Table A7c. Microprobe Analyses of Pyroxenes in Cycle 2 Argillites.

Sample Number	3H-39	3H-39	3H-39	3H-39	3H-39	3H-40	3H-40	3H-40	3H-40	16H-86	16H-86	16H-86	17H-87	17H-87	17H-87
Photo # - Analysis #	1-5	1-9	2-28	3-45	5-64	1-20A	1-5	2-10	3-16	2-19	3-50	3-51	1-9	5-9	5-10
Layer Type	W	V	A	A	V	A	A	W	W	W	A	A	C	A	A
SiO_2	52.54	53.21	53.08	52.62	52.36	52.41	52.26	53.10	52.87	52.77	52.23	52.47	53.14	53.66	54.21
Al_2O_3	0.71	0.73	0.40	0.32	0.41	0.14	0.03	0.19	0.15	0.09	1.92	0.26	0.62	1.19	0.45
FeO	5.56	8.42	9.00	9.64	9.96	11.42	11.33	9.10	9.11	8.00	7.33	9.23	5.37	5.10	6.65
Fe_2O_3	1.47	0.00	1.27	0.68	0.00	0.00	0.00	0.00	0.24	0.14	0.66	0.00	0.92	1.07	0.07
MgO	13.46	12.69	12.53	11.94	10.99	10.52	10.27	11.50	11.93	12.73	12.23	12.20	14.41	14.19	14.06
MnO	0.19	0.19	0.22	0.25	0.41	0.90	0.93	1.27	1.21	0.29	0.23	0.18	0.16	0.09	0.17
TiO_2	0.03	0.03	0.01	0.02	0.04	0.00	0.03	0.00	0.00	0.00	0.12	0.37	0.04	0.11	0.00
Cr_2O_3	0.05	0.11	0.06	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.00
CaO	24.90	24.72	24.33	24.42	23.80	24.07	24.25	24.58	24.76	25.47	24.54	25.13	25.40	25.32	25.42
Na_2O	0.26	0.15	0.28	0.11	0.02	0.00	0.00	0.06	0.00	0.00	0.38	0.00	0.01	0.29	0.08
Total	**99.17**	**100.25**	**101.18**	**100.06**	**98.01**	**99.46**	**99.10**	**99.80**	**100.27**	**99.49**	**99.65**	**99.89**	**100.07**	**101.02**	**101.11**
Cations/6 Oxygens															
Si	1.971	1.987	1.977	1.985	2.012	2.005	2.008	2.007	1.992	1.991	1.959	1.980	1.971	1.967	1.992
^{IV}Al	0.029	0.013	0.018	0.014	0.000	0.000	0.000	0.000	0.007	0.004	0.041	0.012	0.027	0.033	0.008
Total Tetrahedral	**2.000**	**2.000**	**1.995**	**1.999**	**2.012**	**2.005**	**2.008**	**2.007**	**1.999**	**1.995**	**2.000**	**1.992**	**1.998**	**2.000**	**2.000**
^{VI}Al	0.003	0.020	0.000	0.000	0.019	0.006	0.001	0.008	0.000	0.000	0.043	0.000	0.000	0.018	0.012
Fe^{2+}	0.175	0.263	0.280	0.304	0.320	0.365	0.364	0.288	0.287	0.252	0.230	0.291	0.166	0.156	0.204
Fe^{3+}	0.042	0.000	0.035	0.019	0.000	0.000	0.000	0.000	0.007	0.004	0.018	0.000	0.026	0.029	0.002
Mg	0.753	0.706	0.695	0.671	0.630	0.600	0.588	0.648	0.670	0.716	0.683	0.686	0.796	0.775	0.770
Mn	0.006	0.006	0.007	0.008	0.013	0.029	0.030	0.041	0.039	0.009	0.007	0.006	0.005	0.003	0.005
Ti	0.001	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.003	0.011	0.001	0.003	0.000
Cr	0.001	0.003	0.002	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Total Octahedral	**0.981**	**0.999**	**1.019**	**1.005**	**0.984**	**1.000**	**0.984**	**0.985**	**1.003**	**0.981**	**0.984**	**0.995**	**0.994**	**0.984**	**0.993**
Ca	1.001	0.989	0.971	0.987	0.980	0.987	0.998	0.995	1.000	1.029	0.986	1.016	1.009	0.994	1.001
Na	0.019	0.011	0.020	0.008	0.001	0.000	0.000	0.004	0.000	0.000	0.028	0.000	0.001	0.021	0.006
Total Cations	**4.001**	**3.999**	**4.005**	**3.999**	**3.977**	**3.992**	**3.990**	**3.991**	**4.002**	**4.005**	**3.998**	**4.003**	**4.002**	**3.999**	**4.000**
%Quad	95.33	97.63	96.25	97.83	97.97	99.37	99.78	99.15	99.33	99.60	93.43	98.80	97.29	94.25	98.64
%'Others'	4.67	2.37	3.75	2.17	2.03	0.63	0.22	0.85	0.67	0.40	6.57	1.20	2.71	5.08	1.36
Breakdown of Quad															
%Ca	51.91	50.51	49.87	50.30	50.79	50.55	51.18	51.55	51.09	51.54	51.91	50.97	51.18	51.64	50.67
%Mg	39.03	36.06	35.72	34.21	32.62	30.73	30.15	33.55	34.24	35.83	35.98	34.42	40.38	40.25	38.98
$\%Fe^{2+}$	9.05	13.43	14.40	15.49	16.59	18.72	18.67	14.90	14.67	12.64	12.10	14.61	8.44	8.11	10.35
$Fe^{2+}/(Fe^{2+} + Mg)$	0.189	0.271	0.287	0.312	0.337	0.378	0.382	0.308	0.300	0.260	0.252	0.298	0.173	0.168	0.209

Table A7c. Continued. Page 2 of 3 Pages.

Sample Number	20H-100	20H-100	20H-100	20H-100	8H-59	8H-59	8H-59	8H-59	8H-59	5H-44	5H-44	5H-44	5H-44	5H-44	5H-44
Photo # - Analyses #	1-14	2-22	3-29	4-26	1-7	2-20	3-8A	4-11A	5-16A	1-44	1-45	3-27	4-21	5-7A	5-9A
Layer Type	W	A	W	A	A	A	A	A	A	A+C	A+C	A+C	A+C	A+C	A+C
SiO_2	52.42	52.08	52.32	51.84	53.04	53.81	51.81	52.84	53.11	53.04	52.79	53.18	52.98	53.61	54.04
Al_2O_3	0.06	0.00	0.19	0.78	0.94	0.94	0.57	1.49	1.26	1.32	1.57	1.54	1.13	0.22	0.10
FeO	10.51	12.95	9.10	10.97	6.38	6.17	7.50	6.04	5.87	7.32	6.21	5.87	7.50	9.64	6.42
Fe_2O_3	0.10	0.10	0.00	0.00	0.10	0.00	0.17	0.65	1.77	0.35	0.00	0.00	0.00	0.09	0.00
MgO	11.14	9.88	11.08	10.55	13.90	14.65	13.63	13.53	14.19	13.41	13.60	14.38	13.60	12.41	14.14
MnO	0.94	0.39	2.48	1.07	0.13	0.11	0.14	0.16	0.12	0.14	0.11	0.10	0.22	0.29	0.11
TiO_2	0.06	0.00	0.00	0.15	0.14	0.07	0.40	0.12	0.06	0.06	0.09	0.24	0.12	0.00	0.00
Cr_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	24.73	24.74	23.67	24.06	24.93	24.17	24.13	25.27	24.11	24.92	24.80	24.41	23.93	25.02	25.40
Na_2O	0.05	0.04	0.00	0.08	0.07	0.05	0.03	0.13	0.30	0.04	0.06	0.11	0.07	0.00	0.00
Total	**100.01**	**100.18**	**98.84**	**99.50**	**99.63**	**99.97**	**98.38**	**100.23**	**100.79**	**100.60**	**99.23**	**99.83**	**99.55**	**101.28**	**100.21**
Cations/6 Oxygens															
Si	1.992	1.994	2.005	1.982	1.977	1.988	1.967	1.960	1.957	1.966	1.971	1.968	1.980	1.994	2.001
^{VI}Al	0.003	0.000	0.000	0.018	0.023	0.012	0.026	0.040	0.043	0.034	0.029	0.032	0.020	0.006	0.000
Total Tetrahedral	**1.995**	**1.994**	**2.005**	**2.000**	**2.000**	**2.000**	**1.993**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.001**
^{VI}Al	0.000	0.000	0.009	0.017	0.018	0.029	0.000	0.025	0.012	0.024	0.040	0.035	0.029	0.004	0.004
Fe^{2+}	0.334	0.415	0.292	0.351	0.199	0.191	0.238	0.187	0.181	0.227	0.194	0.182	0.234	0.300	0.199
Fe^{3+}	0.003	0.003	0.000	0.000	0.003	0.000	0.005	0.018	0.049	0.010	0.000	0.000	0.000	0.003	0.000
Mg	0.631	0.564	0.633	0.601	0.772	0.807	0.771	0.748	0.779	0.741	0.757	0.793	0.757	0.688	0.780
Mn	0.030	0.013	0.081	0.035	0.004	0.003	0.005	0.005	0.004	0.004	0.003	0.003	0.007	0.009	0.003
Ti	0.002	0.000	0.000	0.004	0.004	0.002	0.011	0.003	0.002	0.002	0.003	0.007	0.003	0.000	0.000
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Octahedral	**1.000**	**0.995**	**1.015**	**1.008**	**1.000**	**1.032**	**1.030**	**0.986**	**1.027**	**1.008**	**0.997**	**1.020**	**1.030**	**1.004**	**0.986**
Ca	1.007	1.015	0.972	0.986	0.995	0.957	0.982	1.004	0.952	0.990	0.992	0.968	0.958	0.997	1.008
Na	0.004	0.003	0.000	0.006	0.005	0.004	0.002	0.009	0.021	0.003	0.004	0.008	0.005	0.000	0.000
Total Cations	**4.006**	**4.007**	**3.992**	**4.000**	**4.000**	**3.993**	**4.007**	**3.999**	**4.000**	**4.001**	**3.993**	**3.996**	**3.993**	**4.001**	**3.995**
%Quad	99.53	99.70	99.14	97.87	97.54	96.93	97.45	95.37	93.74	96.48	95,71	95.81	96.72	99.39	99.56
%'Others'	0.47	0.30	0.86	2.13	2.46	3.07	2.55	4.63	6.26	3.52	4.29	4.19	3.28	0.61	0.44
Breakdown of Quad															
%Ca	51.07	50.92	51.25	50.87	50.63	48.96	49.31	51.78	49.79	50.56	51.07	49.82	49.14	50.24	50.72
%Mg	32.00	28.28	33.37	31.03	39.26	41.28	38.74	38.36	40.75	37.84	38.95	40.82	38.84	34.66	39.27
$\%Fe^{2+}$	16.94	20.80	15.38	18.10	10.11	9.76	11.96	9.66	9.46	11.60	9.98	9.35	12.02	15.10	10.01
$Fe^{2+}/(Fe^{2+} + Mg)$	0.346	0.424	0.316	0.369	0.205	0.191	0.236	0.200	0.189	0.236	0.204	0.187	0.236	0.304	0.203

Table A7c. Continued. Page 3 of 3 Pages.

Sample Number Photo # - Analysis # Layer Type	7H-54A 3-32 A	23H-135 3-57 C	23H-135 3-4 C	23H-135 4-14 A	23H-135 4-16 A
SiO_2	52.81	51.31	51.83	51.43	51.33
Al_2O_3	0.12	0.79	0.80	0.14	0.05
FeO	8.62	11.90	10.27	15.55	15.82
Fe_2O_3	0.08	0.53	1.14	0.14	0.00
MgO	12.33	10.62	11.80	8.49	8.45
MnO	0.12	0.19	0.25	0.54	0.57
TiO_2	0.02	0.08	0.04	0.02	0.02
Cr_2O_3	0.05	0.00	0.03	0.04	0.01
CaO	25.22	23.55	24.76	24.05	23.23
Na_2O	0.03	0.05	0.00	0.00	0.00
Total	**99.40**	**99.02**	**100.94**	**100.40**	**99.58**
Cations/6 Oxygens					
Si	1.996	1.974	1.951	1.988	1.999
^{VI}Al	0.004	0.026	0.035	0.006	0.001
Total Tetrahedral	**2.000**	**2.000**	**1.986**	**1.994**	**2.000**
^{VI}Al	0.001	0.010	0.000	0.000	0.001
Fe^{2+}	0.272	0.383	0.323	0.503	0.515
Fe^{3+}	0.002	0.015	0.032	0.004	0.000
Mg	0.695	0.609	0.663	0.489	0.490
Mn	0.004	0.006	0.008	0.018	0.019
Ti	0.001	0.002	0.001	0.001	0.001
Cr	0.001	0.000	0.001	0.001	0.000
Total Octahedral	**0.976**	**1.025**	**1.028**	**1.016**	**1.026**
Ca	1.021	0.971	0.999	0.996	0.973
Na	0.002	0.004	0.000	0.000	0.000
Total Cations	**3.999**	**4.000**	**4.013**	**4.006**	**3.999**
%Quad	99.44	97.27	96.45	99.36	99.82
%'Others'	0.56	2.75	3.55	0.64	0.18
Breakdown of Quad					
%Ca	51.37	49.46	50.31	50.11	49.19
%Mg	34.93	31.02	33.40	24.60	24.78
%Fe	13.70	19.51	16.29	25.28	26.03
$Fe^{2+}/(Fe^{2+} + Mg)$	0.281	0.386	0.328	0.507	0.512

A = Argillite Layer = Diopside + Feldspars. C = Calcite-rich Layer. W = Wollastonite-rich Layer. V = Vesuvianite-rich Layer.

Table A7d. Microprobe Analyses of Pyroxenes from Cycle 6 Argillites from Station 10H.

Sample Number Photo # - Analysis # Layer Type	10H-102 0-14 G	10H-102 1-12 G	10H-102 2-46 A	10H-102 3-40 A	10H-102 3-41 A	10H-103 2-47 C	10H-103 2-51 C	10H-103 3-39 W	10H-103 4-47 V*	10H-103 5-25 W	10H-104 1-72 V	10H-104 3-43 V	10H-104 4-14 A
SiO_2	51.27	52.94	52.87	54.09	53.27	54.28	53.90	54.47	52.37	54.07	53.36	52.90	53.64
Al_2O_3	0.41	0.13	0.47	0.27	0.50	1.14	1.11	0.44	1.86	0.65	0.62	0.50	0.21
FeO	18.51	13.24	12.08	7.79	11.30	2.39	2.40	3.44	6.97	2.74	5.84	5.35	6.28
Fe_2O_3	0.00	0.04	0.48	0.00	0.00	0.46	1.99	0.00	0.00	1.35	1.46	1.25	0.30
MgO	5.27	9.11	9.39	13.44	10.87	16.41	15.86	16.04	13.20	16.25	13.93	14.03	13.68
MnO	1.89	1.55	0.83	0.24	0.49	0.07	0.12	0.61	0.17	0.46	0.53	0.91	1.00
TiO_2	0.00	0.00	0.00	0.04	0.04	0.06	0.12	0.00	0.09	0.00	0.05	0.00	0.00
Cr_2O_3	0.00	0.01	0.00	0.00	0.04	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	23.13	24.20	24.05	25.13	24.26	25.05	25.53	24.74	24.68	24.89	25.17	24.75	24.98
Na_2O	0.16	0.10	0.47	0.00	0.14	0.25	0.23	0.07	0.03	0.13	0.23	0.18	0.10
Total	**100.64**	**101.32**	**100.64**	**101.00**	**100.91**	**100.17**	**101.26**	**99.81**	**99.37**	**100.54**	**101.19**	**99.87**	**100.19**
Cations/6 Oxygens													
Si	2.009	2.008	2.006	1.998	2.001	1.976	1.954	1.998	1.960	1.972	1.966	1.972	1.995
^{IV}Al	0.000	0.000	0.000	0.002	0.000	0.024	0.046	0.002	0.040	0.028	0.027	0.022	0.005
Total Tetrahedral	**2.009**	**2.008**	**2.006**	**2.000**	**2.001**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**1.993**	**1.994**	**2.000**
^{VI}Al	0.019	0.006	0.021	0.010	0.022	0.025	0.001	0.017	0.042	0.000	0.000	0.000	0.004
Fe^{2+}	0.607	0.420	0.383	0.241	0.355	0.073	0.073	0.106	0.218	0.083	0.180	0.167	0.195
Fe^{3+}	0.000	0.000	0.014	0.000	0.000	0.012	0.054	0.000	0.000	0.037	0.041	0.035	0.008
Mg	0.308	0.515	0.531	0.740	0.609	0.890	0.857	0.877	0.736	0.883	0.765	0.780	0.758
Mn	0.063	0.050	0.027	0.008	0.016	0.002	0.004	0.019	0.005	0.014	0.017	0.029	0.032
Ti	0.000	0.000	0.000	0.001	0.001	0.002	0.003	0.000	0.003	0.000	0.001	0.000	0.000
Cr	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Octahedral	**0.997**	**0.991**	**0.976**	**1.000**	**1.004**	**1.006**	**0.992**	**1.019**	**1.004**	**1.017**	**1.004**	**1.011**	**0.997**
Ca	0.971	0.984	0.978	0.995	0.976	0.977	0.992	0.972	0.990	0.973	0.994	0.989	0.995
Na	0.012	0.007	0.035	0.000	0.010	0.018	0.016	0.005	0.002	0.009	0.016	0.013	0.007
Total Cations	**3.989**	**3.990**	**3.995**	**3.995**	**3.991**	**4.001**	**4.000**	**4.996**	**3.996**	**3.999**	**4.007**	**4.007**	**3.999**
%Quad	98.11	99.26	96.54	98.86	97.55	95.96	94.10	98.32	95.50	96.29	95.80	96.50	98.76
%'Others'	1.89	0.74	3.46	1.14	2.45	4.04	5.90	1.68	4.50	3.71	4.20	3.50	1.24
Breakdown of Quad													
%Ca	51.51	51.27	51.67	50.36	50.33	50.36	51.62	49.74	50.91	50.15	51.26	51.10	51.08
%Mg	16.32	26.84	28.06	37.46	31.37	45.89	44.60	44.86	37.87	45.54	39.46	40.29	38.90
%Fe	32.17	21.89	20.26	12.18	18.30	3.75	3.78	5.40	11.22	4.30	9.29	8.62	10.02
$Fe^{2+}/(Fe^{2+} + Mg)$	0.663	0.450	0.419	0.246	0.368	0.076	0.079	0.108	0.229	0.086	0.190	0.176	0.205

Table A7d. Continued. Page 2 of 2 Pages.

Sample Number Photo # - Analysis # Layer Type	10H-105 2-18 A	10H-105 3-34 V*	10H-105 4-53 W	10H-105 4-54 A	10H-105 5-63 C	10H-106A 2-30 W	10H-106A 3-49 W	10H-106A 4-55 A	10H-108 1-50 C	10H-108 3-38 A	10H-108 4-29 A	10H-108 4-27 A	10H-108 5-15 C
SiO_2	53.67	53.33	52.41	53.79	53.31	53.50	54.17	53.82	53.26	53.15	53.08	53.54	52.52
Al_2O_3	0.66	0.23	0.75	1.35	0.57	1.18	1.02	0.82	0.63	0.51	1.04	0.69	0.99
FeO	5.20	5.74	8.71	4.46	7.49	6.55	5.89	8.20	6.52	9.14	9.92	6.47	9.93
Fe_2O_3	0.00	0.64	1.13	0.00	0.87	0.73	0.18	0.48	0.34	0.00	0.46	0.73	0.30
MgO	14.47	13.90	11.86	15.58	13.00	13.01	13.90	13.05	13.66	12.13	11.22	13.31	11.16
MnO	0.21	0.18	0.35	0.19	0.50	0.19	0.17	0.12	0.11	0.16	0.16	0.12	0.13
TiO_2	0.04	0.00	0.03	0.09	0.00	0.06	0.05	0.02	0.04	0.03	0.03	0.01	0.03
Cr_2O_3	0.00	0.00	0.04	0.00	0.02	0.05	0.00	0.03	0.00	0.02	0.00	0.00	0.02
CaO	25.72	25.31	24.46	24.93	25.36	25.13	24.79	24.58	25.52	24.99	23.95	24.69	23.78
Na_2O	0.00	0.14	0.25	0.00	0.02	0.41	0.48	0.28	0.01	0.12	0.59	0.45	0.52
Total	**99.97**	**99.46**	**99.98**	**100.39**	**101.14**	**100.81**	**100.65**	**101.40**	**100.09**	**100.25**	**100.45**	**100.00**	**99.38**
Cations/6 Oxygens													
Si	1.985	1.991	1.975	1.969	1.976	1.976	1.991	1.984	1.981	1.993	1.991	1.991	1.992
^{IV}Al	0.015	0.009	0.025	0.031	0.024	0.024	0.009	0.016	0.019	0.007	0.009	0.009	0.008
Total Tetrahedral	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**	**2.000**
^{VI}Al	0.014	0.001	0.008	0.027	0.001	0.028	0.035	0.020	0.008	0.015	0.037	0.021	0.036
Fe^{2+}	0.161	0.179	0.274	0.137	0.232	0.202	0.181	0.253	0.203	0.287	0.311	0.201	0.315
Fe^{3+}	0.000	0.018	0.032	0.000	0.024	0.020	0.005	0.013	0.010	0.000	0.013	0.020	0.009
Mg	0.798	0.773	0.666	0.850	0.718	0.716	0.761	0.717	0.757	0.678	0.627	0.738	0.631
Mn	0.007	0.006	0.011	0.006	0.016	0.006	0.005	0.004	0.003	0.005	0.005	0.004	0.004
Ti	0.001	0.000	0.001	0.002	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.001
Cr	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.001
Total Octahedral	**0.981**	**0.977**	**0.993**	**1.022**	**0.992**	**0.975**	**0.988**	**1.009**	**0.982**	**0.987**	**0.994**	**0.984**	**0.997**
Ca	1.019	1.013	0.990	0.978	1.007	0.995	0.976	0.971	1.017	1.004	0.963	0.984	0.966
Na	0.000	0.010	0.018	0.000	0.001	0.029	0.034	0.020	0.001	0.009	0.043	0.032	0.038
Total Cations	**4.000**	**4.000**	**4.001**	**4.000**	**4.000**	**3.999**	**3.998**	**4.000**	**4.000**	**4.000**	**4.000**	**4.000**	**4.001**
%Quad	98.50	98.09	95.77	96.88	97.44	94.87	95.83	96.50	98.07	98.32	94.91	95.85	95.41
%'Others'	1.50	1.91	4.23	3.12	2.56	5.13	4.17	3.50	1.93	1.68	5.09	4.15	4.59
Breakdown of Quad													
%Ca	51.54	51.52	51.22	49.78	51.46	51.99	50.88	50.03	51.44	51.01	50.64	51.17	50.54
%Mg	40.33	39.36	34.54	43.27	36.69	37.43	39.68	36.94	38.30	34.43	32.99	38.37	32.99
%Fe	8.13	9.12	14.23	6.95	11.86	10.58	9.43	13.03	10.26	14.56	16.37	10.46	16.47
$Fe^{2+}/(Fe^{2+} + Mg)$	0.168	0.188	0.291	0.139	0.244	0.220	0.192	0.261	0.211	0.297	0.331	0.214	0.333

A = Argillite-rich Layer = Diopside + Feldspars. C = Calcite-rich Layer. G = Garnet-rich Layer. V = Vesuvianite-rich Layer. V* = Vesuvianite-rich Layer with an Inclusion. W = Wollastonite-rich Layer.

Table A8. Microprobe Analyses of Olivine in Cycle 2 Limestones.

Sample Number Photo # - Analysis #	14H-81 2-25	14H-81 2-29	14H-81 2-34	14H-81 4-39	3H-38A 2-49
SiO_2	41.45	41.20	41.91	41.50	41.44
Al_2O_3	0.00	0.00	0.00	0.00	0.02
FeO_T	2.85	2.90	2.80	2.96	4.16
MgO	55.92	55.52	55.55	55.64	54.96
MnO	0.07	0.06	0.04	0.01	0.06
CaO	0.31	0.19	0.23	0.20	0.22
Total	**100.60**	**99.87**	**100.53**	**100.31**	**100.86**
Cations/4 Oxygens					
Si	0.981	0.982	0.991	0.984	0.983
Al	0.000	0.000	0.000	0.000	0.001
Fe^{2+}	0.056	0.058	0.055	0.059	0.083
Mg	1.972	1.972	1.957	1.966	1.943
Mn	0.001	0.001	0.001	0.000	0.001
Ca	0.008	0.005	0.006	0.005	0.006
Total Cations	**3.018**	**3.018**	**3.010**	**3.014**	**3.017**
%Fo	97.24	97.14	97.26	97.09	95.90
$Fe^{2+}/(Fe^{2+} + Mg)$	0.028	0.029	0.027	0.029	0.041

Table A9a. Microprobe Analyses of Feldspars in Cycle 2 Limestones.

	K-Feldspar		Plagioclase													
Sample Number Photo #- Analysis #	16H-85 1-13	8H-130 1-10	16H-85 1-8	16H-85 2-21	20H-99 2-51	20H-99 4-30	8H-130 1-18	5H-46 6-30	5H-46 6-31	23H-136 3-46	23H-136 3-47	23H-136 3-52	11H-116 4-16	12H-122 1-16	12H-122 1-17	12H-122 3-18
SiO_2	63.56	64.26	67.45	66.34	65.33	65.42	67.33	61.87	63.63	68.27	68.33	67.60	68.61	68.14	68.15	68.49
Al_2O_3	18.53	18.01	19.52	20.93	21.24	21.28	19.49	23.70	22.76	19.97	19.38	19.07	19.46	19.88	19.18	19.62
FeO	0.00	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
CaO	0.40	0.46	0.26	1.61	2.58	2.83	1.03	5.33	4.36	0.32	0.32	0.99	0.81	1.28	0.97	1.14
Na_2O	0.29	0.95	11.64	10.74	10.24	10.37	11.16	8.63	9.36	11.54	11.48	11.29	11.56	10.90	11.37	11.29
K_2O	15.82	15.30	0.02	0.03	0.04	0.04	0.08	0.18	0.19	0.09	0.06	0.06	0.13	0.10	0.06	0.02
Sum	**98.60**	**98.98**	**98.89**	**99.67**	**99.44**	**99.94**	**99.10**	**99.71**	**100.30**	**100.19**	**99.57**	**99.01**	**100.59**	**100.30**	**99.73**	**100.56**
Cations/8 Oxygens																
Si	2.979	2.997	2.981	2.918	2.888	2.882	2.974	2.752	2.807	2.977	2.996	2.988	2.986	2.972	2.990	2.980
Al	1.024	0.990	1.017	1.085	1.107	1.105	1.015	1.243	1.184	1.027	1.002	0.994	0.999	1.022	0.992	1.006
Total Tetrahedral	**4.003**	**3.987**	**3.998**	**4.003**	**3.995**	**3.987**	**3.989**	**3.995**	**3.991**	**4.004**	**3.998**	**3.982**	**3.985**	**3.994**	**3.982**	**3.986**
Fe	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Ca	0.020	0.023	0.012	0.076	0.122	0.134	0.049	0.254	0.206	0.015	0.015	0.047	0.038	0.060	0.046	0.053
Na	0.026	0.086	0.998	0.916	0.878	0.886	0.956	0.744	0.800	0.976	0.976	0.968	0.976	0.922	0.967	0.953
K	0.946	0.910	0.001	0.002	0.002	0.002	0.005	0.010	0.011	0.005	0.003	0.003	0.007	0.006	0.003	0.001
Total 'X' Cations	**0.992**	**1.019**	**1.011**	**0.995**	**1.002**	**1.022**	**1.010**	**1.008**	**1.017**	**0.996**	**0.994**	**1.018**	**1.022**	**0.988**	**1.016**	**1.007**
Or	95.36	89.30	0.10	0.20	0.20	0.20	0.50	0.99	1.08	0.50	0.30	0.29	0.69	0.61	0.30	0.10
Ab	2.62	8.44	98.71	92.15	87.62	86.69	94.65	73.81	78.66	97.99	98.19	95.09	95.59	93.32	95.18	94.64
An	2.02	2.26	1.18	7.65	12.18	13.11	4.85	25.20	20.26	1.51	1.51	4.62	3.72	6.07	4.53	5.26

Table A9b. Microprobe Analyses of Plagioclase in Cycle 1 Argillites.

Sample Number	14H-80	14H-80	3H-36	3H-36	3H-37	3H-37	16H-84	16H-84	18H-89	20H-98	20H-98	8H-129	8H-129	7H-56	7H-56	23H-137	11H-115
Photo # - Analysis #	1-22	4-44	2-21	1-15	1-23	3-18	2-9	3-40	2-20	4-26	3-21	1-23	1-15A	1-16	3-29	1-5	1-5
SiO_2	69.90	58.37	67.52	57.11	67.49	64.21	60.31	56.39	65.58	69.08	66.76	60.63	46.76	51.53	48.13	63.67	67.88
Al_2O_3	19.47	26.68	19.82	27.23	20.10	23.33	24.38	26.57	20.77	19.83	21.28	24.90	33.87	30.23	33.32	22.13	20.03
FeO_T	0.09	0.08	0.07	0.07	0.06	0.06	0.12	0.10	0.08	0.00	0.02	0.06	0.06	0.24	0.00	0.00	0.05
CaO	0.29	8.09	0.47	8.87	0.42	4.68	5.93	8.22	2.03	0.63	2.26	6.92	16.40	12.41	15.64	3.16	0.67
Na_2O	11.65	6.75	11.61	6.34	10.92	9.02	8.25	6.55	10.27	11.33	10.44	8.08	1.76	3.96	2.65	9.06	11.38
K_2O	0.05	0.19	0.22	0.20	0.31	0.21	0.14	0.20	0.18	0.19	0.23	0.11	0.11	0.17	0.05	1.00	0.12
Total	**101.54**	**100.16**	**99.71**	**99.82**	**99.30**	**101.51**	**99.13**	**98.03**	**98.91**	**101.06**	**100.99**	**100.70**	**98.96**	**98.54**	**99.79**	**99.02**	**100.13**
Cations/8 Oxygens																	
Si	3.008	2.604	2.967	2.564	2.970	2.798	2.706	2.576	2.911	2.987	2.905	2.685	2.165	2.370	2.206	2.841	2.967
Al	0.987	1.403	1.027	1.441	1.043	1.198	1.290	1.431	1.087	1.011	1.092	1.300	1.848	1.639	1.800	1.164	1.032
Total Tetrahedral	**3.995**	**4.007**	**3.994**	**4.005**	**4.013**	**3.996**	**3.996**	**4.007**	**3.998**	**3.998**	**3.997**	**3.985**	**4.013**	**4.009**	**4.006**	**4.005**	**3.999**
Fe	0.003	0.003	0.003	0.003	0.002	0.002	0.005	0.004	0.003	0.000	0.001	0.002	0.002	0.009	0.000	0.000	0.002
Ca	0.013	0.387	0.022	0.427	0.020	0.218	0.285	0.402	0.097	0.029	0.105	0.328	0.813	0.611	0.768	0.151	0.031
Na	0.971	0.584	0.989	0.552	0.932	0.762	0.718	0.580	0.884	0.950	0.881	0.694	0.158	0.353	0.236	0.784	0.964
K	0.003	0.011	0.012	0.011	0.017	0.012	0.008	0.012	0.010	0.010	0.013	0.006	0.006	0.010	0.003	0.057	0.007
Total 'X' Cations	**0.990**	**0.985**	**1.026**	**0.993**	**0.971**	**0.994**	**1.016**	**0.998**	**0.994**	**0.989**	**1.000**	**1.030**	**0.979**	**0.983**	**1.007**	**0.992**	**1.004**
Or	0.30	1.12	1.17	1.11	1.75	1.21	0.79	1.21	1.01	1.01	1.30	0.58	0.61	1.03	0.30	5.74	0.70
Ab	98.38	59.47	96.68	55.76	96.18	76.81	71.02	58.35	89.20	96.06	88.19	67.51	16.17	36.24	23.43	79.03	96.21
An	1.32	39.41	2.15	43.13	2.06	21.98	28.19	40.44	9.79	2.93	10.51	31.90	83.21	62.73	76.27	15.22	3.09

Table A9c. Microprobe Analyses of Plagioclase in Cycle 2 Argillites.

Sample Number Photo # - Analysis #	3H-39 6-54	3H-39 2-23	16H-86 2-45	17H-87 0-13	20H-100 2-19	20H-100 4-10	8H-59 5-19A	8H-59 3-2A	5H-44 4-23	7H-54A 4-15	23H-135 4-18	23H-135 4-46	11H-117 2-49	12H-123 1-28	12H-123 1-24
SiO_2	67.85	60.58	67.44	67.86	51.39	46.76	65.20	47.82	44.47	49.93	47.83	47.80	67.39	68.81	63.37
Al_2O_3	20.21	24.72	20.10	20.02	30.39	33.23	22.05	30.06	35.36	32.34	32.17	32.11	20.21	19.60	22.98
FeO_T	0.00	0.12	0.04	0.06	0.15	0.09	0.14	0.08	0.08	0.13	0.22	0.37	0.07	0.01	0.06
CaO	0.13	5.98	0.69	0.87	12.45	16.96	0.35	16.26	18.35	15.19	16.10	15.68	1.14	0.64	4.20
Na_2O	11.39	8.05	11.24	11.08	4.18	1.73	10.82	2.39	1.07	2.46	2.59	2.35	11.02	11.59	9.18
K_2O	0.02	0.20	0.05	0.09	0.08	0.03	0.63	0.05	0.47	0.70	0.14	0.24	0.13	0.03	0.20
Total	**99.60**	**99.65**	**99.56**	**99.98**	**98.64**	**98.80**	**99.19**	**100.66**	**99.80**	**100.75**	**99.60**	**98.55**	**99.96**	**100.68**	**99.99**
Cations/8 Oxygens															
Si	2.972	2.703	2.962	2.968	2.362	2.172	2.885	2.177	2.062	2.266	2.205	2.224	2.953	2.988	2.802
Al	1.044	1.300	1.041	1.032	1.646	1.820	1.150	1.828	1.933	1.730	1.778	1.761	1.044	1.003	1.192
Total Tetrahedral	**4.016**	**4.003**	**4.003**	**4.000**	**4.008**	**3.992**	**4.035**	**4.005**	**3.995**	**3.996**	**3.983**	**3.985**	**3.997**	**3.991**	**3.994**
Fe	0.000	0.004	0.001	0.002	0.006	0.003	0.005	0.003	0.003	0.005	0.008	0.014	0.003	0.000	0.002
Ca	0.006	0.286	0.032	0.041	0.613	0.844	0.017	0.793	0.912	0.739	0.796	0.782	0.054	0.030	0.199
Na	0.967	0.696	0.957	0.940	0.372	0.156	0.928	0.211	0.096	0.216	0.231	0.212	0.936	0.976	0.787
K	0.001	0.011	0.003	0.005	0.005	0.002	0.036	0.003	0.028	0.041	0.008	0.014	0.007	0.002	0.011
Total 'X' Cations	**0.974**	**0.997**	**0.993**	**0.988**	**0.996**	**1.005**	**0.986**	**1.010**	**1.039**	**1.001**	**1.043**	**1.022**	**1.000**	**1.008**	**0.999**
Or	0.10	1.11	0.30	0.50	0.50	0.20	3.67	0.30	2.70	4.12	0.77	1.39	0.70	0.20	1.10
Ab	99.28	70.09	96.47	95.33	37.58	15.57	94.60	20.95	9.27	21.69	22.32	21.03	93.88	96.82	78.94
An	0.61	28.80	3.23	4.16	61.92	84.23	1.73	78.75	88.03	74.20	76.91	77.58	5.42	2.97	19.96

Table A9d. Microprobe Analyses of Plagioclase in Intrusion and Cycle 6 Argillites at Station 10H.

Sample Number Photo # - Analysis #	10H-101 1-27	10H-101 1-30	10H-101 1-31	10H-101 2-52	10H-101 2-51	10H-101 2-50	10H-102 0-27	10H-102 2-50	10H-102 2-48	10H-105 2-25	10H-105 2-28	10H-106A 2-27	10H-108 3-41
SiO_2	64.47	61.06	62.40	62.76	65.41	68.21	68.12	65.30	58.26	67.24	59.68	68.00	60.04
Al_2O_3	22.89	24.35	24.00	23.07	21.45	19.88	20.44	23.01	26.58	20.52	25.62	20.43	20.61
FeO_T	0.12	0.20	0.18	0.14	0.14	0.04	0.03	0.10	0.16	0.20	0.19	0.00	0.22
CaO	3.46	5.39	4.80	4.35	2.31	0.69	0.28	2.39	7.93	0.80	7.13	1.23	1.03
Na_2O	9.37	8.46	8.81	9.21	10.17	11.59	11.45	10.31	6.65	10.95	7.39	10.72	10.76
K_2O	0.54	0.33	0.49	0.23	0.26	0.15	0.05	0.03	0.47	0.07	0.16	0.22	0.13
Total	**100.85**	**99.79**	**100.68**	**99.76**	**99.74**	**100.56**	**100.37**	**101.14**	**100.05**	**99.78**	**100.17**	**100.60**	**100.79**
Cations/8 Oxygens													
Si	2.824	2.721	2.752	2.787	2.885	2.971	2.964	2.840	2.605	2.948	2.656	2.957	2.953
Al	1.182	1.279	1.248	1.208	1.115	1.021	1.049	1.180	1.401	1.061	1.344	1.047	1.055
Total Tetrahedral	**4.006**	**4.000**	**4.000**	**3.995**	**4.000**	**3.992**	**4.013**	**4.020**	**4.006**	**4.009**	**4.000**	**4.004**	**4.008**
Fe	0.004	0.007	0.007	0.005	0.005	0.001	0.001	0.004	0.006	0.007	0.007	0.000	0.008
Ca	0.162	0.257	0.227	0.207	0.109	0.032	0.013	0.111	0.380	0.038	0.340	0.057	0.048
Na	0.796	0.731	0.753	0.793	0.870	0.979	0.966	0.869	0.577	0.931	0.638	0.904	0.905
K	0.030	0.019	0.028	0.013	0.015	0.008	0.003	0.002	0.027	0.004	0.009	0.012	0.007
Total 'X' Cations	**0.992**	**1.014**	**1.015**	**1.018**	**0.999**	**1.020**	**0.983**	**0.986**	**0.990**	**0.980**	**0.994**	**0.973**	**0.968**
Or	3.04	1.89	2.78	1.28	1.51	0.78	0.31	0.20	2.74	0.41	0.91	1.23	0.73
Ab	80.57	72.59	74.70	78.28	87.53	96.07	98.37	88.49	58.64	95.68	64.64	92.91	94.27
An	16.40	25.52	22.52	20.43	10.97	3.14	1.32	11.30	38.62	3.90	34.45	5.86	5.00

Table A9e. Microprobe Analyses of K-feldspar in Cycle 1 Argillites.

Sample Number Photo # - Analysis #	14H-80 1-21	14H-80 3-29	3H-36 2-22	3H-36 1-19	3H-37 1-22	3H-37 3-34	16H-84 6-11	16H-84 0-32	18H-89 2-18	20H-98 4-28	20H-98 5-39	8H-129 1-20	5H-47 2-52	7H-56 1-11	23H-137 6-41	23H-137 6-39
SiO_2	65.59	65.85	63.76	64.13	63.51	64.53	64.13	63.81	64.07	65.69	65.47	64.07	64.93	63.81	64.36	63.99
Al_2O_3	18.46	18.89	18.46	18.61	18.34	18.94	18.63	18.85	18.49	18.02	17.90	18.08	18.50	18.63	17.42	17.85
FeO	0.00	0.06	0.14	0.06	0.11	0.08	0.00	0.09	0.05	0.15	0.06	0.08	0.09	0.00	0.00	0.00
CaO	0.12	0.13	0.13	0.38	0.13	0.09	0.40	0.15	0.15	0.15	0.08	0.20	0.14	0.40	0.24	0.53
Na_2O	0.51	1.78	0.27	1.52	0.35	1.84	1.25	1.98	0.70	0.60	1.97	0.52	0.77	0.79	0.65	1.20
K_2O	15.98	14.07	16.18	14.23	16.07	14.17	14.62	13.90	15.30	15.81	13.93	15.74	15.52	14.84	15.55	14.68
Total	**100.66**	**100.78**	**98.94**	**98.93**	**98.51**	**99.65**	**99.03**	**98.78**	**98.76**	**100.42**	**99.41**	**98.69**	**99.95**	**98.47**	**98.22**	**98.25**
Cations/8 Oxygens																
Si	3.005	2.993	2.983	2.980	2.984	2.975	2.980	2.968	2.989	3.017	3.018	2.999	2.995	2.981	3.023	3.000
Al	0.997	1.012	1.018	1.019	1.016	1.029	1.021	1.034	1.017	0.976	0.973	0.998	1.006	1.026	0.965	0.987
Total Tetrahedral	**4.002**	**4.005**	**4.001**	**3.999**	**4.000**	**4.004**	**4.001**	**4.002**	**4.004**	**3.993**	**3.991**	**3.997**	**4.001**	**4.007**	**3.988**	**3.987**
Fe	0.000	0.002	0.005	0.002	0.004	0.003	0.000	0.004	0.002	0.006	0.002	0.003	0.003	0.000	0.000	0.000
Ca	0.006	0.006	0.007	0.019	0.007	0.004	0.020	0.007	0.007	0.007	0.004	0.010	0.007	0.020	0.012	0.027
Na	0.045	0.157	0.024	0.137	0.032	0.164	0.113	0.179	0.063	0.053	0.176	0.047	0.069	0.072	0.059	0.109
K	0.934	0.816	0.966	0.844	0.963	0.833	0.867	0.825	0.911	0.926	0.819	0.940	0.913	0.885	0.932	0.878
Total 'X' Cations	**0.985**	**0.981**	**1.002**	**1.002**	**1.006**	**1.004**	**1.000**	**1.015**	**0.983**	**0.992**	**1.001**	**1.000**	**0.992**	**0.977**	**1.003**	**1.014**
Or	94.82	83.35	96.89	84.40	96.11	83.22	86.70	81.60	92.86	93.91	81.98	94.28	92.31	90.58	92.92	86.59
Ab	4.57	16.04	2.41	13.70	3.19	16.38	11.30	17.70	6.42	5.37	17.62	4.71	6.98	7.37	5.88	10.75
An	0.61	0.61	0.70	1.90	0.70	0.40	2.00	0.69	0.71	0.71	0.40	1.00	0.71	2.05	1.20	2.66

Table A9f. Microprobe Analyses of K-feldspar in Cycle 2 Argillites.

Sample Number Photo # - Analysis #	3H-39 5-62	3H-39 2-39	16H-86 2-16	17H-87 5-9	17H-87 0-17	8H-59 3-30	8H-59 2-27	5H-44 2-16	7H-54A 2-46	23H-135 2-19	23H-135 4-13	11H-117 2-46	12H-123 1-25	12H-123 2-48
SiO_2	62.93	64.20	63.19	65.05	64.67	64.39	64.51	65.26	64.12	63.39	63.80	63.38	64.21	64.51
Al_2O_3	18.83	19.45	18.76	18.04	18.22	18.69	18.97	18.32	18.17	18.28	18.33	18.74	18.21	18.71
FeO_T	0.03	0.04	0.15	0.04	0.16	0.00	0.08	0.05	0.37	0.37	0.05	0.00	0.02	0.09
CaO	0.09	0.05	0.45	0.09	0.19	0.06	0.37	0.50	0.08	0.15	0.45	0.24	0.53	0.30
Na_2O	0.20	0.85	0.21	0.15	1.35	0.19	0.74	0.78	0.71	0.43	0.70	0.43	0.43	0.18
K_2O	16.38	15.65	15.83	16.28	14.67	16.20	15.44	15.17	14.71	15.77	15.44	16.05	15.99	16.12
Total	**98.46**	**100.24**	**98.59**	**99.65**	**99.26**	**99.53**	**100.10**	**100.08**	**98.16**	**98.39**	**98.77**	**98.84**	**99.39**	**99.91**
Cations/8 Oxygens														
Si	2.963	2.957	2.966	3.014	2.998	2.988	2.973	3.002	3.003	2.982	2.984	2.968	2.990	2.984
Al	1.045	1.056	1.038	0.985	0.996	1.022	1.031	0.993	1.003	1.014	1.011	1.035	1.000	1.020
Total Tetrahedral	**4.008**	**4.013**	**4.004**	**3.999**	**3.994**	**4.010**	**4.004**	**3.995**	**4.006**	**3.996**	**3.995**	**4.003**	**3.990**	**4.004**
Fe	0.001	0.002	0.006	0.002	0.006	0.000	0.003	0.002	0.014	0.015	0.002	0.000	0.001	0.003
Ca	0.005	0.002	0.023	0.004	0.009	0.003	0.018	0.025	0.004	0.008	0.023	0.012	0.026	0.015
Na	0.018	0.076	0.019	0.013	0.121	0.017	0.066	0.070	0.064	0.039	0.063	0.039	0.039	0.016
K	0.984	0.920	0.948	0.962	0.868	0.959	0.908	0.890	0.879	0.946	0.921	0.959	0.950	0.951
Total 'X' Cations	**1.008**	**1.000**	**0.996**	**0.981**	**1.004**	**0.979**	**0.995**	**0.987**	**0.961**	**1.008**	**1.009**	**1.010**	**1.016**	**0.985**
Or	97.71	92.18	95.76	98.26	86.97	97.96	91.53	90.36	92.82	95.27	91.46	94.95	93.60	96.84
Ab	1.79	7.62	1.91	1.33	12.12	1.74	6.65	7.11	6.76	3.93	6.26	3.86	3.84	1.63
An	0.50	0.20	2.32	0.41	0.90	0.31	1.81	2.54	0.42	0.80	2.28	1.19	2.56	1.53

Table A9g. Microprobe Analyses of K-feldspar in Intrusion and Cycle 6 Argillites at Station 10H.

Sample Number Photo # - Analysis #	10H-101 1-37	10H-101 1-38	10H-101 2-54	10H-105 1-9	10H-105 2-22	10H-105 4-58	10H-106A 1-24	10H-106A 3-48	10H-108 4-31	10H-108 4-30	10H-108 3-39
SiO_2	65.17	65.35	65.11	64.64	64.49	65.10	64.52	64.72	64.59	64.85	64.39
Al_2O_3	18.72	18.86	18.61	18.96	18.63	19.18	18.70	19.01	18.46	18.93	18.65
FeO_T	0.07	0.08	0.11	0.04	0.22	0.20	0.02	0.00	0.09	0.12	0.10
CaO	0.00	0.05	0.02	0.16	0.04	0.32	0.27	0.43	0.35	0.38	0.41
Na_2O	1.15	2.69	0.65	1.90	0.27	1.49	0.29	1.61	0.15	2.68	0.75
K_2O	15.21	12.84	15.70	13.98	16.34	14.42	16.93	14.23	16.26	12.33	15.07
Total	**100.32**	**99.87**	**100.20**	**99.68**	**99.99**	**100.71**	**99.30**	**100.00**	**99.90**	**99.29**	**99.37**
Cations/8 Oxygens											
Si	2.991	2.988	2.995	2.976	2.985	2.971	2.986	2.973	2.990	2.979	2.984
Al	1.013	1.017	1.009	1.029	1.017	1.032	1.013	1.029	1.008	1.025	1.019
Total Tetrahedral	**4.004**	**4.005**	**4.004**	**4.005**	**4.002**	**4.003**	**3.999**	**4.002**	**3.998**	**4.004**	**4.003**
Fe	0.003	0.003	0.004	0.002	0.009	0.008	0.001	0.000	0.003	0.005	0.004
Ca	0.000	0.002	0.001	0.008	0.002	0.016	0.013	0.021	0.017	0.019	0.020
Na	0.102	0.238	0.058	0.170	0.024	0.132	0.026	0.143	0.013	0.239	0.067
K	0.891	0.749	0.922	0.821	0.965	0.840	0.960	0.834	0.960	0.723	0.891
Total 'X' Cations	**0.996**	**0.992**	**0.985**	**1.001**	**1.000**	**0.996**	**1.000**	**0.998**	**0.993**	**0.986**	**0.982**
Or	89.73	75.73	93.98	82.18	97.38	85.02	96.10	83.57	96.97	73.70	91.10
Ab	10.27	24.06	5.91	17.02	2.42	13.36	2.60	14.33	1.31	24.36	6.85
An	0.00	0.20	0.10	0.80	0.20	1.62	1.30	2.10	1.72	1.94	2.04

Table A10a. Microprobe Analyses of Scapolite in the Cycle 2 Limestones.

Sample Number Photo # - Analysis #	5H-46 1-28	5H-46 2-21	5H-46 2-23	5H-46 3-26	7H-55 1-36	7H-55 1-39	7H-55 3-33	7H-55 4-41	7H-55 6-44
SiO_2	53.88	54.11	53.91	54.66	56.26	53.06	55.67	54.82	54.49
Al_2O_3	23.79	23.28	23.88	23.03	23.03	23.81	22.67	23.90	23.30
FeO[a]	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
CaO	9.88	9.68	10.08	8.89	7.75	9.90	8.98	9.94	9.44
Na_2O	8.43	8.30	8.20	8.92	9.78	8.29	8.63	8.51	8.42
K_2O	0.66	0.79	0.75	0.39	0.64	0.35	0.74	0.35	0.64
Cl	2.36	2.32	2.36	2.55	2.87	2.34	2.53	2.36	2.50
Total	**99.00**	**98.48**	**99.18**	**98.44**	**100.33**	**97.75**	**99.20**	**99.88**	**98.79**
$-O \equiv Cl$	-0.53	-0.52	-0.53	-0.58	-0.65	-0.53	-0.57	-0.53	-0.56
New Total	**98.47**	**97.96**	**98.65**	**97.86**	**99.68**	**97.22**	**98.63**	**99.35**	**98.23**
Ions/(Si + Al = 12)									
Si	7.892	7.962	7.883	8.018	8.094	7.848	8.108	7.926	7.978
Al	4.108	4.038	4.117	3.982	3.906	4.152	3.892	4.074	4.022
Total Tetrahedral	**12.000**	**12.000**	**12.000**	**12.000**	**12.000**	**12.000**	**12.000**	**12.000**	**12.000**
Ca	1.551	1.526	1.579	1.397	1.195	1.569	1.401	1.540	1.481
Na	2.394	2.368	2.325	2.537	2.728	2.377	2.437	2.386	2.390
K	0.123	0.148	0.140	0.073	0.117	0.066	0.137	0.065	0.120
Total 'X'	**4.068**	**4.042**	**4.044**	**4.007**	**4.040**	**4.012**	**3.975**	**3.991**	**3.991**
Cl	0.586	0.579	0.585	0.634	0.700	0.587	0.624	0.578	0.620
Me[b]	38.13	37.75	39.05	34.86	29.58	39.11	35.25	38.59	37.11
Eq_{An}[c]	36.93	34.60	37.23	32.73	30.20	37.16	29.73	35.80	34.07

[a] Iron did not exceed detection limits.
[b] %Me = Ca/(Ca + Na + K) x 100.
[c] Eq_{An} = (Al - 3)/3 x 100.
n.d. = not detected.

Table A10b. Microprobe Analyses of Scapolite in Cycle 1 Argillites.

Sample Number Photo # - Analysis #	8H-129 4-45	8H-129 4-47	5H-47 4-54	5H-47 1-59
SiO_2	50.19	50.59	49.11	51.18
Al_2O_3	25.49	25.45	25.86	25.48
FeO[a]	n.d.	n.d.	n.d.	n.d.
CaO	14.62	14.70	15.18	14.07
Na_2O	5.06	4.77	4.30	5.57
K_2O	0.93	0.92	0.86	1.09
Cl	1.11	1.15	1.02	1.38
Total	**97.40**	**97.58**	**96.33**	**98.77**
$-O \equiv Cl$	-0.25	-0.26	-0.23	-0.31
Total	**97.15**	**97.32**	**96.10**	**98.46**
Ions/(Si + Al = 12)				
Si	7.506	7.533	7.404	7.562
Al	4.494	4.467	4.596	4.438
Total Tetrahedral	**12.000**	**12.000**	**12.000**	**12.000**
Ca	2.343	2.345	2.452	2.227
Na	1.467	1.377	1.257	1.596
K	0.177	0.175	0.165	0.205
Total 'X'	**3.987**	**3.897**	**3.874**	**4.028**
Cl	0.281	0.290	0.261	0.346
%Me[b]	58.77	60.17	63.29	55.29
Eq_{An}[c]	49.80	48.90	53.20	47.93

[a] Iron did not exceed detection limits.
[b] %Me = Ca/(Ca + Na + K) x 100.
[c] Eq_{An} = (Al - 3)/3 x 100.
n.d. = not detected.

Table A11. Microprobe Analyses of Epidote in Skarn from Station 10H.

Sample Number Photo # - Analysis #	10H-102 0-23 a	 b	10H-102 1-20 a	 b	10H-102 1-29 a	 b
SiO_2	38.60	38.60	39.09	39.09	38.15	38.15
Al_2O_3	23.83	23.83	24.63	24.63	24.20	24.20
FeO	12.08	--	10.62	--	11.80	--
Fe_2O_3	--	13.43	--	11.80	--	13.11
MgO	0.00	0.00	0.00	0.00	0.00	0.00
MnO	0.32	0.32	0.53	0.53	0.57	0.57
TiO_2	0.03	0.03	0.13	0.13	0.11	0.11
Cr_2O_3	0.00	0.00	0.00	0.00	0.02	0.02
CaO	23.65	23.65	23.35	23.35	22.94	22.94
Na_2O	0.00	0.00	0.00	0.00	0.00	0.00
K_2O	0.00	0.00	0.00	0.00	0.00	0.00
Total	**98.51**	**99.86**	**98.35**	**99.53**	**97.79**	**99.10**
Si	6.222	6.026	6.253	6.081	6.185	5.994
^{IV}Al	0.000	0.000	0.000	0.000	0.000	0.000
Total Tetrahedral	**6.222**	**6.026**	**6.253**	**6.081**	**6.185**	**5.994**
^{VI}Al	4.528	4.384	4.645	4.516	4.625	4.480
Fe^{2+}	1.628	--	1.421	--	1.600	--
Fe^{3+}	--	1.578	--	1.381	--	1.550
Mg	0.000	0.000	0.000	0.000	0.000	0.000
Mn	0.044	0.042	0.072	0.070	0.078	0.075
Ti	0.004	0.004	0.016	0.015	0.013	0.013
Cr	0.000	0.000	0.000	0.000	0.003	0.002
Total Octahedral	**6.204**	**6.008**	**6.154**	**5.982**	**6.319**	**6.120**
Ca	4.085	3.957	4.002	3.892	3.985	3.862
Na	0.000	0.000	0.000	0.000	0.000	0.000
K	0.000	0.000	0.000	0.000	0.000	0.000
Total 'X'	**4.085**	**3.967**	**4.002**	**3.892**	**3.985**	**3.862**

a = All Fe as Fe^{2+}.
b = All Fe as Fe^{3+}.

Table A12a. Microprobe Analyses of Garnets in Cycle 1 Argillites.

Sample Number Photo # - Analysis #	14H-80 2-22[a]	14H-80 2-23[a]	3H-36 1-12[b]	3H-37 2-25[c]	3H-37 2-26[c]	16H-84 1-23[d]	16H-84 1-25[d]	16H-84 5-9[e]	16H-84 5-12[e]	18H-89 1-29[f]	18H-89 1-28[f]	18H-89 3-43[g]
SiO_2	37.66	37.50	39.22	39.12	38.91	37.79	37.79	38.44	37.94	38.54	38.41	38.76
Al_2O_3	11.75	12.06	19.08	18.23	18.19	16.76	16.47	17.87	15.56	17.83	17.28	19.86
Fe_2O_3[h]	13.51	13.57	6.48	6.29	5.95	8.08	8.18	6.63	8.38	6.00	6.42	4.87
MgO	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.01	0.06	0.05	0.00
MnO	0.18	0.15	0.28	0.09	0.14	0.21	0.20	0.21	0.18	0.07	0.06	0.08
TiO_2	1.13	0.75	0.01	0.79	0.71	0.99	1.42	0.90	1.50	1.01	1.49	0.30
Cr_2O_3	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.04	0.02	0.00	0.00	0.00
CaO	35.11	35.41	34.93	36.13	36.48	35.55	35.48	35.64	35.51	35.49	35.85	36.54
Total	**99.34**	**99.44**	**100.00**	**100.71**	**100.40**	**99.39**	**99.54**	**99.73**	**99.10**	**99.00**	**99.56**	**100.41**
Cations/12 Oxygens												
Si	**2.996**	**2.983**	**2.994**	**2.978**	**2.974**	**2.943**	**2.940**	**2.962**	**2.969**	**2.982**	**2.966**	**2.947**
Al	1.102	1.131	1.717	1.636	1.639	1.539	1.510	1.623	1.435	1.627	1.573	1.780
Fe^{3+}	0.809	0.812	0.372	0.360	0.342	0.473	0.479	0.385	0.493	0.349	0.373	0.279
Ti	0.068	0.045	0.001	0.045	0.041	0.058	0.083	0.052	0.088	0.059	0.087	0.017
Cr	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.002	0.001	0.000	0.000	0.000
Total Y Cations	**1.979**	**1.988**	**2.090**	**2.041**	**2.023**	**2.071**	**2.072**	**2.062**	**2.017**	**2.035**	**2.033**	**2.076**
Ca	2.993	3.018	2.858	2.947	2.988	2.966	2.957	2.943	2.977	2.943	2.966	2.977
Mn	0.012	0.010	0.018	0.006	0.009	0.014	0.013	0.014	0.012	0.005	0.004	0.005
Mg	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.001	0.007	0.006	0.000
Total X Cations	**3.005**	**3.028**	**2.876**	**2.960**	**2.997**	**2.980**	**2.970**	**2.957**	**2.990**	**2.555**	**2.976**	**2.982**
%Grossular	55.28	56.54	81.58	79.72	80.72	73.88	72.44	78.27	70.70	79.56	77.03	85.60
%Andradite	40.88	40.84	17.80	17.64	16.91	22.84	23.12	18.67	24.44	17.15	18.35	13.44
%"Ti"	3.44	2.26	0.05	2.20	2.03	2.80	4.01	2.52	4.36	2.90	4.28	0.82
%Uvarovite	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.10	0.05	0.00	0.00	0.00
%Spessertine	0.40	0.33	0.62	0.21	0.30	0.47	0.44	0.47	0.40	0.17	0.13	0.17
%Pyrope	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.03	0.24	0.20	0.00

[a] Area 2. Poikolitic grain ∿2 mm, not adjacent to vesuvianite. Analysis 2-22 within ∿60 μm of rim, analysis 2-23 400 μm into interior.
[b] Area 1. Anhedral grain <100 μm partially altered by prehnite.
[c] Area 2. Poikolitic grain ∿2 cm partially replacing vesuvianite (see Table A13a). Analysis 2-25 wiwthin 30 μm of adjacent vesuvianite, analysis 2-26 ∿50 μm into interior.
[d] Area 1. Poikolitic grain ∿2 cm partially replacing vesuvianite (see Table A13a). Analysis 1-23 within 60 μm of adjacent vesuvianite, analysis 1-25 ∿200 μm into interior.
[e] Area 5. Each analysis from a poikolitic anhedral grain ∿500 μm intergrown with wollastonite.
[f] Area 1. Poikolitic ∿300 μm thick rim on vesuvianite (see Table A13a). Analysis 1-29 within 50 μm of adjacent vesuvianite, analysis 1-28 at center of rim.
[g] Area 3. Non-poikolitic clear grain ∿1 mm adjacent to calcite-rich layer.
[h] Total iron calculated as Fe_2O_3.

Table A12b. Microprobe Analyses of Garnets in Cycle 2 Argillites.

Sample Number Photo # - Analysis #	16H-86 1-67[a]	16H-86 1-70[a]	16H-86 2-33[b]	16H-86 2-32[b]	16H-86 2-29[b]	16H-86 2-28[b]	16H-86 3-56[c]	17H-87 3-37[d]	17H-87 3-38[d]	17H-87 4-25[e]
SiO_2	39.42	39.13	38.61	38.63	38.55	38.86	38.79	39.07	39.33	38.51
Al_2O_3	19.43	18.93	16.20	17.31	17.60	18.57	16.60	19.96	20.37	18.57
Fe_2O_3[f]	4.87	5.06	8.65	7.68	7.44	6.54	9.38	4.10	3.74	3.62
MgO	0.01	0.02	0.00	0.01	0.00	0.02	0.01	0.02	0.00	0.07
MnO	0.17	0.21	0.20	0.20	0.20	0.19	0.26	0.13	0.08	0.06
TiO_2	0.67	0.88	0.92	0.88	0.72	0.70	0.14	0.47	0.62	1.67
Cr_2O_3	0.00	0.00	0.00	0.03	0.02	0.00	0.02	0.00	0.00	0.00
CaO	36.53	36.21	36.13	35.71	35.65	36.07	35.79	36.87	37.08	36.90
Total	**101.10**	**100.44**	**100.71**	**100.45**	**100.18**	**100.95**	**100.99**	**100.62**	**101.21**	**99.40**
Cations/12 Oxygens										
Si	**2.975**	**2.976**	**2.972**	**2.965**	**2.964**	**2.955**	**2.977**	**2.959**	**2.957**	**2.959**
Al	1.729	1.697	1.470	1.566	1.595	1.665	1.502	1.782	1.805	1.682
Fe^{3+}	0.276	0.289	0.501	0.444	0.430	0.374	0.542	0.234	0.211	0.210
Ti	0.038	0.050	0.053	0.051	0.042	0.040	0.008	0.027	0.035	0.097
Cr	0.000	0.000	0.000	0.002	0.001	0.000	0.001	0.000	0.000	0.000
Total Y Cations	**2.043**	**2.036**	**2.024**	**2.063**	**2.068**	**2.079**	**2.053**	**2.043**	**2.051**	**1.989**
Ca	2.954	2.951	2.980	2.937	2.937	2.939	2.943	2.993	2.987	3.038
Mn	0.011	0.014	0.013	0.013	0.013	0.012	0.017	0.008	0.005	0.004
Mg	0.001	0.002	0.000	0.001	0.000	0.002	0.001	0.002	0.000	0.008
Total X Cations	**2.966**	**2.967**	**2.993**	**2.951**	**2.950**	**2.953**	**2.961**	**3.003**	**2.992**	**3.050**
%Grossular	84.24	82.81	72.20	75.46	76.69	79.65	72.58	86.90	87.84	84.16
%Andradite	13.51	14.19	24.75	21.52	20.79	17.99	26.40	11.45	10.29	10.56
%"Ti"	1.86	2.46	2.62	2.47	2.03	1.92	0.39	1.32	1.71	4.88
%Uvarovite	0.00	0.00	0.00	0.10	0.05	0.00	0.05	0.00	0.00	0.00
%Spessertine	0.37	0.47	0.43	0.44	0.44	0.41	0.57	0.27	0.17	0.13
%Pyrope	0.03	0.07	0.00	0.03	0.00	0.07	0.03	0.07	0.00	0.26

a Area 1. Poikolitic grain ∿2 cm partially rimming vesuvianite (Table A13b). Analysis 1-67 within 60 μm of adjacent vesuvianite, analysis 1-70 ∿350 μm into interior.
b Area 2. Same garnet as above near edge of grain, adjacent to wollastonite-rich zone. Analysis 2-32 within ∿60 μm of rim. Analysis 2-28 ∿200 μm into interior.
c Area 3 Same garnet as above adjacent to K-feldspar- + diopside-rich layer. Analysis 3-56 ∿100 μm from rim.
d Area 3. Poikolitic anhedral grain ∿2 cm in calcite-rich layer.
e Area 4. Poikolitic anhedral grain ∿40 μm in calcite-rich layer.
f Total iron calculated as Fe_2O_3.

Table A12c. Microprobe Analyses of Garnets in Skarn at Locality 10H.

Sample Number Photo # - Analysis #	10H-102 1-6[a]	10H-102 1-7[a]	10H-102 1-8[a]	10H-102 1-9[a]	10H-102 1-10[a]	10H-102 2-51[b]	10H-102 2-53[b]	10H-102 2-55[c]	10H-102 2-56[c]	10H-102 4-70[d]	10H-102 4-69[d]
SiO_2	36.77	37.08	37.39	37.40	36.93	36.71	37.14	38.42	38.58	38.94	39.35
Al_2O_3	4.47	4.98	6.27	6.63	7.26	7.74	8.12	14.39	14.14	18.98	18.83
Fe_2O_3[e]	25.85	24.64	22.77	22.09	21.27	20.02	19.28	12.11	12.32	5.52	5.66
MgO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
MnO	0.65	0.72	0.72	0.61	0.66	0.57	0.52	1.50	1.64	0.06	0.14
TiO_2	0.12	0.30	0.34	0.37	0.46	1.83	1.62	0.21	0.37	0.48	0.55
Cr_2O_3	0.03	0.01	0.02	0.00	0.00	0.09	0.02	0.04	0.02	0.00	0.01
CaO	33.49	33.48	33.72	34.07	33.89	33.52	33.55	33.40	33.77	36.38	36.30
Total	**101.38**	**101.21**	**101.23**	**101.17**	**100.47**	**100.48**	**100.25**	**100.07**	**100.84**	**100.39**	**100.84**
Cations/12 Oxygens											
Si	**2.996**	**3.012**	**3.014**	**3.011**	**2.989**	**2.957**	**2.986**	**3.006**	**3.002**	**2.967**	**2.984**
Al	0.429	0.477	0.596	0.629	0.693	0.735	0.770	1.327	1.297	1.705	1.683
Fe^{3+}	1.585	1.506	1.382	1.339	1.295	1.213	1.167	0.713	0.722	0.317	0.323
Ti	0.007	0.018	0.021	0.022	0.028	0.111	0.098	0.012	0.022	0.028	0.031
Cr	0.002	0.001	0.001	0.000	0.000	0.006	0.001	0.002	0.001	0.000	0.001
Total Y Cations	**2.023**	**2.002**	**2.000**	**1.990**	**2.016**	**2.065**	**2.036**	**2.054**	**2.042**	**2.050**	**2.038**
Ca	2.924	2.914	2.913	2.939	2.939	2.893	2.890	2.800	2.815	2.970	2.950
Mn	0.045	0.050	0.049	0.042	0.045	0.039	0.035	0.099	0.108	0.004	0.009
Mg	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000
Total X Cations	**2.969**	**2.964**	**2.962**	**2.981**	**2.984**	**2.932**	**2.925**	**2.899**	**2.923**	**2.977**	**2.959**
%Grossular	19.72	22.18	28.15	30.20	32.89	34.33	36.67	61.39	59.99	82.94	82.28
%Andradite	78.35	75.22	69.10	67.29	64.24	58.74	57.32	34.71	35.35	15.46	15.85
%"Ti"	0.35	0.90	1.05	1.11	1.39	5.38	4.81	0.58	1.08	1.37	1.52
%Uvarovite	0.10	0.05	0.05	0.00	0.00	0.29	0.05	0.10	0.05	0.00	0.05
%Spessertine	1.47	1.69	1.65	1.41	1.51	1.33	1.20	3.41	3.69	0.13	0.30
%Pyrope	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00

[a] Area 1. Optically zoned euhedral garnet ∿1.2 mm, not associated with vesuvianite. Analysis 1-6 within ∿40 μm of rim, analysis 1-10 approximate core of grain.
[b] Area 2. Isotropic anhedral grain ∿800 μm adjacent to garnet described in c. Both analyses within ∿100 μm of grain edge.
[c] Area 2. Birefringent anhedral grain ∿1000 μm adjacent to garnet described in b. Analysis 2-55 within ∿30 μm of adjacent garnet, analysis 2-56 ∿200 μm into interior.
[d] Area 4. Poikolitic grain ∿3 cm partially rimming vesuvianite (Table A13c). Analysis 4-70 ∿300 μm from adjacent vesuvianite, analysis 4-69 ∿600 μm into interior.
[e] Total iron calculated as Fe_2O_3.

Table A12d. Microprobe Analyses of Garnets in Cycle 6 Argillites at Locality 10H.

Sample Number Photo # - Analysis #	10H-103 2-21[a]	10H-103 2-55[a]	10H-103 3-52[b]	10H-103 5-22[c]	10H-104 2-47[d]	10H-104 2-65[d]	10H-104 3-44[e]	10H-104 3-45[e]	10H-104 4-9[f]	10H-104 4-11[f]	10H-104 4-12[f]	10H-105 3-31[g]	10H-105 3-52[g]	10H-106 1-14[h]	10H-106 1-13[h]	10H-106 1-12[h]
SiO_2	39.40	39.19	39.13	39.31	37.62	38.18	38.01	38.41	37.92	37.37	37.76	38.73	38.47	38.62	38.60	38.78
Al_2O_3	19.88	18.29	18.18	17.89	14.95	12.84	14.96	16.01	12.19	11.83	13.11	18.85	18.61	15.70	16.28	16.72
Fe_2O_3[j]	4.08	6.54	6.94	7.64	10.76	13.67	10.85	9.57	14.66	14.46	13.01	6.81	6.00	8.04	7.67	6.67
MgO	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.00	0.04
MnO	0.00	0.21	0.70	0.67	0.71	0.53	0.68	0.61	0.59	0.56	0.61	0.10	0.08	0.17	0.21	0.21
TiO_2	0.70	0.33	0.30	0.15	0.23	0.78	0.48	0.43	0.53	0.65	0.69	0.52	1.16	2.53	2.39	2.43
Cr_2O_3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
CaO	37.00	36.09	36.19	35.97	35.12	34.72	34.98	35.22	35.23	34.79	34.79	36.76	36.36	35.81	35.83	36.08
Total	**101.17**	**100.65**	**101.44**	**101.63**	**99.39**	**100.72**	**99.96**	**100.25**	**101.20**	**99.66**	**99.97**	**101.73**	**100.72**	**100.94**	**101.00**	**100.95**
Cations/12 Oxygens																
Si	**2.966**	**2.987**	**2.971**	**2.982**	**2.962**	**2.988**	**2.971**	**2.977**	**2.974**	**2.975**	**2.977**	**2.928**	**2.932**	**2.961**	**2.953**	**2.960**
Al	1.764	1.643	1.627	1.600	1.388	1.185	1.379	1.463	1.127	1.110	1.218	1.680	1.672	1.419	1.468	1.504
Fe^{3+}	0.231	0.375	0.396	0.436	0.637	0.805	0.638	0.558	0.865	0.866	0.772	0.388	0.344	0.464	0.441	0.383
Ti	0.040	0.019	0.017	0.009	0.014	0.046	0.028	0.025	0.031	0.039	0.041	0.030	0.066	0.146	0.137	0.139
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
Total Y Cations	**2.035**	**2.037**	**2.040**	**2.045**	**2.039**	**2.036**	**2.045**	**2.046**	**2.023**	**2.015**	**2.031**	**2.098**	**2.082**	**2.029**	**2.047**	**2.027**
Ca	2.984	2.947	2.944	2.923	2.963	2.912	2.930	2.925	2.961	2.968	2.939	2.978	2.969	2.942	2.937	2.951
Mn	0.000	0.014	0.045	0.043	0.047	0.035	0.045	0.040	0.039	0.038	0.041	0.006	0.005	0.011	0.014	0.014
Mg	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.008	0.000	0.005
Total X Cations	**2.996**	**2.961**	**2.989**	**2.966**	**3.010**	**2.947**	**2.975**	**2.965**	**3.000**	**3.006**	**2.980**	**2.984**	**2.979**	**2.961**	**2.951**	**2.970**
%Grossular	86.29	80.20	78.28	76.82	66.54	57.06	65.97	70.19	54.42	53.82	58.64	79.89	79.99	69.31	71.26	73.57
%Andradite	11.35	18.41	19.41	21.32	31.24	39.54	31.20	27.27	42.76	42.98	38.01	18.49	16.52	22.87	21.54	18.89
%"Ti"	1.96	0.93	0.83	0.44	0.69	2.26	1.37	1.22	1.53	1.94	2.02	1.43	3.17	7.20	6.69	6.85
%Uvarovite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05
%Spessertine	0.00	0.47	1.51	1.45	1.56	1.19	1.51	1.35	1.30	1.26	1.38	0.20	0.17	0.37	0.48	0.47
%Pyrope	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.27	0.00	0.17

a Area 2. Poikolitic grain ∿5 mm adjacent to calcite-rich layer. Analysis 2-21 ∿60 μm from grain edge, analysis 2.55 ∿1.5 mm into interior.
b Area 3. Anhedral grain ∿1 mm near vesuvianite (see Table A13c).
c Area 5. Subhedral grain ∿1.5 mm near vesuvianite (see Table A13c).
d Area 2. Euhedral grains ∿100 μm intergrown with calcite and quartz as inclusions in vesuvianite (see Table A13c).
e Area 3. Poikolitic anhedral layer replaced by vesuvianite (see Table A13c) altered by prehnite.
f Area 4. Anhedral grains ∿50-100 μm in cloudy K-feldspar groundmass.
g Area 3. Poikolitic anhedral grain ∿1 cm replacing vesuvianite (see Table A13c). Both analyses within 100 μm of adjacent vesuvianite.
h Area 1. Poikolitic euhedral inclusion in vesuvianite (see table A13c). Analysis 1-14 within ∿30 μm of vesuvianite, analysis 1-12 near core.
j Total iron calculated as Fe_2O_3.

Table A13a. Microprobe Analyses of Vesuvianites in Cycle 1 Argillites.

Sample Number Photo #-Analysis #	14H-80 1-4[a]	14H-80 1-6[a]	14H-80 1-10[a]	14H-80 5-20[a]	3H-37 1-9[b]	3H-37 1-11[b]	3H-37 1-13[b]	3H-37 2-28[c]	3H-37 2-30[c]	16H-84 1-19[d]	16H-64 1-21[d]	16H-64 2-45[e]	16H-64 3-37[e]	16H-64 3-38[e]
SiO_2	35.97	35.78	35.81	35.92	36.23	36.46	36.37	36.42	36.49	35.90	35.65	35.34	35.70	35.38
Al_2O_3	15.14	13.96	13.65	13.73	17.08	17.19	17.50	16.00	16.22	15.28	15.49	15.55	15.50	15.43
$Fe_2O_3^t$	5.11	5.59	5.72	5.70	3.38	3.58	3.47	3.69	3.75	4.78	4.67	4.70	5.03	4.99
MgO	1.13	1.26	1.39	1.32	1.40	1.62	1.55	1.64	1.67	1.29	1.39	0.94	1.40	1.22
MnO	0.04	0.03	0.08	0.05	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.05	0.02	0.04
TiO_2	3.57	4.24	4.29	4.05	2.26	1.32	1.03	2.97	2.61	3.08	2.76	3.26	2.55	2.88
Cr_2O_3	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	34.97	34.64	34.51	34.86	35.62	35.62	36.00	35.53	35.26	35.03	34.92	34.50	35.15	34.96
Na_2O	0.29	0.18	0.25	0.18	0.15	0.09	0.09	0.18	0.16	0.16	0.15	0.25	0.20	0.11
Total	**96.22**	**95.68**	**95.70**	**95.83**	**96.12**	**95.88**	**96.01**	**96.43**	**96.16**	**95.57**	**95.07**	**94.49**	**95.55**	**95.01**
Ions/50 Cations														
Si	**17.967**	**18.070**	**18.079**	**18.110**	**17.909**	**18.020**	**17.926**	**18.002**	**18.069**	**18.015**	**17.948**	**17.929**	**17.880**	**17.866**
Al	8.915	8.312	8.124	8.161	9.953	10.016	10.169	9.324	9.469	9.040	9.194	9.300	9.152	9.186
Fe^{3+}	1.922	2.125	2.174	2.163	1.257	1.331	1.286	1.373	1.396	1.805	1.769	1.795	1.897	1.896
Mg	0.841	0.948	1.046	0.992	1.031	1.193	1.139	1.208	1.232	0.965	1.043	0.711	1.045	0.918
Mn	0.017	0.013	0.034	0.021	0.000	0.000	0.000	0.000	0.000	0.021	0.017	0.021	0.008	0.017
Ti	1.341	1.610	1.629	1.536	0.840	0.491	0.382	1.104	0.972	1.162	1.045	1.244	0.960	1.094
Cr	0.000	0.000	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Y Cations	**13.036**	**13.008**	**13.007**	**12.881**	**13.081**	**13.031**	**12.976**	**13.009**	**13.069**	**12.993**	**13.068**	**13.071**	**13.062**	**13.111**
Ca	18.716	18.745	18.669	18.833	18.866	18.863	19.013	18.818	18.708	18.836	18.838	18.754	18.863	18.916
Na	0.281	0.176	0.245	0.176	0.144	0.086	0.086	0.173	0.154	0.156	0.146	0.246	0.194	0.108
Total X Cations	**18.997**	**18.921**	**18.914**	**19.009**	**19.010**	**18.949**	**19.099**	**18.991**	**18.862**	**18.992**	**18.984**	**19.000**	**19.057**	**19.024**

Table A13a. Continued. Page 2 of 2 Pages.

Sample Number Photo #-Analysis #	18H-89 1-24[g]	18H-89 1-25[g]	18H-89 1-26[g]	18H-89 4-47[h]	18H-89 4-48[h]	18H-89 4-49[h]	18H-89 4-50[h]	18H-89 4-51[h]
SiO_2	36.11	36.05	36.01	36.05	36.12	36.13	36.32	36.11
Al_2O_3	15.99	16.08	15.87	15.61	15.85	15.99	16.58	16.50
Fe_2O_3[f]	4.45	4.48	4.67	3.96	4.49	4.15	4.00	4.36
MgO	1.50	1.59	1.80	1.85	1.69	1.77	1.73	1.59
MnO	0.03	0.03	0.02	0.00	0.02	0.05	0.04	0.04
TiO_2	2.62	1.90	2.08	2.83	1.97	2.13	1.62	1.60
Cr_2O_3	0.00	0.00	0.02	0.04	0.01	0.00	0.00	0.00
CaO	35.40	35.55	35.87	35.74	35.40	35.36	35.52	35.17
Na_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**96.10**	**95.68**	**96.34**	**96.08**	**95.55**	**95.58**	**95.81**	**95.37**
Ions/50 Cations								
Si	**17.971**	**17.972**	**17.836**	**17.910**	**18.035**	**18.016**	**18.022**	**18.031**
Al	9.382	9.451	9.267	9.143	9.330	9.400	9.699	9.713
Fe^{3+}	1.665	1.680	1.740	1.479	1.687	1.555	1.494	1.637
Mg	1.113	1.181	1.329	1.370	1.258	1.315	1.279	1.183
Mn	0.013	0.013	0.008	0.000	0.008	0.021	0.017	0.017
Ti	0.981	0.712	0.775	1.057	0.740	0.799	0.605	0.601
Cr	0.000	0.000	0.008	0.016	0.004	0.000	0.000	0.000
Total Y Cations	**13.154**	**13.037**	**13.127**	**13.065**	**13.027**	**13.090**	**13.094**	**13.151**
Ca	18.877	18.990	19.037	19.026	18.939	18.893	18.885	18.818
Na	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total X Cations	**18.877**	**18.990**	**19.037**	**19.026**	**18.939**	**18.893**	**18.885**	**18.818**

[a] Areas 1 and 5. Poikolitic grain ∿2.5 cm not associated with garnets. All analyses within ∿60 μm of rim.
[b] Area 1. Poikolitic grain ∿1.5 mm, optically zoned, not associated with garnet. Analysis 1-9 within ∿60 μm of rim, analysis 1-13 ∿750 μm into interior.
[c] Area 2. Poikolitic grain ∿1 mm adjacent to garnet (Table A12a). Analysis 2-28 within ∿50 μm of adjacent garnet, analyses 2-30 ∿500 μm into interior.
[d] Area 1. Poikolitic grain ∿1 mm partially replaced by garnet (Table A12a). Analysis 1-19 within ∿50 μm of adjacent garnet, 1-21 ∿200 μm into interior.
[e] Areas 2 and 3. Clear grains each ∿200 μm in fine grained K-feldspar + diopside-rich layer.
[f] Total iron calculated as Fe_2O_3.
[g] Area 1. Poikolitic grain ∿3 mm partially rimmed by garnet (Table A12a). Analysis 1-24 within ∿40 μm of adjacent garnet, analysis 1-26 ∿160 μm into interior.
[h] Area 4. Poikolitic grain not associated with garnets. Analysis 4-47 within 60 μm of rim, analysis 4-51 ∿800 μm into interior.

Table A13b. Microprobe Analyses of Vesuvianites in Cycle 2 Argillites.

Sample Number	3H-39	3H-39	3H-39	3H-39	3H-39	3H-39	3H-40	3H-40	3H-40	16H-86	16H-86	16H-86	16H-86	16H-86	16H-86	16H-86	16H-86	16H-86	16H-86
Photo #-Analysis #	1-11[a]	1-13[a]	1-14[a]	5-53[b]	6-68[c]	6-72[c]	4-25[d]	4-28[d]	4-30[d]	1-66[e]	1-64[e]	1-62[e]	1-60[e]	1-58[e]	4-71[f]	4-73[f]	4-75[f]	4-77[f]	5-63[g]
SiO_2	36.40	36.21	36.54	35.97	35.94	36.32	36.08	36.63	36.46	36.81	36.49	36.60	36.50	36.31	36.18	36.43	36.24	36.41	36.49
Al_2O_3	14.72	17.26	16.71	14.89	15.86	16.33	16.10	16.50	16.28	17.34	17.01	16.18	16.09	16.37	16.99	17.02	16.75	16.63	16.13
Fe_2O_3[h]	4.73	3.42	3.57	4.78	3.93	3.50	4.65	4.40	4.79	3.25	3.61	4.11	4.23	3.80	3.65	3.59	3.78	3.63	3.57
MgO	1.64	1.22	1.24	1.35	1.46	1.41	1.63	1.66	1.63	1.51	1.44	1.35	1.28	1.48	1.52	1.55	1.58	1.58	1.72
MnO	0.00	0.00	0.00	0.00	0.00	0.08	0.11	0.14	0.16	0.05	0.02	0.05	0.05	0.02	0.06	0.07	0.03	0.07	0.09
TiO_2	3.60	2.04	2.25	3.72	3.43	2.97	1.60	1.26	1.33	1.68	1.97	2.88	3.14	2.74	1.97	1.94	2.11	2.28	2.93
Cr_2O_3	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.05	0.00	0.00	0.00	0.00	0.00
CaO	34.59	34.47	35.21	34.78	34.77	34.26	35.84	35.95	36.09	36.48	36.01	35.95	35.98	35.79	35.95	35.77	35.81	35.63	35.64
Na_2O	0.20	0.25	0.18	0.12	0.18	0.24	0.00	0.00	0.00	0.09	0.12	0.15	0.10	0.10	0.00	0.00	0.00	0.00	0.06
Total	**95.88**	**94.87**	**95.70**	**95.61**	**95.59**	**95.15**	**96.01**	**96.54**	**96.74**	**97.21**	**96.68**	**97.33**	**97.34**	**96.66**	**96.32**	**96.37**	**96.30**	**96.23**	**96.63**
Ions/50 Cations																			
Si	**18.215**	**18.122**	**18.172**	**18.088**	**17.975**	**18.193**	**17.917**	**18.052**	**17.962**	**17.954**	**17.934**	**17.968**	**17.946**	**17.916**	**17.863**	**17.972**	**17.911**	**18.015**	**18.004**
Al	8.684	10.184	9.797	8.827	9.351	9.644	9.426	9.587	9.455	9.971	9.856	9.364	9.324	9.522	9.889	9.899	9.759	9.700	9.382
Fe^{3+}	1.783	1.289	1.335	1.808	1.481	1.320	1.736	1.632	1.776	1.191	1.336	1.519	1.566	1.411	1.354	1.333	1.405	1.353	1.324
Mg	1.223	0.910	0.919	1.012	1.088	1.053	1.206	1.219	1.197	1.098	1.055	0.988	0.938	1.088	1.118	1.140	1.164	1.165	1.265
Mn	0.000	0.000	0.000	0.000	0.000	0.034	0.046	0.058	0.067	0.021	0.008	0.021	0.021	0.008	0.025	0.029	0.013	0.029	0.038
Ti	1.355	0.768	0.842	1.407	1.290	1.119	0.598	0.467	0.493	0.616	0.728	1.063	1.161	1.017	0.731	0.720	0.784	0.848	1.087
Cr	0.000	0.000	0.000	0.000	0.008	0.016	0.000	0.000	0.000	0.000	0.004	0.023	0.000	0.020	0.000	0.000	0.000	0.000	0.000
Total Y Cations	**13.045**	**13.151**	**12.893**	**13.054**	**13.218**	**13.186**	**13.012**	**12.963**	**12.988**	**12.897**	**12.987**	**12.978**	**13.010**	**13.066**	**13.117**	**13.121**	**13.125**	**13.095**	**13.096**
Ca	18.547	18.485	18.762	18.740	18.633	18.389	19.071	18.984	19.051	19.065	18.964	18.911	18.950	18.922	19.019	18.908	18.964	18.889	18.842
Na	0.194	0.243	0.174	0.117	0.175	0.233	0.000	0.000	0.000	0.085	0.114	0.143	0.095	0.096	0.000	0.000	0.000	0.000	0.057
Total X Cations	**18.741**	**18.728**	**18.936**	**18.857**	**18.808**	**18.622**	**19.071**	**19.984**	**19.051**	**19.150**	**19.078**	**19.054**	**19.045**	**19.018**	**19.019**	**18.908**	**19.964**	**18.889**	**18.899**

Table A13b. Continued. Page 2 of 2 Pages.

Sample Number Photo #-Analysis #	17H-87 2-20[i]	17H-87 2-19[i]	17H-87 2-21[i]	17H-87 2-18[i]	17H-87 2-22[i]	17H-87 2-26[i]	17H-87 2-23[i]	17H-87 2-25[i]	17H-87 4-27[j]	20H-100 1-7[k]	20H-100 1-9[k]
SiO_2	36.68	36.62	36.59	36.38	36.30	36.43	36.39	36.39	36.47	36.10	36.46
Al_2O_3	16.41	16.40	16.06	15.71	14.44	15.26	15.51	16.64	16.42	16.95	16.93
Fe_2O_3[h]	4.12	3.75	3.81	3.82	4.61	4.39	4.61	3.56	3.53	4.99	5.08
MgO	1.72	1.76	1.85	1.53	1.37	1.81	1.80	1.48	2.56	1.29	1.23
MnO	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.07	0.07
TiO_2	1.73	2.41	2.98	3.83	4.77	3.29	2.37	3.02	0.28	1.20	1.24
Cr_2O_3	0.07	0.07	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	35.45	35.31	35.58	35.55	35.02	35.22	35.62	35.30	36.34	35.13	35.43
Na_2O	0.13	0.19	0.10	0.20	0.34	0.22	0.21	0.13	0.00	0.00	0.00
Total	**96.31**	**96.53**	**97.09**	**97.03**	**96.85**	**96.64**	**96.51**	**96.54**	**95.60**	**95.73**	**96.44**
Ions/50 Cations											
Si	**18.107**	**18.042**	**17.971**	**17.934**	**18.041**	**18.021**	**17.982**	**17.970**	**17.974**	**17.984**	**18.044**
Al	9.550	9.526	9.299	9.130	8.461	8.899	9.036	9.687	9.540	9.955	9.878
Fe^{3+}	1.532	1.389	1.409	1.418	1.725	1.634	1.715	1.321	1.311	1.871	1.892
Mg	1.265	1.292	1.352	1.124	1.015	1.334	1.326	1.089	1.880	0.958	0.907
Mn	0.000	0.008	0.000	0.004	0.000	0.008	0.000	0.008	0.000	0.030	0.029
Ti	0.642	0.893	1.101	1.420	1.783	1.224	0.881	1.122	0.104	0.450	0.462
Cr	0.027	0.027	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Y Cations	**13.016**	**13.135**	**13.208**	**13.092**	**12.984**	**13.099**	**12.958**	**13.227**	**12.835**	**13.264**	**13.168**
Ca	18.751	18.641	18.724	18.778	18.649	18.668	18.860	18.678	19.191	18.753	18.788
Na	0.124	0.182	0.095	0.191	0.328	0.211	0.201	0.124	0.000	0.000	0.000
Total X Cations	**18.875**	**18.823**	**18.819**	**18.969**	**18.977**	**18.879**	**19.061**	**18.802**	**19.191**	**18.753**	**18.788**

[a] Area 1. Poikolitic grain ∿3 mm. Analysis 1-11 within ∿40 μm of rim, analysis 1-10 ∿140 μm into interior.
[b] Area 5. Poikolitic grain ∿3 mm optically zoned. Analysis 5-53 ∿40 μm from rim.
[c] Area 6. Poikolitic grain ∿3 cm rimmed by 600 μm thick nonpoikolitic rim. Analysis 6-68 within 60 μm of rim, analysis 6-72 ∿450 μm into interior.
[d] Area 4. Anedhral grains each < 60 μm in wollastonite and prehnite layer.
[e] Area 1. Poikolitic grain ∿1 cm partially rimmed by garnet (Table A12b). Analysis 1-66 within ∿40 μm of adjacent garnet, Analysis 1-58 ∿450 μm into interior.
[f] Area 4. Non-poikolitic grain ∿50 mm intergrown with wollastonite not associated with garnet. Analysis 4-77 ∿250 μm from grain edge, analysis 4-71 ∿1 mm into interior.
[g] Area 5. Nonpoikolitic grain ∿1 mm intergrown with other vesuvianite. Analysis is ∿100 μm from grain edge.
[h] Total iron calculated as Fe_2O_3.
[i] Area 2. Poikolitic grain ∿2 cm not associated with garnet. Analyses 2-20, 2-19, 2-18 on thin (∿100 μm) zoned rim, analysis 2-22 on inner side of rim, analysis 2-26 ∿600 μm into interior.
[j] Area 4. Anhedral clear grain ∿1 mm in calcite-rich layer.
[k] Area 1. Skeletal grain ∿2 mm with inclusions of wollastonite needles.

Table A13c. Microprobe Analyses of Vesuvianites in the Skarn and Cycle 6 Argillites at Station 10H.

Sample Number Photo #-Analysis #	10H-102 3-38[a]	10H-102 4-57[b]	10H-102 4-60[b]	10H-102 5-73[c]	10H-102 5-75[c]	10H-103 2-53[d]	10H-103 6-27[d]	10H-103 6-32[d]	10H-103 3-55[e]	10H-103 3-30[e]	10H-103 4-40[f]	10H-103 4-44[f]	10H-103 5-8[g]	10H-103 5-10[g]	10H-103 5-12[g]	10H-103 5-14[g]	10H-103 5-16[g]
SiO_2	35.45	36.10	36.98	36.44	36.91	36.56	36.57	36.64	36.45	36.46	36.66	36.63	36.94	36.92	36.74	37.21	36.93
Al_2O_3	16.02	16.63	15.62	15.10	14.53	16.59	17.12	17.17	14.65	16.43	16.73	16.52	15.62	16.06	16.29	16.48	17.05
Fe_2O_3[h]	3.42	3.56	4.80	5.68	5.97	3.86	3.26	3.22	4.28	4.09	3.73	3.56	4.21	3.98	3.83	3.50	3.79
MgO	1.55	1.59	1.72	2.65	2.61	2.21	2.40	2.22	1.92	1.84	2.16	2.19	1.95	1.72	1.83	1.85	1.93
MnO	0.04	0.01	0.05	0.12	0.11	0.00	0.07	0.00	0.06	0.10	0.00	0.00	0.13	0.16	0.17	0.07	0.00
TiO_2	4.22	2.88	2.71	0.60	0.67	1.39	0.78	0.88	3.55	2.01	1.58	1.57	2.84	2.66	2.40	2.24	1.21
Cr_2O_3	0.00	0.03	0.02	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
CaO	35.16	34.94	35.07	35.61	35.33	35.92	36.79	36.72	36.10	35.86	36.80	36.69	35.81	36.20	36.08	36.52	36.54
Na_2O	0.29	0.16	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.00	0.00	0.04	0.00	0.13	0.08
Total	**96.15**	**95.90**	**97.00**	**96.22**	**96.19**	**96.53**	**96.99**	**96.85**	**97.01**	**96.82**	**97.79**	**97.16**	**97.50**	**97.74**	**97.34**	**98.00**	**97.53**
Ions/50 Cations																	
Si	**17.608**	**17.925**	**18.252**	**18.006**	**18.286**	**17.948**	**17.779**	**17.852**	**18.002**	**17.920**	**17.757**	**17.861**	**18.099**	**18.025**	**17.981**	**18.035**	**17.931**
Al	9.381	9.735	9.089	8.796	8.487	9.602	9.812	9.862	8.533	9.520	9.553	9.497	9.023	9.244	9.399	9.417	9.760
Fe^{3+}	1.279	1.329	1.783	2.112	2.225	1.425	1.191	1.182	1.591	1.513	1.361	1.305	1.553	1.462	1.412	1.277	1.385
Mg	1.147	1.177	1.265	1.951	1.927	1.617	1.739	1.612	1.414	1.348	1.559	1.591	1.424	1.251	1.335	1.336	1.397
Mn	0.017	0.004	0.021	0.050	0.046	0.000	0.029	0.000	0.025	0.042	0.000	0.000	0.054	0.066	0.070	0.029	0.000
Ti	1.576	1.075	1.006	0.223	0.250	0.513	0.285	0.322	1.319	0.743	0.576	0.576	1.047	0.977	0.883	0.817	0.442
Cr	0.000	0.012	0.008	0.008	0.024	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000
Total Y Cations	**13.400**	**13.332**	**13.172**	**13.140**	**12.959**	**13.157**	**13.056**	**12.978**	**12.882**	**13.166**	**13.068**	**12.969**	**13.101**	**13.000**	**13.099**	**12.876**	**12.984**
Ca	18.712	18.589	18.547	18.854	18.755	18.895	19.165	19.170	19.110	18.886	19.099	19.170	18.800	18.937	18.920	18.967	19.010
Na	0.279	0.154	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.075	0.000	0.000	0.038	0.000	0.122	0.075
Total X Cations	**18.991**	**18.754**	**18.576**	**18.854**	**18.755**	**18.895**	**19.165**	**19.170**	**19.110**	**18.915**	**19.174**	**19.170**	**18.800**	**18.975**	**18.920**	**19.089**	**19.085**

Table A13c. Continued. Page 2 of 4 Pages.

Sample Number Photo #-Analysis #	10H-104 1-71[i]	10H-104 2-51[j]	10H-104 2-53[j]	10H-104 2-55[j]	10H-104 3-21[k]	10H-104 3-23[k]	10H-104 3-25[k]	10H-104 3-27[k]	10H-104 3-29[k]	10H-105 3-40[m]	10H-105 3-42[m]	10H-105 3-44[m]	10H-105 3-46[m]
SiO_2	36.33	36.03	36.28	36.18	36.68	36.40	36.42	36.99	36.24	36.26	36.09	36.40	36.20
Al_2O_3	16.77	16.26	16.47	16.28	16.02	15.34	16.51	16.18	16.03	16.06	16.01	16.15	15.78
Fe_2O_3[h]	3.30	3.72	4.01	3.76	3.20	3.81	3.32	3.57	3.51	4.39	4.61	3.79	3.65
MgO	2.68	2.74	2.47	2.65	2.08	2.00	2.72	3.00	2.95	1.45	1.56	1.81	1.91
MnO	0.00	0.12	0.00	0.00	0.12	0.11	0.06	0.00	0.06	0.07	0.08	0.07	0.05
TiO_2	1.16	0.48	0.28	0.40	2.50	2.69	1.28	1.42	1.46	3.05	2.94	2.83	2.93
Cr_2O_3	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CaO	36.13	35.28	35.51	35.47	35.99	36.15	36.69	35.70	35.62	36.07	35.30	35.32	35.09
Na_2O	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.00
Total	**96.37**	**94.63**	**95.02**	**94.74**	**96.59**	**96.57**	**96.00**	**96.86**	**95.87**	**97.39**	**96.61**	**96.37**	**95.61**
Ions/50 Cations													
Si	**17.780**	**17.952**	**18.022**	**18.008**	**18.048**	**17.977**	**17.907**	**18.037**	**17.853**	**17.820**	**17.884**	**18.016**	**18.057**
Al	9.676	9.551	9.645	9.553	9.293	8.932	9.570	9.301	9.310	9.305	9.353	9.423	9.280
Fe^{3+}	1.216	1.396	1.500	1.407	1.185	1.417	1.230	1.309	1.302	1.624	1.720	1.412	1.368
Mg	1.955	2.035	1.829	1.966	1.525	1.472	1.993	2.180	2.166	1.062	1.152	1.335	1.420
Mn	0.000	0.051	0.000	0.000	0.050	0.046	0.025	0.000	0.025	0.029	0.034	0.029	0.021
Ti	0.427	0.180	0.105	0.150	0.925	0.999	0.473	0.521	0.541	1.127	1.096	1.053	1.099
Cr	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Y Cations	**13.274**	**13.213**	**13.079**	**13.076**	**12.978**	**12.893**	**13.291**	**13.311**	**13.344**	**13.147**	**13.355**	**13.252**	**13.188**
Ca	18.947	18.835	18.900	18.917	18.974	19.130	18.802	18.652	18.803	18.994	18.743	18.731	18.755
Na	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.019	0.000	0.000
Total X Cations	**18.947**	**18.835**	**18.900**	**18.917**	**18.974**	**19.130**	**18.802**	**18.652**	**18.803**	**19.032**	**18.762**	**18.731**	**18.755**

Table A13c. Continued. Page 3 of 4 Pages.

Sample Number Photo #-Analysis #	10H-106A 1-20[n]	10H-106A 1-22[n]	10H-106A 2-33[p]	10H-106A 2-37[p]	10H-106A 2-41[p]	10H-106A 2-42[p]	10H-106A 5-62[q]	10H-106A 5-64[q]	10H-108 4-22[r]	10H-108 4-20[r]	10H-108 4-26[r]	10H-108 4-18[r]
SiO_2	36.83	36.78	36.95	37.26	37.05	37.32	37.56	37.10	36.38	36.35	36.61	36.68
Al_2O_3	15.28	15.38	15.45	16.52	17.19	16.91	17.85	16.27	15.49	15.66	15.09	15.48
Fe_2O_3[h]	4.25	4.38	4.96	3.37	3.55	3.61	2.72	5.25	5.76	6.20	6.15	5.71
MgO	1.19	1.22	1.60	1.53	1.07	1.05	2.14	1.63	1.25	1.14	1.22	1.32
MnO	0.02	0.05	0.07	0.04	0.03	0.03	0.09	0.04	0.01	0.00	0.03	0.00
TiO_2	4.55	4.63	2.73	3.07	2.80	2.94	0.64	1.25	2.85	2.50	2.63	2.50
Cr_2O_3	0.00	0.03	0.06	0.00	0.01	0.04	0.01	0.00	0.02	0.00	0.02	0.00
CaO	35.70	35.48	35.91	36.10	36.25	36.16	36.73	35.89	34.89	35.58	35.30	35.12
Na_2O	0.33	0.30	0.11	0.18	0.29	0.25	0.00	0.18	0.20	0.15	0.12	0.15
Total	**98.15**	**98.25**	**97.84**	**98.07**	**98.24**	**98.31**	**97.74**	**97.61**	**96.85**	**97.58**	**97.17**	**96.92**
Ions/50 Cations												
Si	**18.029**	**17.999**	**18.090**	**18.101**	**17.964**	**18.110**	**18.099**	**18.109**	**18.050**	**17.911**	**18.138**	**18.159**
Al	8.818	8.873	8.917	9.461	9.826	9.674	10.140	9.362	9.060	9.097	8.814	9.035
Fe^{3+}	1.564	1.613	1.826	1.231	1.293	1.319	0.987	1.927	2.149	2.299	2.291	2.128
Mg	0.868	0.890	1.167	1.108	0.773	0.759	1.537	1.186	0.924	0.837	0.901	0.974
Mn	0.008	0.021	0.029	0.016	0.012	0.012	0.037	0.017	0.004	0.000	0.013	0.000
Ti	1.675	1.704	1.005	1.122	1.021	1.073	0.232	0.459	1.063	0.926	0.980	0.931
Cr	0.000	0.012	0.023	0.000	0.004	0.015	0.004	0.000	0.008	0.000	0.008	0.000
Total Y Cations	**12.933**	**13.113**	**12.867**	**12.938**	**12.929**	**18.852**	**12.937**	**12.951**	**13.208**	**13.159**	**13.007**	**13.068**
Ca	18.725	18.604	18.838	18.791	18.833	18.802	18.964	18.771	18.548	18.785	18.740	18.630
Na	0.313	0.285	0.104	0.170	0.273	0.235	0.000	0.170	0.192	0.143	0.115	0.144
Total X Cations	**19.038**	**18.889**	**18.942**	**18.961**	**19.106**	**19.037**	**18.964**	**18.941**	**18.740**	**18.928**	**18.855**	**18.774**

Table A13c. Footnotes. Page 4 of 4 Pages.

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a Area 3. Poikolitic grain ∿1 mm near garnet (see Table A12c). Analysis 3-38 within 60 μm of grain edge.
b Area 4. Poikolitic grain ∿4.5 mm partially rimmed by garnet (see Table A12c). Analysis 4-57 within ∿60 μm of adjacent garnet, analysis 4-60 ∿400 μm into interior.
c Area 5. Both analyses from nonpoikolitic grain ∿600 μm in calcite-rich layer.
d Area 2 and 6. Anhedral grains each ∿200 μm in calcite-rich layer.
e Area 3. Subhedral poikolitic grain ∿1.5 mm partially rimming garnet (see Table A12d). Analysis 3-55 within ∿40 μm of adjacent garnet, analysis 3-30 ∿150 μm into interior.
f Area 4. Euhedral grain ∿1.5 mm. Interior of grain contains diopside inclusions. Outer ∿100 μm is clear. Both analyses in outer clear layer.
g Area 5. Optically zoned poikolitic grain ∿3 mm near garnet (see Table A12d). analysis 5-8 witthin ∿60 μm of grain edge, analysis 5-16 ∿700 μm into interior.
h Total iron calculated as Fe_2O_3.
i Area 1. Non-poikolitic grain ∿200 μm intergrown with wollastonite diopside garnet. Grain is altered by prehnite.
j Area 2. Non-poikolitic grains ∿600 μm with wollastonite, calcite, quartz and euhedral garnet inclusions. Analyses 2-51 and 2-53 from vesuvianite which surrounds garnet (see Table A12d).
k Area 3. Euhedral poikolitic grain ∿600 μm partially replaced by garnet (see Table A12d). Analysis 2-29 within ∿150 μm of adjacent garnet near core of grain, analyses 3-27 and 3-25 in poikolitic portion of grain, analyses 3-21 and 3-23 within clear 50 μm thick outer rim of grain.
m Area 3. Poikolitic anticular grain ∿6 mm x 1 mm rimmed by garnet (see Table A12d). Analysis 3-40 within ∿100 μm of adjacent garnet, analysis 3-46 ∿300 μm into interior.
n Area 1. Poikolitic subhedral grain ∿2 cm with euhedral garnet inclusions (see Table A12d). Analysis 1-20 within ∿30 μm of garnet, analysis 1-22 ∿100 μm away from garnet.
p Area 2. Same grain as above near outer rim adjacent to diopside + wollastonite-rich layer. Analysis 2-33 in outer rim, analysis 2-37 ∿50 μm into interior, analyses 2-41 and 2-42 ∿600 μm into interior.
q Area 5. Both analyses from individual anhedral grains ∿100 μm in calcite-rich layer.
r Area 4. Poikolitic vesuvianite-rich layer ∿5 mm thick. Both analyses within ∿100 μm of adjacent wollastonite-rich layer.