

Division of Geological & Geophysical Surveys

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**MAJOR-OXIDE, MINOR-OXIDE, AND TRACE-ELEMENT GEOCHEMICAL DATA
FROM ROCKS COLLECTED IN THE LIBERTY BELL AREA,
FAIRBANKS A-4 QUADRANGLE, ALASKA, IN 2005**

by

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Larry K. Freeman, and Richard R. Lessard

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Note: This report (including all analytical data and tables) is available in digital format from the DGGS web site (<http://www.dggs.dnr.state.ak.us>) at no charge. The digital data are available as PDF files and Excel spreadsheets.

MAJOR-OXIDE, MINOR-OXIDE, AND TRACE-ELEMENT GEOCHEMICAL DATA FROM ROCKS COLLECTED IN THE LIBERTY BELL AREA, FAIRBANKS A-4 QUADRANGLE, ALASKA, IN 2005

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INTRODUCTION

Mineral-resources personnel from the Alaska Division of Geological & Geophysical Surveys carried out a geological field survey, including mapping and sampling in the Liberty Bell area of the Fairbanks A-4 Quadrangle, Alaska, from July 11 through August 1, 2005. The fieldwork provides basic information critical to building an understanding of Alaska's geology and is part of an integrated program of airborne geophysical surveys followed by geological mapping. During 2005, 116 rock samples were collected for geochemical trace-element analysis, and 73 rock samples were collected for whole-rock (major- and minor-oxide, and petrogenetically important trace-elements) analysis. Location coordinates were collected using hand-held GPS units (no differential correction was applied), with the exception of five core samples (05JEA1A, 05JEA2A, and 05JEA4A–05JEA6A) whose collar locations were determined in GIS from a georeferenced map and orthorectified aerial photographs. Coordinates are presented in latitude and longitude (based on the NAD 27 Alaska datum) and in UTM coordinates (based on the Clark 1866 spheroid, NAD 27 datum, UTM zone 6 projection). Additional details about the sampling program can be found in the metadata file associated with the digital version of this report. Sample numbers, location data, descriptions, and analytical results for each sample are tabulated in tables 1, 2, 3, and 4.

ANALYTICAL METHODS

All trace-element geochemical analyses (table 2) collected in 2005 were performed by ALS Chemex. Rock samples were crushed with a Terminator jaw crusher with chrome steel alloy plates so that at least 70 percent of the material passes through a -10 (2 mm) mesh screen. Representative aliquots of 200 grams and 30 grams each were taken using a stainless steel riffle splitter. These samples were then pulverized in a chrome steel ring mill so that 85 percent of the sample passed through a -200 (75 micron) mesh screen. Most trace-element analyses were performed on the 200 gram split while gold analyses were performed on the 30 gram representative split.

Initially, all samples were assayed for gold by atomic absorption spectroscopy following a fire assay fusion (FA-AAS). Samples containing greater than 1,000 ppb gold were also assayed by gravimetric finish following a fire assay fusion (FA-GRAV). Samples containing greater than 15 ppb gold were assayed for mercury by atomic absorption spectroscopy (AAS) after aqua regia/cold vapor digestion. All other trace-element geochemical analyses were performed by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) methods after four-acid, near-total digestion. This method of digestion is possibly incomplete for some elements and may result in lower analytical results for these elements. The elements that may be affected by incomplete digestion, analytical methods, and lower and upper detection limits are tabulated in table 5.

All whole-rock analyses (table 4) were performed by ALS Chemex. Major- and minor-element oxides were determined by X-ray fluorescence spectrometry following a lithium borate fusion (LBF-XRF), and trace elements were determined using X-ray fluorescence spectrometry on pressed pellets (PP-XRF). Analytical methods and detection limits are tabulated in table 6.

ACKNOWLEDGMENTS

This project is part of the Alaska Airborne Geophysical/Geological Mineral Inventory Program funded by the Alaska State Legislature and managed by State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys. Partial funding for the geologic mapping and geochemical analyses was also provided through the U.S. Geological Survey STATEMAP Program under award number 05HQAG0025, and the State of Alaska Operating Budget General Fund.

Table 1. Location and description of rocks collected for trace-element geochemical analyses in Liberty Bell area of the Fairbanks A-4 Quadrangle, Alaska. Rock names in () are derived from geochemical data and rock textures in hand samples.						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05JEA30C	64.0293	-148.9464	404906	7101536	06W	<u>Metarhyolite</u> ; altered paleozoic rock above dike with arsenopyrite and scorodite.
05JEA49A	64.0732	-148.8636	409092	7106300	06W	<u>Phyllite</u> ; quartz veined and sericitized, with 1 percent arsenopyrite and scorodite staining. Prospect pits.
05JEA121B	64.0856	-148.6123	421384	7107352	06W	<u>Quartz vein</u> ; with green mineral (epidote?) and weathered pyrite.
05JEA249A	64.0748	-148.7443	414916	7106322	06W	<u>Conglomerate</u> ; bedded and lithified Tertiary rock with clasts of schist, white quartz, and black quartzite (≤ 2 inches in diameter), and quartz grains (1-2 mm) cemented by a sericite(?) + silica(?) matrix.
05JEA254C	64.0945	-148.8225	411164	7108620	06W	<u>Phyllite</u> ; with quartz veins; strong iron oxide and trace green scorodite(?) staining.
05JEA256C	64.0960	-148.8186	411357	7108776	06W	<u>Quartz vein</u> ; ~4 inches thick, parallel to foliation, weakly mineralized, with minor light green scorodite(?) staining and sericite alteration.
05JEA259A	64.0984	-148.8211	411247	7109052	06W	<u>Quartz vein</u> ; fractured with iron oxide and possible arsenopyrite.
05LF39B	64.0546	-148.7437	414881	7104070	06W	<u>Quartz stockwork</u> ; white, milky quartz in veinlets (≤ 3 cm wide), cut by drusy gossanous gashes fractures, and 1 percent limonite in semi-schist (metagranite host).
05LF40B	64.0550	-148.7429	414925	7104112	06W	<u>Fault breccia</u> ; limonite cemented, with 10 percent quartz veins. Breccia zone is in conjugate fractures along larger fault zone.
05LF42B	64.0568	-148.7379	415175	7104308	06W	<u>Semi-schist</u> ; green, rusty, with 25 percent pale green quartz eyes, and very-fine- to coarse-grained pyrite.
05LF52A	64.0708	-148.6479	419603	7105746	06W	<u>Rhyolite-granite</u> ; 3-10 cm pieces in regolith, porphyritic, with 10 percent euhedral quartz (1-3 mm), 5-10 percent clay altered relict feldspar, in a waxy-clay altered aphanitic matrix.
05LF53B	64.0689	-148.6453	419726	7105536	06W	<u>Quartz-tourmaline vein</u> ; 10 percent of regolith, 2-10 cm pieces in 10 m-wide zone, contains 5-40 percent red-brown/limonite coated boxwork, with no relict sulfides.
05LF57C	64.0655	-148.6242	420747	7105122	06W	<u>Phyllite</u> ; strongly sericite altered, with 10 percent quartz eyes (1 mm) in a light green, very-fine-grained, sugary matrix. 5 percent disseminated pyrite.
05LF59B	64.0678	-148.6152	421190	7105370	06W	<u>Quartz-chlorite vein</u> ; white quartz with black chlorite selvages.
05LF61B	64.0707	-148.6042	421738	7105685	06W	<u>Granite</u> ; porphyritic, strongly altered, sericitized, relict fine grain textured quartz, and fractures with veinlets of green-yellow and gray boxwork quartz.
05LF75B	64.0785	-148.5809	422893	7106521	06W	<u>Granite dike</u> ; 20-m-wide, gray, porphyritic, very-fine-grained, with 10 percent euhedral quartz (2 mm) and black fine grained biotite, in a very-fine-grained, sugary groundmass. Strong sericite and clay alteration, with 1 percent disseminated gray unknown mineral replaced mafic mineral.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05LF75C	64.0785	-148.5809	422893	7106521	06W	Granite dike; gray, porphyritic, very-fine-grained, with 10 percent euhedral quartz (2 mm) and black fine-grained biotite, in a very-fine-grained, sugary groundmass. Strong sericite and clay alteration, with 1 percent disseminated gray unknown mineral after mafic mineral, and 2-3 mm fracture fillings of quartz-tourmaline containing stibnite-like mineral in yellow boxwork.
05LF75E	64.0785	-148.5809	422893	7106521	06W	Quartz-tourmaline vein in schist; 1 inch wide, brecciated quartz infilled with tourmaline, oxidized gray sulfide, and yellow oxide possible stibiconite.
05LF77A	64.0792	-148.5820	422844	7106607	06W	Quartz vein; 5 cm thick, drusy quartz, with 30 percent arsenopyrite infill.
05LF78A	64.0798	-148.5817	422860	7106673	06W	Quartz vein; 2-5 cm wide, brecciated, with 75 percent gray-white quartz, 5-20 percent arsenopyrite infill, 5 percent green tourmaline, 5 percent boxwork, and 0-20 percent green-blue cryptocrystalline infill - unknown.
05LF79B	64.0832	-148.5802	422944	7107050	06W	Fault breccia; bleached, with quartz-arsenopyrite-unknown-gray mineral vein, 0.6-m-wide chip sample.
05LF92A	64.0633	-148.6258	420661	7104888	06W	Andesite; tan, porphyritic, 95 percent silicified, with 5 percent rectangular and octahedral orthopyroxene pits, altered to white clay, limonite pseudomorphs of pyrite, trace scorodite.
05LF93B	64.0621	-148.6262	420641	7104754	06W	Quartz-tourmaline vein; 3-cm-wide, banded, with green-black acicular tourmaline in gray quartz, and up to 2 percent limonite boxwork.
05LF96A	64.0573	-148.6336	420264	7104227	06W	Breccia; clasts of sericite-altered, fine-grained, intrusive rock, with Fe-oxide cement.
05LF99A	64.0514	-148.6369	420086	7103570	06W	Schist; (metagranite), fine-grained, with 20 percent quartz (1 mm), 60 percent feldspar, 20 percent greenish sericite, and 1 mm green tourmaline ± sericite veinlets every 1-2 cm.
05LF113A	64.0341	-148.6629	418765	7101675	06W	Schist; (metarhyolite), light green, strongly bleached, foliated, porphyritic, with sericite, feldspar, quartz, and 1 percent quartz vein with limonite pseudomorphs of pyrite in fractures.
05LF140B	64.0581	-148.5052	426531	7104159	06W	Quartz vein/fracture zone; with limonite, gossan, boxwork, and yellow powdery oxide.
05LF141A	64.0660	-148.5014	426738	7105041	06W	Quartz vein; 4-m-thick, fine-grained quartz, with disseminated pyrite, arsenopyrite, and locally brecciated with infill of stibnite.
05LF141B	64.0660	-148.5014	426738	7105041	06W	Quartz breccia vein; angular blocks of quartz in matrix and with fractures filled with massive stibnite, with possible arsenopyrite and galena. Grab sample of 0.4-m-thick zone in larger quartz vein.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05LF160B	64.1031	-148.5276	425558	7109202	06W	Schist; (metagranite porphyry), megablastic, foliated, strongly bleached and oxidized to kaolin(?) and quartz; locally relic green sericite-quartz alteration with disseminated tourmaline, arsenopyrite, and pyrite.
05LF171B	64.0879	-148.7929	412588	7107839	06W	Vein; 2-cm-thick limonite gossan in anastomosing fractures, cross-cut foliation, with yellow-green oxide.
05LF180A	64.0762	-148.7658	413870	7106503	06W	Quartz breccia; forming prominent rib, silica flooded, white altered schist (metarhyolite) clasts, with very fine chalcedonic quartz cement, local tourmaline.
05LF210A	64.0565	-148.8072	411792	7104365	06W	Semi-schist; (metagranite), hornfelsed, with quartz eyes, and up to 1 percent disseminated pyrite.
05LF211B	64.0398	-148.5324	425155	7102154	06W	Schist; (metagranite), foliated, medium-grained, 10 percent quartz eyes, 40 percent feldspar eyes (1-5 mm), 40 percent quartz-feldspar bands (< 1 mm). Bleached, sericite-altered, and strong yellow stain with up to 2 percent disseminated pyrite.
05LF226A	64.0590	-148.7310	415515	7104541	06W	Schist; green with 5-15 percent quartz (1 mm), 20-40 percent feldspar (1 mm) altered to sericite, and fractures with limonite staining after pyrite.
05LF228A	64.0556	-148.8664	408900	7104351	06W	Vein; 3- to 5-cm-wide, in white sericite altered felsic rock, with quartz, tourmaline, and arsenopyrite from push-pile in "northwest copper zone," Liberty Bell property.
05LF230A	64.0576	-148.8429	410049	7104535	06W	Skarn; (skarn), foliated, with acicular actinolite, cut by quartz-sericite veins, 1 percent chalcopyrite, 2 percent pyrrhotite, and trace arsenopyrite. Industry map unit "Mesozoic meta-gabbro."
05LF231A	64.0585	-148.8577	409330	7104660	06W	Skarn; (skarn), medium- to coarse-grained, random-oriented actinolite with interstitial plagioclase, 1-4 percent pyrrhotite, 2-3 percent chalcopyrite, 1 percent arsenopyrite. Industry map unit "Mesozoic meta-gabbro."
05LF231B	64.0585	-148.8577	409330	7104660	06W	Silicified rock; (skarn), gray to light green, dense, aphanitic, with 2 percent arsenopyrite (1-2 mm), and very-fine-grained euhedral pyrite.
05MBW36B	64.0495	-148.9184	406338	7103743	06W	Hornfels; bright orange weathering, mottled and spotted adjacent to a sericitized, granite porphyry dike that is cut by brown tourmaline veinlets that strike 223 degrees (azimuth) and dip 63 degrees.
05MBW37A	64.0495	-148.9238	406078	7103750	06W	Rhyolite dike; white to tan to rusty orange weathering, with quartz phenocrysts. Cut by stockwork quartz and brown tourmaline, or quartz only, or tourmaline only veins. One vein strikes 295 degrees (azimuth) and dips 63 degrees.
05MBW40A	64.0485	-148.9247	406029	7103645	06W	Gossan-breccia; angular fragments of pinkish orange and gray weathering hornfels up to 1 inch across, cemented with medium to dark brown goethite or limonite.
05MBW47A	64.0495	-148.9282	405863	7103755	06W	Hornfels; composed of white, granular quartz grains (\leq 1 mm). Tourmaline usually occurs as veins and occasionally massive replacements(?). Local faint red/yellow weathering, suggesting possible scorodite or kermesite(?). Small prospecting trench at this site.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05MBW50A	64.0475	-148.9273	405897	7103538	06W	Intermediate composition dike; (granodiorite), grayish-green, brown weathering, porphyritic, with biotite and quartz phenocryst. Contains disseminated pyrite and arsenopyrite.
05MBW54B	64.0495	-148.9297	405786	7103756	06W	Breccia zone; brecciated, hornfelsed metasedimentary rock adjacent to a quartz-phyritic, sericite-altered felsic dike. Geochemical sample taken from both the metasedimentary rock breccia and a shear zone within the dike that contains brown tourmaline and quartz. Breccia zone along dike-wall rock contact strikes 183 degrees (azimuth) and dips 50 degrees. Shear zone containing tourmaline and fractured quartz strikes 343 degrees (azimuth) and dips 75 degrees.
05MBW67A	64.0458	-148.9400	405271	7103363	06W	Hornfels; white, Fe-oxide coated, sugary, finely granular. Cut by up to 1.5-cm-wide veins of brown, fine-grained, felted tourmaline masses, containing up to 5 percent disseminated pyrite. Veins also contain euhedral quartz crystals formed in open vugs up to 1.4 cm long. Vein set strikes 302 degrees (azimuth) and dips 74 degrees.
05MBW105C	64.0763	-148.8832	408148	7106675	06W	Granite dike; white, equigranular, fine grained, with no visible mafics, cut by stockwork quartz \pm Fe-oxide bearing veins up to 1 cm wide.
05MBW106A	64.0760	-148.8831	408151	7106648	06W	Granite dike; white, equigranular, fine grained, with no visible mafics, weathers white except where stained red, orange, yellow, and brown near quartz and Fe-oxide stockwork veins up to 3 cm wide.
05MBW113A	64.0822	-148.8704	408789	7107320	06W	Quartz; white, angular fragments in a > 100-foot-wide fault(?) zone.
05MBW133A	64.0726	-148.9201	406335	7106324	06W	Phyllite; pale gray weathering, finely color laminated, foliated, fissile, aphanitic, lightly Fe-oxide coated, composed of quartz and white mica. Locally quartz veined, brecciated, and silica flooded. Contains disseminated Fe-oxide (former pyrite cubes). Breccia zone strikes 293 degrees (azimuth) and dips 62 degrees.
05MBW163A	64.0600	-148.5651	423615	7104440	06W	Quartz-feldspar vein; yellow coating might be stibiconite(?).
05MBW166B	64.0595	-148.5609	423817	7104377	06W	Vein; white and massive quartz with limonite and local vugs.
05MBW167A	64.0590	-148.5598	423869	7104320	06W	Vein; quartz and green white mica(?) \pm trace limonite (after sulfides?) plus yellow staining on surfaces (potentially cerusite?).
05MBW169A	64.0574	-148.5562	424041	7104138	06W	Quartz vein; white, vuggy, with red and yellow Fe-oxide. Contains sericitized wall rock inclusions and crystalline tan feldspar. Yellow color may be stibiconite(?).
05MBW174A	64.0571	-148.5496	424362	7104098	06W	Quartz vein; small prospecting pit containing light yellow-stained quartz vein material, dark-brown Fe-oxide and quartz-crystal breccias, and intergrown quartz and Fe-oxide. Scattered vein material composed of massive, dark-gray stibnite, and cubic pyrite. Mineralized fault zone trends approximately 155 degrees (azimuth).

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05MBW209B	64.0675	-148.5387	424923	7105243	06W	<u>Rhyolite porphyry dikes</u> ; 1 inch by 1 foot, with 15 percent quartz and 20 percent feldspar phenocrysts (\leq 1.5 mm). Cut by stibiconite- and Fe-oxide-filled fractures with or without crystalline quartz that has grown outward from the wall rock.
05MBW223A	64.0521	-148.5784	422945	7103577	06W	<u>Breccia</u> ; black, aphanitic to finely granular, Fe-oxide coated, with disseminated pyrite (up to 0.5 mm in diameter). Locally cut by Fe-oxide filled, 1-cm-wide fractures.
05MBW224A	64.0494	-148.5785	422929	7103278	06W	<u>Meta-ash(?)</u> ; gray colored, yellow-, orange-, and gray-weathering, foliated, aphanitic to very finely granular, finely color laminated, with Fe-oxide and possibly stibiconite(?) coatings. Contains disseminated, empty vugs (up to 0.2 mm in diameter) that may have contained sulfides.
05MBW225A	64.0481	-148.5770	423000	7103136	06W	<u>Quartz vein</u> ; mottled gray- and white-colored, yellow and orange-brown weathering, Fe-oxide and possibly scorodite(?) coated, contains irregular, tiny (0.5- to 1-mm diameter) vugs \pm filled with Fe-oxide.
05MBW257A	64.0316	-148.6617	418817	7101397	06W	<u>Brecciated carbonaceous phyllite</u> ; bright orange and brown, gossanous.
05MBW290A	64.0561	-148.7290	415606	7104216	06W	<u>Phyllite</u> ; contains vuggy gossanous areas and is cut by foliation-crossing quartz veins. Heavily Fe-oxide coated, with yellow and greenish-yellow oxide coatings (scorodite?).
05MBW292A	64.0564	-148.7276	415672	7104245	06W	<u>Fault gouge</u> ; 1- to 2-inch-wide fault zone that widens out to approximately 1-foot wide cutting foliation in phyllite. Fault is filled with brecciated, angular wall rock fragments, rock flour, and quartz veins with finely disseminated arsenopyrite. Fault strikes 309 degrees (azimuth) and dips 30 degrees.
05MBW293A	64.0571	-148.7272	415695	7104319	06W	<u>Phyllite</u> ; Fe-oxide coated, highly quartz-veined, quartz- and feldspar-phyric metarhyolite with disseminated, fine grained pyrite.
05MBW296A	64.0606	-148.7236	415883	7104714	06W	<u>Phyllite</u> ; light greenish gray, massive, foliated, with relict quartz and feldspar phenocrysts, and white mica. Highly Fe-oxide coated, with up to 20 percent disseminated pyrite.
05MBW296B	64.0606	-148.7236	415883	7104714	06W	<u>Quartz vein</u> ; from shear zone up to 3 inches wide. Sample contains light gray to clear quartz with disseminated crystals (\leq 3 mm) of arsenopyrite up to 40 percent of vein but generally < 20 percent. Shear zone strikes 258 degrees (azimuth) and dips 38 degrees.
05MBW297A	64.0640	-148.7255	415801	7105089	06W	<u>Phyllite</u> ; Fe-oxide- and yellow-oxide-stained, contains up to 10 percent disseminated pyrite cubes (\leq 1.5 mm in diameter) in wall rock, and is cut by veins of quartz, Fe-oxide, and trace scorodite.
05MBW298A	64.0643	-148.7233	415908	7105119	06W	<u>Metarhyolite</u> ; brecciated, sheared, and \pm quartz-veined. Quartz veins \pm disseminated vugs, \pm coated with scorodite.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05MBW300A	64.0648	-148.7224	415955	7105175	06W	Fault gouge; in metarhyolite with heavily Fe-oxide stained rock flour.
05MBW301A	64.0655	-148.7194	416101	7105248	06W	Skarn(?) or hornfels; green, red, and gray, rusty weathering, hard, massive, finely granular, with up to 10 percent disseminated pyrrhotite.
05MBW303A	64.0671	-148.7230	415930	7105437	06W	Shear zone; varies from 1- to 3-feet wide, with peripheral quartz + iron oxide veins extending off of the main shear zone. Heavily Fe-oxide- and yellow-stained veins contain quartz, pyrite, and arsenopyrite, with dark brownish-green tourmaline sprays, chlorite(?), secondary Fe-oxide, and scorodite. Shear zones strike 310 degrees (azimuth) and dip 60 degrees.
05MBW305A	64.0682	-148.7289	415644	7105559	06W	Silicified fault zone; in metarhyolite cut by micro-fractures of quartz containing 5 percent fine grained disseminated pyrite cubes (< 0.5 mm in diameter).
05MBW320C	64.0629	-148.9218	406219	7105241	06W	Hornfels; quartz and Fe-oxide veins with dark green tourmaline crystals (\leq 2 mm).
05MBW322A	64.0643	-148.9258	406030	7105401	06W	Hornfelsed(?) meta-ash or meta-argillite; variably Fe-oxide stained, cut by 6-inch-wide zone of quartz, fine-grained brown tourmaline, and limonite veins (1 mm to 1 cm wide). Veins occur in the center of a 2-foot-wide Fe-oxide stained zone.
05MBW325B	64.0647	-148.9306	405798	7105460	06W	Fault breccia; 1- to 2-cm diameter, angular fragments of carbonaceous phyllite cemented by Fe-oxide.
05MBW345A	64.0608	-148.9333	405651	7105027	06W	Phyllite; white, granular silica-rich and carbon-rich layers, bright yellow and Fe-oxide stained.
05MBW355A	64.0564	-148.9463	405000	7104550	06W	Hornfelsed carbonaceous phyllite; heavily Fe-oxide stained, fractured, with quartz veins up to 5 inches thick.
05MBW363A	64.0566	-148.9543	404610	7104593	06W	Quartz vein; Loose rubble of hornfelsed, carbonaceous metasedimentary rocks that have been intruded and hornfelsed by a fine-grained, equigranular, granite dike, which is cut by quartz veins. Sampled heavily Fe-oxide-coated, gray, massive, granular quartz vein material that is intergrown with very fine-grained arsenopyrite and stibnite. Locally stibnite crystals are up to 2 inches long.
05MBW365A	64.0559	-148.9564	404508	7104519	06W	Fault breccia; limonitic gossan.
05MBW374A	64.0528	-148.9624	404205	7104179	06W	Hornfelsed meta-argillite; white, foliated, very finely granular, cut by veins (up to 1 inch wide) and veinlets containing various combinations of white crystalline quartz, sprays and mats of very tiny, acicular, brown- to forest green-colored tourmaline crystals, and disseminated Fe-oxides (after pyrite(?) cubes).
05MBW380A	64.0557	-148.9762	403542	7104519	06W	Breccia; located in a > 250-foot-wide, Fe-stained, east-west-trending fault zone. Fe-oxide cemented breccia with angular clasts of quartz-veined carbonaceous phyllite up to 2 inches in diameter.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05MBW385A	64.0506	-148.9924	402733	7103981	06W	Quartz vein and breccia; hornfelsed phyllite cut by veins of dark-brown, very-fine-grained mats of tourmaline within fractures up to 5 mm wide. Some tourmaline veins are accompanied by Fe-oxide, and other quartz veins are up to 1 cm wide. Phyllite is locally brecciated and cemented with Fe-oxide.
05MBW386A	64.0506	-148.9950	402605	7103986	06W	Phyllite; bright orange-brown weathering, heavily Fe-oxide coated, white, foliated, hornfelsed. Cut by micro-fractures and veins variably filled with quartz, tourmaline, and Fe-oxide (partially after pyrite(?) cubes).
05MBW395B	64.0670	-148.9719	403788	7105770	06W	Gossan; quartz and Fe-oxide.
05MBW407A	64.0532	-148.7248	415799	7103886	06W	Quartz vein; abundant Fe-oxide coating, yellow oxides (scorodite), and local \leq 1 percent pyrite in hornfelsed phyllite.
05MBW412A	64.0470	-148.7238	415831	7103199	06W	Quartz vein; phyllite that is highly fractured and quartz veined.
05MBW417A	64.0632	-148.9777	403495	7105359	06W	Dike; cut by crystalline, vuggy, quartz and limonite veins.
05MBW426A	64.0670	-148.9718	403794	7105774	06W	Gossan; in red Fe-oxide-stained carbonaceous phyllite.
05RN348A	64.0170	-148.5353	424952	7099621	06W	Phyllite; metarhyolite(?), cut by quartz-sulfide veins.
05RN424A	64.0227	-148.5371	424880	7100252	06W	Meta-granite; foliated, medium grained, quartz and feldspar (2-4 mm) with 0.5 to 1 cm thick folded veins, 20-60 percent pyrite cubes with remainder quartz.
05RN426C	64.0243	-148.5379	424848	7100437	06W	Schist; sericitized feldspar and quartz, with abundant veins, 50-70 percent pyrite and remainder quartz.
05Z51B	64.0913	-148.7301	415660	7108139	06W	Quartz-tourmaline-chlorite veins; white, black, and orange, Fe-oxide stained, vuggy, with euhedral quartz crystals, and dark green chlorite mats on some vein selvages. Moderate limonite.
05Z55B	64.0846	-148.7291	415684	7107386	06W	Quartz vein; yellowish-white, with chlorite clots, and open spaces with weak to moderate limonite staining, and some patches of brick red Fe-oxide.
05Z56B	64.0883	-148.7207	416105	7107794	06W	Quartz-Fe-oxide-chlorite veins; white to cream, common orange-brown Fe-oxide (limonite) stain, with rare vugs. Some veins contain dark green patches or mats of chlorite.
05Z57B	64.0878	-148.7179	416243	7107736	06W	Quartz vein; milky white with weak to moderate limonite stains, some dark green chlorite splotches, and vugs partially filled with psilomelane.
05Z62B	64.0929	-148.7266	415834	7108306	06W	Quartz vein; maroon colored weathering, vuggy, quartz, Fe-oxide, and chlorite.
05Z64A	64.0804	-148.7280	415726	7106923	06W	Augen phyllite; (meta-graywacke), semi-schist texture, abundant white feldspar porphyrocrysts, grayish quartz porphyrocrysts, in a white, black and green matrix, with disseminated orange Fe-oxide spots and disseminated arsenopyrite.
05Z66B	64.0786	-148.7284	415700	7106716	06W	Quartz-tourmaline-scorodite vein; with discontinuous black tourmaline fractures, light yellow-green powder (scorodite?) and no visible sulfides.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05Z68A	64.0767	-148.7318	415532	7106508	06W	<u>Quartzite</u> ; (quartzite), light gray, light yellow, tan, orange-brown weathered surfaces, competent, and highly siliceous.
05Z93A	64.0763	-148.6810	418006	7106398	06W	<u>Quartz eye porphyry</u> ; white to light gray, compact, granular, highly Fe-oxide stained orange-red, sucratic texture, and rare quartz eyes (≤ 1 mm).
05Z107A	64.0668	-148.6546	419269	7105307	06W	<u>Granite dike</u> ; tan to light yellow-brown weathering, light gray to light tan, sucratic texture, fine grained sericitic phenocrysts, possibly altered hornblende, occasional quartz phenocryst (1 mm), with clots of disseminated pyrite and Fe-oxide after pyrite.
05Z108B	64.0655	-148.6579	419103	7105167	06W	<u>Quartz-tourmaline-arsenopyrite-Fe-oxide vein</u> ; dark brown and orange, gossanous, Fe-oxide stained, with patches of pale yellow staining and clots of discontinuous patches of very fine grained arsenopyrite (2-3 percent up to 7 percent).
05Z114B	64.0596	-148.6787	418070	7104537	06W	<u>Quartz vein</u> ; white, with Fe-oxide on margins and as discontinuous clots.
05Z140C	64.0009	-148.6484	419380	7097957	06W	<u>Quartz vein</u> ; white to orange-brown, vuggy with moderate to strong Fe-oxide stain, and black Mn-oxide \pm Fe-oxide.
05Z180B	64.0675	-148.9453	405086	7105792	06W	<u>Quartz vein</u> ; white, vuggy, slightly Fe-oxide stained orange (limonite), and rare patches of very fine grained black materials.
05Z189A	64.0720	-148.9661	404088	7106326	06W	<u>Quartz-feldspar vein</u> ; highly Fe-oxide stained, orange and brown, with quartz >> feldspar, and yellow-orange-black Fe-oxide \pm Mn-oxide.
05Z200B	64.0789	-148.9709	403878	7107095	06W	<u>Quartz vein</u> ; white, mostly massive, weak Fe-oxide (limonite) stain, with occasional orange-black moderate Fe-oxide stains.
05Z207B	64.0774	-148.9920	402847	7106960	06W	<u>Quartz vein</u> ; discontinuous yellow to orange-brown stained, moderate Fe-oxide (limonite).
05Z207C	64.0774	-148.9920	402847	7106960	06W	<u>Phyllite</u> ; granulated, carbon, sheared, cemented and stained brown, and small white acicular crystals (gypsum?).
05Z209C	64.0773	-148.9976	402570	7106958	06W	<u>Veins</u> ; white and canary yellow, with black streaks.
05Z217B	64.1223	-148.9829	403446	7111954	06W	<u>Quartz vein</u> ; white to Fe-oxide orange, with black streaks and splotches of very fine grained mineral that may be biotite.
05Z222B	64.1195	-148.9898	403097	7111648	06W	<u>Quartz vein</u> ; white to gray, with Fe-oxide stain (orange), abundant large vugs partially filled with subhedral quartz, limonite, and black very fine grained specks of oxidized pyrite(?). Selvage is black chlorite.
05Z231A	64.0057	-148.6719	418244	7098529	06W	<u>Quartz veined quartzite</u> ; dark gray, coarse grained, biotite bearing, with moderate Fe-oxide staining (limonite).
05Z238B	64.0741	-148.7942	412479	7106307	06W	<u>Quartz-tourmaline veins</u> ; white, gray, yellow, with patches, rosettes, and micro-veinlets of tourmaline, with disseminated brown Fe-oxide spots.

Table 1. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05Z242A	64.0718	-148.7807	413129	7106032	06W	<u>Quartz-tourmaline-Fe-oxide vein</u> ; white to gray, vuggy, with rosettes, patches, and veinlets of black tourmaline.
05Z252A	64.0755	-148.7597	414165	7106416	06W	<u>Quartz-tourmaline-Fe-oxide vein</u> ; white, massive, with splotches, patches, and micro-veinlets of black tourmaline, and orange Fe-oxide with disseminated orange-brown Fe-oxide grains. Fe-oxide replacing pyrite(?).
05Z253B	64.0744	-148.7647	413919	7106296	06W	<u>Quartz-tourmaline vein</u> ; white, black, and occasionally orange, with micro-veinlets, splotches, and patches of tourmaline and rosettes up to 3 mm thick.

Table 2. Trace-element geochemical analyses for rocks collected in the Liberty Bell area, Fairbanks A-4 Quadrangles, Alaska.																			
Note: - = sample not analyzed for Au(+) or Hg, ppm = parts per million, % = percent, (Au+) = see table 5.																			
Sample Number	Au	Au(+)	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo
	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	%	ppm	ppm
05JEA30C	0.014	-	0.9	7.66	3030	180	1.4	5	0.66	<0.5	14	177	65	5.54	-	5.10	1.83	114	10
05JEA49A	>10.0	24.40	23.2	2.28	5570	370	0.6	<2	0.05	<0.5	1	19	39	1.35	0.59	1.42	0.11	441	<1
05JEA121B	0.506	-	>100	4.63	1735	80	1.5	<2	0.07	7.1	2	27	186	13.60	0.59	0.12	0.64	236	3
05JEA249A	0.060	-	0.9	3.07	53	550	0.9	<2	0.01	<0.5	1	12	3	0.70	0.11	1.35	0.12	50	<1
05JEA254C	0.009	-	0.6	5.66	35	1590	0.8	<2	0.04	1.2	9	12	13	2.44	-	4.89	0.05	3540	1
05JEA256C	0.012	-	<0.5	7.03	6	2380	0.9	<2	0.02	<0.5	2	11	4	0.60	-	5.48	0.07	194	<1
05JEA259A	<0.005	-	<0.5	1.15	6	450	0.7	<2	0.01	0.8	23	18	15	5.93	-	0.74	0.02	3530	<1
05LF39B	0.005	-	<0.5	4.01	26	430	3.0	<2	0.25	0.5	3	27	7	2.03	-	1.22	0.34	134	2
05LF40B	0.005	-	<0.5	5.72	226	1180	1.8	<2	0.02	2.1	2	6	7	2.67	-	5.42	0.15	90	1
05LF42B	0.034	-	0.8	6.25	183	910	1.8	<2	0.02	<0.5	1	10	4	1.66	0.10	3.42	0.49	77	1
05LF52A	0.394	-	0.8	7.71	39	850	3.8	<2	0.02	<0.5	1	4	3	0.92	0.03	3.78	0.18	106	<1
05LF53B	0.906	-	3.4	4.07	246	500	2.6	858	0.06	0.8	32	17	268	18.10	0.34	0.99	0.69	2010	1
05LF57C	0.011	-	<0.5	5.68	26	3810	1.5	3	0.01	<0.5	<1	4	2	0.75	-	4.37	0.14	60	1
05LF59B	0.009	-	<0.5	3.61	7	1340	0.6	5	0.11	<0.5	1	18	2	0.68	-	3.21	0.10	64	<1
05LF61B	0.026	-	63.4	7.26	844	1830	2.6	<2	0.01	<0.5	1	5	37	2.57	0.18	4.52	0.16	93	2
05LF75B	<0.005	-	0.9	7.31	56	720	4.2	<2	0.02	<0.5	<1	4	3	0.88	-	3.76	0.15	78	<1
05LF75C	0.012	-	9.6	7.05	82	580	4.1	<2	0.01	<0.5	<1	3	14	1.05	-	3.80	0.21	92	1
05LF75E	0.557	-	6.7	5.87	1940	850	3.8	<2	0.07	<0.5	3	16	4	3.48	0.10	0.82	0.91	54	<1
05LF77A	6.140	-	14.3	3.07	>10000	210	1.1	104	0.05	<0.5	3	9	50	11.85	0.11	0.74	0.39	59	1
05LF78A	6.570	-	15.4	0.76	>10000	50	<0.5	112	0.05	<0.5	<1	2	13	16.95	0.04	0.04	0.15	17	1
05LF79B	2.770	-	15.8	3.87	>10000	500	1.0	328	0.03	<0.5	2	9	87	8.57	0.28	1.35	0.38	58	2
05LF92A	0.017	-	0.5	6.61	429	510	1.1	<2	0.01	<0.5	1	15	7	0.76	0.02	1.64	0.22	47	<1
05LF93B	0.038	-	<0.5	2.82	486	820	1.2	<2	0.03	<0.5	<1	18	7	1.16	0.06	1.22	0.22	45	<1
05LF96A	0.054	-	1.4	4.14	308	640	1.2	<2	0.01	<0.5	8	8	15	11.10	0.25	1.84	0.09	577	<1
05LF99A	<0.005	-	<0.5	6.28	37	1060	1.6	<2	0.36	<0.5	2	13	4	1.85	-	2.70	0.46	230	<1
05LF113A	0.029	-	<0.5	4.38	44	350	1.4	<2	0.01	<0.5	1	4	6	0.97	0.05	2.37	0.17	61	<1
05LF140B	0.013	-	<0.5	5.82	1415	1000	0.7	<2	0.02	<0.5	<1	11	4	1.22	-	5.33	0.11	27	1
05LF141A	0.048	-	<0.5	2.27	139	190	0.6	4	0.01	<0.5	<1	13	4	0.86	0.86	0.93	0.09	32	3
05LF141B	0.108	-	0.9	2.28	338	140	0.6	2	0.01	<0.5	1	11	9	1.39	3.56	0.91	0.09	37	5
05LF160B	2.040	-	<0.5	7.58	1975	3440	0.6	<2	0.02	<0.5	<1	8	4	0.56	0.03	4.79	0.06	17	<1
05LF171B	0.013	-	<0.5	4.03	22	900	4.2	<2	0.03	1.3	31	6	4	22.70	-	2.49	0.22	1140	1
05LF180A	0.007	-	<0.5	4.50	15	630	1.3	<2	0.01	<0.5	<1	12	2	0.31	-	0.50	0.06	17	1
05LF210A	<0.005	-	<0.5	6.70	54	1010	1.4	<2	0.12	<0.5	1	12	13	1.34	-	3.82	0.84	84	1

Table 2. (continued)											
Sample Number	Na	Ni	P	Pb	S	Sb	Sr	Ti	V	W	Zn
	%	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
05JEA30C	0.53	34	160	14	2.78	8	106	0.46	194	<10	40
05JEA49A	0.03	3	200	1415	0.19	260	26	0.06	9	<10	20
05JEA121B	0.42	8	410	1970	0.12	267	112	0.08	26	<10	337
05JEA249A	0.03	3	80	42	0.05	24	22	0.08	10	<10	9
05JEA254C	0.10	5	370	176	<0.01	<5	37	0.07	12	<10	217
05JEA256C	0.10	3	240	111	<0.01	<5	23	0.09	20	<10	59
05JEA259A	0.03	11	150	98	0.01	<5	6	0.02	5	<10	282
05LF39B	1.03	5	350	23	0.02	<5	72	0.59	37	20	80
05LF40B	0.09	3	1130	13	0.08	15	43	0.08	6	<10	145
05LF42B	0.35	2	220	235	0.32	396	50	0.12	17	<10	31
05LF52A	0.08	2	110	5	0.01	128	62	0.08	5	<10	10
05LF53B	0.30	15	960	425	0.02	66	81	0.06	54	<10	89
05LF57C	0.22	2	60	38	0.02	28	37	0.04	2	<10	14
05LF59B	0.38	2	510	8	<0.01	8	51	0.05	2	<10	7
05LF61B	0.08	3	960	4970	0.68	67	63	0.13	9	<10	78
05LF75B	0.06	<1	250	112	0.07	16	33	0.08	5	<10	42
05LF75C	0.05	<1	190	640	0.11	34	36	0.08	5	<10	103
05LF75E	0.47	2	500	18	0.37	64	229	0.14	27	<10	10
05LF77A	0.15	2	690	409	2.63	625	90	0.05	13	<10	15
05LF78A	0.07	2	120	55	0.67	579	17	0.01	5	<10	5
05LF79B	0.12	3	430	615	1.18	712	49	0.08	17	<10	8
05LF92A	0.02	2	240	38	0.01	27	101	0.07	21	<10	28
05LF93B	0.13	1	230	9	0.01	10	90	0.06	6	<10	9
05LF96A	0.20	3	820	98	0.88	46	79	0.06	9	<10	62
05LF99A	1.68	2	490	19	<0.01	16	92	0.21	21	<10	30
05LF113A	0.02	1	190	19	<0.01	6	39	0.05	5	<10	18
05LF140B	0.07	1	920	10	0.05	39	30	0.08	7	10	7
05LF141A	0.01	1	170	19	0.52	4470	14	0.03	3	<10	3
05LF141B	0.01	3	510	49	2.32	>10000	15	0.03	3	<10	5
05LF160B	2.61	1	260	24	0.07	39	63	0.15	10	<10	8
05LF171B	0.65	16	930	548	0.02	18	133	0.05	11	<10	722
05LF180A	0.03	2	430	8	<0.01	8	210	0.09	7	10	2
05LF210A	1.01	2	400	12	0.12	10	67	0.11	18	<10	13

Table 2. (continued)																			
Sample Number	Au	Au(+)	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo
	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	%	ppm	ppm
05LF211B	<0.005	-	<0.5	6.19	18	1010	1.3	<2	0.05	<0.5	<1	8	3	1.11	-	4.07	0.40	49	1
05LF226A	0.009	-	<0.5	6.72	21	1580	1.7	<2	0.07	<0.5	<1	13	3	1.64	-	4.39	0.53	82	1
05LF228A	>10.0	21.70	>100	2.14	>10000	170	0.7	840	0.06	1.5	40	18	>10000	12.50	0.06	0.96	0.23	22	1
05LF230A	0.721	-	5.0	5.45	359	500	3.8	6	3.11	1.1	20	34	2720	5.78	0.01	3.59	8.25	940	2
05LF231A	0.137	-	0.7	3.91	677	100	2.6	41	7.09	2.2	2	37	167	6.70	0.01	0.07	8.37	1720	3
05LF231B	0.107	-	<0.5	6.22	1925	220	3.7	2	6.50	<0.5	12	48	63	3.38	<0.01	0.15	5.02	1450	2
05MBW36B	0.018	-	<0.5	8.73	110	740	8.0	<2	0.04	<0.5	<1	3	27	1.71	0.02	5.26	1.27	74	1
05MBW37A	0.032	-	1.2	4.14	30	490	2.3	<2	0.05	<0.5	<1	17	14	0.71	0.40	0.44	0.46	36	1
05MBW40A	0.122	-	<0.5	5.42	92	850	6.7	<2	0.01	5.1	5	4	106	5.16	0.12	2.13	0.35	547	1
05MBW47A	0.068	-	0.8	7.60	36	50	6.1	<2	0.12	<0.5	1	15	12	1.56	0.46	0.03	1.87	38	2
05MBW50A	0.560	-	24.9	7.22	>10000	1680	3.5	51	0.18	0.9	5	76	2020	3.39	0.04	4.41	1.07	60	3
05MBW54B	0.029	-	1.4	3.89	84	290	2.1	<2	0.05	1.2	1	9	100	1.22	0.21	0.40	0.31	47	1
05MBW67A	0.422	-	3.5	1.46	1925	210	1.4	15	0.04	<0.5	7	31	89	1.14	0.04	0.07	0.29	26	2
05MBW105C	0.009	-	<0.5	4.32	60	40	<0.5	<2	0.01	<0.5	<1	17	2	0.59	-	0.04	0.01	23	1
05MBW106A	<0.005	-	<0.5	4.17	23	50	<0.5	<2	0.01	<0.5	<1	11	2	0.81	-	0.04	0.01	33	1
05MBW113A	<0.005	-	<0.5	1.10	7	120	<0.5	<2	0.01	<0.5	<1	37	2	0.32	-	0.37	0.07	24	<1
05MBW133A	0.033	-	0.6	1.78	50	820	1.1	<2	0.01	<0.5	<1	20	7	0.92	0.09	1.45	0.03	85	4
05MBW163A	<0.005	-	<0.5	4.49	13	900	<0.5	<2	0.10	<0.5	1	20	27	0.39	-	4.99	0.04	48	<1
05MBW166B	<0.005	-	<0.5	1.42	14	440	<0.5	<2	0.04	<0.5	<1	23	4	0.53	-	0.81	0.05	34	1
05MBW167A	<0.005	-	1.1	6.01	75	870	1.7	<2	0.04	<0.5	<1	12	38	1.16	-	4.32	0.35	171	9
05MBW169A	0.016	-	<0.5	7.00	68	1420	1.5	<2	0.03	<0.5	<1	12	3	1.80	0.50	4.93	0.27	75	2
05MBW174A	0.647	-	>100	1.88	2770	280	0.7	<2	0.01	106.0	3	5	873	8.50	5.66	0.93	0.05	1025	2
05MBW209B	0.008	-	1.9	4.38	87	650	1.3	<2	0.01	<0.5	1	8	3	2.57	-	2.53	0.25	40	1
05MBW223A	0.032	-	2.6	5.33	76	640	1.1	<2	0.03	1.6	2	7	34	2.98	0.56	2.90	0.16	161	1
05MBW224A	0.387	-	27.3	0.67	53	110	8.6	<2	0.01	<0.5	1	21	4	0.80	0.68	0.62	0.03	25	<1
05MBW225A	0.028	-	<0.5	6.26	31	1120	0.5	<2	0.01	<0.5	<1	22	4	0.37	0.04	5.96	0.04	20	<1
05MBW257A	0.005	-	<0.5	3.57	86	780	1.1	<2	<0.01	<0.5	8	24	24	17.10	-	1.38	0.12	289	10
05MBW290A	<0.005	-	<0.5	4.74	123	2130	<0.5	<2	0.01	<0.5	<1	17	2	0.72	-	4.84	0.11	22	<1
05MBW292A	1.760	-	0.5	5.23	>10000	600	1.3	<2	0.04	6.6	2	12	18	4.93	0.04	2.67	0.40	108	<1
05MBW293A	0.008	-	<0.5	7.03	134	1420	1.8	<2	0.13	<0.5	3	11	5	1.60	-	3.83	0.49	176	<1
05MBW296A	0.007	-	0.7	6.29	140	850	1.5	5	0.03	<0.5	1	8	3	1.81	-	4.20	0.30	61	<1
05MBW296B	0.278	-	0.5	3.55	>10000	170	0.8	8	0.02	<0.5	5	10	24	4.14	0.01	1.17	0.27	49	<1
05MBW297A	<0.005	-	<0.5	5.87	185	1310	0.6	<2	0.05	<0.5	<1	12	3	0.99	-	3.46	0.16	76	<1
05MBW298A	3.040	-	<0.5	5.75	9240	710	1.7	4	0.27	<0.5	2	8	36	2.69	0.01	3.33	0.48	201	<1

Table 2. (continued)											
Sample Number	Na	Ni	P	Pb	S	Sb	Sr	Ti	V	W	Zn
	%	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
05LF211B	0.79	1	430	15	0.18	<5	38	0.10	13	<10	17
05LF226A	0.69	3	450	16	0.02	16	47	0.24	25	<10	32
05LF228A	0.28	11	410	69	4.28	538	29	0.06	38	<10	12
05LF230A	0.30	125	450	6	0.41	9	147	0.29	112	280	110
05LF231A	0.24	41	210	7	1.86	12	205	0.27	108	<10	326
05LF231B	0.57	35	340	8	1.15	7	329	0.37	121	<10	83
05MBW36B	0.16	6	110	20	0.01	9	40	0.10	3	<10	36
05MBW37A	0.15	3	320	110	<0.01	9	100	0.05	7	<10	29
05MBW40A	0.05	4	320	141	0.01	47	13	0.05	4	10	397
05MBW47A	0.70	8	160	47	<0.01	30	48	0.07	11	<10	27
05MBW50A	1.60	18	740	45	0.81	266	202	0.19	64	20	71
05MBW54B	0.11	10	240	48	0.01	23	34	0.04	13	<10	56
05MBW67A	0.11	10	60	15	0.05	30	17	0.05	102	10	5
05MBW105C	3.47	<1	60	19	0.08	<5	37	0.03	2	<10	5
05MBW106A	3.52	3	120	4	0.03	<5	36	0.03	2	<10	11
05MBW113A	0.41	1	10	<2	<0.01	<5	17	0.01	1	<10	3
05MBW133A	0.09	1	80	32	0.02	5	20	0.03	3	<10	28
05MBW163A	0.10	1	500	9	<0.01	<5	64	0.04	1	<10	34
05MBW166B	0.03	2	220	74	0.01	<5	20	0.03	3	<10	19
05MBW167A	0.27	1	620	1685	0.05	<5	45	0.10	9	<10	40
05MBW169A	0.09	1	1150	35	0.31	30	74	0.11	6	<10	21
05MBW174A	0.01	2	1050	>10000	4.27	>10000	29	0.02	4	<10	1040
05MBW209B	0.02	1	1680	185	0.59	216	39	0.09	12	<10	14
05MBW223A	0.10	3	650	715	0.10	428	29	0.07	11	<10	417
05MBW224A	0.01	<1	490	204	0.19	20	12	<0.01	1	<10	7
05MBW225A	0.13	<1	160	44	0.02	22	44	0.07	3	<10	2
05MBW257A	0.05	49	2100	77	0.30	11	33	0.06	148	<10	624
05MBW290A	0.07	<1	110	95	0.09	47	83	0.15	6	<10	21
05MBW292A	0.03	<1	430	71	0.95	266	20	0.12	18	10	77
05MBW293A	1.06	<1	490	47	0.57	11	56	0.13	16	<10	21
05MBW296A	0.16	<1	440	51	0.59	35	30	0.10	9	10	13
05MBW296B	0.10	<1	230	38	1.89	200	9	0.04	5	10	5
05MBW297A	1.90	<1	190	23	0.22	9	86	0.07	7	<10	14
05MBW298A	0.14	1	880	32	0.79	48	22	0.10	16	<10	17

Table 2. (continued)																			
Sample Number	Au	Au(+)	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo
	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	%	ppm	ppm
05MBW300A	<0.005	-	<0.5	6.76	90	1110	1.7	<2	0.08	<0.5	2	8	71	3.40	-	4.01	0.44	105	<1
05MBW301A	0.036	-	0.5	6.80	167	400	1.2	<2	0.22	<0.5	7	365	157	9.40	0.05	2.30	2.53	749	<1
05MBW303A	0.463	-	<0.5	5.38	>10000	800	2.0	9	0.04	<0.5	50	16	48	3.87	0.01	3.55	0.32	49	<1
05MBW305A	0.009	-	<0.5	5.57	139	1600	1.1	<2	0.04	<0.5	1	12	4	0.46	-	3.48	0.14	30	<1
05MBW320C	<0.005	-	<0.5	4.80	38	2260	1.4	<2	0.01	<0.5	1	95	5	0.51	-	4.67	0.06	23	<1
05MBW322A	0.016	-	0.7	2.59	927	1060	1.0	<2	0.03	<0.5	2	74	39	2.61	0.29	1.87	0.15	49	1
05MBW325B	0.007	-	1.7	1.46	92	610	5.1	<2	0.01	13.2	10	107	67	12.80	-	0.65	0.15	496	7
05MBW345A	<0.005	-	1.6	1.71	129	1270	2.6	<2	<0.01	<0.5	1	187	17	2.69	-	1.22	0.21	34	15
05MBW355A	0.014	-	<0.5	1.52	94	4430	<0.5	<2	0.01	<0.5	1	44	56	4.26	-	0.71	0.40	175	<1
05MBW363A	6.900	-	33.9	3.65	>10000	120	1.7	922	0.14	5.4	108	103	734	11.45	1.35	0.04	0.87	142	28
05MBW365A	0.013	-	<0.5	2.06	459	3120	1.3	2	0.85	<0.5	7	16	283	22.10	-	0.43	<0.01	22300	<1
05MBW374A	1.130	-	2.8	1.60	161	250	0.8	86	0.05	<0.5	<1	96	21	0.92	0.08	0.10	0.37	101	1
05MBW380A	0.049	-	<0.5	1.27	929	1100	1.2	5	0.01	<0.5	2	254	15	4.83	0.15	0.40	0.05	34	21
05MBW385A	1.170	-	<0.5	3.25	731	310	2.6	<2	0.10	<0.5	2	95	69	7.23	0.05	0.05	0.77	118	2
05MBW386A	0.264	-	<0.5	2.04	570	250	1.4	3	0.07	<0.5	2	230	50	3.59	0.15	0.04	0.53	52	1
05MBW395B	0.013	-	<0.5	5.25	33	5520	1.7	<2	0.02	<0.5	1	72	15	3.56	-	5.25	0.14	63	22
05MBW407A	0.285	-	<0.5	4.24	>10000	1170	1.0	<2	<0.01	0.7	1	204	9	1.82	0.05	3.93	0.04	71	2
05MBW412A	<0.005	-	<0.5	5.96	44	2030	0.5	<2	<0.01	<0.5	<1	58	3	0.44	-	5.56	0.03	42	<1
05MBW417A	<0.005	-	<0.5	4.76	47	230	<0.5	<2	0.03	<0.5	1	211	4	1.26	-	0.06	0.04	34	3
05MBW426A	0.019	-	2.0	2.44	47	3430	0.6	7	0.02	<0.5	2	113	35	5.92	0.33	2.18	0.02	87	16
05RN348A	0.026	-	2.0	3.08	270	100	1.1	<2	0.03	<0.5	4	246	10	12.15	15.55	2.34	0.08	50	5
05RN424A	0.014	-	<0.5	4.43	166	110	1.0	<2	0.01	<0.5	1	69	8	11.40	-	3.53	0.17	47	<1
05RN426C	0.006	-	<0.5	3.87	403	120	1.0	<2	0.01	<0.5	9	177	9	10.25	-	2.51	0.17	27	1
05Z51B	<0.005	-	<0.5	3.05	5	830	0.8	<2	0.01	<0.5	2	139	8	1.38	-	1.32	0.15	158	<1
05Z55B	<0.005	-	<0.5	4.87	10	1080	0.5	<2	0.12	<0.5	3	211	15	1.28	-	1.96	0.06	329	<1
05Z56B	<0.005	-	<0.5	5.20	5	730	0.7	<2	0.15	<0.5	5	81	6	1.62	-	1.40	0.25	399	<1
05Z57B	<0.005	-	<0.5	4.86	<5	470	0.7	<2	0.11	<0.5	2	141	11	0.90	-	1.02	0.17	256	<1
05Z62B	<0.005	-	<0.5	1.36	26	200	0.9	<2	0.07	<0.5	35	74	12	11.85	-	0.39	0.56	1275	<1
05Z64A	<0.005	-	<0.5	7.29	36	1770	1.3	<2	0.14	<0.5	3	86	4	1.44	-	4.31	0.41	176	<1
05Z66B	0.005	-	<0.5	4.59	136	1910	0.7	2	0.07	<0.5	2	84	5	0.89	-	3.78	0.15	78	<1
05Z68A	0.065	-	<0.5	5.90	70	720	1.0	<2	0.01	<0.5	1	62	10	0.45	0.36	2.41	0.12	31	<1
05Z93A	0.042	-	<0.5	5.36	49	1580	1.4	<2	0.01	<0.5	1	38	9	3.29	1.50	3.82	0.11	90	<1
05Z107A	0.014	-	<0.5	7.76	26	1130	2.5	<2	0.18	<0.5	1	73	7	1.30	-	3.82	0.22	61	<1
05Z108B	0.712	-	5.7	3.17	>10000	220	2.0	138	0.13	<0.5	7	59	327	10.75	0.08	0.55	0.47	584	<1

Table 2. (continued)											
Sample Number	Na	Ni	P	Pb	S	Sb	Sr	Ti	V	W	Zn
	%	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
05MBW300A	1.05	<1	830	48	0.12	9	76	0.15	18	10	29
05MBW301A	0.02	94	1380	257	1.09	254	38	0.20	114	10	70
05MBW303A	0.79	6	410	67	1.33	107	66	0.04	16	<10	6
05MBW305A	0.11	<1	210	24	0.08	34	91	0.11	7	10	3
05MBW320A	0.31	4	80	11	<0.01	6	41	0.07	2	<10	24
05MBW322A	0.11	2	190	14	0.36	65	43	0.04	2	<10	15
05MBW325B	0.01	156	2670	17	0.05	42	25	0.05	352	<10	1335
05MBW345A	0.01	11	450	20	0.70	18	38	0.08	509	<10	12
05MBW355A	0.02	7	590	18	0.27	64	54	0.06	68	<10	21
05MBW363A	0.36	22	1710	2710	5.39	>10000	98	0.07	141	<10	217
05MBW365A	0.02	106	>10000	48	0.31	369	124	0.02	35	10	321
05MBW374A	0.11	3	110	59	0.01	119	34	0.09	64	10	3
05MBW380A	0.03	14	2260	43	0.25	849	12	0.10	1070	<10	9
05MBW385A	0.28	7	1280	43	0.01	157	92	0.13	187	10	30
05MBW386A	0.18	6	240	21	0.01	124	40	0.09	72	10	23
05MBW395B	0.09	2	720	15	0.13	25	31	0.08	14	<10	86
05MBW407A	0.25	4	1660	47	0.27	126	35	0.06	2	10	41
05MBW412A	0.10	4	50	10	<0.01	<5	65	0.05	1	<10	3
05MBW417A	3.81	4	260	10	0.10	7	63	0.07	42	<10	42
05MBW426A	0.05	20	710	57	0.12	41	30	0.02	17	<10	311
05RN348A	0.05	<1	60	104	>10.0	31	40	0.04	5	<10	7
05RN424A	0.57	<1	70	77	>10.0	25	28	0.05	7	<10	27
05RN426C	0.02	8	120	40	>10.0	36	16	0.04	5	<10	8
05Z51B	0.97	3	50	30	0.06	<5	32	0.07	14	<10	14
05Z55B	2.19	3	600	148	0.03	<5	53	0.07	6	<10	177
05Z56B	2.45	6	630	54	0.01	<5	77	0.14	15	<10	56
05Z57B	2.72	7	450	23	<0.01	<5	92	0.09	9	10	16
05Z62B	0.02	22	640	4	<0.01	<5	7	0.25	87	<10	73
05Z64A	1.03	2	630	17	0.01	8	91	0.16	23	10	20
05Z66B	0.11	1	570	20	0.06	12	79	0.09	8	<10	10
05Z68A	0.06	1	210	27	0.03	41	126	0.15	13	20	3
05Z93A	0.07	<1	230	32	0.36	26	46	0.09	4	<10	15
05Z107A	2.18	6	330	22	<0.01	20	369	0.10	21	<10	31
05Z108B	0.26	1	520	72	0.98	117	126	0.04	10	10	44

Table 2. (continued)																			
Sample Number	Au	Au(+)	Ag	Al	As	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Hg	K	Mg	Mn	Mo
	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	%	ppm	ppm
05Z114B	<0.005	-	<0.5	2.32	123	590	1.7	<2	0.01	0.8	17	229	11	6.63	-	1.58	0.16	395	<1
05Z140C	<0.005	-	<0.5	0.29	131	70	<0.5	<2	0.05	<0.5	17	102	10	5.42	-	0.08	0.01	1205	<1
05Z180B	<0.005	-	<0.5	3.63	17	270	<0.5	<2	0.01	<0.5	2	193	4	0.61	-	0.55	0.12	43	<1
05Z189A	<0.005	-	<0.5	5.43	21	1930	0.9	<2	0.01	<0.5	2	77	6	1.62	-	5.87	0.08	94	<1
05Z200B	<0.005	-	<0.5	5.73	11	3700	0.8	<2	<0.01	<0.5	2	190	30	0.94	-	5.95	0.16	165	<1
05Z207B	0.005	-	1.2	4.68	33	1190	2.6	<2	0.19	0.5	2	168	12	1.86	-	2.52	0.35	128	11
05Z207C	<0.005	-	0.6	2.94	162	1170	2.5	<2	0.79	0.9	1	156	26	3.08	-	1.40	0.36	83	12
05Z209C	<0.005	-	0.7	5.01	465	7090	2.1	<2	0.01	0.7	11	160	11	2.74	-	4.05	0.26	1515	12
05Z217B	<0.005	-	<0.5	4.25	13	1500	0.6	<2	0.05	<0.5	5	194	3	1.22	-	1.54	0.05	578	<1
05Z222B	<0.005	-	<0.5	4.79	14	270	0.6	<2	0.02	<0.5	1	80	5	0.75	-	0.53	0.05	57	<1
05Z231A	<0.005	-	<0.5	0.48	<5	260	<0.5	<2	0.01	<0.5	<1	208	4	0.90	-	0.15	0.01	26	4
05Z238B	0.010	-	<0.5	3.39	10	770	0.7	<2	0.01	<0.5	1	95	6	0.78	-	2.17	0.09	60	<1
05Z242A	0.060	-	<0.5	4.62	26	3900	2.3	7	0.04	<0.5	5	141	49	2.00	0.03	2.48	0.48	140	6
05Z252A	0.017	-	<0.5	1.97	5	320	0.7	<2	0.02	<0.5	1	97	12	0.93	0.01	0.68	0.14	63	1
05Z253B	0.065	-	<0.5	3.36	7	300	1.2	3	0.03	<0.5	1	194	8	0.77	0.02	1.09	0.36	56	2

Table 2. (continued)											
Sample Number	Na	Ni	P	Pb	S	Sb	Sr	Ti	V	W	Zn
	%	ppm	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm
05Z114B	0.11	11	240	77	0.01	5	38	0.04	6	20	121
05Z140C	0.01	6	780	61	0.01	<5	7	<0.01	2	<10	81
05Z180B	2.06	1	120	22	<0.01	<5	53	0.06	4	<10	7
05Z189A	0.10	2	150	17	0.01	<5	31	0.05	9	<10	24
05Z200B	0.08	4	210	307	<0.01	<5	47	0.14	14	<10	39
05Z207B	0.26	18	3970	19	0.22	13	46	0.24	260	<10	31
05Z207C	0.01	36	>10000	9	0.40	161	44	0.13	281	<10	57
05Z209C	0.06	5	5490	33	0.10	12	29	0.38	184	10	49
05Z217B	1.91	6	350	15	<0.01	<5	71	0.10	12	<10	18
05Z222B	3.19	1	60	13	<0.01	<5	64	0.08	6	<10	5
05Z231A	0.02	4	130	7	<0.01	<5	42	0.01	31	<10	<2
05Z238B	0.08	1	50	12	<0.01	<5	24	0.05	4	20	4
05Z242A	0.31	5	210	35	0.01	11	73	0.05	13	20	13
05Z252A	0.06	4	90	13	<0.01	<5	37	0.02	5	<10	10
05Z253B	0.14	6	80	31	<0.01	24	29	0.06	12	10	5

Table 3. Location and description of rocks collected for major-oxide, minor-oxide, and trace-element analyses in the Liberty Bell area, Fairbanks A-4 Quadrangle, Alaska. Rock names in () are derived from geochemical data and rock textures in hand samples.						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05JEA1A	64.0501	-148.8532	409523	7103721	06W	Phyllite; (meta-graywacke), dark brown, locally competent, with 15 percent relict feldspar phenocrysts (0.1-1 mm) in lenses. LB001 core sample 217.5 to 218 feet. Industry map unit "Lower tuff". (Location accuracy, ± 30 m).
05JEA2A	64.0501	-148.8532	409523	7103721	06W	Meta-mafic; (meta-mafic), sugary, brown, fine grained, with bands of massive green actinolite. Chalcopyrite (trace) + actinolite + pyrrhotite veins. LB001 core sample, 201-202 feet. (Location accuracy, ± 30 m).
05JEA4A	64.0492	-148.8535	409508	7103612	06W	Phyllite; (meta-graywacke), brown, massive to phyllitic, with 35 percent relict feldspar phenocrysts (2-3 mm) and 3 percent wispy pyrrhotite. LB011 core sample, 270.5-271 feet. Industry map unit "Dacite crystal tuff". (Location accuracy, ± 30 m).
05JEA5A	64.0430	-148.8527	409526	7102925	06W	Phyllite; (meta-mafic, carbonate altered), laminated, with biotite and calcite. Acicular actinolite in calcite lenses. LBG 24 core sample, 38-54 feet. Industry map unit "Eva Creek phyllite". (Location accuracy, ± 100 m).
05JEA6A	64.0379	-148.8603	409139	7102370	06W	Porphyry; (granite) tan to white, with 5-10 percent euhedral, smoky quartz (2-3 mm) and 15-20 percent white, clay-altered feldspar crystals in a yellowish tan, creamy matrix with 1-2 percent black tourmaline as splays. LBG 25 core sample, 91.5-92 feet. (Location accuracy, ±100 m).
05JEA11A	64.0668	-148.8054	411909	7105514	06W	Phyllite; (meta-graywacke), slightly foliated, porphyritic, with 67.5 percent relict feldspar (< 5 mm) and 15 percent gray relict quartz (2 mm) phenocrysts.
05JEA12A	64.0660	-148.8030	412027	7105418	06W	Granodiorite dike; (granodiorite), medium to coarse grained, with 7 percent biotite (1 mm), 5 percent hornblende (5 mm long), and potassium feldspar crystals up to 2 cm long.
05JEA18A	64.0616	-148.7777	413245	7104892	06W	Phyllite; (meta-graywacke), massive, foliated, fine to medium grained, with sericite, quartz crystals (2-5 mm), feldspar (2 mm average), and trace biotite in dark brown lenses.
05JEA23A	64.0599	-148.7593	414137	7104680	06W	Phyllite; (meta-graywacke), foliated, with quartz + sericite + feldspar crystals. Quartz and feldspar crystals up to 4 mm in diameter (2 mm average).
05JEA24A	64.0615	-148.7509	414551	7104851	06W	Phyllite; (meta-graywacke), light green, with quartz (< 7 mm), interstitial or sheared out feldspar, with larger white mica crystals.
05JEA25A	64.0611	-148.7491	414639	7104797	06W	Phyllite; (meta-graywacke), red weathered, vuggy, medium grained, with 5 percent quartz (2-4 mm), feldspar, and sericite.
05JEA26A	64.0611	-148.7446	414859	7104793	06W	Phyllite; (meta-graywacke), light green, foliated, medium grained, with quartz, feldspar, and white mica.

Table 3. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05JEA27A	64.0577	-148.7443	414863	7104410	06W	Phyllite; (meta-rhyolite), light to medium green, massive to phyllitic, medium grained, with 25 percent feldspar crystals (2-3 mm).
05JEA30A	64.0293	-148.9464	404906	7101536	06W	Granite dike; (granodiorite), 8-feet-thick, biotite granite dike, with secondary biotite. Dike emplaced sub-parallel to foliation.
05JEA33A	64.0719	-148.8193	411249	7106093	06W	Phyllite; (meta-granite), well foliated, medium to coarse grained, with quartz and feldspar crystals in layers segregated by crystal size (2-10 mm).
05JEA37A	64.0774	-148.8219	411141	7106714	06W	Semi-schist; (meta-graywacke), medium grained, with 70 percent feldspar crystals (3-4 mm) and little or no quartz eyes.
05JEA38B	64.0789	-148.8229	411094	7106884	06W	Phyllite; (meta-graywacke), light colored, fine- to very fine-grained, friable layers, with quartz, feldspar, and sericite. Recessively weathering.
05JEA45A	64.0767	-148.8521	409664	7106682	06W	Phyllite/semi-schist; (meta-graywacke), green, well foliated, medium grained, with 5 percent quartz eyes (\leq 4 mm), 45 percent feldspar crystals (\leq 4 mm), chlorite, and sericite.
05JEA47A	64.0702	-148.8626	409129	7105971	06W	Phyllite; (meta-graywacke), finely foliated layers of quartz, feldspar, and sericite, with pieces of quartz vein and a few pieces of blocky semi-schist with quartz eyes (2 mm) and feldspar crystals (5 mm). In frost boils.
05JEA54A	64.0698	-148.8781	408372	7105947	06W	Phyllite; (meta-granite), light green, fine grained, thinly parting, with quartz, feldspar, and sericite.
05JEA64B	64.0626	-148.8508	409684	7105105	06W	Phyllite; (meta-granite), pale green, foliated, medium to coarse grained, with 20 percent quartz eyes ($<$ 2-4 mm) and 20 percent feldspar crystals ($<$ 3-4 mm). Some feldspar altered to yellow clay.
05JEA77A	64.0756	-148.8069	411864	7106494	06W	Phyllite; (meta-granite), foliated, slabby breaking, medium grained, with 30 percent quartz + feldspar crystals (2-3 mm).
05JEA82A	64.0722	-148.6516	419427	7105905	06W	Schist; (meta-graywacke), gray weathered; local, bright-red, iron-oxide staining; 85 percent crystalline; medium grained; with 13 percent quartz and 70 percent feldspar crystals in a well foliated matrix of chlorite(?) and white mica. 3-inch-wide quartz vein sub-parallel to foliation.
05JEA84A	64.0733	-148.6468	419668	7106024	06W	Schist; (meta-graywacke), foliated, medium grained, with 20 percent rotated quartz augens (3 mm), 30 percent feldspar (3-4 mm), and chlorite + white mica that is darker gray in foliation planes.
05JEA99A	64.0924	-148.6573	419207	7108168	06W	Schist; (meta-graywacke), greenish gray, very friable, medium grained, 60 percent quartz + feldspar crystals (3 mm) with chlorite and white mica.
05JEA109A	64.0775	-148.6024	421842	7106436	06W	Schist; (meta-graywacke), foliated, medium grained, with 12 percent quartz eyes (4-5 mm), 15 percent feldspar eyes, minor chlorite(?), and sericite.

Table 3. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05JEA112A	64.0786	-148.6089	421532	7106572	06W	Schist; (meta-graywacke), medium to coarse grained, with 80 percent quartz + feldspar crystals (4 mm long).
05JEA141A	64.1235	-148.8903	407957	7111943	06W	Schist; (meta-granite), coarse to very coarse grained, with 40 percent quartz eyes (3 mm), 10 percent feldspar (1.5 cm), chlorite(?), and white mica.
05JEA166A	64.0519	-148.7367	415217	7103756	06W	Schist; (meta-granite), foliated, coarse-grained, with 20 percent relict quartz phenocrysts (3-4 mm), 70 percent relict feldspar phenocrysts (4-5 mm; sheared out in foliation), and white mica.
05JEA174A	64.1082	-148.5149	426191	7109754	06W	Schist; (meta-graywacke), gray, foliated, medium to coarse grained, with 10 percent quartz crystals (< 4 mm), 30 percent feldspar crystals [2-3 mm; sheared out(?)],
05JEA183A	64.0394	-148.5293	425308	7102106	06W	Schist; (meta-graywacke), gray, foliated, friable to massive, medium grained, with 15 percent quartz, 40 percent feldspar, and white mica.
05JEA184A	64.0405	-148.5271	425415	7102228	06W	Schist; (meta-graywacke), gray, foliated to massive, medium to coarse grained, with 45 percent quartz + feldspar crystals (2 mm), chlorite, and white mica.
05LF6A	64.0481	-148.8604	409168	7103504	06W	Metarhyolite: (metagranite), brown, blocky, foliated, hornfelsed, fine to medium grained, meta felsic rock, with 15 percent quartz eyes (1-2 mm), 20 percent relict feldspar (1 mm), in a brown splotchy matrix. Industry map unit of "Dacite crystal tuff".
05LF19A	64.0391	-148.8644	408940	7102511	06W	Semi-schist; (meta-graywacke), foliated, fine grained, with 15 percent quartz eyes, 20 percent feldspar grains (2 mm), 25 percent biotite, in a 70 percent fine granular quartz-feldspar matrix.
05LF21A	64.0350	-148.8561	409333	7102036	06W	Granite porphyry; (granite), 20 percent euhedral quartz, 20 percent white feldspar phenocryst, in a sugary fine grained groundmass. 5 percent pits of altered mafics (biotite?).
05LF41B	64.0558	-148.7405	415042	7104201	06W	Semi-schist; (meta-graywacke), pale green, foliated, medium grained, with 30 percent relict quartz (1-3 mm), 50 percent relict feldspar (1-2 mm), 10 percent chlorite partings, and 10 percent other granulated crystals.
05LF54A	64.0669	-148.6373	420112	7105296	06W	Schist; (meta-graywacke), foliated, medium grained, porphyroclastic, with 15 percent quartz eyes (1-2 mm), 30 percent feldspar eyes (1-2 mm), 30 percent chlorite, and 25 percent interfoliated fine grained quartz + feldspar.
05LF65A	64.0679	-148.5960	422129	7105359	06W	Semi-schist; (meta-graywacke), foliated, medium grained porphyroclastic, with 10 percent quartz eyes, 40 percent feldspar eyes, 20 percent chlorite, and 30 percent fine grained feldspar + quartz.
05LF138A	64.0517	-148.5013	426708	7103442	06W	Schist; (meta-graywacke), foliated, fine grained, porphyroclastic, with 5 percent quartz eyes (1 mm), 20 percent feldspar eyes (1-2 mm), 20 percent fine grained quartz-feldspar lenses, and 55 percent dark green-brown chlorite.

Table 3. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05LF139A	64.0548	-148.5043	426569	7103791	06W	<u>Schist</u> ; (meta-graywacke), mega-porphyroclastic, foliated, very coarse grained, with 5-30 percent feldspar augens (1-5 cm) 15-30 percent chlorite lenses (1-2 cm), 5 percent quartz (1-3 mm), 15 percent feldspar (1-4 mm), in a greenish, very fine grained chlorite-sericite, feldspar-quartz matrix.
05LF155A	64.0978	-148.5333	425269	7108616	06W	<u>Schist</u> ; (meta-graywacke), 20-40 percent feldspar (1-3 mm), 1-10 percent quartz crystals, 10-40 percent feldspar-quartz bands, and foliated chlorite-white mica-brown mica in streaky bands. Abundant chlorite-feldspar-calcite veinlets.
05LF230A	64.0576	-148.8429	410049	7104535	06W	<u>Skarn</u> ; (skarn), foliated, with acicular actinolite, cut by quartz-sericite veins, 1 percent chalcopyrite, 2 percent pyrrhotite, trace arsenopyrite. Industry map unit "Mesozoic meta-gabbro".
05LF231A	64.0585	-148.8577	409330	7104660	06W	<u>Skarn</u> ; (skarn), medium to coarse grained, random oriented actinolite with interstitial plagioclase, 1-4 percent pyrrhotite, 2-3 percent chalcopyrite, 1 percent arsenopyrite. Industry map unit "Mesozoic meta-gabbro".
05MBW24A	64.0476	-148.9128	406606	7103524	06W	<u>Rhyolite porphyry</u> ; (granite), tan to white to pale brown, weathered, with 1 percent quartz phenocryst (0.5-2.5 mm), 10percent feldspar phenocryst (0.5-2.5 mm), in a pale tan to white, aphanitic to faintly granular matrix. Intrusion is locally clay altered and cut by quartz and brown tourmaline veins (\leq 1 cm wide). Quartz veins associated with iron oxide cubes (pyrite?).
05MBW50A	64.0475	-148.9273	405897	7103538	06W	<u>Intermediate dike</u> ; (granodiorite), grayish green, brown weathering, not foliated, porphyritic, with phenocryst of biotite and feldspar. Disseminated pyrite and arsenopyrite (\leq 3 percent) is spatially associated with biotite.
05MBW71A	64.0427	-148.9434	405095	7103019	06W	<u>Granodiorite</u> ; (tonalite), rusty weathering, equigranular, medium grained, with 30 percent biotite and hornblende.
05MBW83A	64.0672	-148.9007	407262	7105687	06W	<u>Sandstone</u> ; spheroidally weathered or stream rounded boulders of gabbro (\pm diabasic texture), white quartz, black chert, granitic rocks, basalt, and sedimentary rocks, coated with fine gravel. Sample analyzed was gabbro (mafic dike) boulder.
05MBW201B	64.0667	-148.5533	424209	7105176	06W	<u>Alkali gabbro dike</u> ; (mafic dike), 5 feet wide, crosscuts foliation, brown, spheroidally weathering, blocks of dark green, equigranular, fine grained, with 33 percent biotite, 33 percent plagioclase, and 33 percent clinopyroxene(?).
05MBW204A	64.0682	-148.5486	424440	7105339	06W	<u>Alkali gabbro dike</u> ; (mafic dike), brown weathering boulders (\leq 3 inches), with amygdules (\leq 5 mm) rimmed with pink feldspar/laumontite(?) and calcite.

Table 3. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05MBW218A	64.0561	-148.5772	423013	7104025	06W	Alkali gabbro dike; (mafic dike), brown weathering, equigranular to faintly porphyritic, fine grained, biotite bearing (25 percent), with 5-8 percent bright green epidote (or olivine), and phenocryst of altered plagioclase (\leq 1 cm). Probably contains clinopyroxene and plagioclase.
05MBW418A	64.0634	-148.9766	403545	7105381	06W	Pluton; (granite), equigranular, fine grained, with quartz veins \pm yellow and red stains.
05RN215B	64.0274	-148.9289	405753	7101298	06W	Granite dike or sill; (granodiorite) 10 m X 50 m, unaltered, slightly porphyritic, medium grained.
05RN269A	64.0000	-148.5702	423202	7097762	06W	Dacite; (dacite) medium green, massive, porphyritic, with 10 percent feldspar, 10 percent biotite \pm hornblende, 5 percent quartz phenocryst (2-4 mm) in aphanitic groundmass.
05RN270A	64.0012	-148.5669	423367	7097892	06W	Andesite; (dacite), dark green, weathered, very fine to medium grained, with 10 percent hornblende phenocryst, 10 percent feldspar phenocryst, in aphanitic groundmass.
05RN277B	64.0122	-148.5540	424027	7099101	06W	Phyllite; (quartzite), black, graphitic, very fine grained.
05RN306A	64.0152	-148.5347	424980	7099416	06W	Phyllite; (quartzite), black, 2 m thick, very fine grained.
05RN311A	64.0192	-148.5442	424523	7099872	06W	Granite gneiss; (arkosic meta-sandstone), coarse to fine grained, equigranular, with feldspar > quartz, and no mafics. Feldspar altering to clay.
05RN312A	64.0227	-148.5503	424236	7100267	06W	Semi-schist; (meta-granite), foliated, medium grained, with quartz, feldspar, sericite, and distinctive pale green micas.
05RN313B	64.0239	-148.5509	424212	7100408	06W	Phyllite; (meta-mafic, carbonate altered), medium green, very pale weathering, fine grained, with chlorite and actinolite(?).
05RN321A	64.0142	-148.5093	426216	7099274	06W	Greenstone; (meta-mafic), massive to strongly foliated, very fine grained, metabasite, chlorite rich, and calcite in fractures.
05RN330A	64.0148	-148.5309	425164	7099363	06W	Metabasite; (meta-mafic), medium green, massive, fine grained, with chlorite, epidote, and calcite on fracture surfaces.
05RN330C	64.0148	-148.5309	425164	7099363	06W	Phyllite; (quartzite), black, calcareous, fine to very fine grained, with quartz eyes.
05RN331A	64.0154	-148.5328	425069	7099440	06W	Phyllite; (quartzite), black, 0.5-3 cm thick, quartz rich.
05RN332B	64.0194	-148.5341	425018	7099881	06W	Phyllite; pale yellow to green, aphanitic, finely laminated, and very fine grained.
05RN440A	64.0475	-148.8512	409613	7103426	06W	Phyllite; (meta-mafic, carbonate altered), very fine grained, with chlorite and no carbonate Industrial map unit "Eva Creek phyllite".
05Z39A	64.1260	-148.7374	415408	7112013	06W	Phyllite; (meta-rhyolite), green and white, with 1-5 cm long augens, in a finer grained matrix of greenish gray, pale green, and white, sericite, chlorite, quartz, and feldspar. Metavolcanic rock?

Table 3. (continued)						
Sample Number	Latitude	Longitude	UTM E	UTM N	Zone	Description
05Z85A	64.0696	-148.6603	418998	7105631	06W	<u>Granite porphyry</u> ; (granite) light gray, with 15-20 percent quartz phenocryst, with possibly some amount of feldspar phenocryst, black elongated phenocryst of hornblende? (0.5-2 mm).
05Z102A	64.0829	-148.6982	417190	7107162	06W	<u>Schist</u> ; (meta-graywacke), well foliated, fissile, with 40 percent porphyroclasts of feldspar and quartz, and white mica. Metavolcanic?
05Z119A	64.0577	-148.6923	417400	7104342	06W	<u>Schist</u> ; (meta-graywacke), white to light gray, crenulated, porphyritic, with 5-7 percent quartz porphyroblast, 20 percent (1-2 mm) punky-clay altered feldspar porphyroblasts, and white mica. Metavolcanic?
05Z131A	64.1237	-148.8673	409078	7111939	06W	<u>Meta-granite porphyry</u> ; (meta-granite), schistose to semi-schistose, metagranite, with augens up to 6 cm by 2 cm, quartz porphyroclasts (0.5 cm), 25 percent feldspar, and 15 percent quartz, in a pale green to green micaceous matrix.
05Z184A	64.0725	-148.9555	404608	7106360	06W	<u>Granite porphyry</u> ; (granite), light gray to pale yellow-orange, dark weathering, blocky, unfoliated, with 25 percent angular to sub-rounded quartz phenocryst (2-6 mm), in a white aphanitic to sucratic matrix with light green white mica.
05Z204A	64.0768	-148.9811	403374	7106874	06W	<u>Schist</u> ; (meta-graywacke), green to greenish gray, mostly muscovite with up to 10 percent lenticular quartz (≤ 3 mm) porphyroclasts. Metavolcanic rock.
05Z239A	64.0735	-148.7888	412739	7106230	06W	<u>Meta-granite</u> ; (meta-graywacke), gray with light brown, white, and light green speckles of interlocking grains (2 mm), foliated, plutonic textured, with 15-20 percent quartz, 60 percent feldspar, 20 percent brown biotite to green chlorite. Trace amounts of quartz and quartz-tourmaline veinlets and veins.

Sample	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SiO ₂	SrO	TiO ₂	LOI	Total	Ba	Nb	Rb	Sr	Y	Zr
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm
05JEA1A	14.40	0.37	0.75	<0.01	4.74	4.16	4.81	0.01	0.58	0.10	65.93	<0.01	0.66	3.10	99.6	3520	47	142	8	46	219
05JEA2A	15.52	0.07	8.27	0.02	12.41	1.73	6.96	0.13	2.89	0.46	46.67	0.04	2.24	2.51	99.92	690	48	97	335	33	247
05JEA4A	15.58	0.32	2.39	<0.01	4.52	4.31	1.90	0.02	2.89	0.05	65.52	0.02	0.28	1.74	99.54	2860	129	106	119	52	718
05JEA5A	9.15	0.13	30.10	0.08	6.23	2.06	4.31	0.37	0.83	0.23	23.15	0.02	0.99	22.10	99.74	1250	9	36	145	12	63
05JEA6A	14.57	1.31	0.35	<0.01	1.72	4.88	0.45	<0.01	0.63	0.02	71.73	0.02	0.11	4.03	99.82	>1000	23	272	114	32	69
05JEA11A	14.53	0.15	1.08	<0.01	3.07	5.70	0.90	0.02	1.87	0.14	71.02	0.01	0.40	0.98	99.87	1310	10	189	79	23	173
05JEA12A	12.99	0.13	0.22	0.03	2.46	4.68	0.95	0.03	2.31	0.17	73.59	0.01	0.37	1.47	99.4	1050	9	137	50	19	132
05JEA18A	14.66	0.11	1.41	<0.01	2.30	3.85	0.60	<0.01	3.90	0.08	71.53	0.08	0.32	1.00	99.87	1040	4	236	621	6	109
05JEA23A	16.07	0.17	0.11	0.01	3.38	5.65	1.54	0.03	1.96	0.11	67.59	0.01	0.51	2.85	99.99	1350	14	178	54	20	192
05JEA24A	12.04	0.09	0.17	0.01	1.68	4.65	0.53	0.02	1.11	0.13	77.22	<0.01	0.20	1.58	99.43	880	7	249	29	31	98
05JEA25A	14.28	0.15	0.52	0.02	3.04	4.35	0.93	0.02	2.48	0.11	71.65	0.02	0.45	1.95	99.96	1210	12	167	108	17	186
05JEA26A	14.47	0.15	0.24	<0.01	2.60	4.94	1.14	0.01	2.43	0.16	70.98	0.01	0.44	1.68	99.25	1190	11	175	71	21	165
05JEA27A	12.22	0.11	0.02	<0.01	1.20	7.82	0.25	<0.01	0.33	0.03	76.50	0.01	0.19	1.05	99.73	1030	33	188	47	31	116
05JEA30A	14.96	0.31	3.00	<0.01	3.41	2.71	2.23	0.01	2.94	0.16	67.60	0.09	0.55	1.52	99.51	3060	10	131	627	19	154
05JEA33A	12.90	0.18	0.01	0.01	1.44	6.61	0.42	0.01	0.29	0.04	75.69	0.01	0.35	1.55	99.51	1480	10	217	48	26	120
05JEA37A	13.21	0.11	0.17	<0.01	2.08	7.28	0.43	0.07	0.64	0.13	73.70	0.02	0.41	1.63	99.87	890	7	221	69	25	112
05JEA38B	11.60	0.09	0.24	<0.01	1.11	5.96	0.31	0.01	0.82	0.17	77.20	0.01	0.32	1.32	99.16	750	10	195	56	29	129
05JEA45A	13.05	0.13	0.13	0.01	3.25	4.03	0.73	0.13	2.45	0.11	73.55	0.01	0.37	1.82	99.78	1090	10	126	58	22	148
05JEA47A	13.11	0.09	0.22	<0.01	2.04	4.45	0.93	0.01	1.65	0.14	74.61	0.01	0.30	1.91	99.47	740	7	136	56	30	106
05JEA54A	11.72	0.15	0.05	<0.01	1.33	4.44	1.71	<0.01	0.82	0.01	77.21	0.02	0.28	2.02	99.75	1290	14	103	70	17	106
05JEA64B	13.68	0.13	0.05	0.02	1.19	5.33	0.90	0.02	0.89	0.13	74.58	0.02	0.49	2.31	99.73	1320	11	163	69	32	144
05JEA77A	13.54	0.12	0.19	<0.01	1.83	6.08	0.48	0.05	0.91	0.13	74.21	0.01	0.31	2.02	99.89	1010	9	223	41	26	125
05JEA82A	16.13	0.20	0.14	0.02	3.97	4.75	1.54	0.03	2.27	0.11	67.76	0.01	0.50	2.51	99.94	1740	13	109	51	24	233
05JEA84A	15.75	0.30	0.15	<0.01	4.20	4.70	1.16	0.08	2.47	0.13	68.36	0.01	0.52	2.10	99.93	2500	14	100	54	23	235
05JEA99A	15.54	0.18	0.22	<0.01	3.24	4.91	1.10	0.02	2.74	0.17	69.09	0.01	0.56	2.27	100.05	1580	16	116	64	32	268
05JEA109A	15.39	0.13	0.18	0.01	2.87	4.20	0.72	0.01	3.12	0.16	70.60	0.01	0.47	1.99	99.86	1210	14	93	61	28	221
05JEA112A	16.75	0.18	0.11	<0.01	4.59	5.08	1.77	0.09	2.84	0.12	64.76	0.01	0.61	2.55	99.46	1620	15	109	44	25	245
05JEA141A	13.44	0.17	0.14	0.02	2.41	6.03	0.68	0.02	1.16	0.14	73.31	0.01	0.32	1.88	99.72	1580	11	186	9	26	141
05JEA166A	13.70	0.17	0.01	<0.01	1.35	7.83	0.09	0.02	0.20	0.03	73.73	0.01	0.43	1.51	99.08	1340	10	212	20	22	159
05JEA174A	14.69	0.18	0.11	0.01	3.19	3.65	1.32	<0.01	3.38	0.09	70.33	0.01	0.51	1.93	99.41	1630	12	77	89	19	189
05JEA183A	15.57	0.16	0.22	<0.01	2.59	5.81	0.95	0.01	2.01	0.14	69.66	0.01	0.39	2.18	99.7	1340	10	153	62	22	157
05JEA184A	14.71	0.14	0.36	0.01	3.38	5.66	1.20	0.06	1.40	0.11	70.07	0.01	0.40	2.64	100.15	1260	10	126	40	22	161
05LF6A	15.79	0.26	1.00	<0.01	2.98	4.54	1.61	0.01	3.56	0.05	68.24	0.01	0.34	1.44	99.83	2260	99	102	70	47	692
05LF19A	15.23	0.21	1.67	<0.01	2.33	3.66	2.22	<0.01	2.28	0.04	69.39	0.02	0.26	2.03	99.34	1710	153	123	99	79	919

Table 4. (continued)																					
Sample	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SiO ₂	SrO	TiO ₂	LOI	Total	Ba	Nb	Rb	Sr	Y	Zr
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm
05LF21A	15.00	0.19	0.08	0.01	0.96	4.42	0.23	<0.01	2.85	0.02	74.17	0.02	0.11	1.80	99.88	1560	21	274	168	34	83
05LF41B	13.08	0.10	1.08	<0.01	1.36	6.57	0.97	0.06	0.74	0.11	72.57	0.01	0.32	2.32	99.28	840	9	186	88	26	125
05LF54A	15.46	0.20	0.12	0.01	3.76	5.33	1.57	0.05	2.27	0.12	68.23	0.01	0.56	2.28	99.98	1800	13	107	39	25	221
05LF65A	15.08	0.17	0.14	<0.01	3.86	5.08	1.19	0.12	2.67	0.12	68.76	0.01	0.56	2.18	99.94	1550	13	134	28	30	221
05LF138A	15.78	0.21	0.26	<0.01	4.07	6.57	1.27	0.02	2.41	0.14	66.56	0.01	0.68	1.92	99.92	1820	15	127	83	27	251
05LF139A	13.29	0.08	0.23	<0.01	2.92	5.99	0.58	0.04	0.76	0.16	73.44	0.01	0.27	2.13	99.9	720	10	211	36	32	129
05LF155A	14.11	0.13	0.28	<0.01	3.49	3.09	1.02	0.01	4.49	0.12	70.72	0.02	0.41	1.28	99.17	1310	12	51	102	24	194
05LF230A	8.93	0.06	6.18	<0.01	10.13	4.17	15.90	0.16	0.48	0.08	50.77	0.01	0.46	2.49	99.81	550	<2	1005	125	30	140
05LF231A	7.77	0.01	11.71	0.01	10.86	0.15	14.01	0.31	0.50	0.03	50.01	0.03	0.44	3.72	99.57	80	10	10	226	35	128
05MBW24A	11.80	0.09	0.06	<0.01	0.57	6.87	0.01	<0.01	1.55	0.02	77.89	0.01	0.12	0.43	99.41	780	30	191	48	20	115
05MBW50A	15.70	0.36	1.41	0.03	5.94	4.79	2.51	0.03	2.86	0.22	62.45	0.06	0.49	2.76	99.61	3330	3	382	416	18	149
05MBW71A	16.13	0.12	4.76	0.01	5.94	3.47	2.96	0.08	2.78	0.22	61.50	0.08	0.66	0.86	99.58	1180	12	181	617	19	182
05MBW83A	14.90	0.04	12.02	0.02	11.89	0.51	6.62	0.18	1.86	0.12	48.12	0.03	1.48	2.17	99.96	560	7	13	191	21	87
05MBW201B	12.72	0.13	6.94	0.06	5.97	3.61	7.02	0.13	2.34	0.29	51.65	0.07	0.53	8.36	99.81	1240	5	133	528	16	154
05MBW204A	14.03	0.13	5.93	0.05	6.64	2.59	6.98	0.11	2.83	0.17	53.34	0.08	0.65	6.35	99.89	1220	7	84	568	15	146
05MBW218A	11.67	0.20	9.19	0.10	8.36	4.02	9.58	0.17	1.43	0.29	49.14	0.06	0.72	5.00	99.94	1930	4	144	505	21	122
05MBW418A	13.17	0.03	0.09	0.03	0.76	0.08	<0.01	<0.01	7.19	0.03	77.08	0.01	0.23	1.34	100.05	120	50	2	45	16	503
05RN215B	15.44	0.57	2.46	0.02	4.29	3.77	2.89	0.03	2.58	0.21	64.54	0.07	0.62	2.40	99.89	5290	11	212	509	11	148
05RN269A	15.34	0.09	3.16	<0.01	3.84	2.73	2.00	0.07	2.90	0.18	64.77	0.02	0.49	4.36	99.95	720	8	96	158	25	153
05RN270A	15.71	0.09	3.43	0.02	3.97	2.72	1.73	0.05	2.99	0.19	65.01	0.03	0.53	3.41	99.88	770	9	98	182	21	156
05RN277B	7.16	0.28	0.09	0.01	1.33	1.73	0.37	<0.01	0.17	0.14	84.91	0.01	0.34	2.93	99.46	2580	7	84	37	14	71
05RN306A	13.90	0.13	0.05	0.01	1.46	3.75	1.28	<0.01	0.15	0.10	72.96	0.01	0.31	5.30	99.41	1180	12	130	10	20	119
05RN311A	10.50	0.04	0.02	<0.01	1.14	3.85	0.50	<0.01	0.13	0.03	81.74	<0.01	0.12	1.82	99.89	270	9	262	9	19	67
05RN312A	13.04	0.11	0.02	0.02	1.50	4.84	0.27	0.01	0.13	0.05	77.48	<0.01	0.25	1.84	99.57	910	8	214	16	33	122
05RN313B	16.37	0.08	0.40	0.04	9.80	2.32	5.40	0.11	2.44	0.43	54.50	<0.01	2.97	4.70	99.56	820	35	65	34	52	256
05RN321A	15.90	0.09	5.42	0.04	10.19	1.41	7.51	0.12	4.05	0.25	47.90	0.02	1.48	5.29	99.69	900	20	35	145	30	260
05RN330A	15.94	0.10	6.34	0.03	10.68	1.75	7.52	0.12	3.52	0.26	47.80	0.03	1.53	4.32	99.93	970	19	52	255	25	246
05RN330C	9.89	0.08	0.07	0.01	0.93	3.13	0.81	<0.01	<0.01	0.02	82.00	<0.01	0.38	2.26	99.57	750	13	98	11	15	47
05RN331A	3.47	0.13	0.08	0.03	0.58	1.17	0.47	<0.01	0.12	0.01	84.66	<0.01	0.15	7.55	98.39	1230	8	49	2	6	52
05RN332B	13.89	0.06	0.02	<0.01	1.36	4.60	0.58	<0.01	0.11	0.02	76.97	<0.01	0.15	2.24	100	660	10	253	4	29	94
05RN440A	16.61	0.26	0.34	0.06	16.20	3.61	8.98	0.22	0.18	0.16	41.33	<0.01	2.66	9.12	99.73	2480	30	202	26	23	158
05Z39A	13.28	0.12	0.23	0.02	1.96	5.86	0.67	0.01	1.37	0.16	74.33	<0.01	0.32	1.48	99.83	1040	12	196	25	32	168
05Z85A	15.20	0.09	0.12	<0.01	1.69	4.53	0.19	0.03	3.31	0.05	73.09	0.02	0.18	1.38	99.89	840	19	253	135	23	95
05Z102A	16.12	0.22	0.05	<0.01	3.47	5.59	1.14	0.01	1.99	0.08	67.48	0.01	0.45	2.59	99.21	1840	12	146	66	33	216

Table 4. (continued)																					
Sample	Al ₂ O ₃	BaO	CaO	Cr ₂ O ₃	Fe ₂ O ₃	K ₂ O	MgO	MnO	Na ₂ O	P ₂ O ₅	SiO ₂	SrO	TiO ₂	LOI	Total	Ba	Nb	Rb	Sr	Y	Zr
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm
05Z119A	10.56	0.08	0.13	<0.01	1.43	3.26	0.99	<0.01	0.80	0.11	79.48	0.01	0.21	2.17	99.22	720	10	99	27	25	105
05Z131A	12.31	0.23	0.19	<0.01	1.48	6.36	0.41	0.01	1.07	0.16	75.45	0.01	0.28	1.21	99.19	2010	9	183	26	29	133
05Z184A	10.22	0.41	0.01	0.02	1.02	7.31	0.06	<0.01	0.21	0.05	79.30	0.01	0.31	0.74	99.67	3350	7	232	24	16	123
05Z204A	16.26	0.19	0.13	0.01	4.24	4.95	0.57	<0.01	0.19	0.10	68.64	<0.01	0.50	3.63	99.42	1640	14	178	13	31	230
05Z239A	15.25	0.17	0.25	0.01	2.30	7.21	0.83	0.02	1.78	0.12	69.60	0.01	0.40	1.31	99.27	1470	9	239	53	20	154

Table 5. Detection limits for geochemical analyses. Analytical methods include: FA-AAS = Fire Assay-Atomic Absorption Spectroscopy, FA-GRAV = Fire Assay-Gravimetric Finish, ICP-AES = Inductively Coupled Plasma-Atomic Emission Spectroscopy, AAS = Atomic Absorption Spectroscopy. NOTE: * = possibly incomplete digestion dependent on mineralogy.

Element	Units	Lower Detection Limit	Upper Detection Limit	Analytical Method
Au	ppm	0.005	10	FA-AAS
Au(+)	ppm	0.05	1,000	FA-GRAV
Ag	ppm	0.5	100	ICP-AES
Al	percent	0.01	25	ICP-AES
As	ppm	5	10,000	ICP-AES
Ba*	ppm	10	10,000	ICP-AES
Be	ppm	0.5	1,000	ICP-AES
Bi	ppm	2	10,000	ICP-AES
Ca	percent	0.01	25	ICP-AES
Cd	ppm	0.5	500	ICP-AES
Co	ppm	1	10,000	ICP-AES
Cr*	ppm	1	10,000	ICP-AES
Cu	ppm	1	10,000	ICP-AES
Fe	percent	0.01	25	ICP-AES
Hg	ppm	0.01	100	AAS
K	percent	0.01	10	ICP-AES
Mg	percent	0.01	15	ICP-AES
Mn	ppm	5	10,000	ICP-AES
Mo	ppm	1	10,000	ICP-AES
Na	percent	0.01	10	ICP-AES
Ni	ppm	1	10,000	ICP-AES
P	ppm	10	10,000	ICP-AES
Pb	ppm	2	10,000	ICP-AES
S	percent	0.01	10	ICP-AES
Sb	ppm	5	10,000	ICP-AES
Sr	ppm	1	10,000	ICP-AES
Ti*	percent	0.01	10	ICP-AES
V	ppm	1	10,000	ICP-AES
W*	ppm	10	10,000	ICP-AES
Zn	ppm	2	10,000	ICP-AES

Table 6. Detection limits for major-oxide, minor-oxide, and trace-element analyses. Analytical methods include: LBF-XRF = Lithium borate fusion and X-ray fluorescence spectroscopy, PP-XRF = X-ray fluorescence spectroscopy on a pressed pellet. Note: Fe₂O₃ = total iron as Fe₂O₃; LOI* = loss on ignition.

Element	Units	ALS Chemex		
		Lower Detection Limit	Upper Detection Limit	Analytical Method
Al ₂ O ₃	percent	0.01	100.00	LBF-XRF
BaO	percent	0.01	100.00	LBF-XRF
CaO	percent	0.01	100.00	LBF-XRF
Cr ₂ O ₃	percent	0.01	100.00	LBF-XRF
Fe ₂ O ₃	percent	0.01	100.00	LBF-XRF
K ₂ O	percent	0.01	100.00	LBF-XRF
MgO	percent	0.01	100.00	LBF-XRF
MnO	percent	0.01	100.00	LBF-XRF
Na ₂ O	percent	0.01	100.00	LBF-XRF
P ₂ O ₅	percent	0.01	100.00	LBF-XRF
SiO ₂	percent	0.01	100.00	LBF-XRF
SrO	percent	0.01	100.00	LBF-XRF
TiO ₂	percent	0.01	100.00	LBF-XRF
LOI*	percent	0.01	100.00	LBF-XRF
Total	percent	-	-	Calculation
Ba	ppm	10	10,000	PP-XRF
Nb	ppm	2	10,000	PP-XRF
Rb	ppm	2	10,000	PP-XRF
Sr	ppm	2	10,000	PP-XRF
Y	ppm	2	10,000	PP-XRF
Zr	ppm	2	10,000	PP-XRF