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Analyses and descriptions of rock and nonmagnetic panned concentrate samples, Lewiston and Portland 1 x 2 degree quadrangles, north-central New Hampshire

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Abstract

Semiquantitative emission spectrographic analyses for 31 elements on 236 rock samples and 14 panned concentrates collected within the Lewiston and Portland 1° x 2° degree quadrangles of north-central New Hampshire are reported here in detail. Atomic-absorption spectrometric analyses for tin on 236 rock samples and quantitative energy-dispersive x-ray fluorescence spectrometric analyses for 10 trace elements on 23 rock samples are also reported. Latitude and longitude for all samples are given along with brief descriptions of the rock samples. Rocks analyzed include igneous rocks and quartz veins from the Jurassic White Mountain Plutonic-Volcanic Suite and rocks, dikes, and quartz veins from the surrounding Paleozoic terrane.

Introduction

The analyses reported here are on 259 rock and vein samples and 14 concentrated stream sediment samples collected within the Lewiston and Portland 1° x 2° quadrangles of north-central New Hampshire. The samples were collected as one of several multi-disciplinary studies associated with the Conterminus U.S. Mineral Appraisal Program (CUSMAP) conducted in the Lewiston 1° x 2° quadrangle. The samples were collected during 1983 by Leslie Cox, Terri Cheatham, and Debby Kay of the U.S. Geological Survey. A section of brief rock sample descriptions precedes 3 tables of analyses. Tables 1 and 2 list the semiquantatitive emission spectrographic analyses for 236 rocks (Table 1) and 14 panned concentrates (Table 2). Table 1 also lists atomic absorption spectrometric analyses for tin for 236 rocks. Table 3 lists quantitative analyses on 23 rocks by energy dispersive x-ray fluorescence spectrometry (EDS-XRF).

The rock samples were collected to delineate with greater certainty the boundaries of tin resource potential (Moench, Canney, and Gazdik, 1983) in the areas centering on the White Mountain Batholith and for further study on the possible bedrock sources contributing to the tin values reported in stream sediment and non-magnetic heavy mineral concentrate samples collected in surveys conducted within CUSMAP and overlapping Wilderness and Roadless Areas of the White Mountain National Forest, New Hampshire (Domenico, 1982; Canney and others (in press), and Sabin and others, 1982).

Rock Sample Descriptions

The rocks collected are predominately from the Jurassic White Mountain Plutonic-Volcanic Suite (WMP-VS). Fewer than 20% of the rocks are from the surrounding Paleozoic terrane. The sampling strategy reflects a greater interest in the younger rocks about which lies a geochemical tin anomaly (Moench and others, 1983). The older rocks were generally collected where outcrop was found downstream from the contact with intruding rock of the WMP-VS. An exception is the series of quartz vein and host rock collected in Beaver Brook in the Mt. Moosilauke quadrangle, where there is no adjacent outcrop of a member of the WMP-VS.

Each sample is a single rock collected from outcrop unless otherwise noted in the description. The Paleozoic rocks are identified by age, formation name, and quadrangle location. Rock names for the Mesozoic WMP-VS are unspecified but briefly described by rock type, texture, and visible alteration where present except for the Conway granite, Mount Osceloa granite, and the Moat Volcanics.

The term Conway granite is used in place of description for pink biotite granites, medium- to coarse-grained equigranular in texture. In this report the term Conway granite also includes the Black Cap granite. The term Mount Osceola granite is used in place of description for greenish gray to pink hornblende and hornblende-biotite granite. In places the Mount Osceola granite is difficult to distinguish from Conway granite by visual examination. These samples are queried (?). The Moat Volcanics include basalt and rhyolite flows of variable texture and composition and are briefly described.

Field number	Sample description
83TM001	Porphyritic Conway granite. Rusty.
83TM002	Porphyritic Conway granite.
83TM003	Porphyritic Conway granite.
83TM004	Medium- to fine-grained felsic vein cuts Conway granite.
83TM005	Conway granite.
83TM006	Subporphyritic Conway granite.
83TM006B	Basic aphanitic dike cuts Conway granite.
83TM007	Porphyritic Conway granite.
83TM008	Porphyritic Conway granite.
83TM009	Conway granite.
83TM010	Porphyritic Conway granite.
83TM011	Conway granite.
83TM012A	Mica schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM012B	High grade schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM012C	High grade schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM013A	Altered Conway granite.
83TM013B	Conway granite.
83TM013C	Subporphyritic Conway granite.
83TM014	Porphyritic Conway granite.
83TM015	Porphyritic Conway granite.
83TM017A	Porphyritic Conway granite.
83TM017B	Dark aphanitic dike cuts Conway granite.
83TM018	Altered subporphyritic Conway granite.
83TM019	Porphyritic Conway granite.

Field number	Sample description
83TM020A	Mica schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM020B	Migmatite. Devonian Littleton Formation injected by Kinsman quartz monzonite. Plymouth quadrangle.
83TM021	Mica schit. Devonian Littleton Formation. Plymouth quadrangle.
83TM022	Porphyritic Conway granite.
83TM023	Porphyritic Conway granite.
83TM024A	Altered porphyritic Conway granite cut by quartz veins.
83TM024B	Altered Conway granite.
83TM025	Porphyritic Conway granite.
83TM026	Subporphyritic Conway granite.
83TM027	Porphyritic Conway granite.
83TM028	Schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM029	Conway granite.
83TM030	Schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM031A	Altered(?), foliated, Devonian Kinsman quartz monzonite. Plymouth quadrangle.
83TM031B	Altered, foliated, Devonian Kinsman quartz monzonite. Plymouth quadrangle.
83TM032	Subporphyritic Conway granite.
83TM033	High grade schist. Devonian Littleton Formation. Plymouth quadrangle.
83TM034	Porphyritic Conway granite.
83TM035A	Fine- to medium-grained felsic dike cuts Conway granite.
83TM035B	Altered Conway granite.
83TM035C	Porphyritic Conway granite.

Field number	Sample description
83TM036	Replicate of 83TM002.
83TM037	Replicate of 83TM005.
83TM038	Replicate of 83TM025.
83TM039	Replicate of 83TM029.
83TM040	Replicate of 83TM032.
83TM051A	Dark aphanitic dike cutting Conway granite.
83TM051B	Porphyritic Conway granite.
83TM052B	Altered prophyritic Conway granite cut by thin quartz veins (1-20 mm wide) bearing sulfides, fluorite, magnetite.
83TM052C	Porphyritic Conway granite.
83TM053	Porphyritic Conway granite.
83TM054	Porphyritic Conway granite containing minor disseminated sulfide.
83TM055	Conway granite cut by thin ($\leq$1 mm wide) magnetite veins.
83TM056	Conway granite. Semi-rusty.
83TM057	Composite of 0.1-6.0 cm wide quartz veins cutting Conway granite.
83TM064	Meta-felsite. Devonian Littleton Formation. Crawford Notch quadrangle.
83TM065	Altered Conway granite.
83TM066	4 mm wide quartz + feldspar + muscovite vein cutting micaceous schist of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83TM067	1 cm wide micaceous quartz vein cutting the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.

Field number	Sample description
83TM068	1-2 cm wide micaceous quartz vein cutting micaceous schist of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83TM069	Composite chips of unidentified black, bladed mineral taken from felsic outcrop of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83TM070	Mica schist cut by thin quartz veins. Rusty. Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83TM071	15 cm thick quartz vein cutting Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83TM072	20-30 cm wide vein of mostly quartz cutting Devonian Kinsman Quartz Monzonite, Mt. Moosilauke quadrangle.
83TM074	Porphyritic quartz syenite.
83TM076	Porphyritic Conway granite.
83TM077	Fine-grained Conway granite. Rusty weathered biotite.
83TM078	Composite of quartz veins 0.1 to 10 cm thick cutting Conway granite.
83TM079	Porphyritic Conway granite.
83TM080	Conway granite.
83TM082	0.5-1.0 cm thick quartz veins cut Conway granite.
83TM083	Conway granite.
83TM083A	Conway granite.

Field number	Sample description
83TM084	Altered porphyritic Conway granite cut by dark gray quartz veins. Disseminated grains of pyrrhotite and chalcopyrite up to 3 mm across.
83TM085A	Fine-grained granitic dike cuts porphyritic Conway granite.
83TM085B	Porphyritic Conway granite.
83TM085C	Aplite within Conway granite.
83TM086	Porphyritic Conway granite. Contains miarolitic cavities. Semi-rusty.
83TM087	3 cm wide, variably textured, semi-rusty aplite dike cutting Conway granite.
83TM087A	Composite of closely spaced quartz veins (0.5-1 cm thick) cutting Conway granite. Unidentified metallic gray tantalum bearing mineral is disseminated in the quartz. Some of the veins are open, exposing quartz crystals.
83TM088A	Fine-grained granitic dike (2.5 feet wide) cutting Conway granite.
83TM088B	Aplite dike cutting Conway granite.
83TM089	Altered Conway granite contains minor disseminate pyrite.
83TM090	Altered Conway granite cut by 5 mm wide quartz and quartz + feldspar veins.
83TM091	Devonian Kinsman quartz monzonite. Mt. Chocura quadrangle.
83TM092	Devonian Kinsman quartz monzonite. Mt. Chocura quadrangle.
83TM093	Replicate of 83C425.
83TM094	Conway granite cut by closely spaced 1-2 mm thick quartz veins.
83TM200	Altered quartz monzonite. Devonian. Plymouth quadrangle.

Field number	Sample description
83TM200A	Altered quartz monzonite. Devonian. Plymouth quadrangle.
83C302A	Composite of thin (≤1 mm wide) gray quartz veins cutting Mount Osceola granite.
83C302B	Mount Osceola granite.
83C303	Moat volcanics. Porphyritic rhyolite with 3-4 mm quartz and feldspar phenocrysts contains darker angular rock fragments 1-2.5 cm in size.
83C304	Moat volcanics. Same description as 83C303.
83C305A	Moat volcanics. Same description as 83C303.
83C306A	Quartz vein cutting Conway granite. 5-8 cm wide.
83C306B	Composite of chips of Conway granite cut by quartz veins and containing disseminated euhedral pyrite (<1/2 mm across) adjacent to the veins.
83C306E	Same description as 83C306B.
83C307A	Quartz vein (10-15 cm wide) cutting pegmatite within the Devonian Kinsman quartz monzonite. Lincoln quadrangle.
83C307B	Devonian Kinsman Quartz Monzonite. Lincoln quadrangle.
83C307D	Garnet-bearing aplite within Devonian Kinsman Quartz Monzonite. Lincoln quadrangle.
83C308A	Devonian(?) migmatite. Lincoln quadrangle.
83C308B	Devonian(?) migmatite. Lincoln quadrangle.
83C308C	Devonian(?) pegmatite. Lincoln quadrangle.
83C309	Devonian(?) pegmatite. Lincoln quadrangle.
83C310A	Phaneritic mafic dike cutting Conway granite.
83C310B	Conway granite.

Field number	Sample description
83C311	Altered Conway granite containing base metal sulfides along fractures.
83C312A	Altered Conway granite containing coarse grained ($\leq$6 mm) disseminated sulfides (sphalerite and galena).
83C312B	Conway granite(?) or Mount Osceola granite(?).
83C312C	Altered Conway granite.
83C313	Mount Osceola granite.
83C314A	Mount Osceola granite.
83C314B	Mount Osceola granite.
83C315	Mount Osceola granite.
83C316	Mount Osceola granite.
83C318B	Conway granite cut by 1-2 mm wide quartz veins.
83C319A	Composite of 0.1-1.0 cm wide quartz veins cutting Conway granite.
83C319B	Altered Conway(?) granite containing disseminated pyrite and fluorite.
83C319C	Same description as 83C319B.
83C320	Flow banded rhyolite dike (2 meters wide) cutting Mount Osceola granite.
83C321	Quartz vein cutting Mount Osceola granite.
83C322	Mount Osceola granite.
83C323	Fine-grained Conway granite.
83C324	Fine-grained felsic dike (4-5 cm wide) cutting Conway granite.
83C326	Fine-grained semi-rusty felsic dike (25-30 cm wide) cutting Conway granite.
83C327	Conway granite.

Field number	Sample description
83C328	Pegmatitic pod within fine-grained felsic dike cutting Conway granite.
83C330	Porphyritic Conway granite.
83C331A	Pegmatitic pod within fine-grained felsic dike cutting Conway granite.
83C331B	Porphyritic Conway granite cut by thin quartz vein with 3 cm wide alteration selvedge.
83C332	Composite of chips from several 5 to 20 cm wide quartz veins cutting Conway granite.
83C333A	Hanging wall to 0.5 meter wide pegmatitic dike. Moat Volcanics(?).
83C333B	Float piece of extensive pegmatite from Conway granite.
83C333C	Footwall to 0.5 meter wide pegmatitic dike. Conway granite(?).
83C334	Quartz and feldspar porphyry dense with miarolitic cavities 1-6 cm across.
83C337	Porphyritic quartz syenite.
83C338	Porphyritic Conway granite.
83C339A	Conway granite.
83C339B	Pegmatitic Conway granite. Half-meter long pods of coarse quartz and feldspar within variably textured but mostly equigranular Conway granite.
83C340	Conway granite.
83C342	Mesozoic gabbro.
83C343	Rusty meta-quartzite. Silurian Rangeley Formation. Crawford Notch quadrangle.

Field number	Sample description
83C344	Meta-quartzite. Silurian Rangeley Formation. Crawford Notch quadrangle.
83C345A	Fragments of altered schist with copper-oxide stain from dike-intruded breccia zone. Within Silurian Rangeley Formation. Crawford Notch quadrangle.
83C345B	Light aphanitic dike cutting brecciated schist of Silurian Rangeley(?) Formation. Crawford Notch quadrangle.
83C345C	Dark aphanitic dike cutting brecciated schist of Silurian Rangeley(?) Formation. Crawford Notch quadrangle.
83C346	Porphyritic Conway granite.
83C347	Altered Conway granite cut by <1 mm to 10 mm wide quartz veins.
83C347A	Altered Conway granite cut by <1-10 mm wide quartz veins.
83C347V	Composite of <1 mm to 15 cm thick quartz veins cutting Conway granite.
83C349	Porphyritic quartz syenite cut by thin (1 mm wide) quartz plus feldspar veins.
83C350A	Moat Volcanics. Thin (2 cm) basalt dikes with disseminated fine grained pyrite cut gray tuff.
83C350B	Altered moat volcanics bearing unidentified metallic mineral.
83C351	2-3 cm thick micaceous dike composed of quartz + feldspar + muscovite cuts magnetic basalt of the Moat Volcanics.
83C352	Moat Volcanics. Flow-banded quartz porphyry.
83C354A	Quartz vein (10 cm wide) cutting Conway granite.
83C354B	Porphyritic Conway granite.

Field number	Sample description
83C355A	7 mm wide quartz vein cuts Mount Osceola granite.
83C355B	Mount Osceola granite cut by 1-2 mm veins of gray quartz.
83C356A	Altered Moat Volcanics. Gray tuff with fewer than 10% phenocrysts of quartz and feldspar. Local disseminated pyrite grains with alteration selvedges. Random hairline quartz veins.
83C356B	Pegmatitic pod of rusty quartz and feldspar along joint crossing Moat Volcanics.
83C361	Porphyritic quartz syenite.
83C362	Conway granite.
83C363	Conway granite. Semi-rusty.
83C364A	Conway granite.
83C364B	Porphyritic Conway granite.
83C365	Pegmatite within Conway granite.
83C366	Conway granite.
83C367	Porphyritic Conway granite.
83C369	Conway granite.
83C370	Light aphanitic dike cuts porphyritic Conway granite.
83C371	Quartz vein cutting porphyritic Conway granite.
83C374A	Meter long block of Conway granite within rhyolite dike cutting meta-sediment of Ordovician Albee Formation. Guildhall quadrangle.
83C375	Fluorite bearing rhyolite dike cutting meta-sediment of Ordovician Albee Formation. Guildhall quadrangle.

Field number	Sample description
83C376	Rhyolite dike cutting meta-sediment of Ordovician Albee Formation. Guildhall quadrangle.
83C377A	Meta-sediment. Ordovician Albee Formation. Guildhall quadrangle.
83C378	Replicate of 83C347A.
83C379	Replicate of 83C354B.
83C380	Replicate of 83C366.
83C381	Dark aphanitic dike at contact of 2 Mesozoic intrusive units.
83C384	Composite chips from clastic porphyritic quartz syenite.
83C385	Amphibole granite.
83C386A	Altered Conway granite. Rusty.
83C387A	Composite of small ($\leq$1-5 mm wide) dark quartz veins cutting Conway granite.
83C390A	Light gray aphanitic dike cutting Paleozoic rocks.
83C390B	Rhyolite dike cutting Paleozoic rocks.
83C393	Fine-grained granitic dike cutting Conway granite.
83C394	Quartz vein cutting Conway granite.
83C395	Fine- to medium-grained Conway grantie cut by 1 mm veins of mostly biotite.
83C396	Conway granite.
83C398	3-7 cm wide quartz vein cutting Mt. Moosilauke member of the Devonian Littleton Formation. Vein contains unidentified equant black mineral. Mt. Moosilauke quadrangle.
83C399	3-7 cm wide quartz vein cutting Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.

Field number	Sample description
83C400	Thin (1-2 mm) quartz vein with 3 cm alteration selvedge cutting schist of the Mt. Moosilauke member of the Devonian Littleton formation. Mt. Moosilauke quadrangle.
83C401	5 cm wide quartz vein cutting schist of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83C402	Hematite stained quartz vein cutting schist of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83C403	Gray, aphanitic Mesozoic dike (0.5 meters wide) cutting schist of the Mt. Moosilauke member of the Devonian Littleton Formation. Mt. Moosilauke quadrangle.
83C405	Composite of Moat Volcanics basalt. Magnetic basalt with quartz and epidote filled amygdules and basaltic breccia.
83C406A	Moat Volcanics. Rhyolitic crystal tuff with roughly 50% 2-3 mm quartz and feldspar phenocrysts and lesser rock fragments.
83C407	Moat Volcanics. Gray crystal rich tuffs cut by thin dark gray veins (quartz?).
83C409	Porphyritic Conway granite. Semi-rusty.
83C410	Composite of thin quartz veins ($\leq$1 mm to 10 mm) cutting porphyritic Conway granite.
83C411	Altered Conway granite.
83C413	Conway granite.

Field number	Sample description
83C414	Altered Conway granite. Hematite stained and cut by 1 cm wide quartz veins.
83C415A	Composite of 1-10 cm wide quartz and quartz plus feldspar veins cutting Conway granite, spaced 1/2 to 1 meter apart.
83C415B	Felsic dike cutting Conway granite.
83C417A	Conway granite with unidentified altered mineral.
83C417B	Porphyritic Conway granite with unidentified disseminated rusty mineral.
83C417C	Gray phaneritic dike cuts Conway granite.
83C417D	Altered Conway granite. Rusty.
83C419A	Micaceous quartz veins cut porphyritic Conway granite.
83C419B	Porphyritic Conway granite contains minor disseminated molybdenite.
83C419B2	Porphyritic Conway granite. Contains minor disseminated sulfides.
83C419C	Porphyritic Conway granite containing miarolitic cavities of coarser quartz and feldspar and disseminated sulfides.
83C420	Porphyritic syenite cut by 2 cm wide micaceous quartz vein (with narrow alteration selvedge) that widens into a coarse quartz and feldspar filled cavity. Near Conway granite contact.
83C421	Porphyritic Conway granite.
83C422A	Pegmatitic dike within Conway granite associated with miarolitic cavities.

Field number	Sample description
83C422B	Conway granite. Miarolitic cavities contain euhedral smoky quartz crystals.
83C424B	Altered Conway granite cut by closely spaced thin quartz veins.
83C425	Semi-rusty fine-grained granitic dike 5 meters wide cutting Conway granite.
83C426A	Semi-rusty aplitic phase of Conway granite containing thin discontinuous quartz veins.
83C426B	Conway granite.
83C427	Pegmatite cuts Paleozoic rock.
83C428	Conway granite.
83C429	Composite of 1-3 cm thick quartz veins with pyrite cutting Mount Osceola granite.
83C430	Replicate of 83TM088B.
83C431	Replicate of 83TM088A.
83C432	Replicate of 83TM085B.
83C433	Replicate of 83TM093.
83C437B	Dark phaneritic dike cutting Mount Osceola granite.
83C440	Mount Osceola granite cut by very thin bifurcating pyritic quartz(?) veins.
83C442	Mesozoic leucogranite.
83C443	Mesozoic leucogranite.
83C444	Mesozoic leucogranite.
83C450	Seriate porphyritic Conway granite.

Field number	Sample description
83C460A	Conway granite. Rusty.
83C460C	Aplite dike cutting Conway granite.
83C460D	Conway granite.
83C500A1	Altered porphyritic Conway granite cut by quartz veins with 1 cm wide altered selvedges. Rusty.
83C500A2	Quartz vein cutting Conway granite. Visible fluorite.
83C500B	Conway granite.

Analytical Techniques for Table 1 and Table 2

236 rock samples were crushed to approximately 6 mm and pulverized to minus 140-mesh (0.105 mm) in a vertical grinder having ceramic plates.

The samples were analyzed semiquantitatively for 31 elements by means of a six-step, D.C.-(direct-current) arc, optical-emission spectrographic method (Grimes and Marranzino, 1968) by E. F. Cooley in USGS laboratories, Denver, Colorado. The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, 0.15, or multiples of 10 of these numbers) and are approximate geometric midpoints of the concentration ranges. The expected precision is within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals 96 percent of the time (Motooka and Grimes, 1976).

In addition, each sample was analyzed by means of an atomic absorption technique for tin (Welsch and Chao, 1976) by R. Hill in USGS laboratories, Denver, Colorado. The method employed is very effective in releasing tin from cassiterite but for samples in which tin is occluded or substituting in the structure of silicate minerals, destruction of the silicate structure would be necessary to release the tin. This was not done for the samples reported here, therefore the tin values reported for this method are representative of the non-silicate tin in the sample.

The 14 concentrated stream sediment samples were collected from sites upstream to sample sites reported by Domenico, et al., 1982. Eight sites were chosen for their relationship to specific geologic contacts.

Stream sediment was concentrated by panning at the collection site. Subsequent concentration and sample preparation were performed in USGS laboratories in Denver, Colorado. The samples were analyzed semiquantitatively for 31 elements using the six-step optical-emission spectrographic method by J. A. Domenico in Denver, Colorado.

Explanation of Table 1 and Table 2

Paul G. Schruben formatted the analytical data by computer methods for Table 1. Table 1 shows the results of geochemical analyses of rock samples from the Lewiston 1 x 2° quadrangle. The rock samples are listed in the order of increasing number. In Tables 1 and 2 the spectrographic analyses of iron, magnesium, calcium, and titanium concentrations are reported in percent (pct.); all other elements are given in parts per million (ppm). Symbols used in the table are: N, not detected; --, not determined; <, amount detected is below the lowest limit of determination (which is the figure shown); and >, amount detected is above the highest limit of determination (which is the figure shown). Tin determined by atomic absorption (aa) for the rock samples has been added as the last column of values in Table 1.

Of the 31 elements looked for spectrographically, those not found in the rock samples have been omitted from Table 1. The elements omitted with the detection limits following in parenthesis are: Au (10), Sb (100), W (50), and Th (100). An exception is sample 83C314A which contains 200 ppm Th.

The concentrated stream sediment samples were analyzed by emission spectrography only. These samples are listed in Table 2. Elements looked for spectrographically and not found include: Ag (1.5), As (500), Au (10), Cd (20), Co (5), Cu (10), Ni (5), Sb (100), Sr (100), and Zn (200) with the exceptions of sample 83C372 which contains 500 ppm As and sample 83C418 which contains 20 ppm Cu. These ten elements have been omitted from Table 2.

Explanation of Table 3.

23 rock samples were crushed between ceramic plates in a jaw crusher then ground to a fine powder (less than 200 mesh) in an alumina-ceramic dish within a shatterbox. The packed powder was analyzed by EDS-XRF on a Kevex 0700 system by J. Eckert in a USGS laboratory, Reston, Virginia. The values were determined using simple linear regressions derived from values obtained from powdered rock standards. Elements looked for and not found by EDS-XRF are Cr (33) and Ni (20) which have been omitted from Table 3. The detection limit for each element is in parenthesis below each element. Values are reported in ppm's.

Table 1.-- Analyses of rock samples by semi-quantitative spectrographic analysis and atomic absorption. Analysts E. F. Cooley and R. H. Hill.

Rock Samples

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83TM001	43 53 32	71 34 20	1.50	<.02	.05	.050	300	N	N	<10	100	7
83TM002	43 55 45	71 31 20	2.00	.05	.10	.050	300	N	N	<10	100	7
83TM003	43 55 16	71 34 37	1.50	.02	<.05	.020	200	<.5	N	<10	20	10
83TM004	43 55 20	71 34 40	2.00	.02	.07	.020	100	N	N	10	30	10
83TM005	43 55 24	71 34 46	2.00	.10	.10	.070	500	N	N	<10	100	10
83TM006	43 55 22	71 35 4	3.00	.10	.20	.100	300	N	N	10	150	7
83TM006B	43 55 22	71 35 4	10.00	3.00	2.00	1.000	2,000	N	N	<10	1,000	2
83TM007	43 55 11	71 35 15	5.00	.20	.30	.100	300	N	N	10	300	7
83TM008	43 55 6	71 35 23	3.00	.10	.20	.100	300	N	N	10	200	20
83TM009	43 54 59	71 35 28	2.00	.02	.10	.050	200	N	N	10	30	7
83TM010	43 54 49	71 35 27	5.00	.15	.50	.100	700	N	N	10	70	10
83TM011	43 54 45	71 35 28	2.00	.02	.10	.030	200	N	N	10	70	7
83TM012A	43 58 0	71 33 20	15.00	3.00	<.05	1.000	2,000	N	N	20	500	2
83TM012B	43 58 0	71 33 20	5.00	1.00	.10	.500	1,000	N	N	20	500	3
83TM012C	43 58 0	71 33 20	7.00	1.00	.07	.500	700	N	N	20	500	5
83TM013A	43 57 56	71 33 27	7.00	2.00	<.05	1.000	700	N	N	50	500	3
83TM013B	43 57 56	71 33 27	1.00	.02	.05	.020	200	N	N	10	50	10
83TM013C	43 57 56	71 33 27	1.00	.02	<.05	.020	200	N	N	10	30	10
83TM014	43 57 34	71 33 20	1.00	.02	.05	.020	200	N	N	<10	<20	10
83TM015	43 57 46	71 32 46	2.00	.05	.10	.050	300	N	N	10	100	10
83TM017A	43 57 58	71 32 30	3.00	.10	.05	.050	500	N	N	<10	100	10
83TM017B	43 57 58	71 32 30	20.00	7.00	7.00	1.000	2,000	N	N	<10	500	1
83TM018	43 58 2	71 32 5	3.00	1.00	.70	.300	1,000	N	N	10	1,000	10
83TM019	43 53 30	71 33 30	2.00	.02	.30	.070	200	N	N	<10	30	10
83TM020A	43 53 17	71 33 17	5.00	2.00	2.00	.500	700	N	N	<10	100	5
83TM020B	43 53 17	71 33 17	5.00	1.50	.20	.300	300	N	N	10	300	5
83TM021	43 53 13	71 34 45	10.00	2.00	<.05	1.000	2,000	N	N	10	500	7
83TM022	43 56 5	71 30 57	2.00	.05	.05	.070	200	N	N	10	100	10
83TM023	43 55 35	71 30 14	2.00	.05	.10	.070	200	N	N	10	100	10
83TM024A	43 55 27	71 30 10	2.00	.03	.05	.050	200	1.0	N	<10	50	10
83TM024B	43 55 27	71 30 10	1.00	.05	<.05	.020	1,000	N	N	10	30	7
83TM025	43 55 23	71 30 2	2.00	.02	.10	.050	200	N	N	10	50	5
83TM026	43 54 39	71 30 40	2.00	.05	.05	.070	300	N	N	10	100	10
83TM027	43 56 10	71 30 17	5.00	.05	.30	.070	700	N	N	10	100	10
83TM028	43 52 26	71 32 50	10.00	5.00	10.00	.500	1,500	N	N	200	150	2
83TM029	43 59 14	71 33 6	1.50	.30	.50	.100	500	N	N	10	200	10
83TM030	43 54 10	71 35 47	7.00	2.00	1.00	.500	300	N	N	10	200	5
83TM031A	43 54 47	71 35 49	10.00	2.00	.50	.500	1,000	N	N	10	500	10
83TM031B	43 54 47	71 35 49	2.00	.70	<.05	.010	500	N	N	30	300	70
83TM032	43 54 52	71 32 58	1.00	.02	.10	.030	300	N	N	10	30	20
83TM033	43 58 19	71 34 4	5.00	1.00	.05	.500	500	N	N	50	70	2
83TM034	43 55 36	71 31 36	2.00	.05	.20	.070	300	N	N	10	150	15
83TM035A	43 55 42	71 32 0	10.00	.50	.50	.200	1,500	N	N	<10	1,000	10
83TM035B	43 55 42	71 32 0	1.00	.02	.10	.050	100	N	N	10	50	20
83TM035C	43 55 42	71 32 0	2.00	.03	.07	.050	300	N	N	10	30	20

Rock Samples

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83TM001	N	N	N	N	<5	50	5	50	N	50	N	N	N
83TM002	N	N	N	N	<5	100	N	50	N	50	N	10	N
83TM003	10	N	N	N	7	50	N	30	N	50	N	30	N
83TM004	N	N	N	N	7	20	50	30	50	100	N	20	N
83TM005	N	N	N	N	5	200	10	50	30	50	N	20	N
83TM006	N	N	N	N	<5	70	50	50	50	100	5	10	N
83TM006B	N	N	50	20	30	100	30	100	50	20	30	<10	1,000
83TM007	N	N	N	N	<5	70	30	70	50	50	5	10	N
83TM008	N	N	N	N	10	70	10	50	20	50	5	10	N
83TM009	N	N	N	N	<5	50	5	50	30	50	<5	<10	N
83TM010	N	N	N	N	<5	100	20	70	N	50	5	N	N
83TM011	N	N	N	N	<5	70	N	50	N	50	<5	<10	N
83TM012A	N	N	70	N	<5	70	N	50	100	20	30	10	N
83TM012B	N	N	10	N	5	100	N	20	20	30	10	15	150
83TM012C	N	N	20	150	5	50	N	20	50	30	15	30	100
83TM013A	N	N	50	50	20	100	10	50	70	10	20	<10	N
83TM013B	N	N	N	50	<5	50	N	50	5	70	N	<10	N
83TM013C	N	N	N	N	<5	50	N	50	N	50	N	<10	N
83TM014	N	N	N	100	<5	50	N	100	N	50	N	10	N
83TM015	N	N	N	N	<5	100	N	50	10	70	N	20	N
83TM017A	N	N	N	N	5	100	N	70	N	50	5	50	N
83TM017B	N	N	70	200	50	50	10	50	150	15	20	N	1,000
83TM018	N	N	5	N	10	200	50	20	50	70	7	150	1,000
83TM019	N	N	N	N	<5	50	N	100	<5	50	5	10	N
83TM020A	N	N	15	50	5	50	N	20	20	20	10	N	100
83TM020B	N	N	5	20	20	70	20	20	30	50	10	N	100
83TM021	N	N	70	150	50	50	N	20	70	30	30	50	<100
83TM022	N	N	N	N	20	150	20	100	70	50	5	50	N
83TM023	N	N	N	N	<5	50	20	50	N	50	5	10	N
83TM024A	<10	N	N	N	<5	50	N	70	N	100	<5	10	N
83TM024B	N	N	N	N	<5	50	N	50	5	20	<5	N	N
83TM025	N	N	N	N	<5	50	5	50	10	50	<5	<10	N
83TM026	N	N	N	N	<5	50	20	50	20	50	5	<10	N
83TM027	N	N	N	N	<5	50	N	50	5	50	5	<10	N
83TM028	N	N	50	100	50	50	10	<20	100	10	30	N	300
83TM029	<10	N	N	N	<5	50	N	20	N	100	<5	N	100
83TM030	N	N	20	50	50	70	N	30	10	50	15	N	200
83TM031A	N	N	20	100	20	100	5	30	50	20	20	10	100
83TM031B	<10	N	N	N	<5	50	30	20	50	10	<5	20	N
83TM032	<10	N	N	N	<5	100	N	50	5	50	<5	N	N
83TM033	N	N	10	70	10	70	20	30	50	30	10	N	100
83TM034	N	N	N	N	<5	150	5	70	10	50	N	10	N
83TM035A	N	N	N	N	<5	100	N	70	<5	30	15	N	100
83TM035B	N	N	N	N	<5	200	5	70	20	30	N	<10	N
83TM035C	N	N	N	N	<5	150	20	70	20	50	N	10	N

Rock Samples

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83TM001	<10	50	200	200	2
83TM002	<10	50	<200	300	3
83TM003	<10	<10	<200	50	6
83TM004	15	30	<200	30	4
83TM005	10	50	200	150	4
83TM006	10	50	200	200	3
83TM006B	100	50	300	200	3
83TM007	20	50	200	200	2
83TM008	10	50	200	200	N
83TM009	10	10	<200	200	3
83TM010	<10	50	500	300	N
83TM011	<10	20	<200	200	7
83TM012A	200	70	700	200	<2
83TM012B	100	20	200	300	N
83TM012C	100	20	<200	500	<2
83TM013A	150	50	300	200	2
83TM013B	<10	10	<200	200	15
83TM013C	<10	50	<200	150	5
83TM014	<10	50	<200	200	N
83TM015	<10	30	<200	300	4
83TM017A	<10	30	<200	200	15
83TM017B	200	30	<200	200	N
83TM018	100	20	<200	200	25
83TM019	<10	100	<200	200	3
83TM020A	100	10	200	200	N
83TM020B	100	10	<200	300	2
83TM021	200	50	<200	300	2
83TM022	70	70	<200	300	5
83TM023	<10	50	<200	200	2
83TM024A	<10	50	200	200	2
83TM024B	10	50	<200	100	<2
83TM025	10	50	<200	200	2
83TM026	20	10	200	200	<2
83TM027	10	30	300	200	2
83TM028	200	20	200	100	N
83TM029	10	10	200	70	2
83TM030	100	20	500	300	N
83TM031A	200	50	300	300	N
83TM031B	50	N	<200	N	N
83TM032	10	50	<200	100	6
83TM033	100	10	200	100	2
83TM034	<10	50	200	100	<2
83TM035A	<10	50	700	500	2
83TM035B	10	100	<200	200	2
83TM035C	10	20	<200	200	<2

Rock Samples--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83TM036	43 55 45	71 31 20	1.00	.02	.05	.050	200	N	N	<10	200	10
83TM037	43 55 24	71 34 46	2.00	.05	.30	.100	300	N	N	10	150	15
83TM038	43 55 23	71 30 2	.70	<.02	.05	.020	100	N	N	10	20	7
83TM039	43 59 14	71 33 6	2.00	.20	.10	.070	1,000	N	N	10	300	10
83TM040	43 54 52	71 32 52	2.00	.05	.10	.050	500	N	N	10	50	300
83TM051A	43 55 45	71 30 55	20.00	3.00	2.00	1.000	2,000	N	N	10	1,000	5
83TM051B	43 55 45	71 30 55	2.00	.10	.20	.070	300	N	N	10	100	10
83TM052B	43 55 36	71 30 50	2.00	.05	.20	.020	1,500	7.0	N	10	100	10
83TM052C	43 55 36	71 30 50	2.00	.10	.30	.070	700	N	N	10	100	10
83TM053	43 55 27	71 30 51	2.00	.10	.10	.070	300	N	N	10	100	10
83TM054	43 55 22	71 30 43	2.00	.10	.10	.070	1,000	<.5	700	10	100	15
83TM055	43 55 14	71 30 22	1.00	<.02	<.05	.050	200	N	N	10	30	10
83TM056	43 55 16	71 30 10	1.00	.02	.10	.050	300	N	N	10	50	10
83TM057	43 55 27	71 30 10	1.50	.02	<.05	.030	500	N	N	10	<20	10
83TM064	44 12 15	71 25 48	1.00	.50	.10	.200	200	<.5	N	10	100	10
83TM065	44 12 52	71 25 42	1.00	.02	<.05	.020	100	<.5	N	10	50	30
83TM066	44 2 16	71 48 5	5.00	1.00	2.00	.500	1,000	N	N	500	200	100
83TM067	44 2 13	71 48 10	5.00	1.00	.20	.500	500	N	N	>2,000	150	10
83TM068	44 2 12	71 48 19	.50	.05	.20	.020	50	N	N	50	50	2
83TM069	44 2 11	71 48 19	2.00	.70	.10	.070	100	N	N	>2,000	70	2
83TM070	44 2 13	71 48 14	5.00	1.00	1.00	.500	300	<.5	N	50	100	2
83TM071	44 2 15	71 48 7	.05	.02	<.05	.010	50	N	N	300	20	2
83TM072	44 2 18	71 47 55	2.00	.70	.50	.200	1,000	N	N	50	50	7
83TM074	44 13 49	71 30 2	5.00	.10	.70	.200	1,000	N	N	10	200	7
83TM076	43 57 14	71 33 21	1.50	.02	.05	.015	500	N	N	<10	20	10
83TM077	43 57 16	71 33 32	1.00	<.02	<.05	.010	200	N	N	10	<20	7
83TM078	44 9 29	71 41 49	.50	.02	<.05	.010	100	N	N	10	50	5
83TM079	44 9 35	71 41 23	2.00	.05	.20	.050	300	N	N	10	70	10
83TM080	44 9 44	71 41 39	2.00	.07	.20	.030	700	N	N	<10	100	10
83TM082	44 9 50	71 41 34	2.00	.03	<.05	.030	300	N	N	<10	70	7
83TM083	44 9 50	71 41 33	1.50	.02	<.05	.020	200	N	N	<10	<20	10
83TM083A	44 9 50	71 41 33	.50	.02	<.05	.010	20	N	N	<10	<20	7
83TM084	44 4 30	71 32 58	2.00	<.02	.10	.200	100	N	N	15	50	10
83TM085A	44 4 45	71 34 2	1.00	.05	.05	.050	50	N	N	10	70	10
83TM085B	44 4 45	71 34 2	3.00	.05	.50	.050	500	N	N	10	100	15
83TM085C	44 4 45	71 34 2	1.00	<.02	.05	.010	200	N	N	<10	<20	50
83TM086	44 4 45	71 34 5	1.00	<.02	.05	.020	100	N	N	<10	<20	10
83TM087	44 4 46	71 34 9	.50	<.02	.05	.010	70	N	N	<10	<20	7
83TM088A	44 4 47	71 34 14	1.00	<.02	.05	.005	300	N	N	10	<20	10
83TM088B	44 4 47	71 34 41	.50	<.02	<.05	.005	50	N	N	10	<20	10
83TM089	44 4 47	71 34 15	2.00	.02	.20	.050	300	N	N	10	100	10
83TM090	43 55 50	71 29 16	1.50	<.02	.50	.030	300	<.5	N	10	<20	20
83TM091	43 55 50	71 29 15	2.00	.70	.50	.150	300	N	N	10	500	2
83TM092	43 55 10	71 28 25	1.00	.50	1.00	.100	200	N	N	10	500	3
83TM093	43 56 41	71 20 30	5.00	<.02	.30	.050	500	N	N	10	<20	15

Rock Samples--continued

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83TM036	N	N	N	N	N	50	N	20	N	50	N	<10	N
83TM037	<10	N	N	N	<5	500	10	50	N	70	<5	10	N
83TM038	N	N	N	N	<5	50	N	30	N	20	<5	<10	N
83TM039	<10	N	N	N	<5	50	N	20	N	200	<5	<10	100
83TM040	<10	N	N	N	5	50	5	50	N	100	<5	<10	N
83TM051A	N	N	70	50	50	50	10	50	150	20	20	<10	700
83TM051B	N	N	N	N	<5	50	N	50	N	100	N	10	N
83TM052B	20	20	N	N	<5	50	N	50	5	500	<5	100	N
83TM052C	N	N	N	N	<5	50	N	50	N	50	<5	20	N
83TM053	N	N	N	N	<5	50	N	50	N	50	<5	10	N
83TM054	10	N	N	N	<5	70	N	50	N	500	<5	30	N
83TM055	N	N	N	N	<5	50	N	50	N	50	N	10	N
83TM056	N	N	N	N	<5	200	N	20	N	50	N	<10	N
83TM057	<10	N	N	N	<5	50	N	50	N	150	N	<10	N
83TM064	N	N	N	N	10	100	<5	100	10	30	5	20	100
83TM065	N	N	N	N	<5	50	<5	100	10	20	N	20	N
83TM066	N	N	N	N	20	50	<5	20	N	20	15	50	300
83TM067	N	N	10	200	5	50	N	20	20	20	10	20	150
83TM068	N	N	N	N	<5	<20	20	<20	30	30	5	N	<100
83TM069	N	N	N	N	<5	50	N	<20	10	20	20	N	200
83TM070	N	N	N	100	30	50	N	<20	20	20	15	N	200
83TM071	N	N	N	N	<5	50	N	<20	5	<10	N	N	N
83TM072	N	N	<5	20	7	50	N	<20	10	50	5	N	200
83TM074	N	N	N	N	20	100	<5	100	5	50	5	20	<100
83TM076	N	N	N	N	<5	50	N	50	5	50	<5	10	N
83TM077	N	N	N	N	<5	20	N	50	10	50	N	20	N
83TM078	N	N	N	N	<5	20	N	20	20	<10	N	N	N
83TM079	N	N	N	N	<5	20	N	100	<5	50	<5	N	N
83TM080	N	N	N	N	<5	20	N	50	10	50	<5	<10	N
83TM082	N	N	N	N	<5	20	N	70	10	30	<5	N	N
83TM083	N	N	N	N	<5	<20	N	100	10	50	N	N	N
83TM083A	N	N	N	N	<5	20	N	70	<5	10	N	N	N
83TM084	10	N	N	N	5	70	N	50	10	50	<5	30	N
83TM085A	N	N	N	N	<5	100	<5	100	10	30	<5	20	N
83TM085B	N	N	N	N	<5	70	N	150	5	50	<5	30	N
83TM085C	N	N	N	N	<5	30	5	50	10	30	N	10	N
83TM086	N	N	N	N	<5	<20	10	50	20	20	N	10	N
83TM087	N	N	N	N	<5	<20	5	50	N	50	N	<10	N
83TM088A	N	N	N	N	<5	30	N	50	5	100	N	20	N
83TM088B	N	N	N	N	<5	20	N	50	5	50	N	N	N
83TM089	N	N	N	N	<5	100	5	70	5	50	<5	10	N
83TM090	N	N	N	N	<5	150	N	50	7	50	<5	<10	N
83TM091	N	N	N	N	20	50	N	<20	10	50	5	N	100
83TM092	N	N	N	N	<5	50	5	<20	20	50	5	N	200
83TM093	N	N	N	N	<5	200	<5	200	N	50	N	20	N

Rock Samples--continued

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83TM036	<10	10	<200	<10	N
83TM037	<10	50	<200	200	3
83TM038	<10	10	<200	100	3
83TM039	10	N	300	100	N
83TM040	<10	50	<200	300	2
83TM051A	100	50	500	200	N
83TM051B	<10	50	200	200	<2
83TM052B	<10	70	1,000	200	<2
83TM052C	<10	70	500	100	<2
83TM053	<10	50	<200	300	3
83TM054	<10	50	500	200	2
83TM055	<10	50	<200	300	4
83TM056	<10	50	<200	100	<2
83TM057	<10	50	500	50	N
83TM064	10	70	N	300	4
83TM065	10	70	<200	150	6
83TM066	100	20	200	100	4
83TM067	100	70	<200	500	N
83TM068	50	N	<200	20	2
83TM069	<10	N	<200	20	4
83TM070	70	50	<200	500	2
83TM071	20	N	<200	<10	<2
83TM072	50	50	<200	100	N
83TM074	<10	100	500	500	<2
83TM076	<10	30	<200	100	N
83TM077	<10	<10	<200	100	2
83TM078	10	<10	<200	70	N
83TM079	<10	20	<200	200	3
83TM080	10	20	200	200	5
83TM082	<10	70	<200	200	4
83TM083	10	20	<200	200	<2
83TM083A	<10	50	<200	200	<2
83TM084	<10	50	<200	200	4
83TM085A	10	70	<200	200	<2
83TM085B	<10	70	300	300	5
83TM085C	<10	50	<200	300	2
83TM086	10	20	<200	<10	5
83TM087	<10	50	N	70	4
83TM088A	<10	70	<200	200	N
83TM088B	<10	30	<200	100	<2
83TM089	10	50	200	200	N
83TM090	<10	70	300	20	N
83TM091	50	10	200	100	N
83TM092	50	<10	200	150	<2
83TM093	<10	70	500	1,000	3

The latitude and longitude for 83TM094 through 83C332 are on the following page.

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83TM094	<10	20	200	500	5
83TM200	20	10	<200	200	2
83TM200A	20	10	200	200	2
83C302A	10	70	300	500	3
83C302B	10	50	200	300	3
83C303	10	70	500	500	2
83C304	10	70	500	500	5
83C305A	10	70	500	500	5
83C306A	10	10	<200	150	N
83C306B	10	70	700	200	2
83C306E	10	50	300	500	<2
83C307A	10	70	<200	200	2
83C307B	10	70	1,000	100	<2
83C307D	10	N	N	<10	2
83C308A	50	70	700	300	N
83C308B	100	70	300	300	N
83C308C	<10	N	<200	N	N
83C309	<10	N	200	<10	N
83C310A	100	20	300	70	N
83C310B	<10	50	500	300	<2
83C311	<10	50	2,000	300	15
83C312A	10	50	>10,000	70	15
83C312B	10	50	1,000	200	N
83C312C	10	50	>10,000	200	9
83C313	<10	70	1,000	70	2
83C314A	<10	200	500	200	N
83C314B	<10	50	300	150	N
83C315	<10	50	700	300	2
83C316	<10	20	200	300	2
83C318B	<10	50	500	200	<2
83C319A	<10	50	700	300	3
83C319B	<10	70	500	300	5
83C319C	<10	50	500	300	9
83C320	<10	50	<200	300	N
83C321	<10	50	200	20	N
83C322	<10	50	300	500	6
83C323	<10	50	300	150	<2
83C324	<10	<10	<200	150	2
83C326	<10	<10	<200	100	4
83C327	<10	<10	<200	100	<2
83C328	<10	<10	<200	20	<2
83C330	<10	<10	<200	100	2
83C331A	<10	70	<200	20	40
83C331B	<10	50	300	300	4
83C332	10	50	<200	100	N

Rock Samples--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83TM094	43 56 53	71 19 40	5.00	.03	<.05	.100	500	<.5	N	10	50	10
83TM200	43 58 49	71 33 34	1.00	.50	1.00	.070	500	N	N	10	500	7
83TM200A	43 58 49	71 33 34	2.00	.50	.50	.150	500	N	N	10	500	7
83C302A	44 3 53	71 11 40	3.00	.02	.30	.050	500	<.5	N	10	100	7
83C302B	44 3 53	71 11 40	1.50	.02	.30	.020	300	<.5	N	10	100	7
83C303	44 3 52	71 11 48	2.00	.02	<.05	.020	300	N	N	10	20	50
83C304	44 3 52	71 11 56	2.00	.02	.05	.020	300	N	N	10	20	10
83C305A	44 3 54	71 11 54	2.00	.02	.05	.020	300	<.5	N	10	20	10
83C306A	44 3 3	71 39 12	.50	.02	<.05	.010	100	N	N	10	30	5
83C306B	44 3 3	71 39 12	3.00	.02	<.05	.020	1,000	1.0	N	10	200	7
83C306E	44 3 3	71 39 12	2.00	.02	.10	.030	300	N	N	10	100	10
83C307A	44 3 18	71 39 25	.15	.02	<.05	.010	200	N	N	10	30	5
83C307B	44 3 18	71 39 25	2.00	.20	.30	.015	1,500	N	N	10	50	10
83C307D	44 3 18	71 39 25	1.00	.02	.10	.010	5,000	N	N	10	<20	10
83C308A	44 3 20	71 39 26	3.00	.50	.10	.200	1,000	N	N	10	100	10
83C308B	44 3 20	71 39 26	10.00	1.50	.10	.500	2,000	N	N	10	300	5
83C308C	44 3 20	71 39 26	1.00	.05	.05	.010	700	N	N	10	20	10
83C309	44 3 22	71 39 26	1.00	.05	.20	.015	300	N	N	10	150	7
83C310A	44 3 0	71 16 10	15.00	5.00	3.00	1.000	2,000	N	N	<10	700	2
83C310B	44 2 0	71 16 10	3.00	.05	.50	.100	1,000	N	N	10	200	10
83C311	44 2 59	71 16 7	10.00	.05	<.05	.070	5,000	.5	N	10	300	10
83C312A	44 2 56	71 16 8	7.00	.10	.05	.070	>5,000	20.0	N	<10	150	10
83C312B	44 2 56	71 16 8	1.00	.05	.07	.070	300	<.5	N	<10	200	10
83C312C	44 2 56	71 16 8	10.00	.50	.70	.200	5,000	.5	N	10	500	10
83C313	44 2 50	71 16 1	3.00	<.02	.05	.050	500	N	N	10	<20	10
83C314A	44 2 20	71 15 38	3.00	.50	.70	.050	200	N	N	10	150	20
83C314B	44 2 20	71 15 38	.70	<.02	.05	.010	150	N	N	10	<20	10
83C315	44 2 7	71 15 40	2.00	<.02	<.05	.050	500	N	N	10	<20	10
83C316	44 1 57	71 15 44	1.00	<.02	<.05	.010	200	N	N	10	<20	10
83C318B	44 8 48	71 22 33	2.00	.02	<.05	.050	300	<.5	N	10	20	7
83C319A	44 8 49	71 22 42	1.50	.02	<.05	.020	300	N	N	10	50	50
83C319B	44 8 49	71 22 42	2.00	.02	.50	.070	500	N	N	10	20	10
83C319C	44 8 49	71 22 42	2.00	.02	<.05	.050	300	N	N	<10	50	20
83C320	44 8 51	71 22 57	1.50	.05	.05	.020	200	N	N	50	50	15
83C321	44 8 51	71 22 57	1.00	.02	1.00	.010	5,000	N	N	<10	50	100
83C322	44 8 50	71 23 8	2.00	.02	.20	.070	700	N	N	10	50	20
83C323	44 8 47	71 22 17	1.50	<.02	.20	.050	300	N	N	10	<20	20
83C324	44 39 42	71 26 15	1.00	.02	.05	.020	200	N	N	20	50	10
83C326	44 39 42	71 26 15	.50	<.02	<.05	.010	300	N	N	20	<20	100
83C327	44 39 43	71 26 9	1.00	.05	.20	.030	300	N	N	10	70	20
83C328	44 39 40	71 26 6	.70	.02	.10	.015	300	N	N	10	20	7
83C330	44 39 30	71 26 3	1.00	.05	.20	.050	300	N	N	10	70	15
83C331A	44 2 16	71 10 33	1.50	.02	.20	.015	300	N	N	10	<20	20
83C331B	44 2 16	71 10 33	3.00	.05	.05	.050	500	<.5	N	10	100	10
83C332	44 2 17	71 10 40	.50	<.02	<.05	.005	300	<.5	N	10	50	10

Rock Samples--continued

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83TM094	N	N	N	N	<5	50	<5	70	<5	30	N	10	N
83TM200	N	N	N	N	<5	50	N	20	N	30	<5	<10	300
83TM200A	N	N	N	N	<5	150	N	<20	N	50	<5	<10	300
83C302A	N	N	N	N	<5	200	N	50	N	50	<5	15	N
83C302B	N	N	N	N	<5	200	N	30	N	50	<5	<10	N
83C303	N	N	N	N	<5	100	N	100	N	10	<5	<10	N
83C304	N	N	N	N	<5	100	N	100	N	50	N	10	N
83C305A	N	N	N	N	<5	100	N	100	N	50	<5	15	N
83C306A	N	N	N	N	<5	50	<5	30	N	10	<5	10	N
83C306B	10	N	N	N	<5	200	100	100	N	1,000	<5	20	N
83C306E	N	N	N	N	<5	200	<5	100	N	100	<5	20	N
83C307A	N	N	N	N	<5	50	N	50	N	<10	N	N	N
83C307B	<10	N	N	N	7	50	N	50	N	100	<5	10	N
83C307D	N	N	N	N	<5	20	N	<20	N	50	N	N	N
83C308A	N	N	5	70	20	50	N	50	10	30	10	N	N
83C308B	N	N	50	70	100	70	N	20	50	30	15	N	100
83C308C	<10	N	N	N	<5	30	N	<20	N	100	N	N	N
83C309	N	N	N	N	<5	50	N	20	N	50	N	<10	N
83C310A	N	N	70	70	30	50	5	20	70	10	20	N	1,000
83C310B	N	N	N	N	<5	100	<5	50	N	30	5	<10	<100
83C311	<10	20	N	N	30	100	<5	70	N	500	5	50	150
83C312A	100	200	N	N	5	70	N	50	N	5,000	<5	150	100
83C312B	N	<20	N	N	<5	100	N	50	N	150	<5	20	N
83C312C	20	300	N	N	10	100	N	100	N	500	<5	200	200
83C313	N	N	N	N	<5	100	N	50	N	50	N	10	N
83C314A	N	N	N	N	<5	100	N	100	N	20	N	10	150
83C314B	N	N	N	N	<5	50	N	50	N	30	N	N	N
83C315	N	N	N	N	<5	50	N	100	N	50	N	10	N
83C316	N	N	N	N	<5	50	N	50	N	30	N	N	N
83C318B	<10	N	N	N	<5	50	N	50	N	50	N	20	N
83C319A	15	N	N	N	<5	50	200	50	N	50	N	20	N
83C319B	<10	N	N	N	<5	200	N	70	N	30	N	50	N
83C319C	50	N	N	N	<5	200	200	50	N	100	N	70	N
83C320	N	N	N	N	<5	50	N	200	N	20	N	15	N
83C321	<10	N	N	N	10	50	50	30	N	20	N	N	N
83C322	N	N	N	N	<5	100	N	70	N	50	N	20	N
83C323	<10	N	N	N	<5	70	N	70	N	70	N	10	N
83C324	N	N	N	N	<5	20	N	150	N	50	N	10	N
83C326	N	N	N	N	<5	20	N	50	N	30	N	30	N
83C327	N	N	N	N	<5	20	N	30	N	50	N	N	N
83C328	N	N	N	N	<5	20	N	30	N	50	N	N	N
83C330	N	N	N	N	<5	100	N	30	N	50	N	10	N
83C331A	N	N	N	N	<5	30	N	30	N	50	N	10	N
83C331B	<10	N	N	N	20	100	N	30	N	50	N	150	N
83C332	N	N	N	N	<5	50	N	20	N	20	N	N	N

Rock Samples--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83C333A	44 2 5	71 11 10	2.00	<.02	.05	.050	300	N	N	10	<20	15
83C333B	44 2 5	71 11 10	.50	<.02	.05	.005	200	<.5	N	10	<20	10
83C333C	44 2 5	71 11 10	1.00	<.02	.05	.010	200	<.5	N	10	100	10
83C334	44 2 2	71 11 15	2.00	.05	.05	.070	500	N	N	10	<20	10
83C337	44 8 56	71 10 54	2.00	.10	.50	.200	1,500	N	N	10	300	10
83C338	44 7 18	71 7 49	2.00	.03	.20	.050	300	N	N	10	150	10
83C339A	44 7 23	71 7 47	2.00	.03	.30	.050	300	N	N	10	150	10
83C339B	44 7 23	71 7 47	2.00	.02	.20	.050	200	N	N	10	100	10
83C340	44 9 48	71 21 33	2.00	1.00	1.00	.100	500	N	N	10	20	10
83C342	44 11 41	71 20 27	15.00	3.00	5.00	>1.000	2,000	<.5	N	15	200	2
83C343	44 11 25	71 20 45	1.50	.20	1.00	.070	200	<.5	N	20	200	5
83C344	44 10 44	71 21 9	7.00	1.50	.70	.700	2,000	N	N	>2,000	300	10
83C345A	44 10 47	71 21 5	15.00	3.00	2.00	1.000	3,000	N	N	50	150	7
83C345B	44 10 47	71 21 5	15.00	5.00	2.00	1.000	3,000	N	N	20	150	7
83C345C	44 10 47	71 21 5	15.00	5.00	3.00	1.000	3,000	N	N	10	500	3
83C346	44 1 5	71 29 40	1.50	.05	.30	.050	300	N	N	10	100	10
83C347	44 1 9	71 29 15	2.00	<.02	.20	.070	300	N	N	10	100	10
83C347A	44 1 9	71 29 15	1.00	.05	<.05	.020	100	N	N	10	20	10
83C347V	44 1 9	71 29 15	2.00	.02	<.05	.050	300	N	N	10	100	10
83C349	44 12 27	71 26 43	2.00	.05	.70	.100	1,000	N	N	<10	200	10
83C350A	44 12 34	71 26 46	15.00	1.50	3.00	.500	2,000	N	N	10	500	7
83C350B	44 12 34	71 26 46	10.00	1.50	7.00	.300	2,000	.5	N	10	70	5
83C351	44 12 38	71 27 24	15.00	.20	<.05	.020	300	N	N	50	100	200
83C352	44 12 37	71 27 16	1.50	.50	1.00	.020	500	<.5	N	10	100	100
83C354A	44 12 36	71 28 7	.20	<.02	<.05	.010	100	N	N	<10	50	7
83C354B	44 12 36	71 28 7	1.50	.02	.50	.030	300	N	N	10	100	70
83C355A	44 3 52	71 11 48	1.50	<.02	.05	.030	300	5.0	N	10	70	20
83C355B	44 3 52	71 11 48	2.00	<.02	.10	.030	300	N	N	10	100	10
83C356A	44 3 15	71 13 15	5.00	.20	.05	.300	1,500	<.5	200	<10	50	50
83C356B	44 3 15	71 13 15	10.00	.10	<.05	.300	2,000	.5	N	<10	50	70
83C361	44 13 4	71 3 53	10.00	.50	1.00	.500	2,000	N	N	10	200	5
83C362	44 13 52	71 4 42	1.00	<.02	<.05	.010	300	<.5	N	10	<20	10
83C363	44 13 53	71 4 30	1.50	<.02	<.05	.010	300	<.5	N	10	<20	10
83C364A	44 14 9	71 4 3	1.00	<.02	<.05	.010	300	N	N	10	<20	10
83C364B	44 14 9	71 4 3	2.00	.20	.05	.100	500	N	N	10	150	50
83C365	44 14 8	71 3 57	.50	<.02	<.05	.005	200	N	N	<10	<20	10
83C366	44 14 8	71 3 50	1.00	<.02	<.05	.010	300	N	N	10	<20	10
83C367	44 32 35	71 20 49	3.00	.50	.10	.200	700	N	N	10	200	7
83C369	44 32 31	71 20 48	2.00	.30	.20	.200	500	N	N	10	200	10
83C370	44 32 26	71 20 50	1.00	.05	.05	.020	200	N	N	<10	70	20
83C371	44 32 22	71 20 48	2.00	.20	.05	.100	500	<.5	N	<10	100	7
83C374A	44 41 27	71 32 3	3.00	.50	.20	.200	500	N	N	10	500	10
83C375	44 41 23	71 32 4	1.00	.10	.20	.050	700	N	N	10	150	10
83C376	44 41 21	71 32 5	20.00	2.00	.70	1.000	300	N	N	10	200	10
83C377A	44 41 21	71 32 5	10.00	2.00	.70	.500	1,000	1.5	N	10	150	5

Rock Samples--continued

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83C333A	N	N	N	N	<5	100	N	100	N	50	N	15	N
83C333B	<10	N	N	N	<5	20	N	50	N	100	N	10	N
83C333C	N	N	N	N	<5	50	N	20	N	30	N	<10	N
83C334	N	N	N	N	<5	70	N	150	N	70	N	10	N
83C337	N	N	N	N	<5	50	N	50	N	20	5	N	N
83C338	N	N	N	N	<5	70	N	50	N	30	<5	10	N
83C339A	N	N	N	N	<5	70	N	50	N	50	N	10	N
83C339B	N	N	N	N	<5	100	N	50	N	50	N	10	N
83C340	N	N	N	N	<5	100	N	200	N	30	<5	15	N
83C342	N	N	50	N	30	50	<5	50	10	20	20	N	1,000
83C343	N	N	<5	20	30	50	N	20	5	50	<5	<10	100
83C344	N	N	30	100	150	100	N	20	70	30	20	100	100
83C345A	N	N	70	200	100	100	N	50	200	30	20	10	300
83C345B	N	N	70	200	100	50	<5	50	200	30	20	<10	300
83C345C	N	N	70	200	70	50	<5	30	300	30	20	<10	500
83C346	N	N	N	N	<5	50	N	70	<5	50	N	<10	N
83C347	N	N	N	N	N	150	N	70	N	50	N	20	N
83C347A	N	N	N	N	N	50	N	70	N	20	N	<10	N
83C347V	N	N	N	N	N	200	N	100	N	50	N	15	N
83C349	N	N	N	N	N	100	N	70	N	50	5	20	<100
83C350A	N	N	10	N	5	150	N	70	N	50	20	10	300
83C350B	N	N	10	70	N	50	N	20	20	20	10	150	200
83C351	N	N	N	N	N	50	N	50	N	30	5	200	<100
83C352	<10	N	N	N	N	70	N	70	N	70	N	20	200
83C354A	N	N	N	N	<5	<20	N	20	N	10	N	N	N
83C354B	N	N	N	N	5	100	N	50	10	50	N	30	N
83C355A	10	N	N	N	N	100	N	70	<5	500	N	10	N
83C355B	N	N	N	N	5	100	N	70	N	50	N	10	N
83C356A	N	N	N	N	<5	100	N	200	N	50	5	15	N
83C356B	N	N	N	N	<5	200	10	100	N	50	5	15	N
83C361	N	N	N	N	20	200	15	100	N	20	10	10	N
83C362	N	N	N	N	<5	20	N	100	N	50	N	30	N
83C363	N	N	N	N	<5	20	N	100	N	50	N	50	N
83C364A	N	N	N	N	<5	30	N	70	N	30	N	20	N
83C364B	N	N	N	N	<5	100	N	50	N	30	<5	20	N
83C365	N	N	N	N	<5	100	N	100	N	30	N	30	N
83C366	N	N	N	N	<5	<20	N	50	N	30	N	20	N
83C367	N	N	N	N	<5	<20	N	50	N	30	<5	10	N
83C369	N	N	N	N	<5	<20	N	50	N	30	<5	10	N
83C370	N	N	N	N	<5	<20	N	50	N	30	N	<10	N
83C371	N	N	N	N	<5	<20	N	70	N	50	N	<10	N
83C374A	N	N	N	N	<5	50	N	50	10	50	5	<10	200
83C375	N	N	N	N	<5	50	10	100	20	20	N	10	100
83C376	N	N	50	20	100	70	50	100	100	50	20	15	200
83C377A	N	N	200	50	1,500	50	<5	20	50	50	15	20	200

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83C333A	10	70	200	300	5
83C333B	10	50	<200	<10	15
83C333C	10	10	<200	150	3
83C334	10	50	500	500	7
83C337	10	20	500	200	5
83C338	10	50	200	200	N
83C339A	10	50	200	300	5
83C339B	10	50	200	300	3
83C340	10	70	500	700	3
83C342	300	30	500	200	2
83C343	20	10	<200	200	2
83C344	200	50	500	300	<2
83C345A	200	50	500	200	<2
83C345B	200	20	500	150	2
83C345C	200	30	700	100	N
83C346	10	70	300	300	2
83C347	<10	70	<200	300	5
83C347A	<10	50	200	300	3
83C347V	<10	70	200	300	4
83C349	<10	50	500	500	4
83C350A	20	50	700	700	4
83C350B	50	30	700	200	6
83C351	10	10	200	100	8
83C352	10	70	500	200	4
83C354A	<10	10	N	<10	4
83C354B	10	50	<200	300	12
83C355A	<10	50	500	300	5
83C355B	<10	70	500	300	6
83C356A	10	50	1,000	1,000	3
83C356B	<10	50	1,000	1,000	4
83C361	<10	50	500	1,000	<2
83C362	<10	<10	<200	100	6
83C363	<10	10	<200	150	6
83C364A	<10	<10	<200	100	7
83C364B	<10	20	200	100	2
83C365	<10	N	<200	N	9
83C366	<10	N	<200	100	7
83C367	<10	<10	<200	100	3
83C369	<10	10	<200	200	3
83C370	<10	10	N	100	4
83C371	<10	10	N	100	3
83C374A	20	<10	N	500	3
83C375	10	50	N	150	4
83C376	200	70	200	150	3
83C377A	100	20	200	200	4

The latitude and longitude for 83C378 through 83C427 are on the following page.

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83C378	<10	50	<200	100	4
83C379	<10	50	<200	150	10
83C380	<10	30	<200	100	8
83C381	10	50	500	300	3
83C384	10	50	500	300	4
83C385	<10	50	500	300	5
83C386A	<10	50	500	300	5
83C387A	<10	50	200	300	3
83C390A	50	50	<200	500	N
83C390B	10	20	<200	200	4
83C393	<10	10	<200	100	N
83C394	10	<10	<200	150	<2
83C395	<10	<10	<200	70	2
83C396	<10	10	<200	50	3
83C398	30	10	<200	100	N
83C399	100	20	500	200	N
83C400	150	50	<200	200	N
83C401	50	<10	<200	50	N
83C402	20	<10	<200	20	N
83C403	70	50	500	300	<2
83C405	70	50	500	300	<2
83C406A	10	50	<200	100	2
83C407	50	70	500	300	<2
83C409	<10	20	<200	300	2
83C410	20	10	<200	200	N
83C411	<10	70	<200	500	8
83C413	30	50	<200	150	<2
83C414	10	10	200	200	N
83C415A	<10	<10	<200	70	5
83C415B	10	50	200	200	3
83C417A	10	70	<200	200	N
83C417B	10	70	300	200	5
83C417C	15	70	300	150	<2
83C417D	15	70	200	100	2
83C419A	15	30	200	20	<2
83C419B	10	50	<200	150	8
83C420	30	70	500	300	14
83C421	10	50	<200	200	<2
83C422A	10	<10	<200	100	60
83C422B	10	10	<200	100	N
83C424B	<10	20	<200	100	<2
83C425	<10	70	500	1,000	6
83C426A	15	<10	<200	200	2
83C426B	10	10	<200	200	2
83C427	15	<10	<200	50	<2

Rock Samples--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83C378	44 1 9	71 29 15	1.00	.02	.10	.030	300	N	N	<10	100	10
83C379	44 12 36	71 28 7	1.00	.05	.20	.050	200	N	N	10	100	10
83C380	44 14 8	71 3 50	1.00	.02	.05	.010	300	N	N	10	<20	10
83C381	44 5 15	71 6 30	10.00	1.00	1.00	1.000	5,000	N	N	10	2,000	5
83C384	44 5 23	71 6 32	5.00	.05	.07	.300	2,000	N	N	10	150	7
83C385	44 9 54	71 7 59	1.50	<.02	.05	.100	300	N	N	10	20	10
83C386A	44 5 0	71 6 30	5.00	.05	.05	.200	500	N	N	<10	100	10
83C387A	44 5 5	71 6 30	2.00	.02	.05	.050	300	N	N	<10	100	7
83C390A	44 41 19	71 33 17	2.00	.20	.10	.500	1,000	<.5	N	<10	50	5
83C390B	44 41 19	71 33 17	1.50	.03	.05	.050	150	<.5	N	<10	100	15
83C393	44 43 4	71 33 5	1.50	<.02	.05	.020	150	<.5	N	<10	<20	15
83C394	44 43 4	71 33 9	1.00	<.02	.05	.020	100	N	N	10	30	10
83C395	44 43 4	71 33 12	.70	<.02	<.05	.020	200	N	N	<10	20	10
83C396	44 43 0	71 33 28	2.00	.03	.10	.030	700	N	N	<10	50	7
83C398	44 2 16	71 48 20	1.50	.50	.10	.100	200	<.5	N	>2,000	70	200
83C399	44 2 16	71 48 20	7.00	2.00	.05	.500	300	N	N	>2,000	20	10
83C400	44 2 10	71 48 21	7.00	2.00	.07	.500	700	N	N	200	500	2
83C401	44 2 10	71 48 23	1.00	.30	.50	.070	150	N	N	1,000	100	2
83C402	44 2 8	71 48 24	1.00	.30	.50	.050	100	N	N	>2,000	100	2
83C403	44 2 8	71 48 27	15.00	2.00	2.00	.700	2,000	N	N	50	500	3
83C405	44 13 17	71 30 45	10.00	2.00	1.50	.700	1,000	N	N	10	500	3
83C406A	44 13 4	71 30 55	2.00	.02	.05	.020	200	N	N	10	<20	100
83C407	44 13 3	71 31 0	3.00	1.00	.30	.500	500	<.5	N	20	200	20
83C409	44 8 20	71 1 39	2.00	.20	.30	.150	500	N	N	10	100	5
83C410	44 8 20	71 1 34	1.50	.02	.05	.150	300	N	N	10	100	5
83C411	44 8 22	71 1 20	3.00	.02	.07	.150	300	N	N	<10	50	7
83C413	44 6 37	71 5 3	1.00	<.02	.05	.010	100	N	N	20	<20	10
83C414	44 6 41	71 4 41	1.50	<.02	<.05	.010	100	N	N	10	<20	10
83C415A	44 6 40	71 4 37	.20	<.02	<.05	.010	50	N	N	<10	20	5
83C415B	44 6 40	71 4 37	1.00	<.02	<.05	.010	200	N	N	<10	<20	10
83C417A	44 5 43	71 25 35	1.50	<.02	.30	.020	200	N	N	<10	70	20
83C417B	44 5 43	71 25 35	1.50	<.02	.20	.020	300	N	N	10	<20	10
83C417C	44 5 43	71 25 35	1.50	<.02	.10	.020	200	N	N	10	20	10
83C417D	44 5 43	71 25 35	2.00	<.02	.10	.020	300	N	N	10	100	10
83C419A	44 5 44	71 25 46	2.00	<.02	.05	.010	200	<.5	N	10	20	500
83C419B	44 5 44	71 25 46	2.00	<.02	.10	.020	200	N	N	<10	100	10
83C420	44 5 44	71 25 49	15.00	1.00	1.00	.300	1,500	N	N	20	200	10
83C421	44 38 44	71 24 40	2.00	.15	.30	.050	500	N	N	10	100	10
83C422A	44 38 40	71 24 39	1.00	<.02	<.05	.010	500	N	N	10	N	10
83C422B	44 38 40	71 24 39	1.50	1.00	.10	.050	500	N	N	10	100	10
83C424B	43 57 18	71 21 4	1.00	.02	.05	.050	100	N	N	10	50	10
83C425	43 56 41	71 20 30	2.00	<.02	.05	.050	500	N	N	<10	<20	20
83C426A	43 56 57	71 20 16	1.00	<.02	<.05	.010	200	N	N	10	<20	10
83C426B	43 56 57	71 20 16	1.00	<.02	.05	.070	500	N	N	10	20	10
83C427	43 26 29	71 19 52	1.50	.50	.50	.100	200	N	N	10	100	10

Rock Samples--continued

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83C378	N	N	N	N	<5	100	N	50	10	30	N	<10	N
83C379	N	N	N	N	<5	100	N	50	5	30	N	20	N
83C380	N	N	N	N	<5	50	N	70	N	30	N	20	N
83C381	N	N	<5	N	<5	70	N	50	<5	30	20	N	500
83C384	N	N	N	N	7	70	<5	50	20	30	5	15	100
83C385	N	N	N	N	<5	70	N	50	N	20	N	10	N
83C386A	N	N	N	N	<5	70	N	100	10	50	5	<10	N
83C387A	N	N	N	N	<5	100	N	70	N	30	<5	N	N
83C390A	N	N	20	20	100	70	N	20	15	20	7	N	N
83C390B	N	N	N	N	<5	30	<5	150	15	100	N	N	<100
83C393	N	N	N	N	<5	<20	10	150	N	30	N	N	N
83C394	N	N	N	N	<5	<20	10	50	10	20	N	N	N
83C395	<10	N	N	N	<5	<20	<5	70	N	20	N	10	N
83C396	N	N	N	10	<5	30	15	50	20	30	N	N	N
83C398	N	N	<5	N	10	20	<5	50	15	30	5	150	100
83C399	<10	N	50	100	7	50	N	20	70	20	20	50	150
83C400	N	N	50	100	30	50	N	20	70	50	20	N	100
83C401	N	N	<5	N	5	20	5	<20	50	50	5	N	100
83C402	N	N	N	N	<5	20	10	<20	50	30	10	N	100
83C403	N	N	10	N	<5	50	N	30	50	15	10	N	200
83C405	N	N	20	N	5	50	N	30	20	20	20	N	300
83C406A	<10	N	N	N	<5	50	5	100	10	50	<5	<10	N
83C407	<10	N	10	100	10	50	N	50	50	70	15	50	<100
83C409	N	N	N	N	<5	70	N	20	5	50	5	10	N
83C410	N	N	N	N	<5	50	10	30	20	20	5	N	N
83C411	N	N	N	N	<5	100	N	100	N	50	<5	30	N
83C413	N	N	N	N	<5	50	20	50	50	30	N	10	N
83C414	N	N	N	N	<5	50	N	50	5	30	N	10	N
83C415A	N	N	N	N	<5	50	<5	50	<5	<10	N	15	N
83C415B	N	N	N	N	<5	50	N	50	<5	50	N	10	N
83C417A	N	N	N	N	<5	70	N	50	5	50	N	<10	N
83C417B	N	N	N	N	<5	50	<5	100	5	50	N	50	N
83C417C	N	N	N	N	<5	50	<5	100	10	50	N	10	N
83C417D	N	N	N	N	<5	150	10	50	50	50	N	15	N
83C419A	50	N	N	N	100	50	200	50	30	50	N	20	N
83C419B	N	N	N	N	30	70	<5	50	10	70	N	50	N
83C420	N	N	N	N	5	100	20	50	30	70	10	150	<100
83C421	N	N	N	N	<5	50	N	50	5	20	<5	10	N
83C422A	N	N	N	N	<5	50	N	50	<5	30	N	100	N
83C422B	N	N	N	N	<5	50	10	30	10	20	N	<10	<100
83C424B	N	N	N	N	<5	70	N	20	<5	50	N	<10	N
83C425	N	N	N	N	<5	200	N	200	<5	50	N	15	N
83C426A	N	N	N	N	<5	50	5	30	50	30	N	N	N
83C426B	N	N	N	N	<5	50	<5	50	7	30	N	N	N
83C427	N	N	N	N	<5	20	N	20	10	50	5	N	200

Rock Samples--continued

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
83C428	43 57 13	71 19 55	1.00	<.02	.20	.020	200	N	N	10	<20	10
83C429	43 57 14	71 19 55	1.00	<.02	<.05	.020	100	<.5	N	10	<20	10
83C430	44 4 47	71 34 14	1.00	<.02	<.05	.005	100	N	N	10	20	10
83C431	44 4 47	71 34 14	1.00	<.02	<.05	.002	300	N	N	10	<20	10
83C432	44 4 45	71 34 2	2.00	.02	.20	.050	300	N	N	10	100	10
83C433	43 56 41	71 20 30	5.00	<.02	.10	.030	1,500	N	N	10	N	10
83C437B	44 9 7	71 17 51	1.50	<.02	.05	.015	200	N	N	10	50	10
83C440	44 9 12	71 18 33	5.00	<.02	.50	.070	2,000	N	N	10	50	10
83C442	44 46 33	71 17 14	.50	.20	.10	.015	300	N	N	10	150	15
83C443	44 46 52	71 17 20	1.00	.10	.10	.200	300	N	N	10	100	10
83C444	44 46 44	71 18 30	1.00	<.02	<.05	.010	200	N	N	10	N	10

Sample	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
83C428	N	N	N	N	10	70	N	20	10	30	N	N	N
83C429	N	N	N	N	<5	50	50	50	10	30	N	10	N
83C430	N	N	N	N	<5	200	10	50	50	50	N	<10	N
83C431	N	N	N	N	<5	50	N	50	5	50	N	20	N
83C432	N	N	N	N	<5	50	N	50	5	50	<5	10	N
83C433	N	N	N	N	<5	200	<5	20	5	100	N	20	N
83C437B	N	N	N	N	<5	100	<5	70	5	50	N	N	N
83C440	N	N	N	N	30	200	N	70	N	100	<5	50	N
83C442	N	N	N	N	<5	50	N	<20	N	50	N	N	<100
83C443	N	N	N	N	5	50	N	50	N	20	N	<10	<100
83C444	N	N	N	N	<5	20	N	50	N	50	N	10	N

Sample	V-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Sn-ppm aa
83C428	20	20	<200	150	N
83C429	10	20	<200	300	<2
83C430	20	70	<200	150	2
83C431	10	50	<200	150	N
83C432	10	70	200	100	4
83C433	<10	70	500	1,000	2
83C437B	10	50	<200	200	2
83C440	<10	70	700	200	10
83C442	<10	<10	<200	50	3
83C443	<10	15	<200	150	N
83C444	<10	<10	<200	100	<2

Table 2.— Analyses of panned concentrates by semi-quantitative spectrographic analysis. Analyst: J. A. Domenico

Sample	Latitude	Longitude	Fe % (0.10)	Mg % (0.05)	Ca % (0.10)	Ti % (0.005)	Mn-ppm (20)	B-ppm (20)	Ba-ppm (50)	Be-ppm (2)	Bi-ppm (20)	Cr-ppm (20)	Cu-ppm (10)	La-ppm (50)	Mo-ppm (10)	Nb-ppm (50)	Pb-ppm (20)	Sc-ppm (10)	Sn-ppm (20)	V-ppm (20)	W-ppm (100)	Y-ppm (20)	Th-ppm (200)
83TM073	44°13'15"	71°30'06"	0.30	0.10	1.00	>2.00	500	100	50	—	20	30	<10	300	—	70	20	15	100	50	100	500	—
83TM075	44°13'51"	71°30'00"	0.15	0.05	0.70	>2.00	200	30	<50	—	—	20	<10	200	—	100	20	15	150	30	100	700	—
83TM101	43°54'47"	71°35'44"	0.10	<0.05	2.00	>2.00	300	30	<50	150	—	100	<10	50	—	100	<20	15	100	100	<100	200	—
83TM102	43°54'19"	71°35'16"	0.10	<0.05	2.00	>2.00	300	30	50	100	—	100	—	70	15	100	20	15	>2000	70	150	300	200
83TM103	43°54'53"	71°33'42"	0.20	<0.05	1.00	2.00	500	30	<50	100	—	50	<10	200	—	150	20	15	>2000	50	—	500	300
83TM104	43°55'42"	71°32'00"	<0.10	—	0.10	0.50	100	—	—	100	500	—	—	—	—	200	30	15	>2000**	—	100	150	300
83C348A	44°12'17"	71°26'25"	0.15	<0.05	0.10	1.50	150	30	<50	100	100	—	—	200	—	70	30	10	1500	20	—	200	500
83C348B	44°12'17"	71°26'25"	0.20	0.05	0.10	1.50	150	<20	50	2	—	<20	—	150	—	70	200	10	>2000	30	—	300	300
83C353	44°12'36"	71°27'20"	0.15	0.05	0.20	>2.00	150	30	70	15	—	20	<10	200	—	70	30	10	2000	30	—	500	200
83C358	44°02'57"	71°13'25"	0.20	0.05	0.10	1.00	200	30	100	2	—	20	—	200	—	100	50	15	200	<20	—	700	500
83C372	44°32'01"	71°21'09"	0.20	0.05	2.00	>2.00	300	—	70	2	—	30	<10	500	50	100	50	15	70	30	200	700	700
83C408	44°08'39"	71°01'42"	<0.10	<0.05	0.20	1.50	200	100	70	10	—	—	—	—	—	50	20	15	1000	<20	—	500	<200
83C416	44°05'41"	71°25'24"	0.30	0.05	0.50	1.50	300	—	<50	7	30	—	<10	700	—	70	30	15	>2000***	—	200	700	300
83C418	44°05'43"	71°25'35"	0.20	<0.05	0.30	2.00	300	—	70	5	500	—	20	500	—	100	50	15	>2000****	—	500	700	500

* much greater

Table 3.-- Analyses of rock samples by EDS-XRF. Analyst: J. R. Eckert

Sample	Latitude	Longitude	Sn (10)	Ba (17)	Rb (2)	Sr (large error below 60)	Y (12)	Zr (10)	Nb (4)	Mo (12)	Cu (8)	Zn (20)
83TM051B	43°55'34"	71°30'45"	17	207	406	51	56	198	62	L	10	73
83TM052C	43°55'29"	71°30'34"	12	519	420	83	53	184	55	L	L	56
83TM085B	44°04'45"	71°34'02"	18	237	421	39	88	289	124	L	12	115
83TM086	44°04'45"	71°34'05"	18	40	486	11	30	49	86	L	9	40
83TM087	44°04'46"	71°34'09"	17	36	284	17	75	122	66	L	18	L
83TM087A	44°04'46"	71°34'09"	17	134	264	28	55	200	83	L	L	48
83TM088A	44°04'47"	71°34'14"	21	18	703	8	78	138	41	L	12	55
83C312	44°02'56"	71°16'08"	77	69	247	37	107	258	148	L	10	352
83C354B	44°12'36"	71°28'07"	31	195	469	58	73	266	106	L	L	45
83C417A	44°05'43"	71°25'35"	17	180	472	27	82	277	127	L	L	72
83C417B	44°05'43"	71°25'35"	72	39	676	23	142	286	279	L	19	121
83C417C	44°05'43"	71°25'35"	19	35	659	13	127	281	238	L	15	109
83C419B	44°05'44"	71°25'46"	38	155	467	27	76	174	115	79	15	87
83C419B2	44°05'44"	71°25'46"	43	160	500	27	76	181	117	38	33	94
83C419C	44°05'44"	71°25'46"	20	106	440	20	57	153	136	L	13	37
83C421	44°38'44"	71°24'40"	11	253	301	59	41	236	86	L	L	26
83C450	44°04'19"	71°09'40"	15	259	357	40	58	314	88	L	8	80
83C460A	44°00'41"	71°11'24"	15	306	309	47	75	348	91	L	9	104
83C460C	44°00'41"	71°11'24"	15	26	564	12	54	95	68	L	17	L
83C460D	44°00'41"	71°11'24"	17	300	329	56	80	422	98	L	10	115
83C500A1	44°08'11"	71°40'28"	14	51	260	29	73	202	129	L	10	43
83C500A2	44°08'11"	71°40'28"	15	67	241	33	65	232	109	L	14	59
83C500B	44°08'11"	71°40'28"	12	57	256	30	75	296	121	L	10	45

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