

## APPENDIX

### Electron Microprobe Analyses of White Mica, Myra Falls VHMS Camp

The white mica electron microprobe data are a supplement to the paper entitled “Shortwave infrared spectral characteristics of the HW horizon: Implications for exploration in the Myra Falls volcanic-hosted massive sulfide camp, Vancouver Island, B.C., Canada” by Sarah Jones, Walter Herrmann, and J. Bruce Gemmell (*Economic Geology*, vol. 100, issue 2, p. 273–294). White mica was analyzed from samples in the HW horizon across the Myra Falls property to investigate subtle changes in mica chemistry with proximity to ore and changing lithology.

Analyses were conducted on the Cameca SX-50 electron microprobe at the Central Science Laboratory, University of Tasmania. Mineral formulas for the white mica were calculated on the basis of 22 oxygens. Analytical conditions were as follows: current 25 nA, acceleration voltage 15 kV, take off angle 40°, beam size 1  $\mu\text{m}$ .



APPENDIX (Cont.)

Rock unit Lithology	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Chert	HW horizon Chert	HW horizon Chert
Location	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle South	Battle South	Battle South
Sample no.	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ758-109	SJ784-160	SJ784-160	SJ784-160
Drive/drill hole	G171XS	G171XS	G171XS	G171XS	G171XS	G171XS	G171XS	G171XS	G171XS	L14-681	L14-681	L14-681
Wt percent												
SiO <sub>2</sub>	46.2	46.03	46.02	46.08	46.81	45.61	47.02	47.15	46.42	46.96	46.45	46.38
TiO <sub>2</sub>	0.21	0.26	0.14	0.2	0.2	0.16	0.12	0.11	0.05	0.09	0.04	0.36
Al <sub>2</sub> O <sub>3</sub>	35.86	35.85	35.53	35.57	35.08	35.75	34.91	36.95	36.76	36.54	37.25	35.23
Cr <sub>2</sub> O <sub>3</sub>	0.04	0.04	nd	0.08	nd	nd	nd	nd	0.04	nd	nd	0.06
FeO	0.6	0.89	0.72	0.91	0.99	0.86	0.85	0.47	0.4	0.42	0.44	0.95
V <sub>2</sub> O <sub>5</sub>	0.13	0.13	0.19	0.09	0.19	0.15	0.18	nd	nd	nd	nd	0.1
ZnO	0.35	0.55	nd	nd	0.99	0.04	0.22	nd	0.06	0.02	nd	0.08
MnO	0.02	0.05	nd	0.05	0	0.04	nd	0.1	0.05	nd	nd	nd
MgO	0.8	0.95	0.85	0.91	1.14	0.74	1.05	0.78	0.77	0.92	0.83	1.44
CaO	0.02	0	0.01	nd	0.03	0.03	0.05	nd	0.01	nd	nd	0.03
N <sub>2</sub> O	0.62	0.55	0.54	0.59	0.44	0.6	0.48	0.72	0.7	0.89	0.86	0.52
K <sub>2</sub> O	10.18	10.41	10.28	10.72	10.54	10.58	10.12	10.12	10.53	10.27	10.27	10.49
BaO	0.75	0.61	0.64	0.71	0.86	0.46	0.46	0.33	0.44	0.33	0.55	1.39
Rb <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
Cr <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
SrO	-	-	-	-	-	-	-	-	-	-	-	-
NiO	-	-	-	-	-	-	-	-	-	-	-	nd
F	0.18	0.13	0.11	0.14	0.14	0.12	0.12	0.25	0.28	0.29	0.2	0.41
Cl	0.02	0.01	0.01	0.02	0	0	0	0	0.01	0.01	0.01	0.02
H <sub>2</sub> O(c)	4.43	4.46	4.43	4.43	4.48	4.42	4.46	4.48	4.42	4.44	4.48	4.34
O = F	0.07	0.06	0.05	0.06	0.06	0.05	0.05	0.1	0.12	0.12	0.08	0.17
O = Cl	0	0	0	0	0	0	0	0	0	0	0	0
Sum Ox percent	100.33	100.87	99.4	100.34	101.84	99.52	99.99	101.35	100.81	101.06	101.29	101.61
At. percent												
Si	6.134	6.099	6.155	6.135	6.169	6.108	6.241	6.149	6.112	6.152	6.082	6.127
Ti	0.021	0.026	0.014	0.01	0.02	0.016	0.012	0.011	0.005	0.009	0.004	0.036
Al/Al IV	1.866	1.901	1.845	1.865	1.831	1.892	1.759	1.851	1.888	1.848	1.918	1.873
Al VI	3.745	3.697	3.756	3.716	3.617	3.75	3.702	3.828	3.816	3.793	3.831	3.612
Cr	0.004	0.004	nd	0.008	nd	nd	nd	nd	0.004	nd	nd	0.006
Fe <sup>2+</sup>	0.067	0.098	0.05	0.101	0.109	0.097	0.095	0.052	0.044	0.046	0.048	0.104
V	0.014	0.014	0.021	0.01	0.02	0.016	0.022	0.022	nd	0.001	nd	0.011
Zn	0.034	0.053	nd	nd	0.097	0.004	0.022	nd	0.006	0.002	nd	0.008
Mn <sup>2+</sup>	0.002	0.006	nd	0.005	nd	0.005	nd	0.011	0.005	nd	nd	nd
Mg	0.159	0.187	0.169	0.181	0.224	0.149	0.208	0.152	0.151	0.18	0.162	0.284
Ca	0.003	nd	0.003	nd	0.005	0.004	0.007	nd	0.001	nd	nd	0.004
Na	0.159	0.141	0.139	0.152	0.111	0.157	0.123	0.182	0.178	0.226	0.218	0.133
K	1.724	1.76	1.754	1.821	1.772	1.807	1.713	1.683	1.769	1.717	1.715	1.717
Ba	0.039	0.032	0.033	0.037	0.045	0.024	0.024	0.017	0.022	0.017	0.028	0.072
Rb	-	-	-	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-	-	-	-
Sr	-	-	-	-	-	-	-	-	-	-	-	-
Ni	-	-	-	-	-	-	-	-	-	-	-	nd
F	0.075	0.056	0.046	0.058	0.06	0.05	0.052	0.101	0.119	0.121	0.082	0.171
Cl	0.005	0.002	0.003	0.004	nd	nd	nd	nd	0.002	0.003	0.002	0.004
OH	3.92	3.942	3.951	3.938	3.94	3.95	3.948	3.899	3.879	3.876	3.916	3.825
Sum Cat number	17.971	18.018	17.967	18.042	18.018	18.029	17.925	17.934	18.002	17.99	18.006	18.037
XMg	0.704	0.655	0.678	0.642	0.673	0.605	0.688	0.746	0.775	0.797	0.772	0.731
Oct	4.033	4.072	4.019	4.022	4.066	4.02	4.038	4.052	4.032	4.029	4.045	4.05
Int	1.925	1.933	1.927	2.01	1.932	1.992	1.867	1.881	1.97	1.96	1.961	1.976



APPENDIX (Cont.)

Rock unit Lithology	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert	HW horizon Chert
Location	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine	Battle mine
Sample no.	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42	SJ154-42
Drive/drill hole	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126	18-1126
Wt percent												
SiO <sub>2</sub>	46.57	46.87	48	47.25	46.7	47.53	47.02	47.32	46.67	46.62	46.23	46.45
TiO <sub>2</sub>	0.08	0.08	0.07	0.15	0.08	0.05	0.04	0.05	0.05	0.05	0.04	0.09
Al <sub>2</sub> O <sub>3</sub>	34.97	36.56	34.71	35.45	36.72	35.67	35.97	35.28	37.03	36.18	36.7	36.23
Cr <sub>2</sub> O <sub>3</sub>	nd	0.01	nd	nd	nd	nd	0.07	nd	nd	0.02	0.03	nd
FeO	1.18	0.37	0.51	0.47	0.32	0.32	0.39	0.56	0.63	0.77	0.75	0.54
V <sub>2</sub> O <sub>5</sub>	0.02	0.05	nd	nd	0.12	nd	0.08	nd	0.05	0.03	0.04	0.01
ZnO	0.07	nd	nd	nd	nd	0.11	0.17	0.04	0.05	0.29	0.01	0.09
MnO	0.06	nd	0.03	0.01	0.07	nd	0.05	0.01	0.01	nd	nd	nd
MgO	0.73	0.7	0.92	0.99	0.78	1.08	0.92	0.92	0.71	0.84	0.79	0.8
CaO	0.09	0.02	0.07	nd	0.03	0.01	0.03	nd	0.05	0.02	nd	nd
N <sub>2</sub> O	0.64	0.6	0.53	0.54	0.74	0.5	0.65	0.67	0.88	0.54	0.72	0.63
K <sub>2</sub> O	9.6	10.31	9.72	10.1	9.8	9.78	10.04	10.32	9.93	10.28	10.19	10.17
BaO	0.49	0.63	0.62	0.24	0.36	0.4	0.27	0.41	0.42	0.43	0.52	0.54
Rb <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
Cs <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
SrO	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
NiO	nd	0.1	0.05	0.01	0.03	nd	0.01	nd	0.1	nd	nd	nd
F	0.14	0.15	0.32	0.16	0.11	0.16	0.15	0.16	0.08	0.13	0.14	0.13
Cl	0.01	0.05	0.04	0.03	nd	nd	nd	nd	0.02	0.02	nd	0.01
H <sub>2</sub> O(c)	4.41	4.48	4.37	4.45	4.51	4.48	4.48	4.46	4.54	4.48	4.48	4.47
O = F	0.06	0.13	0.07	0.07	0.05	0.07	0.06	0.07	0.03	0.06	0.06	0.05
O = Cl	0	0.01	0.01	0.01	0	0	0	0	0	0	0	0
Sum Ox percent	99	100.88	99.82	99.77	100.34	100.01	100.28	100.15	101.18	100.64	100.6	100.11
At. percent												
Si	6.236	6.16	6.347	6.249	6.142	6.26	6.197	6.257	6.109	6.152	6.101	6.151
Ti	0.008	0.008	0.007	0.015	0.008	0.005	0.004	0.005	0.005	0.005	0.004	0.009
Al/Al IV	1.764	1.84	1.653	1.751	1.858	1.74	1.803	1.743	1.891	1.848	1.899	1.849
Al VI	3.753	3.822	3.757	3.775	3.835	3.797	3.785	3.756	3.823	3.778	3.808	3.806
Cr	nd	0.001	nd	nd	nd	nd	0.007	nd	nd	0.002	0.003	nd
Fe <sup>2+</sup>	0.132	0.041	0.056	0.052	0.036	0.036	0.043	0.062	0.069	0.085	0.083	0.06
V	0.002	0.005	nd	nd	0.013	nd	0.008	nd	0.005	0.003	0.004	0.001
Zn	0.007	nd	nd	nd	nd	0.01	0.016	0.004	0.005	0.029	0.001	0.009
Mn <sup>2+</sup>	0.007	nd	0.003	0.001	0.008	nd	0.005	0.002	0.002	nd	nd	nd
Mg	0.146	0.137	0.181	0.195	0.153	0.212	0.18	0.182	0.138	0.165	0.156	0.159
Ca	0.013	0.004	0.01	nd	0.005	0.001	0.005	nd	0.007	0.003	nd	nd
Na	0.165	0.153	0.137	0.14	0.188	0.127	0.166	0.171	0.223	0.003	0.185	0.163
K	1.64	1.728	1.64	1.704	1.644	1.644	1.689	1.74	1.658	1.731	1.716	1.719
Ba	0.026	0.032	0.032	0.012	0.018	0.02	0.014	0.021	0.022	0.022	0.027	0.028
Rb	-	-	-	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-	-	-	-
Sr	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ni	nd	0.01	0.005	0.001	0.003	nd	0.001	nd	0.011	nd	nd	nd
F	0.06	0.064	0.134	0.065	0.046	0.068	0.061	0.067	0.033	0.055	0.06	0.054
Cl	0.002	0.01	0.008	0.006	nd	nd	nd	nd	0.004	0.003	nd	0.001
OH	3.938	3.926	3.858	3.929	3.954	3.932	3.939	3.933	3.963	3.942	3.94	3.944
Sum Cat number	17.899	17.939	17.829	17.895	17.913	17.852	17.924	17.944	17.967	17.962	17.988	17.953
XMg	0.524	0.769	0.764	0.79	0.812	0.856	0.806	0.745	0.668	0.661	0.652	0.725
Oct	4.054	4.018	4.01	4.039	4.044	4.06	4.043	4.011	4.052	4.064	4.056	4.043
Int	1.844	1.916	1.819	1.856	1.856	1.792	1.873	1.933	1.91	1.896	1.928	1.909





## APPENDIX (Cont.)

Rock unit Lithology	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Altered argillite	HW horizon Rhyolitic sandstone	HW horizon Rhyolitic sandstone	HW horizon Rhyolitic sandstone	HW horizon Rhyolitic sandstone
Location	HW mine	HW mine	HW mine	HW mine	HW mine	HW mine	HW mine	HW mine	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33
Sample no.	SJ650-98	SJ650-98	SJ650-98	SJ650-98	SJ650-98	SJ650-98	SJ650-98	SJ650-98	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33
Drive/drill hole	S335C	S335C	S335C	S335C	S335C	S335C	S335C	S335C	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33	South Flank SJ600-T6 16-33
Wt percent												
SiO <sub>2</sub>	46.84	47.86	47.53	48.29	48.62	46.49	47.81	49.47	49.04	47.61	48.63	47.01
TiO <sub>2</sub>	0.16	0.37	0.18	3.61	0.29	0.34	0.99	nd	0.01	0.13	0.11	0.13
Al <sub>2</sub> O <sub>3</sub>	32.14	33.69	34.58	31.1	31.26	34.36	31.76	32.01	30.76	32.82	32.52	33.35
Cr <sub>2</sub> O <sub>3</sub>	0.06	0.05	nd	0.01	0.11	0.03	0.04	0.03	0.04	0.05	nd	0.03
FeO	0.57	0.73	0.77	0.55	0.67	0.91	0.46	1.86	2.12	1.51	1.93	1.71
V <sub>2</sub> O <sub>5</sub>	0.12	0.17	0.21	0.1	0.14	0.23	0.03	nd	nd	nd	0.03	nd
ZnO	nd	nd	nd	0.08	0.09	nd	nd	nd	0.02	nd	nd	nd
MnO	0.02	0.03	nd	0.02	nd	nd	nd	0.05	0.08	nd	0.06	nd
MgO	1.32	1.37	1.21	1.08	1.35	1.53	1.18	2.07	2.22	1.79	2.18	1.56
CaO	nd	0.07	0.09	0.01	0.03	0	1.86	0.01	nd	nd	nd	nd
Na <sub>2</sub> O	0.3	0.47	0.49	0.45	0.4	0.45	0.38	0.19	0.14	0.19	0.15	0.23
K <sub>2</sub> O	10.06	9.88	10.03	9.29	9.97	10.46	9.42	11.12	11.14	11.16	11.08	11.19
BaO	1.1	0.98	1.02	0.88	1.11	1.46	1.04	0.68	0.64	0.73	0.62	0.74
Rb <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
CS <sub>2</sub> O	-	-	-	-	-	-	-	-	-	-	-	-
SrO	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
NiO	0.02	nd	nd	nd	nd	nd	nd	0.04	0.03	0.08	0.03	nd
F	0.4	0.39	0.24	0.28	0.34	0.4	0.27	0.19	0.19	0.15	0.18	0.11
Cl	0.02	0.03	0.01	0.02	0.01	0.01	0.01	nd	0.01	nd	nd	0.01
H <sub>2</sub> O(c)	4.18	4.33	4.42	4.39	4.28	4.31	4.43	4.49	4.41	4.43	4.47	4.43
O = F	0.17	0.17	0.1	0.12	0.14	0.17	0.11	0.08	0.08	0.07	0.08	0.05
O = Cl	0	0.01	0	0	0	0	0	0	0	0	0	0
Sum Ox percent	97.13	100.25	100.67	100.05	98.52	100.82	99.49	102.13	100.77	100.59	101.92	100.45
At. percent												
Si	6.418	6.343	6.279	6.4	6.359	6.189	6.404	6.485	6.531	6.345	6.394	6.283
Ti	0.016	0.037	0.017	0.36	0.029	0.034	0.099	nd	0.001	0.013	0.011	0.013
Al/Al IV	1.582	1.657	1.721	1.6	1.441	1.811	1.596	1.515	1.469	1.655	1.606	1.717
Al VI	3.608	3.605	3.663	3.258	3.529	3.58	3.417	3.429	3.358	3.5	3.432	3.536
Cr	0.006	0.005	nd	0.001	0.011	0.003	0.004	0.003	0.004	0.005	nd	0.003
Fe <sup>2+</sup>	0.065	0.081	0.085	0.061	0.075	0.101	0.052	0.204	0.236	0.168	0.212	0.191
V	0.013	0.018	0.023	0.01	0.015	0.025	0.003	nd	nd	0.003	0.003	nd
Zn	nd	nd	nd	0.008	0.009	nd	nd	nd	0.002	nd	nd	nd
Mn <sup>2+</sup>	0.002	0.004	nd	0.002	nd	nd	nd	0.006	0.01	0.006	0.006	nd
Mg	0.27	0.271	0.239	0.214	0.271	0.303	0.235	0.405	0.44	0.355	0.427	0.311
Ca	nd	0.011	0.011	0.001	0.005	nd	0.268	0.001	0.001	nd	nd	nd
Na	0.079	0.121	0.126	0.117	0.103	0.116	0.098	0.049	0.035	0.049	0.038	0.059
K	1.757	1.67	1.69	1.571	1.715	1.776	1.61	1.859	1.893	1.898	1.858	1.908
Ba	0.059	0.051	0.053	0.046	0.059	0.076	0.055	0.035	0.034	0.038	0.032	0.039
Rb	-	-	-	-	-	-	-	-	-	-	-	-
Cs	-	-	-	-	-	-	-	-	-	-	-	-
Sr	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ni	0.002	nd	nd	nd	nd	nd	nd	0.004	0.003	0.009	0.003	nd
F	0.173	0.165	0.101	0.118	0.144	0.168	0.114	0.078	0.081	0.065	0.076	0.047
Cl	0.003	0.006	0.002	0.004	0.001	0.003	0.003	nd	0.001	nd	0.001	0.003
OH	3.824	3.829	3.897	3.878	3.855	3.829	3.883	3.922	3.918	3.935	3.923	3.95
Sum Cat number	17.879	17.873	17.908	17.649	17.823	18.015	17.841	17.995	18.016	18.036	18.023	18.06
XMg	0.805	0.77	0.738	0.778	0.783	0.749	0.819	0.665	0.651	0.679	0.668	0.619
Oct	3.97	4.003	4.005	3.905	3.926	4.021	3.807	4.051	4.054	4.05	4.091	4.054
Int	1.896	1.852	1.881	1.734	1.882	1.969	2.031	1.944	1.962	1.985	1.928	2.006





## APPENDIX (Cont.)

Rock unit Lithology	HW horizon Rhyolitic sandstone	HW horizon Rhyolitic sandstone	Rock unit Lithology	HW horizon Rhyolitic sandstone	HW horizon Rhyolitic sandstone
Location Sample no. Drive/drill hole	HW North SJ66-47 W202	HW North SJ66-47 W202	Location Sample no. Drive/drill hole	HW North SJ66-47 W202	HW North SJ66-47 W202
Wt percent			At. percent		
SiO <sub>2</sub>	46.78	47.14	Si	6.314	6.478
TiO <sub>2</sub>	0.06	0.1	Ti	0.006	0.01
Al <sub>2</sub> O <sub>3</sub>	32.34	30.33	Al/Al IV	1.686	1.522
Cr <sub>2</sub> O <sub>3</sub>	0.03	0.07	Al VI	3.458	3.392
FeO	2.76	2.38	Cr	0.003	0.007
V <sub>2</sub> O <sub>3</sub>	nd	0.03	Fe <sup>2+</sup>	0.311	0.273
ZnO	0.01	0.15	V	nd	0.003
MnO	nd	nd	Zn	0.001	0.015
MgO	1.58	1.69	Mn <sup>2+</sup>	nd	nd
CaO	0.01	0.04	Mg	0.317	0.346
Na <sub>2</sub> O	0.28	0.25	Ca <sup>a</sup>	0.001	0.005
K <sub>2</sub> O	10.55	10.14	Na	0.074	0.065
BaO	1.22	1.23	K	1.815	1.777
Rb <sub>2</sub> O	-	-	Ba	0.065	0.066
Cs <sub>2</sub> O	-	-	Rb	-	-
SrO	nd	nd	Cs	-	-
NiO	nd	0.09	Sr	nd	nd
F	0.15	0.11	Ni	nd	0.01
Cl	0.06	0.03	F	0.064	0.048
H <sub>2</sub> O(c)	4.36	4.3	Cl	0.014	0.008
O = F	0.06	0.05	OH	3.923	3.944
O = Cl	0.01	0.01	Sum Cat number	18.051	17.971
Sum Ox percent	100.1	98.01	XMg	0.505	0.559
			Oct	4.096	4.053
			Int	1.955	1.915

Notes: White mica analyzed by the Cameca SX-50 electron microprobe at the Central Science Laboratory, University of Tasmania; white mica compositions calculated on the basis of 22 oxygens; analytical conditions: beam current 25 nA, acceleration voltage 15 kV, take-off angle 40°, beam size 1 μm; - = below detection limit