

TABLE 1. MINERAL IDENTIFICATION FROM POWDER X-RAY DIFFRACTION

B-10, gneiss in the footwall, collected 7 meters below the hanging wall; clay analysis-A*.

2χ	d-spacing	Intensity [#]	Mineral	Miller Index
8.79	10.06	96.96	illite [†]	002
17.73	5.00	41.61	Illite	004
24.27	3.67	112.50	illite	023
26.65	3.35	420.89	Illite	006
6.20	14.26	171.25	chlorite	001
12.47	7.10	448.04	chlorite	002
18.73	4.74	210.71	chlorite	003
25.01	3.56	309.11	chlorite	004
20.88	4.25	100.00	quartz	100

B-10; whole-rock***

2χ	d-spacing	Intensity	Mineral	Miller Index
41.01	2.20	23.87	dolomite	113
44.85	2.02	14.79	dolomite	202
20.86	4.26	100.00	quartz	100
27.94	3.20	159.18	feldspar	110

B-2; foliated breccia collected 0.35 meters below the hanging wall; Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
5.10	17.35	40.35	smectite	001
8.84	10.00	1257.89	illite ^{†,‡}	001
17.72	5.01	552.63	illite	002
6.24	14.17	1590.35	chlorite	001
12.43	7.12	7218.42	chlorite	002
18.73	4.74	1889.47	chlorite	003
25.13	3.54	5024.56	chlorite	004
20.89	4.25	100.00	quartz	100
27.94	3.19	389.47	feldspar	110

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B-7, gouge collected 0.3 meters below the hanging wall, Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
4.93	17.94	208.74	smectite	001
8.81	10.04	63.59	illite [‡]	001
17.75	5.00	2732.04	illite	002
12.45	7.11	2377.67	chlorite	002
25.10	3.55	100.00	chlorite	004
20.90	4.25	223.79	quartz	100
27.99	3.19	208.74	feldspar	110

B-1b, gouge collected 0.2 meters below the hanging wall, Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
5.20	16.00	369	smectite	001
8.86	9.98	6818	illite [†]	001
17.80	4.98	3631	illite	002
12.50	7.08	1573	chlorite	002
25.16	3.54	1038	chlorite	004
20.92	4.25	100	quartz	100
27.98	3.19	277	feldspar	110

B-1a, gouge collected 0.15 meters below the hanging wall, Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
4.99	17.70	151.40	Smectite	001
8.74	10.12	5852.34	Illite	001
17.74	5.00	2728.04	Illite	002
12.42	7.13	3414.02	Chlorite	002
25.00	3.55	2102.8	Chlorite	004
20.87	4.26	100.00	Quartz	100
27.88	3.20	204.67	Feldspar	110

CC94, clay gouge from the Copper Canyon detachment, Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
5.41	16.34	100.00	chlorite/smectite	001
12.34	7.17	35.33	chlorite/smectite	002
25.20	3.53	21.51	chlorite/smectite	003
8.92	9.91	6.22	illite	001
17.47	5.08	5.00	illite	002

A7, hanging wall of Copper Canyon; Clay analysis-G**.

2χ	d-spacing	Intensity	Mineral	Miller Index
8.80	10.05	62.23	illite	002
17.74	5.00	31.89	illite	004
12.43	7.12	170.59	chlorite	002
25.10	3.55	91.64	chlorite	004
20.92	4.25	100.00	quartz	100
27.94	3.19	219.20	feldspar	110
29.44	3.03	193.19	calcite	104

* Clay analysis-A: grains <2mm are separated by centrifuge (assuming Stokes-law), settled onto a Milipore filter and mounted onto a glass slide to promote <00l> reflections of phyllosilicates. The sample is air-dried. All samples were studied with machine conditions of CuK ζ radiation at 40mA and 50kV (2000 watts), 0.01°/step, and 1s count time.

** Clay analysis-G: same routine as Clay analysis-A, slide is placed in a desiccator with ethylene glycol for 24 hours at 60°C to encourage swelling of clay mineral phases that contain hydrous layers (e.g. Smectite).

*** Whole-rock analyses are powders of crushed ~30g samples mounted on a glass slide to promote a random orientation of grains and enhance <hkl> reflections.

Background is subtracted from the number of counts/peak, and then the intensity is normalized for Quartz (e.g. Quartz is the internal standard at 100%), except for sample CC94 which is normalized for the most intense peak (Chlorite/Smectite).

† Mostly 2M polytype, prominent 10A reflection is (002).

‡ Some 1M polytype in illite inferred from I_{002}/I_{004} , prominent 10A reflection is (001)

ˆ No swelling component to illite

ˆ Small (~0.1 2theta) shift in illite peak with ethylene-glycol solvation, indicates possible intrastratified Smectite component.

• Anorthite-rich plagioclase, note that Hayman (2000) identified authigenic orthoclase in fault rocks.