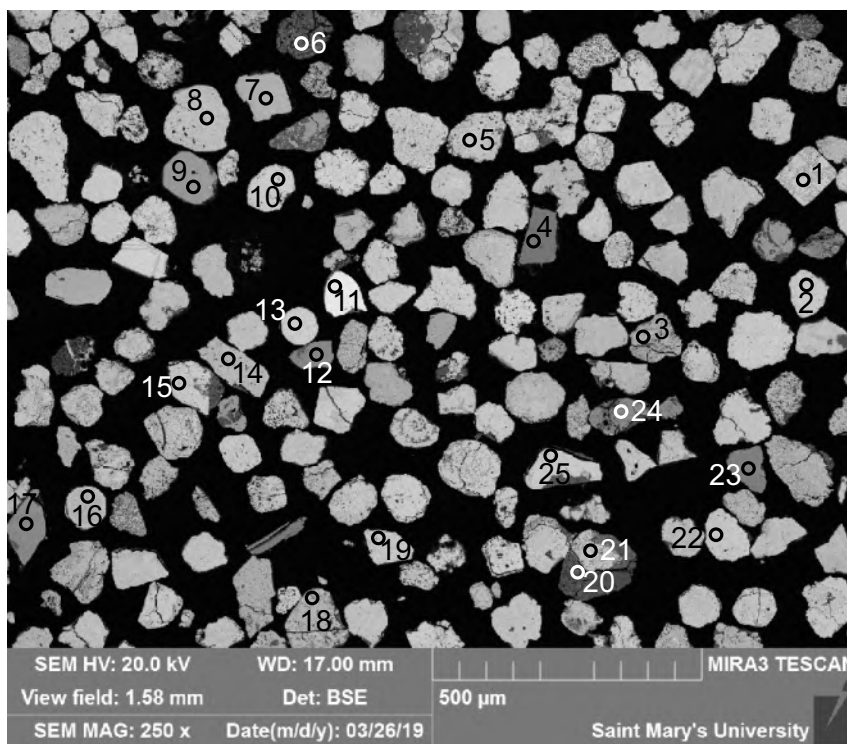
Figure B12.20: Sample S24 site 12.1 (SEM). An original clast made up of Fe-oxide grains (originally magnetite) + probably chloritized muscovite, all pedogenically altered. Original hydrothermal.



- 1:Chromite +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:Fe-oxide/hydroxide +
- 7:Fe-oxide/hydroxide +
- 8:Spinel
- 9:Fe-oxide/hydroxide +
- 10:Ti-Magnetite
- 11:Apatite
- 12:Fe-oxide/hydroxide +
- 13:Spinel
- 14:Chromite
- 15:Ilmenite
- 16:Quartz +
- 17:Epidote
- 18:Fe-oxide/hydroxide +
- 19:Fe-oxide/hydroxide +
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Garnet
- 23:Fe-oxide/hydroxide +
- 24:Fe-oxide/hydroxide +
- 25:TiO<sub>2</sub>
- 26:Fe-oxide/hydroxide +
- 27:Fe-oxide/hydroxide +
- 28:Epidote
- 29:Mix
- 30:Garnet

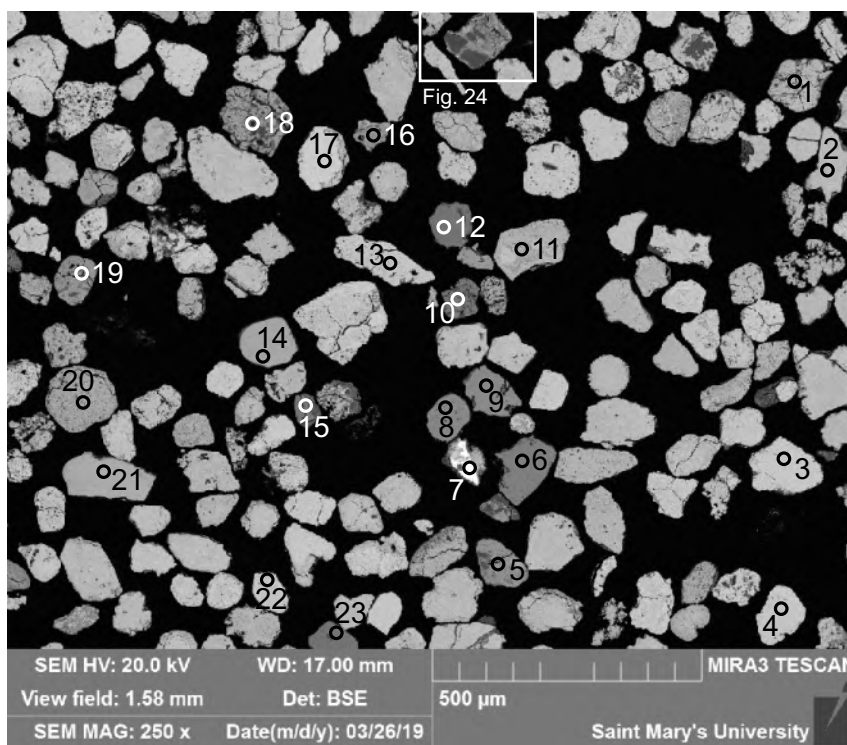
Figure B12.21: Sample S24 site 13 (SEM). Similar to Fig. 2. Detrital mineral grains: Chr, Spl, Ap, Ti-Mag, Ilm, Qz, Ep, Grt, TiO<sub>2</sub>.





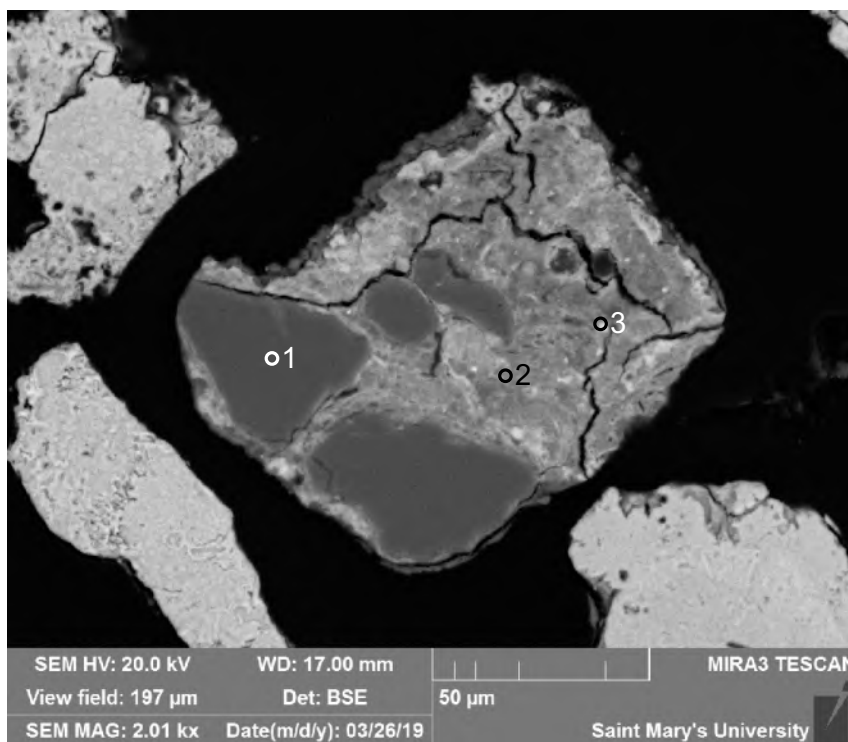
- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +
- 4:Garnet
- 5:Fe-oxide/hydroxide +
- 6:Muscovite +
- 7:Chromite
- 8:Fe-oxide/hydroxide +
- 9:TiO<sub>2</sub>
- 10:Fe-oxide/hydroxide +
- 11:Zircon
- 12:Apatite
- 13:Fe-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Titanite
- 18:Fe-oxide/hydroxide +
- 19:Fe-oxide/hydroxide +
- 20:Mix
- 21:Fe-oxide/hydroxide +
- 22:Fe-oxide/hydroxide +
- 23:Garnet
- 24:Mix
- 25:Fe-oxide/hydroxide +

Figure B12.22: Sample S24 site 14 (SEM). Similar to Fig. 2.  
Detrital mineral grains: Grt, Ms, Chr, TiO<sub>2</sub>, Zrn, Ap, Ttn.



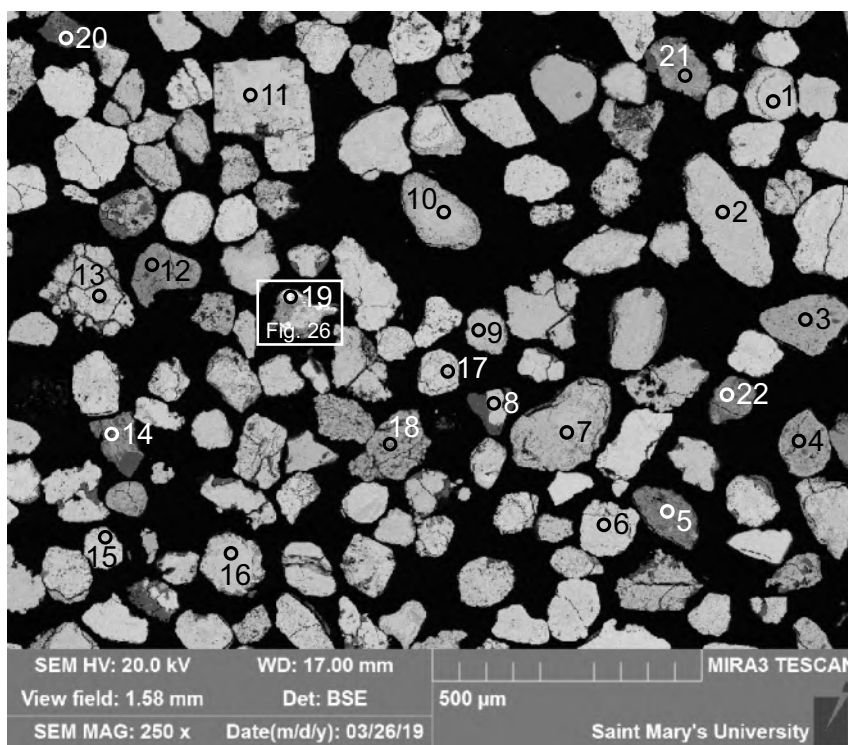
- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide
- 4:Fe-oxide/hydroxide +
- 5:Fe-oxide/hydroxide +
- 6:Spinel
- 7:Fe-oxide/hydroxide
- 8:Garnet
- 9:Garnet
- 10:Epidote
- 11:Fe-oxide/hydroxide +
- 12:Epidote
- 13:Fe-oxide/hydroxide +
- 14:Chromite
- 15:Epidote
- 16:Quartz + Fe-oxide/hydroxide
- 17:Fe-oxide/hydroxide +
- 18:Mix
- 19:Mix
- 20:Fe-oxide/hydroxide +
- 21:Chromite
- 22:Fe-oxide/hydroxide +
- 23:Epidote

Figure B12.23: Sample S24 site 15 (SEM). Similar to Fig. 2.  
Detrital mineral grains: Fe-oxide, Spl, Grt, Ep, Chr, Qz.



- 1:Quartz
- 2:Chlorite +
- 3:Mix

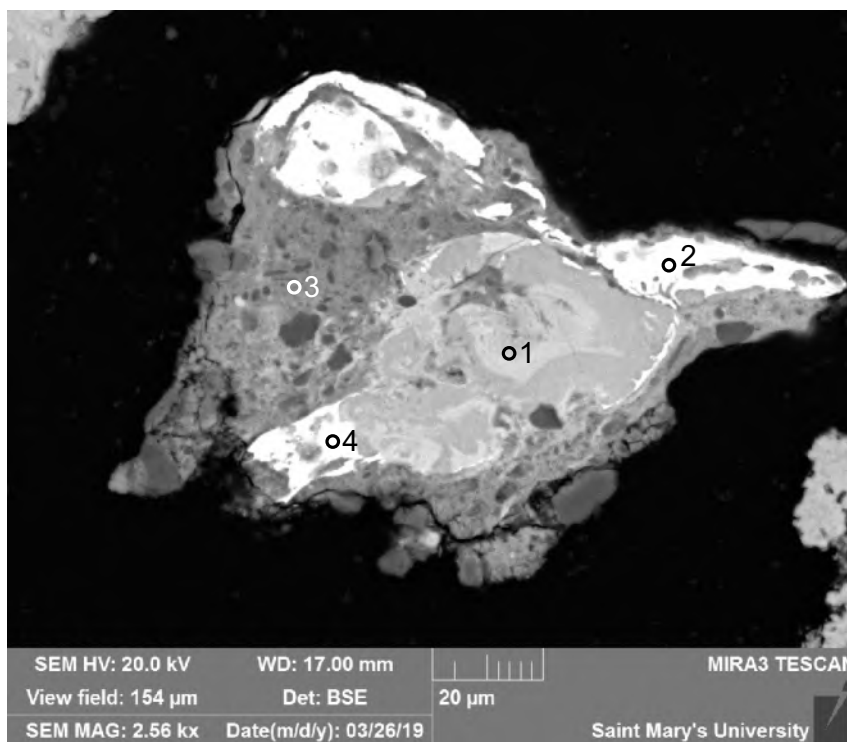
Figure B12.24: Sample S24 site 15.1 (SEM). Original lithic clast made up of quartz + probably chlorite, siltstone, now pedogenically altered.



- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Mix
- 4:Mix
- 5:Mix
- 6:Fe-oxide/hydroxide +
- 7:Fe-oxide/hydroxide +
- 8:Fe-oxide/hydroxide +
- 9:Fe-oxide/hydroxide +
- 10:Fe-oxide/hydroxide +
- 11:Fe-oxide/hydroxide +
- 12:Mix
- 13:Fe-oxide/hydroxide + Chlorite +
- 14:Titanite +
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Fe-oxide/hydroxide +
- 18:Fe-oxide/hydroxide + Chlorite +
- 19:Fe-oxide/hydroxide
- 20:Quartz +
- 21:Titanite +
- 22:Fe-oxide/hydroxide + Chlorite

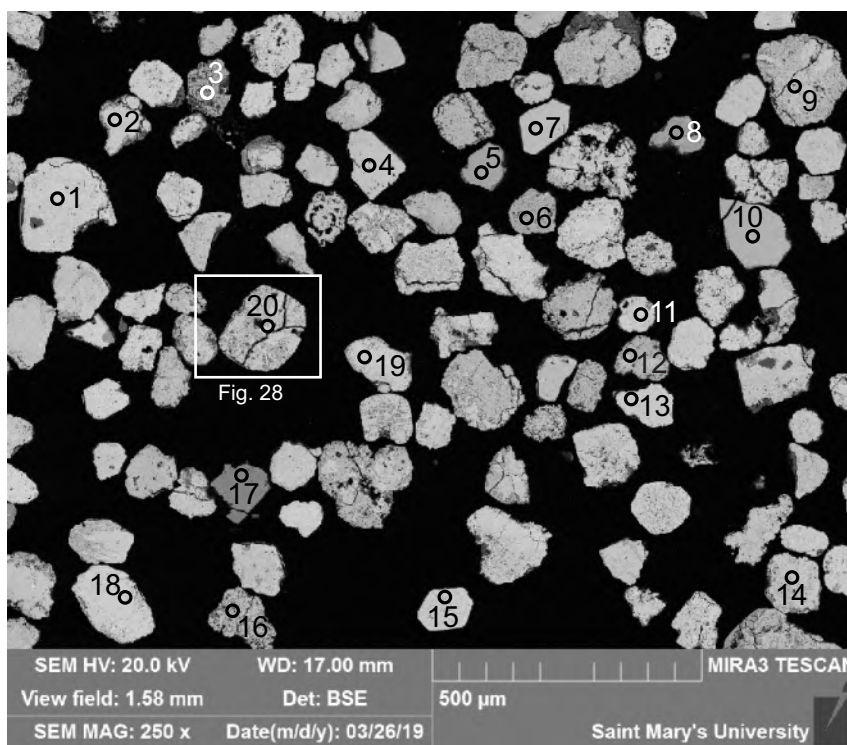
Figure B12.25: Sample S24 site 16 (SEM). Similar to Fig. 2. Detrital mineral grains: Ttn, Chl, Qz, Fe-oxide.





- 1:Fe-oxide/hydroxide
- 2:Magnetite
- 3:Mix
- 4:Magnetite

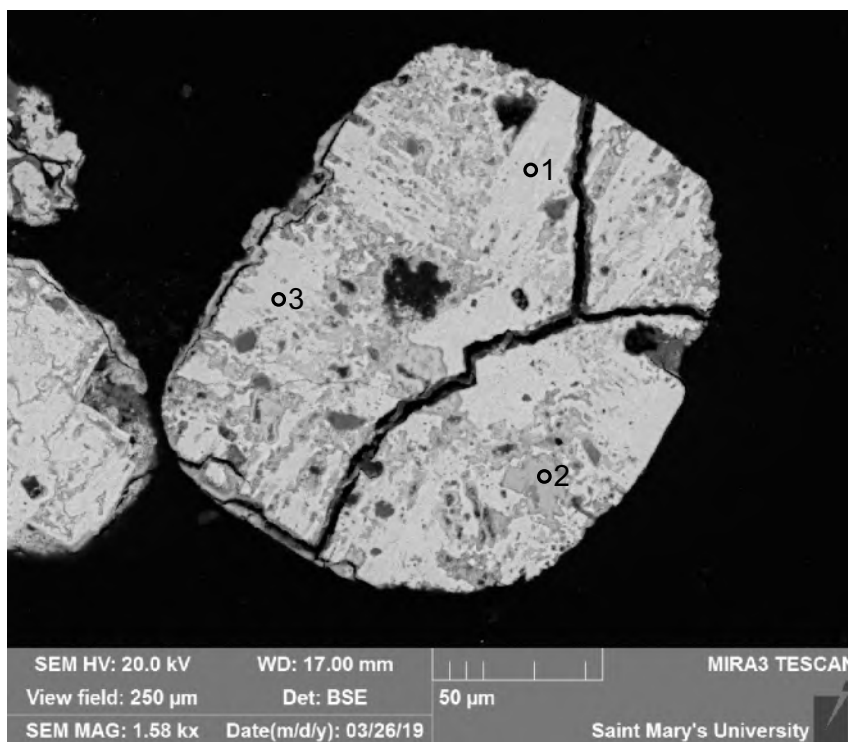
Figure B12.26: Sample S24 site 16.1 (SEM). Original lithic clast made up of Fe-oxide + other grains all pedogenically affected. Common zinc.



- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Mix
- 4:Ilmenite + Quartz
- 5:Chromite
- 6:"Ilmenite"
- 7:Chromite
- 8:TiO<sub>2</sub> +
- 9:Fe-oxide/hydroxide +
- 10:Chromite
- 11:Fe-oxide/hydroxide +
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Spinel
- 18:Fe-oxide/hydroxide +
- 19:Fe-oxide/hydroxide +
- 20:Fe-oxide/hydroxide +

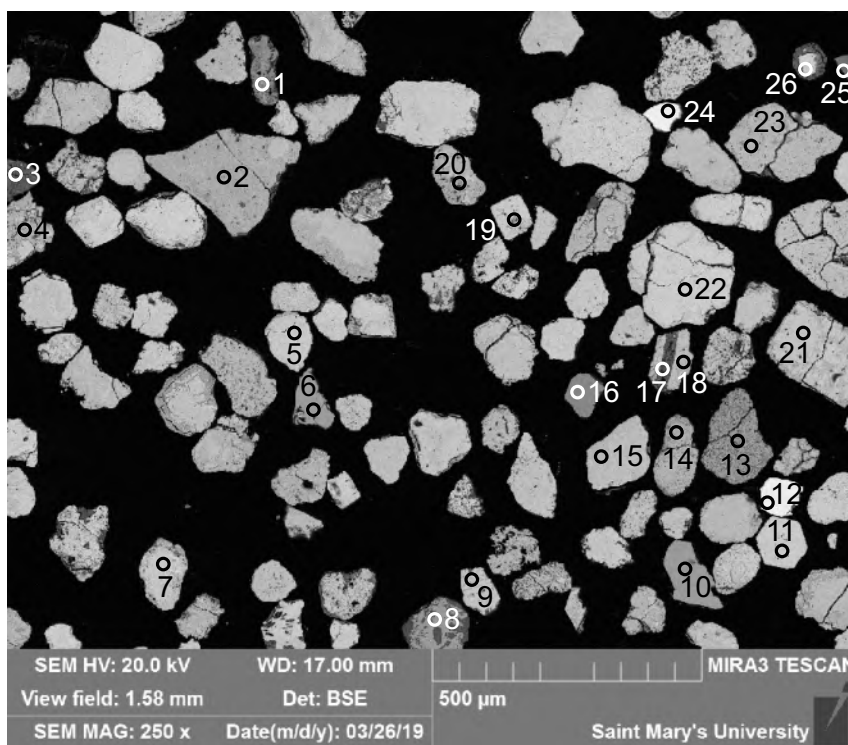
Figure B12.27: Sample S24 site 17 (SEM). Similar to Fig. 2. Detrital mineral grains: Chr, Ilm, TiO<sub>2</sub>, Spl, Fe-oxide.





- 1:Fe-oxide/hydroxide +
- 2:Fe-oxide/hydroxide +
- 3:Fe-oxide/hydroxide +

Figure B12.28: Sample S24 site 17.1 (SEM). Original detrital probably Fe-oxide mineral (magnetite) modified by diagenesis. Has zinc.



- 1:Mix
- 2:Fe-oxide/hydroxide +
- 3:Mix
- 4:Mix
- 5:Fe-oxide/hydroxide +
- 6:Mix
- 7:Fe-oxide/hydroxide +
- 8:"Ilmenite" +
- 9:Fe-oxide/hydroxide +
- 10:Chromite
- 11:Fe-oxide/hydroxide +
- 12:Zircon
- 13:TiO<sub>2</sub> +
- 14:Mix
- 15:Fe-oxide/hydroxide +
- 16:Garnet
- 17:Muscovite +
- 18:Fe-oxide/hydroxide +
- 19:Fe-oxide/hydroxide +
- 20:Fe-oxide/hydroxide +
- 21:Fe-oxide/hydroxide +
- 22:Fe-oxide/hydroxide +
- 23:Fe-oxide/hydroxide +
- 24:Zircon
- 25:Epidote
- 26:Fe-oxide/hydroxide +

Figure B12.29: Sample S24 site 18 (SEM). Similar to Fig. 2. Detrital minerals: Ilm, Chr, Zrn, ?TiO<sub>2</sub>, Grt, Ep.

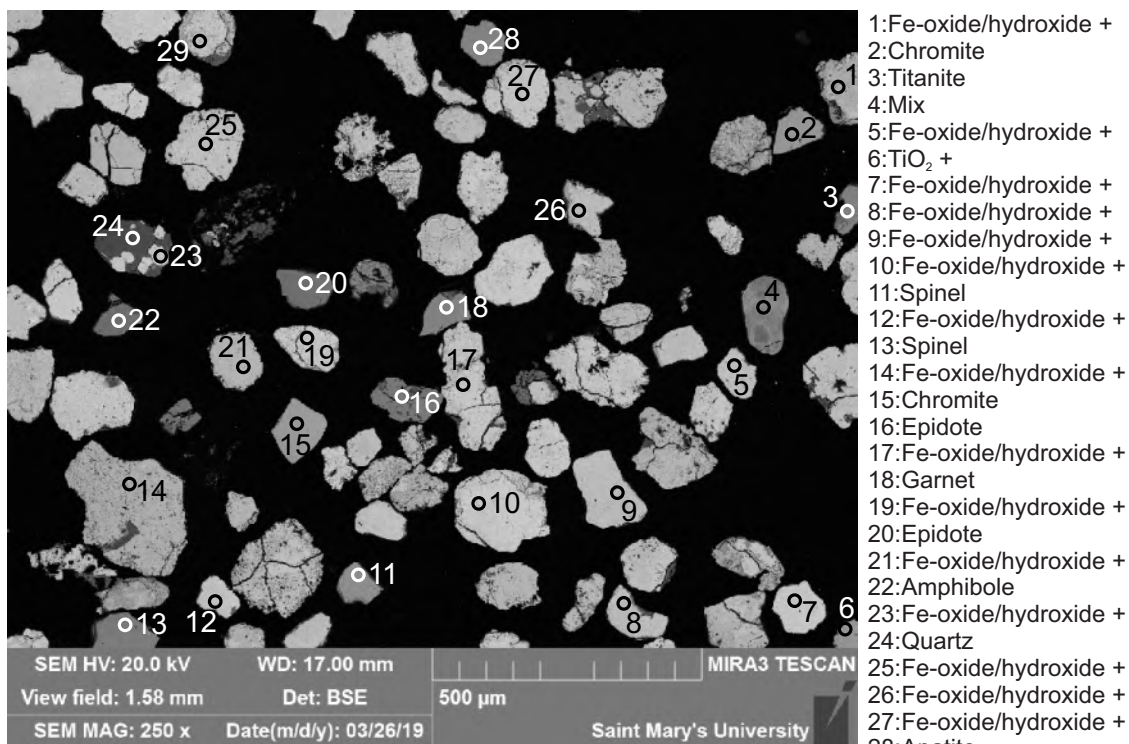


Figure B12.30: Sample S24 site 19 (SEM). Similar to Fig. 2.  
Detrital mineral grains: Chr, Ttn, TiO<sub>2</sub>, Spl, Ep, Grt, Amph, Qz, Ap.

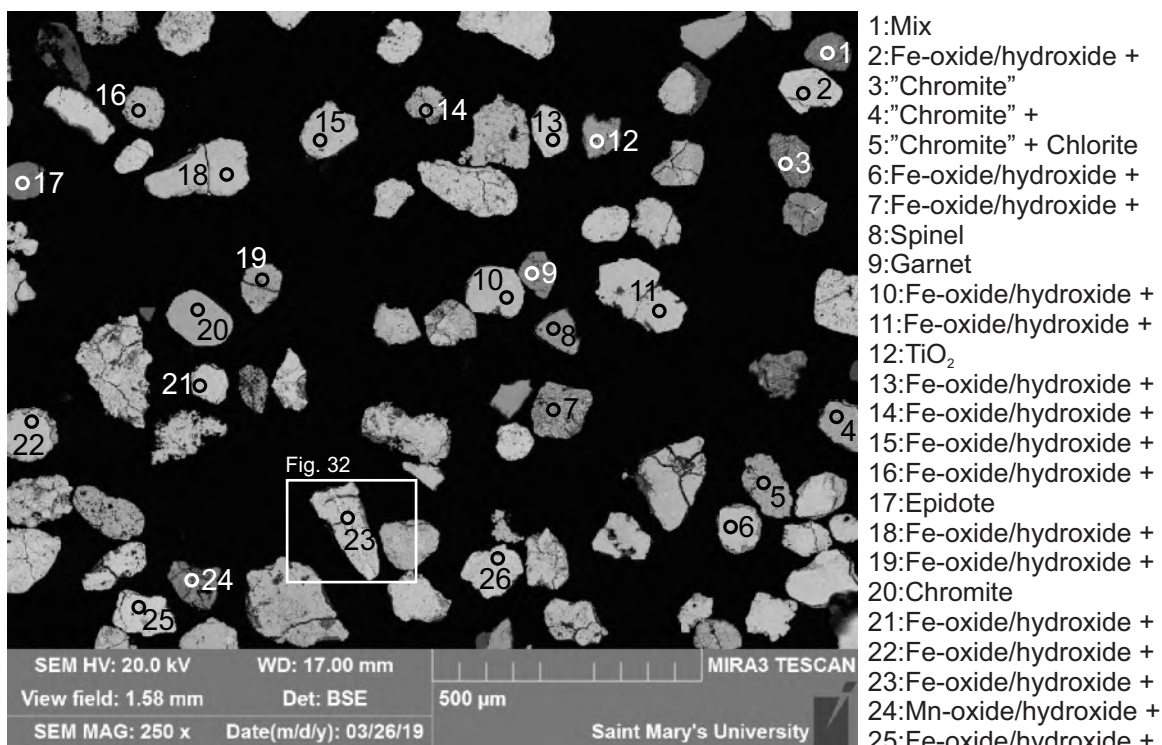
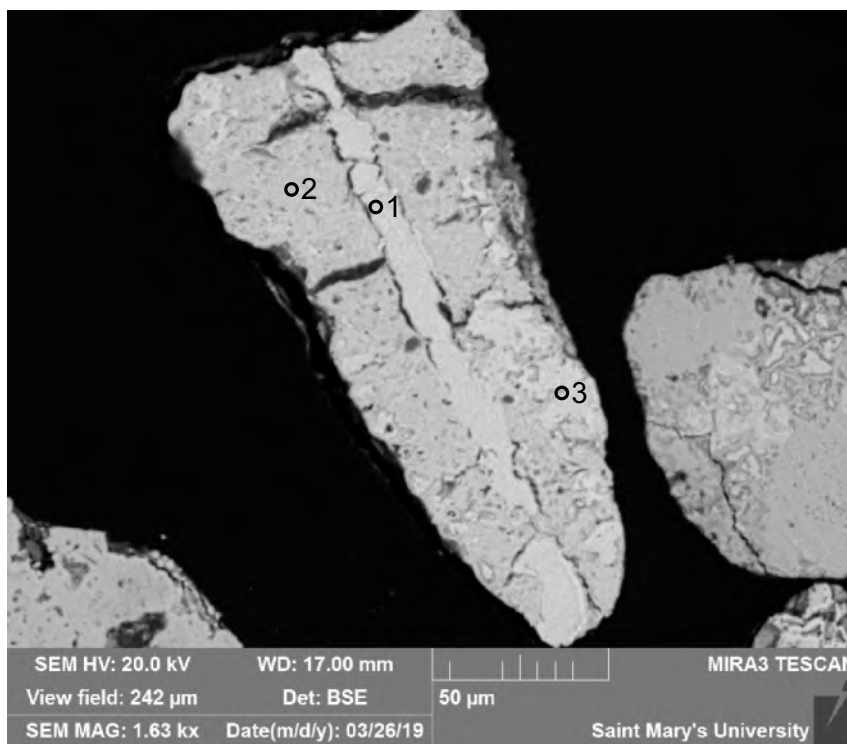


Figure B12.31: Sample S24 site 20 (SEM). Similar to Fig. 2.  
Detrital mineral grains: Chr, Spl, Grt, TiO<sub>2</sub>, Ep, Fe-oxide.



1:Fe-oxide/hydroxide +  
2:Fe-oxide/hydroxide +  
3:Fe-oxide/hydroxide +

Figure B12.32: Sample S24 site 20.1 (SEM). Probably an original detrital Fe-oxide grain affected by pedogenesis, precipitating around a rootlet. Presence of zinc.

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	1	1	Feohy +	3.61		1.29	93.42			0.45			1.23														100	91
S24	1	2	Feohy +	5.34		2.28	91.23						1.14														100	89
S24	1	3	Feohy +	3.18		0.83	96.00																				100	82
S24	1	4	Mnohy +	10.03	0.33	27.57	2.46	37.34	1.14	0.38	2.56	0.58			10.19					5.94	1.47						100	99
S24	1	5	Amph	44.38	3.04	9.88	11.61	0.28	13.95	10.44	2.23	0.99				0.21											97	121
S24	1	6	Feohy +	5.63		8.05	78.59			0.49			2.41					0.97								3.87	100	80
S24	1	7	Feohy +	5.14		2.84	82.51			0.44	0.84		2.38					0.57								5.28	100	93
S24	1	8	Feohy +	2.31		1.25	92.86			0.36			1.28													1.93	100	98
S24	1	9	Feohy +	2.72			97.28																				100	88
S24	1	10	Feohy +	19.25		9.06	66.76		1.43	0.73		1.44	1.33														100	95
S24	1	11	Feohy +	5.57		3.25	88.10			0.68			2.41														100	87
S24	1	12	Feohy +	7.31		2.39	89.12	0.47	0.71																		100	85
S24	1	13	Ap				0.88			44.41			39.38		8.07											7.26	100	82
S24	1	14	Grt	39.54		20.50	30.80	2.93	3.37	2.86																	100	120
S24	1	15	Feohy +	4.19		1.44	94.36																				100	93
S24	1	16	Feohy +	5.84		3.04	84.97			0.39	0.92		1.18													3.65	100	91
S24	1	17	Feohy +	3.62		1.59	93.63			0.49	0.67																100	94
S24	1	18	Feohy				100.00																				100	81
S24	1	19	Feohy +	3.08		1.10	94.84						0.98														100	89
S24	1	20	Feohy +	3.59		1.83	92.98						1.14					0.46									100	89
S24	1	21	Feohy +	5.69		3.43	85.69			0.48			1.44					0.45								2.82	100	82
S24	1	22	Feohy +	4.37		1.52	93.26						0.84														100	84
S24	1	23	Feohy +	3.27		1.82	93.58			0.41			0.93														100	88
S24	1	24	Qz	99.58			0.42																				100	115
S24	1	25	Chr		0.83	19.47	28.17		9.17								0.44	41.93									100	109
S24	1	26	Feohy +	3.83		1.54	93.25			0.37			1.01														100	84
S24	1	27	Qz +	87.50		5.20	1.96			5.34																	100	115
S24	1	28	Mix	21.60		14.99	53.60		0.59	0.51	0.55	0.61	1.65													5.89	100	85
S24	1	29	TiO <sub>2</sub>		99.49		0.51																				100	107
S24	1	30	Feohy +	4.32		1.33	92.36						1.99														100	80
S24	1	31	Feohy +	4.46		2.12	92.06			0.34			1.02														100	83
S24	1	32	TiO <sub>2</sub> + Qz	18.00	78.71	1.92	0.70					0.67															100	108
S24	1	33	Qz	97.83			1.18			0.99																	100	119
S24	1	34	Feohy +	3.83		1.54	93.53						1.09														100	84
S24	1	35	Spl			40.68	16.63		13.17									29.52									100	114
S24	1	36	Feohy +	4.53		1.38	92.55			0.47			1.07														100	88
S24	1	37	Feohy +	3.13		0.95	95.92																				100	81
S24	1	38	Chr			16.82	27.59		9.39									46.20									100	113
S24	1	39	TiO <sub>2</sub>		99.35		0.65																				100	111
S24	1	40	Grt	39.89		20.92	31.56	1.41	3.63	2.59																	100	116
S24	1	41	Qz +	59.03		1.49	5.28		32.19	0.33	0.65							1.02									100	119
S24	2	1	Zrn	30.93																			69.07				100	128
S24	2	2	Feohy +	6.46		1.13	91.58						0.83														100	88
S24	2	3	Feohy +	3.30		1.53	92.37			0.58			2.22														100	101
S24	2	4	Feohy +	8.47		5.46	82.09			0.48			2.69								0.81						100	87

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	2	5	TiO <sub>2</sub> +	1.90	91.66	1.08	5.04			0.32																	100	84
S24	2	6	Spl			37.59	15.95		15.90									30.55									100	116
S24	2	7	Feohy +	4.10		1.74	91.38			0.52			1.75					0.51									100	92
S24	2	8	Grt + Ms?	30.56	0.87	25.39	8.60	24.40	1.96	0.41		1.92			3.05					2.83							100	95
S24	2	9	Ms + Chl	50.19	0.57	23.02	7.98	6.62	1.64	0.40	1.41	3.07	0.74												4.37	100	96	
S24	2	10	Feohy +	3.31		1.90	92.42	1.06					0.89					0.42									100	92
S24	2	11	TiO <sub>2</sub> + Qz	11.44	86.44	0.53	1.31			0.27																	100	113
S24	2	12	Feohy +	8.19		3.79	87.31		0.71																		100	92
S24	2	13	Grt	41.37		21.78	18.64	0.39	10.21	7.61																	100	114
S24	2	14	Mix	60.82	0.50	15.77	6.81	2.33	1.51		1.80	1.88			8.30			0.28									100	120
S24	2	15	Feohy +	3.71		2.16	91.97			0.62			1.12					0.41									100	90
S24	2	16	Spl			31.53	21.19		12.97									34.31									100	112
S24	2	17	Feohy +	5.60		1.99	87.51						1.85												3.05	100	86	
S24	2	18	Feohy +	3.38		3.63	90.90			0.64			1.45														100	77
S24	2	19	Ep	40.39		26.57	7.69			22.35																	97	107
S24	2	20	Chr			23.95	16.67		11.40									47.98									100	106
S24	2	21	Amph	42.37	3.77	12.26	10.07		13.85	11.04	2.89	0.75															97	114
S24	2	22	Feohy +	4.59	0.51	3.29	85.05			0.56	0.88		2.04												3.07	100	85	
S24	2	23	Mix	64.04	0.79	14.19	6.88	3.61	1.17		1.09	1.44			6.79												100	107
S24	2	24	Feohy +	7.04		1.26	90.61						1.09														100	88
S24	2	25	Spl			33.49	16.22		12.61									37.68									100	115
S24	2	26	Ap							47.27	0.71		40.39	1.40	8.71										1.51	100	119	
S24	2	27	Chr			21.20	17.33		10.67									50.80									100	106
S24	2	28	Feohy +	15.41		6.74	74.26		0.76	0.65		0.47	1.71														100	77
S24	2	29	TiO <sub>2</sub>		99.53		0.47																				100	108
S24	2	30	Chr			17.76	19.53		9.55									53.15									100	100
S24	2.1	1	Feohy +	4.35		1.52	91.69			0.40			1.53					0.50									100	89
S24	2.1	2	Feohy +	3.27	0.57	2.65	82.62			0.57	0.92		3.17					0.97							5.28	100	88	
S24	2.1	3	Feohy +	3.22		1.86	92.65			0.99			1.29														100	89
S24	2.1	4	Feohy +	6.01		4.60	85.75		0.78	0.94			1.92														100	85
S24	2.1	5	Feohy +	7.31		2.03	88.72			0.68			1.25														100	81
S24	2.1	6	Spl			37.24	16.36		16.20									30.21									100	114
S24	3	1	Mix	36.48	0.39	24.38	32.13		0.97		1.53	1.24	1.28					0.51							1.10	100	98	
S24	3	2	Feohy +	6.74		2.82	89.44						1.00														100	85
S24	3	3	Ilm		51.45		46.33	2.23																			100	106
S24	3	4	Chr		0.40	29.55	19.68		14.67									35.70									100	112
S24	3	5	Feohy +	5.35		1.17	91.40	0.95		0.43											0.70						100	84
S24	3	6	Feohy +	4.84		2.03	91.28	0.45		0.32			1.07														100	96
S24	3	7	Grt	41.50		21.06	2.77			34.66																	100	126
S24	3	8	Feohy +	4.84		1.42	91.74	0.47		0.37			1.15														100	94
S24	3	9	Feld + Chl	54.34	0.78	20.18	9.53	6.16	1.75		1.06	2.60	0.72												2.88	100	96	
S24	3	10	Feohy +		6.57	3.76	86.16	1.18	2.33																		100	105
S24	3	11	Mix	25.45	0.49	19.51	45.92		1.29	0.32	1.45	0.69	1.71	0.68												2.50	100	88
S24	3	12	Feohy +	6.26	1.80	3.63	85.83			0.49			2.00														100	88
S24	3	13	Ep	39.94		20.62	13.93			22.50																	97	113



Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	3	14	Ilm		53.01		43.82	2.62	0.55																		100	108
S24	3	15	Feohy +	8.45	0.62	5.77	78.11			0.45		0.37	2.52													3.71	100	80
S24	3	16	Feohy +	3.59		1.22	93.42			0.40			1.37														100	87
S24	3	17	Feohy +	3.79		2.04	92.55	0.51					1.11														100	86
S24	3	18	Mix	26.17	0.49	26.47	4.10	25.94	2.55		1.12	2.17			7.75					3.24							100	96
S24	3	19	Feohy +		8.18	3.33	85.37	1.16	1.97																		100	100
S24	3	20	Feohy +	7.66		3.26	87.55						1.52														100	79
S24	3	21	Feohy +	2.63		2.00	92.75			0.57			1.42				0.63										100	87
S24	3	22	Spl			34.06	16.20		15.51									34.22									100	109
S24	3	23	Feohy +	6.35		5.85	81.11		0.66	0.49			2.37				0.70				1.22	1.26					100	77
S24	3	24	Grt +	38.06	1.25	16.51	3.52		1.87	33.77					5.02												100	106
S24	3	25	Chr			20.05	17.03		10.68								0.47	51.77									100	106
S24	3	26	Qz	99.66			0.34																				100	114
S24	3	27	Feohy +	9.60		5.52	82.24			0.41			2.23														100	76
S24	3	28	Feohy +	4.17		1.18	92.56	1.12					0.97														100	75
S24	3	29	Feohy +	3.21		1.59	95.20																				100	79
S24	3	30	Qz	99.72			0.28																				100	112
S24	3	31	Chr			20.50	24.14		10.25									45.12									100	100
S24	3	32	Feohy +	8.24		8.01	79.58		0.80	0.79			2.57														100	70
S24	4	1	Zrn	30.93																			69.07				100	118
S24	4	2	Feohy +	13.26	0.90	5.86	77.89					1.16	0.94														100	41
S24	4	3	Feohy +	3.17		1.80	93.12			0.71			1.19														100	90
S24	4	4	Feohy +	7.24		2.80	88.02			0.53			1.42														100	81
S24	4	5	Feohy +	3.88		1.20	94.43			0.49																	100	88
S24	4	6	Zrn	31.35		0.57	0.74			0.39													66.95				100	117
S24	4	7	Mix	24.78	0.42	13.19	54.74	0.54	1.27	0.63	0.61	1.31	2.52														100	96
S24	4	8	Feohy +		13.98	2.93	79.30	0.65	2.44								0.69										100	108
S24	4	9	Grt	39.69		20.75	19.50	15.99	2.63	1.44																	100	125
S24	4	10	Grt	39.40		20.88	23.15	6.84	0.72	9.00																	100	119
S24	4	11	Feohy +	2.72			97.28																				100	83
S24	4	12	Feohy +	4.27		1.23	94.02			0.48																	100	88
S24	4	13	Amph	41.81	3.97	12.47	10.12		14.23	11.31	2.47	0.62						0.49									97	114
S24	4	14	Feohy +	3.42		1.40	90.03	0.78		0.47			0.99													2.41	100	89
S24	4	15	Feohy +	4.61		2.27	90.27			0.85			2.00														100	83
S24	4	16	Opx	59.40			5.34		34.81	0.45																	100	112
S24	4	17	Feohy +	2.47		1.21	96.32																				100	83
S24	4	18	Feohy +	4.32		1.88	91.59	0.55		0.44			1.23														100	80
S24	4	19	Tur	38.13	0.51	31.83	6.57		7.13	0.64	2.18																87	98
S24	4	20	Feohy +	4.07		1.40	92.76			0.50			1.26														100	78
S24	4	21	Grt	39.43		20.68	25.56	5.74	0.86	7.72																	100	105
S24	4	22	Mix	32.66	45.59	12.78	3.09		0.84		0.43	2.57			2.03												100	83
S24	4	23	Ilm		54.00		43.77	2.23																			100	106
S24	4	24	Feohy +	4.90		1.44	92.95		0.71																		100	86
S24	4	25	Grt	39.86		20.53	26.07	3.82	1.32	8.40																	100	109
S24	4	26	Amph	52.99	0.56	4.11	10.82	0.31	15.52	11.71	0.65	0.32															97	109
S24	4	27	Feohy +	8.06		9.69	74.52			0.43			2.91													4.39	100	72

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	4	28	Feohy +	7.36		4.49	84.38		0.90	0.84			2.03														100	76
S24	4	29	Feohy +	3.51		1.07	95.09			0.33																	100	82
S24	4	30	Pl (An)	44.76		33.78	1.75			18.39					1.32												100	93
S24	4	31	Feohy +	5.55		2.86	89.73			0.57			1.29														100	80
S24	4.1	1	Feohy +	5.32	0.46	2.34	85.13	0.77		0.47	0.74		1.97												2.81	100	87	
S24	4.1	2	Mix	45.07	1.25	21.53	12.83	5.04	1.35		1.36	2.73	0.70		5.24										2.89	100	92	
S24	4.1	3	Mix	24.04	0.64	16.50	53.78		0.96	0.62	0.82	1.05	1.60													100	66	
S24	4.1	4	Feohy +	5.04		1.54	90.53	1.55		0.46			0.88														100	83
S24	4.1	5	Feohy +	5.98	0.68	6.25	76.68			0.91			2.41												7.09	100	70	
S24	4.1	6	Feohy +	6.79	0.72	6.18	78.00			0.64			2.09												5.57	100	72	
S24	5	1	Qz	98.11		1.33	0.57																				100	104
S24	5	2	Grt	39.69		20.89	32.51	0.88	4.07	1.96																	100	113
S24	5	3	Feohy +	2.92		1.29	95.39			0.41																	100	86
S24	5	4	TiO <sub>2</sub> + Chl	8.79	80.43	5.73	3.22		1.09			0.74															100	105
S24	5	5	Feohy +	3.82		1.71	92.26						2.21														100	84
S24	5	6	Feohy +	3.72		1.63	93.03			0.44			1.18														100	80
S24	5	7	Feohy +	5.76		3.24	88.83			0.46			1.06				0.64										100	78
S24	5	8	Ep	40.72		25.38	8.57			22.32																	97	108
S24	5	9	Feohy +	4.15		2.19	91.79			0.66			1.21														100	79
S24	5	10	Spl			39.42	17.15		15.64									27.79									100	107
S24	5	11	Feohy +	2.10		2.04	93.72			0.44			1.30					0.40									100	88
S24	5	12	Feohy +	5.41		6.50	82.87			0.83			3.06							1.34							100	77
S24	5	13	Feohy +	1.81		1.02	95.82			0.42			0.92														100	85
S24	5	14	Feohy +	9.88		6.90	75.55		0.67	0.73			2.55					0.42							3.30	100	76	
S24	5	15	Feohy +	4.29		1.62	92.54			0.50			1.05														100	76
S24	5	16	Grt	40.25		20.89	29.56	0.50	3.64	5.16																	100	105
S24	5	17	Feohy +		6.07	2.53	88.27	0.93	1.52								0.67										100	91
S24	5	18	Feohy +	4.22		1.50	91.52			0.42			1.87					0.47									100	81
S24	5	19	Feohy +	9.11		5.80	82.68			0.45			1.96														100	76
S24	5	20	Feohy +	5.18		1.73	91.53			0.63			0.94														100	74
S24	5	21	Feohy +	3.01		4.34	91.27						1.38														100	85
S24	5	22	TiO <sub>2</sub> + Qz	27.24	71.13	0.77	0.86																				100	116
S24	5	23	Qz +	92.40		0.84	6.45		0.31																		100	114
S24	5	24	Qz + Feohy	50.72		0.76	48.52																				100	104
S24	5	25	Ep	40.36		26.50	7.27			22.87																	97	117
S24	5	26	Mix	77.41		8.41	10.80		1.53		0.76	1.09															100	87
S24	5	27	Feohy +	3.57		1.88	92.38			0.47			1.69														100	87
S24	5	28	Feohy +	7.24	0.62	4.17	80.00			0.51	0.83		2.00												4.62	100	85	
S24	6	1	Spl			35.24	16.49		14.37									33.89									100	110
S24	6	2	Feohy +	3.39		3.32	89.15			0.62			1.27												2.25	100	81	
S24	6	3	TiO <sub>2</sub>		99.16		0.84																				100	116
S24	6	4	Feohy +	4.16		1.56	92.32			0.42			1.15					0.39									100	94
S24	6	5	Feohy +	11.72	0.49	7.94	65.47		0.69	0.68	1.33	0.58	4.28												6.82	100	99	
S24	6	6	Grt	41.03		21.37	23.11	0.35	8.92	5.22																	100	130
S24	6	7	Feohy +	6.14		0.95	92.21	0.70																			100	87

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	6	8	Zrn	30.83			0.57																68.60				100	130
S24	6	9	Chr		0.89	25.84	24.26		10.25								0.45	38.31									100	115
S24	6	10	Feohy +	3.34		1.14	95.15											0.37									100	93
S24	6	11	Qz + Feohy	72.49			27.51																				100	109
S24	6	12	Qz	99.64			0.36																				100	126
S24	6	13	Feohy +	4.29		2.12	90.21	1.32		0.49			1.57														100	87
S24	6	14	Feohy +	7.41		6.09	83.23			0.56			2.71														100	77
S24	6	15	TiO2 + Qz	29.41	61.38	2.67	5.03			0.35			1.15														100	103
S24	6	16	Chr			20.98	16.17		12.13									50.72									100	104
S24	6	17	Feohy +	2.63		1.03	94.44	0.66					1.24														100	84
S24	6	18	Ep	39.90	0.39	23.17	11.15			22.40																	97	104
S24	6	19	Spl			31.22	18.55		12.41									37.82									100	109
S24	6	20	Feohy +	2.96		0.98	95.44		0.62																		100	89
S24	6	21	Mix	7.43		29.79	5.09	44.20	2.27	0.60					3.04				0.74	4.36	1.03			1.45			100	86
S24	6	22	Feohy +	3.81		1.69	92.50	0.67		0.33			1.01														100	88
S24	6	23	Feohy +	19.93		10.66	63.84		1.79	0.84		1.43	1.51														100	88
S24	6	24	Feohy +	3.80		1.97	92.87			0.45			0.92														100	87
S24	6	25	Chr			16.68	21.89		10.28								0.45	50.70									100	115
S24	6	26	Ill +	48.81	1.23	24.90	12.48	3.27	1.42	0.42	1.38	3.19													2.89		100	76
S24	6	27	Feohy +	6.63		3.94	87.12			0.45			1.86														100	76
S24	7	1	Zrn	30.82			0.60			0.35													66.34		1.89		100	122
S24	7	2	Mix	25.64	0.65	18.60	45.62		0.62	0.68	0.57	0.85	2.82					0.80								3.15	100	97
S24	7	3	Feohy +	5.64		1.53	91.89						0.95														100	82
S24	7	4	Ap				0.65			45.51	1.13		38.99	1.60	9.01											3.11	100	89
S24	7	5	Feohy +	2.94		1.64	92.88	0.46		0.56			0.99					0.53									100	95
S24	7	6	Feohy +	5.03		1.64	92.85			0.48																	100	85
S24	7	7	Feohy +	6.68		2.00	88.83		0.77	0.50			1.21														100	91
S24	7	8	Zrn	31.29																			68.71				100	125
S24	7	9	Ep	39.66		22.57	12.08	0.34		22.36																	97	113
S24	7	10	Grt	39.01		20.27	2.14	22.87		13.16					2.55												100	122
S24	7	11	Feohy +	4.25			95.75																				100	82
S24	7	12	Feohy +	9.46		2.31	80.58			0.39			2.45					0.65								4.16	100	89
S24	7	13	Zrn	30.94			0.45																68.61				100	123
S24	7	14	Ilm	0.68	50.60	0.60	43.89	1.28	2.96																		100	104
S24	7	15	Qz	97.13		1.88	0.82					0.18															100	114
S24	7	16	Feohy +	4.71		2.46	89.47				0.81		1.99					0.58									100	83
S24	7	17	Feohy +	13.15		7.90	73.97	2.24		0.57		0.80	1.37														100	63
S24	7	18	Zrn	31.15																			67.29		1.57		100	115
S24	7	19	Feohy +	6.87		2.68	88.29			0.49			1.67														100	77
S24	7	20	Ap +	1.32		1.04	0.81			42.54	0.77		37.53	1.25	12.02											2.72	100	84
S24	7	21	Feohy +	5.34		2.52	89.12			0.49			1.96					0.58									100	83
S24	7	22	Ap				0.79			48.21			40.91		7.70											2.38	100	76
S24	7	23	Chr			19.34	24.13		10.10									46.43									100	108
S24	7	24	Feohy +	3.40		1.48	93.06	0.57		0.48			1.00														100	87
S24	7	25	Feohy +	4.32		4.99	85.50						2.04													3.15	100	75
S24	7	26	Chr		0.50	12.27	27.28		8.56									51.40									100	110

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	7.1	1	Qz	99.00			1.00																				100	124
S24	7.1	2	Mix	14.52	0.70	14.09	62.21	0.96	0.86				3.02													3.65	100	90
S24	7.1	3	Kfs	64.81		17.33	2.40					15.46															100	113
S24	7.1	4	Mix	42.79	0.62	8.02	42.97	0.52	0.55				1.74														100	92
S24	7.1	5	Qz	99.08			0.92																				100	119
S24	8	1	Chr			24.23	15.00		14.25									46.52									100	109
S24	8	2	Feohy +	13.46	0.58	6.97	75.59			0.44	0.87	0.80	1.29														100	89
S24	8	3	Feohy +	8.56		1.40	88.36			0.38			1.30														100	85
S24	8	4	Qz	98.82		0.77	0.41																				100	118
S24	8	5	Feohy +	8.99		7.01	80.80						1.34				0.57					1.29					100	75
S24	8	6	Feohy +		13.58	6.38	77.96	0.67	1.41																		100	99
S24	8	7	Feohy +	4.83			94.43		0.74																		100	78
S24	8	8	Ep	39.53		19.80	12.29	4.92		20.46																	97	114
S24	8	9	Feohy +	5.02		2.76	89.55			0.49			1.05								1.13						100	78
S24	8	10	Mix	30.45	0.49	20.46	18.73		1.36	0.42	4.45	2.33	0.81		19.96		0.54										100	133
S24	8	11	Feohy +	4.45		1.72	92.05			0.52			1.27														100	81
S24	8	12	Feohy +	2.47		1.16	96.37																				100	81
S24	8	13	Feohy +	3.99			95.45			0.57																	100	73
S24	8	14	Grt	40.24		22.16	26.56	0.68	4.86	5.50																	100	108
S24	8	15	Feohy +	3.64			91.71			0.51			1.57													2.57	100	82
S24	8	16	Feohy +	2.14			97.86																				100	76
S24	8	17	Zrn	31.06			0.42																68.52				100	118
S24	8	18	Spl			37.93	16.00		13.64									32.44									100	107
S24	8	19	Spl			36.41	16.98		13.77									32.84									100	110
S24	8	20	Feohy +	4.21		2.44	92.04						1.31														100	91
S24	8	21	Feohy +	6.97		0.90	88.79						0.95				0.55					1.85					100	84
S24	8	22	Grt	39.29		20.90	25.56	4.27	1.12	8.85																	100	118
S24	8	23	Chr			28.70	20.91		12.92									37.46									100	112
S24	8	24	Zrn	31.16			0.44																68.40				100	131
S24	8	25	Feohy +	4.79		0.80	92.81			0.65			0.94														100	90
S24	8	26	Feohy +	3.38		2.52	88.14			0.44			2.21					0.43								2.88	100	89
S24	8	27	Chr			17.35	18.11		10.80									53.74									100	116
S24	8	28	Feohy +	11.11	0.76	5.67	71.68		0.88	0.41		0.42	2.37					1.35								5.35	100	85
S24	9	1	Chr			28.08	13.71		15.94									42.27									100	109
S24	9	2	Feohy +	2.38			97.63																				100	80
S24	9	3	Feohy +	4.39		2.02	91.57			0.55			1.47														100	87
S24	9	4	Feohy +	3.00			97.00																				100	76
S24	9	5	Chr			14.91	23.11		8.00									53.97									100	100
S24	9	6	Feohy +	7.99		4.46	83.69			0.84			1.71									1.31					100	74
S24	9	7	Ep	40.23		23.28	11.71			21.79																	97	103
S24	9	8	Ilm		52.15		47.27	0.59																			100	99
S24	9	9	Feohy +	3.44		1.21	94.14						1.22														100	77
S24	9	10	Mnohy +	4.13		29.15	3.89	40.04	1.33	0.54	1.77				10.40			0.70	5.86	1.49	0.70						100	89
S24	9	11	Zrn	31.06			0.41																68.54				100	113
S24	9	12	Feohy +	17.09		9.21	70.05		1.35			0.42	1.88														100	78
S24	9	13	Grt	39.67		21.11	28.36	1.44	4.69	4.73																	100	113

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	9	14	Chr			13.31	19.68		11.17									55.84									100	108
S24	9	15	Ep	40.18		23.27	11.84			21.71																	97	108
S24	9	16	Feohy +	10.08		6.46	79.46		1.18	0.45		0.44	1.93														100	77
S24	9	17	Feohy +	4.61		3.65	87.53			0.56			1.23												2.43		100	88
S24	9	18	Feohy +	2.92		1.34	91.36			0.47			1.58												2.33		100	89
S24	9	19	Ep	39.55		20.65	11.10	2.50		23.20																	97	120
S24	9	20	Feohy +	3.79		1.53	93.20			0.51			0.98														100	94
S24	9	21	Chr			21.62	15.23		11.41									51.73									100	111
S24	9	22	Feohy +	2.80		3.35	92.30			0.45			1.10														100	86
S24	9	23	Feohy +	6.69		8.83	75.37			0.47	0.99		2.02					0.46							5.18		100	81
S24	9	24	Feohy +	5.48		1.04	91.96	1.20		0.32																	100	90
S24	9	25	Feohy +	5.86		1.38	89.47													3.28							100	80
S24	9	26	Feohy +	14.46		7.45	71.76		0.78	0.67		0.37	2.14								1.70	0.67					100	78
S24	9	27	Feohy +	3.66		1.26	93.94						1.15														100	90
S24	9	28	Feohy +	3.96		1.66	91.68	0.99		0.48			1.23														100	81
S24	9.1	1	Qz	99.33			0.67																				100	117
S24	9.1	2	Feohy +	6.42	0.78	6.98	74.86			1.05	0.91		2.56												6.45		100	73
S24	9.1	3	Feohy +	3.63		1.34	93.05	0.63		0.41			0.95														100	86
S24	10	1	Feohy +	7.20		6.19	83.78			0.67			2.17														100	75
S24	10	2	Chr			10.77	30.26		6.83									52.13									100	103
S24	10	3	Chr			26.99	16.03		13.25								0.45	43.29									100	108
S24	10	4	Ttn	32.23	37.06	1.74	1.06			26.87					1.03												100	114
S24	10	5	Mix	22.87	0.65	20.10	5.18	34.78	1.52	0.38	1.35	0.58			8.89					3.02	0.67						100	89
S24	10	6	Spl			34.27	18.12		12.98									34.63									100	113
S24	10	7	Feohy +	3.76			95.40						0.84														100	90
S24	10	8	Chr		0.60	28.96	26.80		11.82									31.82									100	112
S24	10	9	Feohy +	6.46		2.39	89.51			0.51			1.13														100	83
S24	10	10	Feohy +	4.34		1.80	91.43	0.71		0.48										1.24							100	79
S24	10	11	Ap				0.42			48.71	0.46		45.56		2.54	0.26									2.06		100	92
S24	10	12	Feohy +	4.45		1.73	93.31			0.51																	100	84
S24	10	13	Feohy +	9.44		4.70	84.10					0.50	1.25														100	82
S24	10	14	Qz	100.00																							100	110
S24	10	15	Mix	36.53		22.27	4.35	22.27	1.11	0.54	0.74	1.14			6.45				1.14	3.47							100	89
S24	10	16	Feohy +	4.98		1.46	91.86			0.49			1.21														100	78
S24	10	17	Feohy +	4.72		1.56	92.31	1.42																			100	73
S24	10	18	Grt	38.68		20.52	29.63	3.34	1.24	6.58																	100	104
S24	10	19	Mix	54.33	0.40	11.72	30.51		0.92	0.44		0.93	0.76														100	96
S24	10	20	Feohy +	7.12		1.61	90.77			0.50																	100	79
S24	10	21	Qz	99.72			0.28																				100	116
S24	10	22	Feohy +	5.24		2.10	91.11			0.38			1.16														100	73
S24	10	23	Qz +	96.34		2.14	1.21					0.31															100	108
S24	10	24	Feohy +	3.85		2.15	91.32			0.53			2.15														100	81
S24	10	25	Grt	39.60		21.15	32.00	1.10	2.84	3.31																	100	109
S24	10	26	Feohy +	6.66		6.30	81.54			0.48			2.60				0.58				0.88	0.96					100	79
S24	10	27	Feohy +	7.17		4.48	82.73			0.61			1.82												3.19		100	81
S24	10.1	1	Feohy +	8.44		3.98	84.69			0.88			2.01														100	75



Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	10.1	2	Feohy +	4.99		2.31	90.74			0.58			1.39														100	79
S24	10.1	3	Feohy +	7.83		5.03	84.43			0.64			2.07														100	76
S24	11	1	Feohy +	4.12		0.77	94.63			0.49																	100	78
S24	11	2	Grt	39.41		20.83	24.98	9.52	3.39	1.86																	100	119
S24	11	3	Feohy +	5.56		2.23	88.68	0.87	0.66				1.39						0.61								100	85
S24	11	4	Qz + Feohy	50.92		1.02	48.06																				100	106
S24	11	5	Chr			27.36	17.80		11.52									43.31									100	115
S24	11	6	Feohy +	3.98			94.00	1.10		0.34								0.58									100	94
S24	11	7	Mix	29.66		12.46	52.20		2.27			2.29	1.13														100	96
S24	11	8	Feohy +	6.36		2.84	89.03			0.52			1.26														100	81
S24	11	9	Feohy +	3.40		1.55	93.25			0.45			1.35														100	93
S24	11	10	Feohy +	2.51		2.02	95.10			0.37																	100	97
S24	11	11	Feohy +	2.87		1.92	94.03	0.69		0.49																	100	92
S24	11	12	Feohy +	2.59		1.21	96.20																				100	91
S24	11	13	Spl			35.55	14.23		16.77									33.44									100	115
S24	11	14	Spl			31.34	20.47		13.36									34.83									100	113
S24	11	15	Ep	40.39		24.27	9.66			22.68																	97	110
S24	11	16	Chr		0.40	24.03	23.96		10.32									41.29									100	108
S24	11	17	Feohy +	9.20		6.02	81.88			0.64			2.26														100	78
S24	11	18	Feohy +	1.96		1.07	93.95			0.58			1.14												1.29		100	72
S24	11	19	TiO2 + Qz	15.04	83.85	0.61	0.50																				100	108
S24	11	20	Mix	43.43	3.50	14.09	9.08		14.90	11.39	2.80	0.82															100	107
S24	11	21	Feohy +	4.72		2.03	88.40			0.41			1.78												2.67		100	85
S24	11	22	Feohy +	3.95		2.23	91.57			0.53			1.72														100	86
S24	11	23	Feohy +	3.62		1.18	94.17						1.03														100	85
S24	11.1	1	Feohy +	6.98		1.30	91.72																				100	80
S24	11.1	2	Qz	99.46			0.54																				100	127
S24	11.1	3	Chl +	43.58	0.74	22.04	11.74	5.42	11.09	0.37	0.74	1.44													2.84		100	91
S24	12	1	Feohy +	4.10		2.17	90.48	1.11		0.38			1.76														100	89
S24	12	2	Feohy +	4.09		2.53	89.89	0.76		0.37			1.86					0.51									100	93
S24	12	3	Feohy +	7.87		1.88	88.86			0.52			0.86														100	82
S24	12	4	Ep	40.26		23.59	11.20			21.94																	97	112
S24	12	5	Spl			32.32	15.74		13.59									38.35									100	109
S24	12	6	Feohy +	5.67		2.45	90.04		0.72				1.12														100	76
S24	12	7	Feohy +	4.15		1.15	94.29			0.41																	100	87
S24	12	8	Chr			28.53	19.90		12.74									38.82									100	107
S24	12	9	Feohy +	12.37		11.91	68.88			0.54	0.67	0.38	5.26														100	80
S24	12	10	Ep +	49.23		18.12	13.38			19.26																	100	107
S24	12	11	Feohy +	3.24		3.44	87.33			0.53	0.79		2.29												2.38		100	85
S24	12	12	Feohy +	13.30	0.89	5.06	75.85		0.82			1.03	0.78												2.27		100	71
S24	12	13	Feohy +	3.70		1.09	94.80			0.41																	100	84
S24	12	14	Feohy +	4.27		1.52	92.03			0.48			1.70														100	87
S24	12	15	Tur	37.43	0.35	27.49	11.84		6.64	0.99	2.26																87	101
S24	12	16	Feohy +	6.76		5.63	84.31		0.77	0.61			1.92														100	79
S24	12	17	Chr			12.02	22.85		8.89									56.24									100	103
S24	12	18	Ap				0.52			45.71	0.91		39.79	1.32	9.30											2.45	100	106

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	12	19	Feohy +	4.05		1.06	92.56	0.99		0.42			0.93														100	84
S24	12	20	Feohy +	4.42		1.58	94.00																				100	90
S24	12	21	Feohy +	3.24		0.98	95.78																				100	91
S24	12	22	Feohy +	2.67		1.72	92.61	0.56		0.49			1.50				0.46										100	94
S24	12	23	Chr			9.72	23.82		8.78									57.68									100	117
S24	12	24	Feohy +	8.57		3.13	86.19			0.64			1.47														100	86
S24	12	25	Cpx	53.25	0.70	3.85	4.36		16.15	21.26	0.43																100	115
S24	12	26	Kfs + Chl	62.55	0.99	20.09	8.87	1.32	1.89	0.58	0.76	2.95															100	86
S24	12	27	TiO2		99.29		0.71																				100	108
S24	12.1	1	Feohy +	4.82		1.51	93.28			0.40																	100	85
S24	12.1	2	Feohy +	12.64		5.03	75.85			0.57	0.84		2.02												3.05		100	84
S24	12.1	3	Chl + Ms	43.57	0.54	16.20	28.78		3.31		0.92	3.86													2.81		100	92
S24	12.1	4	Feohy +	4.56		1.42	94.02																				100	82
S24	13	1	Chr +	14.73		23.21	19.20		11.09		0.97							30.15				0.64					100	96
S24	13	2	Feohy +	4.73		4.36	83.91			0.42			2.69													3.88	100	84
S24	13	3	Feohy +	6.65		4.34	85.53			0.61			2.08									0.77					100	80
S24	13	4	Feohy +	5.69		2.97	89.80			0.37			1.16														100	83
S24	13	5	Feohy +	4.81		4.04	86.96						1.18													3.01	100	76
S24	13	6	Feohy +	3.80		2.43	87.63			0.45			2.20													3.50	100	92
S24	13	7	Feohy +	3.30		4.31	88.09		1.18	0.74			2.38														100	84
S24	13	8	Spl			30.07	18.19		12.10									39.64									100	115
S24	13	9	Feohy +	2.78		1.11	94.29	0.48					1.35														100	90
S24	13	10	Ti-Mag		28.19	0.58	68.69	1.74	0.80																		100	107
S24	13	11	Ap				0.49			47.79			41.76		8.21											1.75	100	110
S24	13	12	Feohy +	6.61		5.11	83.70			0.48	1.25		2.24								0.62						100	82
S24	13	13	Spl			52.49	12.25		17.11									18.15									100	111
S24	13	14	Chr			13.87	25.07		9.03									52.03									100	107
S24	13	15	Ilm		57.33		40.71	1.96																			100	98
S24	13	16	Qz +	94.94			5.06																				100	100
S24	13	17	Ep	40.26		23.16	11.71			21.88																	97	103
S24	13	18	Feohy +	3.18		0.86	95.56			0.39																	100	72
S24	13	19	Feohy +	5.35	0.57	5.26	80.30			0.51			1.85					0.55			0.89					4.71	100	74
S24	13	20	Feohy +	2.58			96.52			0.48								0.41									100	86
S24	13	21	Feohy +	4.73		1.08	94.20																				100	87
S24	13	22	Grt	39.72		21.17	29.79	3.20	3.72	2.40																	100	117
S24	13	23	Feohy +	3.54			94.70	1.42		0.35																	100	78
S24	13	24	Feohy +	4.96		1.96	91.59						1.48														100	84
S24	13	25	TiO2	0.91	98.30		0.79																				100	103
S24	13	26	Feohy +	4.21		2.56	86.05			0.60	0.80		1.82					0.65								3.31	100	83
S24	13	27	Feohy +	6.64		2.65	88.42			0.60			1.69														100	75
S24	13	28	Ep	40.15		24.21	10.20			22.43																	97	102
S24	13	29	Mix	47.77		11.35	34.40		1.16	0.31		0.96	2.31					0.38								1.36	100	93
S24	13	30	Grt	39.66		21.02	26.58	3.47	0.88	8.39																	100	106
S24	14	1	Feohy +	2.92		1.66	92.25			0.47			1.64					1.06									100	89
S24	14	2	Feohy +	1.87		1.37	95.16			0.50			1.11														100	93
S24	14	3	Feohy +	11.55		8.00	77.39						2.22								0.84						100	82

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	14	4	Grt	41.23		21.27	1.86	0.35		35.28																	100	113
S24	14	5	Feohy +	4.04		1.89	91.76						1.20					0.44			0.67						100	84
S24	14	6	Ms +	56.94	0.92	22.44	8.55	3.05	1.35	0.38	1.53	2.17														2.67	100	96
S24	14	7	Chr			12.76	21.58		8.19									57.47									100	102
S24	14	8	Feohy +	3.11		2.22	92.46	0.52					1.10					0.59									100	79
S24	14	9	TiO <sub>2</sub>		99.54		0.46																				100	101
S24	14	10	Feohy +	4.09		2.05	92.86			0.59								0.41									100	83
S24	14	11	Zrn	31.00																			69.00				100	116
S24	14	12	Ap							47.76			44.49		5.94											1.81	100	120
S24	14	13	Feohy +	2.74		1.75	92.52			0.86			1.54					0.59									100	85
S24	14	14	Feohy +	7.40		2.84	87.82			0.54			1.40														100	77
S24	14	15	Feohy +	4.52		2.61	89.91	0.63		0.70			1.62														100	82
S24	14	16	Feohy +	7.35		3.63	86.66			0.77			1.60														100	73
S24	14	17	Ttn	34.23	35.18	1.18	1.98			27.43																	100	101
S24	14	18	Feohy +	6.86		5.10	84.28				0.89		2.87														100	82
S24	14	19	Feohy +	3.93		2.34	90.95			0.76			1.37					0.65									100	87
S24	14	20	Mix	72.74	0.47	16.87	5.38	1.21	1.11		0.93	1.30															100	100
S24	14	21	Feohy +	4.36		1.53	92.64			0.41			1.05														100	87
S24	14	22	Feohy +	3.62		1.71	92.16	0.52		0.39			1.60														100	93
S24	14	23	Grt	40.24		21.01	16.45	8.49	3.31	10.51																	100	120
S24	14	24	Mix	8.14	0.44	25.87		38.73	1.38	0.35	2.81	0.56			14.96				0.51	4.80	1.46						100	102
S24	14	25	Feohy +	3.60		1.71	89.90	0.87	0.61				0.98													2.34	100	91
S24	15	1	Feohy +	3.95	0.59	3.26	83.95			0.47	0.77		2.38													4.62	100	81
S24	15	2	Feohy +	3.95		1.70	91.12	1.34		0.54			1.34														100	83
S24	15	3	Feohy		12.83		87.17																				100	99
S24	15	4	Feohy +	2.79		1.88	90.44			0.48			1.59													2.83	100	94
S24	15	5	Feohy +	24.85	0.47	14.77	54.86	0.57	0.89	0.51	0.60	0.46	2.01														100	91
S24	15	6	Spl			44.64	14.94		14.28									26.14									100	108
S24	15	7	Feohy	0.57			98.87	0.56																			100	139
S24	15	8	Grt	38.98		19.42	19.82	17.81	2.78	1.20																	100	112
S24	15	9	Grt	39.42		20.57	30.18	3.65	1.60	4.58																	100	114
S24	15	10	Ep	40.61		20.16	14.62			21.18	0.44																97	110
S24	15	11	Feohy +	5.24		6.87	78.00			0.65			2.98					0.70								5.55	100	77
S24	15	12	Ep	40.04		22.64	11.84			22.48																	97	107
S24	15	13	Feohy +	2.47		2.58	90.09			0.71			1.94													2.21	100	85
S24	15	14	Chr			12.15	15.62		12.21									60.02									100	102
S24	15	15	Ep	39.72		21.66	13.01			22.61																	97	105
S24	15	16	Qz + Feohy	67.78		4.22	26.68		0.63			0.68															100	92
S24	15	17	Feohy +	3.69			95.46		0.85																		100	83
S24	15	18	Mix	14.56	1.80	8.76	63.62	0.95	1.88	1.69	1.72	0.50	3.57					0.93									100	38
S24	15	19	Mix	26.32	0.62	16.98	47.23		1.19		0.74	1.06	2.43													3.42	100	78
S24	15	20	Feohy +	9.32		5.10	83.41			0.53			1.65														100	72
S24	15	21	Chr			16.96	19.91		8.60									54.53									100	100
S24	15	22	Feohy +	3.49		1.90	88.69			0.41			1.78					0.57								3.17	100	83
S24	15	23	Ep	39.45		23.35	11.49	0.40		22.31																	97	108
S24	15.1	1	Qz	99.55			0.45																				100	121

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	15.1	2	Chl +	34.42	0.65	13.24	44.06	0.75	2.86		0.61	1.99	1.42														100	90
S24	15.1	3	Mix	22.12		8.19	65.32	0.58		0.29	0.67	0.63	2.18														100	93
S24	16	1	Feohy +	4.19		2.04	90.99			0.55			1.66								0.56						100	89
S24	16	2	Feohy +	7.53		2.30	87.82			0.56			1.26								0.51						100	85
S24	16	3	Mix	38.17		11.16	45.09	0.64	0.87	0.53		1.21	2.11								0.21						100	103
S24	16	4	Mix	24.23	0.80	16.02	50.88				2.87	0.63	1.86				0.53								2.18	100	102	
S24	16	5	Mix	12.96		27.26	4.70	34.57	1.35		1.48	0.80			10.62				4.96	0.63	0.68						100	104
S24	16	6	Feohy +	5.33		2.91	89.20			0.49			1.53								0.54						100	94
S24	16	7	Feohy +	6.98		5.20	83.19		0.70	0.40			2.55								0.99						100	87
S24	16	8	Feohy +	3.52		1.51	91.51	0.83		0.56			1.38								0.69						100	86
S24	16	9	Feohy +	6.99		2.13	87.45						1.33								2.10						100	83
S24	16	10	Feohy +	4.89		1.55	90.74			0.82			1.48								0.51						100	82
S24	16	11	Feohy +	3.76			95.37														0.87						100	77
S24	16	12	Mix	17.71		28.38	3.95	31.27	2.17		1.21	1.39			7.80			0.73	4.81	0.59							100	95
S24	16	13	Feohy + Chl +	18.65		5.96	70.00		0.98	0.63		0.60	1.08								2.10						100	82
S24	16	14	Ttn +	30.64	32.46	7.33	6.59		2.94	14.64	0.66				4.75												100	76
S24	16	15	Feohy +	4.93			92.41	0.52		0.52			1.08								0.54						100	88
S24	16	16	Feohy +	3.85		1.10	92.71	0.59											0.99		0.75						100	81
S24	16	17	Feohy +	4.88		2.28	89.07			0.39			2.34					0.88			0.16						100	91
S24	16	18	Feohy + Chl +	32.04		12.62	44.29	0.35	3.14	0.55	1.12	0.89	2.23												2.76	100	101	
S24	16	19	Feohy	1.01		0.56	96.60	0.53			1.31																100	125
S24	16	20	Qz +	78.14		8.86	3.97			8.67											0.36						100	94
S24	16	21	Ttn +	23.25	49.45	1.71	2.85	0.44		22.13											0.18						100	108
S24	16	22	Mix	35.18	1.34	16.16	41.65		0.66		1.07	1.22	1.93				0.80										100	98
S24	16.1	1	Feohy	1.05			97.76			0.40											0.78						100	89
S24	16.1	2	Mag				98.84	0.61													0.54						100	142
S24	16.1	3	Mix	34.80	1.05	14.94	44.10		1.32	0.35	1.89	1.55															100	103
S24	16.1	4	Mag	0.56			98.24	0.59													0.62						100	141
S24	17	1	Feohy +	3.77		1.05	93.46						1.33								0.39						100	81
S24	17	2	Feohy +	3.71		1.74	89.63						1.72								0.85				2.35		100	83
S24	17	3	Mix	21.77		11.36	56.81	1.19	5.43	0.42	0.93	1.15	0.94														100	81
S24	17	4	Ilm + Qz	36.06	34.12		25.36	4.04			0.42																100	127
S24	17	5	Chr			23.05	20.44		12.65									43.24				0.62					100	110
S24	17	6	"Ilm"		71.89	0.55	22.80		4.52												0.24						100	100
S24	17	7	Chr			7.29	23.73		7.95									60.52				0.51					100	107
S24	17	8	TiO2 +	1.70	93.52	0.79	3.98																				100	107
S24	17	9	Feohy +	7.66		5.12	82.03			0.38			2.85								1.06	0.89					100	81
S24	17	10	Chr			11.45	17.75		9.21									61.01				0.58					100	112
S24	17	11	Feohy +	3.77		1.82	91.99			0.48			1.43								0.51						100	90
S24	17	12	Feohy +	5.37		2.18	89.98			0.67			1.20								0.60						100	86
S24	17	13	Feohy +	3.80		1.47	92.28						1.78								0.68						100	90
S24	17	14	Feohy +	4.51		1.66	91.59			0.44			1.11								0.69						100	95
S24	17	15	Feohy +	4.77		2.23	91.69			0.52											0.79						100	91
S24	17	16	Feohy +	5.40		3.39	88.91						1.65								0.64						100	78
S24	17	17	Spl			45.70	15.67		14.21									23.78				0.64					100	107
S24	17	18	Feohy +	4.51		2.61	87.30			0.37			1.77								0.95				2.48	100	85	

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	17	19	Feohy +	3.43		1.33	93.84						1.00									0.39					100	89
S24	17	20	Feohy +	4.54		1.89	91.08			0.53			1.48									0.48					100	85
S24	17.1	1	Feohy +	4.36		1.51	91.73			0.39			1.39									0.62					100	87
S24	17.1	2	Feohy +	12.39		9.41	73.60		0.83	0.42		0.39	2.06									0.89					100	85
S24	17.1	3	Feohy +	6.31		1.75	89.57			0.57			1.18									0.61					100	85
S24	18	1	Mix	11.53		21.76	38.31	21.56	1.14	0.53		0.47	1.31							2.73		0.66					100	79
S24	18	2	Feohy +	14.94		7.83	72.67		1.03	0.45		0.82	1.56									0.71					100	81
S24	18	3	Mix	57.98	0.57	21.24	10.42	3.47	1.91	0.62		2.68	0.92									0.18					100	79
S24	18	4	Mix	17.37		7.23	70.71		1.47	0.64		1.28	1.30														100	71
S24	18	5	Feohy +	2.48		1.29	93.08															0.79				2.37	100	84
S24	18	6	Mix	43.44	5.36		40.82	1.53	0.52	0.34	7.98																100	111
S24	18	7	Feohy +	3.99		1.37	93.14	0.86														0.64					100	79
S24	18	8	"Ilm" +	4.32	85.78	2.70	2.53		4.05													0.62					100	106
S24	18	9	Feohy +	3.84		2.00	90.67			0.36			2.24					0.42				0.45					100	88
S24	18	10	Chr			25.90	17.91		13.32									42.41				0.46					100	118
S24	18	11	Feohy +	2.91		1.21	92.35			0.42			1.65					0.81				0.65					100	93
S24	18	12	Zrn	31.24			0.52															0.48	67.75				100	123
S24	18	13	TiO <sub>2</sub> +	2.61	91.60	1.83	2.87			0.23												0.86					100	102
S24	18	14	Mix	6.20	0.45	6.48	79.16		1.08				2.69									1.16				2.78	100	85
S24	18	15	Feohy +	5.38		1.20	93.00															0.42					100	83
S24	18	16	Grt	40.19		21.13	30.66	1.39	4.06	2.57																	100	120
S24	18	17	Ms +	47.53	0.71	27.73	16.64	0.70	1.63	0.43	1.30	2.69	0.64														100	89
S24	18	18	Feohy +	7.17		5.05	83.87			0.42			2.05									1.45					100	83
S24	18	19	Feohy +	4.00	0.67	3.70	83.37			0.60	1.97		2.20													3.50	100	70
S24	18	20	Feohy +	18.34		11.52	64.63		1.06	0.83	0.97	0.62	1.49					0.54									100	69
S24	18	21	Feohy +	4.12		1.40	92.31			0.52			1.03									0.62					100	87
S24	18	22	Feohy +	4.37		2.31	91.37						1.15									0.81					100	88
S24	18	23	Feohy +	6.57		4.68	84.57				0.95		2.28									0.95					100	82
S24	18	24	Zrn	30.87			0.37																67.14		1.62		100	122
S24	18	25	Ep	40.61		24.99	9.22			22.19																	97	110
S24	18	26	Feohy +	3.30		2.42	93.41	0.73														0.14					100	87
S24	19	1	Feohy +	7.52		4.35	85.17			0.45			1.89									0.62					100	76
S24	19	2	Chr			23.03	16.42		13.83									45.94				0.78					100	104
S24	19	3	Ttn	32.66	37.53	1.15	0.68			27.65												0.33					100	112
S24	19	4	Mix	29.58	0.61	18.71	40.93		0.77	0.30	4.62	1.57	2.24					0.67									100	98
S24	19	5	Feohy +	2.84		1.71	92.80			0.51			1.59									0.56					100	88
S24	19	6	TiO <sub>2</sub> +	1.36	96.53	0.84	0.63					0.21										0.45					100	117
S24	19	7	Feohy +	2.22		1.50	94.90						1.05									0.34					100	95
S24	19	8	Feohy +	3.94		1.15	90.80	1.94		0.47			1.03									0.68					100	87
S24	19	9	Feohy +	5.19		1.03	90.12	2.48		0.41												0.76					100	83
S24	19	10	Feohy +	3.49		2.46	88.28	0.77					1.67									0.79				2.53	100	88
S24	19	11	Spl			32.15	15.53		15.65									36.26				0.41					100	112
S24	19	12	Feohy +	4.18			92.96			0.42			1.99									0.45					100	81
S24	19	13	Spl			46.79	14.39		15.20									22.98				0.64					100	104
S24	19	14	Feohy +	10.85		5.34	79.76			0.64			1.40								0.67	1.34					100	75



Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	19	15	Chr			23.43	15.59		13.11								0.43	47.45									100	107
S24	19	16	Ep	40.39		21.57	13.07			21.97																	97	111
S24	19	17	Feohy +	3.28			95.75			0.53											0.45						100	88
S24	19	18	Grt	40.32		21.09	27.20	0.45	4.94	6.01																	100	112
S24	19	19	Feohy +	3.79		2.21	88.23			0.53			2.08								0.60					2.55	100	85
S24	19	20	Ep	40.50		24.89	9.14			22.47																	97	106
S24	19	21	Feohy +	7.52		1.32	88.87			0.56			1.06								0.67						100	77
S24	19	22	Amph	42.83	3.72	11.46	10.19		14.09	10.95	3.05	0.73															97	106
S24	19	23	Feohy +	3.32		1.20	94.57														0.91						100	78
S24	19	24	Qz	99.60			0.40																				100	110
S24	19	25	Feohy +	6.25		2.86	89.38			0.47											1.04						100	80
S24	19	26	Feohy +	4.34		1.51	88.25	1.61					0.94								0.80					2.55	100	83
S24	19	27	Feohy +	2.92		1.67	92.91			0.48			1.43								0.58						100	85
S24	19	28	Ap							50.02			43.83	1.17	2.92											2.05	100	111
S24	19	29	Feohy +	4.01	1.01		91.10	0.66		0.42			1.26					0.50			1.05						100	76
S24	20	1	Mix	9.67		26.10	12.87	32.89	1.21	0.29	1.85	0.64	0.83		8.44					5.22							100	83
S24	20	2	Feohy +	4.98	0.54	2.96	88.69			0.57			1.99								0.26						100	80
S24	20	3	"Chr"	23.99	49.97	11.94	9.64		1.84		1.79	0.83															100	99
S24	20	4	"Chr" +	2.78	0.84	2.66	42.85	2.77	2.06									44.40			1.64						100	92
S24	20	5	"Chr" + Chl	12.88		9.08	73.19	0.72		0.53		0.49	2.86								0.25						100	88
S24	20	6	Feohy +	3.92		1.34	92.47			0.41										1.22	0.64						100	86
S24	20	7	Feohy +	6.73		4.68	85.61			0.53			1.64								0.80						100	64
S24	20	8	Spl			33.40	19.64		13.64									32.64			0.67						100	109
S24	20	9	Grt	40.36		20.82	24.33	1.60	2.51	10.38																	100	111
S24	20	10	Feohy +	4.27		1.15	93.18						0.94								0.45						100	81
S24	20	11	Feohy +	2.56			96.86														0.58						100	79
S24	20	12	TiO <sub>2</sub>	0.65	93.80		5.30														0.25						100	99
S24	20	13	Feohy +	3.29		1.38	93.73						1.00								0.61						100	82
S24	20	14	Feohy +	8.36		4.05	78.93			0.72			2.03								1.40					4.52	100	72
S24	20	15	Feohy +	4.93		1.67	92.09			0.56											0.75						100	75
S24	20	16	Feohy +	7.91		2.60	86.83			0.43			1.54								0.70						100	73
S24	20	17	Ep	40.39		24.63	9.30			22.68																	97	99
S24	20	18	Feohy +	6.12		3.38	80.73			0.90			1.26								0.47					7.15	100	75
S24	20	19	Feohy +	19.62		7.27	68.90		1.05	0.63		0.67	1.34								0.51						100	82
S24	20	20	Chr		0.39	22.49	24.40		10.79									41.27			0.65						100	103
S24	20	21	Feohy +	4.52		2.40	89.58			0.43			1.91					0.47			0.69						100	81
S24	20	22	Feohy +	4.55		1.00	90.73	1.36	0.88	0.49											0.99						100	72
S24	20	23	Feohy +	4.20		1.54	93.14						0.82								0.29						100	89
S24	20	24	Mnohy +	8.46	0.71	15.51	4.41	52.38	1.34	8.41		1.04		0.89						3.80	1.12	1.93					100	39

Table B12.1: Mineral chemical analyses from sample S24.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	CoO	NiO	CuO	ZnO	ZrO2	BaO	HfO2	WO3	Total	Actual Total
S24	20	25	Feohy +	3.44		1.58	92.61			0.61			1.17									0.58					100	85
S24	20	26	Feohy +	4.16			93.72						1.57									0.55					100	87
S24	20.1	1	Feohy +	4.45		2.28	91.87						1.07									0.32					100	89
S24	20.1	2	Feohy +	8.33		5.93	84.08						1.11									0.55					100	89
S24	20.1	3	Feohy +	5.08		2.62	91.61															0.69					100	88
			Notes																									
			+ = indicates more than one mineral present																									
			" " = indicates that mineral is altered																									

B13: SEM-BSE images and EDS mineral analyses for sample S25.

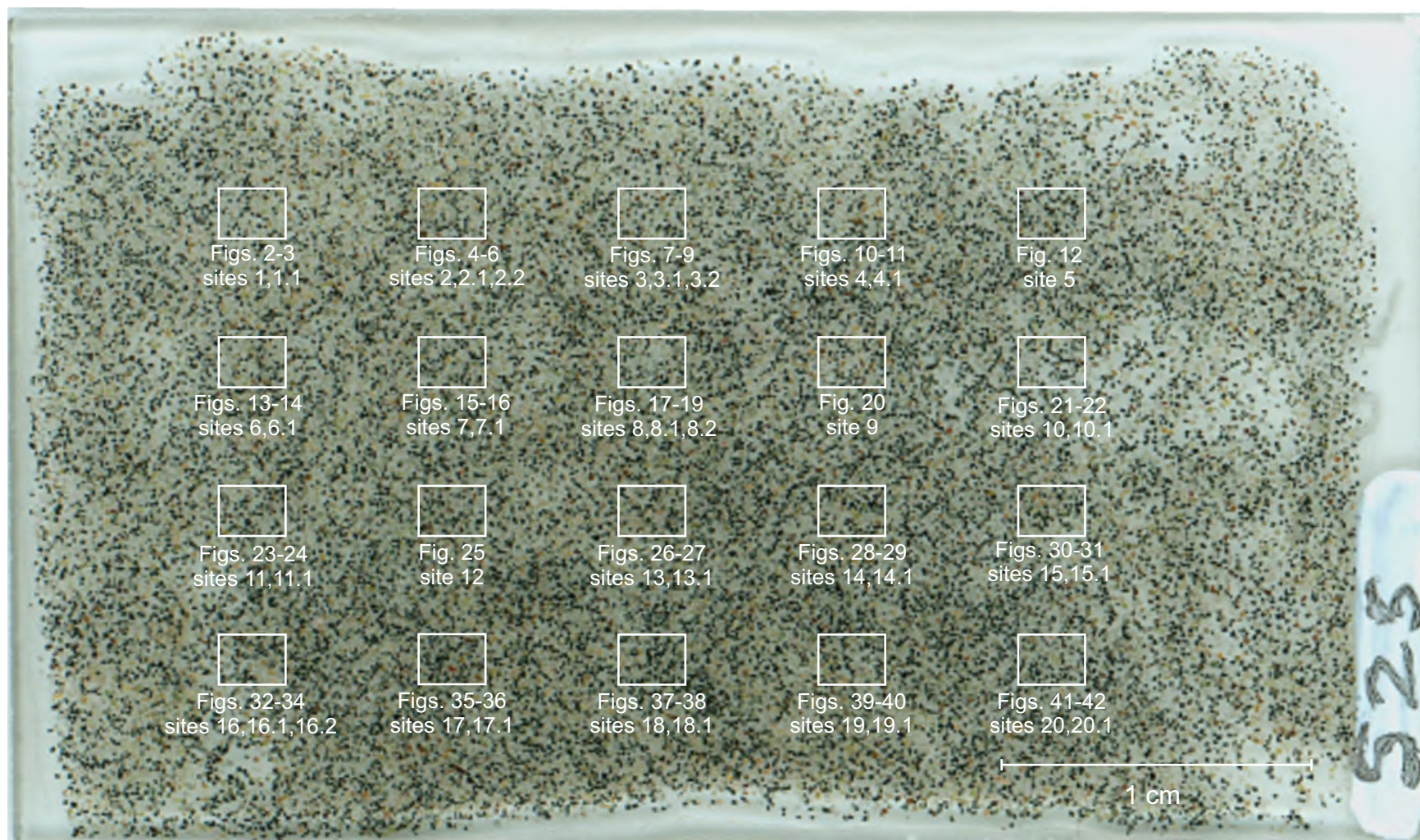
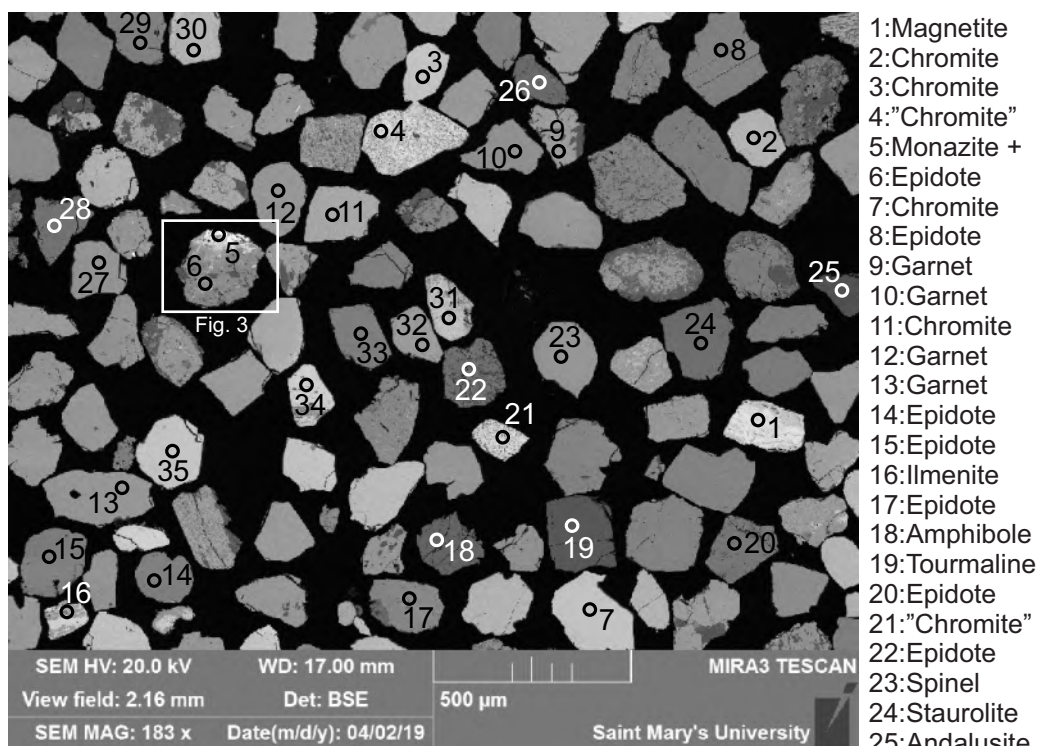


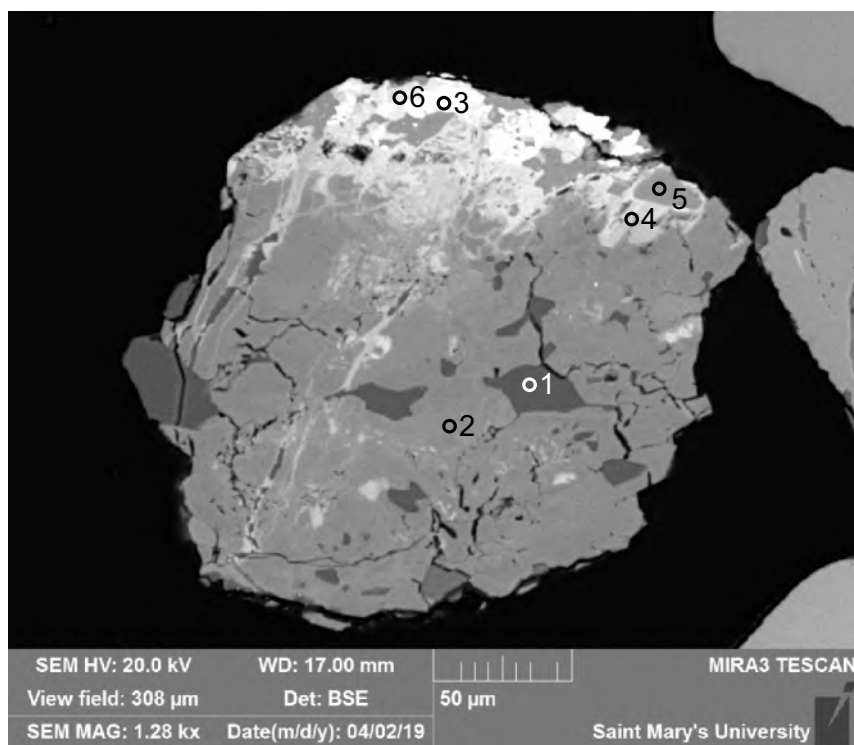
Figure B13.1: Sample S25





- 1:Magnetite
- 2:Chromite
- 3:Chromite
- 4:"Chromite"
- 5:Monazite +
- 6:Epidote
- 7:Chromite
- 8:Epidote
- 9:Garnet
- 10:Garnet
- 11:Chromite
- 12:Garnet
- 13:Garnet
- 14:Epidote
- 15:Epidote
- 16:Ilmenite
- 17:Epidote
- 18:Amphibole
- 19:Tourmaline
- 20:Epidote
- 21:"Chromite"
- 22:Epidote
- 23:Spinel
- 24:Staurolite
- 25:Andalusite
- 26:Epidote
- 27:Garnet
- 28:Clinopyroxene
- 29:Epidote
- 30:Chromite
- 31:Fe-oxide/hydroxide +
- 32:Titanite
- 33:Epidote
- 34:Ilmenite
- 35:Chromite

Figure B13.2: Sample S25 site 1 (SEM). The detrital minerals include:Fe-oxide, Ilm, Chr, Spl, Grt, Tur, And, St, Ep, Aln, Ttn, Cpx, Ap, Mnz, Qz.



- 1:Quartz
- 2:Epidote
- 3:Monazite +
- 4:Allanite +
- 5:Apatite +
- 6:Allanite

Figure B13.3: Sample S25 site 1.1 (SEM). Detrital epidote grain with quartz and apatite inclusions, patches of allanite, and monazite. These two last minerals also appear to precipitate along fractures (based on their brightness). Hydrothermal.



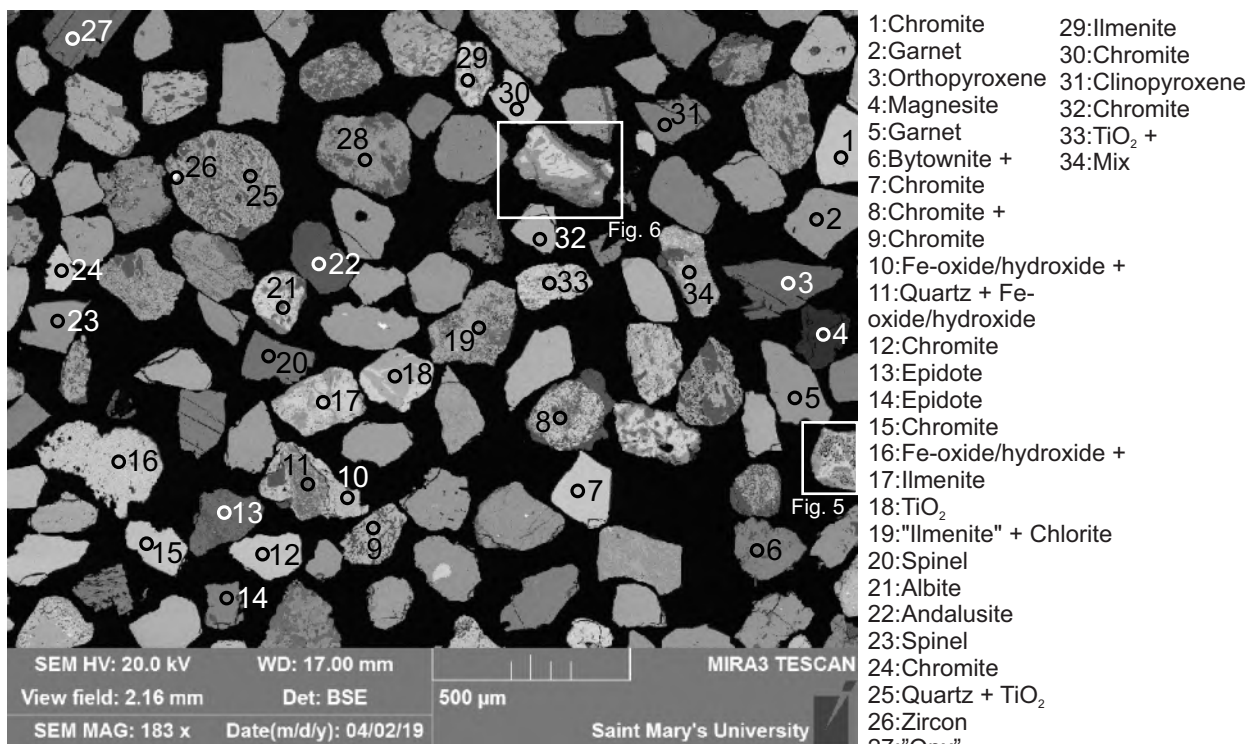


Figure B13.4: Sample S25 site 2 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, And, Ep, Ttn, Zrn, Cpx, Opx, Pl (Ab, Byt), Qz, Chl and Mag.

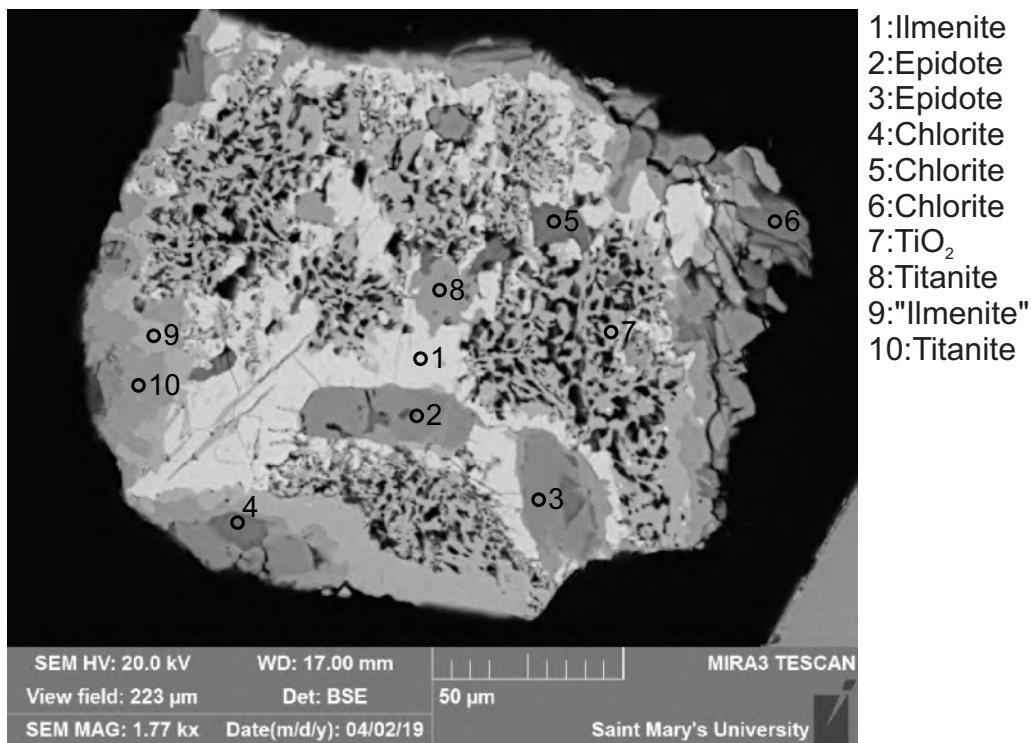
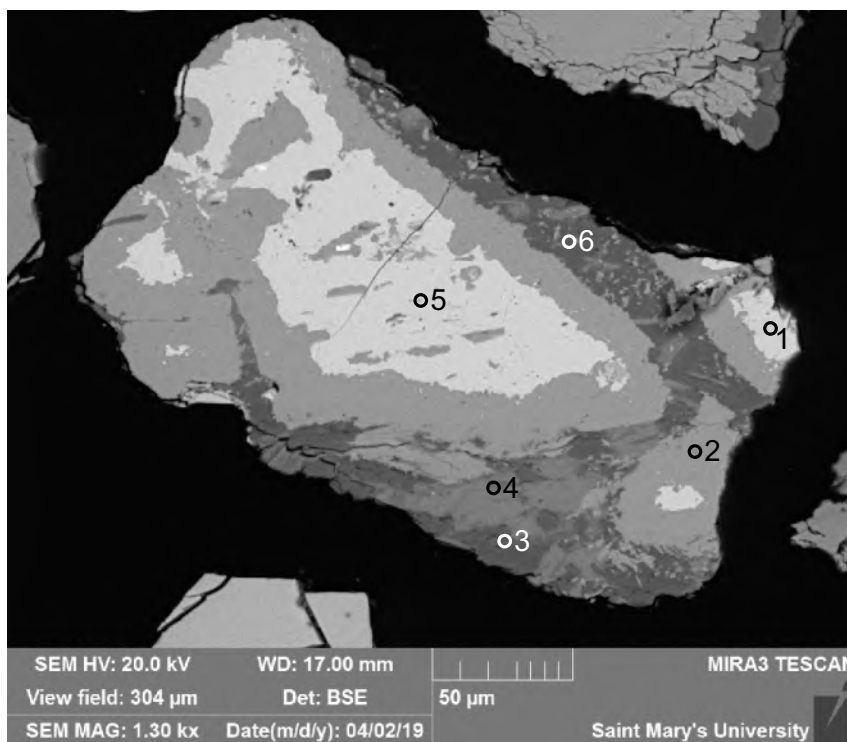
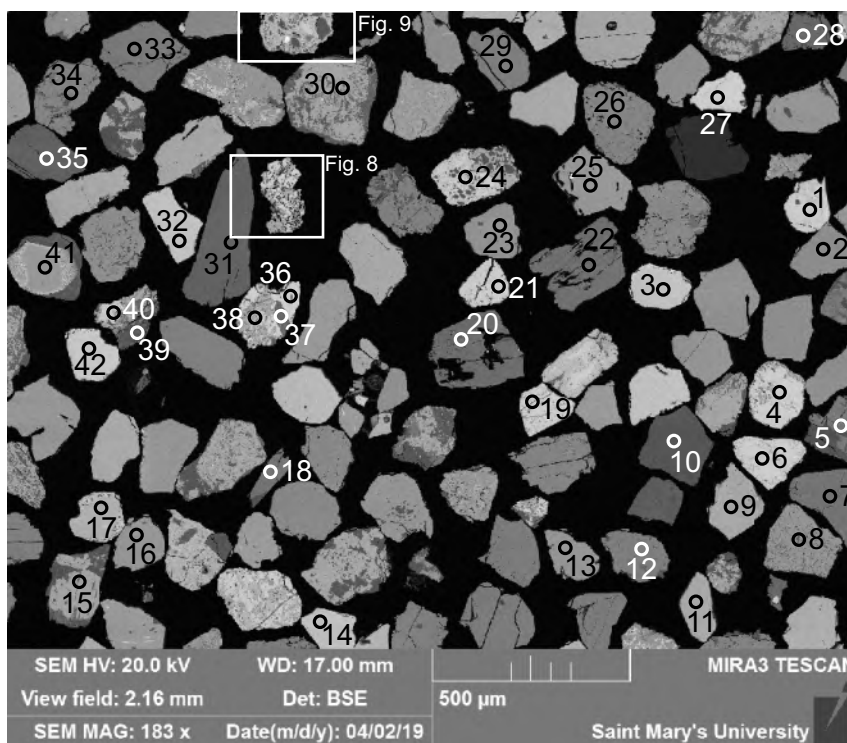


Figure B13.5: Sample S25 site 2.1 (SEM). An altered detrital ilmenite grain with epidote and chlorite inclusions. This ilmenite grain is partly replaced by TiO<sub>2</sub>, and titanite. Original metamorphic origin.



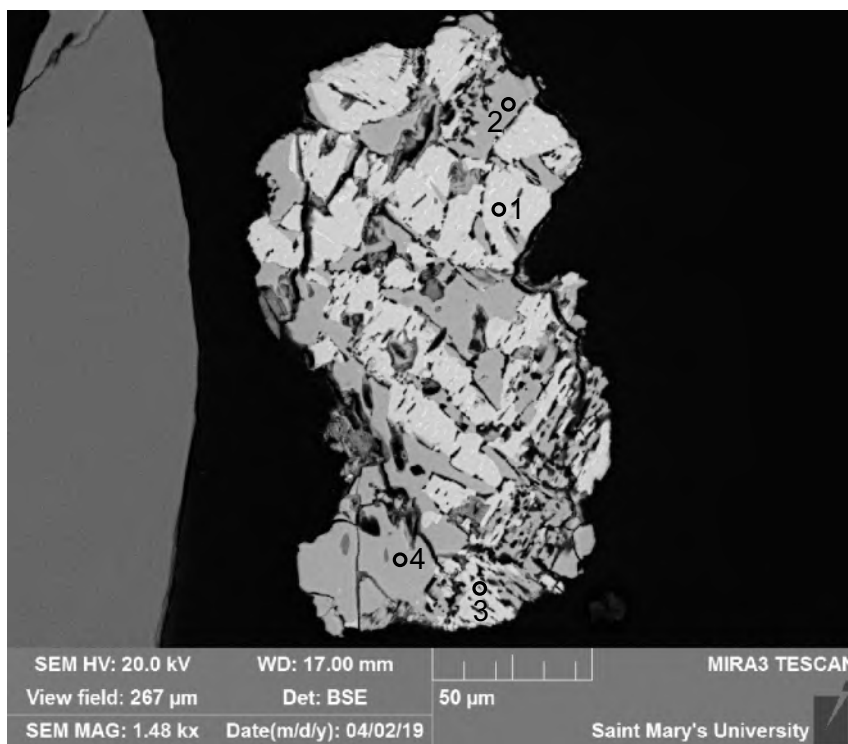
- 1:Ilmenite
- 2:Titanite
- 3:Albite
- 4:Chlorite
- 5:Ilmenite
- 6:Quartz +

Figure B13.6: Sample S25 site 2.2 (SEM). Lithic clast that is made up of fractured ilmenite, altered along the fractures to titanite, and with the fractures also filled with quartz and albite veins. Hydrothermal or deformed metamorphic.



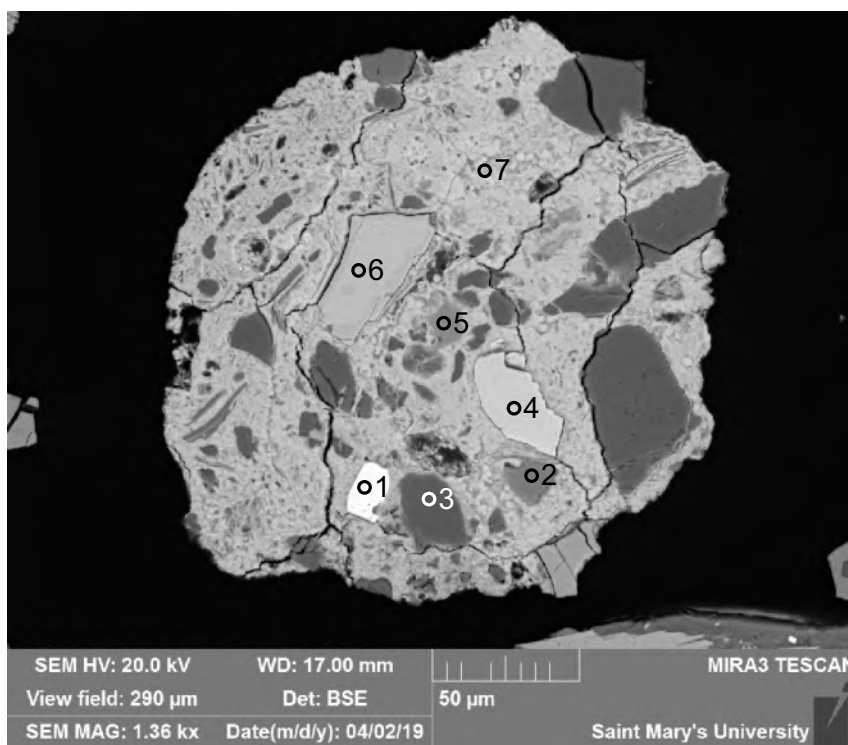
- 1:Ilmenite
- 2:Spinel
- 3:Chromite
- 4:Ilmenite
- 5:Staurolite
- 6:Ilmenite
- 7:Amphibole
- 8:Garnet
- 9:Chromite
- 10:Tourmaline
- 11:Chromite
- 12:Garnet
- 13:Garnet
- 14:Chromite
- 15:TiO<sub>2</sub>
- 16:Garnet
- 17:Chromite
- 18:Staurolite
- 19:Ilmenite
- 20:Amphibole
- 21:Ilmenite
- 22:Clinopyroxene
- 23:Garnet
- 24:"Ilmenite" +
- 25:Garnet
- 26:Epidote
- 27:Ilmenite
- 28:Epidote
- 29:Epidote
- 30:TiO<sub>2</sub> + Muscovite
- 31:Orthopyroxene
- 32:Chromite
- 33:Epidote
- 34:Epidote
- 35:Orthopyroxene
- 36:Ilmenite + Muscovite
- 37:Muscovite +
- 38:"Ilmenite" +
- 39:Albite
- 40:Ilmenite
- 41:Spinel
- 42:Chromite

Figure B13.7: Sample S25 site 3 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Tur, And, St, Ep, Zrn, Cpx, Opx, Pl (Ab), Ms, Amph and Act.



- 1: Ilmenite
- 2:  $\text{TiO}_2$
- 3: Ilmenite
- 4:  $\text{TiO}_2$

Figure B13.8: Sample S25 site 3.1 (SEM). A detrital ilmenite grain partly altered to  $\text{TiO}_2$ .



- 1: Zircon
- 2: Epidote
- 3: Quartz
- 4: "Chromite"
- 5: Epidote
- 6: Chromite
- 7: Fe-oxide/hydroxide +

Figure B13.9: Sample S25 site 3.2 (SEM). Limonite cemented sandstone or pedogenic aggregate made up of chromite and (altered chromite), epidote, and zircon, all cemented with Fe-oxide/hydroxide and clays.



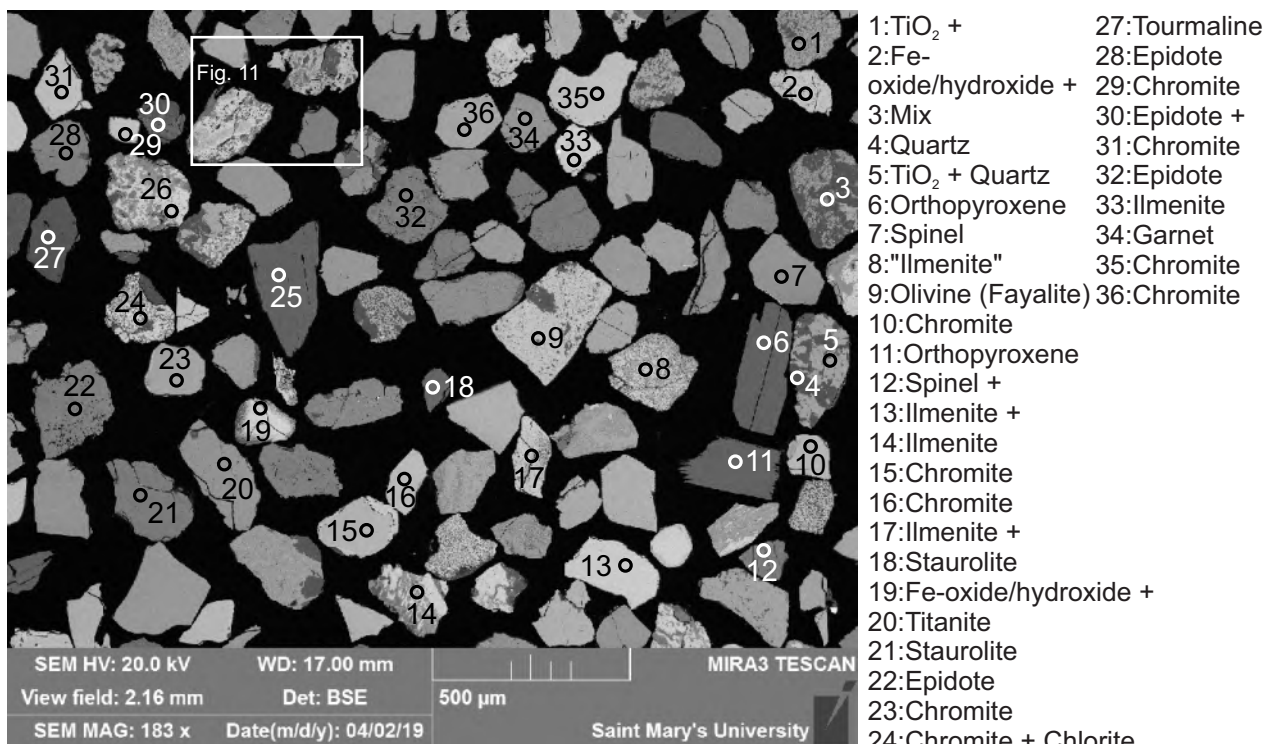


Figure B13.10: Sample S25 site 4 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Tur, St, Ep, Ttn, Opx, Ol, Pl (Ab), Qz and Chl.

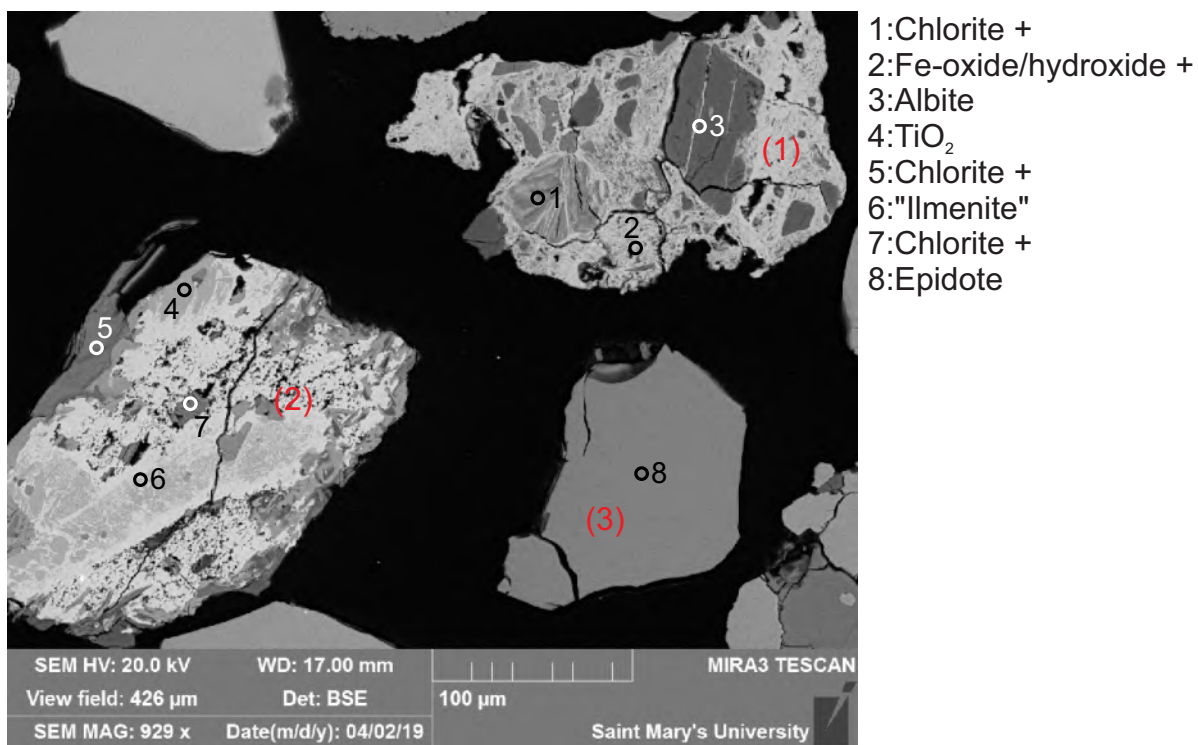


Figure B13.11: Sample S25 site 4.1 (SEM). 1: Sandstone or pedogenic aggregate made up of chlorite and albite cemented with Fe-oxide/hydroxide and clays. 2: Probably a lithic clast of ilmenite altered to TiO<sub>2</sub> in a chloritic schist. 3: A detrital epidote grain.

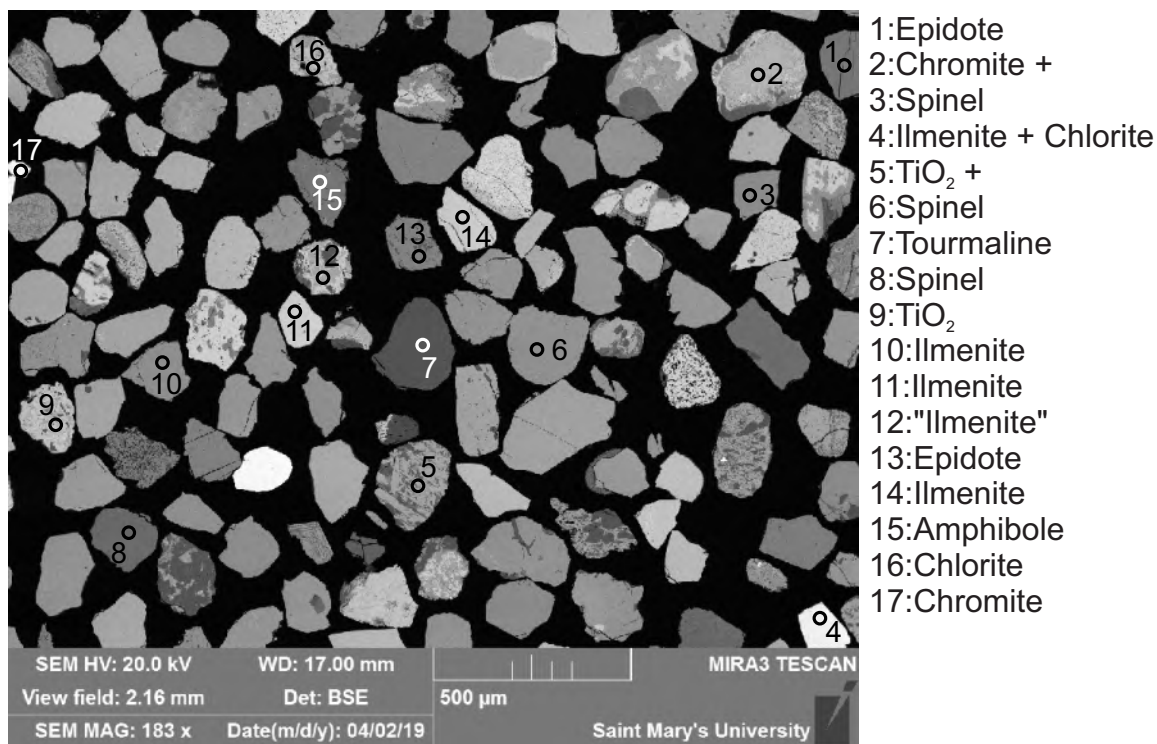


Figure B13.12: Sample S25 site 5 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Tur, Ep, Chl. The TiO<sub>2</sub> minerals may be products of ilmenite alteration.

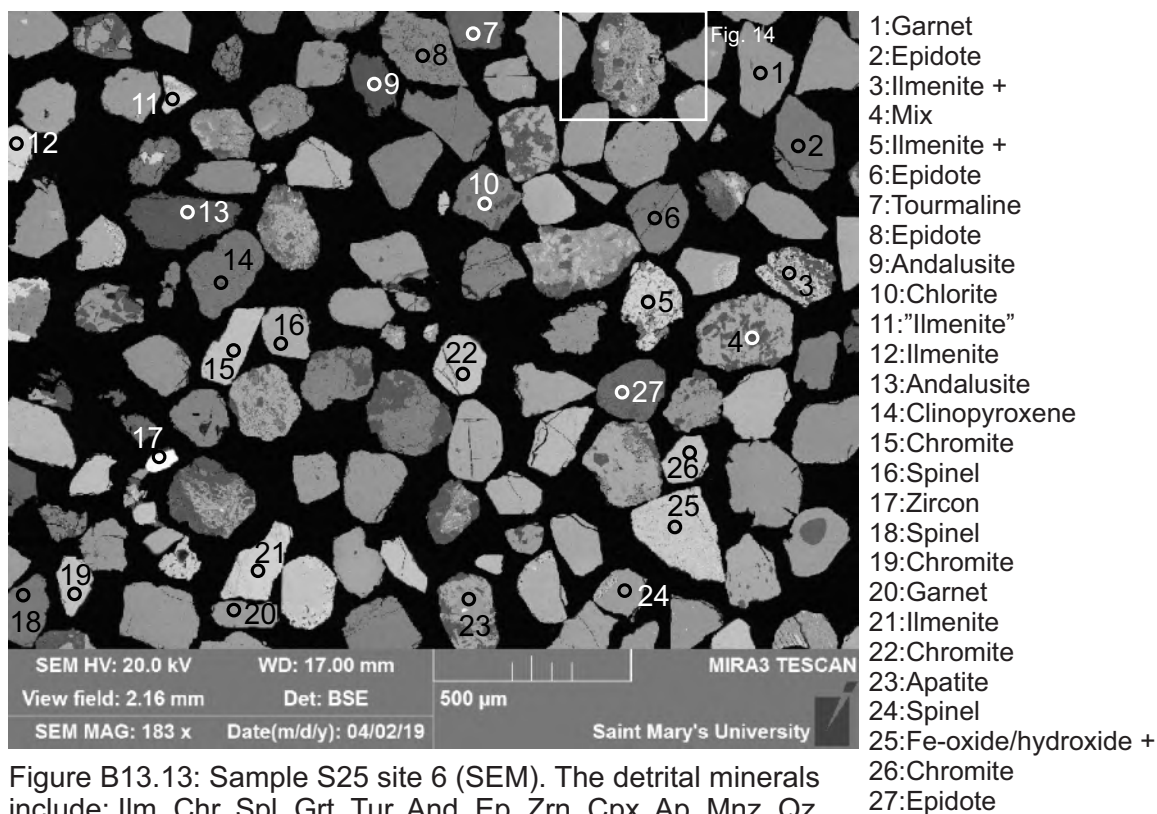
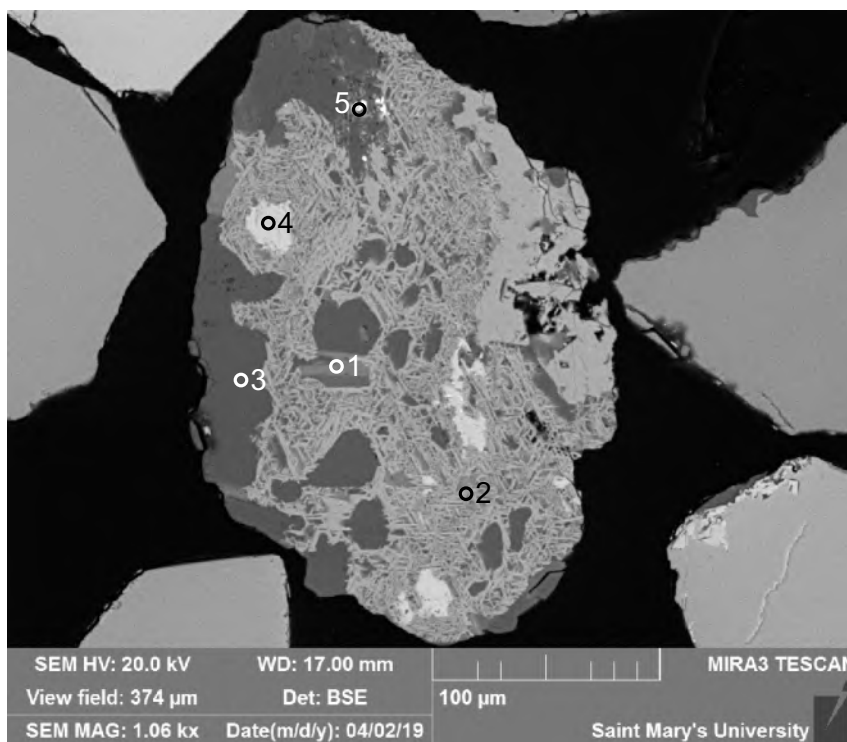


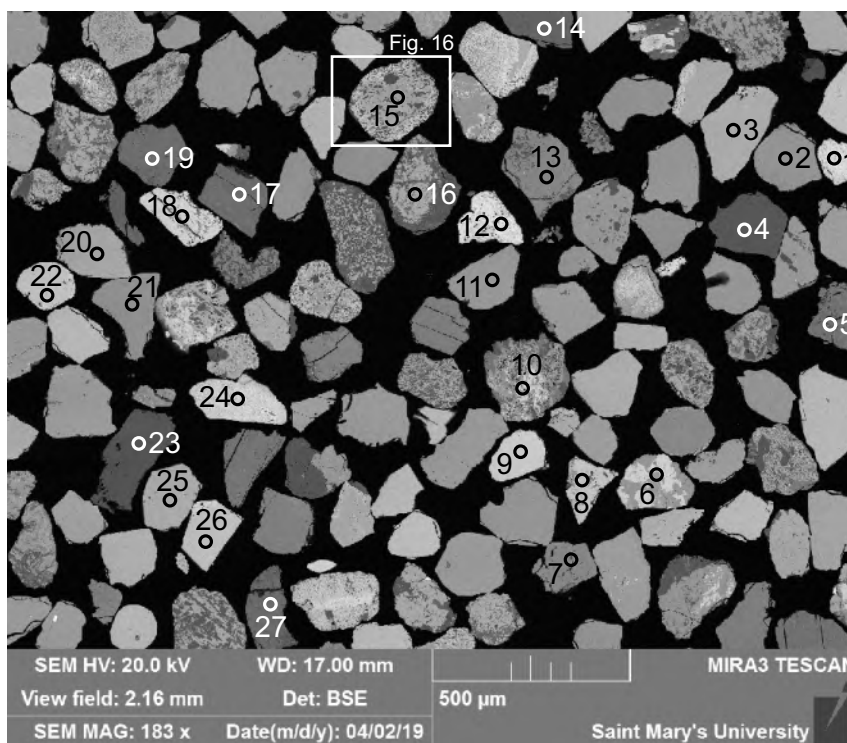
Figure B13.13: Sample S25 site 6 (SEM). The detrital minerals include: Ilm, Chr, Spl, Grt, Tur, And, Ep, Zrn, Cpx, Ap, Mnz, Qz and Chl. Ilmenite is partly altered to TiO<sub>2</sub>. Detrital Fe-oxide may be present (25).





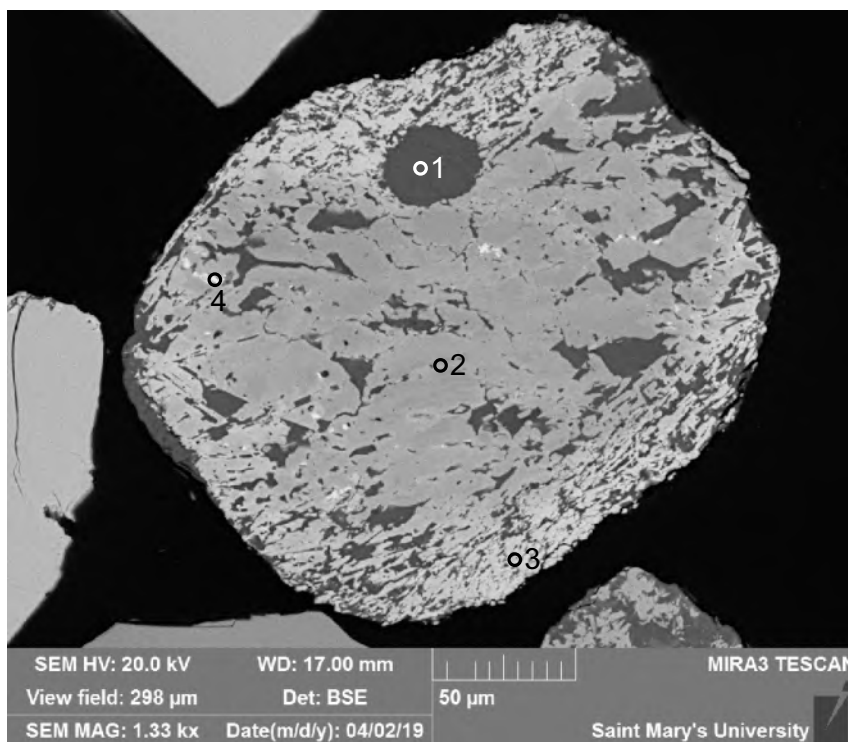
- 1:Chlorite
- 2:TiO<sub>2</sub> + Quartz
- 3:Quartz
- 4:Ilmenite
- 5:Monazite +

Figure B13.14: Sample S25 site 6.1 (SEM). Detrital grain of ilmenite with quartz inclusions, altered to TiO<sub>2</sub>. Additional minerals include chlorite and monazite, metamorphic.



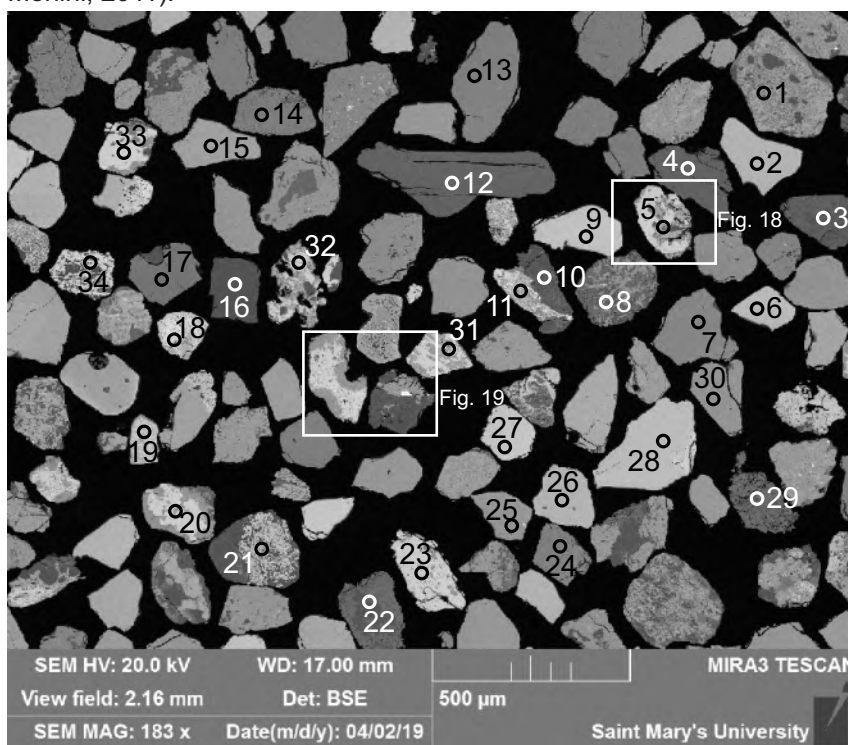
- 1:"Chromite"
- 2:Spinel
- 3:Chromite
- 4:Tourmaline
- 5:Epidote
- 6:Titanite
- 7:Epidote
- 8:Fe-oxide/hydroxide +
- 9:Chromite
- 10:"Ilmenite" +
- 11:Garnet
- 12:Fe-oxide/hydroxide +
- 13:Epidote
- 14:Orthopyroxene
- 15:Spinel
- 16:TiO<sub>2</sub> +
- 17:Albite +
- 18:Ilmenite
- 19:Staurolite
- 20:Chromite
- 21:Spinel
- 22:Chromite
- 23:Andalusite
- 24:"Chromite"
- 25:Chromite
- 26:Chromite
- 27:Epidote +

Figure B13.15: Sample S25 site 7 (SEM). The detrital minerals include: Ilm (often partly altered), Chr, (altered Chr), Spl, Grt, Tur, And, St, Ep, Ttn, Opx, Ab, Chl, and probably Feohy.



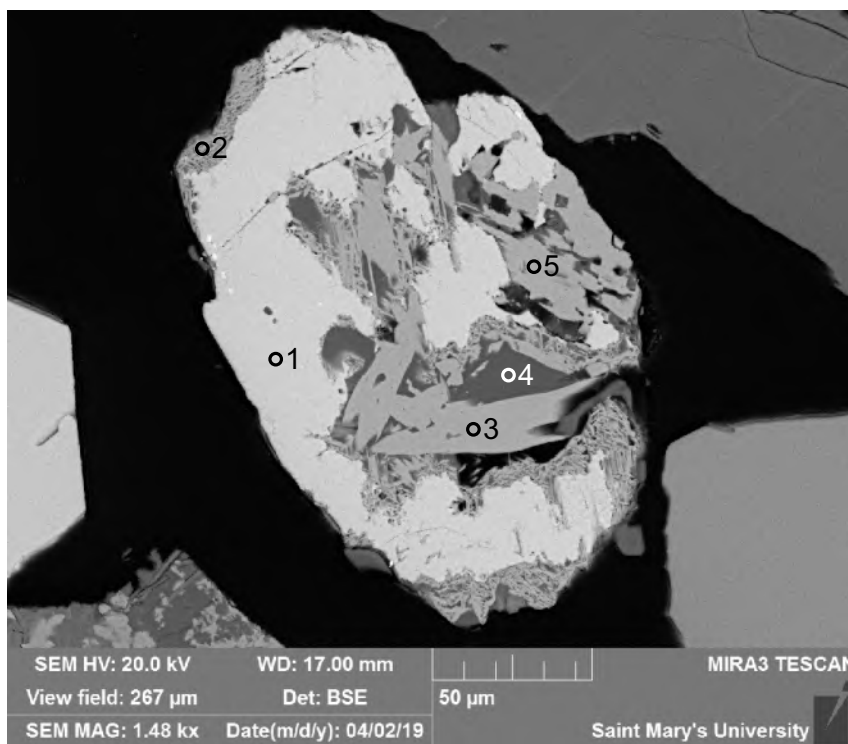
- 1:Chlorite
- 2:Spinel
- 3:Chromite + Chlorite
- 4:"Chromite"

Figure B13.16: Sample S25 site 7.1 (SEM). Probably a spinel - chromite grain altered to altered chromite and chlorite. Typical alteration pattern for metamorphic alteration of the Vourinos ophiolite (G. Grece and A. Merlini, 2011).



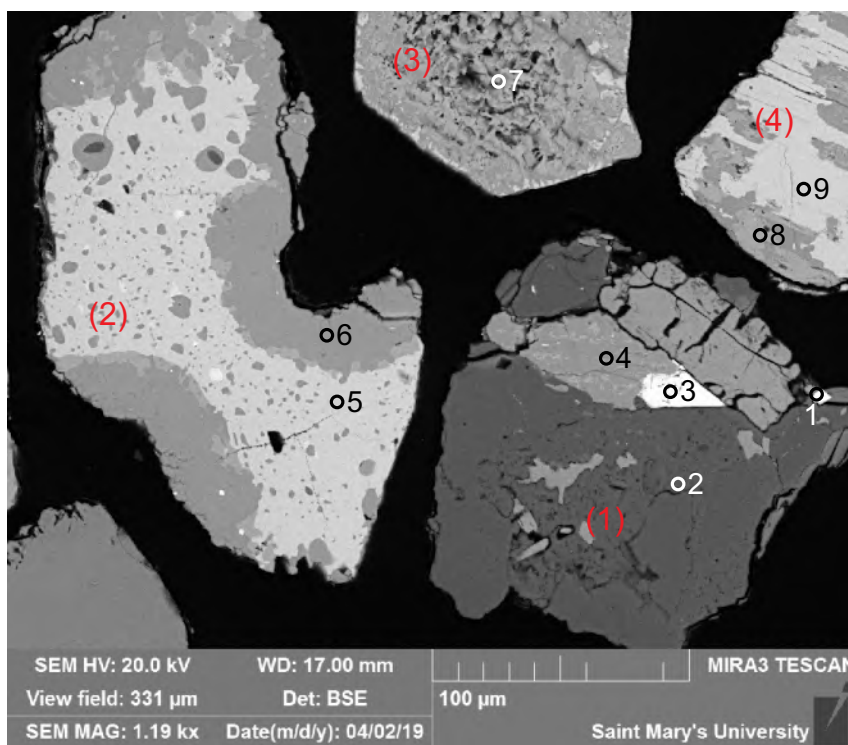
- 1:TiO<sub>2</sub> + Quartz
- 2:Chromite
- 3:Quartz +
- 4:Orthopyroxene
- 5:Mix
- 6:Chromite
- 7:Spinel
- 8:Oligoclase + TiO<sub>2</sub>
- 9:Chromite
- 10:Albite
- 11:TiO<sub>2</sub> + Chlorite
- 12:Orthopyroxene
- 13:Epidote
- 14:Garnet
- 15:Spinel
- 16:Andalusite
- 17:Staurolite
- 18:"Chromite"
- 19:Ilmenite
- 20:Titanite
- 21:Chromite + Chlorite
- 22:Albite
- 23:Ilmenite
- 24:Epidote
- 25:Garnet
- 26:Chromite
- 27:Chromite
- 28:Chromite
- 29:Epidote
- 30:Garnet
- 31:Titanite
- 32:"Ilmenite" +
- 33:Ilmenite
- 34:Chromite + Chlorite

Figure B13.17: Sample S25 site 8 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, And, St, Ep, Ttn, Zrn, Opx, Pl (Ab, Olig), Qz. Chromite and Ilmenite may be altered (21).



- 1: Ilmenite
- 2:  $\text{TiO}_2$  +
- 3:  $\text{TiO}_2$  +
- 4: Quartz
- 5:  $\text{TiO}_2$

Figure B13.18: Sample S25 site 8.1 (SEM). A lithic clast made up of ilmenite +  $\text{TiO}_2$  + quartz. ?schist, metamorphic.



- 1: Zircon
- 2: Albite
- 3: Zircon
- 4:  $\text{TiO}_2$  +
- 5: Ilmenite
- 6: Titanite
- 7:  $\text{TiO}_2$
- 8:  $\text{TiO}_2$  +
- 9: Ilmenite

Figure B13.19: Sample S25 site 8.2 (SEM). 1: Detrital albite grain with inclusions of zircon and probably altered ilmenite/ $\text{TiO}_2$ , metamorphic. 2: An ilmenite grain altering to titanite, metamorphic or hydrothermal. 3: Probably an ilmenite grain completely altered to  $\text{TiO}_2$ . 4: Ilmenite partly altered to  $\text{TiO}_2$ .



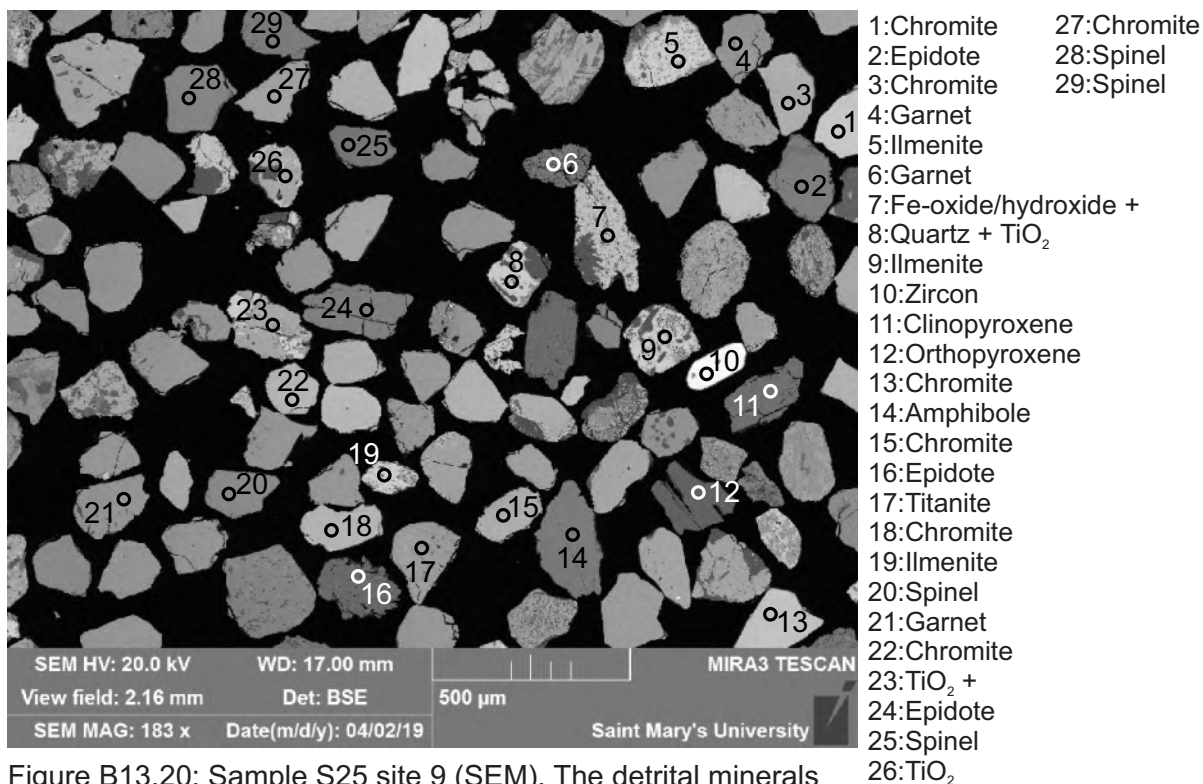


Figure B13.20: Sample S25 site 9 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub> (8,23), Chr, Spl, Grt, Ttn, Zrn, Cpx, Opx, Amph and probably Feohy.

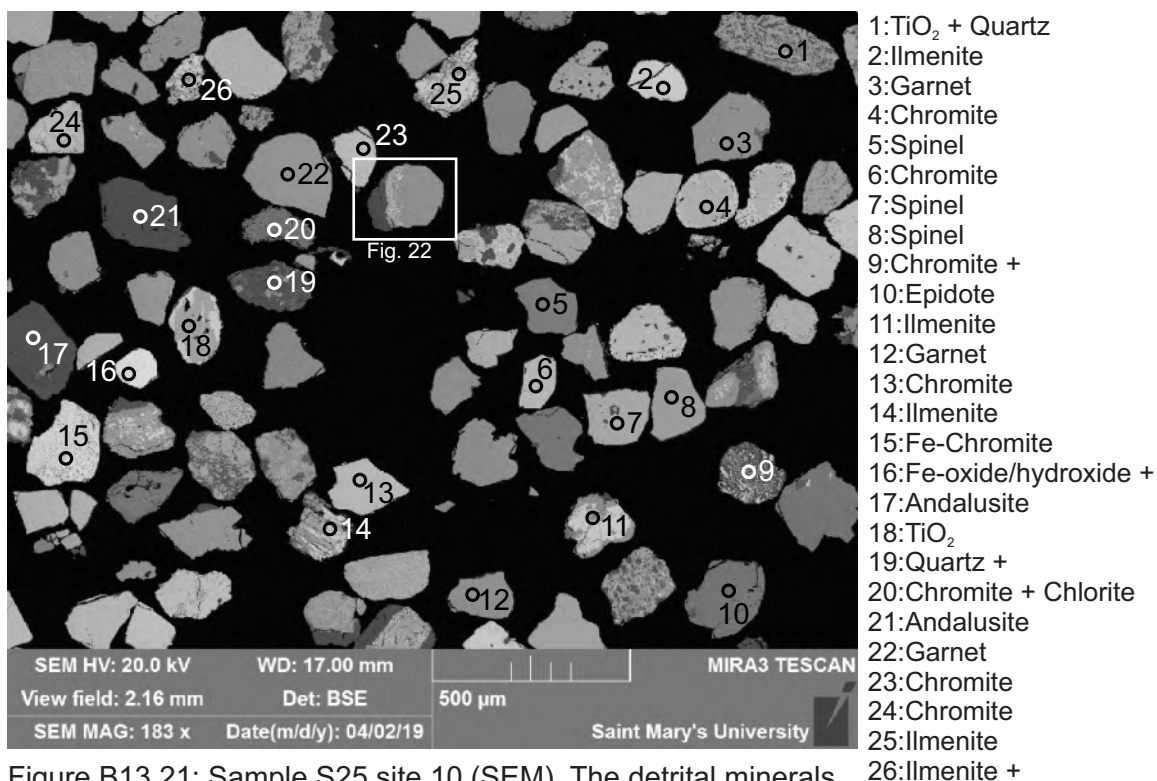
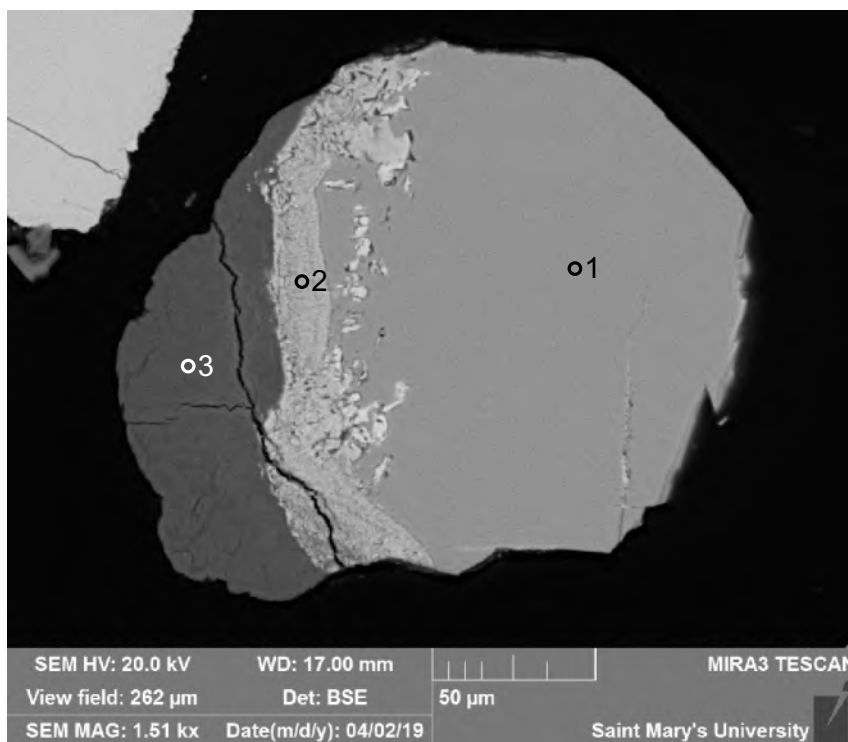
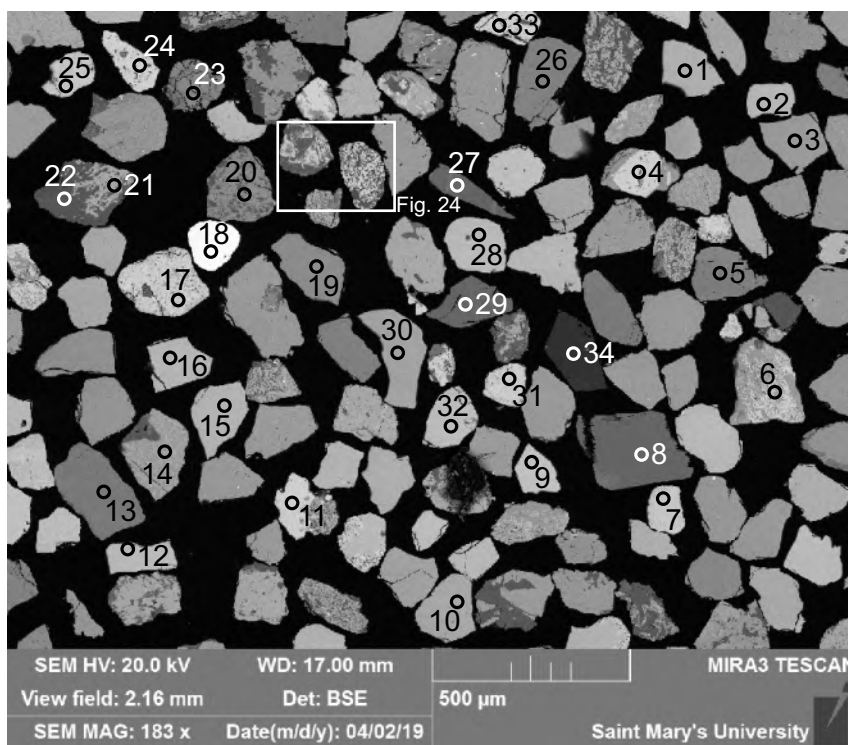


Figure B13.21: Sample S25 site 10 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Fe-Chr (altered chromite), Spl, Gt, And, Ep, Qz, Chl.



- 1: Spinel
- 2: Chlorite + Chromite
- 3: Chlorite

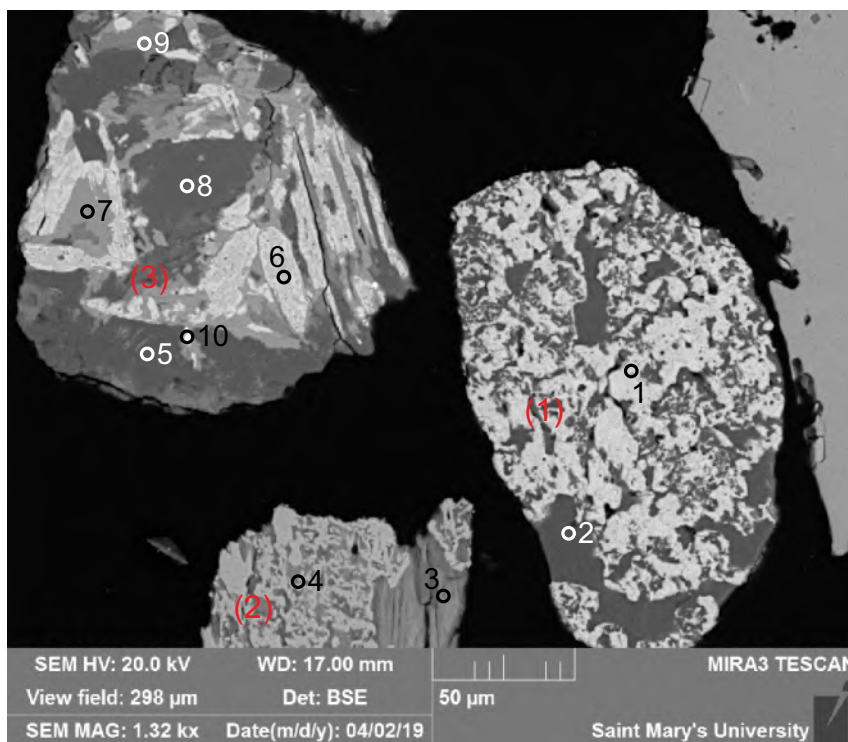
Figure B13.22: Sample S25 site 10.1 (SEM). Lithic clast made up of chlorite + spinel + chromite and chlorite. Ophiolite.



- 1: Chromite
- 2: Chromite
- 3: Garnet
- 4: Mix
- 5: Epidote
- 6: Titanite
- 7: "Chromite"
- 8: Orthopyroxene
- 9: Chromite
- 10:  $\text{TiO}_2$
- 11: Ilmenite
- 12: Chromite
- 13: Epidote
- 14: Titanite
- 15: Chromite
- 16: Chromite
- 17: Fe-oxide/hydroxide +
- 18: Zircon
- 19: Spinel
- 20: Apatite +
- 21:  $\text{TiO}_2$  +
- 22: Quartz
- 23: Epidote
- 24: Ilmenite
- 25: "Ilmenite"
- 26: Epidote
- 27: Orthopyroxene
- 28: Chromite
- 29: Orthopyroxene
- 30: Spinel
- 31: Fe-oxide/hydroxide +
- 32: Chromite
- 33: Ilmenite
- 34: Mg-oxide/hydroxide

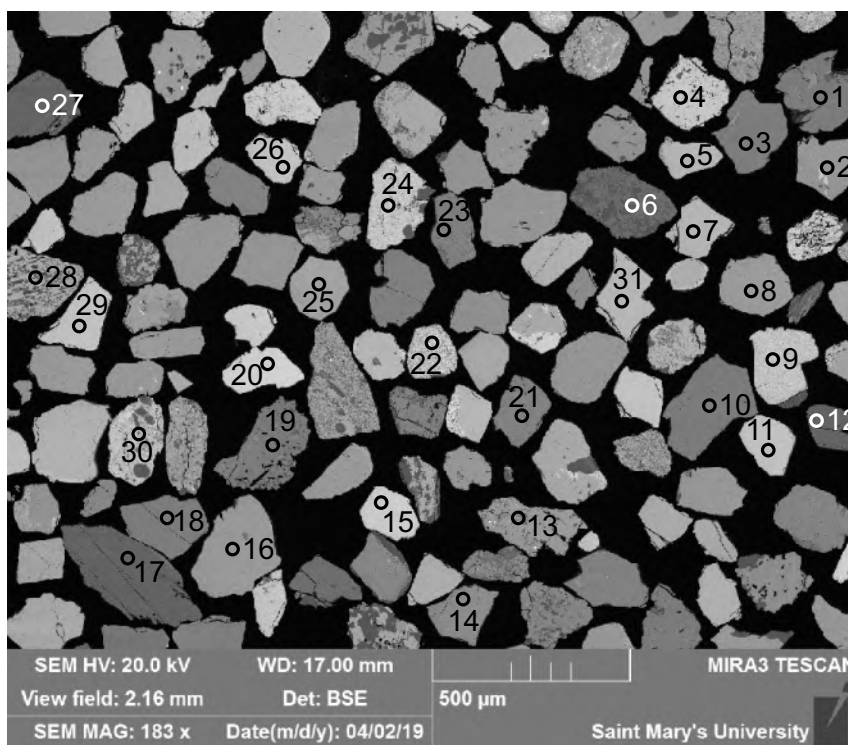
Figure B13.23: Sample S25 site 11 (SEM). The detrital minerals include: Ilm,  $\text{TiO}_2$  (10), Chr, Spl, Grt, Ep, Ttn, Zrn, Opx, Pl (Ab), Ap, Ms, Qz, Chl. A grain of magnesite has been seen (34).





- 1:Chromite
- 2:Garnet
- 3:Chlorite + Muscovite
- 4:TiO<sub>2</sub> +
- 5:Quartz
- 6:"Ilmenite"
- 7:Titanite
- 8:Albite
- 9:Chlorite
- 10:Zircon +

Figure B13.24: Sample S25 site 11.1 (SEM). 1: Lithic clast (chromite and garnet, metaophiolite). 2: Lithic clast (muscovite + TiO<sub>2</sub>, metamorphic). 3: Lithic clast (quartz with zircon inclusion + ilmenite + titanite + chlorite + albite, metamorphic).



- 1:Epidote
- 2:Garnet
- 3:Epidote
- 4:Chromite +
- 5:"Ilmenite"
- 6:Epidote
- 7:Chromite
- 8:Garnet
- 9:Chromite +
- 10:Epidote
- 11:Chromite
- 12:Orthopyroxene
- 13:Garnet
- 14:Spinel
- 15:Chromite
- 16:Garnet
- 17:Orthopyroxene
- 18:Spinel
- 19:Epidote
- 20:Ilmenite
- 21:Epidote
- 22:Chromite + Chlorite
- 23:Spinel
- 24:Fe-oxide/hydroxide +
- 25:Spinel
- 26:"Chromite"
- 27:Orthopyroxene
- 28:Quartz +
- 29:Chromite
- 30:Fe-oxide/hydroxide + Chlorite
- 31:Chromite

Figure B13.25: Sample S25 site 12 (SEM). The detrital minerals include: Ilm, Chr, Spl, Grt, Ep, Opx, Qz and Chl.

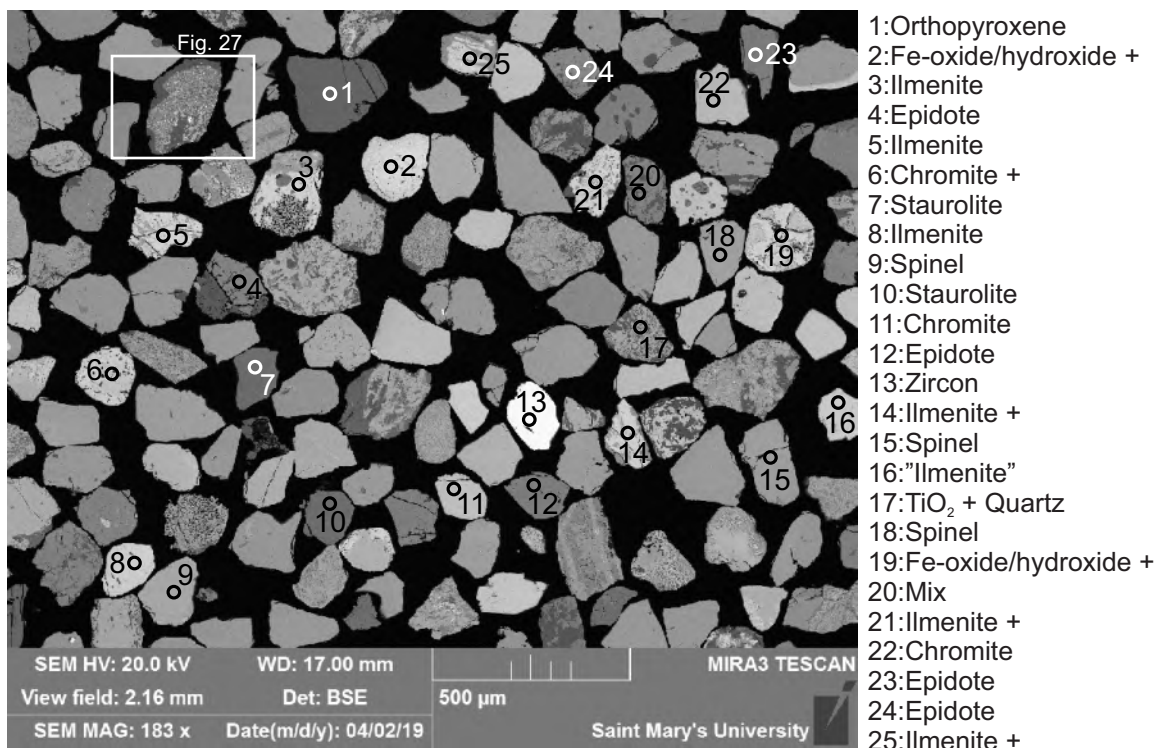


Figure B13.26: Sample S25 site 13 (SEM). The detrital minerals include: Ilm, Chr, Spl, Grt, St, Ep, Zrn, Opx and Qz.

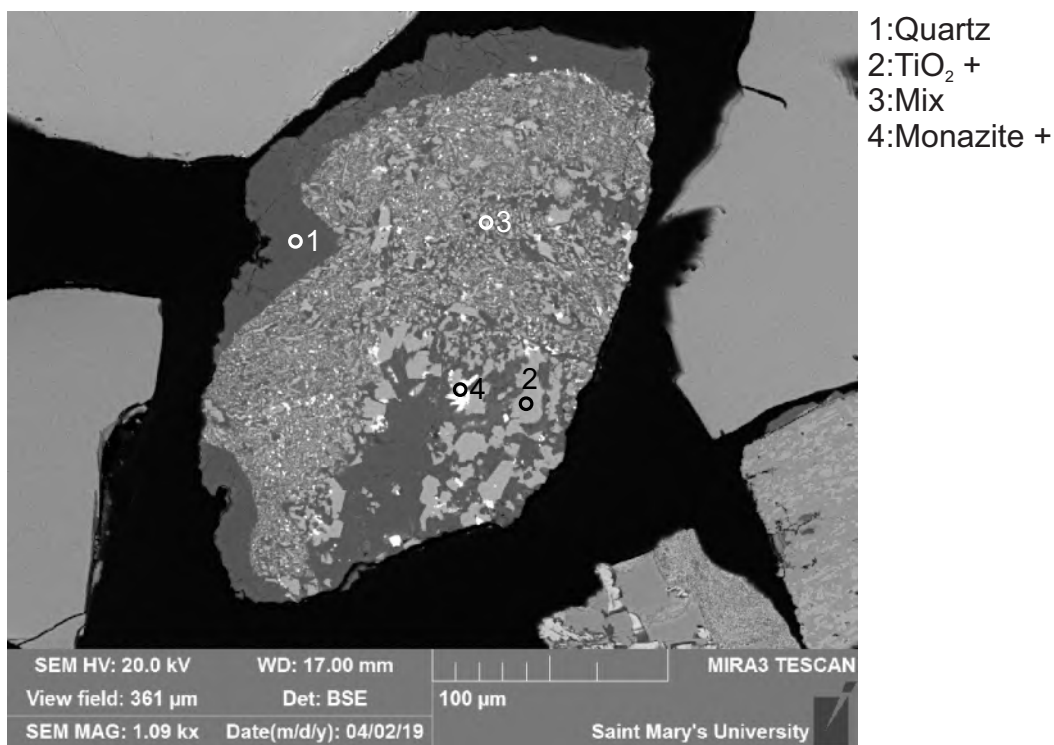


Figure B13.27: Sample S25 site 13.1 (SEM). Lithic clast made up of quartz + TiO<sub>2</sub> + late monazite. ?metamorphic.

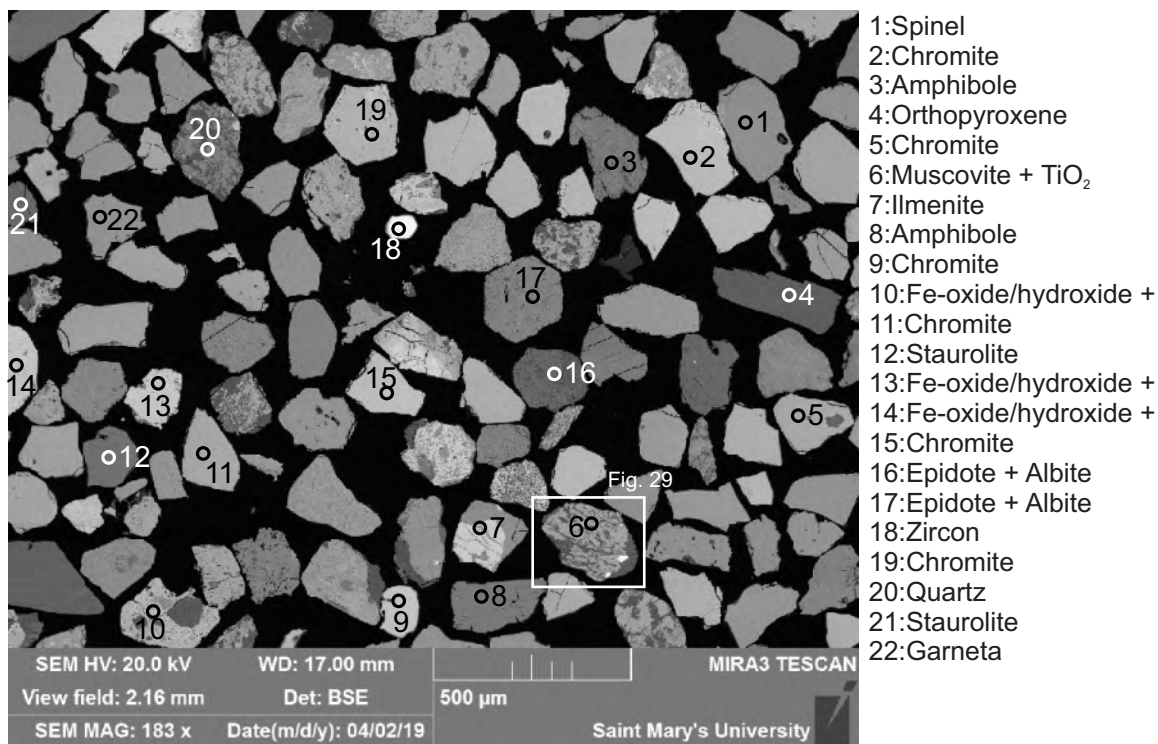


Figure B13.28: Sample S25 site 14 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, St, Ep, Zrn, Cpx, Opx, Amph, Ms, Qz and probably Feohy,

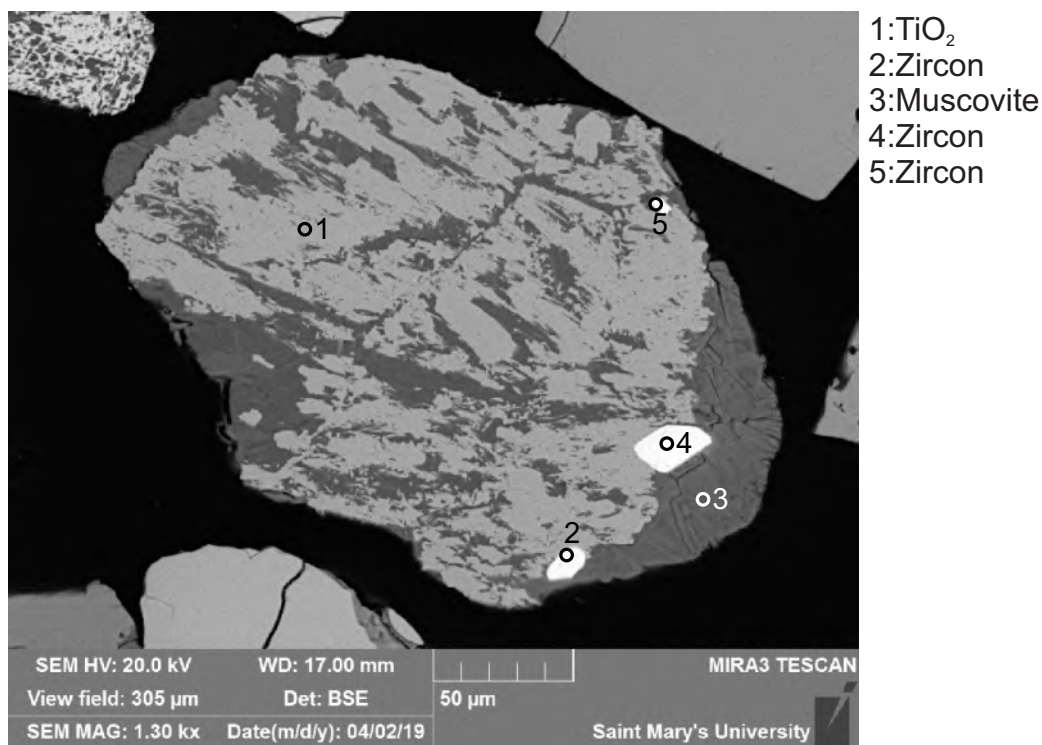


Figure B13.29: Sample S25 site 14.1 (SEM). A lithic clast made up of TiO<sub>2</sub> + muscovite + zircon. Metamorphic.



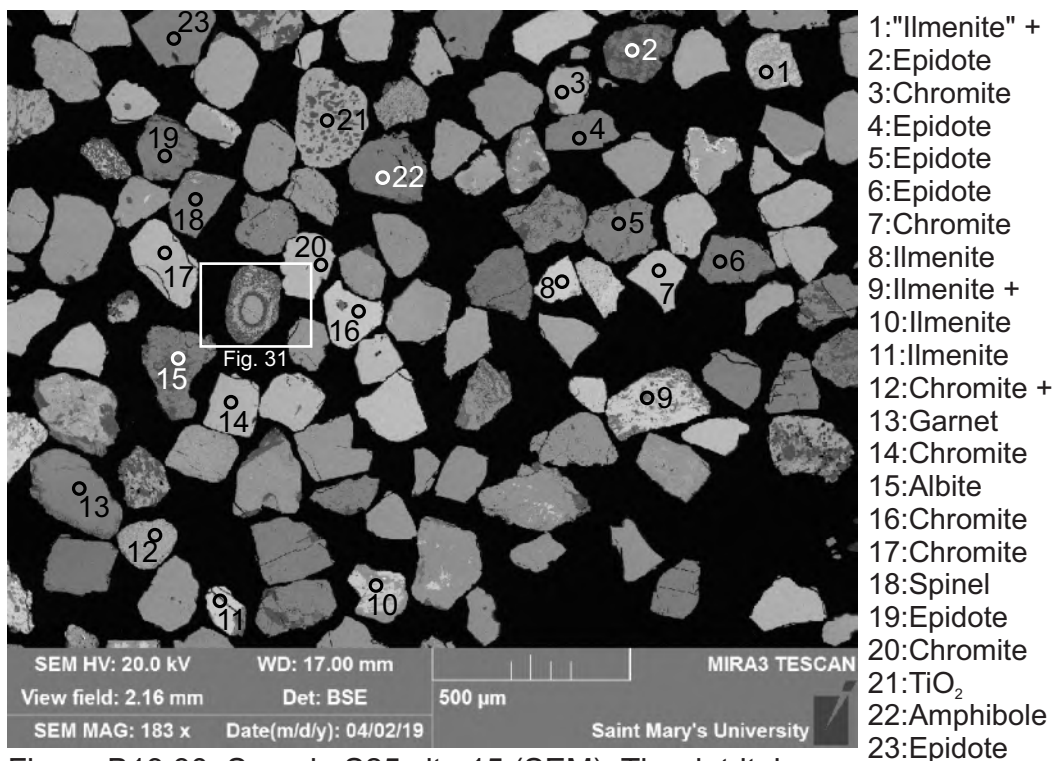


Figure B13.30: Sample S25 site 15 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Pl (Ab), Amph, Chl.

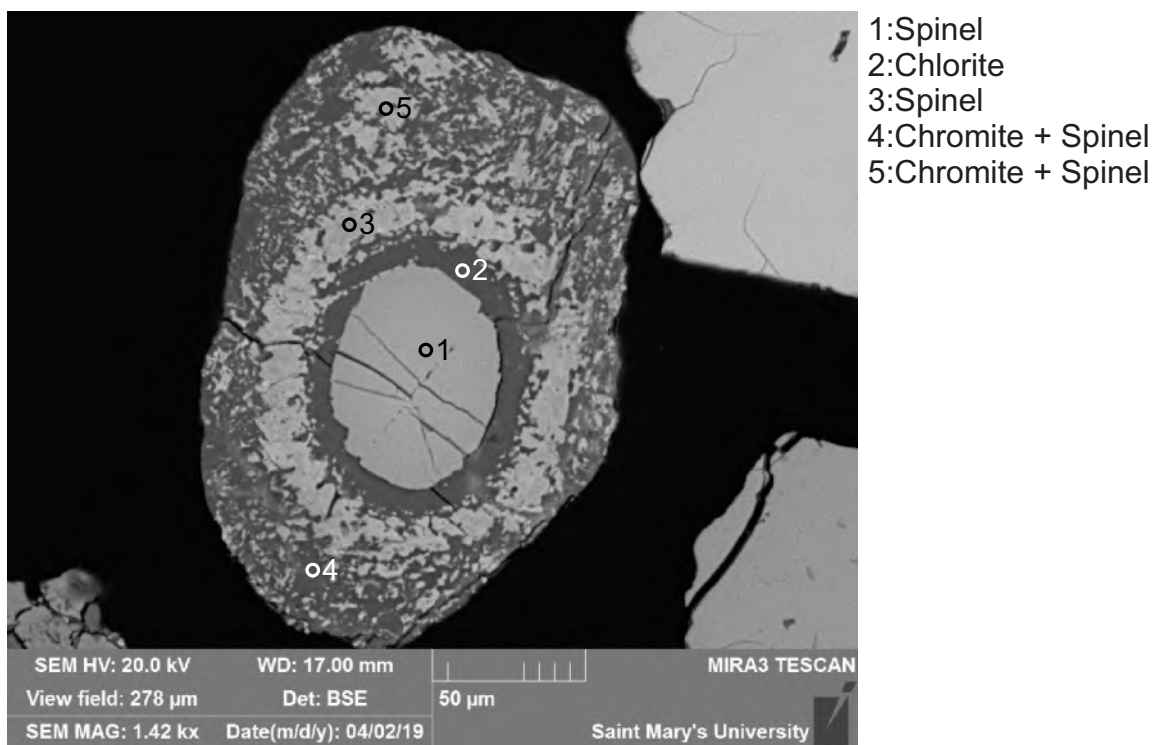
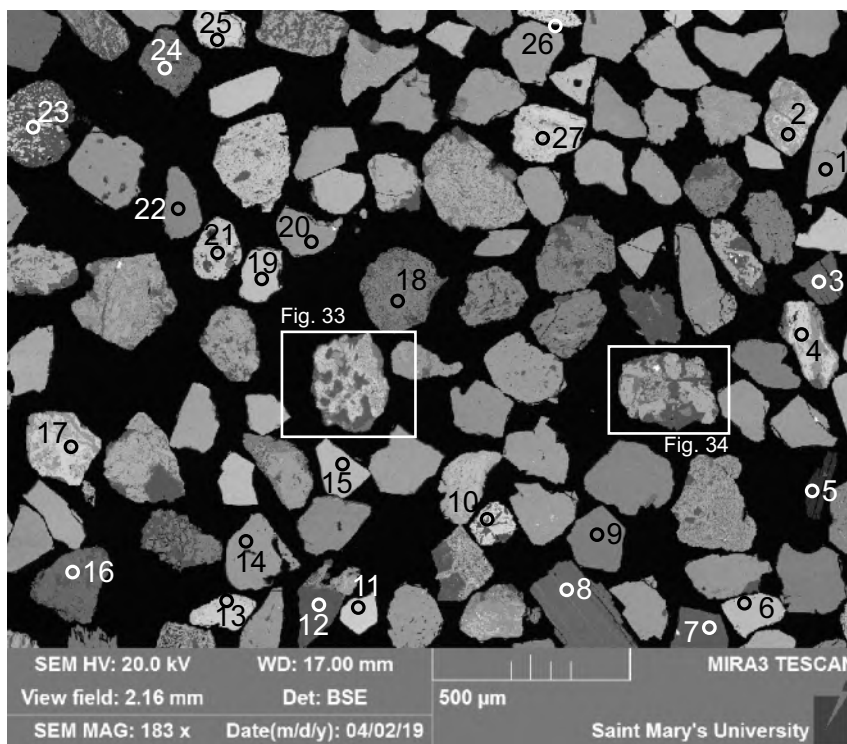
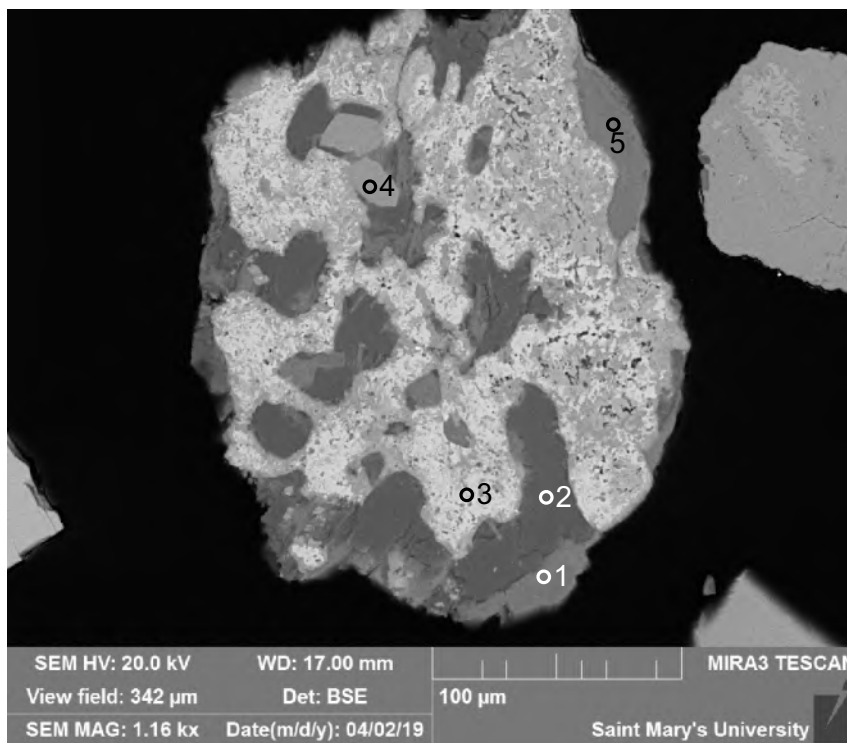


Figure B13.31: Sample S25 site 15.1 (SEM). Zoned spinel grain partly altered to chlorite. Ophiolite or metaophiolite.



- 1: Spinel
- 2: "Ilmenite" +
- 3: Orthopyroxene
- 4: Titanite +
- 5: Mg-oxide/hydroxide
- 6: Chromite
- 7: Tourmaline
- 8: Orthopyroxene
- 9: Epidote
- 10: Chromite +
- 11: "Chromite"
- 12: Quartz
- 13: Ilmenite
- 14: Garnet
- 15: Chromite
- 16: Epidote
- 17:  $\text{TiO}_2$
- 18: Garnet
- 19: Chromite
- 20: Garnet
- 21: Chromite
- 22: Spinel
- 23: Chromite + Chlorite
- 24: Chlorite +
- 25: Ilmenite
- 26: Chromite +
- 27: Spinel

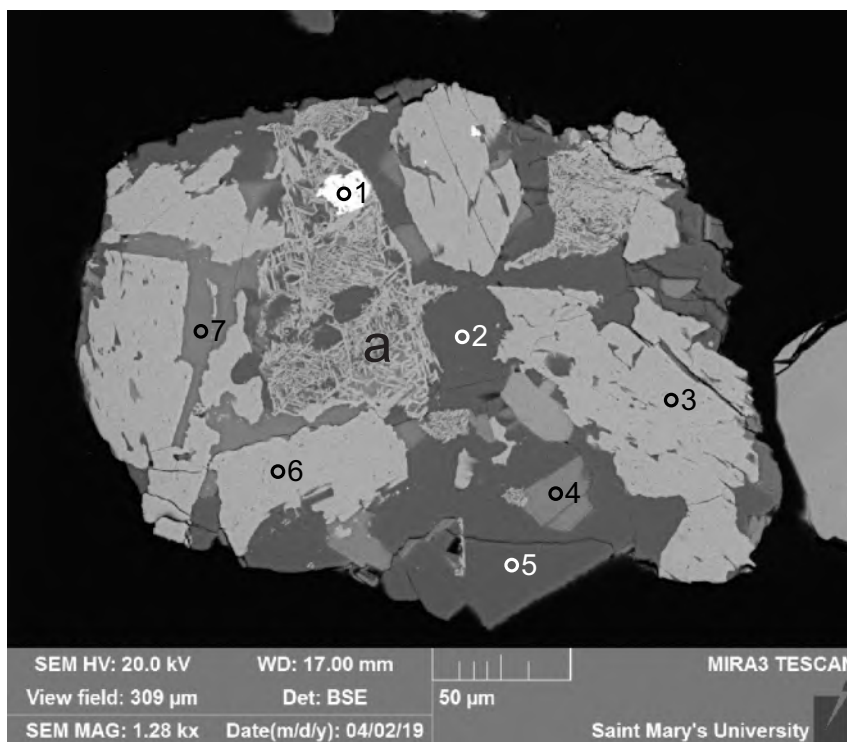
Figure B13.32: Sample S25 site 16 (SEM). The detrital minerals include: Ilm,  $\text{TiO}_2$  (Fig. 34), Chr, Spl, Grt, Tur, Ep, Zrn, Opx, Pl (Ab), Ap, Qz, Chl, Cal.



- 1: Chlorite
- 2: Albite
- 3: Ilmenite + Quartz, with Gypsum contaminant from seawater
- 4: Apatite
- 5: Chlorite

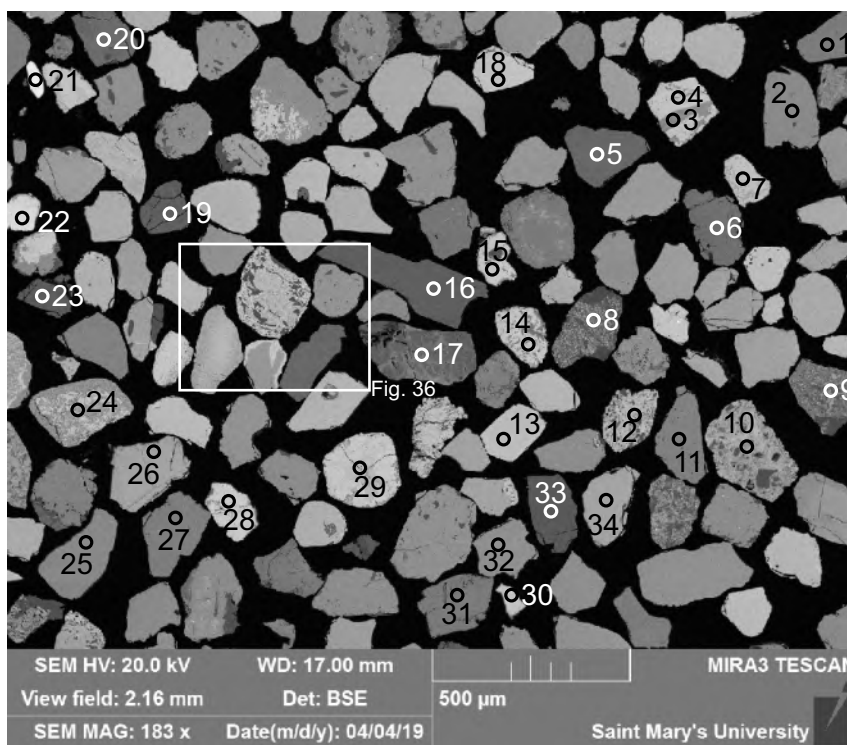
Figure B13.33: Sample S25 site 16.1 (SEM). It appears to be a lithic clast made up of albite + chlorite + apatite + altered ilmenite with quartz. Metamorphic.





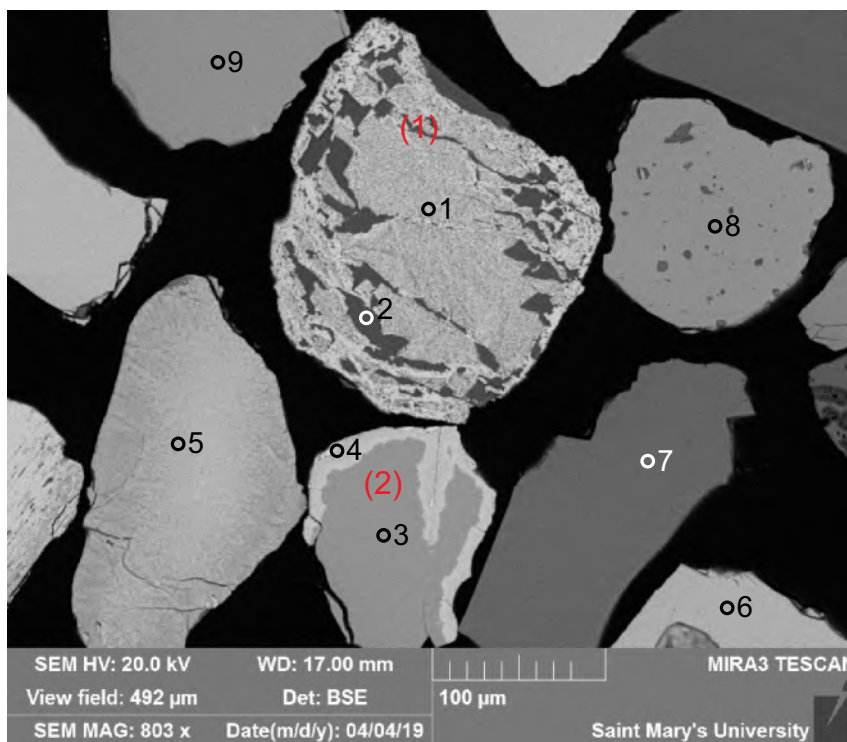
- 1:Zircon
- 2:Albite
- 3:TiO<sub>2</sub>
- 4:Chlorite
- 5:Quartz
- 6:TiO<sub>2</sub>
- 7:Calcite

Figure B13.34: Sample S25 site 16.2 (SEM). A metamorphic lithic clast made up of albite + titania + chlorite + calcite + an altered grain (a) with some replacement by zircon.



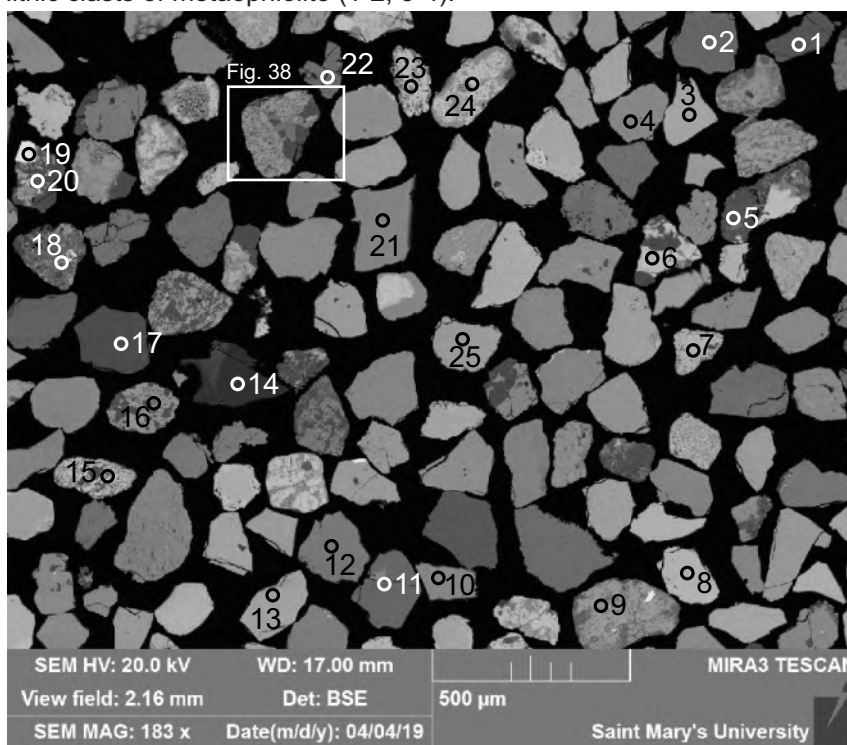
- 1:Garnet
- 2:Garnet
- 3:Titanite
- 4:Ilmenite +
- 5:Staurolite
- 6:Epidote
- 7:Ilmenite
- 8:Chromite +
- 9:Quartz + TiO<sub>2</sub>
- 10:Mix
- 11:Garnet
- 12:"Ilmenite" +
- 13:Chromite
- 14:Mix
- 15:Ilmenite
- 16:Orthopyroxene
- 17:Mix
- 18:Chromite
- 19:Orthopyroxene
- 20:Calcite
- 21:Zircon
- 22:"Chromite"
- 23:Orthopyroxene
- 24:Mix
- 25:Epidote
- 26:Chromite
- 27:Epidote
- 28:Ilmenite
- 29:Fe-oxide/hydroxide +
- 30:Ilmenite
- 31:Epidote
- 32:Garnet
- 33:Tourmaline
- 34:Chromite

Figure B13.35: Sample S25 site 17 (SEM). The detrital minerals include: Ilm, Chr, Spl, Tur, St, Ep, Ttn, Zrn, Opx, Qz, Chl, Cal.



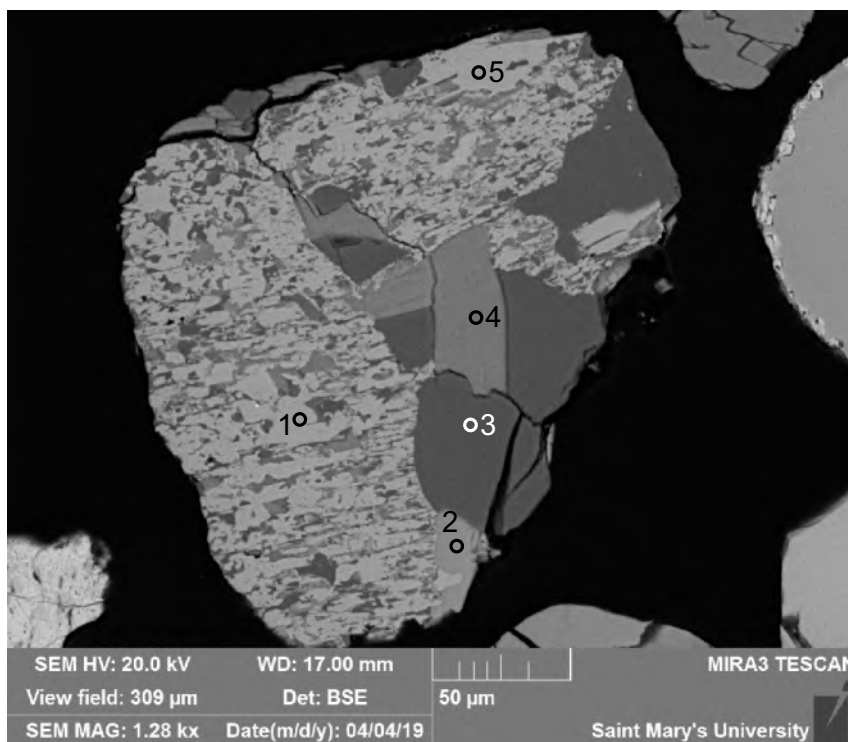
- 1:"Chromite"
- 2:Chlorite
- 3:Spinel
- 4:"Chromite"
- 5:"Chromite"
- 6:Chromite
- 7:Staurolite
- 8:Garnet
- 9:Spinel

Figure B13.36: Sample S25 site 17.1 (SEM). Various detrital grains: Altered chromite and chlorite, spinel overgrown by altered chromite, zoned altered chromite, chromite, staurolite, garnet, and spinel. Two lithic clasts of metaophiolite (1-2, 3-4).



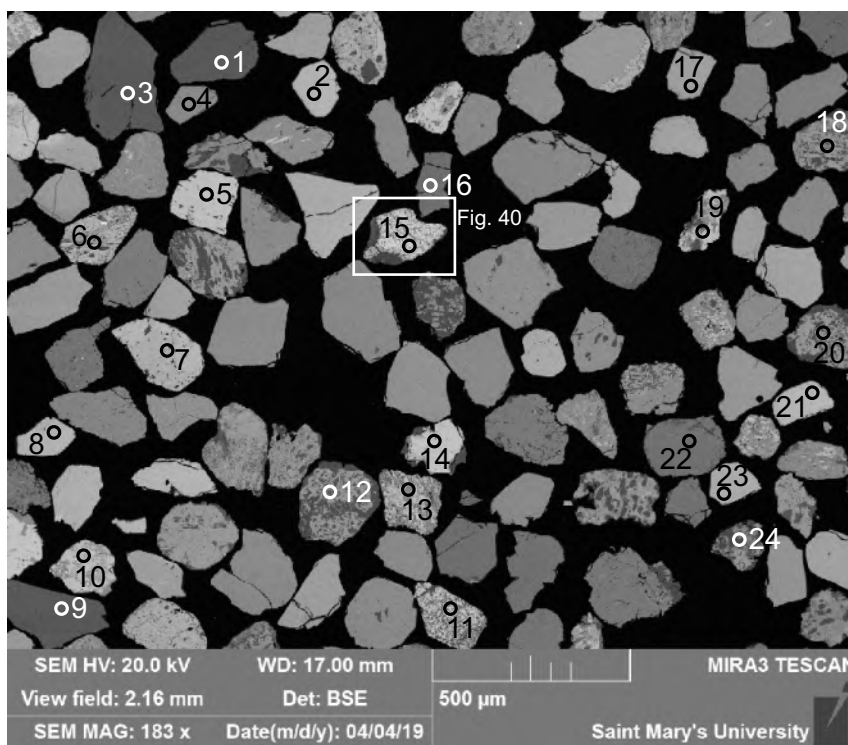
- 1:Orthopyroxene
- 2:Staurolite
- 3:Chromite
- 4:Garnet
- 5:Oligoclase + Chlorite
- 6:Ilmenite +
- 7:Fe-oxide/hydroxide +
- 8:Chromite
- 9:Mix
- 10:Garnet
- 11:Epidote
- 12:Epidote
- 13:Chromite
- 14:Fe-Periclase
- 15:Chromite
- 16:TiO<sub>2</sub> +
- 17:Cordierite
- 18:TiO<sub>2</sub> + Quartz
- 19:Zircon
- 20:Quartz + TiO<sub>2</sub>
- 21:Spinel
- 22:Clinopyroxene
- 23:Ilmenite
- 24:Ilmenite
- 25:Chromite

Figure B13.37: Sample S25 site 18 (SEM). The detrital minerals include: Ilm, Chr, Spl, Fe-Per, Grt, St, Crd, Ep, Zrn, Cpx, Opx, Pl (Olig), Qz, Ap, Chl.



- 1:TiO<sub>2</sub>
- 2:Apatite
- 3:Quartz
- 4:Chlorite
- 5:TiO<sub>2</sub>

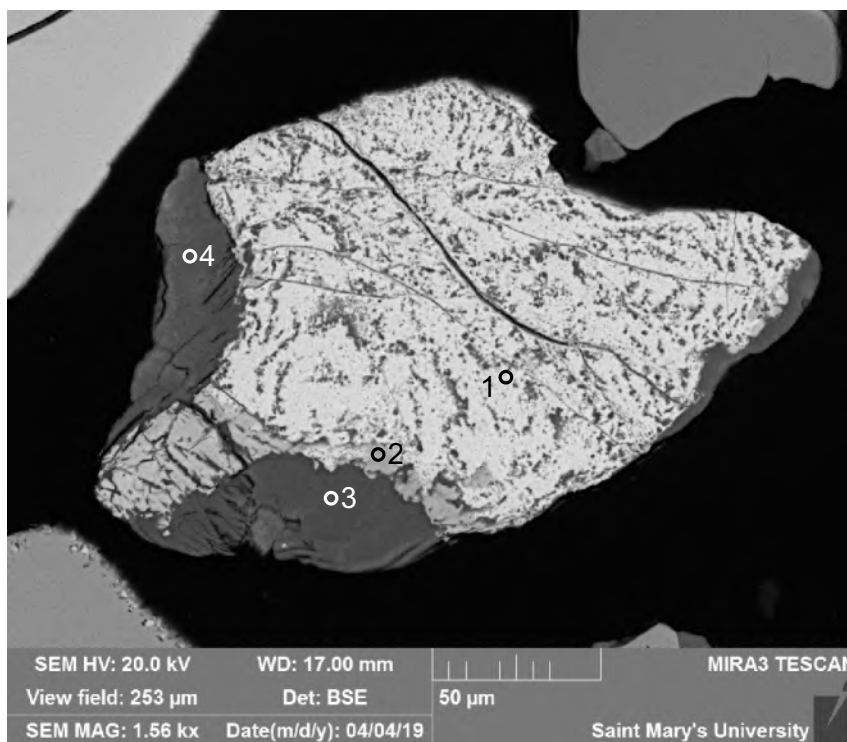
Figure B13.38: Sample S25 site 18.1 (SEM). Lithic clast made up of TiO<sub>2</sub> with trellis texture + apatite + quartz + chlorite. Metamorphic.



- 1:Orthopyroxene
- 2:Chromite
- 3:Orthopyroxene
- 4:Spinel
- 5:Ilmenite
- 6:TiO<sub>2</sub> +
- 7:Chromite
- 8:Chromite
- 9:Orthopyroxene
- 10:Ilmenite
- 11:Chromite +
- 12:TiO<sub>2</sub> + Quartz
- 13:TiO<sub>2</sub> +
- 14:Mix
- 15:"Chromite"
- 16:Epidote
- 17:Chromite
- 18:"Ilmenite" + Chlorite
- 19:Ilmenite +
- 20:TiO<sub>2</sub> + Chlorite
- 21:Chromite
- 22:Garnet
- 23:Chromite
- 24:Albite + TiO<sub>2</sub>

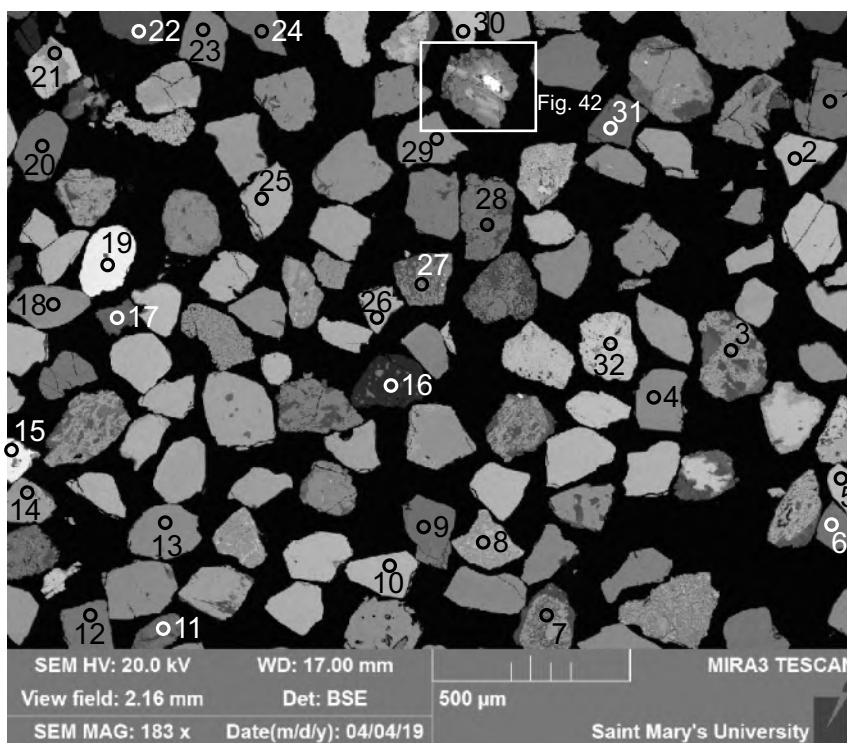
Figure B13.39: Sample S25 site 19 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Opx, Ol, Pl (Ab), Qz, Chl.





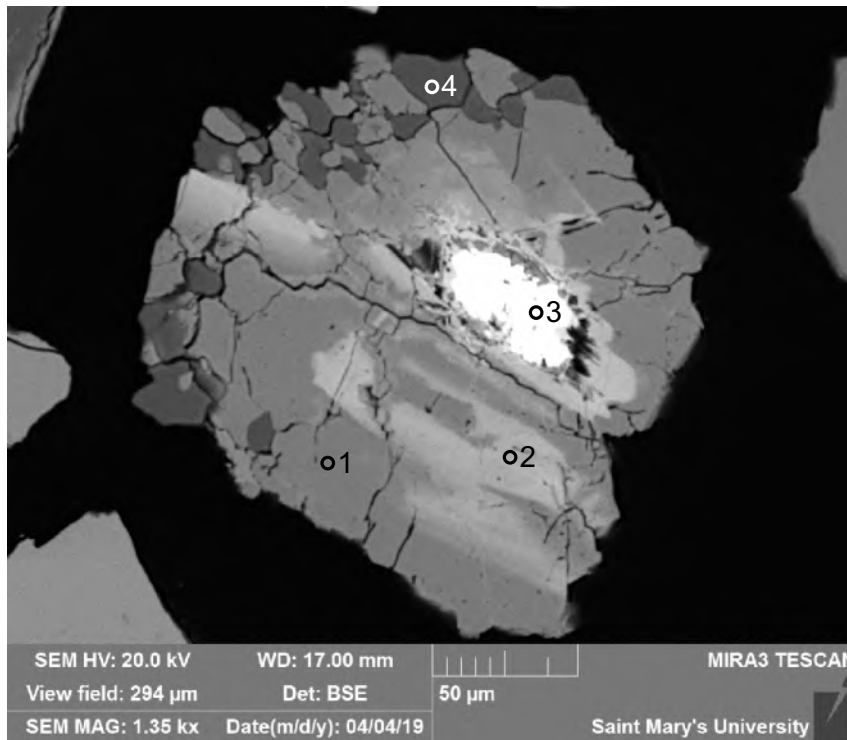
- 1:"Chromite"
- 2:Chromite
- 3:Chlorite
- 4:Serpentine

Figure B13.40: Sample S25 site 19.1 (SEM). A lithic clast made up of a large chromite grain partly altered to altered chromite and chlorite. This lithic clast also contains serpentine. Ophiolite.



- 1:Epidote
- 2:Chromite
- 3:TiO<sub>2</sub> +
- 4:Garnet
- 5:Ilmenite
- 6:Spinel
- 7:TiO<sub>2</sub> + Chlorite
- 8:Mix
- 9:Spinel
- 10:Chromite
- 11:Mix
- 12:Spinel
- 13:Garnet
- 14:Spinel
- 15:Zircon
- 16:Mg-oxide/hydroxide
- 17:Epidote
- 18:Spinel
- 19:Zircon
- 20:Epidote
- 21:"Ilmenite" +
- 22:Tourmaline
- 23:Spinel
- 24:Epidote
- 25:Chromite
- 26:Chromite
- 27:Titanite
- 28:Quartz
- 29:Garnet
- 30:Ilmenite
- 31:Staurolite
- 32:Fe-oxide/hydroxide +

Figure B13.41: Sample S25 site 20 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Per, Tur, St, Ep, Aln, Zrn, Ttn, Qz, Mnz, and probably Feohy.



- 1:Epidote
- 2:Allanite +
- 3:Monazite
- 4:Quartz

Figure B13.42: Sample S25 site 20.1 (SEM). Lithic clast made up of epidote intergrown with allanite in parallel orientation + monazite that appears to be surrounded by a void (?volume reduction) + finally the clast is rimmed by allanite and quartz. Hydrothermal.



Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	1	1	Mag	1.39			98.08	0.52																				100	96	
S25	1	2	Chr		0.34	21.05	24.61		11.09									42.90										100	108	
S25	1	3	Chr			9.57	24.56		9.18									56.69										100	103	
S25	1	4	"Chr"	1.65		2.01	57.48	1.60	5.17									32.08										100	97	
S25	1	5	Mnz +	4.00		1.47	1.69			11.12			30.72		3.43								2.46	12.72	24.12	8.27		100	102	
S25	1	6	Ep	40.73		23.69	10.83			21.75																		97	100	
S25	1	7	Chr			8.76	19.71		9.46									62.08										100	116	
S25	1	8	Ep	39.95		22.91	11.58			22.55																		97	106	
S25	1	9	Grt	39.11		20.66	33.33	1.83	2.41	2.67																		100	112	
S25	1	10	Grt	40.27		21.16	24.69	2.88	6.57	4.43																		100	114	
S25	1	11	Chr			27.44	17.92		14.31									40.32										100	107	
S25	1	12	Grt	40.22		21.02	30.10	0.57	5.33	2.75																		100	110	
S25	1	13	Grt	39.86		20.81	33.08	0.45	4.17	1.64																		100	107	
S25	1	14	Ep	40.35		24.63	9.60			22.42																		97	105	
S25	1	15	Ep	40.67		26.41	7.48			22.44																		97	100	
S25	1	16	Ilm		51.06		45.94	3.00																				100	97	
S25	1	17	Ep	39.93		21.42	13.30			22.36																		97	112	
S25	1	18	Amph	53.63		3.21	3.64		26.54	9.00								0.98										97	123	
S25	1	19	Tur	38.79	0.90	30.80	4.45		8.92	0.72	2.42																	87	106	
S25	1	20	Ep	40.44		28.86	4.47	0.27		22.96																		97	122	
S25	1	21	"Chr"	11.95		4.51	36.88	1.00	15.18									30.48										100	105	
S25	1	22	Ep	41.00		31.11	1.81			23.08																		97	116	
S25	1	23	Spl			38.39	17.53		15.74									28.34										100	115	
S25	1	24	St	29.91	0.56	54.26	13.54		1.73																			100	116	
S25	1	25	And	38.35		61.65																						100	120	
S25	1	26	Ep	53.33		20.97	1.56		2.54	18.59																		97	103	
S25	1	27	Grt	39.75		20.96	28.12	1.33	2.55	7.28																		100	106	
S25	1	28	Cpx	54.06		3.48	2.00		16.99	22.71								0.76										100	105	
S25	1	29	Ep	40.42		25.63	8.48	0.48		22.00																		97	101	
S25	1	30	Chr			20.07	19.44		11.09									49.39										100	100	
S25	1	31	Feohy +	4.75		3.96	81.26		1.28		0.83		1.49														6.43	100	75	
S25	1	32	Ttn	33.35	34.73	2.13	2.08		1.61	26.10																		100	110	
S25	1	33	Ep	40.24		25.60	8.20			22.97																		97	111	
S25	1	34	Ilm		53.64		45.81	0.55																				100	105	
S25	1	35	Chr			10.04	20.83		8.85								0.44	59.84										100	105	
S25	1.1	1	Qz	100.00																								100	124	
S25	1.1	2	Ep	40.45		23.22	11.04			21.42															0.87			97	109	
S25	1.1	3	Mnz +	7.03		3.22	2.53			3.06			27.89										3.03	15.06	29.25	8.93		100	103	
S25	1.1	4	Aln	36.20		19.18	12.09	0.92		14.72														3.07	7.35	3.47		97	107	
S25	1.1	5	Ap +	0.59		0.37	0.58			47.58			43.65		5.76													1.46	100	126
S25	1.1	6	Aln	33.37		14.64	15.17			9.86															7.62	13.72	2.62	97	107	
S25	2	1	Chr			8.70	20.75		9.62									60.93										100	107	
S25	2	2	Grt	39.44		20.60	29.47	4.30	1.80	4.38																		100	115	
S25	2	3	Opx	57.84		1.42	5.26		34.24	0.63								0.61										100	122	
S25	2	4	Mgs						94.09	2.23																		100	49	
S25	2	5	Grt	39.47		20.89	24.69	4.93	1.17	8.84																		100	120	
S25	2	6	Byt +	48.12		20.89	9.74			16.82	4.43																	100	131	
S25	2	7	Chr			10.90	25.84		7.94									55.31										100	115	
S25	2	8	Chr +	19.31		9.91	17.80	0.65	21.00									31.32										100	108	
S25	2	9	Chr	3.89		28.72	18.93		14.06									34.40										100	120	
S25	2	10	Feohy +	15.76		4.22	72.23		1.87	0.44	0.79		1.58					0.39									2.71	100	87	
S25	2	11	Qz + Feohy	73.30		0.74	24.90				0.40		0.66															100	107	
S25	2	12	Chr			9.34	21.01		10.49									59.17										100	107	
S25	2	13	Ep	43.48		28.56	0.87		0.85	21.17	1.14				0.93													97	106	
S25	2	14	Ep	39.92		23.31	11.05	0.33		22.39																		97	108	
S25	2	15	Chr			11.31	22.78		8.48									57.42										100	102	

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	2	16	Feohy +	3.66		3.89	88.82											0.54										3.09	100	72
S25	2	17	Ilm		54.25		40.52	4.79	0.43																				100	106
S25	2	18	TiO2		99.62		0.38																						100	109
S25	2	19	"Ilm" + Chl	9.34	70.83	5.97	10.97		2.89																				100	88
S25	2	20	Spl			58.83	11.39		20.81									8.62	0.36										100	109
S25	2	21	Ab	68.67	2.20	16.85	0.86			1.53	9.88																		100	103
S25	2	22	And	38.18		61.82																							100	113
S25	2	23	Spl			39.55	15.35		16.85									28.25											100	100
S25	2	24	Chr			8.72	19.03		7.32									64.93											100	96
S25	2	25	Qz + TiO2	75.00	24.57			0.43																					100	114
S25	2	26	Zrn	30.95	0.69																	68.36							100	112
S25	2	27	"Opx"	57.44		4.35	6.45		22.81	7.96	1.00																		100	100
S25	2	28	TiO2 +	18.57	64.82	1.14	0.54			14.93																			100	108
S25	2	29	Ilm		49.53		45.60	4.88																					100	101
S25	2	30	Chr			12.76	22.55		8.89									55.79											100	103
S25	2	31	Cpx	48.47	1.37	7.85	7.44		12.33	22.14	0.40																		100	115
S25	2	32	Chr			23.23	18.19		12.97																				100	110
S25	2	33	TiO2 +		92.75	0.74	3.31	0.45							2.75			45.16											100	107
S25	2	34	Mix	20.18	61.34	1.26	1.31			15.91																			100	111
S25	2.1	1	Ilm		52.22		42.14	5.64																					100	107
S25	2.1	2	Ep	39.97	0.83	21.14	13.42			21.63																			97	112
S25	2.1	3	Ep	39.56	0.97	22.68	11.73	0.77		21.30																			97	112
S25	2.1	4	Chl	26.71	1.30	19.03	18.79	0.52	17.67	0.48	0.49																		85	100
S25	2.1	5	Chl	26.64	1.33	19.60	18.67	0.51	18.24																				85	102
S25	2.1	6	Chl	27.32		19.75	18.90	0.52	17.92		0.60																		85	100
S25	2.1	7	TiO2		96.64		3.02			0.34																			100	102
S25	2.1	8	Ttn	33.11	36.87	1.38	1.19		0.40	27.05																			100	112
S25	2.1	9	"Ilm"		91.00		6.17	2.49		0.33																			100	105
S25	2.1	10	Ttn	31.44	39.26	1.18	0.71			25.97					1.44														100	113
S25	2.2	1	Ilm		53.81		36.03	10.16																					100	108
S25	2.2	2	Ttn	39.23	34.59	0.93				25.25																			100	114
S25	2.2	3	Ab	68.17		19.45	0.45				10.74	1.20																	100	114
S25	2.2	4	Chl	28.60		18.53	22.90	0.88	12.92		0.60	0.57																	85	99
S25	2.2	5	Ilm		53.96		36.07	9.97																					100	108
S25	2.2	6	Qz +	95.78	1.41	0.50	0.79		0.29	1.23																			100	120
S25	3	1	Ilm		47.66		49.09	3.25																					100	105
S25	3	2	Spl			39.94	17.08		17.29									25.70											100	111
S25	3	3	Chr			14.88	33.53		7.16									43.94											100	110
S25	3	4	Ilm		53.23		42.52	4.25										0.47											100	113
S25	3	5	St	28.74		43.46	23.64	0.73	3.43																				100	109
S25	3	6	Ilm		48.90		49.86	1.25																					100	113
S25	3	7	Amph	48.06	0.44	11.65	11.31		13.17	9.73	2.30	0.35																	97	119
S25	3	8	Grt	39.30		20.92	29.69	1.71	2.24	6.14																			100	125
S25	3	9	Chr			25.91	19.73		12.66																				100	119
S25	3	10	Tur	38.40	0.84	32.16	4.79		8.00	0.50	2.31						0.51	41.18											87	105
S25	3	11	Chr			22.03	17.13		12.69									48.15											100	119
S25	3	12	Grt	42.02		21.50	1.35			35.13																			100	122
S25	3	13	Grt	39.63		20.66	30.43	1.26	2.33	5.69																			100	120
S25	3	14	Chr		0.39	10.45	25.55		9.76									53.86											100	107
S25	3	15	TiO2		99.51		0.49																						100	97
S25	3	16	Grt	39.85		20.72	24.27	6.08	1.23	7.84																			100	105
S25	3	17	Chr			22.98	21.74		11.25									44.03											100	100
S25	3	18	St	28.63		43.58	21.41	0.37	6.01																				100	95
S25	3	19	Ilm		56.61		41.54	1.85																					100	105
S25	3	20	Amph	55.17		3.67	6.97		19.42	11.30	0.47																		97	115
S25	3	21	Ilm		53.44		35.82	10.74																					100	107

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	3	22	Cpx	54.63		2.00	2.29		20.36	20.06								0.66											100	117
S25	3	23	Grt	39.52		20.70	14.01	16.98	1.00	7.79																			100	112
S25	3	24	"Ilm" +	7.68	67.72		23.23	1.37																					100	101
S25	3	25	Grt	39.66		20.92	30.95		1.22	7.26																			100	112
S25	3	26	Ep	40.02		21.37	13.16	0.37		22.08																			97	105
S25	3	27	Ilm		50.21		48.45	1.34																					100	102
S25	3	28	Ep	40.68		25.67	3.31		7.67	19.67																			97	97
S25	3	29	Ep	40.37		24.46	9.57			22.60																			97	102
S25	3	30	TiO2 + Ms	28.16	52.66	13.57	0.98		1.20			3.44																	100	109
S25	3	31	Opx	56.71		3.46	5.28		32.66	1.17								0.71											100	111
S25	3	32	Chr			9.90	21.35		8.93									59.83											100	98
S25	3	33	Ep	40.83		25.79	8.03			22.35																			97	98
S25	3	34	Ep	40.18	1.27	21.67	11.69			22.19																			97	95
S25	3	35	Opx	56.50		3.57	4.86		32.90	1.44								0.73											100	104
S25	3	36	Ilm + Ms	9.61	44.07	5.75	35.36	2.66				2.54																	100	98
S25	3	37	Ms +	49.72	2.04	27.39	3.14		2.16		0.85	9.70																	95	104
S25	3	38	"Ilm" +	0.78	63.74	1.26	30.33	1.75					0.77														1.38		100	99
S25	3	39	Ab	66.98		19.26	0.83			1.04	11.08	0.80																	100	107
S25	3	40	Ilm		53.43		38.99	7.58																					100	97
S25	3	41	Spl		0.64	38.00	22.38		14.57									24.42											100	98
S25	3	42	Chr			10.68	29.21		6.07									54.04											100	97
S25	3.1	1	Ilm		51.17		43.03	5.80																					100	103
S25	3.1	2	TiO2		98.93		1.07																						100	106
S25	3.1	3	Ilm		53.41		40.54	6.05																					100	105
S25	3.1	4	TiO2		99.15		0.85																						100	107
S25	3.2	1	Zrn	30.82			1.31															67.87							100	122
S25	3.2	2	Ep	40.32		27.79	6.16			22.73																			97	111
S25	3.2	3	Qz	99.30			0.70																						100	122
S25	3.2	4	"Chr"		1.87	14.04	47.93		4.39								0.70	31.08											100	104
S25	3.2	5	Ep	39.78		20.93	14.42			21.86																			97	110
S25	3.2	6	Chr			12.13	18.10		11.08									58.69											100	107
S25	3.2	7	Feohy +	8.98		2.87	80.90		0.93	0.38			1.38															4.55	100	76
S25	4	1	TiO2 +	5.82	82.36	4.02	4.69		3.11																				100	99
S25	4	2	Feohy +	6.47			93.53																						100	74
S25	4	3	Mix	55.04	36.11	5.52	0.66					2.68																	100	107
S25	4	4	Qz	100.00																									100	126
S25	4	5	TiO2 + Qz	30.36	69.64																								100	120
S25	4	6	Opx	55.65		4.12	5.42		31.44	2.60								0.77											100	123
S25	4	7	Spl			39.39	16.75		15.62									28.25											100	111
S25	4	8	"Ilm"	0.63	90.42	0.39	6.81	0.69										1.05											100	107
S25	4	9	Ol (Fayalite)	29.10		0.82	70.08																						100	94
S25	4	10	Chr			13.78	18.84		10.84									56.54											100	115
S25	4	11	Opx	56.46		3.74	5.33		32.30	1.19								0.98											100	123
S25	4	12	Spl +	2.83	0.31	50.95	12.22		19.64									14.05											100	123
S25	4	13	Ilm +		51.00		46.18	0.77	2.04																				100	113
S25	4	14	Ilm		51.49		45.30	2.42		0.79																			100	108
S25	4	15	Chr			16.33	17.14		13.32									53.20											100	108
S25	4	16	Chr			10.24	17.88		11.64									60.24											100	108
S25	4	17	Ilm +	2.00	58.45	0.91	35.06	3.58																					100	100
S25	4	18	St	30.38	0.81	55.79	11.59		0.95												0.48								100	114
S25	4	19	Feohy +	4.02	1.03	2.86	53.90	5.01	4.21									28.11			0.87								100	97
S25	4	20	Ttn	33.15	36.00	1.38	1.15			28.31																			100	104
S25	4	21	St	28.50		42.81	25.22		3.46																				100	94
S25	4	22	Ep	40.09		23.94	10.55			22.41																			97	98
S25	4	23	Chr			28.41	18.11		14.07								0.49	38.93											100	102
S25	4	24	Chr + Chl	12.21	0.62	7.98	31.05		17.56								0.48	30.11											100	100

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	4	25	Opx	56.06		3.61	5.70		33.61	0.44								0.58										100	111	
S25	4	26	Ilm +	2.17	50.87		42.64	2.64		1.69																		100	96	
S25	4	27	Tur	39.04	0.64	31.27	3.82		9.19	0.83	2.21																	87	87	
S25	4	28	Ep	40.40		22.22	12.01	0.37		22.01																		97	95	
S25	4	29	Chr			9.93	20.85		8.66									60.56										100	94	
S25	4	30	Ep +	46.17		25.98	1.74		3.43	20.63	2.05																	100	95	
S25	4	31	Chr			10.63	21.34		9.26								0.50	58.27										100	93	
S25	4	32	Ep	40.31	0.36	23.58	10.74			22.01																		97	104	
S25	4	33	Ilm		53.70		44.05	2.25																				100	103	
S25	4	34	Grt	40.22	0.35	20.91	26.77	0.63	3.01	8.10																		100	108	
S25	4	35	Chr		0.41	12.50	27.27		8.75									51.06										100	102	
S25	4	36	Chr			25.94	16.07		13.72									44.27										100	104	
S25	4.1	1	Chl +	36.92		17.59	30.71		11.31		0.63	2.84																100	92	
S25	4.1	2	Feohy +	25.81		8.98	58.97		2.48	0.68		2.20	0.87															100	84	
S25	4.1	3	Ab	67.15		18.66	2.42			0.56	11.21																	100	119	
S25	4.1	4	TiO <sub>2</sub>		98.94		1.06																					100	106	
S25	4.1	5	Chl +	36.63	0.51	20.23	22.50	0.42	17.12			2.59																100	88	
S25	4.1	6	"Ilm"		84.96		12.90	2.14																				100	104	
S25	4.1	7	Chl +	35.69	1.47	19.57	23.89	0.64	17.31			1.42																100	87	
S25	4.1	8	Ep	40.42		24.04	10.18			22.37																		97	110	
S25	5	1	Ep	40.10		26.57	7.55			22.78																		97	103	
S25	5	2	Chr +	10.24		4.89	36.59	5.22	11.37							0.49		31.19										100	39	
S25	5	3	Spl		0.42	32.28	23.96		13.22									30.12										100	107	
S25	5	4	Ilm + Chl	16.45	45.23	12.42	17.26		8.19		0.45																	100	109	
S25	5	5	TiO <sub>2</sub> +	2.37	97.63																							100	108	
S25	5	6	Spl			40.10	16.71		15.87									27.32										100	109	
S25	5	7	Tur	38.81	0.74	31.47	4.32		8.66	0.44	2.57																	87	98	
S25	5	8	Spl			39.69	16.35		16.85									27.11										100	102	
S25	5	9	TiO <sub>2</sub>		98.96		0.53											0.51										100	75	
S25	5	10	Ilm		47.31		50.57	2.12																				100	93	
S25	5	11	Ilm		39.21		57.76	1.12	1.91																			100	91	
S25	5	12	"Ilm"		84.28		15.06	0.66																				100	98	
S25	5	13	Ep	39.92		21.52	13.21			22.35																		97	105	
S25	5	14	Ilm		49.54		49.15	0.54	0.77																			100	101	
S25	5	15	Amph	55.54		2.58	11.48		15.78	11.14	0.49																	97	101	
S25	5	16	Chl	28.21		20.06	26.01	0.62	8.30	0.88	0.92																	85	86	
S25	5	17	Chr		0.42	27.94	24.13		11.38									36.13										100	94	
S25	6	1	Grt	39.73		20.80	32.15	1.39	3.84	2.10																		100	112	
S25	6	2	Ep	40.53	0.33	27.44	6.09			22.61																		97	111	
S25	6	3	Ilm +	7.01	61.00	2.59	19.95	7.37	0.77			1.31																100	111	
S25	6	4	Mix	72.81	10.77	6.66	6.89		1.73			1.14																100	114	
S25	6	5	Ilm +	4.13	46.77	0.72	43.86	2.73	0.97	0.82																		100	112	
S25	6	6	Ep	40.22		25.90	7.99			22.89																		97	114	
S25	6	7	Tur	36.87	0.82	33.34	12.40		1.50		2.08																	87	95	
S25	6	8	Ep	39.85		21.16	13.57			22.43																		97	105	
S25	6	9	And	37.58		60.66	0.28								1.48													100	114	
S25	6	10	Chl	27.33		14.72	11.78			29.15	0.91	1.11																85	39	
S25	6	11	"Ilm"		58.57		37.74	3.28		0.41																		100	92	
S25	6	12	Ilm		53.33		43.63	3.04																				100	95	
S25	6	13	And	38.26		59.90	1.06					0.78																100	108	
S25	6	14	Cpx	54.75		2.09	4.39		17.68	20.78								0.31										100	111	
S25	6	15	Chr			12.55	20.51		9.86									57.08										100	105	
S25	6	16	Spl		0.40	27.55	23.97		13.00									35.08										100	108	
S25	6	17	Zrn	31.11																	68.89							100	116	
S25	6	18	Spl			54.89	10.01		20.44									14.66										100	101	
S25	6	19	Chr			10.18	21.02		10.74									58.06										100	99	

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	6	20	Grt	39.43		20.75	32.77		1.93	5.12																		100	111	
S25	6	21	Ilm		54.13		44.48	1.39																				100	104	
S25	6	22	Chr			14.02	22.71		8.25									55.01										100	111	
S25	6	23	Ap				1.96		0.44	46.94			45.04		5.21	0.42												100	126	
S25	6	24	Spl			34.45	16.49		15.32									33.74										100	121	
S25	6	25	Feohy +	6.23		2.82	89.17		0.97											0.80								100	85	
S25	6	26	Chr		0.38	14.62	25.67		8.53									50.81										100	117	
S25	6	27	Ep	47.55		23.69	2.87		2.46	20.43																		97	111	
S25	6.1	1	Chl	26.16	1.18	20.26	24.61	0.34	12.44																			85	97	
S25	6.1	2	TiO <sub>2</sub> + Qz	38.38	59.18	0.84	1.60																					100	119	
S25	6.1	3	Qz	99.67	0.33																							100	123	
S25	6.1	4	Ilm		53.99		40.58	5.43																				100	108	
S25	6.1	5	Mnz +	25.28		2.03	2.02		0.77	2.02			26.89		2.39								1.47	8.22	21.69	7.23		100	105	
S25	7	1	"Chr"	1.19		0.78	59.96	0.95	1.81									35.32										100	99	
S25	7	2	Spl			39.52	17.26		16.00									27.23										100	108	
S25	7	3	Chr			24.88	19.63		12.40								0.50	42.60										100	108	
S25	7	4	Tur	38.11	0.71	32.72	5.02		7.55	0.88	2.01																	87	101	
S25	7	5	Ep	40.88		28.23	5.53			22.37																		97	114	
S25	7	6	Ttn	32.19	39.14	0.35	0.90			27.42																		100	120	
S25	7	7	Ep	40.77		22.36	12.30	0.45		21.12																		97	123	
S25	7	8	Feohy +	6.45		1.37	89.47	0.49	0.78				1.44															100	84	
S25	7	9	Chr			7.92	27.70		8.58									55.80										100	112	
S25	7	10	"Ilm" +	2.76	67.60		21.56	4.67		3.40																		100	69	
S25	7	11	Grt	39.59		20.81	27.13	2.57	1.39	8.51																		100	115	
S25	7	12	Feohy +	1.87		2.26	95.49			0.39																		100	87	
S25	7	13	Ep	39.68		20.69	14.30			22.33																		97	108	
S25	7	14	Opx	56.78		3.30	5.48		33.32	0.45								0.67										100	111	
S25	7	15	Spl			36.22	22.90		12.83									28.05										100	104	
S25	7	16	TiO <sub>2</sub> +	2.19	95.50	1.22	0.63					0.45																100	105	
S25	7	17	Ab +	60.71		9.22	13.06		9.35	0.34	7.33																	100	107	
S25	7	18	Ilm		50.43		47.76	1.80																				100	98	
S25	7	19	St	30.00	0.53	54.73	11.90	0.36	1.45											1.03								100	99	
S25	7	20	Chr			27.70	16.63		13.92									41.75										100	101	
S25	7	21	Spl			40.75	14.51		17.64									27.10										100	103	
S25	7	22	Chr			12.07	27.51		8.90									51.52										100	96	
S25	7	23	And	37.19		61.12									1.70													100	111	
S25	7	24	"Chr"	4.15		4.55	41.57	11.69	5.34									30.88			1.81							100	100	
S25	7	25	Chr			25.48	18.23		13.63									42.66										100	104	
S25	7	26	Chr			15.05	25.16		9.82									49.97										100	104	
S25	7	27	Ep +	46.37		26.50	1.41		3.28	19.67	1.18				1.60													100	108	
S25	7.1	1	Chl	31.64		17.81	2.54		31.54	0.30								1.17										85	103	
S25	7.1	2	Spl			33.79	21.81		12.22									32.18										100	111	
S25	7.1	3	Chr + Chl	5.87	0.86	10.94	29.29	0.89	9.11		0.44							42.60										100	95	
S25	7.1	4	"Chr"			3.81	82.71		2.28									11.20										100	95	
S25	8	1	TiO <sub>2</sub> + Qz	48.38	51.62																							100	106	
S25	8	2	Chr			18.18	20.69		11.29									49.84										100	107	
S25	8	3	Qz +	92.34	0.34	4.44	1.74		0.82		0.32																	100	113	
S25	8	4	Opx	56.58		3.62	5.76		33.01	0.41								0.62										100	117	
S25	8	5	TiO <sub>2</sub> + Qz	23.41	76.16		0.43																					100	117	
S25	8	6	Chr			14.97	20.46		10.39									54.19										100	112	
S25	8	7	Spl			44.51	12.05		18.60									24.83										100	114	
S25	8	8	Olig + TiO <sub>2</sub>	62.82	4.64	15.89	0.53			3.89	9.95										2.28							100	119	
S25	8	9	Chr			10.19	20.58		9.22									60.02										100	109	
S25	8	10	Ab	68.10		18.64	0.52			0.42	10.97	1.35																100	120	
S25	8	11	Mix	20.28	23.61	2.36	38.78		1.61	13.36																		100	103	
S25	8	12	Opx	56.70		3.36	5.55		33.29	0.49								0.61										100	115	



Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	8	13	Ep	40.36		23.90	10.51			22.22																		97	103	
S25	8	14	Grt	40.92		22.28	1.17		0.48	35.15																		100	104	
S25	8	15	Spl		0.37	31.58	18.03		15.39									34.63										100	101	
S25	8	16	And	36.63		60.06	0.29								3.01													100	113	
S25	8	17	St	29.05		44.71	20.83		5.41																			100	97	
S25	8	18	"Chr"		0.62	2.09	60.14		2.44									34.70										100	93	
S25	8	19	Ilm		53.20		38.10	7.42									1.27											100	97	
S25	8	20	Ttn	31.18	39.45	0.83	2.93			25.60																		100	105	
S25	8	21	Chr + Chl	10.57		19.94	24.04	0.87	15.91		0.49							28.18										100	101	
S25	8	22	Ab	69.79		18.66					11.56																	100	119	
S25	8	23	Ilm		52.70		45.76	1.54																				100	109	
S25	8	24	Ep	40.07		24.67	9.87			22.39																		97	116	
S25	8	25	Grt	39.35		20.97	28.16	2.12		9.40																		100	117	
S25	8	26	Chr		0.47	23.01	27.48		10.59									38.45										100	114	
S25	8	27	Chr			8.53	26.12		8.09									57.25										100	110	
S25	8	28	Chr			13.32	21.68		11.12									53.89										100	115	
S25	8	29	Ep	41.75		27.06	1.19		3.76	23.23																		97	115	
S25	8	30	Grt	39.58		20.78	27.79	0.68	1.85	9.31																		100	119	
S25	8	31	Ttn	28.15	43.81	0.49	2.19			24.18							1.19											100	113	
S25	8	32	"Ilm" +	3.72	66.07		26.35	1.66		2.19																		100	103	
S25	8	33	Ilm		52.34		44.90	2.76																				100	94	
S25	8	34	Chr + Chl	6.65	0.38	12.03	28.30		10.46									42.18										100	97	
S25	8.1	1	Ilm		53.55		43.19	3.26																				100	106	
S25	8.1	2	TiO <sub>2</sub> +	2.74	94.16	1.10	1.66					0.34																100	102	
S25	8.1	3	TiO <sub>2</sub> +	2.14	97.14		0.72																					100	106	
S25	8.1	4	Qz	99.13	0.62		0.25																					100	121	
S25	8.1	5	TiO <sub>2</sub>		98.81		1.19																					100	106	
S25	8.2	1	Zrn	31.43																		68.57						100	122	
S25	8.2	2	Ab	74.58		15.37				0.40	9.65																	100	113	
S25	8.2	3	Zrn	31.17		0.56	0.55															65.69				2.04		100	117	
S25	8.2	4	TiO2 +	16.09	69.53	1.19	0.41			12.78																		100	112	
S25	8.2	5	Ilm		51.11		42.28	6.60																				100	106	
S25	8.2	6	Ttn	32.51	38.46	0.71	1.12			27.20																		100	111	
S25	8.2	7	TiO <sub>2</sub>	0.75	96.12		2.54			0.60																		100	95	
S25	8.2	8	TiO <sub>2</sub> +	0.63	95.23		3.57			0.57																		100	108	
S25	8.2	9	Ilm		51.38		46.02	2.60																				100	106	
S25	9	1	Chr			3.42	22.28		7.53									66.77										100	104	
S25	9	2	Ep	40.50		24.37	9.57	0.33		22.22																		97	108	
S25	9	3	Chr		0.68	23.92	25.07		9.90									40.42										100	103	
S25	9	4	Grt	39.44		20.86	29.03	4.76	2.29	3.62																		100	107	
S25	9	5	Ilm		52.69		42.72	4.16		0.43																		100	99	
S25	9	6	Grt	39.65		22.66	1.70		0.60	33.20					2.19													100	114	
S25	9	7	Feohy +	8.40		2.50	87.85						1.25															100	79	
S25	9	8	Qz + TiO <sub>2</sub>	61.37	36.77		1.86																					100	120	
S25	9	9	Ilm		52.59		43.60	3.81																				100	107	
S25	9	10	Zrn	31.31																		68.69						100	124	
S25	9	11	Cpx	54.66		3.07	1.85		17.05	22.62								0.75										100	122	
S25	9	12	Opx	56.14		4.08	5.52		32.46	0.99								0.82										100	124	
S25	9	13	Chr			6.65	21.89		8.17									63.29										100	118	
S25	9	14	Amph	43.58	0.67	15.29	14.15	0.30	10.40	10.82	1.41	0.38																97	117	
S25	9	15	Chr		0.60	26.13	23.22		11.29								0.43	38.33										100	113	
S25	9	16	Ep	41.34		27.80	2.06		2.43	23.37																		97	104	
S25	9	17	Ttn	32.99	37.05	1.15	1.37			27.44																		100	109	
S25	9	18	Chr			19.71	21.47		10.66								0.46	47.70										100	108	
S25	9	19	Ilm		52.97		43.35	3.68																				100	107	
S25	9	20	Spl			44.41	15.26		17.50									22.83										100	106	

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	9	21	Grt	39.25	0.32	20.65	17.82	14.08	0.80	7.09																			100	104
S25	9	22	Chr			19.21	21.01		9.10									50.68											100	104
S25	9	23	TiO <sub>2</sub> +	1.45	86.38	2.28	6.16			0.29	0.55		0.59					0.98										1.31	100	93
S25	9	24	Ep	40.23		24.15	10.05	0.36		22.22																			97	104
S25	9	25	Spl			55.53	11.54		20.26									12.67											100	102
S25	9	26	TiO <sub>2</sub>		99.53		0.47																						100	97
S25	9	27	Chr			29.94	17.99		14.40									37.66											100	98
S25	9	28	Spl			47.44	14.92		18.07									19.19	0.39										100	98
S25	9	29	Spl	41.66		26.38	8.56			23.39																			100	97
S25	10	1	TiO <sub>2</sub> + Qz	18.38	81.62																								100	99
S25	10	2	Ilm		49.21		47.83	2.96																					100	97
S25	10	3	Grt	39.80		20.88	30.25	0.50	2.07	6.49																			100	107
S25	10	4	Chr			22.17	24.19		11.20									42.44											100	103
S25	10	5	Spl			48.58	13.87		18.53									19.02											100	108
S25	10	6	Chr			12.29	20.12		9.91								0.58	57.11											100	108
S25	10	7	Spl			25.62	22.81		11.67									39.89											100	110
S25	10	8	Spl		0.63	31.26	19.62		14.32									34.17											100	111
S25	10	9	Chr +	18.17	0.40	14.44	19.37		20.36		0.51							26.74											100	107
S25	10	10	Ep	45.33		23.70	6.86			21.12																			97	115
S25	10	11	Ilm		52.39		41.54	5.59		0.48																			100	109
S25	10	12	Grt	40.02		20.88	26.24	2.05	1.82	8.99																			100	113
S25	10	13	Chr			11.69	18.82		10.57								0.50	58.43											100	105
S25	10	14	Ilm		53.58		37.15	9.27																					100	103
S25	10	15	Fe-Chr			1.84	45.40	0.96	1.46									50.35											100	89
S25	10	16	Feohy +		10.51	2.66	83.04	1.96	1.82																				100	89
S25	10	17	And	38.50		60.85	0.64																						100	99
S25	10	18	TiO <sub>2</sub>		100.00																								100	97
S25	10	19	Qz +	91.80		3.19	2.77		0.69			1.55																	100	110
S25	10	20	Chr + Chl	5.29		4.14	0.93	0.47		45.17					43.12														100	106
S25	10	21	And	38.22		61.46	0.32																						100	102
S25	10	22	Grt	39.41		20.83	32.91	0.60	1.33	4.93																			100	102
S25	10	23	Chr			11.09	19.58		8.92									60.42											100	97
S25	10	24	Chr			12.91	19.26		10.03								0.45	57.35											100	91
S25	10	25	Ilm		52.98		43.02	1.79	1.64									0.57											100	98
S25	10	26	Ilm +	8.84	59.71	2.58	26.29	1.12	0.94		0.52																		100	75
S25	10.1	1	Spl			38.13	14.60		16.46									30.31			0.50								100	107
S25	10.1	2	Chl + Chr	12.30		8.41	30.84		13.19									35.26											100	96
S25	10.1	3	Chl	34.18		14.38	2.95		32.88									0.60											85	98
S25	11	1	Chr			21.44	18.26		12.53									47.76											100	106
S25	11	2	Chr			17.15	21.33		10.56								0.43	50.53											100	107
S25	11	3	Grt	39.32		20.62	29.88	4.24	1.18	4.76																			100	114
S25	11	4	Mix	27.04	26.76	19.22	18.30	3.00	1.38			4.30																	100	117
S25	11	5	Ep	40.07		23.21	11.40			22.33																			97	116
S25	11	6	Ttn	28.75	45.22	0.67	1.83	0.37		23.16																			100	121
S25	11	7	"Chr"		1.05	15.89	43.24		4.88									34.95											100	115
S25	11	8	Opx	55.77		4.40	5.66		32.87	0.39								0.91											100	127
S25	11	9	Chr			9.87	20.51		9.49								0.45	59.68											100	116
S25	11	10	TiO <sub>2</sub>		100.00																								100	113
S25	11	11	Ilm		53.04		45.47	1.50																					100	107
S25	11	12	Chr			14.12	19.74		10.79									55.35											100	102
S25	11	13	Ep	40.08		22.64	8.48		3.33	22.47																			97	97
S25	11	14	Ttn	32.18	37.48	1.36	1.23			27.75																			100	106
S25	11	15	Chr			20.98	17.68		12.00								0.47	48.87											100	107
S25	11	16	Chr			18.03	17.00		10.27									54.70											100	103
S25	11	17	Feohy +	4.32		2.11	92.13		0.83									0.62											100	76
S25	11	18	Zrn	31.03																		68.97							100	113

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	11	19	Spl			45.29	14.64		17.86									22.21											100	109
S25	11	20	Ap +	18.38		3.79	1.24		0.54	37.98		0.63	33.24		4.19														100	113
S25	11	21	TiO2 +	1.02	98.45		0.53																						100	99
S25	11	22	Qz	100.00																									100	109
S25	11	23	Ep	40.51		22.86	11.74			21.89																			100	99
S25	11	24	Ilm		49.85		48.56	1.59																					100	96
S25	11	25	"Ilm"		60.97		36.53	2.50																					100	89
S25	11	26	Ep	39.99		24.78	9.49			22.74																			100	107
S25	11	27	Opx	56.07		4.04	5.51		33.23	0.28								0.87											100	120
S25	11	28	Chr			17.14	21.44		10.85									50.58											100	110
S25	11	29	Opx	56.25		4.01	5.44		32.96	0.43								0.91											100	120
S25	11	30	Spl			31.59	18.88		14.47									35.06											100	112
S25	11	31	Feohy +	4.58		1.04	94.38																						100	82
S25	11	32	Chr			14.34	19.46		11.49									54.70											100	112
S25	11	33	Ilm		53.87		45.56	0.57																					100	102
S25	11	34	Mgohy						100.00																				100	46
S25	11.1	1	Chr		0.60	8.33	31.74		3.17									55.42		0.74									100	104
S25	11.1	2	Grt	38.88		16.84	3.66		37.94									2.68											100	103
S25	11.1	3	Chl + Ms	32.78		17.76	29.67	0.37	12.47		0.67	3.26																3.01	100	94
S25	11.1	4	TiO2 +	11.50	70.85	8.47	5.34		2.43			1.41																	100	108
S25	11.1	5	Qz	99.47			0.53																						100	120
S25	11.1	6	"Ilm"		65.25		32.07	1.63		1.05																			100	99
S25	11.1	7	Ttn	33.47	28.32	7.11	1.42			26.92					2.76														100	114
S25	11.1	8	Ab	67.89		19.52	0.33			1.43	10.84																		100	120
S25	11.1	9	Chl	27.46	0.45	19.33	24.57		13.18																				85	99
S25	11.1	10	Zrn +	37.16	1.18		0.41			0.95												60.30							100	121
S25	12	1	Ep	40.54		28.29	5.69			22.47																			100	97
S25	12	2	Grt	39.66		21.11	28.89	0.78	1.69	7.86																			100	114
S25	12	3	Ep	40.36		25.94	7.99			22.71																			100	97
S25	12	4	Chr +	9.24		6.93	23.58		8.35		0.59							51.31											100	98
S25	12	5	"Ilm"	0.89	80.66		16.80																					1.65	100	100
S25	12	6	Ep	41.16		28.68	2.00		1.59	23.57																			100	97
S25	12	7	Chr			16.57	18.08		12.18								0.47	52.70											100	111
S25	12	8	Grt	39.45		20.63	34.78	1.46	2.74	0.96																			100	118
S25	12	9	Chr +	4.68	0.52	5.02	42.69	2.34	4.76		0.63							37.95		1.42									100	103
S25	12	10	Ep	40.40		27.17	6.58			22.85																			100	97
S25	12	11	Chr			9.31	23.42		9.42									57.85											100	116
S25	12	12	Opx	57.90		1.07	5.61		34.02	0.88								0.52											100	127
S25	12	13	Grt	39.45		20.78	20.43	13.70	1.12	4.52																			100	121
S25	12	14	Spl			43.97	14.27		17.55									24.21											100	115
S25	12	15	Chr			9.68	30.05		4.40									55.87											100	108
S25	12	16	Grt	39.40		20.83	33.69	0.41	4.00	1.68																			100	110
S25	12	17	Opx	55.82		4.03	5.53		33.35	0.52								0.74											100	111
S25	12	18	Spl			51.91	11.79		20.00									15.92	0.39										100	106
S25	12	19	Ep	40.62		27.58	5.53			22.97								0.30											100	97
S25	12	20	Ilm		52.08		47.07	0.84																					100	103
S25	12	21	Ep	41.21		26.30	7.13			22.37																			100	97
S25	12	22	Chr + Chl	7.12	0.61	6.71	29.07	1.28	9.67									45.56											100	107
S25	12	23	Spl	1.70		49.23	11.76		18.90	2.05								16.37											100	110
S25	12	24	Feohy +	4.96		1.17	88.48		1.23																			4.16	100	76
S25	12	25	Spl			31.42	18.93		14.40									35.25											100	106
S25	12	26	"Chr"		2.80	16.64	35.85		7.80								0.53	36.38											100	102
S25	12	27	Opx	56.09		3.93	5.49		33.39	0.31								0.79											100	104
S25	12	28	Qz +	93.03	6.97																								100	108
S25	12	29	Chr			11.25	21.13		9.46									58.16											100	99
S25	12	30	Feohv + Chl	6.09		3.88	69.09	6.88	2.10	0.61	1.58							0.48										9.30	100	73

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	12	31	Chr			18.06	19.42		11.18									51.34											100	112
S25	13	1	Opx	56.21		3.55	5.89		33.41	0.35								0.59											100	109
S25	13	2	Feohy +	2.40		0.91	94.26																					2.43	100	83
S25	13	3	Ilm		51.36	0.55	43.03	4.07	0.99																				100	100
S25	13	4	Ep	39.78	0.38	22.89	11.41	0.49		22.05																			97	103
S25	13	5	Ilm		48.28		48.27	3.46																					100	95
S25	13	6	Chr +	0.94	0.45	9.72	27.38		7.78	1.04								52.68											100	82
S25	13	7	St	30.17	0.80	53.90	11.86		2.24												1.02								100	106
S25	13	8	Ilm		53.65		44.63	1.72																					100	98
S25	13	9	Spl			28.11	18.89		13.53									39.48											100	101
S25	13	10	St	29.81	0.70	53.66	13.09	0.28	2.45																				100	110
S25	13	11	Chr			10.07	19.11		10.44									60.38											100	110
S25	13	12	Ep	40.42		27.16	6.75			22.67																			97	114
S25	13	13	Zrn	31.27																		68.73							100	123
S25	13	14	Ilm +	12.02	46.79		31.18	1.61		8.39																			100	112
S25	13	15	Spl		0.39	32.87	21.34		14.92									30.48											100	115
S25	13	16	"Ilm"		59.33		39.13	1.54																					100	107
S25	13	17	TiO <sub>2</sub> + Qz	17.74	81.89		0.37																						100	114
S25	13	18	Spl		0.41	30.04	18.12		15.28									36.15											100	111
S25	13	19	Feohy +	3.85		1.06	92.85		0.63	0.45			1.17																100	81
S25	13	20	Mix	60.12		15.64	8.42			15.83																			100	110
S25	13	21	Ilm +	4.41	57.02		33.00	1.82		3.74																			100	104
S25	13	22	Chr			13.89	19.95		10.60								0.53	55.04											100	105
S25	13	23	Ep	40.18		24.68	9.16			22.98																			97	103
S25	13	24	Ep	36.17		19.18	22.22			19.43																			97	106
S25	13	25	Ilm +	4.66	51.18		32.68	8.17		3.31																			100	102
S25	13.1	1	Qz	99.40		0.60																							100	117
S25	13.1	2	TiO <sub>2</sub> +	2.47	95.90	0.82	0.82																						100	104
S25	13.1	3	Mix	68.98	24.18	0.78	0.65			0.89			2.65												1.87				100	104
S25	13.1	4	Mnz +	2.69		2.74				4.12		0.66	34.80	6.75	0.12								1.89		27.51	14.01		4.71	100	83
S25	14	1	Spl			39.09	14.65		16.60									29.65											100	105
S25	14	2	Chr			12.11	21.41		9.23									57.24											100	104
S25	14	3	Amph	54.49		1.82	15.93	0.63	13.21	10.91																			97	107
S25	14	4	Opx	57.71		1.58	5.30		33.85	0.84								0.71											100	120
S25	14	5	Chr			22.99	18.46		12.87									45.68											100	113
S25	14	6	Ms + TiO <sub>2</sub>	51.11	24.06	16.85	0.51		0.34		0.95	4.42			1.76														100	118
S25	14	7	Ilm		52.71		44.29	3.00																					100	107
S25	14	8	Amph	46.20	0.66	12.30	14.24		10.82	10.81	1.64	0.34																	97	113
S25	14	9	Chr			7.65	24.60		8.01									59.74											100	107
S25	14	10	Feohy +	10.28		3.82	82.69		0.89			1.46	0.86																100	62
S25	14	11	Chr			23.79	16.54		13.49									46.18											100	101
S25	14	12	St	28.95		44.34	20.14		6.57																				100	92
S25	14	13	Feohy +	3.41		1.35	95.24																						100	71
S25	14	14	Feohy +	4.43		1.14	93.09		0.98	0.37																			100	68
S25	14	15	Chr			9.44	22.93		10.08									57.54											100	103
S25	14	16	Ep + Ab	47.61		26.35	2.23		1.86	19.01	2.94																		100	115
S25	14	17	Ep + Ab	49.83		20.23	9.62			16.07	4.26																		100	108
S25	14	18	Zrn	30.84																		67.53					1.63		100	116
S25	14	19	Chr		0.48	21.40	25.70		10.14									42.28											100	100
S25	14	20	Qz	99.38			0.30			0.33																			100	107
S25	14	21	St	30.37	0.88	54.68	12.13		1.24												0.71								100	94
S25	14	22	Grt	39.98		20.50	22.69	7.53	1.11	8.19																			100	100
S25	14.1	1	TiO <sub>2</sub>		100.00																								100	103
S25	14.1	2	Zrn	30.87	0.88																	68.25							100	119
S25	14.1	3	Ms	47.93	0.40	33.35	2.40		0.70		2.60	7.62																	95	108
S25	14.1	4	Zrn	30.72	0.82																	67.01					1.45		100	118

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	14.1	5	Zrn	31.38	1.13																	67.49							100	120
S25	15	1	"Ilm" +	3.34	67.76		23.29	2.89		2.73																			100	100
S25	15	2	Ep	40.71		30.22	3.51			22.56																			97	103
S25	15	3	Chr			23.37	16.70		13.66									46.28											100	101
S25	15	4	Ep	40.25		25.08	9.66	0.32		21.69																			97	102
S25	15	5	Ep	39.94		21.46	12.90	0.46		22.24																			97	106
S25	15	6	Ep	40.23		24.35	9.61			22.81																			97	108
S25	15	7	Chr			12.68	21.50		10.28									55.54											100	106
S25	15	8	Ilm		50.36		46.34	3.30																					100	103
S25	15	9	Ilm +	3.25	59.93	2.80	18.69	13.19	2.14																				100	112
S25	15	10	Ilm		53.63		22.43	23.94																					100	105
S25	15	11	Ilm		51.74		47.40	0.86																					100	98
S25	15	12	Chr +	11.14	0.64	6.19	22.42	0.95	12.56		0.42							45.01			0.66								100	93
S25	15	13	Grt	39.36		19.60	4.26			36.78																			100	97
S25	15	14	Chr			17.74	18.62		11.87									51.78											100	101
S25	15	15	Ab	67.16		16.39	2.96			4.62	8.87																		100	108
S25	15	16	Chr			9.02	25.69		7.75									57.53											100	102
S25	15	17	Chr			11.69	14.83		13.84									59.64											100	97
S25	15	18	Spl			48.96	12.84		19.01									19.19											100	99
S25	15	19	Ep	40.23		23.77	10.50			22.49																			97	96
S25	15	20	Chr	2.08		20.50	18.60		13.06								0.42	45.35											100	102
S25	15	21	TiO <sub>2</sub>		98.89		1.11																						100	93
S25	15	22	Amph	47.68		10.60	12.69	0.33	12.67	10.43	2.03	0.23						0.35											97	102
S25	15	23	Ep	40.47		22.37	11.83			22.33																			97	94
S25	15.1	1	Spl			30.47	16.61		14.44									38.47											100	106
S25	15.1	2	Chl	31.23		18.19	2.64		31.01									1.94											85	97
S25	15.1	3	Spl			37.15	15.20		15.54									32.11											100	106
S25	15.1	4	Chr + Spl	30.65		21.95	6.57		32.30									8.54											100	102
S25	15.1	5	Chr + Spl	10.73		25.43	15.05		17.84									30.94											100	94
S25	16	1	Spl			30.26	16.71		14.83									38.20											100	111
S25	16	2	"Ilm" +	9.24	78.20		6.24			6.32																			100	108
S25	16	3	Opx	56.33		3.72	5.49		32.82	0.76								0.88											100	123
S25	16	4	Ttn +	24.40	33.61	5.47	15.87	0.85	5.05	14.75																			100	114
S25	16	5	Mgohy				2.73		95.95	1.33																			100	52
S25	16	6	Chr			11.49	17.05		12.38									59.08											100	121
S25	16	7	Tur	37.88	0.83	33.04	6.10		6.32	0.89	1.95																		87	110
S25	16	8	Opx	56.58		4.58	6.39		27.50	3.87								1.08											100	110
S25	16	9	Ep	41.00		27.50	6.18			22.32																			97	119
S25	16	10	Chr +	1.33		4.22	32.33		4.33		0.68						0.75	56.34											100	109
S25	16	11	"Chr"		0.41	13.72	39.46	0.94	5.53									39.94											100	109
S25	16	12	Qz	100.00																									100	121
S25	16	13	Ilm		52.43		44.63	0.60	2.33																				100	102
S25	16	14	Grt	39.65		21.04	31.65	2.03	4.04	1.58																			100	112
S25	16	15	Chr			18.71	20.34		11.90									49.04											100	111
S25	16	16	Ep	41.11		28.24	1.28		2.13	22.79					1.44														97	99
S25	16	17	TiO <sub>2</sub>	0.49	95.75	0.43	2.91			0.42																			100	97
S25	16	18	Grt	40.75		22.29	1.06			35.89																			100	113
S25	16	19	Chr			9.78	17.39		13.13									59.69											100	104
S25	16	20	Grt	40.13		20.88	27.06	0.57	2.27	9.08																			100	110
S25	16	21	Chr	0.70	0.79	14.24	31.08		6.70									46.48											100	101
S25	16	22	Spl			47.01	14.84		17.63									19.92			0.59								100	105
S25	16	23	Chl + Chr	40.87		11.72	8.36		36.25		0.39							2.41											100	80
S25	16	24	Chl +	37.82		22.69	15.04		21.36	1.47	1.63																		100	98
S25	16	25	Ilm		50.96		47.91	1.13																					100	96
S25	16	26	Chr +	3.40	0.41	4.09	27.18		2.59								0.48	60.80			1.04								100	93
S25	16	27	Spl		66.03		32.10	1.87																					100	99



Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	16.1	1	Chl	27.56		18.80	20.47		17.78									0.40											85	100
S25	16.1	2	Ab	69.08	0.37	18.51	0.37				11.67																		100	122
S25	16.1	3	Ilm + Qz + Gp	12.21	32.12	0.44	17.81	0.98		11.11				16.66						8.68									100	131
S25	16.1	4	Ap				0.34			49.48			44.87		5.31														100	123
S25	16.1	5	Chl	26.77	0.44	19.73	20.06		18.00																				85	96
S25	16.2	1	Zrn	31.45	1.05																	67.50							100	117
S25	16.2	2	Ab	69.29	0.43	18.57					11.71																		100	121
S25	16.2	3	TiO <sub>2</sub>		99.50		0.50																						100	109
S25	16.2	4	Chl	25.87	0.67	20.14	26.03	0.42	11.87																				85	101
S25	16.2	5	Qz	100.00																									100	123
S25	16.2	6	TiO <sub>2</sub>		99.16		0.49			0.35																			100	109
S25	16.2	7	Cal		0.43		0.43	1.12		33.44					20.59														56	90
S25	17	1	Grt	40.55	1.66	17.62	4.61			35.56																			100	108
S25	17	2	Grt	39.93		20.95	27.01	1.16	1.66	9.28																			100	112
S25	17	3	Ttn	33.11	38.94		0.52			27.42																			100	111
S25	17	4	Ilm +	4.43	51.75	0.69	38.06	1.49		3.59																			100	105
S25	17	5	St	29.68	0.65	52.90	13.66		2.33												0.78								100	111
S25	17	6	Ep	40.67		28.63	4.87			22.83																			97	114
S25	17	7	Ilm		54.18		44.66	1.16																					100	102
S25	17	8	Chr + Qz	26.19		16.87	11.84		27.71									17.08			0.32								100	99
S25	17	9	Qz + TiO <sub>2</sub>	66.19	33.81																								100	127
S25	17	10	Mix	18.38		6.31	63.07		2.85	2.23	1.44	0.83	0.99															3.90	100	93
S25	17	11	Grt	40.85	0.67	17.06	7.36			34.05																			100	122
S25	17	12	"Ilm" +	4.57	64.27	0.92	27.95	2.29																					100	107
S25	17	13	Chr			9.97	21.70		9.21								0.51	58.61											100	112
S25	17	14	Mix	25.67	34.42	5.24	15.07	0.80	4.60	14.20																			100	116
S25	17	15	Ilm		48.76		48.29	2.95																					100	106
S25	17	16	Opx	56.79		2.86	5.60		33.62	0.45								0.67											100	119
S25	17	17	Mix	53.59		5.19	22.79		11.96		1.56	4.91																	100	115
S25	17	18	Chr			4.80	21.16		7.24									66.80											100	102
S25	17	19	Opx	55.78		4.03	5.61		32.80	0.86								0.93											100	110
S25	17	20	Cal				0.20	0.27	0.41	30.52					24.60														56	89
S25	17	21	Zrn	30.48			0.40															69.12							100	104
S25	17	22	"Chr"				73.42	1.42	2.76									21.48	0.92										100	87
S25	17	23	Opx	55.71		4.20	5.24		32.08	1.91								0.86											100	106
S25	17	24	Mix	21.67	50.45	1.43	6.88	0.94		18.44											0.20								100	95
S25	17	25	Ep	39.56		19.87	13.45	4.20		19.93																			97	104
S25	17	26	Chr			24.63	17.99		13.24									43.60			0.54								100	105
S25	17	27	Ep	39.90		20.71	14.06			22.34																			97	105
S25	17	28	Ilm		51.01		45.56	3.43																					100	102
S25	17	29	Feohy +	6.13		4.82	75.35		0.93	1.11	1.48		1.15															9.03	100	76
S25	17	30	Ilm		54.07		42.98	2.95																					100	114
S25	17	31	Ep	40.00		24.06	10.39			22.55																			97	115
S25	17	32	Grt	39.92		20.73	31.44	1.38	2.78	3.76																			100	121
S25	17	33	Tur	38.51	0.90	30.21	8.19		6.27	0.49	2.44																		87	107
S25	17	34	Chr			22.51	17.44		13.11								0.45	46.49											100	119
S25	17.1	1	"Chr"	5.67		2.18	41.13	2.56	6.69									41.27			0.50								100	99
S25	17.1	2	Chl	32.88		13.62	2.55		31.46						2.58			1.91											85	108
S25	17.1	3	Spl			31.90	16.15		16.49									35.45											100	112
S25	17.1	4	"Chr"	5.59		3.62	43.12	4.56	6.90									35.29			0.93								100	104
S25	17.1	5	"Chr"	10.12		4.58	42.24	1.45	9.97									29.63			2.00								100	101
S25	17.1	6	Chr			14.03	18.31		11.14									55.86			0.66								100	114
S25	17.1	7	St	31.00	0.50	54.60	9.13	0.28	0.85												3.63								100	115
S25	17.1	8	Grt	39.52		20.96	31.60	2.07	3.75	2.09																			100	116
S25	17.1	9	Spl		0.47	37.23	19.74		15.39									27.17											100	110
S25	18	1	Opx	56.35		3.43	5.67		32.72	1.09								0.74											100	110

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	18	2	St	28.32		44.05	21.05	0.42	6.16																				100	98
S25	18	3	Chr			17.76	19.51		11.59									50.86			0.28								100	105
S25	18	4	Grt	39.66		20.99	30.98	1.06	3.74	3.57																			100	109
S25	18	5	Olig + Chl	63.58		16.46	9.02		2.90	2.44	5.60																		100	113
S25	18	6	Ilm +	3.95	51.48		38.95	2.71		2.59											0.32								100	108
S25	18	7	Feohy +	6.04		1.04	91.06			0.41			1.04					0.42											100	84
S25	18	8	Chr			9.64	26.22		7.71								0.50	55.46			0.48								100	118
S25	18	9	Mix	19.68	64.64	7.41	3.15		1.04			3.99									0.08								100	107
S25	18	10	Grt	39.87		20.99	29.97	0.83	3.36	4.71											0.26								100	117
S25	18	11	Ep	40.59		30.87	1.51			22.73					1.30														97	114
S25	18	12	Ep	39.90		21.08	13.65			22.38																			97	109
S25	18	13	Chr			19.25	18.82		12.25									49.68											100	106
S25	18	14	Fe-Per				10.82		89.18																				100	50
S25	18	15	Chr			7.69	30.66		4.24												0.70								100	97
S25	18	16	TiO <sub>2</sub> +	12.48	82.32	2.41	0.52				0.52	0.23			1.51														100	103
S25	18	17	Crd	44.62	0.90	36.00	5.06		9.85	0.76	2.81																		100	91
S25	18	18	TiO <sub>2</sub> + Qz	44.19	54.72		1.09																						100	88
S25	18	19	Zrn	31.21																		68.79							100	102
S25	18	20	Qz + TiO <sub>2</sub>	87.55	12.45																								100	100
S25	18	21	Spl			39.95	14.89		17.07									28.09											100	106
S25	18	22	Cpx	53.42	0.82	2.42	8.03	0.43	15.40	19.05	0.43																		100	107
S25	18	23	Ilm		56.84		40.31	2.84																					100	96
S25	18	24	Ilm		50.34		44.29	5.25													0.12								100	98
S25	18	25	Chr			23.26	16.61		13.47									46.67											100	110
S25	18.1	1	TiO <sub>2</sub>		99.28		0.72																						100	112
S25	18.1	2	Ap	0.46			0.66			47.16			43.85		6.38													1.48	100	130
S25	18.1	3	Qz	100.00																									100	126
S25	18.1	4	Chl	25.87	0.62	21.20	24.62		12.69																				85	102
S25	18.1	5	TiO <sub>2</sub>		98.71		1.29																						100	111
S25	19	1	Opx	56.86		2.99	5.25		33.81	0.39								0.70											100	108
S25	19	2	Chr			9.10	21.59		7.12									62.20											100	99
S25	19	3	Opx	56.08		3.85	5.74		33.28	0.43								0.63											100	107
S25	19	4	Spl			38.22	18.92		15.08									27.78											100	100
S25	19	5	Ilm		53.61		42.06	4.32																					100	101
S25	19	6	TiO <sub>2</sub> +	2.70	96.44		0.85																						100	100
S25	19	7	Chr			11.58	17.13		12.39									58.90											100	103
S25	19	8	Chr			8.40	18.09		9.22									62.41			1.89								100	98
S25	19	9	Opx	56.50		3.38	5.00		30.93	3.57								0.62											100	108
S25	19	10	Ilm	0.80	59.80		31.97	6.71		0.71																			100	98
S25	19	11	Chr +	6.27		7.35	28.62	1.14	9.34								0.60	46.00			0.66								100	109
S25	19	12	TiO <sub>2</sub> + Qz	16.05	83.35		0.60																						100	110
S25	19	13	TiO2 +	7.70	67.75	2.30	9.38	0.67		6.38	0.98		1.09					0.39										3.35	100	99
S25	19	14	Mix	36.15		18.54	12.97	1.76		12.02														5.32	9.98	3.27			100	109
S25	19	15	"Chr"	4.94	0.68	0.93	49.47	6.24	6.80									30.65			0.29								100	103
S25	19	16	Ep	40.23		27.06	6.97			22.74																			97	109
S25	19	17	Chr			21.29	17.71		12.25									48.75											100	106
S25	19	18	"Ilm" + Chl	10.00	70.17	6.30	8.09		4.97		0.47																		100	110
S25	19	19	Ilm +	2.46	50.80		41.85	2.94		1.65											0.31								100	111
S25	19	20	TiO <sub>2</sub> + Chl	6.85	82.65	2.84	3.44		3.66		0.55																		100	88
S25	19	21	Chr			8.17	22.37		7.67									61.49			0.30								100	117
S25	19	22	Grt	41.12		22.20	0.81			35.86																			100	123
S25	19	23	Chr			13.52	17.02		9.86								0.44	59.17											100	118
S25	19	24	Ab + TiO <sub>2</sub>	60.78	7.22	17.47	3.14		0.55		10.84																		100	133
S25	19.1	1	"Chr"	1.05			55.94	7.02	1.96									33.26			0.77								100	105
S25	19.1	2	Chr		0.35	27.78	27.45		9.94																				100	114
S25	19.1	3	Chl	33.04		15.92	2.72		32.68									0.64											85	103

Table B13.1: Mineral chemical analyses from sample 25.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	ZrO2	Ag2O	La2O3	Ce2O3	Nd2O3	HfO2	WO3	Total	Actual Total
S25	19.1	4	Srp	40.71		0.90	7.40		35.97	0.23				1.30				0.50											87	105
S25	20	1	Ep	40.20		23.42	11.09			22.30																			97	109
S25	20	2	Chr			10.12	22.69		8.46									58.22			0.52								100	110
S25	20	3	TiO2 +	3.75	90.16	2.10	1.51					0.81			1.44						0.22								100	119
S25	20	4	Grt	39.87		21.36	30.41	1.35	5.25	1.76																			100	122
S25	20	5	Ilm		52.10		45.16	0.62	2.11																				100	119
S25	20	6	Spl			51.07	13.21		18.98								0.36	16.37											100	124
S25	20	7	TiO2 + Chl	9.69	70.45	7.66	2.32		9.50												0.37								100	113
S25	20	8	Mix	21.76	48.43	0.71	10.92	0.95		17.24																			100	118
S25	20	9	Spl			54.02	12.00		19.61									14.37											100	117
S25	20	10	Chr			12.88	20.38		9.56									57.17											100	113
S25	20	11	Mix	44.37		10.41	8.94		30.93	4.94	0.42																		100	90
S25	20	12	Spl			50.12	12.85		18.78									18.25											100	104
S25	20	13	Grt	39.63		21.04	31.53	0.98	3.66	3.16																			100	110
S25	20	14	Spl			31.58	22.28		12.85									32.82			0.46								100	100
S25	20	15	Zrn	31.25																		68.75							100	108
S25	20	16	Mgohy						97.97						2.03														100	47
S25	20	17	Ep	41.21		26.79	1.60		3.44	22.31	0.33				1.31														97	103
S25	20	18	Spl			35.92	15.90		15.81									32.37											100	100
S25	20	19	Zrn	31.08																		68.92							100	111
S25	20	20	Ep	40.48		27.00	7.20			22.33																			97	98
S25	20	21	"Ilm" +	1.67	76.37		17.98	2.32		1.66																			100	93
S25	20	22	Tur	38.34	1.02	31.60	6.48		6.74	0.44	2.37																		87	90
S25	20	23	Spl			42.75	14.66		17.57									25.02											100	102
S25	20	24	Ep	40.09		24.98	9.35			22.58																			97	102
S25	20	25	Chr			17.47	23.31		10.98									48.23											100	104
S25	20	26	Chr			15.33	18.38		11.39									54.89											100	109
S25	20	27	Ttn	33.91	35.02	1.82	0.58			26.78					1.88														100	116
S25	20	28	Qz	100.00																									100	122
S25	20	29	Grt	39.35		21.05	32.13	0.44	1.64	5.39																			100	113
S25	20	30	Ilm		58.51		40.61	0.88																					100	99
S25	20	31	St	30.35	0.38	53.61	13.76		1.91																				100	112
S25	20	32	Feohy +	2.93		0.70	96.37																						100	91
S25	20.1	1	Ep	40.33		22.11	12.33			22.23																			97	112
S25	20.1	2	Aln +	37.97		20.44	12.32	1.25		15.75														3.26	6.63	2.39			100	109
S25	20.1	3	Mnz							0.65			33.93		1.55				0.12				2.14	18.15	33.74	9.73			100	109
S25	20.1	4	Qz	100.00																									100	124
		Notes																												
		+ = indicates more than one mineral present																												
		* * = indicates that mineral is altered																												

B14: SEM-BSE images and EDS mineral analyses for sample S26.

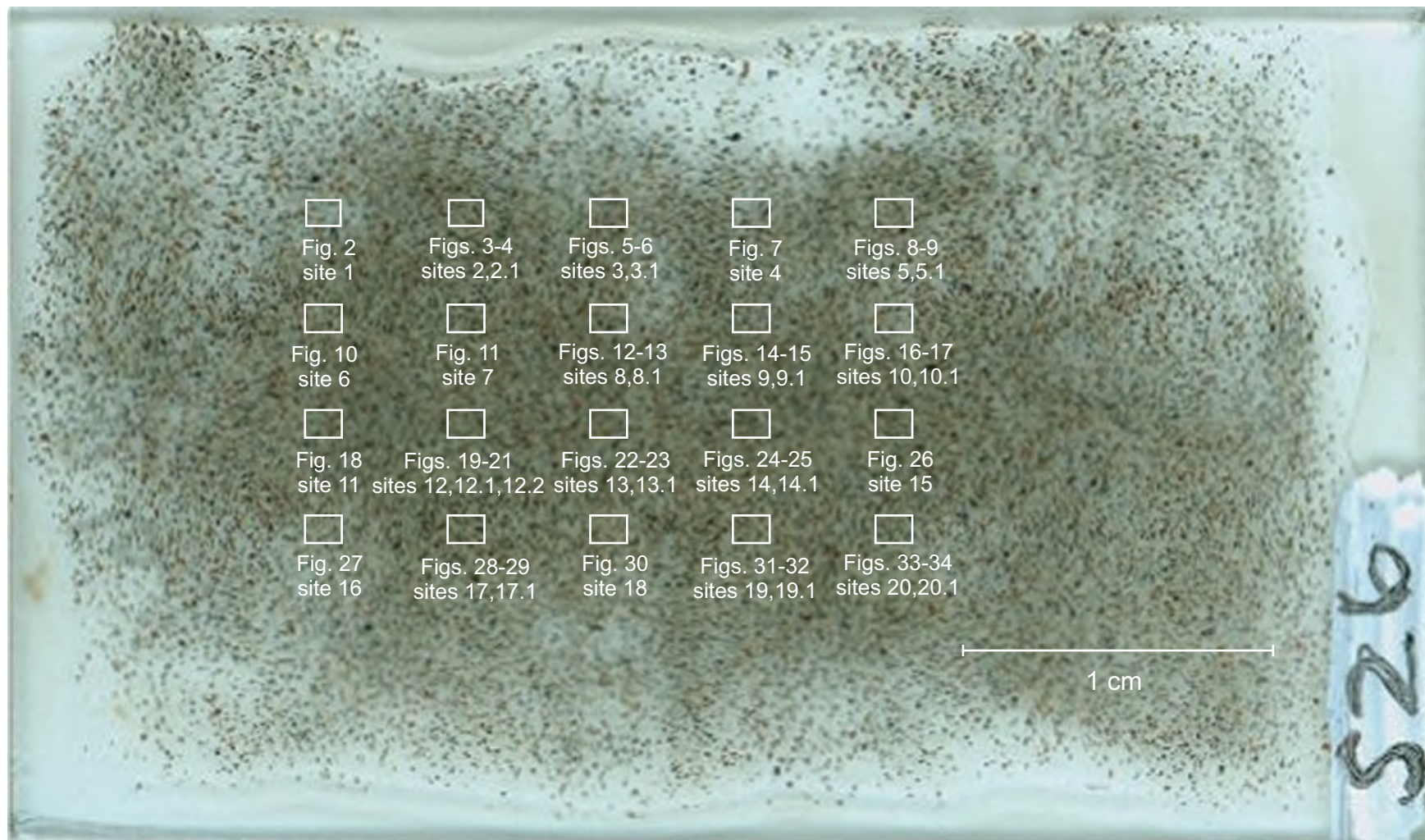
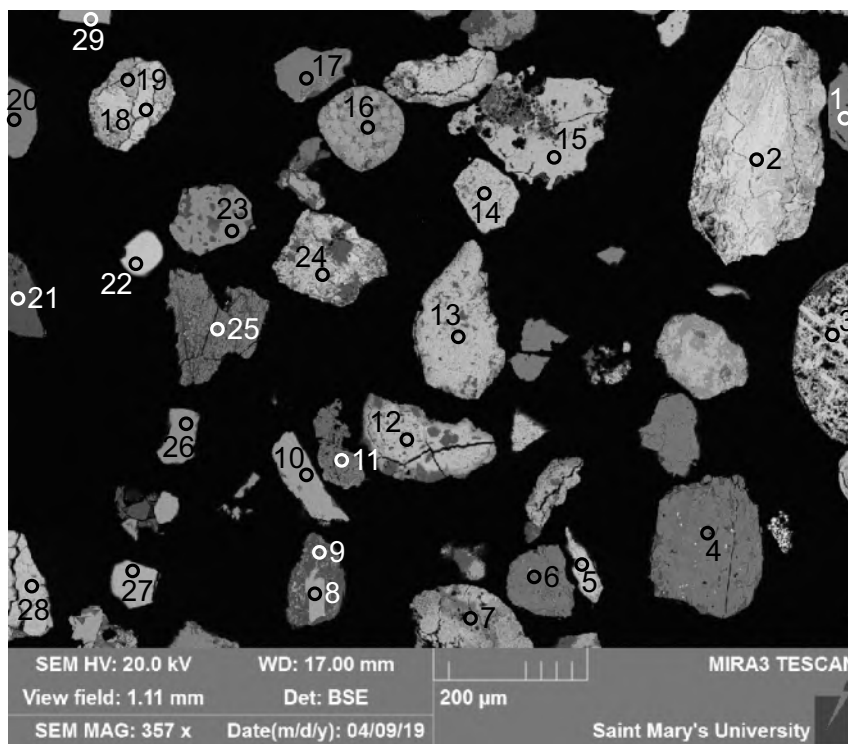


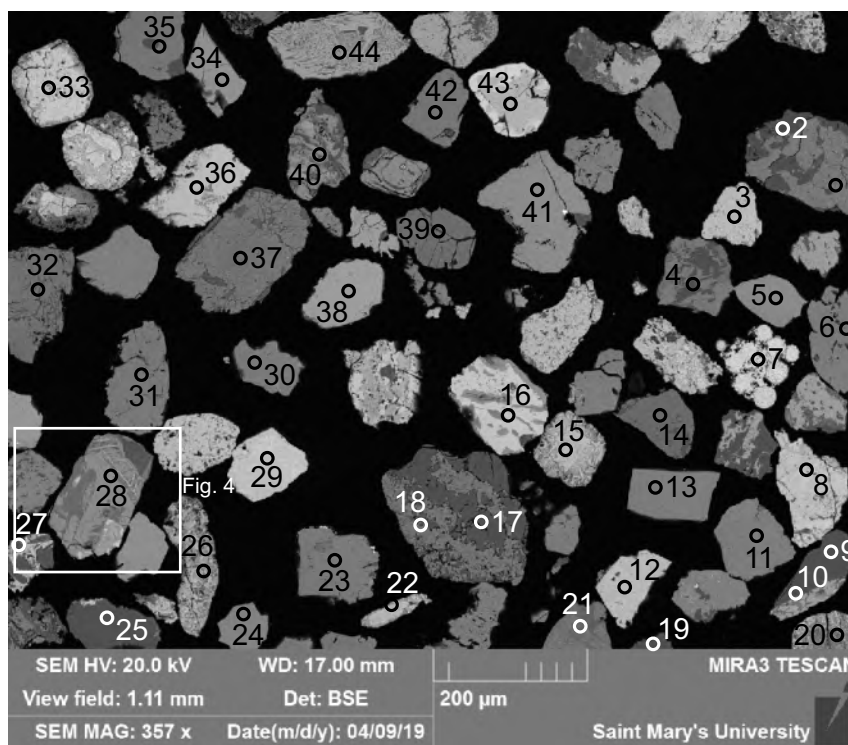
Figure B14.1: Sample S26





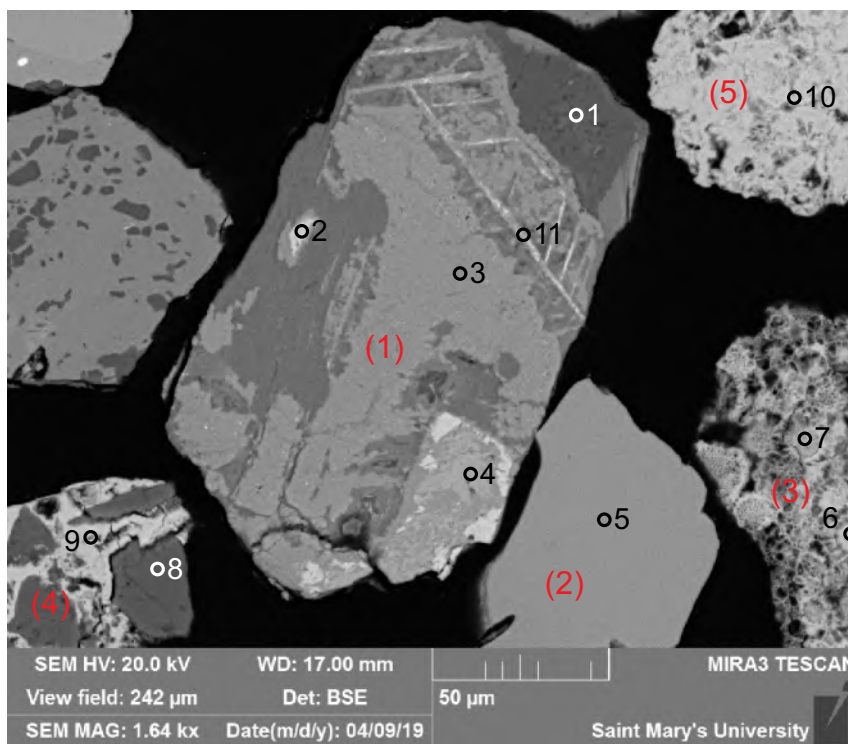
- 1:Epidote
- 2:Fe-oxide/hydroxide
- 3:Fe-oxide/hydroxide
- 4:Amphibole
- 5:Fe-oxide/hydroxide +
- 6:Amphibole
- 7:Fe-oxide/hydroxide + Chlorite +
- 8:TiO<sub>2</sub>
- 9:Mix
- 10:TiO<sub>2</sub>
- 11:Clinopyroxene
- 12:Fe-oxide/hydroxide +
- 13:Fe-oxide/hydroxide +
- 14:Fe-oxide/hydroxide +
- 15:Fe-oxide/hydroxide +
- 16:Fe-oxide/hydroxide +
- 17:Spinel
- 18:Fe-oxide/hydroxide +
- 19:Fe-oxide/hydroxide +
- 20:Epidote
- 21:Quartz
- 22:Ilmenite
- 23:Titanite
- 24:Fe-oxide/hydroxide +
- 25:Epidote
- 26:Garnet
- 27:Chromite
- 28:Fe-oxide/hydroxide +
- 29:Chromite

Figure B14.2: Sample S26 site 1 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Ttn, Cpx, Amph, Kfs, Qz.



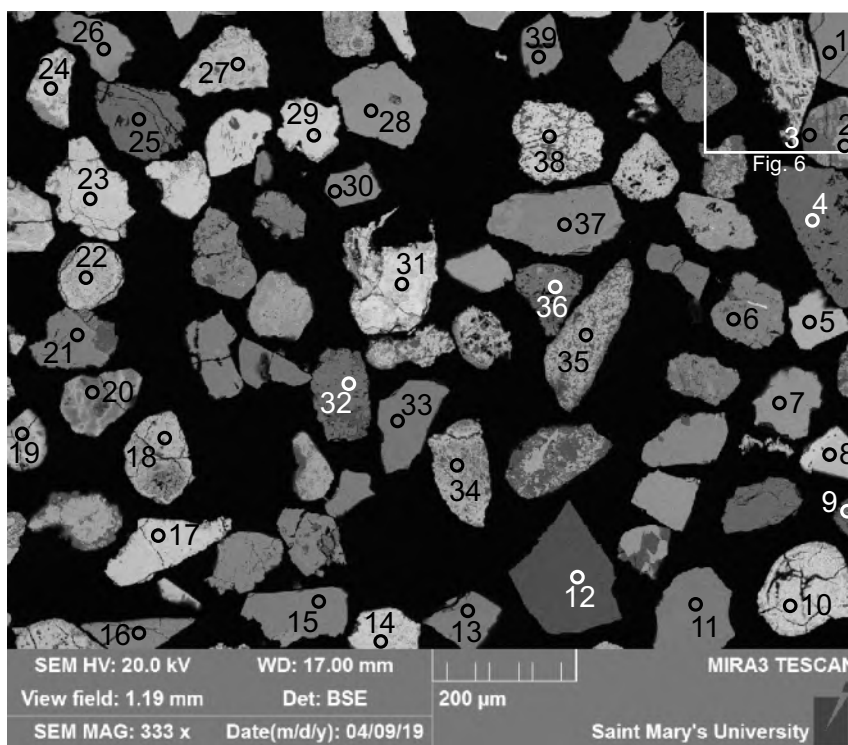
- 1:Epidote
- 2:Quartz
- 3:Fe-oxide/hydroxide +
- 4:Quartz +
- 5:Apatite
- 6:Epidote
- 7:Pyrite
- 8:Fe-oxide/hydroxide +
- 9:Quartz
- 10:Mix
- 11:Epidote
- 12:Fe-oxide/hydroxide +
- 13:Epidote
- 14:Epidote
- 15:Fe-oxide/hydroxide +
- 16:Ilmenite
- 17:Albite
- 18:Epidote
- 19:Quartz
- 20:Chromite + Chlorite +
- 21:Chromite + Chlorite
- 22:Fe-oxide/hydroxide +
- 23:Epidote
- 24:Garnet
- 25:Quartz + Fe-oxide/hydroxide
- 26:Fe-oxide/hydroxide +
- 27:Quartz + Fe-oxide/hydroxide
- 28:Titanite
- 29:Fe-oxide/hydroxide +
- 30:Epidote
- 31:Epidote
- 32:Amphibole
- 33:Fe-oxide/hydroxide +
- 34:Garnet
- 35:Quartz + Epidote
- 36:Fe-oxide/hydroxide +
- 37:Amphibole
- 38:TiO<sub>2</sub>
- 39:Clinopyroxene
- 40:Garnet
- 41:Titanite
- 42:Garnet
- 43:Chromite
- 44:TiO<sub>2</sub> +

Figure B14.3: Sample S26 site 2 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Ttn, Cpx, Amph, Pl (Ab), Qz, Ap, Chl, Py.



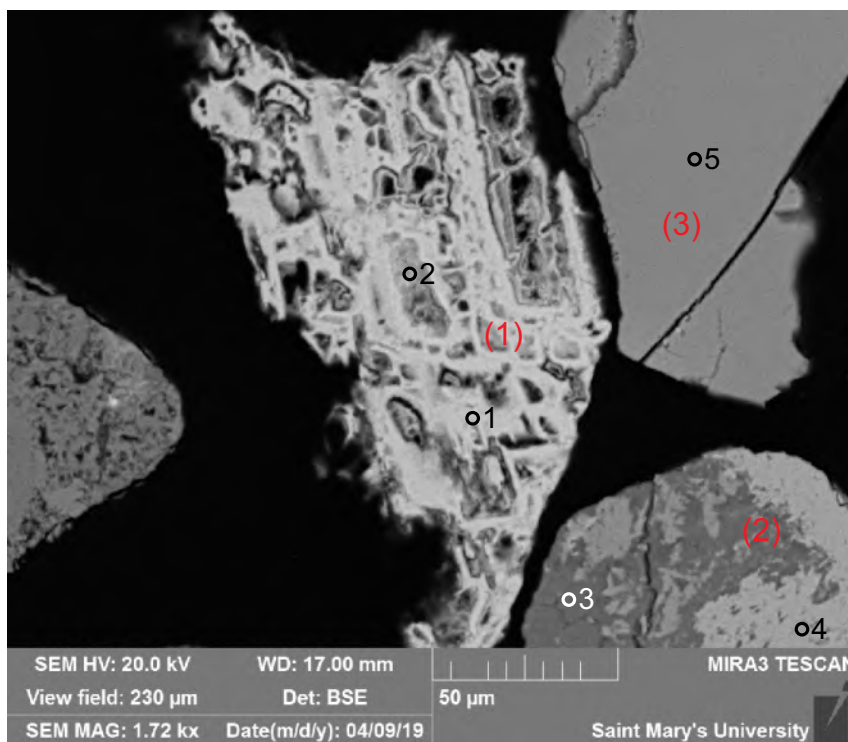
- 1: Albite +
- 2: Ilmenite +
- 3: Titanite
- 4:  $\text{TiO}_2$
- 5: Garnet
- 6: Fe-oxide/hydroxide +
- 7: Fe-oxide/hydroxide +
- 8: Quartz
- 9: Fe-oxide/hydroxide +
- 10: Fe-oxide/hydroxide +
- 11: Titanite + Chlorite

Figure B14.4: Sample S26 site 2.1 (SEM). 1: Lithic clast (albite + titanite + relics of ilmenite probably altering to titanite +  $\text{TiO}_2$  probably with Fe-oxide/hydroxide corona rim, metamorphic). 2: A detrital garnet grain. 3: Pedogenic aggregate with Fe-oxide/hydroxide. 4: Pedogenic aggregate with Fe-oxide/hydroxide cementing quartz grains. 5: Fe-oxide/hydroxide probably pedogenic.



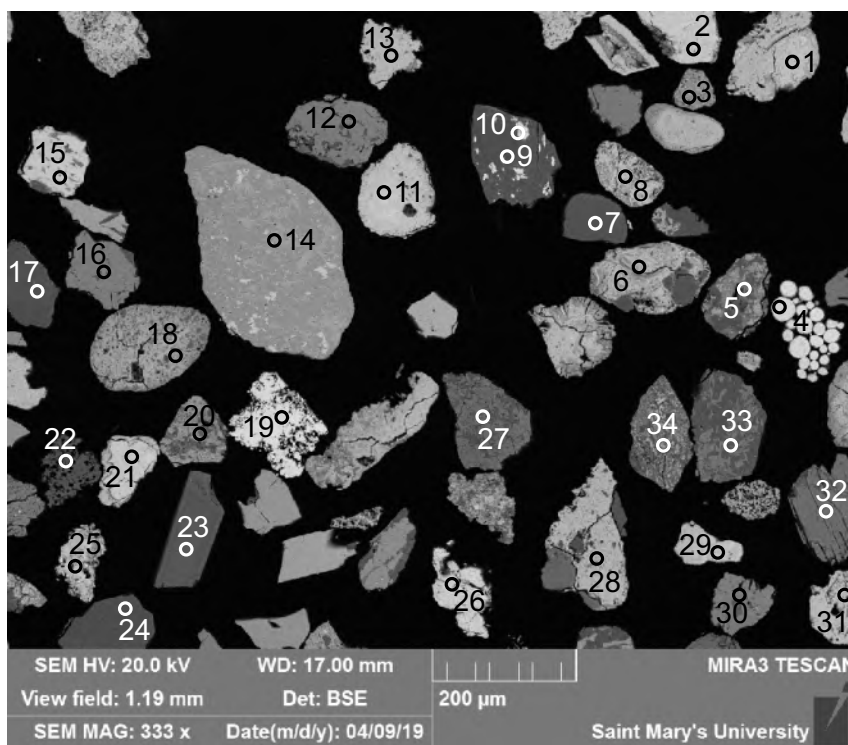
- 1: Spinel
- 2:  $\text{TiO}_2$
- 3: Chlorite
- 4: Epidote
- 5: Chromite
- 6: Epidote
- 7: Titanite
- 8: Chromite
- 9: Muscovite +
- 10: Fe-oxide/hydroxide +
- 11: Amphibole
- 12: Quartz
- 13: Epidote
- 14: Fe-oxide/hydroxide +
- 15: Garnet
- 16: Apatite +
- 17: Fe-oxide/hydroxide +
- 18: Fe-oxide/hydroxide +
- 19: Fe-oxide/hydroxide +
- 20: Fe-oxide/hydroxide +
- 21: Epidote
- 22: Fe-oxide/hydroxide +
- 23: Fe-oxide/hydroxide +
- 24: "Ilmenite"
- 25: Amphibole (Tremolite?)
- 26: Spinel
- 27: Fe-oxide/hydroxide +
- 28: Apatite
- 29: Fe-oxide/hydroxide +
- 30: Epidote
- 31: Fe-oxide/hydroxide
- 32: Epidote
- 33: Spinel
- 34: "Chromite" +
- 35: Fe-oxide/hydroxide + Quartz
- 36: Epidote
- 37: Epidote
- 38: Chromite +
- 39: Garnet +

Figure B14.5: Sample S26 site 3 (SEM). The detrital minerals include: Feohy, Ilm,  $\text{TiO}_2$ , Chr, Spl, Grt, Ep, Ttn, Amph, Ms, Qz, Ap, Chl.



- 1: Fe-oxide/hydroxide +
- 2: Fe-oxide/hydroxide +
- 3: Chlorite
- 4:  $\text{TiO}_2$  +
- 5: Spinel

Figure B14.6: Sample S26 site 3.1 (SEM). 1: Pedogenically affected Fe-oxide/hydroxide. 2: Lithic clast made up of  $\text{TiO}_2$  + chlorite, metamorphic. 3: Detrital spinel grain.



- 1: Fe-oxide/hydroxide + Chlorite +
- 2: Fe-oxide/hydroxide + 29: Fe-oxide/hydroxide +
- 3: Titanite 30: Epidote
- 4: Pyrite 31: Fe-oxide/hydroxide +
- 5: Quartz +  $\text{TiO}_2$  32: Clinopyroxene
- 6: Fe-oxide/hydroxide + Chlorite 33: Epidote +
- 7: Kaolinite + 34: Chlorite
- 8: Fe-oxide/hydroxide +
- 9: Serpentine
- 10: Fe-oxide/hydroxide +
- 11: Fe-oxide/hydroxide +
- 12: Plagioclase (Andesite) +
- 13: Fe-oxide/hydroxide +
- 14:  $\text{TiO}_2$  +
- 15: Ilmenite
- 16: Epidote
- 17: Quartz
- 18: Fe-oxide/hydroxide + Chlorite +
- 19: Fe-oxide/hydroxide
- 20:  $\text{TiO}_2$  +
- 21: Fe-oxide/hydroxide +
- 22: Quartz
- 23: Tourmaline
- 24: Quartz
- 25: Fe-oxide/hydroxide +
- 26: Fe-oxide/hydroxide
- 27: Epidote
- 28: Fe-oxide/hydroxide +

Figure B14.7: Sample S26 site 4 (SEM). The detrital minerals include: Ilm,  $\text{TiO}_2$ , Grt, Tur, Ep, Ttn, Cpx, Pl (And), Qz, Chl, Py, Kln. Some of the Feohy may also be detrital grains.



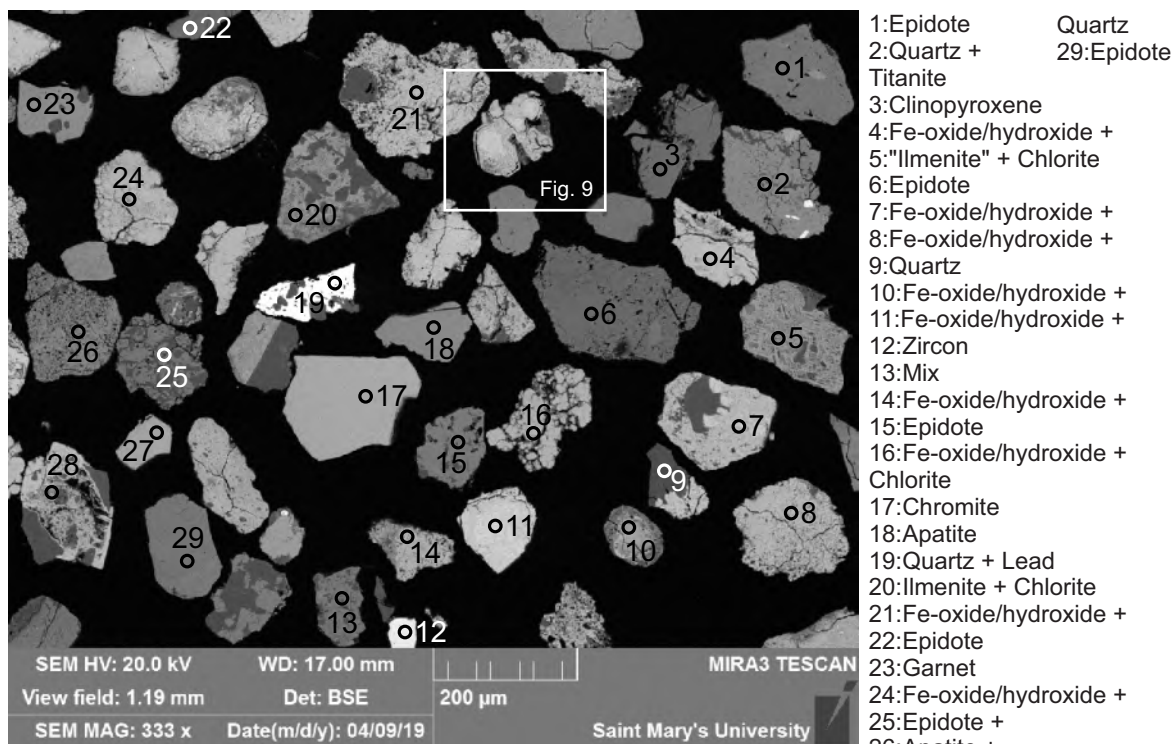


Figure B14.8: Sample S26 site 5 (SEM). The detrital minerals include: Ilm, Chr, Grt, Ep, Zrn, Ttn, Cpx, Kfs, Qz, Ap. Chl. Some of the Feohy grains appear to be detrital.

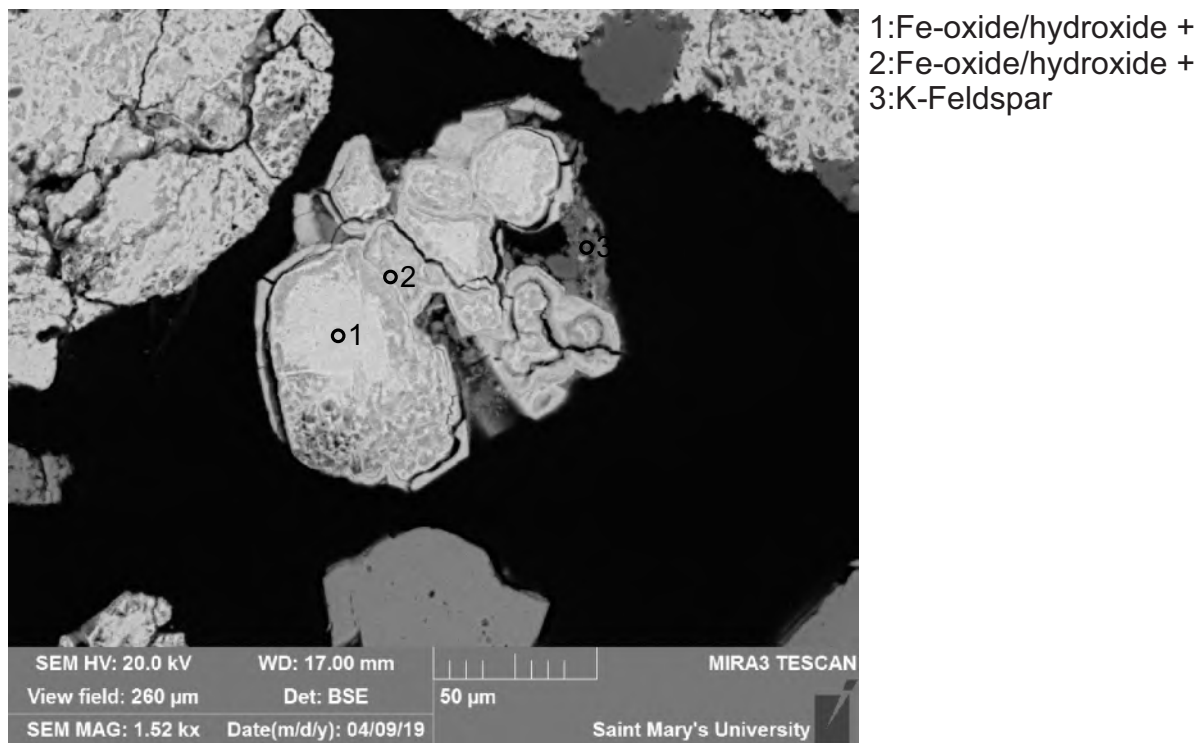
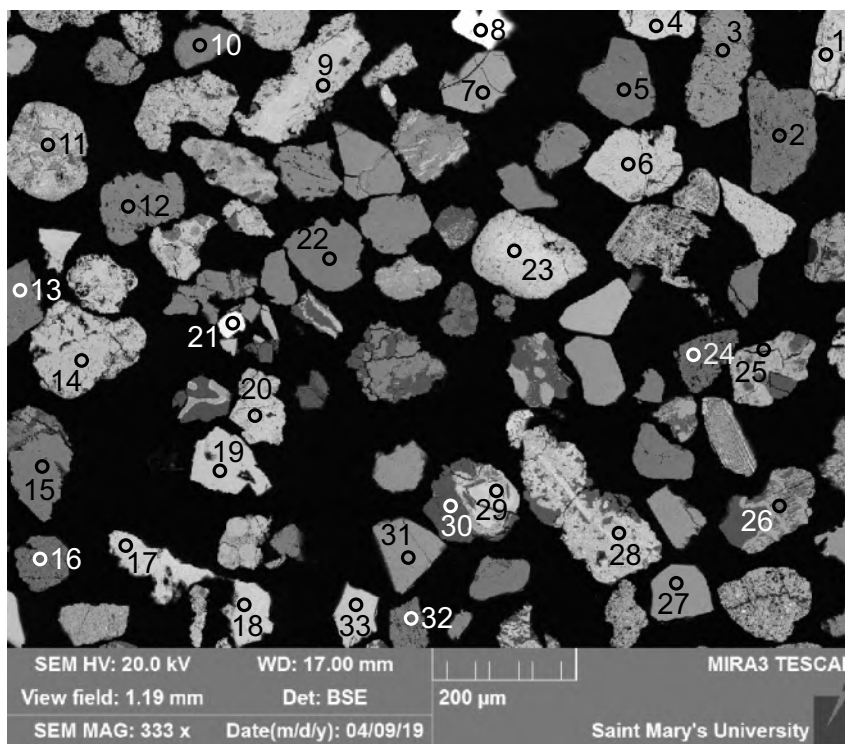
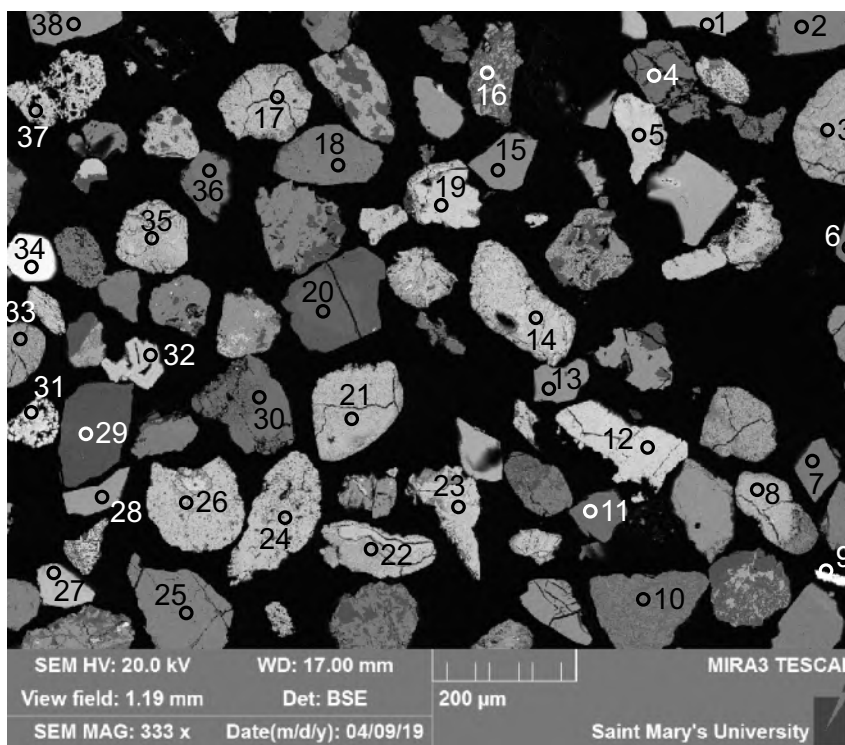


Figure B14.9: Sample S26 site 5.1 (SEM). Probably a lithic clast made up of magnetite grains, pedogenically affected, and K-feldspar. Igneous.



- |                               |                         |
|-------------------------------|-------------------------|
| 1:Fe-oxide/hydroxide +        | 29:Fe-oxide/hydroxide + |
| 2:Epidote                     | 30:Quartz               |
| 3:Titane                      | 31:Apatite              |
| 4:Fe-oxide/hydroxide + Quartz | 32:Epidote              |
| 5:Epidote                     | 33:Chromite             |
| 6:Fe-oxide/hydroxide +        |                         |
| 7:Chromite                    |                         |
| 8:Cu-Zn oxide                 |                         |
| 9:Fe-oxide/hydroxide +        |                         |
| 10:Epidote                    |                         |
| 11:Fe-oxide/hydroxide +       |                         |
| 12:Epidote                    |                         |
| 13:Clinopyroxene              |                         |
| 14:Fe-oxide/hydroxide +       |                         |
| 15:Clinopyroxene              |                         |
| 16:Epidote                    |                         |
| 17:Fe-oxide/hydroxide +       |                         |
| 18:Fe-oxide/hydroxide +       |                         |
| 19:Fe-oxide/hydroxide +       |                         |
| 20:Fe-oxide/hydroxide +       |                         |
| 21:Zircon                     |                         |
| 22:Epidote                    |                         |
| 23:Fe-oxide/hydroxide +       |                         |
| 24:Epidote                    |                         |
| 25:Fe-oxide/hydroxide +       |                         |
| 26:"Ilmenite" + Chlorite +    |                         |
| 27:Apatite                    |                         |
| 28:Fe-oxide/hydroxide +       |                         |

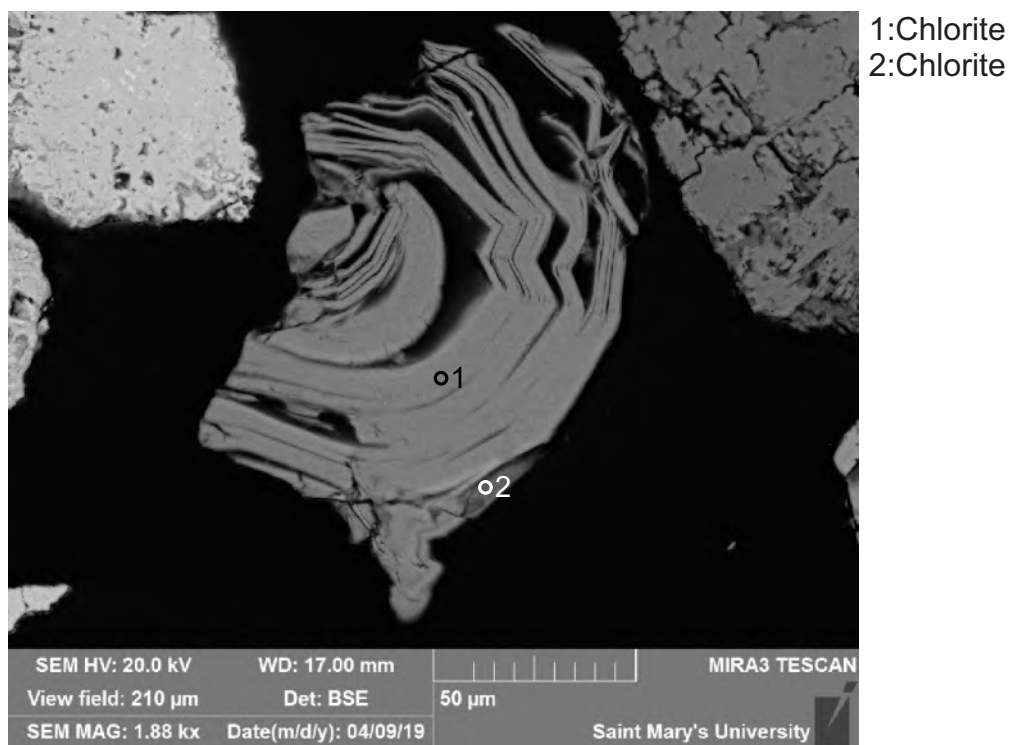
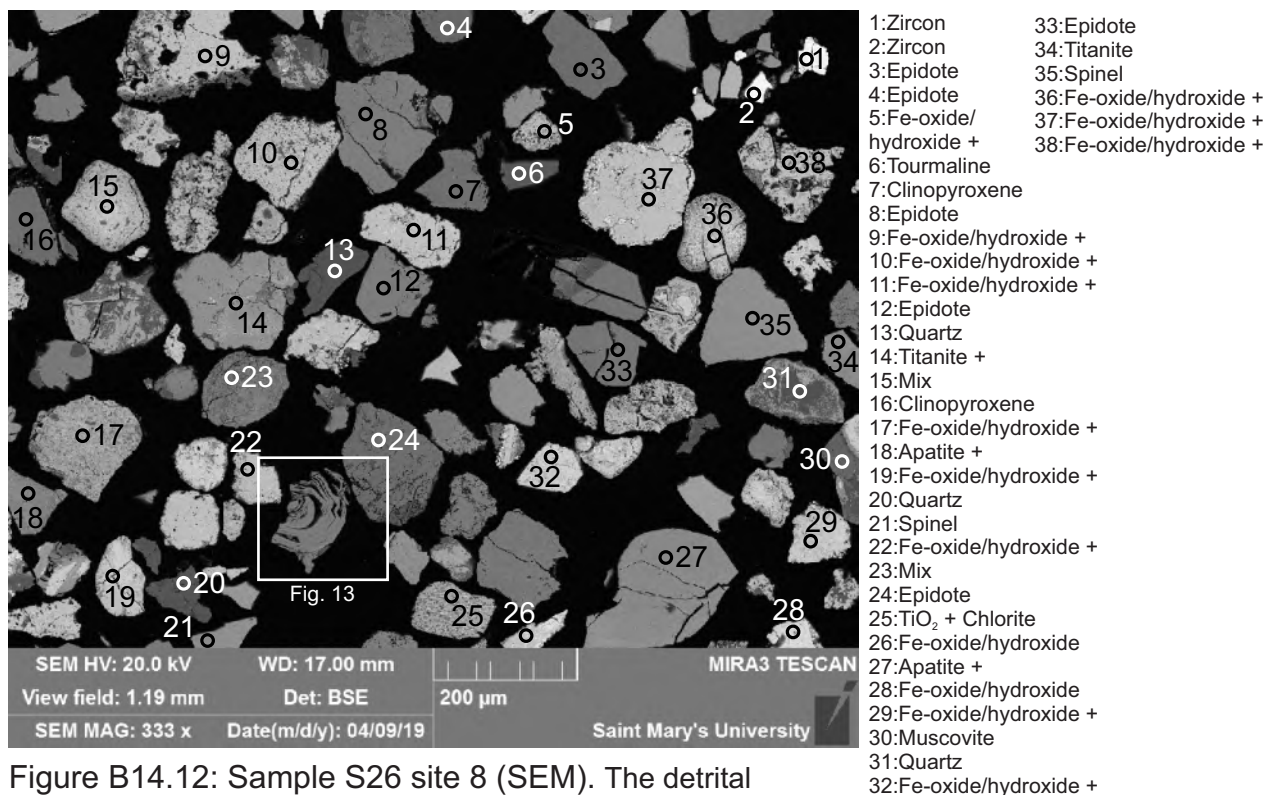
Figure B14.10: Sample S26 site 6 (SEM). The detrital minerals include: Ilm, Chr, Ep, Ttn, Zrn, Cpx, Qz, Ap, Chl and some Feohy.

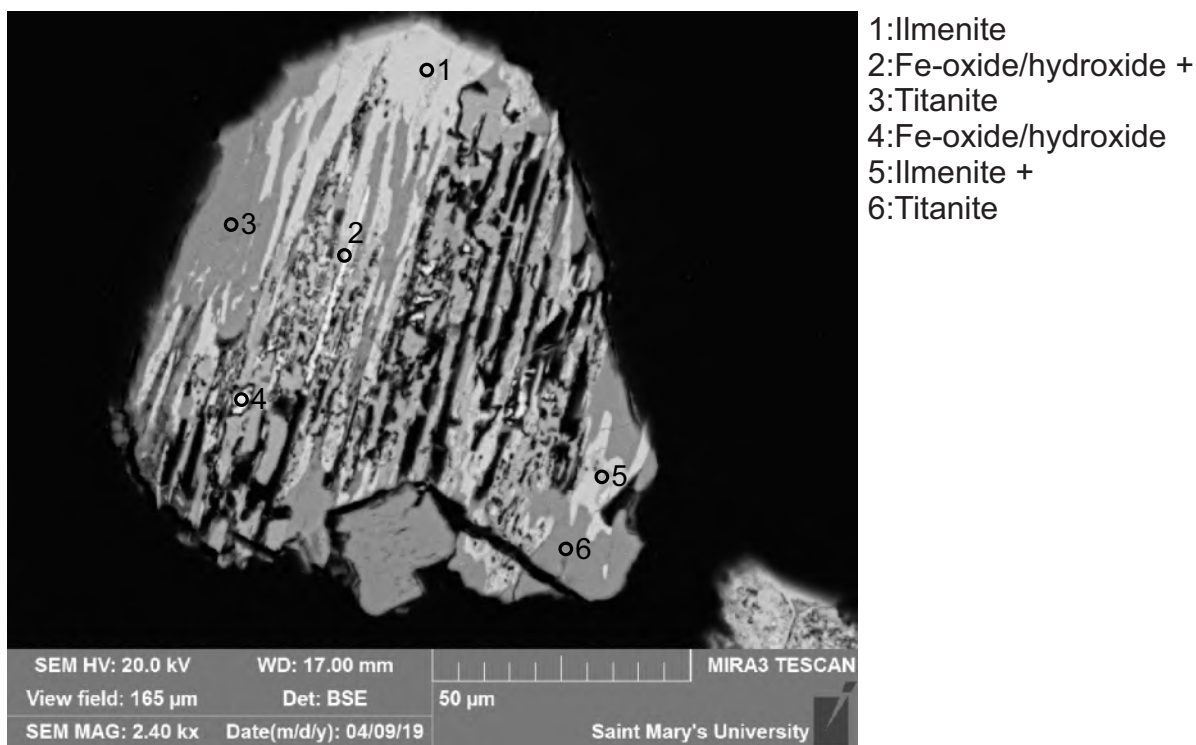
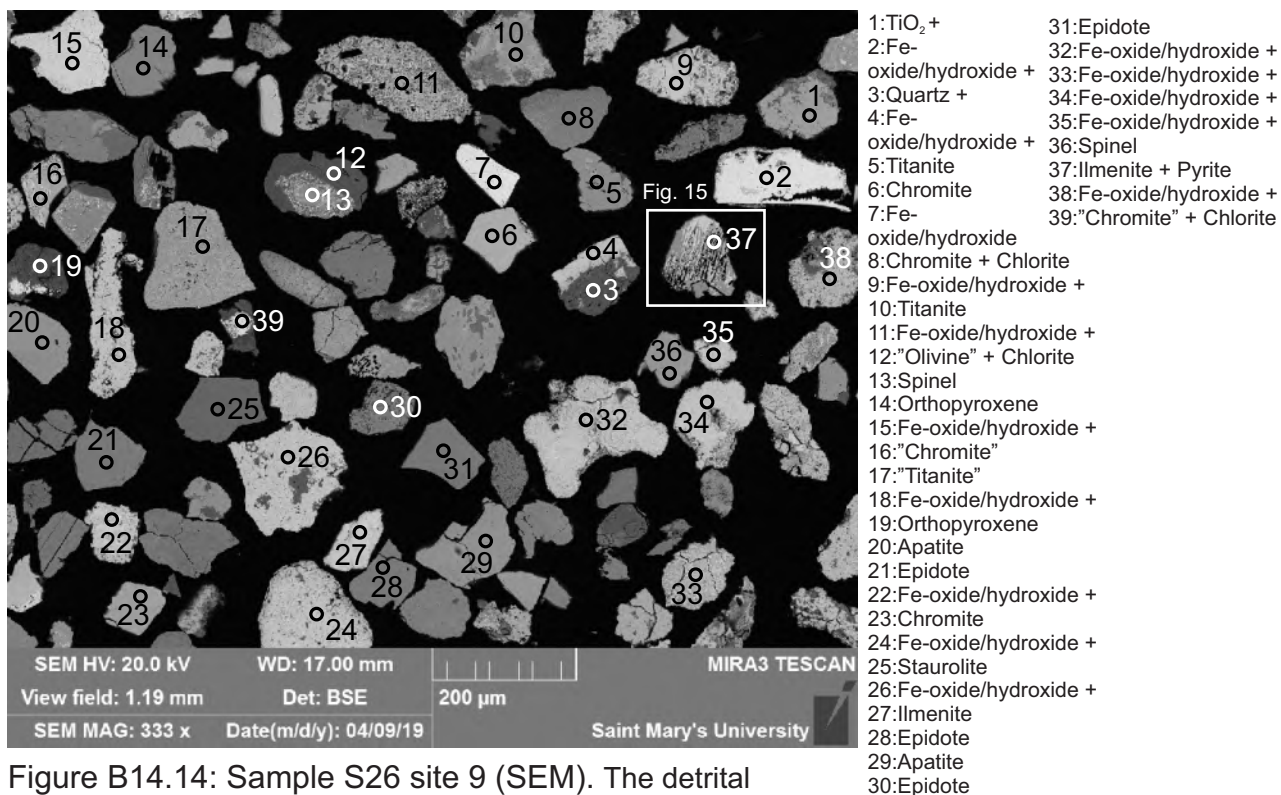


- |                                   |                         |
|-----------------------------------|-------------------------|
| 1:Chromite                        | 31:Pyrite               |
| 2:Epidote                         | 32:Fe-oxide/hydroxide + |
| 3:Fe-oxide/hydroxide +            | 33:TiO <sub>2</sub> +   |
| 4:Epidote +                       | 34:Zircon               |
| 5:Fe-oxide/hydroxide +            | 35:Fe-oxide/hydroxide   |
| 6:Epidote                         | 36:Epidote              |
| 7:Staurolite                      | 37:Fe-oxide/hydroxide + |
| 8:Fe-oxide/hydroxide + Chlorite + | 38:Spinel               |
| 9:Cassiterite                     |                         |
| 10:Epidote                        |                         |
| 11:Amphibole                      |                         |
| 12:Fe-oxide/hydroxide +           |                         |
| 13:Apatite                        |                         |
| 14:Fe-oxide/hydroxide +           |                         |
| 15:Spinel                         |                         |
| 16:TiO <sub>2</sub> +             |                         |
| 17:Fe-oxide/hydroxide +           |                         |
| 18:Epidote                        |                         |
| 19:Fe-oxide/hydroxide +           |                         |
| 20:Tourmaline                     |                         |
| 21:Fe-oxide/hydroxide +           |                         |
| 22:Fe-oxide/hydroxide +           |                         |
| 23:Fe-oxide/hydroxide +           |                         |
| 24:Fe-oxide/hydroxide + Chlorite  |                         |
| 25:Epidote                        |                         |
| 26:Fe-oxide/hydroxide +           |                         |
| 27:Chromite                       |                         |
| 28:Titane                         |                         |
| 29:Quartz                         |                         |
| 30:Epidote                        |                         |

Figure B14.11: Sample S26 site 7 (SEM). The detrital minerals include: TiO<sub>2</sub>, Chr, Spl, Tur, St, Ep, Ttn, Zrn, Cst, Amph, Qz, Ap, Chl and some Feohy (e.g. 12).







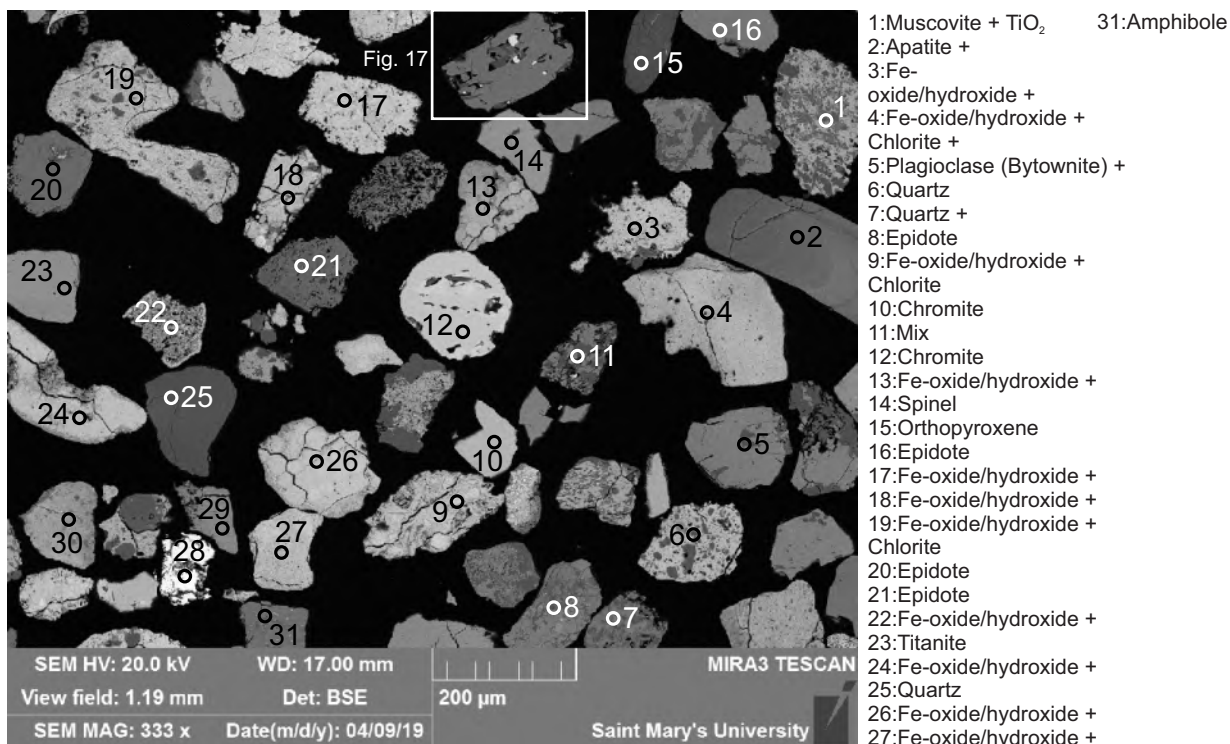


Figure B14.16: Sample S26 site 10 (SEM). The detrital minerals include: Chr, Spl, Ep, Ttn, Opx, Amph, PI (probably bytownite), Ms, Qz, Ap, Chl and Feohy grains.

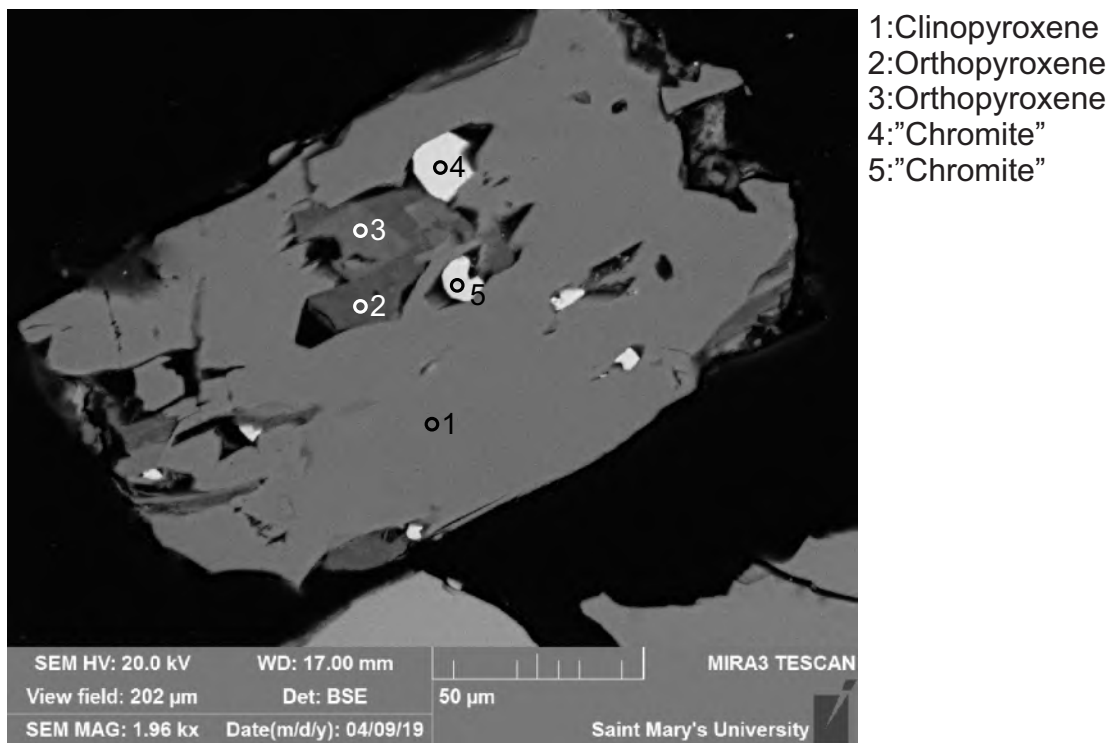


Figure B14.17: Sample S26 site 10.1 (SEM). Detrital clinopyroxene grain, with partially dissolved orthopyroxene patches, and altered chromite inclusions filling voids. Ophiolite.



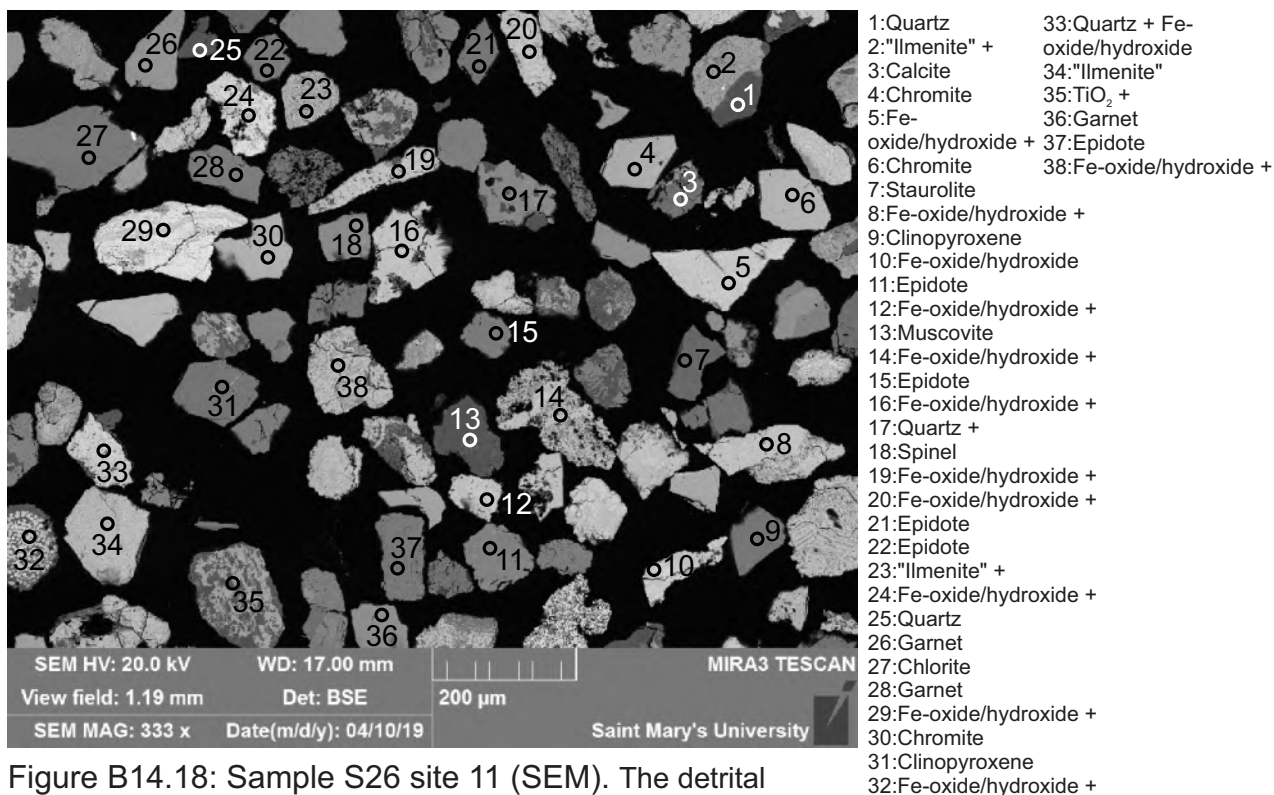


Figure B14.18: Sample S26 site 11 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Feohy, Chr, Spl, Grt, St, Ep, Cpx, Ms, Qz, Chl, Cal.

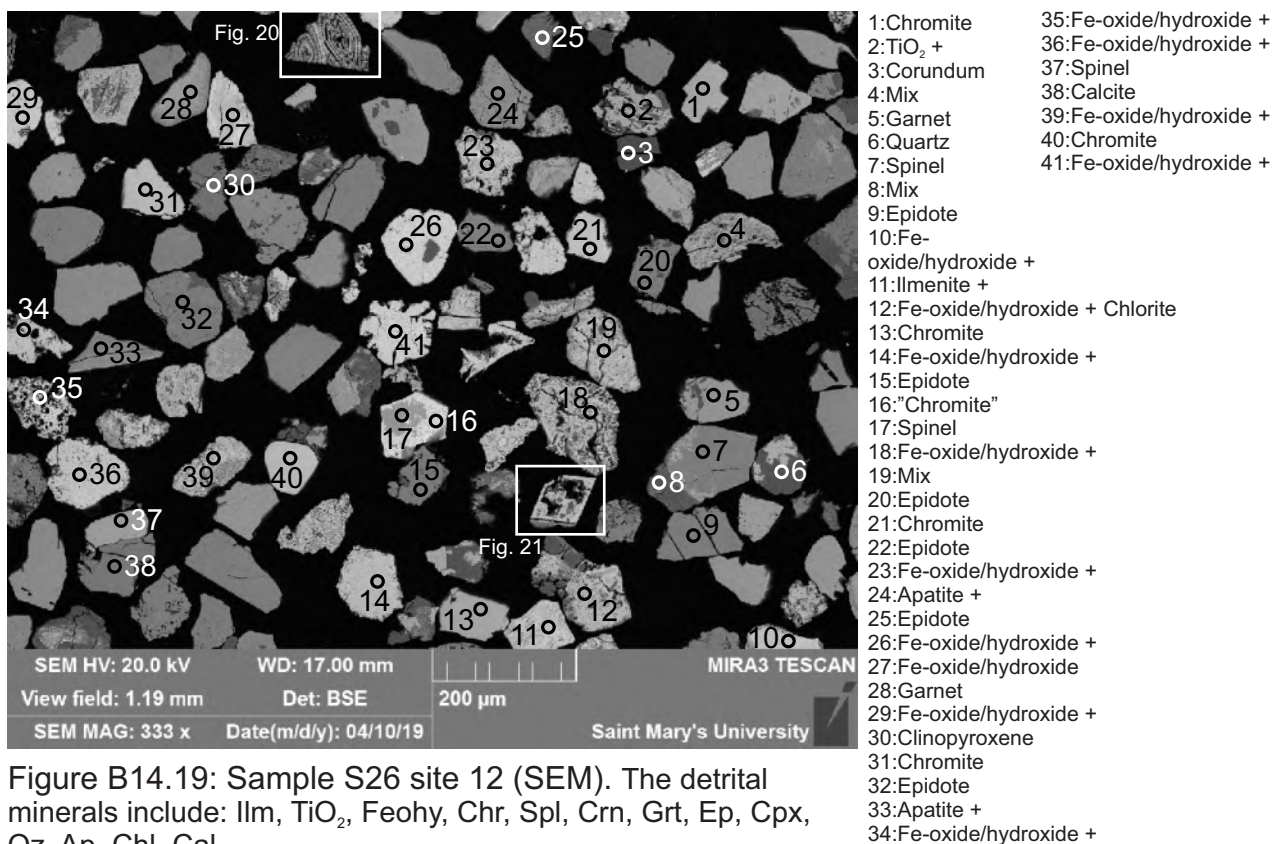
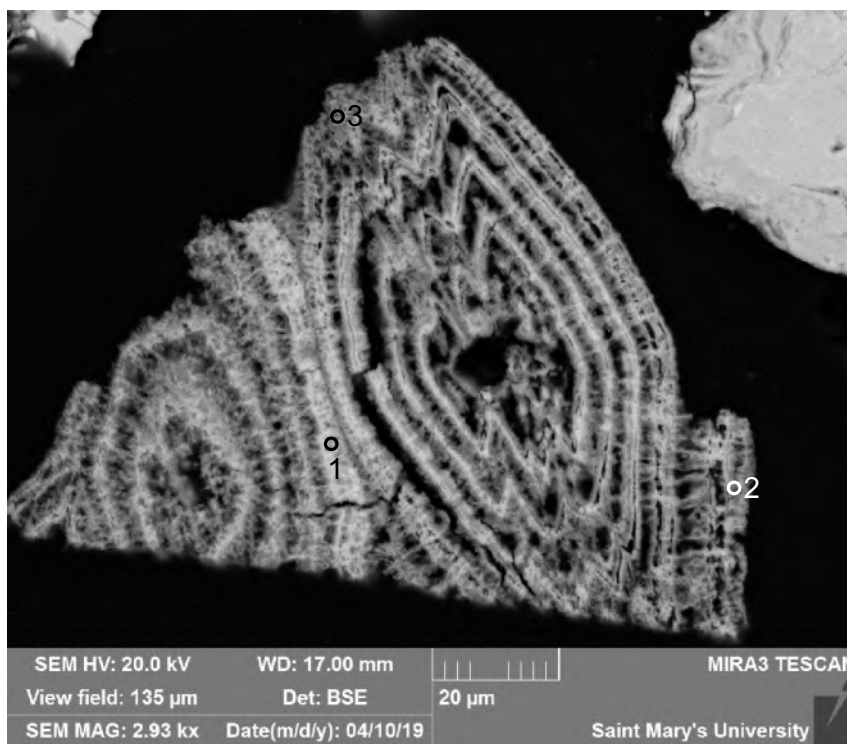
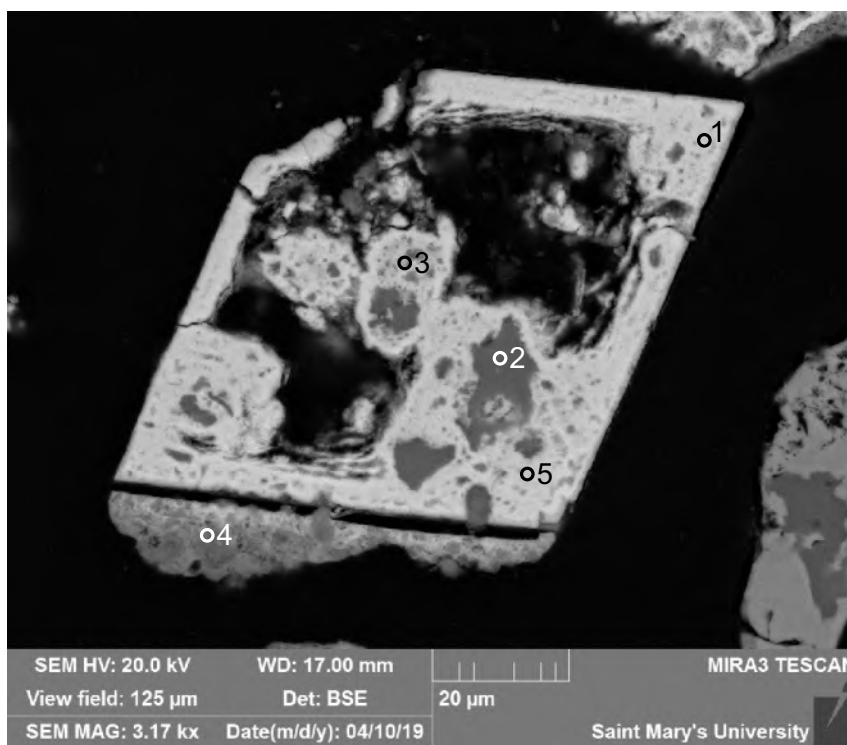


Figure B14.19: Sample S26 site 12 (SEM). The detrital minerals include: Ilm, TiO<sub>2</sub>, Feohy, Chr, Spl, Crn, Grt, Ep, Cpx, Qz, Ap, Chl, Cal.



- 1:Fe-oxide/hydroxide + Chlorite +
- 2:Fe-oxide/hydroxide + Chlorite +
- 3:Fe-oxide/hydroxide + Chlorite +

Figure B14.20: Sample S26 site 12.1 (SEM). Altered detrital grains, probably amphibole (based on habit). Hydrothermal.



- 1:Fe-oxide/hydroxide +
- 2:Quartz
- 3:Fe-oxide/hydroxide +
- 4:Quartz +
- 5:Fe-oxide/hydroxide +

Figure B14.21: Sample S26 site 12.2 (SEM). Altered detrital grain, probably ilmenite with quartz inclusions.



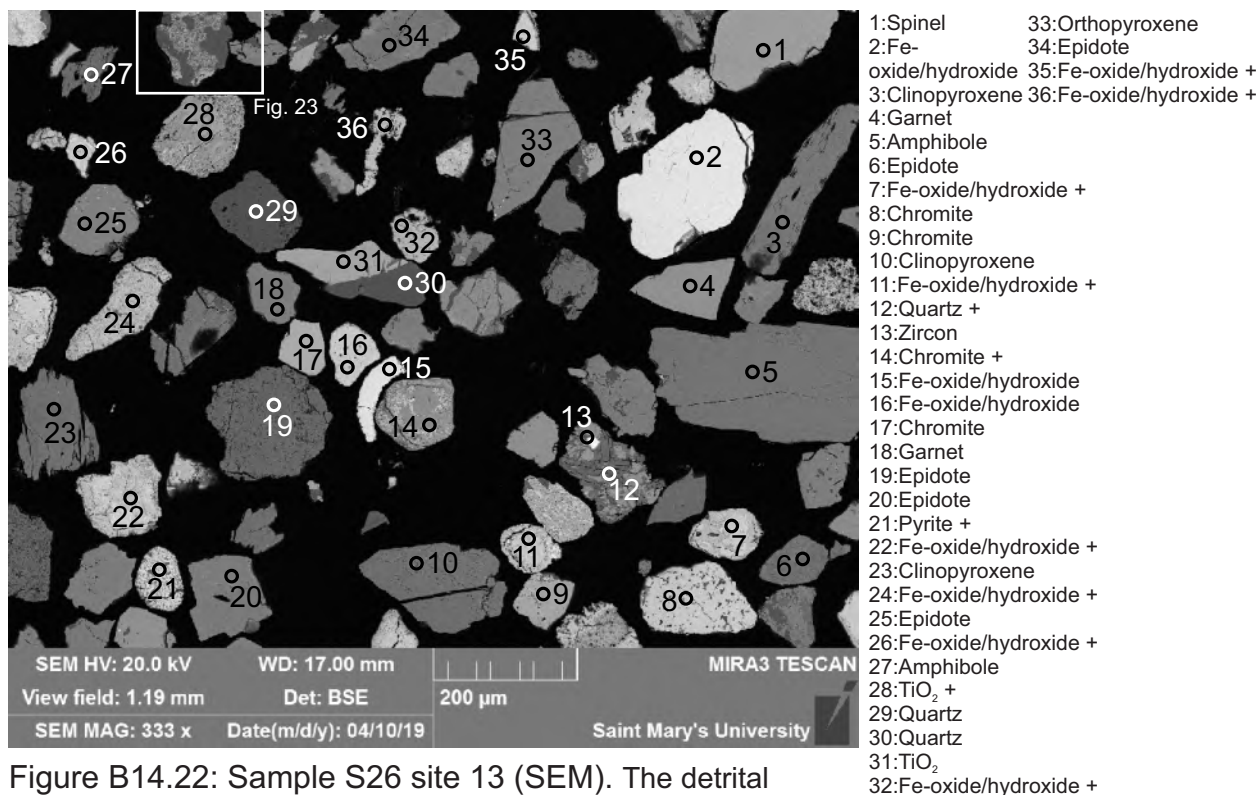


Figure B14.22: Sample S26 site 13 (SEM). The detrital minerals include: Feohy, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Zrn, Cpx, Opx, Amph, Qz, Py.

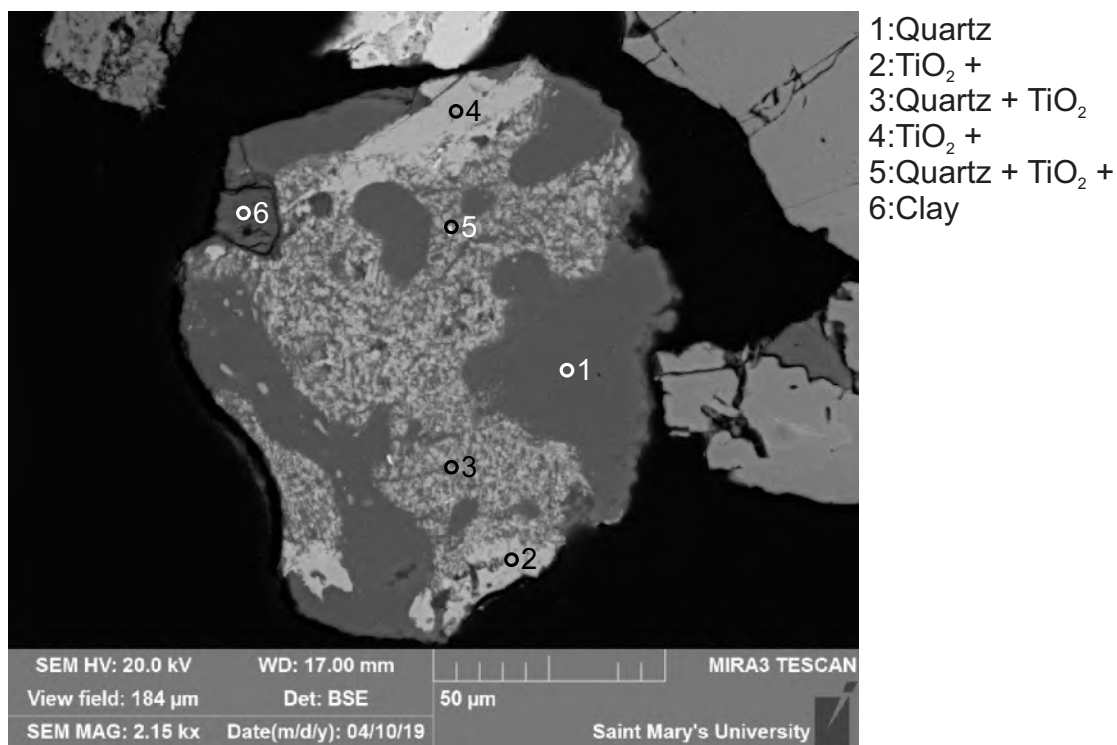


Figure B14.23: Sample S26 site 13.1 (SEM). Lithic clast made up of quartz + TiO<sub>2</sub> or a detrital ilmenite grain altered to TiO<sub>2</sub> with quartz inclusions. Metamorphic.

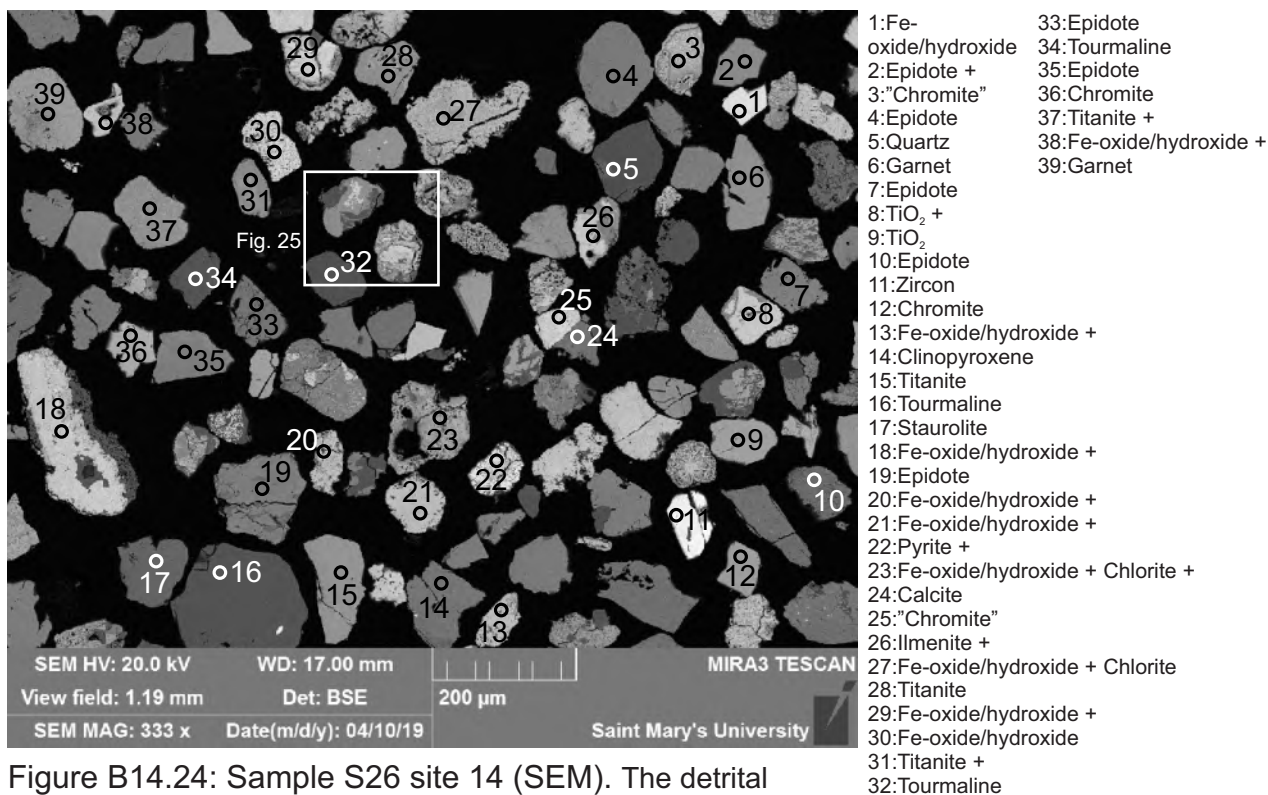


Figure B14.24: Sample S26 site 14 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Tur, St, Ep, Zrn, Ttn, Cpx, Ab, Qz, Chl, Py, Cal.

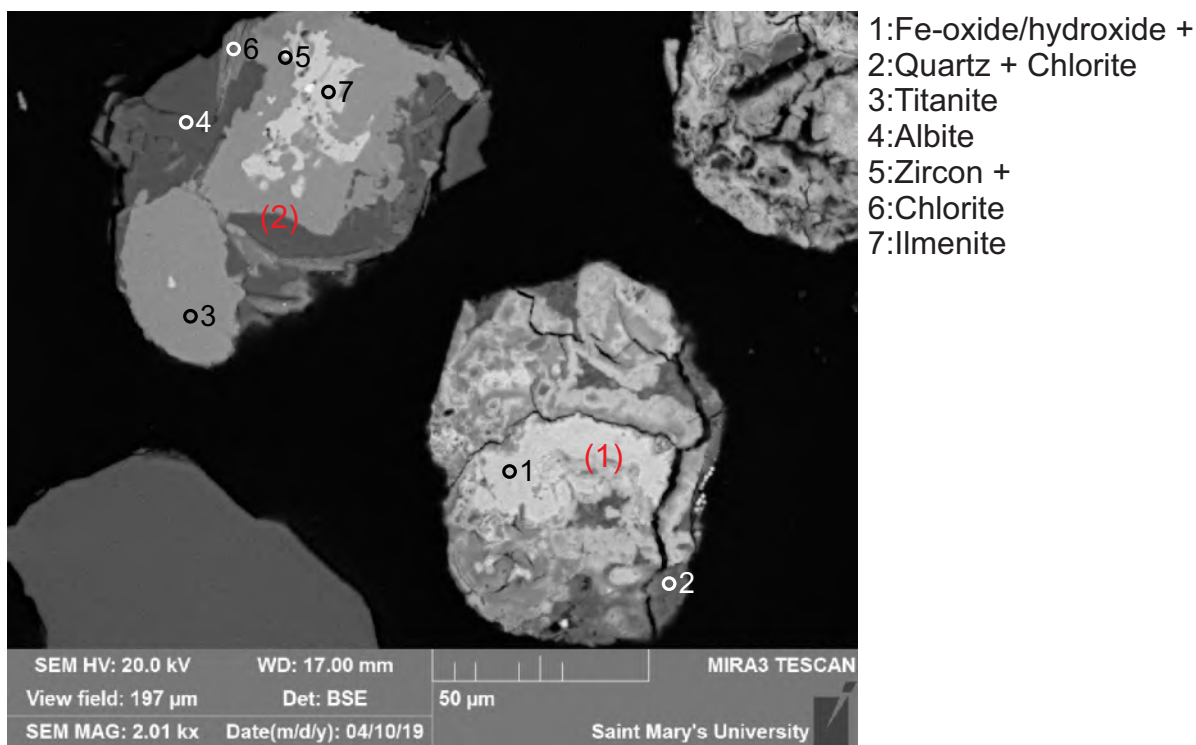


Figure B14.25: Sample S26 site 14.1 (SEM). 1: Pedogenic aggregate made up of Fe-oxide/hydroxide + quartz. 2: Lithic clast made up of titanite + albite + chlorite + ilmenite (probably altered to titanite and with zircon inclusions). Metamorphic.

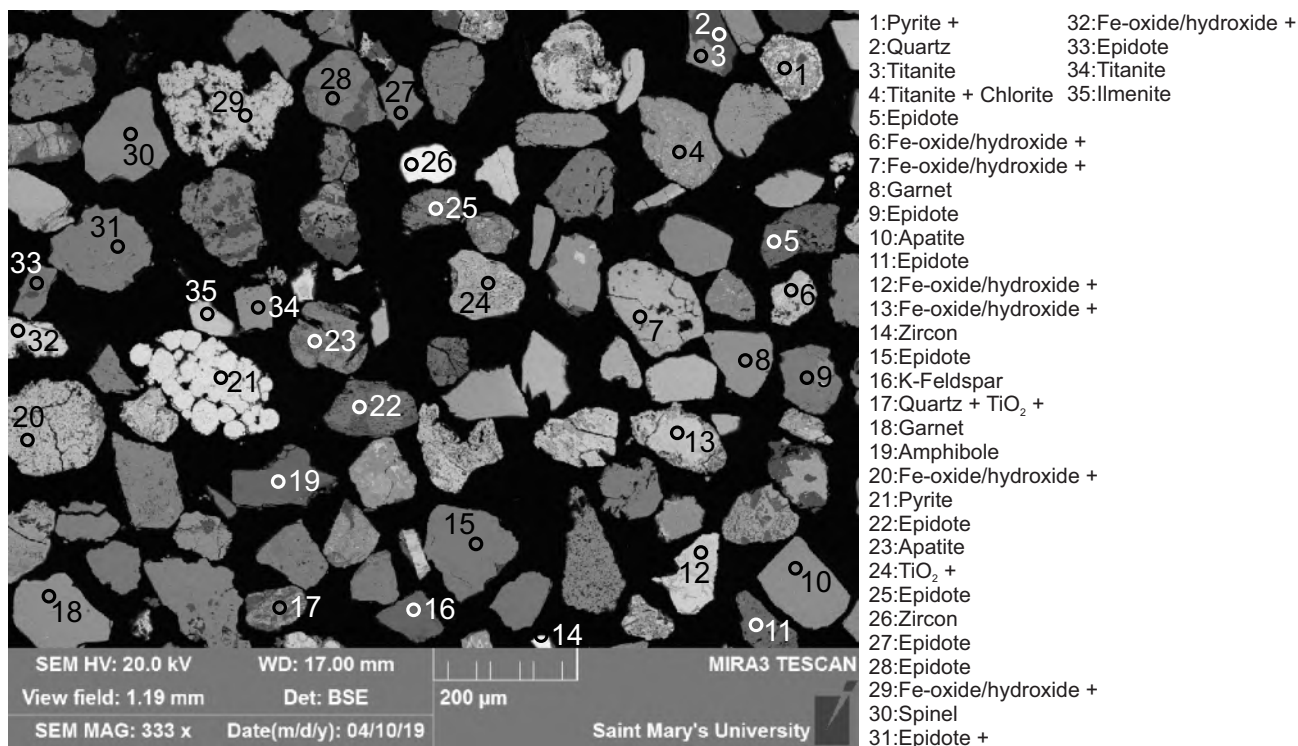


Figure B14.26: Sample S26 site 15 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Spl, Grt, Ep, Ttn, Zrn, Amph, Kfs, Qz, Ap, Chl, Py.

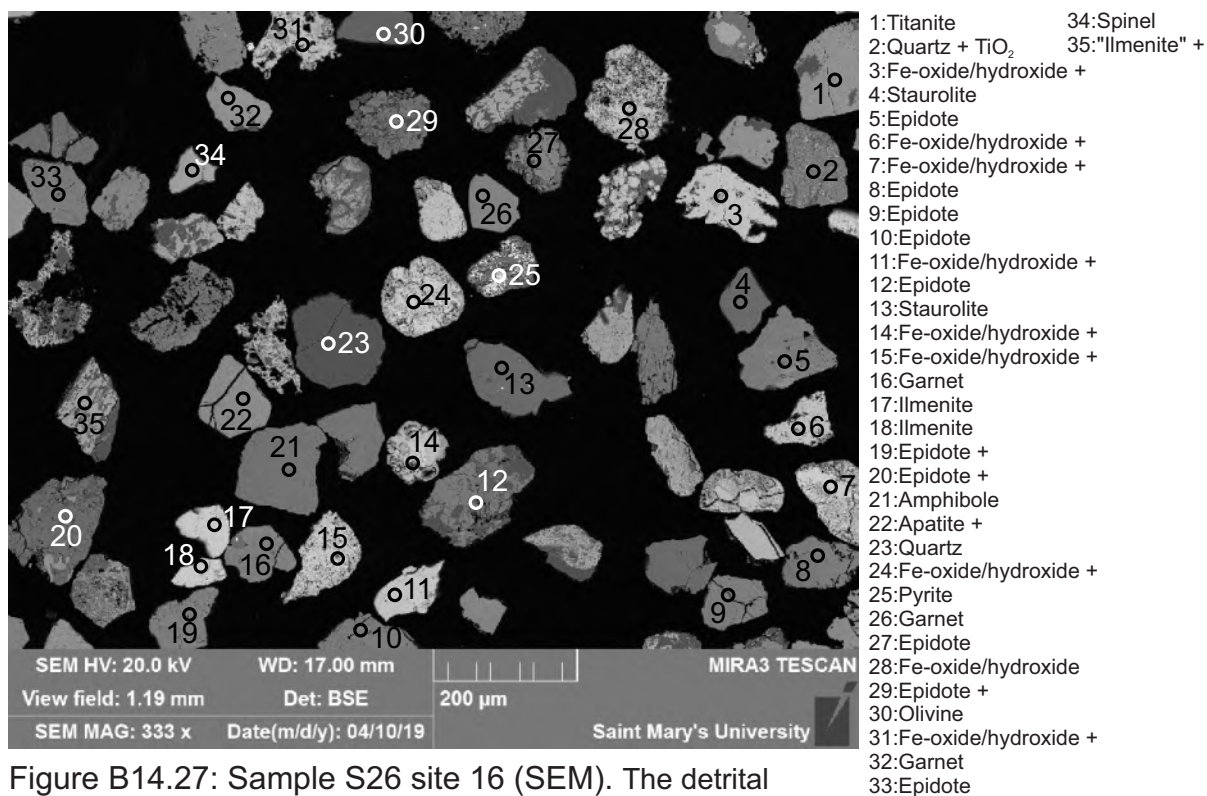


Figure B14.27: Sample S26 site 16 (SEM). The detrital minerals include: Feohy, Ilm, Chr, Grt, St, Ep, Ttn, Ol, Amph, Qz, Ap and Py.



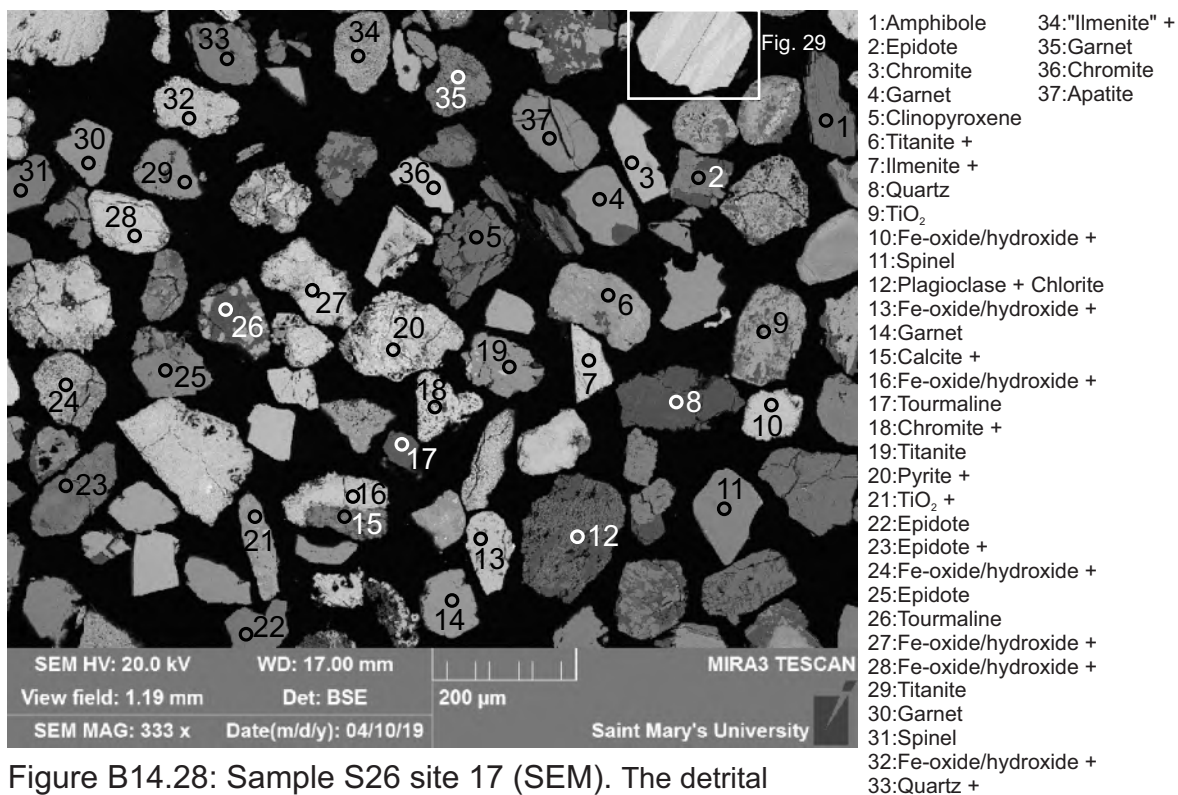


Figure B14.28: Sample S26 site 17 (SEM). The detrital minerals include: Feohy, Ilm, Chr, Spl, Grt, Tur, Ep, Ttn, Cpx, Amph, Pl, Qz, Ap, Chl, Cal, Py.

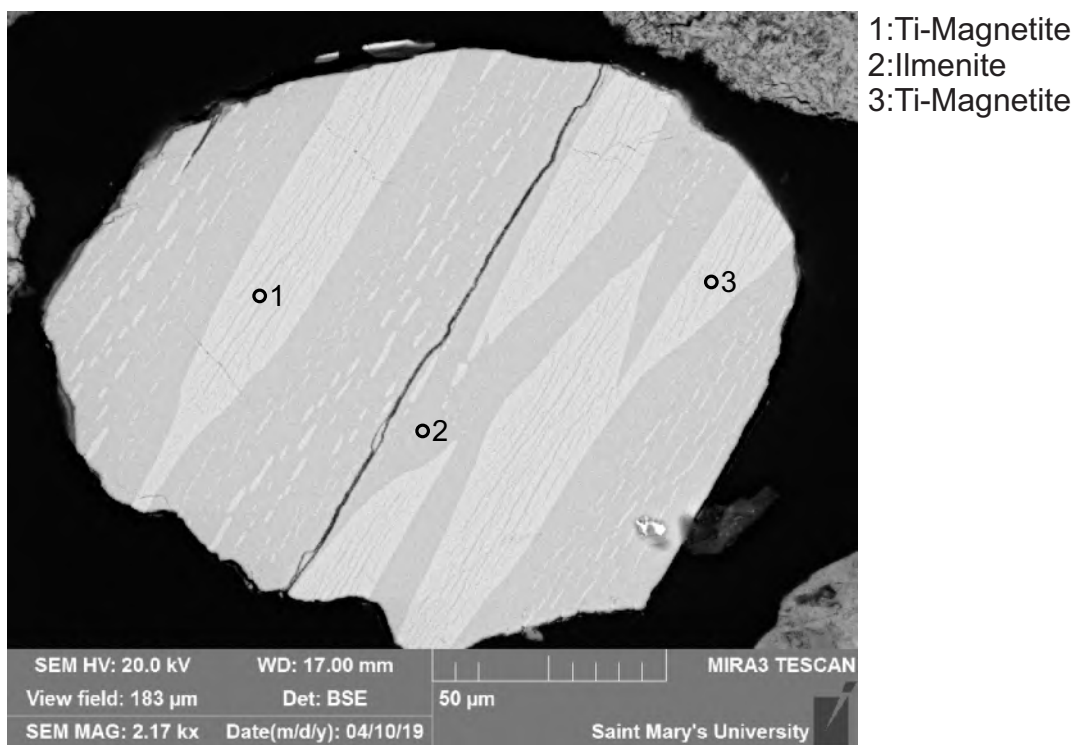


Figure B14.29: Sample S26 site 17.1 (SEM). Detrital Ti-magnetite grain with ilmenite exsolution lamellae or ilmenite with hematite exsolution lamellae.

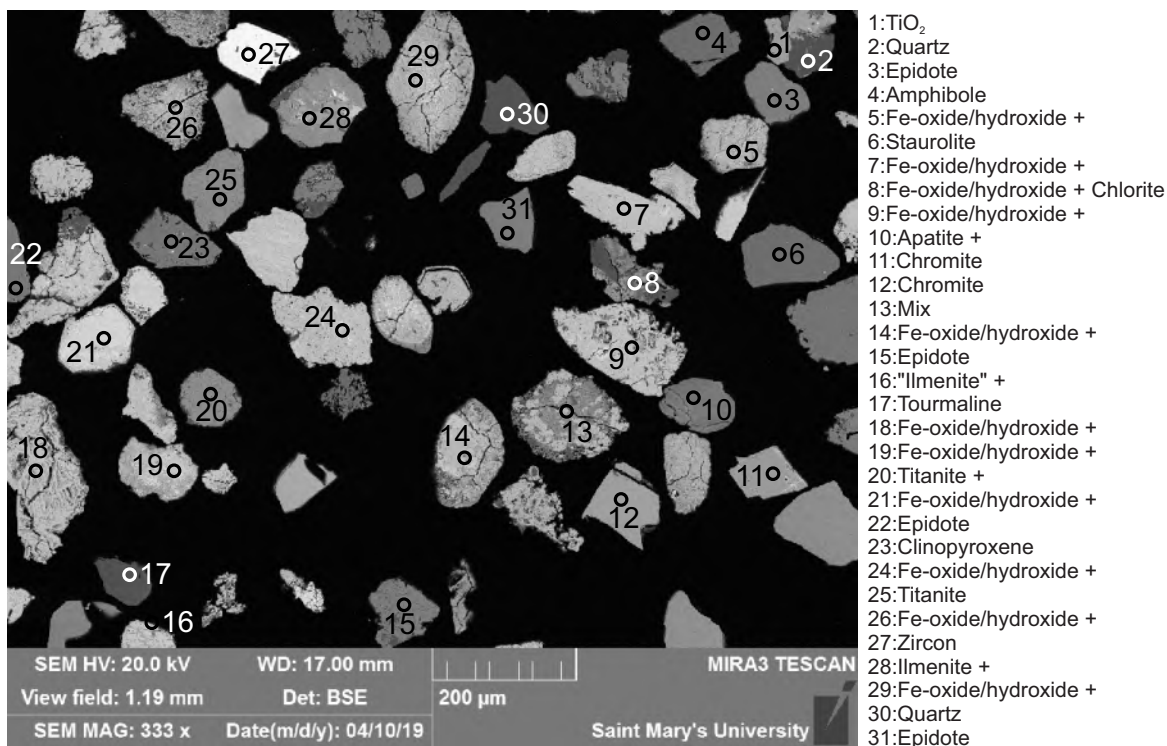


Figure B14.30: Sample S26 site 18 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Grt, Tur, St, Ep, Ttn, Zrn, Cpx, Amph, Qz, Ap.

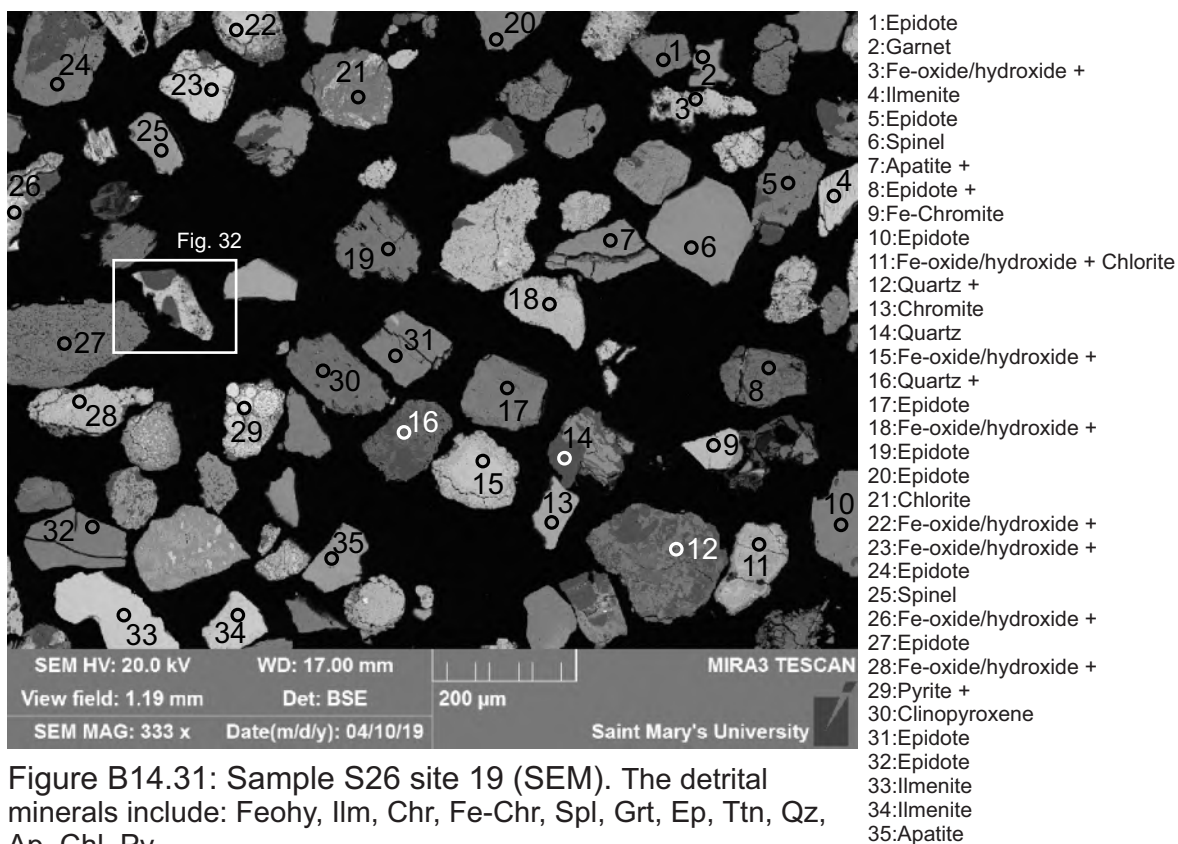
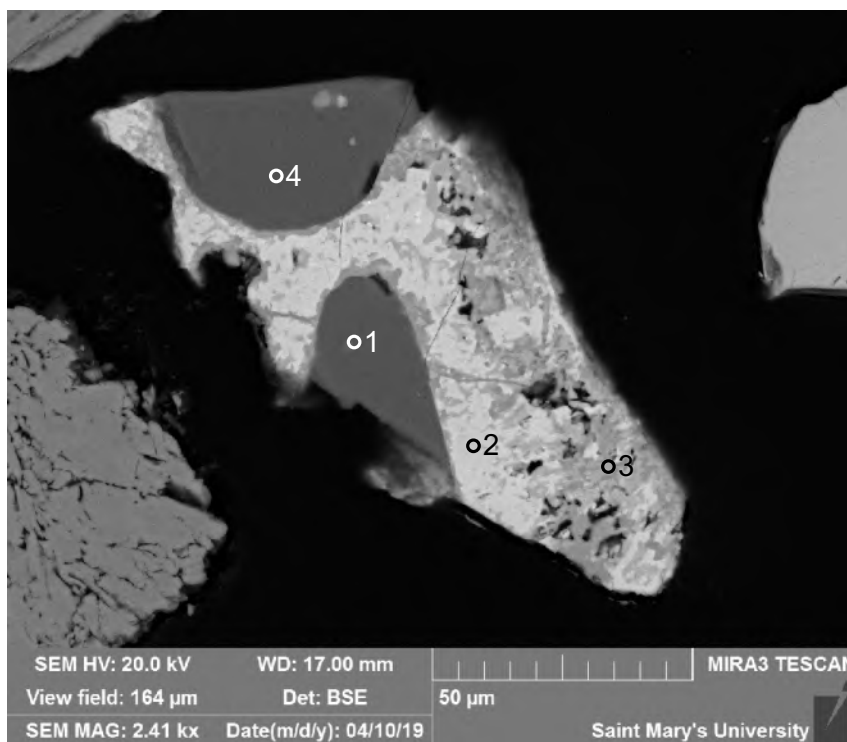


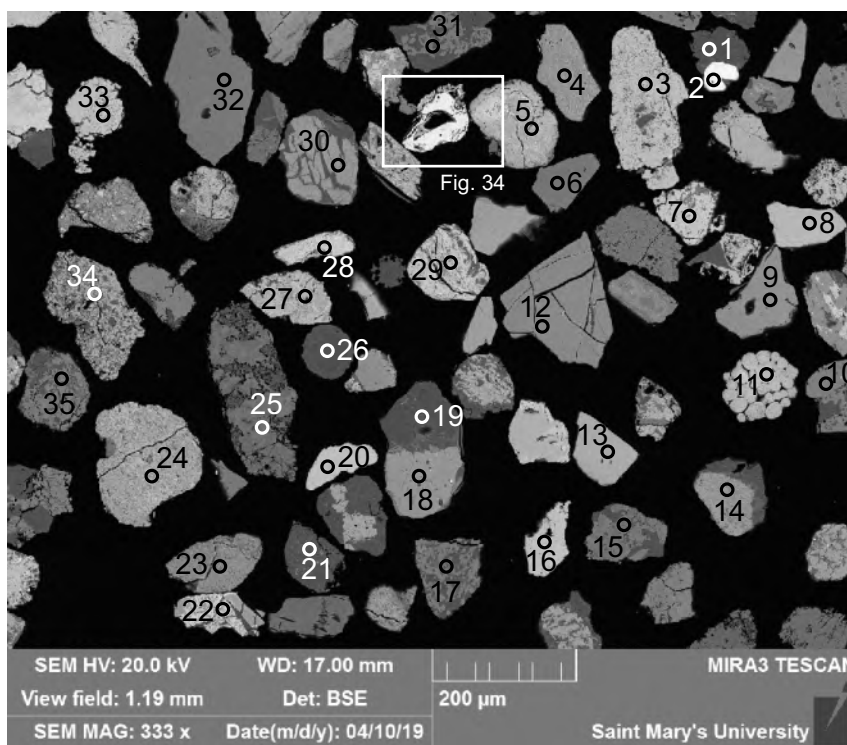
Figure B14.31: Sample S26 site 19 (SEM). The detrital minerals include: Feohy, Ilm, Chr, Fe-Chr, Spl, Grt, Ep, Ttn, Qz, Ap, Chl, Py.





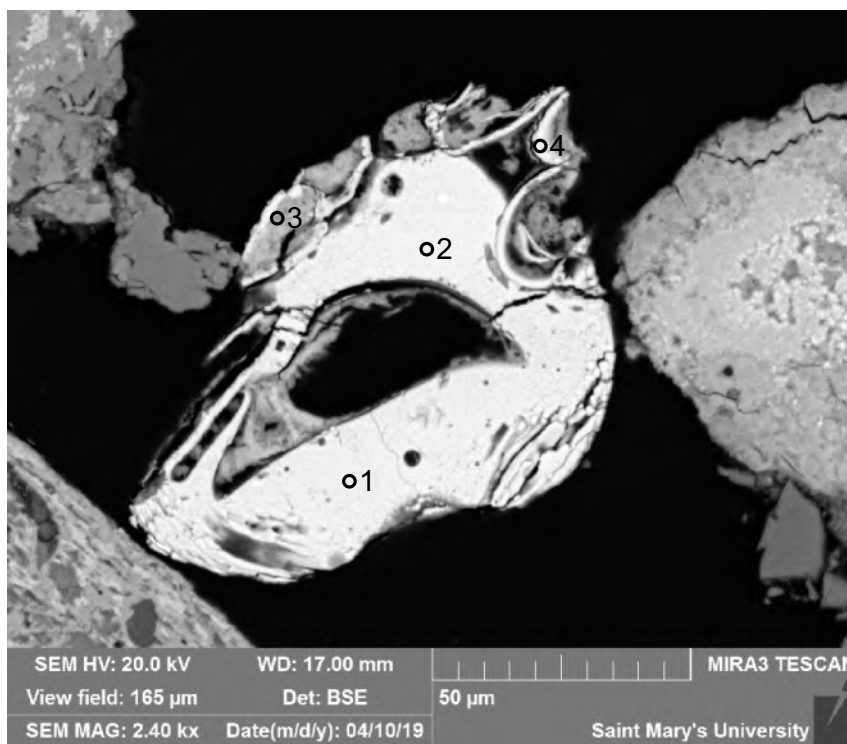
- 1:Quartz
- 2:Ilmenite
- 3:"Titanite"
- 4:Quartz

Figure B14.32: Sample S26 site 19.1 (SEM). Detrital ilmenite grain with quartz and partly altered to titanite. Metamorphic.



- 1:Quartz
- 2:Zircon
- 3:Fe-oxide/hydroxide +
- 4:"Titanite"
- 5:Fe-oxide/hydroxide +
- 6:Epidote
- 7:Ilmenite
- 8:Chromite
- 9:Garnet
- 10:Epidote +
- 11:Fe-oxide/hydroxide +
- 12:Apatite +
- 13:Chromite
- 14:TiO<sub>2</sub> +
- 15:Epidote
- 16:Fe-oxide/hydroxide +
- 17:Quartz +
- 18:Garnet
- 19:Albite
- 20:Fe-oxide/hydroxide +
- 21:Quartz +
- 22:Chromite +
- 23:Titanite
- 24:"Ilmenite"
- 25:Epidote
- 26:Quartz
- 27:Fe-oxide/hydroxide + Quartz
- 28:Fe-oxide/hydroxide +
- 29:Fe-oxide/hydroxide +
- 30:TiO<sub>2</sub> + Quartz
- 31:Mix
- 32:Clinopyroxene
- 33:Fe-oxide/hydroxide + Quartz +
- 34:Mix
- 35:Epidote +

Figure B14.33: Sample S26 site 20 (SEM). The detrital minerals include: Feohy, Ilm, TiO<sub>2</sub>, Chr, Grt, Ep, Ttn, Zrn, Cpx, Ab, Qz, Ap.



- 1:Magnetite
- 2:Magnetite
- 3:Fe-oxide/hydroxide
- 4:Magnetite

Figure B14.34: Sample S26 site 20.1 (SEM). Detrital magnetite pedogenically altered.

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	1	1	Ep	40.32		25.40	9.02			22.25																		97	111	
S26	1	2	Feohy	1.09			92.49	0.52	0.71		0.81		1.27														3.11	100	85	
S26	1	3	Feohy	2.43		1.34	91.18						1.30														3.75	100	89	
S26	1	4	Amph	52.37	1.39	4.85	8.95		15.82	12.59	0.73							0.30										97	118	
S26	1	5	Feohy +	4.46		1.06	93.71		0.76																			100	80	
S26	1	6	Amph	48.01	2.09	7.98	11.04		15.27	10.51	2.10																	97	118	
S26	1	7	Feohy + Chl +	10.47	1.46	6.06	71.04	0.81	0.81	0.41			1.93								0.48						6.52	100	65	
S26	1	8	TiO2		95.78		1.03																	3.19				100	108	
S26	1	9	Mix	84.59	10.64	3.49	0.41					0.87																100	117	
S26	1	10	TiO2		99.46													0.54										100	106	
S26	1	11	Cpx	44.38	0.49	22.47	7.28		3.14	19.86	0.58	1.81																100	91	
S26	1	12	Feohy +	17.01		4.54	73.96					0.33	1.25				0.66			0.72	1.53							100	84	
S26	1	13	Feohy +	12.83		4.71	81.24		0.71			0.52																100	82	
S26	1	14	Feohy +	5.17	0.61	2.49	91.73																					100	74	
S26	1	15	Feohy +	8.71		4.28	84.05		0.77				2.19															100	78	
S26	1	16	Feohy +	1.93			87.85		0.84				1.35	1.79													6.24	100	50	
S26	1	17	Spl			51.47	12.94		17.83									17.76										100	105	
S26	1	18	Feohy +	4.70			95.30																					100	72	
S26	1	19	Feohy +	4.93	1.98	4.67	76.51		0.84	0.41			2.08					0.68									7.89	100	61	
S26	1	20	Ep	40.42		24.61	9.36	0.32		22.29																		97	102	
S26	1	21	Qz	100.00																								100	113	
S26	1	22	Ilm		51.85		45.25	0.58	2.33																			100	101	
S26	1	23	Ttn	33.24	36.16	2.48				28.12																		100	107	
S26	1	24	Feohy +	23.54		2.75	70.96						1.20				0.55				1.01							100	84	
S26	1	25	Ep	40.84		23.59	10.91	0.37		20.86	0.43																	97	98	
S26	1	26	Grt	39.89	1.52	8.24	18.43			31.93																		100	108	
S26	1	27	Chr			19.48	20.21		12.13									48.19										100	105	
S26	1	28	Feohy +	4.50		2.87	78.24		1.05	0.45			2.77														10.12	100	72	
S26	1	29	Chr			26.29	18.98		12.75									41.97										100	95	
S26	2	1	Ep	39.93		22.30	12.30			22.47																		97	108	
S26	2	2	Qz	99.67			0.33																					100	121	
S26	2	3	Feohy +	3.83		2.06	91.85														2.26							100	74	
S26	2	4	Qz +	88.60		4.27	2.91		2.82	1.40																		100	117	
S26	2	5	Ap							50.27			45.03		4.70													100	121	
S26	2	6	Ep	39.98		23.66	10.83			22.54																		97	110	
S26	2	7	Py				33.63				0.48			65.89														100	193	
S26	2	8	Feohy +	5.96		1.14	92.90																					100	83	
S26	2	9	Qz	100.00																								100	126	
S26	2	10	Mix	26.98	24.76	15.06	25.72		5.92		0.86	0.70																100	95	
S26	2	11	Ep	39.73		20.93	14.33			22.01																		97	111	
S26	2	12	Feohy +	4.95		3.49	87.35						1.76				0.67				1.78							100	81	
S26	2	13	Ep	39.79		21.35	13.53			22.34																		97	112	
S26	2	14	Ep	40.09		31.65	0.73			23.11					1.43													97	113	
S26	2	15	Feohy +	4.44		2.61	90.28		0.92	0.53			1.21															100	77	
S26	2	16	Ilm		51.62		46.37	2.01																				100	105	
S26	2	17	Ab	67.18		17.91					11.67	0.25			2.98													100	118	
S26	2	18	Ep	40.31		27.56	6.18			22.95																		97	111	
S26	2	19	Qz	99.64			0.36																					100	126	
S26	2	20	Chr + Chl +	28.31	0.43	7.10	14.31		27.89		0.67			1.38				19.90										100	110	
S26	2	21	Chr + Chl	30.12		13.92	13.70		26.07									14.93	0.59		0.67							100	102	
S26	2	22	Feohy +	3.19		1.67	88.93			0.52			1.03								2.33						2.35	100	74	
S26	2	23	Ep	40.33		22.90	11.31			22.46																		97	108	
S26	2	24	Grt	41.02		21.92	23.65	1.40	6.99	5.01																		100	115	
S26	2	25	Qz + Feohy	85.71			14.29																					100	114	
S26	2	26	Feohy +	2.90		3.01	86.32		1.25				1.54														4.99	100	64	

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	2	27	Qz + Feohy	53.64			45.48														0.88								100	89
S26	2	28	Ttn	33.73	32.73	2.85	3.75		1.42	25.51																			100	103
S26	2	29	Feohy +	3.98			95.19			0.36							0.47												100	78
S26	2	30	Ep	39.94		23.19	11.82			22.06																			97	105
S26	2	31	Ep	40.03		22.96	11.74			22.27																			97	105
S26	2	32	Amph	55.19		2.65	10.43		16.68	11.45	0.60																		97	105
S26	2	33	Feohy +	4.17		1.02	93.88						0.92																100	75
S26	2	34	Grt	39.48		20.58	17.86	15.82	0.49	5.78																			100	105
S26	2	35	Qz + Ep	71.33		11.42	4.89			12.36																			100	107
S26	2	36	Feohy +	4.67			95.33																						100	73
S26	2	37	Amph	56.62		1.88	8.77		18.36	11.37																			97	108
S26	2	38	TiO2		100.00																								100	105
S26	2	39	Cpx	49.36	0.76	3.73	3.04		12.51	21.49	0.75							1.09											100	76
S26	2	40	Grt	39.01		4.64	21.92		3.07	31.36																			100	98
S26	2	41	Ttn	33.50	38.13		0.55			27.82																			100	110
S26	2	42	Grt	41.41		21.86	1.07			34.91					0.75														100	110
S26	2	43	Chr	1.41	0.47	20.57	29.13		8.43								0.47	39.52											100	103
S26	2	44	TiO2 +	5.49	85.53	3.01	4.00		1.97																				100	104
S26	2.1	1	Ab +	61.73		22.89	1.81		0.79	1.45	8.07	2.39		0.86															100	118
S26	2.1	2	Ilm +	1.11	50.33		42.05	5.68		0.82																			100	106
S26	2.1	3	Ttn	33.34	34.33	2.14	2.22		0.73	27.23																			100	111
S26	2.1	4	TiO2		96.85		2.28			0.87																			100	109
S26	2.1	5	Grt	40.13		20.87	31.45	0.78	3.57	3.21																			100	114
S26	2.1	6	Feohy +	1.87		2.39	88.87		1.02	0.50			1.25														4.10		100	70
S26	2.1	7	Feohy +	1.53		2.06	89.54		0.87				1.35														4.65		100	70
S26	2.1	8	Qz	99.57			0.43																						100	118
S26	2.1	9	Feohy +	9.84		2.35	83.36			0.46			1.08				0.72				2.19								100	79
S26	2.1	10	Feohy +	4.37		2.35	91.04																				2.23		100	78
S26	2.1	11	Ttn + Chl	28.21	30.13	6.19	14.69	1.08	4.52	15.19																			100	105
S26	3	1	Spl			45.94	14.58		17.13									22.34											100	109
S26	3	2	TiO2	0.73	98.27		0.72			0.27																			100	108
S26	3	3	Chl	28.98		20.29	15.76		19.60		0.37																		85	98
S26	3	4	Ep	41.44		28.11	2.12	0.31	2.25	22.77																			97	107
S26	3	5	Chr			18.25	16.12		10.26									55.38											100	110
S26	3	6	Ep	39.89		21.00	13.68			22.44																			97	111
S26	3	7	Ttn	32.73	37.47	1.10	1.05			27.65																			100	114
S26	3	8	Chr			12.63	23.44		9.99									53.95											100	112
S26	3	9	Ms +	56.86		21.18	7.49		3.64	3.96	1.94	4.33		0.59															100	97
S26	3	10	Feohy +	3.24			95.20			0.36			1.21																100	88
S26	3	11	Amph	46.95	1.30	8.45	14.59	0.33	11.72	11.42	1.26	0.99																	97	117
S26	3	12	Qz	100.00																									100	124
S26	3	13	Ep	40.31		24.98	9.27			22.44																			97	113
S26	3	14	Feohy +	6.33		3.11	88.81			0.41			1.34																100	77
S26	3	15	Grt	41.98		20.06	3.58			34.38																			100	111
S26	3	16	Ap +				0.61			46.28	1.15		38.33	1.24	9.15												3.25		100	97
S26	3	17	Feohy +	4.41		0.98	93.64						0.97																100	75
S26	3	18	Feohy +	3.71		3.44	79.72		1.00	0.56			2.70														8.86		100	70
S26	3	19	Feohy +	2.80	0.64	2.53	87.24	1.17	0.55	0.41	0.52		1.50														2.65		100	58
S26	3	20	Feohy +	25.49	0.80	13.61	52.66		1.00	0.33		1.18	1.45														3.48		100	75
S26	3	21	Ep	40.43		23.81	10.53			22.23																			97	104
S26	3	22	Feohy +	4.53		5.37	81.32		1.18		0.90		2.54				0.57										3.59		100	72
S26	3	23	Feohy +	4.42			94.22	1.36																					100	73
S26	3	24	"Ilm"		72.17	0.58	25.22	2.02																					100	92
S26	3	25	Amph (Tr)	58.54			7.80		19.25	11.41																			97	105
S26	3	26	Spl			40.49	16.39		15.54									27.59											100	101

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	3	27	Feohy +	4.31		3.81	83.89		0.77		0.76		2.43														4.02		100	72
S26	3	28	Ap				0.56			50.09			45.42		3.36	0.56													100	113
S26	3	29	Feohy +	4.14			94.30		1.11	0.44																			100	79
S26	3	30	Ep	39.22		19.87	9.93	7.20		20.78																			97	110
S26	3	31	Feohy			0.67	92.04		0.95	0.48	0.65		1.20														4.00		100	79
S26	3	32	Ep	41.24		31.81	0.91			23.04																			97	111
S26	3	33	Spl			52.07	12.21		19.86									15.87											100	111
S26	3	34	"Chr" +	33.21	0.71	13.61	45.82		2.15	0.40	1.34	2.29							0.47										100	95
S26	3	35	Feohy + Qz	37.12		0.71	62.17																						100	91
S26	3	36	Ep	40.78		24.08	8.09		1.74	22.32																			97	105
S26	3	37	Ep	39.44		17.98	17.62			21.96																			97	107
S26	3	38	Chr +	1.68	1.22	4.17	34.10		1.42		0.64			1.60			0.61	54.56											100	97
S26	3	39	Grt +	40.96		20.94	23.32	0.66	7.58	6.54																			100	112
S26	3.1	1	Feohy +	6.39		1.85	90.91						0.85																100	78
S26	3.1	2	Feohy +	6.03		2.95	85.27		0.76	0.56			0.99					0.46									2.97		100	73
S26	3.1	3	Chl	28.93		19.58	16.17		19.56		0.44							0.32											85	97
S26	3.1	4	TiO <sub>2</sub> +	2.47	95.23	1.03	0.53			0.36		0.37																	100	107
S26	3.1	5	Spl			45.89	14.40		17.30									22.41											100	109
S26	4	1	Feohy +	4.14		0.86	94.99																						100	76
S26	4	2	Feohy +	4.11		1.28	94.20			0.41																			100	78
S26	4	3	Ttn	30.23	36.74	0.73	5.10			25.93					0.76			0.51											100	105
S26	4	4	Py				30.30							69.70															100	212
S26	4	5	Qz + TiO <sub>2</sub>	64.01	34.86		1.14																						100	115
S26	4	6	Feohy + Chl	16.23		5.85	71.87		4.72			1.33																	100	84
S26	4	7	Kln +	44.13	0.82	37.86	6.86		7.32	0.46	2.57																		100	98
S26	4	8	Feohy +	6.88		0.82	91.86			0.44																			100	78
S26	4	9	Srp	45.31			4.37		36.99									0.33											87	97
S26	4	10	Feohy +	9.31			82.10		8.59																				100	89
S26	4	11	Feohy +	3.98		1.94	86.73	0.63	0.77				1.08	1.20													3.66		100	79
S26	4	12	Pl (Adas) +	57.63		19.34	5.32		9.56	8.15																			100	110
S26	4	13	Feohy +	7.40		2.70	88.71		0.76	0.43																			100	74
S26	4	14	TiO <sub>2</sub> +	3.24	93.92					2.84																			100	104
S26	4	15	Ilm		49.20		47.34	3.45																					100	97
S26	4	16	Ep	40.19		22.80	11.93			22.08																			97	103
S26	4	17	Qz	100.00																									100	111
S26	4	18	Feohy + Chl +	26.08	1.01	10.71	49.75	1.74	1.40	0.35	0.83	0.39	1.94					0.63									5.16		100	79
S26	4	19	Feohy				100.00																						100	88
S26	4	20	TiO <sub>2</sub> +	7.64	83.78	3.27	3.07		1.18			1.06																	100	96
S26	4	21	Feohy +	4.41			94.68		0.91																				100	78
S26	4	22	Qz	98.94		0.73					0.33																		100	82
S26	4	23	Tur	38.36	0.71	30.38	8.69		6.08	0.38	2.39																	87	96	
S26	4	24	Qz	100.00																									100	115
S26	4	25	Feohy +	14.15		5.83	74.30		1.21	0.50		0.88	1.90	1.23															100	63
S26	4	26	Feohy				100.00																						100	79
S26	4	27	Ep	40.58		31.03	1.13			22.56	0.30				1.41														97	110
S26	4	28	Feohy + Chl +	13.73		6.56	68.17		2.03	0.71	1.03	0.33	1.54														5.90		100	73
S26	4	29	Feohy +	4.04			94.65	1.31																					100	80
S26	4	30	Ep	40.64		22.15	12.37			21.84																			97	113
S26	4	31	Feohy +	6.33		1.89	90.25		1.16	0.38																			100	72
S26	4	32	Cpx	55.55		1.79	3.69		17.22	21.37								0.37											100	121
S26	4	33	Ep +	46.93		24.94	6.58			18.54	3.01																		100	115
S26	4	34	Chl	24.62		21.12	4.85		26.71						3.28			4.42											85	103
S26	5	1	Ep	40.24	0.41	22.81	11.13			22.42																			97	106
S26	5	2	Qz + Ttn	70.23	16.23	0.66	0.32			12.56																			100	117
S26	5	3	Cpx	54.54	0.53	2.39	5.31		18.28	17.92	0.39							0.65											100	113



Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	5	4	Feohy +	2.68			95.35	0.64						1.33															100	75
S26	5	5	"Ilm" + Chl	24.23	60.68	5.01	7.75		2.33																				100	107
S26	5	6	Ep	40.64		29.91	2.50			23.95																			97	97
S26	5	7	Feohy +	4.82		2.60	90.43			0.51			1.64																100	80
S26	5	8	Feohy +	8.32			90.42			0.43			0.83																100	81
S26	5	9	Qz	99.26			0.74																						100	121
S26	5	10	Feohy +	4.13		9.01	72.80		1.09		0.95		2.46					0.52									9.04		100	74
S26	5	11	Feohy +	2.69		0.95	96.36																						100	87
S26	5	12	Zrn	31.29			0.43																68.28						100	118
S26	5	13	Mix	52.84		19.94	6.90		1.85	11.22	7.26																		100	109
S26	5	14	Feohy +	5.75		4.85	81.89		1.09	0.42			1.24														4.76		100	76
S26	5	15	Ep	40.02		22.28	12.01			22.69																			97	106
S26	5	16	Feohy + Chl	8.94		5.42	77.07		0.91	0.35			2.66														4.65		100	80
S26	5	17	Chr			18.98	17.73		12.45									50.85											100	106
S26	5	18	Ap							49.74			44.55		5.71														100	117
S26	5	19	Qz + Pb	70.14		0.75	0.54																					28.57	100	101
S26	5	20	Ilm + Chl	22.32	41.76	13.91	13.72		6.86		0.95	0.49																	100	95
S26	5	21	Feohy +	3.35		2.25	88.64										0.80				3.38	1.59							100	72
S26	5	22	Ep	42.68		24.45	5.31		2.65	21.29	0.62																		97	96
S26	5	23	Grt	39.86		20.90	12.69	20.32	2.98	3.24																			100	102
S26	5	24	Feohy +	20.52		4.81	71.23		1.17	0.52	0.91			0.84															100	73
S26	5	25	Ep +	46.40		27.62	6.11		0.72	18.34		0.80																	100	95
S26	5	26	Ap +	0.78		0.43	0.43			48.04	1.34		35.91	2.62	9.00												1.44		100	104
S26	5	27	Chr			22.57	18.61		12.33									46.49											100	102
S26	5	28	Feohy + Qz	48.06		1.20	50.75																						100	88
S26	5	29	Ep	40.23		24.51	9.81			22.46																			97	105
S26	5.1	1	Feohy +	4.20		0.77	95.03																						100	83
S26	5.1	2	Feohy +	3.20		2.46	87.02		1.33	0.49			1.10														4.41		100	78
S26	5.1	3	Kfs	59.52		19.05	7.35		1.91			12.17																	100	84
S26	6	1	Feohy +	3.55		2.48	90.99		0.86	0.72			1.40																100	79
S26	6	2	Ep	41.96		27.52	5.32			21.52	0.68																		97	118
S26	6	3	Ttn	31.99	34.57	2.31	1.55			27.67					1.91														100	104
S26	6	4	Feohy + Qz	11.78		2.20	84.24						1.78																100	93
S26	6	5	Ep	41.25	0.85	27.70	4.83			22.36																			97	119
S26	6	6	Feohy +	3.75			96.25																						100	80
S26	6	7	Chr		0.62	28.77	22.43		13.82									34.36											100	109
S26	6	8	Cu-Zn oxide				0.83													52.74	33.28							13.15	100	136
S26	6	9	Feohy +	5.68			94.32																						100	79
S26	6	10	Ep	40.08		22.75	11.94			22.23																			97	109
S26	6	11	Feohy +	4.54		5.65	76.16		1.00	0.81			2.23					0.52		0.73							8.36		100	66
S26	6	12	Ep	40.55		22.84	11.65			21.96																			97	109
S26	6	13	Cpx	55.46		1.02	4.54		17.34	21.19								0.44											100	113
S26	6	14	Feohy +	6.79		7.23	81.80		1.05				1.52						0.69		0.92								100	79
S26	6	15	Cpx	54.07	0.77	1.82	7.68		14.30	20.99	0.38																		100	114
S26	6	16	Ep	41.84		24.27	7.16		1.73	22.01																			97	102
S26	6	17	Feohy +	4.59		0.77	94.64																						100	86
S26	6	18	Feohy +	4.26			94.83													0.91									100	84
S26	6	19	Feohy +	4.34		0.75	94.91																						100	80
S26	6	20	Feohy +	4.23			94.97			0.41								0.39											100	79
S26	6	21	Zrn	30.94																			69.06						100	121
S26	6	22	Ep	40.27		26.13	8.31			22.29																			97	113
S26	6	23	Feohy +	2.30		2.61	90.19			0.43			1.30														3.17		100	88
S26	6	24	Ep	46.75		26.02	1.86		1.01	21.36																			97	110
S26	6	25	Feohy +	1.22		0.33	96.87			0.39		0.87															0.33		100	46
S26	6	26	"Ilm" + Chl +	24.06	52.74	9.45	6.66		4.19	0.25	1.43	1.21																	100	106

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	6	27	Ap							49.65			45.54		4.32	0.49													100	130
S26	6	28	Feohy +	7.48		3.97	85.32		0.99	0.45			1.79																100	87
S26	6	29	Feohy +	5.67			93.66		0.68																				100	90
S26	6	30	Qz	100.00																									100	129
S26	6	31	Ap							49.96			45.50		1.41	1.65											1.49		100	125
S26	6	32	Ep	40.19		27.02	7.23			22.56																			97	101
S26	6	33	Chr		0.36	10.79	29.97		4.77								0.51	53.61											100	113
S26	7	1	Chr			15.12	19.72		12.26									52.91											100	108
S26	7	2	Ep	39.69		22.22	12.37	0.31		22.41																			97	110
S26	7	3	Feohy +	4.72		9.84	74.30		0.74		0.92		2.75					0.56									6.18		100	81
S26	7	4	Ep +	42.04	0.65	21.57	6.98		2.37	18.15					8.24														100	41
S26	7	5	Feohy +	3.55			93.73						0.96				0.77	0.99											100	84
S26	7	6	Ep	40.84		27.82	5.79			22.55																			97	117
S26	7	7	St	28.07		43.64	25.36	0.61	2.32																				100	109
S26	7	8	Feohy + Chl +	6.67	0.52	5.03	70.38		2.26	0.50	0.66	0.58	2.08					0.69									10.64		100	83
S26	7	9	Cst				0.53														0.67				98.80				100	108
S26	7	10	Ep	38.14		19.71	4.80		7.41	26.94																			97	115
S26	7	11	Amph	50.53		8.39	6.38		18.10	11.69	1.56					0.35													97	120
S26	7	12	Feohy +	2.72		1.29	91.66			0.43																	3.90		100	91
S26	7	13	Ap				0.45	1.39		46.97			44.34		5.64												1.21		100	128
S26	7	14	Feohy +	3.94		0.74	94.09	1.24																					100	82
S26	7	15	Spl			43.53	13.90		17.65									24.92											100	114
S26	7	16	TiO2 +	5.46	93.14	0.62	0.56			0.23																			100	111
S26	7	17	Feohy +	5.02		3.49	83.13		1.13	0.54			1.17														5.50		100	76
S26	7	18	Ep	39.94		24.44	9.79			22.84																			97	110
S26	7	19	Feohy +	4.09			92.14	2.18		0.44											1.15								100	81
S26	7	20	Tur	36.58	0.89	31.47	10.51		4.45	1.21	1.89																		87	100
S26	7	21	Feohy +	4.51		4.12	85.47		1.09				1.29					0.61									2.91		100	78
S26	7	22	Feohy +	3.02		2.98	83.60		0.98	0.91			1.62														6.89		100	72
S26	7	23	Feohy +	4.78		0.93	93.79											0.50											100	81
S26	7	24	Feohy + Chl	7.91		2.11	87.54		0.97	0.41			1.06																100	82
S26	7	25	Ep	40.12		23.47	10.98			22.43																			97	112
S26	7	26	Feohy +	3.34		2.25	88.67		1.32				0.99														3.43		100	76
S26	7	27	Chr			10.72	19.78		9.83									59.67											100	107
S26	7	28	Ttn	32.93	36.51	1.47	1.90			27.20																			100	106
S26	7	29	Qz	100.00																									100	118
S26	7	30	Ep	40.51		24.76	5.94		2.29	23.50																			97	97
S26	7	31	Py	0.77		0.33	42.02	0.37			0.67			55.82															100	152
S26	7	32	Feohy +	5.69		1.29	93.02																						100	78
S26	7	33	TiO2 +	1.75	83.36	3.07	2.84			0.51	0.62		2.14		4.80			0.90											100	98
S26	7	34	Zrn	30.55											1.21								68.24						100	117
S26	7	35	Feohy	0.82		0.42	96.98			0.45			0.39					0.94											100	60
S26	7	36	Ep	40.85		27.34	6.29	0.33		22.18																			97	110
S26	7	37	Feohy +	4.03		1.02	91.76																				3.19		100	77
S26	7	38	Spl			34.88	13.28		16.68									35.16											100	106
S26	8	1	Zrn	31.24																			67.37			1.39			100	122
S26	8	2	Zrn	30.87																			69.13						100	121
S26	8	3	Ep	40.61		31.44	1.89			23.06																			97	110
S26	8	4	Ep	42.33		29.56	1.14		0.87	21.46					1.64														97	112
S26	8	5	Feohy +	10.14	0.96	5.20	75.32			0.97	0.88	0.56	1.59														4.38		100	81
S26	8	6	Tur	38.52	0.93	32.17	6.48		6.24	0.33	2.34																		87	101
S26	8	7	Cpx	54.87		2.26	3.52		16.84	21.86								0.66											100	117
S26	8	8	Ep	40.01		23.67	10.94			22.38																			97	109
S26	8	9	Feohy +	5.85		1.60	87.34			0.40			2.12				0.65			0.76	1.28							100	77	
S26	8	10	Feohy +	8.90		3.00	85.94		0.96				1.20																100	78

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	8	11	Feohy +	5.77		1.02	89.41			0.43			1.39				0.57				1.40								100	79
S26	8	12	Ep	39.84		23.15	11.36			22.65																			97	111
S26	8	13	Qz	100.00																									100	121
S26	8	14	Ttn +	23.53	45.14	2.13	6.92	0.41	0.57	20.90	0.40																		100	105
S26	8	15	Mix	41.39		2.85	51.31		0.73			0.80															2.93		100	91
S26	8	16	Cpx	53.31		4.30	2.30		16.31	22.87								0.91											100	109
S26	8	17	Feohy +	34.10		7.26	53.84		1.23		0.83	0.73	2.00																100	90
S26	8	18	Ap +				0.63			48.93	0.44		39.74	0.57	8.09												1.60		100	114
S26	8	19	Feohy +	3.66		1.26	93.04		0.79				1.25																100	79
S26	8	20	Qz	100.00																									100	113
S26	8	21	Spl			38.72	16.42		15.71									29.15											100	111
S26	8	22	Feohy +	6.93		2.89	88.83	0.54						0.81															100	80
S26	8	23	Mix	55.33	1.02	14.03	10.71		6.66	6.37	4.96	0.32	0.59																100	106
S26	8	24	Ep	40.42		30.72	1.83			22.55					1.47														97	115
S26	8	25	TiO <sub>2</sub> + Chl	3.03	80.94	3.70	4.10	0.35		0.49	0.70		1.65		4.68			0.35											100	105
S26	8	26	Feohy				98.82	0.75		0.43																			100	81
S26	8	27	Ap +			0.47	0.38			45.53	1.14		38.60	1.72	9.41												2.75		100	125
S26	8	28	Feohy				100.00																						100	95
S26	8	29	Feohy +	3.58		1.64	91.71														1.05						2.02		100	87
S26	8	30	Ms	51.29	0.45	24.69	5.01		2.90			10.67																	95	117
S26	8	31	Qz	100.00																									100	126
S26	8	32	Feohy +	4.32		1.11	93.47		0.71	0.39																			100	89
S26	8	33	Ep	40.70		26.70	6.78			22.81																			97	114
S26	8	34	Ttn	32.81	33.68	3.29	0.65			27.55					2.03														100	120
S26	8	35	Spl			40.28	16.13		16.43									27.16											100	116
S26	8	36	Feohy +	3.76		2.60	84.38	0.92					2.37	1.18				0.76									4.04		100	82
S26	8	37	Feohy +	3.08			91.67			0.60			4.65																100	80
S26	8	38	Feohy +	8.47	0.45	1.44	85.48			0.43			1.68								2.04								100	81
S26	8.1	1	Chl	25.07		21.75	26.66		11.53																				85	100
S26	8.1	2	Chl	26.03		23.20	23.32		12.45																				85	47
S26	9	1	TiO <sub>2</sub> +	1.15	98.53					0.32																			100	108
S26	9	2	Feohy +	1.24			98.76																						100	91
S26	9	3	Qz +	96.37		1.96	0.89				0.32	0.46																	100	105
S26	9	4	Feohy +	5.70		1.99	90.91			0.35			1.05																100	78
S26	9	5	Ttn	33.21	36.85	2.03				27.91																			100	111
S26	9	6	Chr			17.29	16.86		12.38								0.50	52.97											100	108
S26	9	7	Feohy		6.54	0.90	91.82										0.74												100	96
S26	9	8	Chr + Chl	24.55		14.51	16.36		25.25		0.53							18.80											100	101
S26	9	9	Feohy +	4.11			95.44			0.45																			100	78
S26	9	10	Ttn	29.04	37.77	5.45	0.86			23.57					3.31														100	111
S26	9	11	Feohy +	3.14		0.96	95.90																						100	63
S26	9	12	"Ol" + Chl	46.12		10.53	3.80		39.55																				100	102
S26	9	13	Spl			46.56	16.62		16.47									20.34											100	109
S26	9	14	Opx	53.65		1.37	24.26	0.65	19.60	0.46																			100	109
S26	9	15	Feohy +	1.84		2.24	87.86			0.71			2.06														5.28		100	80
S26	9	16	"Chr"			16.17	53.83		6.16									23.84											100	96
S26	9	17	"Ttn"	16.27	68.52		0.62			12.98							1.61												100	106
S26	9	18	Feohy +	6.99		2.58	90.05			0.38																			100	74
S26	9	19	Opx	51.69		1.06	3.78		43.47																				100	90
S26	9	20	Ap							49.53			45.10		5.37														100	115
S26	9	21	Ep	40.48		26.27	7.99			22.25																			97	107
S26	9	22	Feohy +	3.60		0.89	94.49														1.02								100	77
S26	9	23	Chr			27.21	16.38		14.15								0.43	41.83											100	108
S26	9	24	Feohy +	3.92		1.64	90.24		0.82																		3.38		100	80
S26	9	25	St	30.01	0.61	55.00	11.99		1.59												0.80								100	109

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	9	26	Feohy +	5.70			93.41														0.89								100	78
S26	9	27	Ilm		51.12		45.95	2.93																					100	107
S26	9	28	Ep	40.26		25.09	9.16			22.49																			97	112
S26	9	29	Ap							49.35			44.50		6.15														100	125
S26	9	30	Ep	40.69		25.02	9.20			22.10																			97	111
S26	9	31	Ep	40.19		25.43	8.32	0.29		22.77																			97	112
S26	9	32	Feohy +	3.83		2.50	91.69						1.11						0.86										100	76
S26	9	33	Feohy +	4.16		5.33	82.78		1.08				1.35													5.29			100	81
S26	9	34	Feohy +	4.59		0.95	93.34						1.13																100	83
S26	9	35	Feohy +	2.74			96.32											0.95											100	81
S26	9	36	Spl		0.40	31.40	14.49		14.78									38.93											100	113
S26	9	37	Ilm + Py	1.15	38.06	0.55	37.38	0.60		1.54				17.03													3.68		100	62
S26	9	38	Feohy +	12.12		6.28	78.71		0.70			0.74	1.44																100	82
S26	9	39	"Chr" + Chl	4.52	0.57	1.37	60.68	0.95	4.12									27.79											100	91
S26	9.1	1	Ilm		53.73		44.26	1.60		0.41																			100	102
S26	9.1	2	Feohy +	2.75	16.38		72.48	1.01		2.53																			100	102
S26	9.1	3	Ttn	33.34	29.06	4.55	6.70		2.11	22.91							1.33												100	108
S26	9.1	4	Feohy		4.53		95.47																						100	94
S26	9.1	5	Ilm +	1.62	57.14	0.78	37.90	0.83	1.04	0.70																			100	104
S26	9.1	6	Ttn	32.82	36.02	1.57	2.12			27.47																			100	112
S26	10	1	Ms + TiO <sub>2</sub>	44.03	22.35	20.48	2.18		1.57		0.64	6.22			2.54														100	111
S26	10	2	Ap +				0.56		0.73	45.90	1.16	0.15	44.22		2.10	2.28										2.91			100	89
S26	10	3	Feohy +	6.09		2.19	85.75			0.47			1.05								1.62						2.82		100	76
S26	10	4	Feohy + Chl +	12.96	0.55	8.75	70.19	1.11	1.46	0.53	0.91	0.70	2.84																100	85
S26	10	5	Pl (Byt) +	59.85		15.91	8.21			16.03																			100	122
S26	10	6	Qz	97.63			2.37																						100	124
S26	10	7	Qz +	80.36		9.92	0.65			7.94	1.12																		100	119
S26	10	8	Ep	40.84		25.39	8.28			22.49																			97	113
S26	10	9	Feohy + Chl	5.05		2.87	80.70		1.38	0.73	1.38		1.77					0.46								5.66			100	67
S26	10	10	Chr			14.41	19.43		9.58									56.59											100	108
S26	10	11	Mix	66.72	2.09	13.49	4.29		1.82	5.06	0.93				5.11			0.49											100	64
S26	10	12	Chr			8.31	28.12		6.93									56.63											100	106
S26	10	13	Feohy +	2.18	0.81	6.78	71.28		1.07	0.43	1.18		2.46					0.54								13.28			100	68
S26	10	14	Spl			33.20	13.99		16.72									36.09											100	108
S26	10	15	Opx	51.00		1.14	5.62		42.04																	0.20			100	94
S26	10	16	Ep	40.76		26.81	6.57			22.86																			97	106
S26	10	17	Feohy +	7.95		3.95	85.08		1.43	0.46			1.14																100	76
S26	10	18	Feohy +	2.93		0.49	92.48																			4.09			100	65
S26	10	19	Feohy + Chl	11.77		4.69	82.30		0.80			0.44																	100	75
S26	10	20	Ep	41.31		27.90	3.28		1.12	23.39																			97	98
S26	10	21	Ep	41.70		29.31	2.29		1.26	22.44																			97	101
S26	10	22	Feohy +	8.85			78.21		1.11				2.07	3.67												6.08			100	39
S26	10	23	Ttn	33.09	36.52	1.98	0.48			27.93																			100	105
S26	10	24	Feohy +	5.08			91.70		0.90	0.33				1.99															100	75
S26	10	25	Qz	100.00																									100	118
S26	10	26	Feohy +	2.74			97.26																						100	78
S26	10	27	Feohy +	7.47		5.27	83.84		0.95	0.55			1.32					0.61											100	77
S26	10	28	Feohy +	37.04	3.13	0.78	57.10			0.80							0.37	0.78											100	163
S26	10	29	Ap +			0.74	0.38			45.77	1.18		39.32	2.25	8.30											2.05			100	114
S26	10	30	Feohy +	26.78		9.95	54.07		1.12		0.63	1.11	1.35													4.98			100	85
S26	10	31	Amph	53.66		4.42	9.93		17.26	10.77	0.58							0.38											97	112
S26	10.1	1	Cpx	56.26			2.27		17.56	23.91																			100	118
S26	10.1	2	Opx	50.54		1.44	3.74		43.97									0.30											100	102
S26	10.1	3	Opx	50.63		0.56	10.76	0.34	37.43	0.28																			100	105
S26	10.1	4	"Chr"		3.44	3.26	74.22	0.90	0.61	0.57							1.43	15.59											100	100

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeO	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	SO <sub>3</sub>	F	Cl	V <sub>2</sub> O <sub>5</sub>	Cr <sub>2</sub> O <sub>3</sub>	NiO	CuO	ZnO	As <sub>2</sub> O <sub>3</sub>	ZrO <sub>2</sub>	Nb <sub>2</sub> O <sub>5</sub>	SnO <sub>2</sub>	HfO <sub>2</sub>	WO <sub>3</sub>	PbO	Total	Actual Total
S26	10.1	5	"Chr"	3.15	3.49	2.65	68.95	0.95	2.17	1.13							1.49	16.00											100	102
S26	11	1	Qz	100.00																									100	122
S26	11	2	"Ilm" +	13.30	60.66	8.15	11.07		5.37	0.49	0.56	0.42																	100	103
S26	11	3	Cal	0.72			0.45	0.24	0.64	30.06	0.36	0.10			23.44														56	95
S26	11	4	Chr		0.48	20.57	20.54		11.75									46.67											100	109
S26	11	5	Feohy +	4.37		1.05	94.13			0.45																			100	85
S26	11	6	Chr			15.52	16.91		9.65									57.92											100	110
S26	11	7	St	30.14	0.67	53.72	13.18		2.29																				100	117
S26	11	8	Feohy +	6.80		0.70	91.88											0.61											100	84
S26	11	9	Cpx	52.45	0.98	2.94	6.87	0.31	14.73	21.32	0.41																		100	121
S26	11	10	Feohy				95.15	0.51																			4.34		100	85
S26	11	11	Ep	38.24	2.44	19.84	13.97			22.50																			97	113
S26	11	12	Feohy +	5.31		0.84	93.09			0.35								0.42											100	81
S26	11	13	Ms	53.32	0.34	24.84	1.84		1.75	1.64	3.14	5.51			2.61														95	118
S26	11	14	Feohy +	6.81		3.46	82.70		1.11	0.47			1.82														3.64		100	73
S26	11	15	Ep	39.99		24.80	9.80			22.41																			97	112
S26	11	16	Feohy +	3.39		0.72	94.21	0.68						1.00															100	80
S26	11	17	Qz +	88.92		2.61	1.59			6.89																			100	121
S26	11	18	Spl			41.67	14.44		16.80									27.09											100	109
S26	11	19	Feohy +	5.42		2.05	88.80			0.50			1.43				0.57				1.23								100	79
S26	11	20	Feohy +	6.19		3.52	82.50						1.17	0.95					3.89		1.79								100	76
S26	11	21	Ep	40.45		26.89	6.88			22.79																			97	110
S26	11	22	Ep	40.45		25.42	8.59			22.53																			97	107
S26	11	23	"Ilm" +	1.47	71.19	0.74	24.51	2.09																					100	92
S26	11	24	Feohy +	10.71		4.28	84.61					0.41																	100	89
S26	11	25	Qz	100.00																									100	113
S26	11	26	Grt	39.92		21.04	28.09		0.96	9.99																			100	109
S26	11	27	Chl	24.30		37.00	20.94	0.56	2.20																				85	98
S26	11	28	Grt	41.76		21.26	2.95			34.02																			100	112
S26	11	29	Feohy +	1.02			98.98																						100	76
S26	11	30	Chr			17.84	15.67		13.09								0.40	53.00											100	109
S26	11	31	Cpx	54.85		1.35	6.00	0.31	14.67	22.83																			100	116
S26	11	32	Feohy +	5.23			94.36											0.41											100	79
S26	11	33	Qz + Feohy	64.38		0.93	34.70																						100	94
S26	11	34	"Ilm"	0.98	78.62		19.95	0.44																					100	100
S26	11	35	TiO <sub>2</sub> +	6.35	92.84	0.43	0.37																						100	113
S26	11	36	Grt	40.13		21.33	26.79	1.34	5.25	5.16																			100	118
S26	11	37	Ep	40.26		25.55	8.14			23.06																			97	113
S26	11	38	Feohy +	7.93		4.69	81.84		0.96	0.33			1.45														2.79		100	81
S26	12	1	Chr	0.83		25.11	15.71		11.17								0.42	46.76											100	109
S26	12	2	TiO <sub>2</sub> +	4.13	91.85	2.10	1.92																						100	95
S26	12	3	Crm		0.53	99.47																							100	110
S26	12	4	Mix	39.56		12.08	38.14		1.74	0.51	0.52	3.95															3.50		100	90
S26	12	5	Grt	38.09	0.34	19.90	7.77	27.17	0.74	3.16					2.84														100	123
S26	12	6	Qz	100.00																									100	127
S26	12	7	Spl	1.97		47.71	12.24		17.64	1.54								18.90											100	117
S26	12	8	Mix	40.21		19.49	6.19		25.08	9.04																			100	106
S26	12	9	Ep	40.40		23.13	11.20			22.27																			97	116
S26	12	10	Feohy +	2.01			97.56			0.44																			100	82
S26	12	11	Ilm		56.71		40.53	2.76																					100	108
S26	12	12	Feohy + Chl	12.29		6.47	77.59		1.51			0.47	1.67																100	85
S26	12	13	Chr			23.82	16.03		12.84									47.32											100	112
S26	12	14	Feohy +	8.50		2.26	87.19		0.84				1.22																100	79
S26	12	15	Ep	40.30		24.40	9.69			22.61																			97	112
S26	12	16	"Chr"	1.88		2.99	58.70	1.98	2.35									31.45			0.66								100	100



Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	12	17	Spl			33.90	16.05		14.60									35.46											100	110
S26	12	18	Feohy +	3.49		2.17	89.17		0.77	0.48			1.49														2.43		100	75
S26	12	19	Mix	14.14		8.20	65.01		1.45		0.66	0.84	2.15														7.55		100	82
S26	12	20	Ep	40.87		23.59	10.51			21.19	0.83																		97	113
S26	12	21	Chr			9.16	27.37		9.31									54.16											100	107
S26	12	22	Ep	39.88		22.97	11.81			22.34																			97	110
S26	12	23	Feohy +	2.90		2.75	78.47		0.99		0.80		2.04														12.05		100	76
S26	12	24	Ap +				0.44			46.49	0.98		39.57	1.75	8.28												2.50		100	110
S26	12	25	Ep	48.36		24.26	4.47		0.45	19.46																			97	111
S26	12	26	Feohy +	3.76		1.14	93.55			0.61			0.95																100	82
S26	12	27	Feohy				92.78		2.18	1.26			1.90	1.88															100	69
S26	12	28	Grt	38.98		2.63	24.54			33.85																			100	101
S26	12	29	Feohy +	4.64		0.93	94.43																						100	73
S26	12	30	Cpx	55.72		1.33	2.75		17.90	21.61								0.69											100	112
S26	12	31	Chr			11.94	19.52		9.44									59.10											100	102
S26	12	32	Ep	42.52		25.20	7.25			22.04																			97	102
S26	12	33	Ap +				0.35			47.42	0.82		39.18	1.33	8.28												2.63		100	105
S26	12	34	Feohy +	7.71		3.74	86.13			0.55			1.48					0.39											100	74
S26	12	35	Feohy +	8.50		3.81	83.32																				4.37		100	64
S26	12	36	Feohy +	5.65		1.26	86.47														2.38						4.24		100	76
S26	12	37	Spl		0.34	30.67	22.15		13.07									33.77											100	102
S26	12	38	Cal						0.31	27.15					28.54														56	118
S26	12	39	Feohy +	4.19		1.82	93.21													0.77									100	73
S26	12	40	Chr			19.96	33.15		7.86									39.02											100	105
S26	12	41	Feohy +	3.14		1.78	89.87	1.28		0.52			0.91														2.51		100	86
S26	12.1	1	Feohy + Chl +	6.01		4.39	80.09	0.81	1.02	0.48			2.15														5.05		100	72
S26	12.1	2	Feohy + Chl +	6.98		5.32	78.10		1.15	0.73			2.04					0.80									4.87		100	44
S26	12.1	3	Feohy + Chl +	13.18		8.10	68.28	0.79	1.56	0.53		0.36	2.04														5.16		100	61
S26	12.2	1	Feohy +	5.89		2.18	86.86			0.36			1.69				0.49				2.53								100	79
S26	12.2	2	Qz	98.89			1.11																						100	123
S26	12.2	3	Feohy +	24.35		2.33	67.58		0.65				1.51				0.72			1.02	1.84								100	87
S26	12.2	4	Qz +	91.57		1.53	6.60					0.30																	100	109
S26	12.2	5	Feohy +	9.22		2.89	82.01			0.43			2.44				0.76				2.24								100	80
S26	13	1	Spl		0.58	30.30	18.88		14.36									35.88											100	108
S26	13	2	Feohy			0.61	99.39																						100	96
S26	13	3	Cpx	52.80		3.21	7.63		14.13	22.22																			100	117
S26	13	4	Grt	39.66		20.89	32.21	0.98		3.75	2.52																		100	117
S26	13	5	Amph	45.79	0.61	12.97	12.04		13.34	9.94	1.92	0.39																	97	117
S26	13	6	Ep	40.53		30.34	2.71			22.68					0.75														97	119
S26	13	7	Feohy +	4.01		1.31	90.86			0.56			0.98					0.36		1.92									100	89
S26	13	8	Chr		0.82	8.19	31.53		5.74									53.72											100	112
S26	13	9	Chr			28.07	24.86		12.00									35.07											100	110
S26	13	10	Cpx	53.33		3.39	4.79		18.57	17.02	0.61							0.49									1.80		100	115
S26	13	11	Feohy +	5.16			93.99			0.45								0.40											100	84
S26	13	12	Qz +	91.17		4.92	1.18		0.63			2.10																	100	121
S26	13	13	Zrn	31.17																		67.46				1.38			100	129
S26	13	14	Chr +	3.96		23.83	33.01		10.20									29.01											100	102
S26	13	15	Feohy				99.41											0.59											100	95
S26	13	16	Feohy	5.19		1.36	91.75	1.33										0.38											100	81
S26	13	17	Chr			19.23	18.40		11.90								0.46	50.01											100	108
S26	13	18	Grt	41.86		21.14	2.57			34.43																			100	112
S26	13	19	Ep	40.81		29.83	0.61		1.22	22.51					2.02														97	108
S26	13	20	Ep	39.82	1.91	23.24	9.15			22.88																			97	109
S26	13	21	Py +	3.28		1.39	34.25			2.76	0.82			54.78													2.72		100	137
S26	13	22	Feohy +	5.84		1.48	89.48	0.65					1.32	1.22															100	75

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	13	23	Cpx	55.59		3.22	6.23		17.89	16.46	0.60																		100	109
S26	13	24	Feohy +	8.71		3.64	85.39		0.92			0.41	0.93																100	76
S26	13	25	Ep	40.03		21.56	13.05	0.57		21.79																			97	105
S26	13	26	Feohy +	4.15		0.92	94.46			0.47																			100	74
S26	13	27	Amph	54.57		2.75	10.31	0.43	19.33	8.59	0.38							0.65											97	92
S26	13	28	TiO2 +	1.22	96.06		0.86			1.85																			100	103
S26	13	29	Qz	100.00																									100	116
S26	13	30	Qz	99.65			0.35																						100	121
S26	13	31	TiO2		99.44		0.56																						100	106
S26	13	32	Feohy +	9.27		4.99	83.34		0.83	0.64			0.93																100	78
S26	13	33	Opx	54.06		1.27	22.10	0.70	21.43	0.43																			100	116
S26	13	34	Ep	40.33		27.20	6.67			22.80																			97	106
S26	13	35	Feohy +	4.91	1.09	1.17	92.82																						100	84
S26	13	36	Feohy +	6.11		1.19	91.18						1.53																100	77
S26	13.1	1	Qz	99.73	0.27																								100	121
S26	13.1	2	TiO2 +	3.06	86.94	0.83	5.68																				3.50		100	105
S26	13.1	3	Qz + TiO2	47.98	49.33		2.43																				0.26		100	110
S26	13.1	4	TiO2 +	1.77	95.21	0.83	2.18																						100	107
S26	13.1	5	Qz + TiO2 +	52.03	36.34	1.59	1.65				0.53												7.86						100	112
S26	13.1	6	Clay	61.04	1.08	25.29	2.59		3.29	0.45	1.36	1.29			3.61														100	102
S26	14	1	Feohy				100.00																						100	94
S26	14	2	Ep +	40.01		20.28	14.98	6.65	0.38	17.69																			100	112
S26	14	3	"Chr"		4.03	16.72	39.02		2.78	0.37	0.62						0.60	32.44			1.22					2.21			100	94
S26	14	4	Ep	39.72		23.57	11.07	0.33		22.32																			97	107
S26	14	5	Qz	100.00																									100	120
S26	14	6	Grt	39.74		21.03	26.82	2.17	1.04	9.20																			100	113
S26	14	7	Ep	39.86		21.02	13.48			22.64																			97	111
S26	14	8	TiO2 +		94.67		4.87			0.46																			100	104
S26	14	9	TiO2		100.00																								100	112
S26	14	10	Ep	41.31		23.07	7.28		2.19	23.15																			97	101
S26	14	11	Zrn	31.12																			68.88						100	124
S26	14	12	Chr			26.83	15.94		14.08									43.16											100	115
S26	14	13	Feohy +	5.61		1.77	91.46		0.73	0.43																			100	79
S26	14	14	Cpx	55.23		1.07	5.06	0.31	15.76	22.56																			100	118
S26	14	15	Ttn	32.66	38.43	0.57	0.79			27.55																			100	109
S26	14	16	Tur	38.23	0.82	32.05	4.63		8.26	0.99	2.03																		87	98
S26	14	17	St	30.55	0.58	55.84	11.13	0.29	1.05												0.56								100	108
S26	14	18	Feohy +	4.07		0.80	93.44	0.53									1.15												100	77
S26	14	19	Ep	40.03		22.85	11.83			22.29																			97	108
S26	14	20	Feohy +	6.46		1.93	85.67			0.45			1.66														3.83		100	75
S26	14	21	Feohy +	7.56			87.61		1.14	0.37			1.37					0.48			1.48								100	81
S26	14	22	Py +	1.22			41.64				0.81		0.96	50.52													4.85		100	152
S26	14	23	Feohy + Chl +	13.55		7.70	73.39	0.84	0.66	0.99		0.61	2.26																100	70
S26	14	24	Cal				0.31	0.50	0.50	29.66					25.02														56	107
S26	14	25	"Chr"	3.62	1.69	0.72	56.11	1.20	4.44									32.20											100	102
S26	14	26	Ilm +	8.92	50.15		32.11	2.68		6.15																			100	110
S26	14	27	Feohy + Chl	9.86		4.72	75.85		0.86	0.53			1.04														7.14		100	73
S26	14	28	Ttn	30.55	41.79	0.75	0.72			26.19																			100	105
S26	14	29	Feohy +	1.47			89.05	0.54	0.82	0.51			0.99														6.61		100	74
S26	14	30	Feohy				100.00																						100	84
S26	14	31	Ttn +	22.38	57.12	0.74	0.92			18.84																			100	107
S26	14	32	Tur	38.56	0.69	31.89	4.25		8.45	0.61	2.56																		87	99
S26	14	33	Ep	40.94		26.41	7.22			22.43																			97	103
S26	14	34	Tur	38.19	0.73	31.45	4.63		8.86	1.02	2.12																		87	95
S26	14	35	Ep	40.32		23.69	10.97			22.02																			97	106

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	14	36	Chr			22.09	21.24		10.17									46.50											100	103
S26	14	37	Ttn +	27.80	45.95	1.42	0.90			23.93																			100	105
S26	14	38	Feohy +	2.97		1.02	92.96			0.41																	2.64		100	71
S26	14	39	Grt	40.73	0.40	3.66	23.37			31.84																			100	95
S26	14.1	1	Feohy +	4.64		0.81	92.91	1.31		0.33																			100	82
S26	14.1	2	Qz + Chl	66.63		13.62	11.41		3.57		0.52	4.25																	100	99
S26	14.1	3	Ttn	32.93	37.38	1.04	0.69			27.96																			100	111
S26	14.1	4	Ab	69.19		18.77	0.36				11.68																		100	116
S26	14.1	5	Zrn +	31.11	7.06		0.90			5.71													53.92			1.32			100	119
S26	14.1	6	Chl	28.27	0.31	15.80	21.61	0.35	12.84	0.35	0.76	1.42		3.29															85	100
S26	14.1	7	Ilm		52.88		40.64	5.76		0.72																			100	105
S26	15	1	Py +	1.70		0.81	47.60	0.33		0.34	3.96			45.26															100	126
S26	15	2	Qz	100.00																									100	116
S26	15	3	Ttn	32.65	36.42	1.07	2.04			27.81																			100	107
S26	15	4	Ttn + Chl	29.58	31.35	5.11	11.93	1.23	2.73	17.60	0.46																		100	100
S26	15	5	Ep	40.60		31.35	1.46			23.58																			97	106
S26	15	6	Feohy +	4.28		3.70	89.55	0.84		0.46			1.17																100	79
S26	15	7	Feohy +	1.55		5.65	80.85		1.18	0.37			2.66					1.06									6.69		100	75
S26	15	8	Grt	39.79		20.68	28.94	0.50	1.42	8.66																			100	115
S26	15	9	Ep	39.87		22.78	11.72			22.64																			97	111
S26	15	10	Ap							49.43			45.21		5.37														100	126
S26	15	11	Ep	40.25		31.24	1.43			22.95					1.13														97	120
S26	15	12	Feohy +	2.67		1.61	93.76			0.48			1.49																100	88
S26	15	13	Feohy +	3.46		2.32	92.46	0.70		0.60								0.45											100	84
S26	15	14	Zrn	31.12																			67.25			1.62			100	126
S26	15	15	Ep	40.18		24.92	9.16	0.34		22.41																			97	111
S26	15	16	Kfs	66.19		17.56					0.67	15.58																	100	116
S26	15	17	Qz + TiO <sub>2</sub> +	67.86	28.35	1.44	0.91		0.87			0.58																	100	109
S26	15	18	Grt	39.85		21.01	25.06	4.03	1.23	8.81																			100	108
S26	15	19	Amph	51.93	0.31	5.80	5.12		20.02	11.21	2.00	0.21						0.40											97	111
S26	15	20	Feohy +	7.80		3.89	81.56		0.82	0.43			1.90					0.45									3.15		100	75
S26	15	21	Py				30.05							69.95															100	198
S26	15	22	Ep	41.98		27.69	6.35			19.47		1.50																	97	108
S26	15	23	Ap							51.51		0.30	44.29		2.20												1.69		100	100
S26	15	24	TiO <sub>2</sub> +	1.26	88.31	1.27	8.32	0.43		0.42																			100	100
S26	15	25	Ep	43.30		21.25	11.50			20.94																			97	111
S26	15	26	Zrn	31.43																			68.57						100	116
S26	15	27	Ep	40.30		23.55	11.16			21.98																			97	104
S26	15	28	Ep	41.51		21.86	11.78		1.39	20.47																			97	106
S26	15	29	Feohy +	5.23		2.15	92.16											0.46											100	70
S26	15	30	Spl			43.09	14.70		17.56									24.65											100	103
S26	15	31	Ep +	39.53	6.87	19.93	9.64			24.03																			100	102
S26	15	32	Feohy +	3.39		1.18	94.41						1.03																100	80
S26	15	33	Ep	40.32		25.58	8.62			22.48																			97	102
S26	15	34	Ttn	32.74	34.57	3.01	0.54			27.46					1.68														100	107
S26	15	35	Ilm		55.20		42.17	2.62																					100	101
S26	16	1	Ttn	33.22	35.68	2.36	0.69			28.05																			100	113
S26	16	2	Qz + TiO <sub>2</sub>	57.81	39.47	0.95	0.62			0.30							0.84												100	116
S26	16	3	Feohy +	4.77			94.33		0.91																				100	80
S26	16	4	St	30.32	0.66	53.24	13.64		2.14																				100	116
S26	16	5	Ep	40.16	0.42	25.18	8.70			22.54																			97	116
S26	16	6	Feohy +	6.16			93.84																						100	83
S26	16	7	Feohy +	4.59		1.22	94.19																						100	87
S26	16	8	Ep	40.78		24.66	9.18			22.39																			97	119
S26	16	9	Ep	40.47		20.62	1.75			34.16																			97	122

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	16	10	Ep	40.23		24.79	9.80	0.48		21.71																		97	111	
S26	16	11	Feohy +	4.95		0.85	94.19																					100	82	
S26	16	12	Ep	41.56		29.18	2.70			22.68					0.88													97	103	
S26	16	13	St	29.66	0.51	53.11	13.65	0.32	2.75																			100	114	
S26	16	14	Feohy +	3.60		1.92	89.57		0.99	0.39			1.17														2.37	100	82	
S26	16	15	Feohy +	3.57		3.95	83.45			0.56	1.02		1.77					0.50								5.17		100	88	
S26	16	16	Grt	41.24	0.69	20.53	2.93			34.61																		100	116	
S26	16	17	Ilm		53.99		42.39	3.62																				100	108	
S26	16	18	Ilm		52.64		43.51	3.85																				100	106	
S26	16	19	Ep +	44.96		22.62	10.36	0.32		19.94	1.81																	100	106	
S26	16	20	Ep +	47.56		24.04	3.55		1.94	16.57	2.29				4.05													100	91	
S26	16	21	Amph	48.34	0.63	10.28	10.95		13.78	11.29	1.73																	97	113	
S26	16	22	Ap +				0.43			50.07	0.90		38.39	1.44	8.77													100	112	
S26	16	23	Qz	100.00																								100	122	
S26	16	24	Feohy +	4.95		1.17	93.39	0.49																				100	83	
S26	16	25	Py	0.48			28.76	0.47			0.28			70.01														100	226	
S26	16	26	Grt	41.62		18.84	4.78			34.77																		100	115	
S26	16	27	Ep	41.94		19.85	13.78			20.73	0.71																	97	110	
S26	16	28	Feohy				93.05		1.20				1.39													4.36		100	71	
S26	16	29	Ep +	52.85		22.39	5.66			19.09																		100	107	
S26	16	30	Ol	42.42			7.84		49.74																			100	114	
S26	16	31	Feohy +	5.95		5.34	77.85		1.26	0.49			3.13													5.98		100	78	
S26	16	32	Grt	39.99		20.57	27.78	0.84	0.82	9.99																		100	109	
S26	16	33	Ep	40.29		25.73	8.13	0.31		22.53																		97	100	
S26	16	34	Spl			28.08	15.87		14.82								0.40	40.83										100	108	
S26	16	35	"Ilm" +	8.01	73.68	7.40	6.84		4.08																			100	105	
S26	17	1	Amph	54.15	0.97	3.42	8.37		18.74	10.53	0.81																	97	115	
S26	17	2	Ep	40.03		24.66	9.64			22.67																		97	111	
S26	17	3	Chr			14.43	18.51		12.45	0.23								54.39										100	110	
S26	17	4	Grt	39.50		20.63	28.69	2.01	0.78	8.37																		100	115	
S26	17	5	Cpx	56.70			2.11		18.04	23.15																		100	117	
S26	17	6	Ttn +	31.14	37.12	2.99	1.06		0.36	25.83					1.50													100	113	
S26	17	7	Ilm +		49.31		44.37	0.99	0.63		3.35	0.29				1.06												100	108	
S26	17	8	Qz	99.75							0.25																	100	126	
S26	17	9	TiO <sub>2</sub>	0.55	98.65		0.80																					100	113	
S26	17	10	Feohy +	5.77		1.35	92.03														0.85							100	84	
S26	17	11	Spl			45.20	13.38		18.16									23.27										100	118	
S26	17	12	Pl + Chl	63.16		16.52	3.26		2.23	14.48	0.36																	100	121	
S26	17	13	Feohy +	7.02		2.10	89.30			0.44			1.13															100	81	
S26	17	14	Grt	37.80		19.73	8.40	28.61		2.92					2.54													100	119	
S26	17	15	Cal +	21.50		0.73	0.61		0.44	41.09	0.48				35.15													100	119	
S26	17	16	Feohy +	4.81		0.91	90.85	2.90		0.53																		100	81	
S26	17	17	Tur	37.23	1.24	29.47	7.89		7.79	1.84	1.54																	87	101	
S26	17	18	Chr +	2.53	0.40	2.92	28.86		4.76									60.52										100	107	
S26	17	19	Ttn	32.77	38.52	0.81				27.91																		100	113	
S26	17	20	Py +	1.31		0.55	48.21		0.39		0.54		49.00															100	140	
S26	17	21	TiO <sub>2</sub> +	0.66	97.94		0.37			1.04																		100	108	
S26	17	22	Ep	40.47		25.82	7.95			22.76																		97	111	
S26	17	23	Ep +	40.91	5.79	21.74	5.84		2.14	23.58																		100	105	
S26	17	24	Feohy +	17.58		5.17	73.34		0.99	0.50			2.42															100	82	
S26	17	25	Ep	40.30		24.34	10.00	1.17		21.18																		97	106	
S26	17	26	Tur	40.45	0.34	30.26	4.13		10.62		0.39	0.17						0.30	0.33									87	102	
S26	17	27	Feohy +	3.88		0.77	94.19	1.16																				100	80	
S26	17	28	Feohy +	4.35			95.65																					100	74	
S26	17	29	Ttn	33.00	38.21	0.76	0.36			27.67																		100	109	

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	17	30	Grt	39.65		20.86	33.01	0.50	3.44	2.54																		100	109	
S26	17	31	Spl			51.87	11.82		19.61									16.70										100	105	
S26	17	32	Feohy +	8.99		2.37	87.27						1.37															100	76	
S26	17	33	Qz +	77.96		8.57	4.55			8.92																		100	118	
S26	17	34	"Ilm" +	1.36	81.23	0.93	16.48																					100	85	
S26	17	35	Grt	41.54		22.91	12.56			22.99																		100	107	
S26	17	36	Chr			8.31	21.94		8.72									61.03										100	106	
S26	17	37	Ap							45.12	1.36		39.38	1.81	8.69												3.64	100	111	
S26	17.1	1	Ti-Mag		23.91		74.99										1.11											100	99	
S26	17.1	2	Ilm		50.43		47.86	0.41	1.30																			100	107	
S26	17.1	3	Ti-Mag		15.43		83.71											0.86										100	98	
S26	18	1	TiO2		100.00																							100	107	
S26	18	2	Qz	100.00																								100	120	
S26	18	3	Ep	39.77		21.66	13.28			22.28																		97	110	
S26	18	4	Amph	47.20	1.13	11.14	10.34	0.45	14.71	9.55	2.47																	97	104	
S26	18	5	Feohy +	1.25		1.16	89.37			0.49			1.71	1.09													4.93	100	74	
S26	18	6	St	29.03		44.41	20.59		5.97																			100	106	
S26	18	7	Feohy +	5.46			92.49	2.05																				100	79	
S26	18	8	Feohy + Chl	14.91		8.18	63.86		1.40	0.47		1.30	2.49								-0.22						7.60	100	51	
S26	18	9	Feohy +	4.36		3.88	84.67		0.85	0.40	0.90		1.37														3.58	100	77	
S26	18	10	Ap +				0.55			45.33	1.14		40.03	1.05	7.43												4.46	100	100	
S26	18	11	Chr			29.47	13.53		15.83									41.17										100	115	
S26	18	12	Chr			27.65	16.32		13.55									42.48										100	112	
S26	18	13	Mix	36.17	0.40	16.99	15.97		2.43	14.04	0.61	4.33			9.05													100	107	
S26	18	14	Feohy +	6.32		4.55	84.59		0.95				2.61							0.98								100	82	
S26	18	15	Ep	40.26		22.74	11.47	0.32		22.21																		97	111	
S26	18	16	"Ilm" +	1.18	66.12	2.28	25.15	4.04		0.35			0.89															100	98	
S26	18	17	Tur	38.33	0.83	31.12	5.11		8.47	0.76	2.39																	87	97	
S26	18	18	Feohy +	4.23		4.06	80.52		0.96	0.46			2.05								1.63						6.10	100	74	
S26	18	19	Feohy +	1.58	1.27	2.94	61.41	1.28	1.19		0.95							26.37									3.02	100	87	
S26	18	20	Ttn +	35.46	25.72	8.84	4.99		3.36	19.80	0.46	1.36																100	103	
S26	18	21	Feohy +	2.56		3.93	86.57				1.60		1.33														4.01	100	83	
S26	18	22	Ep	40.50		27.12	6.60			22.79																		97	103	
S26	18	23	Cpx	55.03		0.65	7.83	0.28	15.00	21.21																		100	111	
S26	18	24	Feohy +	7.38		3.51	85.93			0.52			1.71								0.95							100	79	
S26	18	25	Ttn	33.79	36.25	1.95	0.87			27.14																		100	99	
S26	18	26	Feohy +	2.56		2.66	86.42		1.08		0.89		1.22														5.18	100	70	
S26	18	27	Zrn	30.88																			67.47			1.65		100	116	
S26	18	28	Ilm +	9.93	66.25	3.96	12.32	2.54	0.62	2.22				2.15														100	106	
S26	18	29	Feohy +	17.53		3.33	72.05		0.80		0.77		1.06	0.76													3.71	100	82	
S26	18	30	Qz	99.74			0.26																					100	120	
S26	18	31	Ep	39.93		22.36	12.25			22.46																		97	109	
S26	19	1	Ep	40.69		24.07	9.92			22.32																		97	99	
S26	19	2	Grt	39.28		20.58	30.76	4.98	3.33	1.08																		100	111	
S26	19	3	Feohy +	3.32		2.50	89.09			0.43			1.75				1.36				1.55							100	75	
S26	19	4	Ilm	0.97	51.43	0.48	44.64	1.07	1.40																			100	106	
S26	19	5	Ep	40.22		25.54	8.72			22.52																		97	108	
S26	19	6	Spl			37.67	15.95		15.99									30.38										100	111	
S26	19	7	Ap +	4.75						44.23	1.32		37.84	1.85	10.01													100	117	
S26	19	8	Ep +	48.78		25.10	6.13			19.26	0.74																	100	100	
S26	19	9	Fe-Chr		1.53	16.43	38.49		7.33								0.72	35.50										100	111	
S26	19	10	Ep	37.54		20.76	12.65	0.61		22.78			2.67															97	114	
S26	19	11	Feohy + Chl	18.30		13.14	62.58		1.49	0.36	1.55	0.81	0.87	0.89														100	89	
S26	19	12	Qz +	95.71		2.02	0.73			1.54																		100	118	
S26	19	13	Chr			21.96	18.88		12.54								0.41	46.22										100	112	



Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total
S26	19	14	Qz	99.71			0.29																					100	124	
S26	19	15	Feohy +	4.41		0.86	93.65		0.65	0.43																		100	81	
S26	19	16	Qz +	85.81		7.78	0.58			5.82																		100	117	
S26	19	17	Ep	40.01		23.89	9.93			22.76							0.41											97	111	
S26	19	18	Feohy +	8.18		3.54	87.27			0.50								0.50										100	78	
S26	19	19	Ep	40.06	0.66	24.27	9.38			22.63																		97	108	
S26	19	20	Ep	40.29		22.43	12.69			21.59																		97	104	
S26	19	21	Chl	27.93		17.61	23.22	0.45	15.19					0.60														85	95	
S26	19	22	Feohy +	4.39		1.96	92.15			0.44			1.06															100	80	
S26	19	23	Feohy +	4.93		1.68	91.98		0.89	0.52																		100	74	
S26	19	24	Ep	40.18		25.00	9.25			22.57																		97	102	
S26	19	25	Spl			33.40	18.06		14.34									34.20										100	103	
S26	19	26	Feohy +	10.69		4.05	72.50		1.32	0.38		0.72	1.73	3.47												5.14		100	74	
S26	19	27	Ep	40.75		26.87	6.98			22.39																		97	104	
S26	19	28	Feohy +	6.24			93.76																					100	71	
S26	19	29	Py +	1.67		0.34	43.81				0.54		0.67	51.35												1.62		100	144	
S26	19	30	Cpx	55.86		0.64	4.61		16.43	22.46																		100	113	
S26	19	31	Ep	39.63		22.37	12.42	0.63		21.95																		97	108	
S26	19	32	Ep	39.88		23.62	11.22			22.28																		97	106	
S26	19	33	Ilm		49.29		49.67	1.04																				100	102	
S26	19	34	Ilm		52.11		46.08	1.81																				100	104	
S26	19	35	Ap	0.95						49.42			42.79		5.53												1.30		100	119
S26	19.1	1	Qz	98.88	0.48		0.44			0.20																		100	120	
S26	19.1	2	Ilm		58.58		37.98	3.44																				100	106	
S26	19.1	3	"Ttn"	21.97	57.16	1.30	2.20			17.38																		100	108	
S26	19.1	4	Qz	99.58			0.42																					100	122	
S26	20	1	Qz	100.00																								100	118	
S26	20	2	Zrn	30.92																			69.08					100	118	
S26	20	3	Feohy +	7.16			91.60						1.24															100	75	
S26	20	4	"Ttn"	20.75	61.47		0.80			16.98																		100	109	
S26	20	5	Feohy +	1.69		2.78	85.33		1.51				1.11	2.39												5.18		100	72	
S26	20	6	Ep	40.74		25.78	8.03			22.45																		97	110	
S26	20	7	Ilm		54.09		43.99	1.92																				100	106	
S26	20	8	Chr			12.26	21.00		9.53									57.22										100	110	
S26	20	9	Grt	40.08		20.55	30.14	1.28	2.31	5.64																		100	116	
S26	20	10	Ep +	45.53		21.47	10.46			19.25	3.29																	100	115	
S26	20	11	Feohy +	3.36		4.10	79.61		0.69	0.47	0.81		2.57					0.49								7.90		100	80	
S26	20	12	Ap +				0.32			47.09	1.12		37.86	1.71	9.07											2.84		100	114	
S26	20	13	Chr			20.55	17.35		11.89									50.21										100	110	
S26	20	14	TiO2 +	9.61	82.42	4.87	1.31					1.79																100	111	
S26	20	15	Ep	43.46		23.82	6.87			22.85																		97	98	
S26	20	16	Feohy +	4.97		0.85	92.79			0.51			0.89															100	82	
S26	20	17	Qz +	93.58		2.60	1.07			2.74																		100	106	
S26	20	18	Grt	39.57		20.36	30.53	2.37	1.47	5.70																		100	113	
S26	20	19	Ab	66.54		20.64	0.35			1.65	10.40	0.43																100	117	
S26	20	20	Feohy +	3.96		0.71	95.33																					100	78	
S26	20	21	Qz +	94.26		2.75	1.23		0.82		0.29	0.66																100	118	
S26	20	22	Chr +	9.29	0.39	11.26	40.43	3.18	13.27									22.18										100	103	
S26	20	23	Ttn	34.30	30.36	3.83	3.94		1.68	25.11							0.79											100	109	
S26	20	24	"Ilm"		79.95	0.86	15.11	2.37									1.72											100	97	
S26	20	25	Ep	42.02		21.70	9.51		1.70	22.07																		97	104	
S26	20	26	Qz	100.00																								100	114	
S26	20	27	Feohy + Qz	24.63	0.49	1.97	71.03						0.98					0.43		1.45								100	65	
S26	20	28	Feohy +	4.12		1.20	93.24											0.45										100	82	
S26	20	29	Feohy +	19.76	1.51	4.39	70.15		3.18		1.01																	100	93	

Table B14.1: Mineral chemical analyses of sample S26.

Sample	Site	Position	Mineral	SiO2	TiO2	Al2O3	FeO	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	F	Cl	V2O5	Cr2O3	NiO	CuO	ZnO	As2O3	ZrO2	Nb2O5	SnO2	HfO2	WO3	PbO	Total	Actual Total	
S26	20	30	TiO <sub>2</sub> + Qz	17.67	82.33																								100	106	
S26	20	31	Mix	66.46		12.00	0.46			21.09																				100	105
S26	20	32	Cpx	53.20	0.46	2.88	7.73		13.43	22.30																				100	108
S26	20	33	Feohy + Qz +	10.31		2.51	87.17																							100	73
S26	20	34	Mix	31.21	0.48	13.57	43.45		2.25		0.99	3.60	0.85														3.61			100	90
S26	20	35	Ep +	43.52		24.15	10.31		0.99	20.24	0.39	0.40																		100	92
S26	20.1	1	Mag				98.78	1.22																						100	101
S26	20.1	2	Mag				99.22	0.78																						100	102
S26	20.1	3	Feohy				93.21			0.51	0.84		1.23														4.21			100	82
S26	20.1	4	Mag			0.75	99.25																							100	93
																									</						