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GRANNY

A data bank of chemical analyses of Laramide and younger
high-silica rhyolites and granites from Colorado
and north-central New Mexico

by

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ABSTRACT

GRANNY is a data bank containing information on 507 chemically analyzed Laramide or younger high-silica rhyolites and granites from Colorado and north-central New Mexico. The data were compiled from both published and unpublished sources. The data bank is designed to aid in the recognition of igneous rocks with a high exploration potential for the discovery of molybdenum (and other lithophile element) deposits. Information on source reference, geographic location, age, mineralogic and petrologic characteristics, major constituent analyses, and trace element analyses for each sample are given. The data bank is available in two formats: (1) paper- or microfiche-hardcopy, and (2) fixed format computer readable magnetic tape.

INTRODUCTION

GRANNY is a computer-readable data bank consisting of descriptive and chemical data for 507 rock specimens for which major constituent chemical analyses are available. The analyses were largely compiled from published works and theses, available either on microfilm or through inter-library loan services. Several colleagues made unpublished chemical analyses available to us, and these, together with our own unpublished analyses, were also included in the data bank.

The three 1/ granite (or Climax-type) molybdenite deposits which are currently being mined in the United States occur within the area of our compilation. The source rocks for these deposits are high-silica low-calcium rhyolites and granites (Mutschler and others, 1981; White and others, 1981). Our compilation began as an attempt to assemble all the available petrochemical data for these deposits, and for the many granite molybdenite system prospects in Colorado. We then decided to broaden the data bank to include all Laramide and younger high-silica rhyolites and granites in Colorado for which chemical data were available. Our aim was to produce a data bank that would help in the development of "chemical fingerprints" for the recognition of high-silica rhyolites and granites with a high exploration potential for the discovery of Mo (and other lithophile elements such as Be, Sn, U, and W) deposits in Colorado.

For inclusion in the data bank we have defined high-silica rhyolites and granites as those igneous rocks containing at least 70.0 weight percent SiO₂. We have also included 33 analyses with less than 70.0 weight percent SiO₂ where those analyses represent rocks which are clearly related to granite molybdenite deposits or prospects.

We have tried to structure GRANNY so that it can be interfaced with other petrochemical data banks such as CLAIR (Le Maitre, 1973), IGBA (Chayes and Mutschler, 1978), PETROS (Mutschler and others, 1981), and RASS (U. S. Geological Survey, 1983). This, we hope, will allow the petrologist and explorationist to rapidly test models based on the Colorado data in other areas.

ACKNOWLEDGMENTS

We thank Siegfried Heintze for help with programming and tape production. Denise Rougon-Mutschler proofread GRANNY. Dolores Gable, W. E. Hall, D. A. Johnson, R.

1/ Climax and Henderson, Colorado, and Questa, New Mexico.

U. King, P. W. Lipman, M. E. McCallum, C. M. Rice, Priestley Toulmin, Ogden Tweto, and R. A. Zielenski graciously made unpublished analyses available to us.

DESCRIPTION OF GRANNY

GRANNY is available in two formats: (1) hardcopy, either as paper- or microfiche-copy of computer printout; and (2) computer-readable magnetic tape.

The same information is contained in both formats except that on the hardcopy version some information which is stored in code on the tape version is printed as the corresponding English literals. For example, the mineral name "quartz" is stored on the tape version as "UM", but is printed out as "QUARTZ" on the hardcopy.

The analyses in the hardcopy version of GRANNY are arranged by major groups and by secondary groups as explained below. Major groups are arranged in alphabetic order and secondary groups for each major group are arranged in the order listed on Table 1.

On the tape version of GRANNY analyses are arranged sequentially by record number (see below), in the order in which they were entered into the data bank. Tape characteristics are listed on page 35.

The following two sections are addressed to different audiences. The section, "Variable descriptions" tells the petrologist-user what information is stored in GRANNY. The section "Tape description, data formats, coding form, and program listings" is directed to computer programmers and data managers who will be responsible for loading the data bank into a computer and interfacing it with system- or user-supplied software.

Variable descriptions

Values for up to 106 variables may be stored for each analyzed specimen. Each analysis must have values for the variables AUTHOR, DATE, MAJOR GROUP, ROCK CODE, RECORD NUMBER, and at least eight of the MAJOR CONSTITUENTS: SiO₂, Al₂O₃, Fe₂O₃, FeO, MgO, CaO, Na₂O, K₂O, H₂O, H₂O-, TH₂O, TiO₂, P₂O₅, and MnO.

The variables are described below and are listed on Table 5.

AUTHOR:

Surname of author. Multiple authors are indicated by a plus sign (+) following the senior author's name. Complete citations for all references and unpublished data are given in Table 1.

DATE:

Year of publication, or year of inclusion in data bank for unpublished analyses.

MAJOR GROUP:

The analytical data are divided into 15 major groups which represent geographic areas. A three character alphabetic code is used for each major group. Table 1 contains a listing of the major group codes. The areas represented by the major group codes are shown on Figure 1.

SECONDARY GROUP:

Major groups may be subdivided into secondary groups (abbreviated SECOND GROUP on the printout). Secondary groups represent geographic location, or stratigraphic unit subdivisions. A two- to four-character alphabetic code is used to designate each secondary group. These codes are listed in Table 1. Even if a major group is divided into secondary groups not all analyses in that major group need have secondary group codes. On the printout analyses not assigned to a secondary group are listed last under each major group.

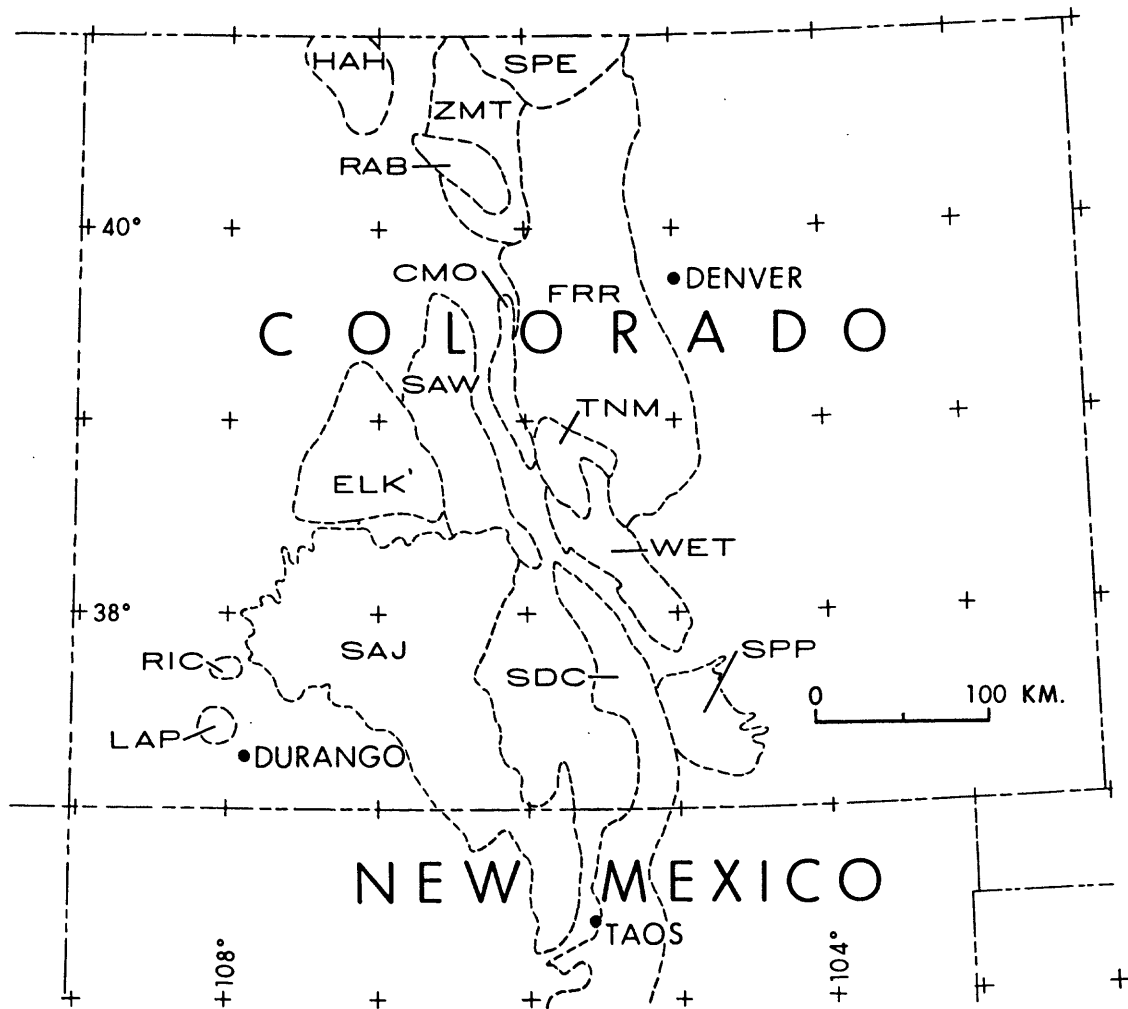


Figure 1 -- Index map showing areas represented by major group codes.

Figure 1. -- Explanation

Code ----	Major group -----
CMO	Mosquito Range
ELK	Elk Range, Ruby Range, and West Elk volcanic field
FRR	Front Range
HAH	Hahns Peak area
LAP	La Plata Mountains
RAB	Rabbit Ears volcanic field
RIC	Rico mining district
SAJ	San Juan volcanic field
SAW	Sawatch Range
SDC	Sangre de Cristo Mountains
SPE	Never Summer Range, Medicine Bow Range, and environs
SPP	Spanish Peaks
TNM	Thirtynine Mile volcanic field
WET	Wet Mountains
ZMT	Misc. Miocene tuffs, northwestern Colorado

Table 1. -- Listing of major group codes, secondary group codes, and sources of analyses for each major group.

Major group code	Location	Number of analyses
*****	*****	*****
CMO	MOSQUITO RANGE, COLORADO	64

SECONDARY GROUP CODES

Climax

CXL Late rhyolite dikes
 CXS Climax stock, undivided
 CXSC Climax stock, central mass
 CXSG Climax stock, seriate granite
 CXSS Climax stock, southwest mass
 CXSL Climax stock, lower intrusive series
 CM Chalk Mountain rhyolite
 CLP Lincoln Porphyry (pre-ore)

Leadville district

LER Rhyolites
 LEP Pando Porphyry

 RU Ruby Mountain (Nathrop) volcanic complex

 UK Buckskin Gulch stock

SOURCES OF ANALYSES

Butler, B. S., and Vanderwilt, J. W., 1933, The Climax molybdenum deposit, Colorado, with a section on history, production, metallurgy and development by Charles W. Henderson: U. S. Geological Survey Bulletin 846-C, p. 195-237.

Carmichael, I. S. E., 1963, The crystallization of feldspar in volcanic acid liquids: Geological Society of London Journal, v. 119, p. 95-131.

Christiansen, E. H., Bikun, J. V., and Burt, D. M., 1980, Petrology and geochemistry of topaz rhyolites, western U. S. A., in, Burt, D. M., and Sheridan, M. F., editors, Uranium mineralization in fluorine-enriched volcanic rocks: U. S. Department of Energy, Report GFBX-225(80), p. 37-122.

Cross, C. W., 1886, On the occurrence of topaz and garnet in lithophyses of rhyolite: American Journal of Science, 3d Series, v. 31, p. 432-438.

Table 1. (continued)

- Emmons, S. F., 1886, Geology and mining industry of Leadville, Colorado: U. S. Geological Survey Monograph 12, 770 p.
- Emmons, S. F., Irving, J. D., and Loughlin, G. F., 1927, Geology and ore deposits of the Leadville mining district, Colorado: U. S. Geological Survey Professional Paper 148, 368 p.
- Hall, W. E., 1973, Unpublished data.
- Johnson, D. A., 1983, Unpublished data.
- Kuntz, M. A., 1968, Petrogenesis of the Buckskin Gulch intrusive complex, northern Mosquito Range, Colorado: Stanford, Stanford University, Ph. D. Thesis, 200 p.
- Lux, D. R., 1977, A major element geochemical study of Laramide igneous rocks of the Colorado mineral belt: Houston, Rice University, M. S. thesis, 77 p.
- Mutschler, F. E., Wright, E. G., Ludington, Steve, and Abbott, J. T., 1981, Granite molybdenite systems: Economic Geology, v. 76, p. 874-897.
- Mutschler, F. E., 1982, Unpublished data.
- Ranta, D. E., 1974, Geology, alteration, and mineralization of the Winfield (La Plata) district, Chaffee County, Colorado: Golden, Colorado School of Mines, Ph. D. Thesis, 261 p.
- Schooler, R. A., 1982, Interpretation of rock and vapor phase relations in the Ruby Mountain volcanic complex, Chaffee County, Colorado: Bowling Green, Ohio, Bowling Green State University, M. S. Thesis, 104 p.
- Spencer, Edmondson, 1930, A contribution to the study of moonstone from Ceylon and other areas and of the stability relations of the alkali-feldspars: Mineralogical Magazine, v. 22, p. 291-367.
- Steininger, Roger, 1973, Hydrothermal alteration in some quartz monzonite dikes at the Climax molybdenum deposit, Colorado: Brigham Young University Geology Studies, v. 20, Part 1, p. 115-128.
- Tweto, Ogden, 1983, Unpublished data.

Table 1. (continued)

Van Alstine, R. E., 1969, Geology and mineral deposits of the Poncha Springs NE quadrangle, Chaffee County, Colorado: U. S. Geological Survey Professional Paper 626, 52 p.

White, W. H., Bookstrom, A. A., Kamilli, R. J., Ganster, M. W., Smith, R. P., Ranta, D. E., and Steininger, R. C., 1981, Character and origin of Climax-type molybdenum deposits: Economic Geology, 75th Anniversary Volume, p. 270-316.

Table 1. (continued)

ELK ELK RANGE, RUBY RANGE, AND WEST ELK VOLCANIC 95
FIELD, COLORADO

SECONDARY GROUP CODES

BOS Boston Peak rhyolite

Granite of Treasure Mountain dome

TM Undivided

TMWQ White quartz porphyry facies

TMBM Bear Mountain porphyry facies

TMTB Twin Bridges porphyry facies

TMGR Granular facies

TMGM Mafic granite facies

RM Round Mountain rhyolite

RR Redwell Basin rhyolite

Mount Emmons

EM Undivided

EMK Keystone stock

EMLP Red Lady stock, porphyry phase

EMLA Red Lady stock, aplite phase

EMLB Red Lady stock, border phase

Miscellaneous felsites

MSA Middle Anthracite Creek, Ruby Range

MSB Buck Hollow, West Elk Mountains

MSE Emerald Lake, Elk Range

MSL Lost Trail Creek, Elk Range

MSP Spring Creek, Elk Range

MSS Smooth Canyon, West Elk Mountains

ITL Italian Mountain Intrusive Complex

PSS Paradise Pass stock

SNS Snowmass stock

Tomichi Dome

TD Undivided

TDU Upper unit

TDL Lower unit

TDX Breccia pipe

TDS Sill

TDT Remote tuff

Table 1. (continued)

SOURCES OF ANALYSES

- Cunningham, C. G., Jr., 1976, Petrogenesis and postmagmatic geochemistry of the Italian Mountain Intrusive Complex, eastern Elk Mountains, Colorado: Geological Society of America Bulletin, v. 86, p. 897-908.
- Ernst, D. R., 1980, Petrography and geochemistry of Boston Peak and Tomichi Dome, and relation to other plutons in Gunnison County, Colorado: Cheney, Eastern Washington University, M. S. Thesis, 52 p.
- Johnson, D. A., 1983, Unpublished data.
- Kurtz, J. P., 1983, A mechanism for the concentration of copper in felsic magmas related to porphyry deposits: Chapel Hill, University of North Carolina, Ph. D. Thesis, 195 p.
- Mutschler, F. E., 1968, Geology of the Treasure Mountain dome, Gunnison County, Colorado: Boulder, University of Colorado, Ph. D. Thesis, 240 p.
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- Vanderwilt, J. W., 1937, Geology and mineral deposits of the Snowmass Mountain area, Gunnison County, Colorado: U. S. Geological Survey Bulletin 884, 184 p.
- White, W. H., Bookstrom, A. A., Kamilli, R. J., Ganster, M. W., Smith, R. P., Ranta, D. E., and Steininger, R. C., 1981, Character and origin of Climax-type molybdenum deposits: Economic Geology, 75th Anniversary Volume, p. 270-316.
- Young, E. J., 1972, Laramide-Tertiary intrusive rocks of Colorado: U. S. Geological Survey Open-File Report, 206 p.

Table 1. (continued)

FRR FRONT RANGE, COLORADO 39

SECONDARY GROUP CODES

	Henderson-Urad
HEU	Undivided
HEUH	Henderson granite
HEUP	Primos porphyry
HEUU	Urad porphyry
HEUR	Red Mountain porphyry
LVN	Leavenworth Gulch (Georgetown) volcanic complex
MON	Montezuma stock
EBO	Bostonite and rhyolite dikes--Eastern slope
ALC	Alice stock
JIM	Jamestown granite complex

SOURCES OF ANALYSES

Bookstrom, A. A., 1981, Tectonic setting and generation of Rocky Mountain porphyry molybdenum deposits: Arizona Geological Society Digest, v. 14, p. 215-226.

Braddock, W. A., 1969, Geology of the Empire quadrangle, Grand, Gilpin, and Clear Lake Counties, Colorado: U. S. Geological Survey Professional Paper 616, 56 p.

Gable, Dolores, 1983, Unpublished data.

Hoblitt, R., and Larson, E., 1975, Paleomagnetic and geochronologic data bearing on the structural evolution of the northeastern margin of the Front Range, Colorado: Geological Society of America Bulletin, v. 86, p. 237-242.

Jenkins, R. E., II, 1979, Geology, geochemistry and origin of mineral deposits in the Hill Gulch area, Jamestown, Colorado: Golden, Colorado School of Mines, Ph. D. Thesis, 220 p.

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King, R. U., 1971, Unpublished data.

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Mutschler, F. E., 1982, Unpublished data.

Phair, George, and Jenkins, L. B., 1975, Tabulation of uranium and thorium data on the Mesozoic-Cenozoic intrusive rocks of known chemical composition in Colorado: U. S. Geological Survey Open-File Report 75-501, 57 p.

Ranta, D. E., 1974, Geology, alteration, and mineralization of the Winfield (La Plata) district, Chaffee County, Colorado: Golden, Colorado School of Mines, Ph. D. Thesis, 261 p.

Rice, C. M., 1983, Unpublished data.

White, W. H., Bookstrom, A. A., Kamilli, R. J., Ganster, M. W., Smith, R. P., Ranta, D. E., and Steininger, R. C., 1981, Character and origin of Climax-type molybdenum deposits: Economic Geology, 75th Anniversary Volume, p. 270-316.

Table 1. (continued)

HAH HAHNS PEAK AREA, COLORADO 1

SOURCES OF ANALYSES

Segerstrom, K., and Young, E. J., 1972, General geology of the Hahns Peak and Farwell Mountain quadrangles, Routt County, Colorado: U. S. Geological Survey Bulletin 1349, 63 p.

LAP LA PLATA MOUNTAINS, COLORADO 2

SECONDARY GROUP CODES

AS Allard stock

SOURCES OF ANALYSES

Werle, J. L., Ikramuddin, Mohammed, and Mutschler, F. E., 1983, Allard stock, La Plata Mountains, Colorado--An enigmatic porphyry copper-precious metal deposit: Canadian Journal of Earth Sciences (in press).

Table 1. (continued)

RAB RABBIT EARS VOLCANIC FIELD, COLORADO 6

SECONDARY GROUP CODES

SPE Welded tuff--probably derived from Never Summer
Range (SPE)

SOURCES OF ANALYSES

Hail, W. J., Jr., 1968, Geology of southwestern North Park
and vicinity, Colorado: U. S. Geological Survey
Bulletin 1257, 119 p.

Izett, G. A., 1968, Geology of the Hot Sulphur Springs
quadrangle, Grand County, Colorado: U. S. Geological
Survey Professional Paper 586, 79 p.

RIC RICO MINING DISTRICT, COLORADO 1

SOURCES OF ANALYSES

McKnight, E. T., 1974, Geology and ore deposits of the
Rico district, Colorado: U. S. Geological Survey
Professional Paper 723, 100 p.

Table 1. (continued)

SAJ SAN JUAN VOLCANIC FIELD, COLORADO

151

SECONDARY GROUP CODES

HIN Hinsdale Formation

Chicago Basin intrusive center

XD Late dike (mafic rock)

XY Younger intrusive

XOD Dikes related to older stock

XO Older stock

Lake City caldera

LRI Post-caldera intrusives

LRIN Nellie Creek intrusive

LAG Alpine Gulch granite

LSP Sunshine Peak Tuff

Post-caldera intrusives near Silverton

SSI South Silverton area

SHI Horseshoe Bend, Chattanooga

SPI Stony Mountain

SNI National Belle plug, Red Mountain

Creede caldera

CMM Mammoth Mountain Tuff--Farmers Creek Rhyolite

CWP Wasson Park Tuff

Cochetopa Park caldera

HD Dome

HCP Cochetopa Park Tuff

Bachelor caldera

BCR Carpenter Ridge Tuff

La Garita caldera

LFC Fish Canyon Tuff

Silverton caldera

SCL Crystal Lake Tuff

San Juan and Uncompahgre calderas

SBH Burns and Henson Formations
(post-collapse flows)

SSM Sapinero Mesa Tuff

SDM Dillon Mesa Tuff

Table 1. (continued)

	Lost Lake caldera
KBM	Blue Mesa Tuff
	Summitville and Platoro calderas
PF	Flows
PTM	Treasure Mountain Tuff
	Bonanza caldera
BZP	Porphyry Peak Rhyolite
BZM	Miscellaneous altered rocks
	Early intermediate stratovolcanoes
EIL	Miscellaneous lavas and tuffs
EIS	Summer Coon volcanic center
OL	Miscellaneous Oligocene
XX	Stratigraphic position unknown

SOURCES OF ANALYSES

- Burbank, W. S., 1932, Geology and ore deposits of the Bonanza mining district, Colorado: U. S. Geological Survey Professional Paper 169, 166 p.
- Ernst, R. P., 1981, Granite and rhyolite relationships of the Lake City caldera area, Hinsdale County, Colorado: Cheney, Eastern Washington University, M. S. Thesis, 60 p.
- Larsen, E. S., Jr., and Cross, Whitman, 1956, Geology and petrology of the San Juan region, southwestern Colorado: U. S. Geological Survey Professional Paper 258, 303 p.
- Leedy, W. P., 1971, Hydrothermal alteration of volcanic rocks in the Red Mountains district of the San Juan Mountains, Colorado: Buffalo, State University of New York at Buffalo, Ph. D. Thesis, 108 p.
- Lipman, P. W., 1968, Geology of the Summer Coon volcanic center, eastern San Juan Mountains, Colorado: Colorado School of Mines Quarterly, v. 63, no. 3, p. 211-236.
- Lipman, P. W., 1975, Evolution of the Platoro caldera complex and related volcanic rocks, southeastern San Juan Mountains, Colorado: U. S. Geological Survey Professional Paper 852, 128 p. (Major element oxide data is original analytical data. Data in Lipman (1975) has been normalized to total 100 percent, volatile free.)

Table 1. (continued)

Lipman, P. W., 1976, Unpublished data.

Mertzman, S. A., Jr., 1971, The Summer Coon volcano, eastern San Juan Mountains, Colorado: New Mexico Geological Society Guidebook of the San Luis Basin, Colorado--Twenty-second field Conference--September 30-October 1-2, 1971, p. 265-272.

Mutschler, F. E., 1982, Unpublished data.

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Ransome, F. L., 1901, Economic geology of the Silverton quadrangle, Colorado: U. S. Geological Survey Bulletin 182, 265 p.

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Schmitt, L. J., and Raymond, W. H., 1977, Geology and mineral deposits of the Needle Mountains district, southwestern Colorado: U. S. Geological Survey Bulletin 1434, 40 p. (Trace element data from: Steven, T. A., Schmitt, L. J., Jr., Sheridan, M. J., and Williams, F. E., 1969, Mineral resources of the San Juan primitive area, Colorado: U. S. Geological Survey Bulletin 1261-F, 187 p.)

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Steven, T. A., Lipman, P. W., Fisher, F. S., Beiniewski, C. L., Meeves, H. C., Popenoe, Peter, and Luedke, R. G., 1977, Mineral resources of study areas contiguous to the Uncompahgre primitive area, San Juan Mountains, southwestern Colorado: U. S. Geological Survey Bulletin 1391-E, p. E1-E126.

Steven, T. A., and Ratte, J. C., 1960, Geology and ore deposits of the Summitville district, San Juan Mountains, Colorado: U. S. Geological Survey Professional Paper 343, 70 p.

Table 1. (continued)

Varnes, D. J., 1963, Geology and ore deposits of the south
Silverton mining area, San Juan County, Colorado:
U. S. Geological Survey Professional Paper 378-A,
p. A1-A56.

Zielinski, R. A., 1983, Unpublished data.

Table 1. (continued)

SAW SAWATCH RANGE, COLORADO 42

SECONDARY GROUP CODES

TU	Turquoise Lake
OH	Ohio City
	Winfield
WIM	Middle Mountain complex
WWP	Winfield Peak complex
GZ	Grizzly Peak caldera
ANT	Mount Antero granite
TW	Twin Lakes stock
ASP	Aspen district

SOURCES OF ANALYSES

Bryant, Bruce, 1979, Geology of the Aspen 15-minute quadrangle, Pitkin and Gunnison Counties, Colorado: U. S. Geological Survey Professional Paper 1073, 146 p.

Dings, M. G., and Robinson, C. S., 1957, Geology and ore deposits of the Garfield quadrangle, Colorado: U. S. Geological Survey Professional Paper 289, 110 p.

Holtzclaw, M. J., 1973, Geology, alteration, and mineralization of the Red Mountain stock, Grizzly Peak cauldron complex, Colorado: Stillwater, Oklahoma State University, M. S. Thesis, 79 p.

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Table 1. (continued)

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Toulmin, Priestley, 1983, Unpublished data.

Wilshire, H. G., 1969, Mineral layering in the Twin Lakes granodiorite, Colorado: Geological Society of America Memoir 115, p. 235-261.

Table 1. (continued)

SDC SANGRE DE CRISTO MOUNTAINS, COLORADO--NEW MEXICO 33

SECONDARY GROUP CODES

CPS Cottonwood Peak stock, Colorado

Questa, New Mexico

QUE Undivided

QUEL Late granite porphyry

QUEG Goat Hill porphyry

QUEA Questa Mine aplite

QUEC Log Cabin granite

QUEV Volcanics

SOURCES OF ANALYSES

Clark, K. R., and Read, C. B., 1972, Geology and ore deposits of the Eagle Nest area, New Mexico: New Mexico Bureau of Mines and Mineral Resources Bulletin 94, 149 p.

Ishihara, Shunso, 1967, Molybdenum mineralization at Questa mine, New Mexico, U. S. A.: Geological Survey of Japan Report no. 218, 64 p.

Kurtz, J. P., 1983, A mechanism for the concentration of copper in felsic magmas related to porphyry deposits: Chapel Hill, University of North Carolina, Ph. D. Thesis, 195 p.

Mutschler, F. E., 1982, Unpublished data.

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Table 1. (continued)

SPE NEVER SUMMER RANGE, MEDICINE BOW RANGE, 25
AND ENVIRONS, COLORADO

SOURCES OF ANALYSES

Corbett, M. K., 1968, Tertiary volcanism of the Specimen-
Lulu-Iron Mountain area, north central Colorado:
Colorado School of Mines Quarterly, v. 63, no. 3,
p. 1-37.

Mc Callum, M. E., 1983, Unpublished data.

Wahlstrom, E. E., 1944, Structures and petrology of
Specimen Mountain, Colorado: Geological Society of
America Bulletin, v. 55, p. 77-90.

SPP SPANISH PEAKS, COLORADO 5

SOURCES OF ANALYSES

Johnson, R. B., 1968, Geology of the igneous rocks of the
Spanish Peaks region, Colorado: U. S. Geological
Survey Professional Paper 594-G, 47 p.

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region, Colorado: Geological Society of America
Bulletin, v. 47, p. 1729-1784.

Young, E. J., 1972, Laramide-Tertiary intrusive rocks of
Colorado: U. S. Geological Survey Open-File Report,
206 p.

Table 1. (continued)

TNM THIRTYNINE MILE VOLCANIC FIELD, COLORADO 8

SECONDARY GROUP CODES

GP	Gribbles Park Tuff
TR	Thorn Ranch Tuff
EG	East Gulch Tuff
SR	Tuff of Stirrup Ranch
WM	Wall Mountain Tuff

SOURCES OF ANALYSES

Epis, R. C., and Chapin, C. E., 1974, Stratigraphic nomenclature of the Thirtynine Mile volcanic field, central Colorado: U. S. Geological Survey Bulletin 1395-C, p. C1-C23.

Van Alstine, R. E., 1969, Geology and mineral deposits of the Poncha Springs NE quadrangle, Chaffee County, Colorado: U. S. Geological Survey Professional Paper 626, 52 p.

Table 1. (continued)

WET WET MOUNTAINS, COLORADO

30

SECONDARY GROUP CODES

AN	Antrim Lode plug
RO	Rosita volcanic center
SL	Silver Cliff volcanic center

SOURCES OF ANALYSES

Anderson, F. G., Selvig, W. A., Baur, G. S., Colbassoni, P. J., and Bank, Walter, 1956, Composition of perlite: U. S. Bureau of Mines Report of Investigations 5199, 13 p.

Cross, Whitman, 1896, Geology of Silver Cliff and the Rosita Hills, Colorado: U. S. Geological Survey 17th Annual Report, Part 2, p. 263-403.

Mutschler, F. E., 1982, Unpublished data.

Mutschler, F. E., Ikramuddin, Mohammed, and Ludington, Steve, 1983, Silver Cliff, Colorado--Possible high-level expression of a granite molybdenite system in a bonanza silver camp: Economic Geology (in press).

Phair, George, and Jenkins, L. B., 1975, Tabulation of uranium and thorium data on the Mesozoic-Cenozoic intrusive rocks of known chemical composition in Colorado: U. S. Geological Survey Open-File Report 75-501, 57 p.

Table 1. (continued)

ZMT MISC. MIOCENE TUFFS, NORTHWESTERN COLORADO 5

* SOURCE AREAS MAY BE OUTSIDE OF COLORADO *

SECONDARY GROUP CODES

BPF Browns Park Formation
NPF North Park Formation
TRF Troublesome Formation

SOURCES OF ANALYSES

Izett, G. A., 1968, Geology of the Hot Sulphur Springs
quadrangle, Grand County, Colorado: U. S. Geological
Survey Professional Paper 586, 79 p.

Izett, G. A., Denson, N. M., and Obradovich, J. D., 1970,
K-Ar age of the lower part of the Browns Park
Formation, northwestern Colorado: U. S. Geological
Survey Professional Paper 700-C, p. C150-C152.

LATITUDE:

Latitude (abbreviated LAT on the printout) of the sample location to the nearest one-hundredth part of a decimal degree, followed by an "N" for north.

LONGITUDE:

Longitude (abbreviated LONG on the printout) of the sample location to the nearest one-hundredth part of a decimal degree, followed by a "W" for west.

FLAGS:

Flags give information on the nature of the analytical data. Up to six flags may be stored for each analysis, but a maximum of two are used in this version of GRANNY. Each flag consists of two characters as shown below:

INFORMATION -----	FLAG ----
Total iron is reported as either Fe2O3 or FeO	2D
Analytical data represents an average of analyses of two or more specimens	3K

ROCK NAME -- CODE:

ROCK NAME is the name assigned to the analyzed specimen by the author. It is recorded by a literal name, and consists of up to 20 alphabetic characters. CODE consists of a four integer number which may be translated as shown on Table 2, and which represents the literal name stored in ROCK NAME.

Table 2. -- Rock names and codes.

ROCK NAME -----	CODE -----
NOT NAMED BY AUTHOR	0010
NAME NOT RECOGNIZED IN GRANNY	0020
ALASKITE	0080
ANDESITE	0190
APHANITE	0280
APLITE	0290
BOSTONITE	0750
FELSITE	1240
GLASS	1390
GRANITE	1420
GRANODIORITE	1490
MICROGRANITE	1440
MONZONITE	2310
NEVADITE	2400
OBSIDIAN	2500
PERLITE	2730
PITCHSTONE	2830
PORPHYRY	2870
PUMICE	2930
QUARTZ BOSTONITE	0760
QUARTZ LATITE	1980
QUARTZ MONZONITE	2330
QUARTZ PORPHYRY	2890
RHYODACITE	3000
RHYOLITE	3010
SODA GRANITE	1470
SYENITE	3350
TUFF	3880
VITROPHYRE	4000
WELDED TUFF	4060

AGE:

Both minimum and maximum values for stratigraphic and isotopic ages may be given for a sample. The method for determining ages may be specified. AGE: STRATIGRAPHIC: Minimum (MIN) and maximum (MAX) limits may be given with four character codes from the following list.

Age ---	m.y. ----	Code ----
Cenozoic	0-65	CENO
Pliocene	2-5	PLIO
Miocene	5-23	MIOC
Oligocene	23-38	OLIG
Eocene	38-53	EOCE
Paleocene	53-65	PALC
Cretaceous	65-135	CRET

Each code is followed by two blank characters. These were left for insertion of modifiers if the user desires.

AGE: ISOTOPIIC: Six-digit minimum (MIN) and maximum (MAX) ages may be given in m.y. Two decimal places are provided for.

AGE: METHOD: A code of up to four characters may be used to designate the age determination method. The current version of GRANNY uses the following codes.

Method -----	Code ----
Potassium-argon	KAR
Fission track	FSTR

NUMBER OF MINERALS:

This field contains the number of mineral names coded for the specimen (see below). It is not included on the printout.

MINERALS:

Up to ten codes for rock-forming minerals occurring in the analyzed sample may be included here. The first two characters of each code represent the mineral name as shown on Table 3. The third through fifth characters refer to the habit of the mineral. Only one of these habit codes is used in this version of GRANNY (see Table 3).

The print program translates the codes stored in the data bank back into mineral names on the printout.

Table 3. -- Mineral names and codes.

MINERAL PRINTOUT -----	CODE ----
Framework silicates	
SiO ₂ minerals	
CRISTOBALITE	UK
QUARTZ	UM
TRIDYMIT	UN
Feldspars	
FELDSPAR	NB
Alkali feldspars	
ALKALI FELDSPAR	NC
ANORTHOCLASE	ND
K-FELDSPAR	NE
MICROCLINE	NF
ORTHOCLASE	NH
PERTHITE	NI
SANIDINE	NJ
Plagioclase feldspars	
ALBITE	NP
ANDESINE	NT
NA-PLAGIOCLASE	NM
OLIGOCLASE	NR
OLIGOCLASE-ANDESINE	NS
PLAGIOCLASE	NL
Sheet silicates	
BIOTITE	PB
CHLORITE	PG
MUSCOVITE	PD
SERICITE	PF
Chain silicates	
AMPHIBOLE	QA
AUGITE	RG
DIOPSIDE	RH
HORNBLENDE	QD
PYROXENE	RA
Orth- and Ring silicates	
EPIDOTE	TH
GARNET	TI
SPESSARTINE	TO
TOPAZ	TR
TOURMALINE	TS

Table 3. (continued)

Non-silicates

FLUORITE	VF
HABIT SUFFIX (PRINTOUT) -----	CODE -----
PHENOCRYST (PHENO.)	7

OCCURRENCE AND PETROGRAPHY:

Mode of occurrence and petrographic descriptors (abbreviated OCCUR-PETROG. on printout) are listed by up to six codes for each specimen. The occurrence is always listed first. The occurrence and petrographic descriptor codes are listed in Table 4. The print program translates the codes back into their literal names on the printout.

Table 4. -- Occurrence and petrographic descriptor codes.

OCCURRENCE -----	CODE ----
ASH FLOW	AE
BRECCIA	AJ
DIKE	AM
DOVE	AN
FLOW	AP
FLOW BRECCIA	AQ
LACCOLITH	AW
PIPE	BI
PLUG	BJ
PLUTON	BK
PYROCLASTIC	BN
SILL	BS
STOCK	BU
TUFF	BZ
WELDED TUFF	CE
PETROGRAPHIC DESCRIPTOR -----	CODE ----
APLITIC	DU
DEVITRIFIED	DZ
EQUIGRANULAR	ED
GLASSY	EH
HOLOHYALINE	EQ
PORPHYRITIC	FP
PUMICEOUS	FQ
VITROPHYRIC	GC

ALTERATION:

Up to four codes may be used to describe alteration assemblages. Each code consists of a one or two character code, which may be suffixed with an additional character to indicate alteration intensity. The codes are listed below. The print program translates the codes into English on the printout.

ALTERATION ASSEMBLAGE -----	CODE ----
FRESH	F
ALTERED (Assemblage not specified)	IC
ALUNITIC	AL
ARGILLIC	AR
POTASSIC	K
QUARTZ-MAGNETITE	QM
QUARTZ-SERICITE	QS
SILICIFICATION	SI
INTENSITY SUFFIX (PRINTOUT) -----	CODE ----
WEAK (-W)	W
MODERATE (-M)	M
STRONG (-S)	S
EXTREME (-X)	X

AUTHOR NUMBER:

AUTHOR NUMBER is the author's sample number or the page (P.) or table (T.) on which the analysis is given in the source. Up to ten characters.

RECORD NUMBER:

Each analysis was assigned a sequential five-digit record number when it was entered into the data bank. This version of GRANNY contains 507 records.

MAJOR CONSTITUENTS:

Weight percentages of up to 26 constituents may be stored for each analysis. The constituents are given in the following order: SiO₂, Al₂O₃, Fe₂O₃, FeO, MgO, CaO, Na₂O, K₂O, H₂O+, H₂O-, TH₂O (Total H₂O), LOI (Loss on ignition), TiO₂, P₂O₅, MnO, ZrO₂, CO₂, SO₃, Cl, F, S, Cr₂O₃, NiO, BaO, Rb₂O, SrO. Major constituent values generally have two decimal places except for TiO₂, P₂O₅, MnO, Cl, F, S, Cr₂O₃, BaO, Rb₂O, and SrO which have three decimal places. A less than sign (<) preceding the CO₂ value indicates less than the value shown.

TOTAL:

This is a computer generated sum of the major constituents.

TRACE ELEMENTS:

Values for up to 37 trace elements may be stored for each sample. The trace elements are given in the order listed below: Ag, As, Au, B, Ba, Be, Bi, Ce, Co, Cr, Cu, F, Ga, Hg, La, Li, Mo, Nb, Nd, Ni, Pb, Rb, Sb, Sc, Sn, Sr, Ta, Te, Th, Tl, U, V, W, Y, Yb, Zn, and Zr.

All values are in parts per million (ppm) except for Au, Hg, and Te which are in parts per billion (ppb). A less than sign (<) before any trace element value indicates less than the amount shown.

Each trace element is stored as up to seven numeric characters with two decimal places. Trailing zeros to the right of the decimal point should be ignored.

Tape description, data formats, coding

form, and program listings

The tape is 9 track, 1600 BPI, ASCII character set. The tape is unlabeled, and contains two files, MOL.TEXT;1 and MOL.DAT;1. Data is blocked at 1214 characters per block. There are 2 records per 1214 character block.

File MOL.TEXT;1 is documentation for GRANNY. Records are fixed format and are 80 characters long.

File MOL.DAT;1 is the GRANNY data base. Records are fixed format and 607 characters long. The petrologist-user will recognize 106 variables per record. Table 5 lists the variable names and their formats.

The GRANNY data bank was built on a VAX 11/780 using DATATRIEVE-11-VERSION V02.04, the DEC query and report writing system. Table 6 gives listings of the DATATRIEVE domain and record definitions for inputting GRANNY records, DATATRIEVE procedures for printing records, and DATATRIEVE description tables.

Table 7 is a coding form which may be used for inputting additional data into GRANNY.

Table 5. -- Variable names and formats for GRANNY.

VARIABLE NAME (INPUT NAME)	DATATRIEVE QUERY NAME	COBOL FORMAT	DATATRIEVE PRINTOUT LABEL
-----	-----	-----	-----
AUTHOR		13X	AUTHOR
DATE		4X	DATE
MAJ-GRP-CODE	MAJ	3X	MAJOR GROUP
SEC-GRP-CODE	SEC	4X	SECOND GROUP
LAT		99V99	LAT
N-OR-S		X	
LONG		999V99	LONG
E-OR-W		X	
ROCK-NAME	RX-CO	20X	ROCK NAME
RX-CODE	RX-NO	9999	CODE
AGE			
AGE-STR-MIN	AG-S-MN	6X	STRAT-MIN
AGE-STR-MAX	AG-S-MX	6X	-MAX
AGE-ISO-MIN	AG-I-MIN	9999V99	ISOTOPIC-MIN
AGE-ISO-MAX	AG-I-MAX	9999V99	-MAX
AGE-ISO-METHOD	AG-I-METH	4X	METHOD
FLAGS			FLAGS
FLAG-1	F-1	2X	
FLAG-2	F-2	2X	
FLAG-3	F-3	2X	
FLAG-4	F-4	2X	
FLAG-5	F-5	2X	
FLAG-6	F-6	2X	
NO-MIN-DESC		99	
(MIN)			MINERALS
MIN-1	M-1	5X	
MIN-2	M-2	5X	
MIN-3	M-3	5X	
MIN-4	M-4	5X	
MIN-5	M-5	5X	
MIN-6	M-6	5X	
MIN-8	M-8	5X	
MIN-9	M-9	5X	
MIN-10	M-10	5X	
(PET)			OCCUR-PETROG.
OCCUR	P-1	2X	
PET-2	P-2	2X	
PET-3	P-3	2X	
PET-4	P-4	2X	
PET-5	P-5	2X	
PET-6	P-6	2X	
			ALTERATION
ALT-1	A-1	3X	
ALT-2	A-2	3X	
ALT-3	A-3	3X	
ALT-4	A-4	3X	
AUT-ANAL-NO	AN-NO	10X	AUTHOR NUMBER
REC-NO		99999	RECORD NUMBER

Table 5. (continued)

(MAJ-OX)		MAJOR CONSTITUENTS
SI02	99V99	Si02
AL203	99V99	Al203
FE203	99V99	Fe203
FE0	99V99	Fe0
MGO	99V99	Mg0
CA0	99V99	Ca0
NA20	99V99	Na20
K20	99V99	K20
H20-PLUS	99V99	H20+
H20-MINUS	99V99	H20-
T-H20	99V99	TH20
LOI	99V99	LOI
TI02	99V999	Ti02
P205	99V999	P205
MNO	99V999	Mn0
ZR02	99V99	Zr02
CO2	99V99	CO2
SC02	X	
S03	99V99	S03
CL	99V999	Cl
F	99V999	F
S	99V999	S
CR203	99V999	Cr203
NIO	99V99	Ni0
BA0	99V999	Ba0
RB20	99V999	Rb20
SRO	99V999	Sr0
AUT-TOT	999V999	TOTAL
(TRACE-ELEM)		TRACE ELEMENTS
AG	99999V99	Ag
S-AG	X	
AS	99999V99	As
S-AS	X	
AU-	99999V99	Au*
S-AU-	X	
B	99999V99	B
S-B	X	
BA	99999V99	Ba
S-BA	X	
BE	99999V99	Be
S-BE	X	
BI	99999V99	Bi
S-BI	X	
CE	99999V99	Ce
S-CE	X	
CO	99999V99	Co
S-CO	X	
CR	99999V99	Cr
S-CR	X	
CU	99999V99	Cu
S-CU	X	

Table 5. (continued)

F2	99999V99	F
S-F2	X	
GA	99999V99	Ga
S-GA	X	
HG-	99999V99	Hg*
S-HG-	X	
LA	99999V99	La
S-LA	X	
LI	99999V99	Li
S-LI	X	
MO	99999V99	Mo
S-MO	X	
NB	99999V99	Nb
S-NB	X	
ND	99999V99	Nd
S-ND	X	
NI	99999V99	Ni
S-NI	X	
PB	99999V99	Pb
S-PB	X	
RB	99999V99	Rb
S-RB	X	
SB	99999V99	Sb
S-SB	X	
SC	99999V99	Sc
S-SC	X	
SN	99999V99	Sn
S-SN	X	
SR	99999V99	Sr
S-SR	X	
TA	99999V99	Ta
S-TA	X	
TE-	99999V99	Te*
S-TE-	X	
TH	99999V99	Th
S-TH	X	
TL	99999V99	Tl
S-TL	X	
U	99999V99	U
S-U	X	
V	99999V99	V
S-V	X	
W	99999V99	W
S-W	X	
Y	99999V99	Y
S-Y	X	
YB	99999V99	Yb
S-YB	X	
ZN	99999V99	Zn
S-ZN	X	
ZR	99999V99	Zr
S-ZR	X	

Table 5. (continued)

Names in parentheses are not stored variables.

Table 6. -- DATATRIEVE programs, procedures and tables.

DATATRIEVE domain and record definition for inputting

GRANNY records.

```

DEFINE DOMAIN MOL
  USING MOL-REC ON MOL.DAT;

DEFINE RECORD MOL-REC
01 GRAN-MO.
    05 AUTHOR PIC X(13).
    05 DATE PIC X(4).
    05 MAJ-GRP-CODE PIC X(3) QUERY-NAME MAJ.
    05 SEC-GRP-CODE PIC X(4) QUERY-NAME SEC.
    05 LAT PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 N-OR-S PIC X.
    05 LONG PIC 999V99 EDIT-STRING ZZZ.ZZ.
    05 E-OR-W PIC X.
    05 ROCK-NAME PIC X(20) QUERY-NAME RX-CO.
    05 RX-CODE PIC 9(4) QUERY-NAME RX-NO.
    05 AGE-STR-MIN PIC X(6) QUERY-NAME AG-S-MN.
    05 AGE-STR-MAX PIC X(6) QUERY-NAME AG-S-MX.
    05 AGE-ISO-MIN PIC 9999V99 EDIT-STRING ZZZZ.ZZ
      QUERY-NAME AG-I-MIN.
    05 AGE-ISO-MAX PIC 9999V99 EDIT-STRING ZZZZ.ZZ
      QUERY-NAME AG-I-MAX.
    05 AGE-ISO-METHOD PIC X(4) QUERY-NAME AG-I-METH.
02 FLAGS.
    03 FLAG-1 PIC X(2) QUERY-NAME IS F-1.
    03 FLAG-2 PIC X(2) QUERY-NAME IS F-2.
    03 FLAG-3 PIC X(2) QUERY-NAME IS F-3.
    03 FLAG-4 PIC X(2) QUERY-NAME IS F-4.
    03 FLAG-5 PIC X(2) QUERY-NAME IS F-5.
    03 FLAG-6 PIC X(2) QUERY-NAME IS F-6.
02 NO-MIN-DESC PIC 99.
02 MIN.
    03 MIN-1 PIC X(5) QUERY-NAME IS M-1.
    03 MIN-2 PIC X(5) QUERY-NAME IS M-2.
    03 MIN-3 PIC X(5) QUERY-NAME IS M-3.
    03 MIN-4 PIC X(5) QUERY-NAME IS M-4.
    03 MIN-5 PIC X(5) QUERY-NAME IS M-5.
    03 MIN-6 PIC X(5) QUERY-NAME IS M-6.
    03 MIN-7 PIC X(5) QUERY-NAME IS M-7.
    03 MIN-8 PIC X(5) QUERY-NAME IS M-8.
    03 MIN-9 PIC X(5) QUERY-NAME IS M-9.
    03 MIN-10 PIC X(5) QUERY-NAME IS M-10.
02 PET.
    03 OCCUR PIC X(2) QUERY-NAME IS P-1.
    03 PET-2 PIC X(2) QUERY-NAME IS P-2.
    03 PET-3 PIC X(2) QUERY-NAME IS P-3.
    03 PET-4 PIC X(2) QUERY-NAME IS P-4.
    03 PET-5 PIC X(2) QUERY-NAME IS P-5.

```

Table 6. (continued)

```

    03 PET-6 PIC X(2) QUERY-NAME IS P-6.
02 ALT-1 PIC X(3) QUERY-NAME IS A-1.
02 ALT-2 PIC X(3) QUERY-NAME IS A-2.
02 ALT-3 PIC X(3) QUERY-NAME IS A-3.
02 ALT-4 PIC X(3) QUERY-NAME IS A-4.
02 AUT-ANAL-NO PIC X(10) QUERY-NAME AN-NO.
02 REC-NO PIC 9(5) EDIT-STRING ZZZZZ.

02 MAJ-0X.
    05 SI02 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 AL203 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 FE203 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 FE0 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 M60 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 CA0 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 NA20 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 K20 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 H20-PLUS PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 H20-MINUS PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 T-H20 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 LOI PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 TI02 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 P205 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 MNO PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 ZR02 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 C02 PIC S99V99 EDIT-STRING ZZ.ZZ.
    05 SC02 PIC X.
    05 S03 PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 CL PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 F PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 S PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 CR203 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 NIO PIC 99V99 EDIT-STRING ZZ.ZZ.
    05 BA0 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 RB20 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 SR0 PIC 99V999 EDIT-STRING ZZ.ZZZ.
    05 AUT-TOT PIC 999V999 EDIT-STRING ZZZ.ZZZ
    QUERY-NAME AUT-TOT.

02 TRACE-ELEM.
    05 AG PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
    05 S-AG PIC X.
    05 AS PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
    05 S-AS PIC X.
    05 AU- PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
    05 S-AU- PIC X.
    05 B PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
    05 S-B PIC X.
    05 BA PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
    05 S-BA PIC X.

```

Table 6. (continued)

```

05 BE PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-BE PIC X.
05 BI PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-BI PIC X.
05 CE PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-CE PIC X.
05 CO PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-CO PIC X.
05 CR PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-CR PIC X.
05 CU PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-CU PIC X.
05 F2 PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-F2 PIC X.
05 GA PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-GA PIC X.
05 HG- PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-HG- PIC X.
05 LA PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-LA PIC X.
05 LI PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-LI PIC X.
05 MO PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-MO PIC X.
05 NB PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-NB PIC X.
05 ND PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-ND PIC X.
05 NI PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-NI PIC X.
05 PB PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-PB PIC X.
05 RB PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-RB PIC X.
05 SB PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-SB PIC X.
05 SC PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-SC PIC X.
05 SN PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-SN PIC X.
05 SR PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-SR PIC X.
05 TA PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-TA PIC X.
05 TE- PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-TE- PIC X.
05 TH PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-TH PIC X.
05 TL PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.
05 S-TL PIC X.

```

Table 6. (continued)

```
05 U PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-U PIC X.  
05 V PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-V PIC X.  
05 W PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-W PIC X.  
05 Y PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-Y PIC X.  
05 YB PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-YB PIC X.  
05 ZN PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-ZN PIC X.  
05 ZR PIC S99999V99 EDIT-STRING ZZZZZ.ZZ.  
05 S-ZR PIC X.
```

Table 6. (continued)

DATA TRIEVE procedures for printing GRANNY records.

```

-----
DEFINE PROCEDURE REC.
  DECLARE X PIC X(3).
  X=0
  :ADD
END-PROCEDURE

DEFINE PROCEDURE ADD.
  X=X+1
  FIND MOL WITH REC-NO=X
  SELECT 1
    DECLARE Z PIC 999V999 EDIT-STRING ZZZ.ZZZ.
    Z=(SIO2)+(AL2O3)+(FE2O3)+(FEO)+(MGO)+(CAO)
      +(NA2O)+(K2O)+(H2O-PLUS)
    Z=Z+(H2O-MINUS)+(T-H2O)+(LOI)+(TIO2)+(P2O5)
      +(MNO)+(ZRO2)+(SO3)+(CL)
    Z=Z+(F)+(S)+(CR2O3)+(NIO)+(BAO)+(RB2O)+(SRO)
    IF CO2<1 THEN Z=(Z)-(CO2) ELSE Z=Z+(CO2)
    MODIFY USING AUT-TOT=Z
  :DAT
END-PROCEDURE

DEFINE PROCEDURE DAT.

FOR CURRENT PRINT SKIP 6, COL 16, "AUTHOR:", SPACE,
AUTHOR (-), SPACE 2, "DATE:", SPACE, DATE (-), SKIP,
COL 54, "LAT:", SPACE 3, LAT (-), SPACE, N-OR-S (-),

COL 16, "MAJOR GROUP:", SPACE, MAJ (-), SPACE 2, "SECOND
GROUP:", SPACE, SEC (-), SPACE 2, "LONG:", SPACE, LONG (-),
SPACE, E-OR-W (-), SPACE 2, "FLAGS", SKIP, COL 72, F-1 (-),

COL 16, "ROCK NAME:", SPACE, RX-CO (-), SPACE, "CODE:",
SPACE, RX-NO (-), COL 72, F-2 (-), COL 72, F-3 (-),

COL 16, "AGE:", SPACE 2, "STRAT-MIN:", SPACE, AG-S-MN (-),
SPACE 2, "ISOTOPIC-MIN:", SPACE, AG-I-MIN (-), COL 72, F-4
(-),

COL 27, "-MAX:", SPACE, AG-S-MX (-), SPACE 10, "-MAX:",
SPACE, AG-I-MAX (-), COL 72, F-5 (-),

COL 47, "METHOD:", SPACE 3, AG-I-METH (-), COL 72, F-6 (-),

COL 26, "MINERALS", COL 42, "OCCUR-PETROG.", COL 62,
"ALTERATION", SKIP,

COL 16, M-1 VIA D-TABLE (-) USING X(22),
  COL 40, P-1 VIA D-TABLE (-) USING X(17),
    COL 59, A-1 VIA D-TABLE (-) USING X(17),

```

Table 6. (continued)

COL 16, M-2 VIA D-TABLE (-) USING X(22),
COL 59, A-2 VIA D-TABLE (-) USING X(17),

COL 16, M-3 VIA D-TABLE (-) USING X(22),
COL 40, P-2 VIA D-TABLE (-) USING X(17),
COL 59, A-3 VIA D-TABLE (-) USING X(17),

COL 16, M-4 VIA D-TABLE (-) USING X(22),
COL 40, P-3 VIA D-TABLE (-) USING X(17),
COL 59, A-4 VIA D-TABLE (-) USING X(17),

COL 16, M-5 VIA D-TABLE (-) USING X(22),
COL 40, P-4 VIA D-TABLE (-) USING X(17),

COL 16, M-6 VIA D-TABLE (-) USING X(22),
COL 40, P-5 VIA D-TABLE (-) USING X(17),

COL 16, M-7 VIA D-TABLE (-) USING X(22),
COL 40, P-6 VIA D-TABLE (-) USING X(17),

COL 16, M-8 VIA D-TABLE (-) USING X(22),

COL 16, M-9 VIA D-TABLE (-) USING X(22),

COL 16, M-10 VIA D-TABLE (-) USING X(22)

RELEASE D-TABLE

FOR CURRENT PRINT COL 16, "MAJOR CONSTITUENTS", COL 52,
"TRACE ELEMENTS",

COL 16, "SiO2", SPACE 3, SiO2 (-), COL 42, "Ag", SPACE 1,
S-AG (-), AG (-), COL 62, "Ta", SPACE 1, S-TA (-), TA (-),

COL 16, "Al2O3", SPACE 2, Al2O3 (-), COL 42, "As", SPACE 1,
S-AS (-), AS (-), COL 62, "Te*", S-TE-, TE- (-),

COL 16, "Fe2O3", SPACE 2, Fe2O3 (-), COL 42, "Au*", S-AU-
(-), AU- (-), COL 62, "Th", SPACE 1, S-TH (-), TH (-),

COL 16, "FeO", SPACE 4, FeO (-), COL 42, "B", SPACE 2,
S-B (-), B(-), COL 62, "Tl", SPACE 1, S-TL (-), TL (-),

COL 16, "MgO", SPACE 4, MgO (-), COL 42, "Ba", SPACE 1, S-BA
(-), BA (-), COL 62, "U", SPACE 2, S-U (-), U (-),

COL 16, "CaO", SPACE 4, CaO (-), COL 42, "Be", SPACE 1, S-BE
(-), BE (-), COL 62, "V", SPACE 2, S-V (-), V (-),

Table 6. (continued)

COL 16, "Na2O", SPACE 3, NA2O (-), COL 42, "Bi", SPACE 1, S-BI (-), BI (-), COL 62, "W", SPACE 2, S-W (-), W (-),

COL 16, "K2O", SPACE 4, K2O (-), COL 42, "Ce", SPACE 1, S-CE (-), CE (-), COL 62, "Y", SPACE 2, S-Y (-), Y (-),

COL 16, "H2O+", SPACE 3, H2O-PLUS (-), COL 42, "Co", SPACE 1, S-CO (-), CO (-), COL 62, "Yb", SPACE 1, S-YB (-), YB (-)

FOR CURRENT PRINT COL 16, "H2O-", SPACE 3, H2O-MINUS (-), COL 42, "Cr", SPACE 1, S-CR (-), CR (-), COL 62, "Zn", SPACE 1, S-ZN (-), ZN (-),

COL 16, "TH2O", SPACE 3, T-H2O (-), COL 42, "Cu", SPACE 1, S-CU (-), CU (-), COL 62, "Zr", SPACE 1, S-ZR (-), ZR (-),

COL 16, "LOI", SPACE 4, LOI (-), COL 42, "F", SPACE 2, S-F2 (-), F2 (-),

COL 16, "TiO2", SPACE 3, TiO2 (-), COL 42, "Ga", SPACE 1, S-GA (-), GA (-),

COL 16, "P2O5", SPACE 3, P2O5 (-), COL 42, "Hg*", S-HG- (-), HG- (-),

COL 16, "MnO", SPACE 4, MNO (-), COL 42, "La", SPACE 1, S-LA (-), LA (-),

COL 16, "ZrO2", SPACE 3, ZRO2 (-), COL 42, "Li", SPACE 1, S-LI (-), LI (-),

COL 16, "CO2", SPACE 3, CO2 (-), COL 42, "Mo", SPACE 1, S-MO (-), MO (-),

COL 16, "SO3", SPACE 4, SO3 (-), COL 42, "Nb", SPACE 1, S-NB (-), NB (-)

FOR CURRENT PRINT COL 16, "Cl", SPACE 5, CL (-), COL 42, "Nd", SPACE 1, S-ND (-), ND (-),

COL 16, "F", SPACE 6, F (-), COL 42, "Ni", SPACE 1, S-NI (-), NI (-),

COL 16, "S", SPACE 6, S (-), COL 42, "Pb", SPACE 1, S-PB (-), PB (-),

COL 16, "Cr2O3", SPACE 2, CR2O3 (-), COL 42, "Pb", SPACE 1, S-RB (-), RB (-), COL 56, "AUTHOR",

COL 16, "NiO", SPACE 4, NIO (-), COL 42, "Sb", SPACE 1, S-SB (-), SB (-), COL 56, "NUMBER:", SPACE 2, AN-NO (-),

Table 6. (continued)

COL 16, "Ba0", SPACE 4, BAO (-), COL 42, "Sc", SPACE 1,
S-SC (-), SC (-),

COL 16, "Rb20", SPACE 4, RB20 (-), COL 42, "Sn", SPACE 1,
S-SN (-), SN (-), COL 56, "RECORD NO:", SPACE 4, REC-NO (-),

COL 16, "Sr0", SPACE 4, SRO (-), COL 42, "Sr", SPACE 1,
S-SR (-), SR (-),

COL 16, "TOTAL", SPACE, AUT-TOT (-), SKIP 8

RELEASE Z

RELEASE CURRENT

:ADD

END-PROCEDURE

Table 6. (continued)

 DATATRIEVE description table for translating codes to

 literals for printing output.

DEFINE TABLE D-TABLE

"NB7" : "FELDSPAR-PHENO",
 "NE" : "K-FELDSPAR",
 "NE7" : "K-FELDSPAR-PHENO",
 "NC" : "ALKALI FELDSPAR",
 "NC7" : "ALKALI FELDSPAR-PHENO",
 "ND7" : "ANORTHOCLASE-PHENO",
 "NJ" : "SANIDINE",
 "NJ7" : "SANIDINE-PHENO",
 "NI7" : "PERTHITE-PHENO",
 "NH" : "ORTHOCLASE",
 "NH7" : "ORTHOCLASE-PHENO",
 "NL" : "PLAGIOCLASE",
 "NL7" : "PLAGIOCLASE-PHENO",
 "NM" : "NA-PLAGIOCLASE",
 "NM7" : "NA-PLAGIOCLASE-PHENO",
 "NP" : "ALBITE",
 "NP7" : "ALBITE-PHENO",
 "NR" : "OLIGOCLASE",
 "NR7" : "OLIGOCLASE-PHENO",
 "NS7" : "OLIGOCL.-ANDESN.-PHENO",
 "NT7" : "ANDESINE-PHENO",
 "NF" : "MICROCLINE",
 "NF7" : "MICROCLINE-PHENO",
 "PB" : "BIOTITE",
 "PB7" : "BIOTITE-PHENO",
 "PD" : "MUSCOVITE",
 "PF" : "SERICITE",
 "PG" : "CHLORITE",
 "QA" : "AMPHIBOLE",
 "QD" : "HORNBLLENDE",
 "QD7" : "HORNBLLENDE-PHENO",
 "RA" : "PYROXENE",
 "RG" : "AUGITE",
 "RG7" : "AUGITE-PHENO",
 "RH7" : "DIOPSIDE-PHENO",
 "TI" : "GARNET",
 "TO" : "SPESSARTINE",
 "TR" : "TOPAZ",
 "TS" : "TOURMALINE",
 "TH" : "EPIDOTE",
 "UK" : "CRISTOBALITE",
 "UM" : "QUARTZ",
 "UM7" : "QUARTZ-PHENO",
 "UN" : "TRIDYMITE",
 "VF" : "FLUORITE",

Table 6. (continued)

```

"AE" : "ASH FLOW",
"AJ" : "BRECCIA",
"AM" : "DIKE",
"AN" : "DOME",
"AP" : "FLOW",
"AQ" : "FLOW BRECCIA",
"AW" : "LACCOLITH",
"BI" : "PIPE",
"BJ" : "PLUG",
"BK" : "PLUTON",
"BN" : "PYROCLASTIC",
"BS" : "SILL",
"BU" : "STOCK",
"BZ" : "TUFF",
"CE" : "WELDED TUFF",
"DU" : "APLITIC",
"DZ" : "DEVITRIFIED",
"ED" : "EQUIGRANULAR",
"EH" : "GLASSY",
"EQ" : "HOLOHYALINE",
"FP" : "PORPHYRITIC",
"FQ" : "PUMICEOUS",
"GC" : "VITROPHYRIC",

"AL" : "ALUNITIC",
"ALM" : "ALUNITIC-M",
"AR" : "ARGILLIC",
"ARW" : "ARGILLIC-W",
"ARM" : "ARGILLIC-M",
"ARS" : "ARGILLIC-S",
"ARX" : "ARGILLIC-X",
"F" : "FRESH",
"IC" : "ALTERED",
"K" : "POTASSIC",
"K W" : "POTASSIC-W",
"K M" : "POTASSIC-M",
"K S" : "POTASSIC-S",
"QM" : "QUARTZ-MAGNETITE",
"QMS" : "QUARTZ-MAGNET.-S",
"QS" : "QUARTZ-SERICITE",
"QSW" : "QUARTZ-SERICITE-W",
"QSM" : "QUARTZ-SERICITE-M",
"QSS" : "QUARTZ-SERICITE-S",
"QSX" : "QUARTZ-SERICITE-X",
"SI" : "SILICIFICATION",
"SIM" : "SILICIFICATION-M",
"SIS" : "SILICIFICATION-S",
"SIX" : "SILICIFICATION-X",
" " : " ",
ELSE "NO CODE"

```

END-TABLE

Table 7. -- GRANNY input coding form.

GRANNY INPUT CODING FORM -- FRONT

```

AUTHOR: ----- DATE: ----
MAJ-GRP-CODE: --- SEC-GRP-CODE: ----
LAT: --.-- N-OR-S: - LONG: --.-- E-OR-W: -
ROCK-NAME: ----- RX-CODE: ----
AGE-STR-MIN: ----- AGE-STR-MAX: -----
AGE-ISO-MIN: --.-- AGE-ISO-MAX: --.--
AGE-ISO-METHOD: ----
FLAG-1:-- FLAG-2:-- FLAG-3:-- FLAG-4:-- FLAG-5:-- FLAG-6:--
NO-MIN-DESC: --
MIN-1:----- MIN-2:----- MIN-3:----- MIN-4:----- MIN-5:-----
MIN-6:----- MIN-7:----- MIN-8:----- MIN-9:----- MIN-10:-----
OCCUR: -- PET-2: -- PET-3: -- PET-4: -- PET-5: -- PET-6: --
ALT-1: --- ALT-2: --- ALT-3: --- ALT-4: ---
AUT-ANAL-NO: ----- REC-NO: -----
SI02: --.-- AL203: --.-- FE203: --.-- FE0: --.--
MG0: --.-- CA0: --.-- NA20: --.-- K20: --.--
H2O-PLUS: --.-- H2O-MINUS: --.-- T-H2O: --.-- LOI: --.--
TI02: --.-- P205: --.-- MN0: --.-- ZR02: --.--
CO2: --.-- SC02: - S03: --.-- CL: --.-- F: --.--
S: --.-- CR203: --.-- NI0: --.-- BA0: --.--
RB20: --.-- SR0: --.-- AUT-TOT: --.--

```

Table 7. (continued)

GRANNY INPUT CODING FORM -- BACK

AG: -----.	S-AG: -	AS: -----.	S-AS: -
AU-: -----.	S-AU-: -	B: -----.	S-B: -
BA: -----.	S-BA: -	BE: -----.	S-BE: -
BI: -----.	S-BI: -	CE: -----.	S-CE: -
CO: -----.	S-CO: -	CR: -----.	S-CR: -
CU: -----.	S-CU: -	F2: -----.	S-F2: -
GA: -----.	S-GA: -	HG-: -----.	S-HG-: -
LA: -----.	S-LA: -	LI: -----.	S-LI: -
MO: -----.	S-MO: -	NB: -----.	S-NB: -
ND: -----.	S-ND: -	NI: -----.	S-NI: -
PB: -----.	S-PB: -	RB: -----.	S-RB: -
SB: -----.	S-SB: -	SC: -----.	S-SC: -
SN: -----.	S-SN: -	SR: -----.	S-SR: -
TA: -----.	S-TA: -	TE-: -----.	S-TE-: -
TH: -----.	S-TH: -	TL: -----.	S-TL: -
U: -----.	S-U: -	V: -----.	S-V: -
W: -----.	S-W: -	Y: -----.	S-Y: -
YB: -----.	S-YB: -	ZN: -----.	S-ZN: -
ZR: -----.	S-ZR: -		

S-(constituent) is for insertion of a less than sign (<), which may be used for C02 and all trace elements.

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APPENDIX

DATA BANK

GRANNY

HARDCOPY VERSION

Major constituents given in weight percent. Trace element values in parts per million (ppm) except for Au*, Hg*, and Te* which are in parts per billion (ppb).

CO2 and all trace elements may be preceded by a less than sign (<) indicating less than the amount shown.

AUTHOR: MUTSCHLER + DATE: 1981

MAJOR GROUP: CMO SECOND GROUP: CXL LAT: 39.37 N
LONG: 106.17 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
-MAX: OLIG -MAX:

METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO DIKE QUARTZ-SERICITE-S
ALKALI FELDSPAR-PHENO
ALBITE PORPHYRITIC
TOPAZ
FLUORITE

MAJOR CONSTITUENTS

SiO2 72.50
Al2O3 10.60
Fe2O3 3.50
FeO .50
MgO 1.10
CaO 1.40
Na2O .15
K2O 3.70

H2O+ 2.21
H2O- .01
TH2O
LOI
TiO2 .150
P2O5 .160
MnO .100

ZrO2
CO2 .05
SO3
Cl
F 2.500
S 2.330
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.960

TRACE ELEMENTS

Ag .20 Ta
As 2.00 Te*
Au* 11.00 Th 7.00
B Tl
Ba 111.00 U 5.00
Be 5.00 V
Bi W 440.00
Ce 50.00 Y 11.00

Co Yb
Cr Zn 68.00
Cu 52.00 Zr 169.00
F 25000.00
Ga 43.00
Hg*
La 24.00

Li 163.00
Mo 80.00
Nb 33.00
Nd
Ni
Pb 1.00
Rb 804.00
Sb
Sc
Sn 221.00
Sr 42.00

AUTHOR
NUMBER: MO-1-4

RECORD NO: 367

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXL LONG: 106.17 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.00
 Al2O3 12.70
 Fe2O3 .55
 FeO .25
 MgO .75
 CaO 1.40
 Na2O .35
 K2O 7.60

 H2O+ 1.38
 H2O- .01
 TH2O
 LOI
 TiO2 .010
 P2O5 .100
 MnO .040

 ZrO2
 CO2 .20
 SO3
 Cl
 F .610
 S .450
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.400

TRACE ELEMENTS

As	.40	Ta	
As	11.00	Te*	
Au*	3.62	Th	11.00
B		Tl	5.75
Ba	368.00	U	12.00
Be	1.00	V	
Bi		W	33.00
Ce	70.00	Y	23.00
Co		Yb	
Cr		Zn	991.00
Cu	206.00	Zr	65.00
F	6100.00		
Ga			
Hg*			
La	45.00		
Li	30.00		
Mo	15.00		
Nb	100.00		
Nd			
Ni			
Pb	56.00		
Rb	888.00	AUTHOR	
Sb		NUMBER:	CX-10
Sc			
Sn	12.00	RECORD NO:	368
Sr	47.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXL LONG: 106.17 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE FRESH
 ALKALI FELDSPAR-PHENO
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	73.80	As	.50 Ta
Al2O3	12.70	As	3.00 Te*
Fe2O3	1.00	Au*	2.26 Th 10.00
FeO	.20	B	Tl 3.80
MgO	.80	Ba	156.00 U 17.00
CaO	1.10	Be	4.00 V
Na2O	3.20	Bi	W 90.00
K2O	4.80	Ce	63.00 Y 28.00
H2O+	1.12	Co	Yb
H2O-	.01	Cr	Zn 179.00
TH2O		Cu	66.00 Zr 40.00
LOI		F	6900.00
TiO2	.010	Ga	25.00
P2O5	.050	Hg*	
MnO	.040	La	38.00
ZrO2		Li	51.00
CO2	.04	Mo	10.00
SO3		Nb	120.00
Cl		Nd	
F	.690	Ni	
S	.580	Pb	72.00
Cr2O3		Rb	716.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	29.00
SrO		Sr	32.00
TOTAL	100.140	AUTHOR NUMBER: MO-1-5 RECORD NO: 369	

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AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.35 N
 MAJOR GROUP: CMO SECOND GROUP: CXL LONG: 106.15 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO
 ALBITE PORPHYRITIC
 TOPAZ

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	73.80	As	.20 Ta
Al2O3	14.70	As <	2.00 Te*
Fe2O3	.40	Au*	Th
FeO	.25	B	Tl
MgO	.10	Ba	105.00 U 16.00
CaO	1.60	Be	3.00 V
Na2O	3.50	Bi	W 4.00
K2O	3.60	Ce	55.00 Y 17.00
H2O+	1.50	Co	Yb
H2O-	.15	Cr	Zn 39.00
TH2O		Cu	5.00 Zr 28.00
LOI		F	16000.00
TiO2	.150	Ga	53.00
P2O5	.150	Hg*	
MnO	.050	La	23.00
ZrO2		Li	21.00
CO2	.10	Mo	1.00
SO3		Nb	66.00
Cl		Nd	
F	1.600	Ni	
S	.020	Pb	
Cr2O3		Rb	827.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	30.00
SrO		Sr	41.00
TOTAL	101.670	AUTHOR NUMBER: 79FM971 RECORD NO: 371	

AUTHOR: BUTLER + V. DATE: 1933
 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK SILICIFICATION-M
 ALKALI FELDSPAR
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 80.78
 Al2O3 9.26
 Fe2O3
 FeO 1.34
 MgO .10
 CaO .10
 Na2O .31
 K2O 7.68
 H2O+ .46
 H2O- .01
 TH2O
 LOI
 TiO2
 P2O5 .080
 MnO

ZrO2
 CO2
 SO3
 Cl .040
 F .050
 S .030
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.240

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER:

RECORD NO: 353

AUTHOR: BUTLER + V. DATE: 1933
 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK SILICIFICATION-M
 ALKALI FELDSPAR
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.62
 Al2O3 10.80
 Fe2O3 .05
 FeO 1.13
 MgO .05
 CaO .05
 Na2O .76
 K2O 8.11
 H2O+ .43
 H2O- .10
 TH2O
 LOI
 TiO2 .040
 P2O5 .100
 MnO

ZrO2
 CO2
 SO3
 Cl .040
 F
 S .060
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.340

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER:

RECORD NO: 354

AUTHOR: BUTLER + V. DATE: 1933 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK POTASSIC-M
 ALKALI FELDSPAR
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 70.83
 Al2O3 14.41
 Fe2O3 .35
 FeO 2.94
 MgO .56
 CaO .64
 Na2O 2.44
 K2O 6.21

H2O+ 1.34
 H2O- .04
 TH2O
 LOI
 TiO2 .240
 P2O5 .150
 MnO

ZrO2
 CO2
 SO3
 Cl
 F .040
 S
 Cr2O3 .010
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.200

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER:

RECORD NO: 355

AUTHOR: HALL

DATE: 1973

LAT: 39.37 N

MAJOR GROUP: CMO SECOND GROUP: CXS

LONG: 106.17 W FLAGS

ROCK NAME: GRANITE PORPHYRY

CODE: 1420

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 30.00
-MAX:

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ

STOCK

POTASSIC-M

ALKALI FELDSPAR

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 77.20

Al2O3 11.80

Fe2O3 .24

FeO .04

MnO .01

CaO .60

Na2O 1.10

K2O 7.80

H2O+ .63

H2O- .09

TH2O

LOI

TiO2 .080

P2O5 .010

MnO .010

ZrO2

CO2 < .05

SO3

Cl

F .350

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.010

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: CL-116

RECORD NO:

357

AUTHOR: HALL

DATE: 1973

LAT: 39.37 N

MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS

ROCK NAME: APLITE

CODE: 0290

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 30.00
-MAX:

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ

STOCK

SILICIFICATION-M

ALKALI FELDSPAR

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 83.60
Al2O3 7.40
Fe2O3 .26
FeO .12
MgO .20
CaO 1.10
Na2O .20
K2O 4.70

H2O+ .55
H2O- .19
TH2O
LOI
TiO2 .140
P2O5 .020
MnO .010

ZrO2
CO2 .08
SO3
Cl
F .670
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.240

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hs*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: CL15-70C

RECORD NO: 358

AUTHOR: MUTSCHLER + DATE: 1981
 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 ALKALI FELDSPAR-PHENO
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	76.00	As	.20	Ta	
Al2O3	11.90	As	5.00	Te*	
Fe2O3	1.00	Au*	2.30	Th	24.00
FeO	.25	B		Tl	
MgO	.60	Ba	16.00	U	12.00
CaO	.70	Be <	1.00	V	
Na2O	2.90	Bi		W	5.00
K2O	5.00	Ce	85.00	Y	50.00
H2O+	.91	Co		Yb	
H2O-	.01	Cr		Zn	52.00
TH2O	.01	Cu	34.00	Zr	66.00
LOI		F	2600.00		
TiO2	.070	Ga	20.00		
P2O5	.030	Hg*			
MnO		La	47.00		
ZrO2		Li <	5.00		
CO2	.04	Mo	1960.00		
SO3		Nb	41.00		
Cl		Nd			
F	.260	Ni			
S	.560	Pb	31.00		
Cr2O3		Rb	650.00	AUTHOR	
NiO		Sb		NUMBER:	MO-1-11
BaO		Sc			
Rb2O		Sn	32.00	RECORD NO:	359
SrO		Sr	28.00		
TOTAL	100.240				

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK POTASSIC-S
 ALKALI FELDSPAR
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 64.30
 Al2O3 16.20
 Fe2O3 1.05
 FeO .30
 MgO .65
 CaO 1.90
 Na2O 3.05
 K2O 9.30
 H2O+ 1.07
 H2O- .01
 TH2O
 LOI
 TiO2 .010
 P2O5 .070
 MnO .010
 ZrO2
 CO2 .10
 SO3
 Cl
 F 1.170
 S .840
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.030

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*	1.32	Th	12.00
B		Tl	7.75
Ba	275.00	U	28.00
Be	4.00	V	
Bi		W	28.00
Ce	66.00	Y	50.00
Co		Yb	
Cr		Zn	99.00
Cu	23.00	Zr	69.00
F	11700.00		
Ga	31.00		
Hg*			
La	29.00		
Li	58.00		
Mo	383.00		
Nb	85.00		
Nd			
Ni			
Pb	69.00		
Rb	1458.00	AUTHOR	
Sb		NUMBER:	CX-12
Sc			
Sn	59.00	RECORD NO:	360
Sr	98.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 QUARTZ MINERALS OCCUR-PETROG. ALTERATION
 STOCK SILICIFICATION-S
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 90.60
 Al2O3 1.50
 Fe2O3 .80
 FeO .25
 MgO .05
 CaO .85
 Na2O .10
 K2O .85

H2O+ .80
 H2O- .03
 TH2O
 LOI
 TiO2 .050
 P2O5 .020
 MnO .010

ZrO2
 CO2 .05
 SO3
 Cl
 F .500
 S .680
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.140

TRACE ELEMENTS

As .20 Ta
 As 4.00 Te*
 Au* 3.96 Th
 B Tl .92
 Ba U 15.00
 Be 4.00 V
 Bi W 95.00
 Ce Y

Co Yb
 Cr Zn
 Cu 17.00 Zr
 F 5000.00

Li 26.00
 Mo 24.00
 Nb 150.00

Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: MO-1-10
 50.00 RECORD NO: 361

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CXS LONG: 106.17 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 ALKALI FELDSPAR-PHENO
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.00
 Al2O3 11.80
 Fe2O3 .50
 FeO .25
 MnO .80
 CaO 1.10
 Na2O 3.50
 K2O 4.70

 H2O+ .51
 H2O- .01
 TH2O
 LOI
 TiO2 .010
 P2O5 .100
 MnO .030

 ZrO2
 CO2 .10
 SO3
 Cl
 F .410
 S .210
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.030

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*	1.30	Th	16.00
B		Tl	1.85
Ba	257.00	U	26.00
Be	4.00	V	
Bi		W	65.00
Ce	47.00	Y	27.00
Co		Yb	
Cr		Zn	77.00
Cu	24.00	Zr	59.00
F	4100.00		
Ga	20.00		
Hg*			
La	24.00		
Li	39.00		
Mo	17.00		
Nb	170.00		
Nd			
Ni			
Pb	96.00		
Rb	725.00	AUTHOR	
Sb		NUMBER:	CX-6-A
Sc			
Sn	17.00	RECORD NO:	362
Sr	24.00		

AUTHOR: WHITE + DATE: 1981
LAT: 39.37 N
MAJOR GROUP: CMO SECOND GROUP: CXSG LONG: 106.17 W FLAGS
3K
ROCK NAME: GRANITE CODE: 1420
AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
MINERALS OCCUR-PETROG. ALTERATION
QUARTZ STOCK FRESH
ALKALI FELDSPAR
ALBITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO ₂	74.00
Al ₂ O ₃	12.90
Fe ₂ O ₃	.36
FeO	.24
MgO	.17
CaO	.51
Na ₂ O	3.60
K ₂ O	5.10

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.060
P2O5	
MnO	.110

ZrO2	
CO2	
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	.110
SrO	
TOTAL	97.160

TRACE ELEMENTS

As		Ta
As		Te*
Au*		Th
B		Tl
Ba	10.00	U
Be		V
Bi		W
Ce		Y
Co		Yb
Cr		Zn
Cu		Zr
F		
Ga		
Hg*		
La		

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.5-5

RECORD NO: 366

16.00

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.70	Ag	Ta
Al2O3	12.70	As	Te*
Fe2O3	.47	Au*	Th
FeO	.57	B	Tl
MnO	.37	Ba	U
CaO	1.07	Be	V
Na2O	3.10	Bi	W
K2O	5.60	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.560	Ga	
P2O5		Hg*	
MnO		La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	AUTHOR
NiO		Sb	NUMBER: T.5-3
BaO		Sc	
Rb2O	.090	Sn	RECORD NO:
SrO		Sr	365
TOTAL	100.230		

AUTHOR: EMMONS

DATE: 1886

MAJOR GROUP: CMO

SECOND GROUP: CM

LAT: 39.37 N

LONG: 106.19 W FLAGS

ROCK NAME: NEVADITE

CODE: 2400

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 30.00
-MAX:

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

FRESH

SANIDINE-PHENO

TOPAZ

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.45

Al2O3 14.72

Fe2O3

FeO .56

MgO .37

CaO .83

Na2O 3.97

K2O 4.53

H2O+

H2O-

TH2O .66

LOI

TiO2

P2O5 .010

MnO .280

ZrO2

CO2

SO3

Cl

F

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.380

TRACE ELEMENTS

As

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR
NUMBER:

RECORD NO: 373

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CM LONG: 106.19 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 30.00
 -MAX: OLIG -MAX:
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 SANIDINE-PHENO
 TOPAZ PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.00
 Al2O3 13.80
 Fe2O3 .90
 FeO .45
 MgO .35
 CaO 1.30
 Na2O 3.40
 K2O 4.30

 H2O+ .60
 H2O- .15
 TH2O
 LOI
 TiO2 .150
 P2O5 .120
 MnO .090

 ZrO2
 CO2 .20
 SO3
 Cl
 F .240
 S .020
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.070

TRACE ELEMENTS

Ag	.20	Ta	
As <	2.00	Te*	
Au*		Th	
B		Tl	
Ba	323.00	U	119.00
Be	7.00	V	
Bi		W	3.00
Ce	102.00	Y	27.00
Co		Yb	
Cr		Zn	52.00
Cu	5.00	Zr	94.00
F	2400.00		
Ga	37.00		
Hg*			
La	50.00		
Li	107.00		
Mo	2.00		
Nb	60.00		
Nd			
Ni			
Pb	20.00		
Rb	544.00	AUTHOR	
Sb		NUMBER:	79FM951
Sc			
Sn	8.00	RECORD NO:	374
Sr	181.00		

AUTHOR: SPENCER		DATE: 1930		LAT: 39.37 N	
MAJOR GROUP: CMO		SECOND GROUP: CM		LONG: 106.19 W FLAGS	
ROCK NAME: NEVADITE		CODE: 2400			
AGE: STRAT-MIN: OLIG		ISOTOPIC-MIN: 30.00			
-MAX: OLIG		-MAX:			
		METHOD: KAR			
MINERALS		OCCUR-PETROG.		ALTERATION	
QUARTZ-PHENO		STOCK		FRESH	
ORTHOCLASE-PHENO					
ALBITE-PHENO		PORPHYRITIC			

SiO ₂	72.66
Al ₂ O ₃	15.31
Fe ₂ O ₃	.25
FeO	.36
MgO	.55
CaO	1.31
Na ₂ O	3.61
K ₂ O	4.54

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.100

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	

AUTHOR
NUMBER: P.336
RECORD NO: 451

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT.CHAMOSITE-DOLOM. CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE ALTERED
 MICROCLINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 67.94
 Al2O3 13.46
 Fe2O3 2.02
 FeO 1.04
 MgO .73
 CaO 2.42
 Na2O 3.75
 K2O 3.97

H2O+
 H2O-
 TH2O
 LOI
 TiO2 2.250
 P2O5 .220
 MnO .150

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 97.950

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 1

RECORD NO: 488

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT.CHLORITE-EPIDOT CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE ALTERED
 MICROCLINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 67.67
 Al2O3 16.11
 Fe2O3 1.94
 FeO .94
 MgO .87
 CaO 2.52
 Na2O 3.41
 K2O 4.38

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .340
 P2O5 .230
 MnO .210

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.620

TRACE ELEMENTS

Ag
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce
 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La
 Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y
 Yb
 Zn
 Zr

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 4

RECORD NO: 489

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT.-CHLOR-EPID-RUTI CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ DIKE ALTERED
 MICROCLINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 68.60
 Al2O3 15.85
 Fe2O3 2.25
 FeO 1.08
 MgO .88
 CaO .95
 Na2O 3.83
 K2O 4.70

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .330
 P2O5 .240
 MnO .080

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.790

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 5
 RECORD NO: 490

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT. ARGILLIC-KAOLIN CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE ARGILLIC
 MICROCLINE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 69.59
 Al2O3 15.32
 Fe2O3 1.42
 FeO .50
 MgO .67
 CaO .45
 Na2O .25
 K2O 7.35

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .220
 P2O5 .220
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 96.010

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 62
 RECORD NO: 491

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT. GREISEN CODE: 1520
 AGE: STRAT-MIN: FALC ISOTOPIC-MIN:
 -MAX: FALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE
 MICROCLINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 68.87
 Al2O3 16.49
 Fe2O3 1.19
 FeO .85
 MgO .49
 CaO .57
 Na2O 3.36
 K2O 5.49

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .250
 P2O5 .230
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.820

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 7

RECORD NO: 492

AUTHOR: STEININGER DATE: 1973 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT. K-SILICATE CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE POTASSIC
 MICROCLINE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 68.67
 Al2O3 14.51
 Fe2O3 1.93
 FeO .40
 MgO .88
 CaO 1.20
 Na2O .17
 K2O 9.29

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5 .160
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.410

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 65
 RECORD NO: 493

AUTHOR: STEININGER DATE: 1973
 LAT: 39.37 N
 MAJOR GROUP: CMO SECOND GROUP: CLP LONG: 106.17 W FLAGS
 ROCK NAME: ALT-SILICIFICATION CODE: 0020
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: PALC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ DIKE SILICIFICATION
 MICROCLINE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 72.02
 Al2O3 13.65
 Fe2O3 2.52
 FeO .52
 MgO .83
 CaO .35
 Na2O .18
 K2O 6.18

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5 .090
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 96.540

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce
 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y
 Yb
 Zn
 Zr

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 31

RECORD NO: 494

AUTHOR: CARMICHAEL DATE: 1963 LAT: N
 MAJOR GROUP: CMO SECOND GROUP: LER LONG: W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PORPHYRITIC
 SANIDINE-PHENO
 PLAGIOCLASE-PHENO

MAJOR CONSTITUENTS

SiO2 75.41
 Al2O3 12.16
 Fe2O3 1.07
 FeO .29
 MgO .68
 CaO .99
 Na2O 3.80
 K2O 4.59
 H2O+ .40
 H2O- .23
 TH2O
 LOI
 TiO2 .240
 P2O5 .060
 MnO .090

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.010

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.127

RECORD NO: 349

AUTHOR: TWETO DATE: 1983 LAT: 39.42 N
 MAJOR GROUP: CMO SECOND GROUP: LER LONG: 106.27 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUTON
 ALKALI FELDSPAR
 SANIDINE PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 73.48
 Al2O3 13.09
 Fe2O3 .56
 FeO .63
 MgO .39
 CaO 1.33
 Na2O 3.30
 K2O 4.05

 H2O+ .92
 H2O- .66
 TH2O
 LOI
 TiO2 .130
 P2O5 .060
 MnO .030

 ZrO2
 CO2 .90
 SO3 .01
 Cl
 F .020
 S
 Cr2O3
 NiO
 BaO .110
 Rb2O
 SrO
 TOTAL 99.670

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 24T55

 RECORD NO: 449

AUTHOR: TWETO DATE: 1983 LAT: 39.25 N
 MAJOR GROUP: CMO SECOND GROUP: LER LONG: 106.25 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: FLIO ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PIPE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.95
 Al2O3 13.37
 Fe2O3 .49
 FeO .05
 MgO .36
 CaO .58
 Na2O 1.36
 K2O 4.30

 H2O+ 2.26
 H2O- 2.28
 TH2O
 LOI
 TiO2 .040
 P2O5
 MnO .060

 ZrO2
 CO2
 SO3
 Cl .010
 F .010
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.120

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 91T53

 RECORD NO: 450

AUTHOR: EMMONS DATE: 1886 LAT: 39.28 N
 MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.27 W FLAGS
 ROCK NAME: PORPHYRY CODE: 2870
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON

MAJOR CONSTITUENTS

SiO2 73.50
 Al2O3 14.87
 Fe2O3 .95
 FeO .42
 MgO .20
 CaO 2.14
 Na2O 3.46
 K2O 3.56

H2O+
 H2O-
 TH2O .90
 LOI
 TiO2
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.030

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.326-I

 RECORD NO: 350

AUTHOR: EMMONS DATE: 1886 LAT: 39.00 N
 MAJOR GROUP: CMD SECOND GROUP: LEP LONG: 106.00 W FLAGS
 ROCK NAME: PORPHYRY CODE: 2870
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON QUARTZ-SERICITE-M

MAJOR CONSTITUENTS

SiO2 70.74
 Al2O3 14.68
 Fe2O3 .69
 FeO .58
 MgO .28
 CaO 4.12
 Na2O 2.29
 K2O 2.59

 H2O+
 H2O-
 TH2O 2.09
 LOI
 TiO2
 P2O5
 MnO .060

 ZrO2
 CO2 2.10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .030
 Rb2O
 SrO
 TOTAL 100.250

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: F.326-II

 RECORD NO: 351

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	74.98	As	Ta
Al2O3	15.27	As	Te*
Fe2O3	1.27	Au*	Th
FeO		B	Tl
MgO		Ba	U
CaO	1.03	Be	V
Na2O	1.89	Bi	W
K2O	2.10	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O	2.00	Cu	Zr
LOI		F	
TiO2		Ga	
P2O5		Hg*	
MnO	1.070	La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	99.610		

AUTHOR
NUMBER: P.45-2

RECORD NO: 352

AUTHOR: TWETO DATE: 1983 LAT: 39.30 N
 MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.26 W FLAGS
 ROCK NAME: QUARTZ LATITE PORPH. CODE: 1980
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN: 70.00
 -MAX: CRET -MAX: 70.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON FRESH
 PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	72.46	As		Ta	
Al2O3	14.96	As		Te*	
Fe2O3	.68	Au*		Th	
FeO	.75	B		Tl	
MgO	.36	Ba	1500.00	U	
CaO	1.93	Be		V	
Na2O	3.33	Bi		W	
K2O	3.89	Ce	150.00	Y	7.00
H2O+	.74	Co		Yb	
H2O-	.20	Cr		Zn	
TH2O		Cu	7.00	Zr	150.00
LOI		F			
TiO2	.110	Ga	7.00		
P2O5	.080	Hg*			
MnO	.050	La	70.00		
ZrO2		Li			
CO2	.10	Mo			
SO3		Nb	15.00		
Cl	.010	Nd			
F	.020	Ni			
S		Pb	15.00		
Cr2O3		Rb		AUTHOR	
NiO		Sb		NUMBER:	152T56
BaO	.160	Sc			
Rb2O		Sn		RECORD NO:	445
SrO	.030	Sr	700.00		
TOTAL	99.860				

AUTHOR: TWETO

DATE: 1983

LAT: 39.25 N

MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.27 W FLAGS

ROCK NAME: QUARTZ LATITE PORPH. CODE: 1980

AGE: STRAT-MIN: CRET
-MAX: CRET

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ
SERICITE

OCCUR-PETROG.
PLUTON

ALTERATION
QUARTZ-SERICITE

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2	78.00
Al2O3	14.27
Fe2O3	.10
FeO	.26
MnO	.39
CaO	.06
Na2O	.08
K2O	3.36
H2O+	2.45
H2O-	.46
TH2O	
LOI	
TiO2	.080
P2O5	.020
MnO	.010
ZrO2	
CO2	.02
SO3	
Cl	
F	.060
S	.010
Cr2O3	
NiO	
BaO	.020
Rb2O	
SrO	
TOTAL	99.650

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	30.00	Tl	
Ba	300.00	U	
Be		V	
Bi		W	
Ce		Y	7.00
Co		Yb	
Cr		Zn	
Cu	7.00	Zr	70.00
F			
Ga	7.00		
Hg*			
La	30.00		
Li			
Mo			
Nb	15.00		
Nd			
Ni			
Pb	7.00		
Rb			
Sb			
Sc			
Sn			
Sr	7.00		

AUTHOR
NUMBER: 153T56

RECORD NO: 446

AUTHOR: TWETO

DATE: 1983

LAT: 39.25 N

MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.24 W FLAGS

ROCK NAME: QUARTZ LATITE PORPH. CODE: 1980

AGE: STRAT-MIN: EOCE ISOTOPIC-MIN: 47.00

-MAX: CRET -MAX:

METHOD: FSTR

MINERALS

OCCUR-PETROG.
SILL

ALTERATION
QUARTZ-SERICITE

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 71.31

Al2O3 15.02

Fe2O3 .18

FeO .21

MgO .26

CaO 1.82

Na2O 2.81

K2O 4.81

H2O+ 1.43

H2O- .48

TH2O

LOI

TiO2 .020

P2O5 .030

MnO .020

ZrO2

CO2 1.20

SO3

Cl .010

F .020

S

Cr2O3

NiO

BaO .100

Rb2O

SrO .030

TOTAL 99.760

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

1500.00

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

1.50

Zr

70.00

F

Ga

15.00

Hg*

La

Li

Mo

Nb

15.00

Nd

Ni

Pb

7.00

Rb

Sb

Sc

Sn

Sr

300.00

AUTHOR
NUMBER: 6T56

RECORD NO: 447

AUTHOR: TWETO DATE: 1983 LAT: 39.30 N
 MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.28 W FLAGS
 ROCK NAME: QUARTZ LATITE PORPH. CODE: 1980
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON QUARTZ-SERICITE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.24
 Al2O3 15.19
 Fe2O3 .15
 FeO .32
 MgO .18
 CaO .03
 Na2O .11
 K2O 3.53

 H2O+ 3.44
 H2O- .12
 TH2O
 LOI
 TiO2 .060
 P2O5 .070
 MnO .010

 ZrO2
 CO2 .02
 SO3
 Cl
 F .060
 S .010
 Cr2O3
 NiO
 BaO .120
 Rb2O
 SrO
 TOTAL 99.660

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	15.00	Tl	
Ba	1500.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu	7.00	Zr	70.00
F			
Ga	7.00		
Hg*			
La			
Li			
Mo			
Nb	15.00		
Nd			
Ni			
Pb			
Rb		AUTHOR	
Sb		NUMBER:	20T55B
Sc			
Sn		RECORD NO:	448
Sr	15.00		

AUTHOR: LUX

DATE: 1977

LAT: 39.30 N

MAJOR GROUP: CMO SECOND GROUP: LEP LONG: 106.26 W FLAGS
2D

ROCK NAME: MONZONITE

CODE: 2310

AGE: STRAT-MIN: CRET
-MAX: CRET

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

MAJOR CONSTITUENTS

SiO2 72.51

Al2O3 14.97

Fe2O3

FeO 1.12

MgO .24

CaO 1.56

Na2O 3.14

K2O 3.93

H2O+

H2O-

TH2O 1.20

LOI

TiO2 .090

P2O5 .050

MnO .040

ZrO2

CO2

SO3

Cl

F

S .010

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 98.860

TRACE ELEMENTS

Ag Ta

As Te*

Au* Th

B Tl

Ba U

Be V

Bi W

Ce Y

Co Yb

Cr Zn

Cu Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR
NUMBER: 75-47

RECORD NO: 482

AUTHOR: MUTSCHLER DATE: 1982

MAJOR GROUP: CMO SECOND GROUP: RU LAT: 38.75 N
LONG: 106.05 W FLAGS

ROCK NAME: RHYOLITE CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 28.00
 -MAX: OLIG -MAX: 29.00
 METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION

QUARTZ-PHENO
SANIDINE-PHENO
GARNET
TOPAZ

MAJOR CONSTITUENTS

SiO2 75.20
Al2O3 13.20
Fe2O3 .40
FeO .16
MgO .12
CaO .91
Na2O 4.20
K2O 4.80

H2O+ .42
H2O- .19
TH2O
LOI
TiO2 .080
P2O5
MnO .110

ZrO2
CO2 .10
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.890

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	100.00	U	
Be	5.00	V	30.00
Bi		W	
Ce	300.00	Y	30.00
Co		Yb	3.00
Cr		Zn	
Cu	3.00	Zr	200.00
F			
Ga	10.00		
Hg*			
La	100.00		
Li			
Mo	3.00		
Nb	10.00		
Nd			
Ni			
Pb	10.00		
Rb		AUTHOR	
Sb		NUMBER: 471	
Sc	7.00		
Sn		RECORD NO:	122
Sr	200.00		

DATE: 1982

LAT: 38.75 N

MAJOR GROUP: CMO SECOND GROUP: RU

LONG: 106.05 W FLAGS

ROCK NAME: RHYOLITE PYROCLASTIC CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

```
ISOTOPIC-MIN: 28.00
      -MAX: 29.00
METHOD: KAR
```

MINERALS
SANIDINE-PHENO
OLIGOCLASE-PHENO

OCCUR-PETROG.
PYROCLASTIC
PUMICEOUS

ALTERATION

MAJOR CONSTITUENTS

SiO2	69.90
Al2O3	13.40
Fe2O3	.70
FeO	
MgO	1.05
CaO	.91
Na2O	2.25
K2O	4.71

H2O+	3.74
H2O-	2.34
TH2O	
LOI	
TiO2	.090
P2O5	.020
MnO	.130

ZrO2	
CO2	
SO3	
Cl	
F	.200
S	
Cr2O3	
NiO	
BaO	.010
Rb2O	
SrO	.005
TOTAL	99.455

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: RM-1

RECORD NO: 123

AUTHOR: SCHOOLER

DATE: 1982

MAJOR GROUP: CMO SECOND GROUP: RU

LAT: 38.75 N

LONG: 106.05 W FLAGS

ROCK NAME: PERLITE

CODE: 2730

AGE: STRAT-MIN: OLIG

ISOTOPIC-MIN: 28.00

-MAX: OLIG

-MAX: 29.00

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

SANIDINE-PHENO

WELDED TUFF

OLIGOCLASE-PHENO

GLASSY

MAJOR CONSTITUENTS

SiO2 72.20

Al2O3 12.70

Fe2O3 .73

FeO .07

MnO 1.35

CaO .66

Na2O 3.16

K2O 4.75

H2O+ 3.17

H2O- 1.19

TH2O

LOI

TiO2 .080

P2O5 .010

MnO .100

ZrO2

CO2

SO3

Cl

F .190

S

Cr2O3

NiO

BaO .010

Rb2O

SrO .003

TOTAL 100.373

As

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

TRACE ELEMENTS

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR

NUMBER: RM-3

RECORD NO:

125

AUTHOR: SCHOOLER

DATE: 1982

MAJOR GROUP: CMO SECOND GROUP: RU

LAT: 38.75 N

LONG: 106.05 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN: 28.00
-MAX: 29.00

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

FLOW

SANIDINE-PHENO

OLIGOCLASE-PHENO

BIOTITE

GARNET

TOPAZ

MAJOR CONSTITUENTS

SiO2 76.40

Al2O3 12.50

Fe2O3 .65

FeO .07

MnO .09

CaO .39

Na2O 4.30

K2O 4.63

H2O+ .21

H2O- .09

TH2O

LOI

TiO2 .080

P2O5 .030

MnO .090

ZrO2

CO2

SO3

Cl

F .050

S

Cr2O3

NiO

BaO .010

Rb2O

SrO .001

TOTAL 99.591

Ag

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

TRACE ELEMENTS

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR

NUMBER: RM-4

RECORD NO:

126

AUTHOR: SCHOOLER

DATE: 1982

MAJOR GROUP: CMO SECOND GROUP: RU

LAT: 38.76 N

LONG: 106.06 W FLAGS

ROCK NAME: RHYOLITE PYROCLASTIC CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 28.00
-MAX: 29.00

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

SANIDINE-PHENO
OLIGOCLASE-PHENO
QUARTZ-PHENO

PYROCLASTIC

MAJOR CONSTITUENTS

SiO2 75.90
Al2O3 12.60
Fe2O3 .72
FeO .09
MnO .21
CaO .63
Na2O 4.35
K2O 4.17

H2O+ .38
H2O- .16
TH2O
LOI
TiO2 .110
P2O5 .040
MnO .090

ZrO2
CO2
SO3
Cl
F .230
S
Cr2O3
NiO
BaO .010
Rb2O
SrO .003
TOTAL 99.693

TRACE ELEMENTS

Ag
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: SL-1

RECORD NO: 127

AUTHOR: SCHOOLER

DATE: 1982

MAJOR GROUP: CMO SECOND GROUP: RU

LAT: 38.76 N

LONG: 106.06 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG

ISOTOPIC-MIN: 28.00

-MAX: OLIG

-MAX: 29.00

METHOD: KAR

MINERALS

OCCUR-PETROG,

ALTERATION

ANDESINE-PHENO

DIKE

SANIDINE-PHENO

MICROCLINE-PHENO

QUARTZ-PHENO

MAJOR CONSTITUENTS

SiO2 70.40

Al2O3 14.10

Fe2O3 .70

FeO .08

MgO 1.02

CaO 1.33

Na2O 3.80

K2O 3.50

H2O+ 2.37

H2O- 1.87

TH2O

LOI

TiO2 .090

P2O5 .110

MnO .120

ZrO2

CO2

SO3

Cl

F .220

S

Cr2O3

NiO

BaO .010

Rb2O

SrO .005

TOTAL 99.725

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: SL-12

RECORD NO:

129

AUTHOR: CHRISTIANSEN+ DATE: 1980

MAJOR GROUP: CMO SECOND GROUP: RU LAT: 38.75 N
LONG: 106.05 W FLAGS
2D

ROCK NAME: RHYOLITE CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
DOME

ALTERATION

VITROPHYRIC

MAJOR CONSTITUENTS

SiO2 75.30
Al2O3 13.10
Fe2O3 .64
FeO
MgO .22
CaO .61
Na2O 4.26
K2O 4.97

H2O+
H2O-
TH2O
LOI
TiO2 .090
P2O5 .010
MnO .100

ZrO2
CO2
SO3
Cl
F .550
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.850

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U 16.00
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: NAT-1

RECORD NO: 298

AUTHOR: CHRISTIANSEN+ DATE: 1980 LAT: 38.75
 MAJOR GROUP: CMO SECOND GROUP: RU LONG: 106.05 FLAGS
 2D
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DOME
 DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 12.70
 Fe2O3 .76
 FeO
 MgO .05
 CaO .41
 Na2O 4.35
 K2O 4.54

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .080
 P2O5 .010
 MnO .060

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.760

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U 6.00
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: NAT-2
 RECORD NO: 299

AUTHOR: CARMICHAEL DATE: 1963 LAT: 38.75 N
 MAJOR GROUP: CMO SECOND GROUP: RU LONG: 106.05 W FLAGS
 ROCK NAME: RHYOLITE-GROUNDMASS CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DOME
 SANIDINE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 77.10
 Al2O3 12.40
 Fe2O3 .35
 FeO .25
 MgO .04
 CaO .43
 Na2O 4.50
 K2O 4.40

 H2O+ .44
 H2O- .09
 TH2O
 LOI
 TiO2 .070
 P2O5
 MnO .070

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.140

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 11G

 RECORD NO: 300

TRACE ELEMENTS

SiO ₂	75.73
Al ₂ O ₃	12.78
Fe ₂ O ₃	.64
FeO	.01
MgO	.50
CaO	3.89
Na ₂ O	4.50
K ₂ O	

As
As
Au*
B
Ba
Be
Bi
Ce

Ta
Te*
Th
Ti
U
V
W
Y

H2O+	
H2O-	
TH2O	.09
LOI	.33
TiO2	.040
P2O5	.040
MnO	

Co
Cr
Cu
F
Ga
Hg*
La

Yb
Zn
Zr

ZrO2	
CO2	
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.550

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 4

RECORD NO: 498

AUTHOR: KUNTZ DATE: 1968 LAT: 39.33 N
 MAJOR GROUP: CMO SECOND GROUP: UK LONG: 106.12 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: PALC ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

MAJOR CONSTITUENTS

SiO2 70.38
 Al2O3 16.81
 Fe2O3 .61
 FeO .98
 MnO .82
 CaO .98
 Na2O 3.79
 K2O 3.61

 H2O+ .35
 H2O-
 TH2O
 LOI
 TiO2 .200
 P2O5 .090
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.650

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: QM9

 RECORD NO: 483

DATE: 1968

LAT: 39.33 N

MAJOR GROUP: CMO SECOND GROUP: UK

LONG: 106.12 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: PALC
-MAX: CRET

ISOTOPIC-MIN:

- MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

MAJOR CONSTITUENTS

SiO2	76.00
Al2O3	14.03
Fe2O3	.37
FeO	.28
MnO	.45
CaO	.28
Na2O	2.92
K2O	4.76

H2O+	.74
H2O-	
TH2O	
LOI	
TiO2	.070
P2O5	.030
MnO	.090

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.020

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: WR1

RECORD NO: 484

AUTHOR: KUNTZ

DATE: 1968

MAJOR GROUP: CMO SECOND GROUP: UK

LAT: 39.33 N

LONG: 106.12 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: PALC
-MAX: CRET

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

MAJOR CONSTITUENTS

SiO2 71.78
Al2O3 13.65
Fe2O3 1.70
FeO 1.67
MgO .72
CaO 1.67
Na2O 3.42
K2O 4.57

H2O+ .88
H2O-
TH2O
LOI
TiO2 .300
P2O5 .310
MnO .090

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.760

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: GR9

RECORD NO: 485

AUTHOR: MUTSCHLER DATE: 1982
 LAT: 38.85 N
 MAJOR GROUP: ELK SECOND GROUP: BOS LONG: 106.75 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.40
 -MAX: MIOC -MAX: 10.20
 METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	PLUG	
SANIDINE-PHENO		
ALBITE-PHENO	PORPHYRITIC	
BIOTITE		
SPESSARTINE		
TOPAZ		
TOURMALINE		
FLUORITE		

MAJOR CONSTITUENTS

SiO2	74.80
Al2O3	13.80
Fe2O3	.35
FeO	.20
MgO	.10
CaO	1.40
Na2O	3.70
K2O	4.50
H2O+	.15
H2O-	.10
TH2O	
LOI	
TiO2	.010
P2O5	.020
MnO	.060
ZrO2	
CO2	.07
SO3	
Cl	
F	.093
S	.010
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.363

TRACE ELEMENTS

Ag	.20	Ta	
As		Te*	
Au*		Th	12.00
B		Tl	
Ba	43.00	U	9.00
Be		V	
Bi		W	
Ce	60.00	Y	47.00
Co		Yb	
Cr		Zn	41.00
Cu	3.00	Zr	50.00
F	930.00		
Ga	19.00		
Hg*			
La	32.00		
Li	65.00		
Mo	3.00		
Nb	45.00		
Nd			
Ni			
Pb	26.00		
Rb	358.00		
Sb			
Sc			
Sn	2.00		
Sr	17.00		

AUTHOR
 NUMBER: M633

RECORD NO: 51

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

```
AGE:   STRAT-MIN: MIOC      ISOTOPIC-MIN:    9.40
      -MAX: MIOC          -MAX:    10.20
                        METHOD:    KAR
```

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	PLUG	
SANIDINE-PHENO		
ALBITE-PHENO	PORPHYRITIC	
BIOTITE		
SPESSARTINE		
TOPAZ		
TOURMALINE		
FLUORITE		

MAJOR CONSTITUENTS

SiO2	75.76
Al2O3	13.51
Fe2O3	.93
FeO	
MnO	.14
CaO	.36
Na2O	3.73
K2O	4.58

H2O+	
H2O-	
TH2O	.99
LOI	
TiO2	.070
P2O5	.020
MnO	.090

ZrO2	
CO2	
SO3	
Cl	
F	.164
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.344

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	66.10	U	7.20
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	1636.00		
Ga			
Hs*			
La			
Li	93.80		
Mo			
Nb	35.00		
Nd			
Ni			
Pb			
Rb	390.00	AUTHOR	
Sb		NUMBER:	222A
Sc			
Sn		RECORD NO:	54
Sr	10.60		

AUTHOR: ERNST

DATE: 1980

MAJOR GROUP: ELK

SECOND GROUP: BOS

LAT: 38.85 N

LONG: 106.75 W

FLAGS
20

ROCK NAME: RHYOLITE PORPHYRY

CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN: 9.40
-MAX: 10.20

METHOD: KAR

MINERALS
QUARTZ-PHENO
SANIDINE-PHENO
ALBITE-PHENO
BIOTITE
SPESSARTINE
TOURMALINE
TOPAZ
FLUORITE

OCCUR-PETROG.
PLUG

ALTERATION

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.17
Al2O3 13.42
Fe2O3 .96
FeO
MgO .02
CaO .23
Na2O 4.43
K2O 4.47

H2O+
H2O-
TH2O .56
LOI
TiO2 .070
P2O5 .020
MnO .140

ZrO2
CO2
SO3
Cl
F .316
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.806

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	53.30	U	18.40
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	3163.00		
Ga			
Hg*			
La			
Li	266.00		
Mo			
Nb	156.00		
Nd			
Ni			
Pb			
Rb	822.00	AUTHOR	
Sb		NUMBER:	202B
Sc			
Sn		RECORD NO:	55
Sr	5.60		

AUTHOR: ERNST DATE: 1980
 LAT: 38.85 N
 MAJOR GROUP: ELK SECOND GROUP: BOS LONG: 106.75 W FLAGS
 2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.40
 -MAX: MIOC -MAX: 10.20
 METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	PLUG	
SANIDINE-PHENO		
ALBITE-PHENO	PORPHYRITIC	
BIOTITE		
SPESSARTINE		
TOPAZ		
TOURMALINE		
FLUORITE		

MAJOR CONSTITUENTS

SiO2 76.13
 Al2O3 13.12
 Fe2O3 1.10
 FeO
 MnO .03
 CaO .50
 Na2O 4.33
 K2O 4.40

H2O+
 H2O-
 TH2O .71
 LOI
 TiO2 .060
 P2O5 .010
 MnO .140

ZrO2
 CO2
 SO3
 Cl
 F .493
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.023

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	61.70	U	12.00
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	4926.00		
Ga			
Hg*			
La			
Li	240.00		
Mo			
Nb	135.00		
Nd			
Ni			
Pb			
Rb	677.00	AUTHOR	
Sb		NUMBER: 204C	
Sc			
Sn		RECORD NO:	56
Sr	7.10		

DATE: 1980

LAT: 38.85 N

MAJOR GROUP: ELK SECOND GROUP: BOS LONG: 106.75 W FLAGS
20

ROCK NAME: VITROPHYRE

CODE: 4000

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN: 9.40

- MAX: 10.20

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

PLUG

HOLOHYALINE

MAJOR CONSTITUENTS

SiO2	74.01
Al2O3	12.89
Fe2O3	1.06
FeO	
MgO	.03
CaO	.31
Na2O	4.26
K2O	4.50

H2O+	
H2O-	
TH2O	2.76
LOI	
TiO2	.070
P2O5	.020
MnO	.150

ZrO2	
CO2	
SO3	
Cl	
F	.530
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.590

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	56.20	U	24.00
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	5129.00		
Ga			
Hg*			
La			
Li	206.00		
Mo			
Nb	142.00		
Nd			
Ni			
Pb			
Rb	743.00	AUTHOR	
Sb		NUMBER:	208D
Sc			
Sn		RECORD NO:	57
Sr	2.70		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TM LONG: 107.10 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 12.50
 Fe2O3 .34
 FeO .60
 MgO .15
 CaO .89
 Na2O 3.30
 K2O 5.30

H2O+ .08
 H2O- .08
 TH2O
 LOI
 TiO2 .180
 P2O5
 MnO

ZrO2
 CO2 .08
 SO3
 Cl
 F .310
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.610

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	17.00
B		Tl	
Ba	127.00	U	15.00
Be	7.00	V	
Bi		W	
Ce	67.00	Y	31.00
Co		Yb	
Cr		Zn	24.00
Cu	2.00	Zr	61.00
F	3100.00		
Ga	8.00		
Hg*			
La	34.00		

Li			
Mo	7.00		
Nb	50.00		
Nd			
Ni			
Pb	43.00		
Rb	286.00	AUTHOR	
Sb		NUMBER: 260	
Sc			
Sn	10.00	RECORD NO:	41
Sr	47.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH

MAJOR CONSTITUENTS

SiO2 74.00
 Al2O3 14.00
 Fe2O3 .15
 FeO .76
 MgO .65
 CaO .05
 Na2O 2.30
 K2O 6.40
 H2O+ 1.10
 H2O- .16
 TH2O
 LOI
 TiO2 .100
 P2O5 .060
 MnO .030

ZrO2
 CO2 < .05
 SO3
 Cl
 F .050
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.860

TRACE ELEMENTS

As		Ta	
As	10.00	Te*	
Au*		Th	14.00
B		Tl	
Ba	1248.00	U	6.00
Be	1.00	V	
Bi		W	
Ce	246.00	Y	22.00
Co		Yb	
Cr		Zn	22.00
Cu	7.00	Zr	520.00
F	500.00		
Ga	12.00		
Hg*			
La	67.00		
Li			
Mo			
Nb			
Nd			
Ni			
Pb	68.00		
Rb	171.00	AUTHOR	
Sb		NUMBER: 15	
Sc			
Sn	20.00	RECORD NO:	42
Sr	94.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 12.90
 Fe2O3 .01
 FeO .88
 MgO .40
 CaO .55
 Na2O 3.80
 K2O 4.50

 H2O+ .72
 H2O- .11
 TH2O
 LOI
 TiO2 .170
 P2O5 .020
 MnO .020

 ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.280

TRACE ELEMENTS

As		Ta
As		Te*
Au*		Th
B		Tl
Ba		U
Be	5.00	V
Bi		W
Ce		Y
Co		Yb
Cr		Zn
Cu	15.00	Zr
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb	15.00	
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: 1067

 RECORD NO: 43

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.02 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.10 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.00
 Al2O3 12.10
 Fe2O3 .01
 FeO .14
 MnO .10
 CaO .30
 Na2O 2.70
 K2O 5.40

 H2O+ .55
 H2O- .13
 TH2O
 LOI
 TiO2 .120
 P2O5
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .081
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.681

TRACE ELEMENTS

As		Ta	
As	13.00	Te*	
Au*		Th	23.00
B		Tl	
Ba	113.00	U	10.00
Be	3.00	V	3.00
Bi		W	
Ce	105.00	Y	30.00
Co		Yb	2.00
Cr		Zn	26.00
Cu	1.00	Zr	104.00
F	810.00		
Ga	18.00		
Hg*			
La	60.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	16.00		
Rb	269.00	AUTHOR	
Sb		NUMBER:	4
Sc			
Sn		RECORD NO:	31
Sr	17.00		

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.11 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.80
 Al2O3 12.50
 Fe2O3 .35
 FeO .24
 MgO .12
 CaO .24
 Na2O 3.30
 K2O 5.30

H2O+ .31
 H2O- .08
 TH2O
 LOI
 TiO2 .170
 P2O5
 MnO .030

ZrO2
 CO2 < .05
 SO3
 Cl
 F .014
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.504

TRACE ELEMENTS

As		Ta	
As	1.00	Te*	
Au*		Th	17.00
B		Tl	
Ba	168.00	U	5.00
Be	5.00	V	10.00
Bi		W	
Ce	77.00	Y	17.00
Co		Yb	2.00
Cr		Zn	17.00
Cu	10.00	Zr	149.00
F	140.00		
Ga	18.00		
Hg*			
La	34.00		
Li			
Mo	20.00		
Nb	30.00		
Nd			
Ni			
Pb	69.00		
Rb	216.00	AUTHOR	
Sb		NUMBER:	27
Sc	3.00		
Sn	30.00	RECORD NO:	32
Sr	24.00		

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.04 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.08 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 13.10
 Fe2O3 .53
 FeO .20
 MgO .15
 CaO .69
 Na2O 4.20
 K2O 4.30

H2O+ .46
 H2O- .18
 TH2O
 LOI
 TiO2 .060
 P2O5
 MnO .090

ZrO2
 CO2 < .05
 SO3
 Cl
 F .011
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.821

TRACE ELEMENTS

As		Ta	
As	3.00	Te*	
Au*		Th	31.00
B		Tl	
Ba	963.00	U	17.00
Be	5.00	V	10.00
Bi		W	
Ce	87.00	Y	73.00
Co		Yb	7.00
Cr		Zn	145.00
Cu	7.00	Zr	120.00
F	110.00		
Ga	11.00		
Hg*			
La	48.00		

Li	
Mo	
Nb	100.00
Nd	
Ni	
Pb	57.00
Rb	157.00
Sb	
Sc	5.00
Sn	20.00
Sr	245.00

AUTHOR
 NUMBER: 60
 RECORD NO: 33

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.06 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.11 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 13.50
 Fe2O3 .27
 FeO .44
 MnO .25
 CaO .54
 Na2O 6.50
 K2O .95
 H2O+ .74
 H2O- .56
 TH2O
 LOI
 TiO2 .060
 P2O5
 MnO .030
 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.690

TRACE ELEMENTS

As		Ta	
As	17.00	Te*	
Au*		Th	31.00
B		Tl	
Ba	296.00	U	18.00
Be	3.00	V	10.00
Bi		W	
Ce	70.00	Y	66.00
Co		Yb	7.00
Cr		Zn	55.00
Cu	15.00	Zr	124.00
F			
Ga	29.00		
Hg*			
La	42.00		
Li			
Mo			
Nb	70.00		
Nd			
Ni			
Pb	67.00		
Rb	24.00	AUTHOR	
Sb		NUMBER:	253
Sc	5.00		
Sn	10.00	RECORD NO:	34
Sr	62.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.11 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.80
 Al2O3 13.40
 Fe2O3
 FeO .33
 MgO .30
 CaO 1.10
 Na2O 3.20
 K2O 5.30

H2O+ .13
 H2O- .16
 TH2O
 LOI
 TiO2 .060
 P2O5
 MnO .030

ZrO2
 CO2 .50
 SO3
 Cl
 F .024
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.334

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	23.00
B		Tl	
Ba	343.00	U	11.00
Be	5.00	V	10.00
Bi		W	
Ce	49.00	Y	51.00
Co		Yb	7.00
Cr		Zn	18.00
Cu	5.00	Zr	103.00
F	240.00		
Ga	17.00		
Hg*			
La	27.00		
Li			
Mo			
Nb	70.00		
Nd			
Ni			
Pb	73.00		
Rb	269.00	AUTHOR	
Sb		NUMBER:	270
Sc	5.00		
Sn	30.00	RECORD NO:	35
Sr	100.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.09 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.50
 Al2O3 12.10
 Fe2O3 5.40
 FeO .40
 MgO .45
 CaO .66
 Na2O 2.40
 K2O 5.40

 H2O+ .67
 H2O- .73
 TH2O
 LOI
 TiO2 .090
 P2O5
 MnO .040

 ZrO2
 CO2 .09
 SO3
 Cl
 F .062
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 103.992

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	150.00	U	10.00
Be	3.00	V	50.00
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	2.00	Zr	70.00
F	620.00		
Ga	15.00		
Hg*			
La			
Li			
Mo	30.00		
Nb	20.00		
Nd			
Ni			
Pb	7.00		
Rb		AUTHOR	
Sb		NUMBER: 296	
Sc			
Sn		RECORD NO:	36
Sr	50.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.09 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 77.30
 Al2O3 12.70
 Fe2O3
 FeO .55
 MgO .08
 CaO .29
 Na2O 3.10
 K2O 5.00

 H2O+ .35
 H2O- .15
 TH2O
 LOI
 TiO2 .110
 P2O5
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .030
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.710

TRACE ELEMENTS

As		Ta	
As	11.00	Te*	
Au*		Th	22.00
B		Tl	
Ba	56.00	U	6.00
Be	5.00	V	10.00
Bi		W	
Ce	39.00	Y	15.00
Co		Yb	7.00
Cr		Zn	36.00
Cu	7.00	Zr	95.00
F	300.00		
Ga	14.00		
Hg*			
La	26.00		
Li			
Mo	10.00		
Nb	30.00		
Nd			
Ni			
Pb	83.00		
Rb	254.00	AUTHOR	
Sb		NUMBER:	300
Sc	3.00		
Sn	20.00	RECORD NO:	37
Sr	31.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.06 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.15 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.32
 Al2O3 12.53
 Fe2O3 .65
 FeO .33
 MgO .24
 CaO .85
 Na2O 2.10
 K2O 6.15

 H2O+ .82
 H2O-
 TH2O
 LOI
 TiO2 .070
 P2O5 .020
 MnO .037

ZrO2
 CO2
 SO3
 Cl
 F .095
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.212

TRACE ELEMENTS

Ag	.09	Ta	
As	3.00	Te*	
Au*	1.10	Th	
B		Tl	2.70
Ba	160.00	U	18.40
Be	3.00	V	
Bi		W	3.00
Ce		Y	70.00
Co		Yb	
Cr		Zn	85.00
Cu	10.00	Zr	130.00
F	950.00		
Ga			
Hg*			
La			
Li	4.00		
Mo	2.00		
Nb	105.00		
Nd			
Ni			
Pb	16.00		
Rb	483.00	AUTHOR	
Sb		NUMBER: E2	
Sc			
Sn	5.70	RECORD NO:	38
Sr	25.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.06 N
 MAJOR GROUP: ELK SECOND GROUP: TMWQ LONG: 107.15 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.27
 Al2O3 12.78
 Fe2O3 .31
 FeO .46
 MgO .09
 CaO .59
 Na2O 2.96
 K2O 5.72

 H2O+ .50
 H2O-
 TH2O
 LOI
 TiO2 .100
 P2O5 .030
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F .302
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.132

TRACE ELEMENTS

As	.04	Ta	
As	3.00	Te*	
Au*	.80	Th	
B		Tl	2.00
Ba	176.00	U	19.00
Be	3.00	V	
Bi		W	4.00
Ce		Y	80.00
Co		Yb	
Cr		Zn	30.00
Cu	8.00	Zr	130.00
F	3020.00		
Ga			
Hg*			
La			
Li	2.00		
Mo	7.00		
Nb	100.00		
Nd			
Ni			
Pb	20.00		
Rb	303.00	AUTHOR	
Sb		NUMBER: E3	
Sc			
Sn	5.30	RECORD NO:	39
Sr	28.00		

AUTHOR: MUTSCHLER DATE: 1982
 LAT: 39.06 N
 MAJOR GROUP: ELK SECOND GROUP: TMWR LONG: 107.15 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.38
 Al2O3 12.54
 Fe2O3 .24
 FeO .51
 MgO .10
 CaO .38
 Na2O 2.37
 K2O 6.73

 H2O+ .50
 H2O-
 TH2O
 LOI
 TiO2 .050
 P2O5 .020
 MnO .014

ZrO2
 CO2
 SO3
 Cl
 F .179
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.013

TRACE ELEMENTS

As	.10	Ta	
As	2.00	Te*	
Au*	1.00	Th	
B		Tl	2.90
Ba	231.00	U	18.90
Be	3.00	V	
Bi		W	5.00
Ce		Y	77.00
Co		Yb	
Cr		Zn	29.00
Cu	10.00	Zr	140.00
F	1790.00		
Ga			
Hg*			
La			
Li	3.00		
Mo	1.00		
Nb	100.00		
Nd			
Ni			
Pb	52.00		
Rb	331.00	AUTHOR	
Sb		NUMBER: E4	
Sc			
Sn	4.60	RECORD NO:	40
Sr	40.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.06 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.13 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 79.10
 Al2O3 11.70
 Fe2O3
 FeO .10
 MnO .12
 CaO .38
 Na2O 6.20
 K2O .68

 H2O+ .38
 H2O- .17
 TH2O
 LOI
 TiO2 .110
 P2O5
 MnO .090

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .019
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.099

TRACE ELEMENTS

As		Ta	
As	4.00	Te*	
Au*		Th	29.00
B		Tl	
Ba	15.00	U	10.00
Be	5.00	V	10.00
Bi		W	
Ce	44.00	Y	24.00
Co		Yb	5.00
Cr		Zn	20.00
Cu	1.00	Zr	83.00
F	190.00		
Ga	25.00		
Hg*			
La	24.00		
Li			
Mo			
Nb	50.00		
Nd			
Ni			
Pb	14.00		
Rb	6.00	AUTHOR	
Sb		NUMBER:	184
Sc			
Sn		RECORD NO:	18
Sr	35.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.13 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1430
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 76.60
 Al2O3 12.80
 Fe2O3 .35
 FeO .36
 MgO .18
 CaO .31
 Na2O 3.60
 K2O 4.80

 H2O+ .42
 H2O- .08
 TH2O
 LOI
 TiO2 .050
 P2O5
 MnO .060

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .013
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.673

TRACE ELEMENTS

As		Ta	
As	12.00	Te*	
Au*		Th	33.00
B		Tl	
Ba	34.00	U	20.00
Be	5.00	V	10.00
Bi		W	
Ce	79.00	Y	30.00
Co		Yb	2.00
Cr		Zn	50.00
Cu	2.00	Zr	97.00
F	130.00		
Ga	12.00		
Hg*			
La	39.00		
Li			
Mo			
Nb	50.00		
Nd			
Ni			
Pb	58.00		
Rb	269.00	AUTHOR	
Sb		NUMBER:	188
Sc	3.00		
Sn	3.00	RECORD NO:	19
Sr	12.00		

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	76.80	Ag	Ta
Al2O3	12.80	As	9.00
Fe2O3	.49	Au*	28.00
FeO	.24	B	Tl
MgO	.09	Ba	97.00
CaO	.39	Be	5.00
Na2O	3.80	Bi	W
K2O	4.50	Ce	79.00
			Y
H2O+	.08	Co	Yb
H2O-	.08	Cr	Zn
TH2O		Cu	7.00
LOI		F	90.00
TiO2	.110	Ga	36.00
P2O5		Hg*	
MnO	.070	La	41.00
ZrO2		Li	
CO2 <	.05	Mo	30.00
SO3		Nb	70.00
Cl		Nd	
F	.009	Ni	
S		Pb	126.00
Cr2O3		Rb	344.00
NiO		Sb	
BaO		Sc	3.00
Rb2O		Sn	20.00
SrO		Sr	19.00
TOTAL	99.509		

AUTHOR NUMBER: 229
 RECORD NO: 20

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.09 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 12.80
 Fe2O3
 FeO .56
 MgO .18
 CaO .81
 Na2O 3.40
 K2O 5.10

H2O+ .10
 H2O- .22
 TH2O
 LOI
 TiO2 .160
 P2O5
 MnO

ZrO2
 CO2 .05
 SO3
 Cl
 F .250
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.430

TRACE ELEMENTS

As		Ta	
As	12.00	Te*	
Au*		Th	43.00
B		Tl	
Ba	44.00	U	19.00
Be	7.00	V	10.00
Bi		W	
Ce	84.00	Y	18.00
Co		Yb	3.00
Cr		Zn	11.00
Cu	7.00	Zr	122.00
F	2500.00		
Ga	31.00		
Hg*			
La	60.00		
Li			
Mo			
Nb	70.00		
Nd			
Ni			
Pb	86.00		
Rb	345.00	AUTHOR	
Sb		NUMBER:	249
Sc	3.00		
Sn	30.00	RECORD NO:	21
Sr	11.00		

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.05 N

MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.10 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN: 12.40

-MAX: MIOC

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

FRESH

K-FELDSPAR-PHENO

ALBITE-PHENO

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

TRACE ELEMENTS

SiO2 76.00

As

Ta

Al2O3 12.70

As

8.00

Te*

Fe2O3 .39

Au*

Th

32.00

FeO .20

B

Tl

MgO .35

Ba

143.00

U

21.00

CaO .56

Be

7.00

V

10.00

Na2O 3.00

Bi

W

K2O 4.60

Ce

95.00

Y

16.00

H2O+ .86

Co

Yb

3.00

H2O- .44

Cr

Zn

17.00

TH2O

Cu

1.00

Zr

125.00

LOI

F

3300.00

TiO2 .060

Ga

9.00

P2O5

Hg*

MnO .030

La

58.00

ZrO2

Li

CO2 .05

Mo

SO3

Nb

30.00

Cl

Nd

F .330

Ni

S

Pb

27.00

Cr2O3

Rb

336.00

AUTHOR

NiO

Sb

NUMBER: 251

BaO

Sc

3.00

Rb2O

Sn

RECORD NO:

22

SrO

Sr

22.00

TOTAL 99.570

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 73.30
 Al2O3 14.40
 Fe2O3 .53
 FeO .20
 MnO .08
 CaO .62
 Na2O 4.60
 K2O 4.90
 H2O+ .30
 H2O- .10
 TH2O
 LOI
 TiO2 .130
 P2O5
 MnO .050

ZrO2
 CO2 < .05
 SO3
 Cl
 F .340
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.600

TRACE ELEMENTS

Ag		Ta	
As	15.00	Te*	
Au*		Th	42.00
B		Tl	
Ba	28.00	U	13.00
Be	10.00	V	10.00
Bi		W	
Ce	84.00	Y	24.00
Co		Yb	3.00
Cr		Zn	18.00
Cu	2.00	Zr	137.00
F	3400.00		
Ga	24.00		
Hg*			
La	49.00		
Li			
Mo			
Nb	30.00		
Nd			
Ni			
Pb	26.00		
Rb	516.00	AUTHOR	
Sb		NUMBER:	269
Sc	3.00		
Sn	7.00	RECORD NO:	23
Sr	3.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.04 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.09 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 74.90
 Al2O3 13.10
 Fe2O3 1.90
 FeO .28
 MnO .08
 CaO .37
 Na2O 4.30
 K2O 4.40

 H2O+ .38
 H2O- .11
 TH2O
 LOI
 TiO2 .080
 P2O5
 MnO .110

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .008
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.068

TRACE ELEMENTS

Ag		Ta	
As	6.00	Te*	
Au*		Th	37.00
B		Tl	
Ba	27.00	U	18.00
Be	10.00	V	10.00
Bi		W	
Ce	58.00	Y	72.00
Co		Yb	7.00
Cr		Zn	19.00
Cu	5.00	Zr	115.00
F	80.00		
Ga	37.00		
Hg*			
La	25.00		
Li			
Mo	10.00		
Nb	70.00		
Nd			
Ni			
Pb	74.00		
Rb	530.00	AUTHOR	
Sb		NUMBER:	301
Sc	7.00		
Sn	7.00	RECORD NO:	24
Sr	13.00		

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.03 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.10 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 76.50
 Al2O3 13.40
 Fe2O3 .34
 FeO .24
 MgO .07
 CaO .45
 Na2O 3.50
 K2O 4.90

 H2O+ .34
 H2O- .04
 TH2O
 LOI
 TiO2 .130
 P2O5
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .180
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.140

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	27.00
B		Tl	
Ba	98.00	U	11.00
Be	7.00	V	10.00
Bi		W	
Ce	62.00	Y	18.00
Co		Yb	3.00
Cr		Zn	29.00
Cu	1.00	Zr	104.00
F	1800.00		
Ga	15.00		
Hg*			
La	43.00		
Li			
Mo			
Nb	50.00		
Nd			
Ni			
Pb	45.00		
Rb	250.00	AUTHOR	
Sb		NUMBER: 302	
Sc	5.00		
Sn	5.00	RECORD NO:	25
Sr	14.00		

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.03 N

MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.11 W FLAGS

ROCK NAME: GRANITE PORPHYRY

CODE: 1420

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN: 12.40

-MAX: MIOC

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

FRESH

K-FELDSPAR-PHENO

ALBITE-PHENO

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

TRACE ELEMENTS

SiO₂ 76.00

As

Ta

Al₂O₃ 12.80

As

2.00

Te*

Fe₂O₃ .31

Au*

Th

18.00

FeO .28

B

Tl

MgO .12

Ba

18.00

U

11.00

CaO .31

Be

10.00

V

10.00

Na₂O 4.00

Bi

W

K₂O 4.60

Ce

87.00

Y

17.00

H₂O+ .50

Co

Yb

2.00

H₂O- .05

Cr

Zn

15.00

TH₂O

Cu

2.00

Zr

88.00

LOI

F

300.00

TiO₂ .080

Ga

31.00

P₂O₅

Hg*

MnO

La

40.00

ZrO₂

Li

CO₂ .05

Mo

30.00

SO₃

Nb

50.00

Cl

Nd

F .030

Ni

S

Pb

28.00

Cr₂O₃

Rb

241.00

AUTHOR

NiO

Sb

NUMBER: 308

BaO

Sc

3.00

Rb₂O

Sn

3.00

RECORD NO:

26

SrO

Sr

13.00

TOTAL 99.130

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE APLITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 76.30
 Al2O3 12.80
 Fe2O3 .31
 FeO .16
 MgO .08
 CaO .21
 Na2O 3.80
 K2O 5.00
 H2O+ .45
 H2O- .11
 TH2O
 LOI
 TiO2 .060
 P2O5 .020
 MnO .060
 ZrO2
 CO2 .05
 SO3
 Cl
 F .018
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.428

TRACE ELEMENTS

As		Ta	
As	7.00	Te*	
Au*		Th	17.00
B		Tl	
Ba	134.00	U	21.00
Be	15.00	V	10.00
Bi		W	
Ce	57.00	Y	
Co		Yb	
Cr		Zn	48.00
Cu	5.00	Zr	81.00
F	180.00		
Ga	20.00		
Hg*			
La	38.00		
Li			
Mo			
Nb	30.00		
Nd			
Ni			
Pb	27.00		
Rb	296.00	AUTHOR	
Sb		NUMBER:	16-A
Sc	5.00		
Sn		RECORD NO:	27
Sr	43.00		

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.01 N

MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.11 W FLAGS

ROCK NAME: GRANITE APLITE

CODE: 1420

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN: 12.40

-MAX: MIOC

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

DIKE

FRESH

K-FELDSPAR-PHENO

ALBITE-PHENO

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

TRACE ELEMENTS

SiO₂ 77.60

Ag

Ta

Al₂O₃ 11.90

As

11.00

Te*

Fe₂O₃ .27

Au*

Th

33.00

FeO .20

B

Tl

MgO .17

Ba

111.00

U

8.00

CaO .31

Be

10.00

V

10.00

Na₂O 3.90

Bi

W

K₂O 4.40

Ce

49.00

Y

2.00

H₂O+ .08

Co

Yb

H₂O- .10

Cr

Zn

13.00

TH₂O

Cu

5.00

Zr

81.00

LOI

F

240.00

TiO₂ .110

Ga

24.00

P₂O₅

Hg*

MnO .140

La

27.00

ZrO₂

Li

CO₂ .10

Mo

SO₃

Nb

20.00

Cl

Nd

F .024

Ni

S

Pb

38.00

Cr₂O₃

Rb

314.00

AUTHOR

NiO

Sb

NUMBER: 30

BaO

Sc

3.00

Rb₂O

Sn

10.00

RECORD NO:

28

SrO

Sr

26.00

TOTAL 99.304

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.20	Ag	Ta
Al2O3	13.00	As	4.00
Fe2O3	.38	Au*	Te*
FeO	.56	B	Th
MgO	.15	Ba	111.00
CaO	.73	Be	5.00
Na2O	3.40	Bi	W
K2O	5.60	Ce	49.00
			Y
H2O+	.44	Co	Yb
H2O-	.16	Cr	Zn
TH2O		Cu	50.00
LOI		F	150.00
TiO2	.190	Ga	24.00
P2O5	.020	Hg*	
MnO	.020	La	27.00
ZrO2		Li	
CO2 <	.05	Mo	20.00
SO3		Nb	50.00
Cl		Nd	
F	.015	Ni	
S		Pb	38.00
Cr2O3		Rb	314.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	26.00
TOTAL	99.915		

AUTHOR
 NUMBER: 465

 RECORD NO: 29

AUTHOR: MUTSCHLER

DATE: 1982

LAT: 39.00 N

MAJOR GROUP: ELK SECOND GROUP: TMBM LONG: 107.11 W FLAGS

ROCK NAME: GRANITE APLITE

CODE: 1420

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN: 12.40

-MAX: MIOC

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

FRESH

K-FELDSPAR-PHENO

ALBITE-PHENO

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

TRACE ELEMENTS

SiO2 75.80

As

Ta

Al2O3 13.00

As

8.00

Te*

Fe2O3 .62

Au*

Th

39.00

FeO .28

B

Tl

MgO .15

Ba

52.00

U

12.00

CaO .75

Be

7.00

V

Na2O 3.40

Bi

W

K2O 5.10

Ce

70.00

Y

H2O+ .49

Co

Yb

H2O- .12

Cr

Zn

24.00

TH2O

Cu

3.00

Zr

150.00

LOI

F

150.00

TiO2 .160

Ga

20.00

P2O5 .020

Hs*

MnO .020

La

38.00

ZrO2

Li

CO2 < .05

Mo

7.00

SO3

Nb

30.00

Cl

Nd

F .015

Ni

S

Pb

7.00

Cr2O3

Rb

325.00

AUTHOR

NiO

Sb

NUMBER: 468

BaO

Sc

Rb2O

Sn

RECORD NO:

30

SrO

Sr

19.00

TOTAL 99.975

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.12 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	71.90	As	Ta
Al2O3	14.70	As	4.00 Te*
Fe2O3	.30	Au*	Th
FeO	.28	B	11.00 Tl
MgO	.23	Ba	1331.00 U
CaO	.18	Be <	1.00 V
Na2O	1.70	Bi	10.00 W
K2O	9.20	Ce	156.00 Y
H2O+	.39	Co	Yb
H2O-	.13	Cr	2.00 Zn
TH2O		Cu	5.00 Zr
LOI		F	950.00
TiO2	.090	Ga	6.00
P2O5	.080	Hg*	
MnO	.040	La	77.00
ZrO2		Li	
CO2	.05	Mo	5.00
SO3		Nb	
Cl		Nd	
F	.095	Ni	
S		Pb	33.00
Cr2O3		Rb	200.00
NiO		Sb	
BaO		Sc	3.00
Rb2O		Sn	10.00
SrO		Sr	108.00
TOTAL	99.365		

AUTHOR
NUMBER: 6
RECORD NO: 11

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.01 N
 MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	73.00	As	Ta
Al2O3	14.50	As	6.00 Te*
Fe2O3	.08	Au*	Th
FeO	.48	B	30.00 Tl
MnO	.33	Ba	245.00 U
CaO	.30	Be	3.00 V
Na2O	3.20	Bi	W
K2O	6.20	Ce	114.00 Y
H2O+	1.40	Co	Yb
H2O-	.19	Cr	Zn
TH2O		Cu	7.00 Zr
LOI		F	510.00
TiO2	.070	Ga	25.00
P2O5	.030	Hs*	
MnO	.040	La	59.00
ZrO2		Li	
CO2	.05	Mo	
SO3		Nb	20.00
Cl		Nd	
F	.051	Ni	
S		Pb	41.00
Cr2O3		Rb	345.00
NiO		Sb	
BaO		Sc	7.00
Rb2O		Sn	7.00
SrO		Sr	65.00
TOTAL	99.921		

AUTHOR
 NUMBER: 16-B
 RECORD NO: 12

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.12 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.10	As	Ta
Al2O3	13.00	As	Te*
Fe2O3	.65	Au*	Th
FeO	.68	B	Tl
MnO	.30	Ba	U
CaO	1.00	Be	V
Na2O	3.90	Bi	W
K2O	4.50	Ce	Y
H2O+	.31	Co	Yb
H2O-	.09	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.250	Ga	
P2O5	.090	Hs*	
MnO	.120	La	
ZrO2		Li	
CO2 <	.05	Mo	
SO3		Nb	
Cl		Nd	
F	.052	Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	100.092		

12.00 12.00
 403.00 7.00
 5.00 10.00
 74.00 31.00
 3.00
 44.00
 191.00
 520.00
 12.00
 39.00
 30.00
 80.00
 192.00
 3.00
 20.00
 114.00

AUTHOR
 NUMBER: 185
 RECORD NO: 13

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.05 N

MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.11 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40

-MAX: MIOC -MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

FRESH

K-FELDSPAR-PHENO

ALBITE-PHENO

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

SiO2 71.00

Al2O3 14.00

Fe2O3 2.10

FeO .32

MgO .50

CaO 1.40

Na2O 4.00

K2O 4.80

H2O+ .52

H2O- .17

TH2O

LOI

TiO2 .500

P2O5 .270

MnO .020

ZrO2

CO2 .10

SO3

Cl

F .200

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 99.900

TRACE ELEMENTS

Ag

Ta

As

11.00

Te*

Au*

Th

5.00

B

Tl

Ba

672.00

U

5.00

Be

3.00

V

Bi

W

Ce

166.00

Y

45.00

Co

Yb

5.00

Cr

Zn

41.00

Cu

2.00

Zr

332.00

F

2000.00

Ga

30.00

Hg*

La

93.00

Li

Mo

Nb

20.00

Nd

Ni

Pb

9.00

Rb

175.00

Sb

AUTHOR

NUMBER: 348

Sc

Sn

RECORD NO:

14

Sr

173.00

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.05 N
 MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.12 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 78.90
 Al2O3 11.60
 Fe2O3 .60
 FeO .36
 MgO .23
 CaO .26
 Na2O 3.30
 K2O 2.80
 H2O+ .82
 H2O- .16
 TH2O
 LOI
 TiO2 .110
 P2O5 .100
 MnO .080

ZrO2
 CO2 < .05
 SO3
 Cl
 F .160
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.530

TRACE ELEMENTS

As		Ta	
As	6.00	Te*	
Au*		Th	8.00
B		Tl	
Ba	933.00	U	4.00
Be	5.00	V	20.00
Bi		W	
Ce	75.00	Y	16.00
Co		Yb	5.00
Cr		Zn	6.00
Cu	3.00	Zr	89.00
F	1600.00		
Ga	3.00		
Hg*			
La	42.00		
Li			
Mo			
Nb	30.00		
Nd			
Ni			
Pb	66.00		
Rb	74.00	AUTHOR	
Sb		NUMBER:	391
Sc	5.00		
Sn		RECORD NO:	15
Sr	55.00		

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.01 N

MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.12 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40

-MAX: MIOC -MAX: 12.40

METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	STOCK	FRESH
K-FELDSPAR-PHENO		
ALBITE-PHENO	PORPHYRITIC	
BIOTITE		

MAJOR CONSTITUENTS

SiO ₂	70.20
Al ₂ O ₃	14.80
Fe ₂ O ₃	1.40
FeO	1.20
MgO	.20
CaO	1.40
Na ₂ O	3.80
K ₂ O	5.40

H ₂ O+	.53
H ₂ O-	.11
TH ₂ O	
LOI	
TiO ₂	.460
P ₂ O ₅	.160
MnO	.020

ZrO ₂	
CO ₂	.10
SO ₃	
Cl	
F	
S	
Cr ₂ O ₃	
NiO	
BaO	
Rb ₂ O	
SrO	
TOTAL	99.780

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	5.00	V	10.00
Bi		W	
Ce	300.00	Y	30.00
Co		Yb	3.00
Cr	3.00	Zn	
Cu	3.00	Zr	700.00
F			
Ga	20.00		
Hg*			
La	70.00		
Li			
Mo	5.00		
Nb	20.00		
Nd			
Ni			
Pb	50.00		
Rb			
Sb			
Sc	7.00		
Sn			
Sr	200.00		

AUTHOR
NUMBER: M270(S)

RECORD NO: 16

AUTHOR: MUTSCHLER

DATE: 1982

LAT: 39.00 N

MAJOR GROUP: ELK SECOND GROUP: TMTB LONG: 107.11 W FLAGS

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN: 12.40

-MAX: MIOC

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHEND

STOCK

FRESH

K-FELDSPAR-PHEND

ALBITE-PHEND

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

TRACE ELEMENTS

SiO2 69.60

As

Ta

Al2O3 13.70

As

14.00

Te*

Fe2O3 1.40

Au*

Th

12.00

FeO 1.70

B

Tl

MnO 1.20

Ba

1282.00

U

7.00

CaO 2.20

Be

5.00

V

Na2O 3.40

Bi

W

K2O 5.10

Ce

239.00

Y

25.00

H2O+ .55

Co

Yb

H2O- .12

Cr

Zn

61.00

TH2O

Cu

30.00

Zr

345.00

LOI

F

2400.00

TiO2 .570

Ga

18.00

P2O5 .320

Hg*

MnO .050

La

142.00

ZrO2

Li

CO2 < .05

Mo

7.00

SO3

Nb

10.00

Cl

Nd

F .240

Ni

S

Pb

26.00

Cr2O3

Rb

175.00

AUTHOR

NiO

Sb

NUMBER: 469

BaO

Sc

Rb2O

Sn

RECORD NO:

17

SrO

Sr

413.00

TOTAL 100.200

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.02 N
 MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.10 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 75.30
 Al2O3 13.40
 Fe2O3 .25
 FeO .16
 MgO .08
 CaO .83
 Na2O 4.10
 K2O 4.80

H2O+ .43
 H2O- .08
 TH2O
 LOI
 TiO2 .140
 P2O5 .020
 MnO

ZrO2
 CO2 < .05
 SO3
 Cl
 F .350
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.990

TRACE ELEMENTS

Ag		Ta	
As	12.00	Te*	
Au*		Th	19.00
B		Tl	
Ba	288.00	U	13.00
Be	5.00	V	150.00
Bi		W	
Ce	81.00	Y	31.00
Co		Yb	5.00
Cr		Zn	23.00
Cu		Zr	116.00
F	3500.00		
Ga	26.00		
Hg*			
La	53.00		

Li
 Mo
 Nb 70.00
 Nd
 Ni
 Pb 23.00
 Rb 358.00
 Sb
 Sc
 Sn
 Sr 44.00

AUTHOR
 NUMBER: 5

RECORD NO: 1

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.03 N
 MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 75.30
 Al2O3 14.00
 Fe2O3 .19
 FeO .28
 MgO .16
 CaO .34
 Na2O 4.00
 K2O 5.20

 H2O+ .26
 H2O- .14
 TH2O
 LOI
 TiO2 .160
 P2O5
 MnO .050

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .085
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.215

TRACE ELEMENTS

Ag		Ta	
As	14.00	Te*	
Au*		Th	25.00
B		Tl	
Ba	246.00	U	9.00
Be	10.00	V	10.00
Bi		W	
Ce	92.00	Y	21.00
Co		Yb	3.00
Cr		Zn	13.00
Cu	2.00	Zr	113.00
F	850.00		
Ga	21.00		
Hg*			
La	40.00		
Li			
Mo	5.00		
Nb	30.00		
Nd			
Ni			
Pb	28.00		
Rb	373.00	AUTHOR	
Sb		NUMBER:	279
Sc	5.00		
Sn	7.00	RECORD NO:	2
Sr	46.00		

AUTHOR: MUTSCHLER

DATE: 1968

LAT: 39.03 N

MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.11 W FLAGS

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN: 12.40

-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ

STOCK

FRESH

K-FELDSPAR

ALBITE

EQUIGRANULAR

BIOTITE

MAJOR CONSTITUENTS

SiO₂ 74.80Al₂O₃ 13.40Fe₂O₃ .54

FeO .44

MgO .17

CaO .68

Na₂O 4.10K₂O 5.00H₂O+ .17H₂O- .07TH₂O

LOI

TiO₂ .170P₂O₅

MnO

ZrO₂CO₂ < .05SO₃

Cl

F .240

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.830

TRACE ELEMENTS

As

Ta

As

10.00

Te*

Au*

Th

33.00

B

Tl

Ba

183.00

U

17.00

Be

7.00

V

10.00

Bi

W

Ce

134.00

Y

33.00

Co

Yb

3.00

Cr

Zn

45.00

Cu

2.00

Zr

149.00

F

2400.00

Ga

26.00

Hg*

La

80.00

Li

Mo

70.00

Nb

50.00

Nd

Ni

Pb

36.00

Rb

378.00

AUTHOR

Sb

NUMBER: 316

Sc

3.00

Sn

7.00

RECORD NO:

3

Sr

34.00

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.03 N
 MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.10 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 72.70
 Al2O3 14.60
 Fe2O3 .14
 FeO .20
 MgO .16
 CaO .79
 Na2O 4.10
 K2O 5.80

 H2O+ .42
 H2O- .20
 TH2O
 LOI
 TiO2 .110
 P2O5
 MnO .060

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .280
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.610

TRACE ELEMENTS

Ag		Ta	
As	3.00	Te*	
Au*		Th	39.00
B		Tl	
Ba	110.00	U	35.00
Be	7.00	V	10.00
Bi		W	
Ce	80.00	Y	30.00
Co		Yb	5.00
Cr		Zn	24.00
Cu	2.00	Zr	132.00
F	2800.00		
Ga	17.00		
Hg*			
La	34.00		
Li			
Mo			
Nb	50.00		
Nd			
Ni			
Pb	21.00		
Rb	377.00	AUTHOR	
Sb		NUMBER:	318
Sc	3.00		
Sn		RECORD NO:	4
Sr	23.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 71.30
 Al2O3 14.70
 Fe2O3 1.00
 FeO 1.10
 MgO .55
 CaO 1.00
 Na2O 3.80
 K2O 5.30

H2O+ .43
 H2O- .09
 TH2O
 LOI
 TiO2 .410
 P2O5 .130
 MnO .030

ZrO2
 CO2 < .05
 SO3
 Cl
 F .009
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.899

TRACE ELEMENTS

As		Ta	
As	6.00	Te*	
Au*		Th	13.00
B		Tl	
Ba	629.00	U	6.00
Be	1.00	V	
Bi		W	
Ce	114.00	Y	16.00
Co		Yb	
Cr		Zn	47.00
Cu	10.00	Zr	167.00
F	90.00		
Ga	22.00		
Hg*			
La	72.00		

Li	
Mo	
Nb	10.00
Nd	
Ni	
Pb	9.00
Rb	236.00
Sb	
Sc	
Sn	
Sr	206.00

AUTHOR
 NUMBER: 466
 RECORD NO: 5

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: TMGR LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 71.70
 Al2O3 14.20
 Fe2O3 1.20
 FeO 1.20
 MgO .62
 CaO 1.20
 Na2O 3.50
 K2O 5.10

 H2O+ .50
 H2O- .13
 TH2O
 LOI
 TiO2 .470
 P2O5 .140
 MnO .030

ZrO2
 CO2 < .05
 SO3
 Cl
 F .099
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.139

TRACE ELEMENTS

Ag		Ta	
As	1.00	Te*	
Au*		Th	8.00
B		Tl	
Ba	629.00	U	7.00
Be	50.00	V	
Bi		W	
Ce	124.00	Y	18.00
Co		Yb	
Cr		Zn	34.00
Cu	5.00	Zr	182.00
F	990.00		
Ga	15.00		
Hg*			
La	66.00		
Li			
Mo	10.00		
Nb	15.00		
Nd			
Ni			
Pb	8.00		
Rb	218.00	AUTHOR	
Sb		NUMBER:	467
Sc			
Sn		RECORD NO:	6
Sr	195.00		

AUTHOR: VANDERWILT DATE: 1937
 MAJOR GROUP: ELK SECOND GROUP: TMGR LAT: 39.02 N
 LONG: 107.10 W FLAGS
 ROCK NAME: SODA GRANITE CODE: 1470
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 76.46
 Al2O3 12.58
 Fe2O3 .52
 FeO .59
 MgO .13
 CaO .52
 Na2O 3.78
 K2O 5.45

H2O+ .48
 H2O-
 TH2O
 LOI
 TiO2 .050
 P2O5 .060
 MnO .040

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.660

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.47

RECORD NO: 7

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: TMGM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE
 AMPHIBOLE
 CHLORITE
 EPIDOTE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	72.40	As	Ta
Al2O3	14.10	As	5.00 Te*
Fe2O3	.85	Au*	Th
FeO	.68	B	23.00 Tl
MgO	.53	Ba	U
CaO	.95	Be	9.00 V
Na2O	3.70	Bi	20.00 W
K2O	4.60	Ce	9.00 Y
H2O+	.59	Co	Yb
H2O-	.18	Cr	3.00 Zn
TH2O		Cu	42.00 Zr
LOI		F	210.00
TiO2	.270	Ga	
P2O5	.160	Hg*	
MnO	.040	La	
ZrO2		Li	
CO2	.08	Mo	
SO3		Nb	30.00
Cl		Nd	
F	.081	Ni	
S		Pb	17.00
Cr2O3		Rb	227.00
NiO		Sb	AUTHOR
BaO		Sc	NUMBER: 34
Rb2O		Sn	RECORD NO:
SrO		Sr	8
TOTAL	99.211		

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: TMGM LONG: 107.11 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.40
 -MAX: MIOC -MAX: 12.40
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK FRESH
 K-FELDSPAR
 ALBITE EQUIGRANULAR
 BIOTITE
 AMPHIBOLE
 CHLORITE
 EPIDOTE

MAJOR CONSTITUENTS

SiO2 69.20
 Al2O3 14.80
 Fe2O3 1.40
 FeO 1.80
 MnO .93
 CaO 2.00
 Na2O 3.60
 K2O 4.30

H2O+ .68
 H2O- .10
 TH2O
 LOI
 TiO2 .680
 P2O5 .240
 MnO .080

ZrO2
 CO2 .09
 SO3
 Cl
 F .110
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.010

TRACE ELEMENTS

As		Ta	
As	4.00	Te*	
Au*		Th	17.00
B		Tl	
Ba	572.00	U	11.00
Be	5.00	V	
Bi		W	
Ce	184.00	Y	35.00
Co		Yb	
Cr		Zn	43.00
Cu	5.00	Zr	442.00
F	1100.00		
Ga	30.00		
Hg*			
La	88.00		

Li	
Mo	30.00
Nb	30.00
Nd	
Ni	
Pb	54.00
Rb	179.00
Sb	
Sc	
Sn	
Sr	259.00

AUTHOR
 NUMBER: 324

RECORD NO: 9

AUTHOR: MUTSCHLER

DATE: 1982

LAT: 39.00 N

MAJOR GROUP: ELK SECOND GROUP: TMGM LONG: 107.11 W FLAGS

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOCISOTOPIC-MIN: 12.40
-MAX: 12.40

METHOD: KAR

MINERALS

OCCUR-PETROG.
STOCKALTERATION
FRESH

QUARTZ

K-FELDSPAR

ALBITE

EQUIGRANULAR

BIOTITE

AMPHIBOLE

CHLORITE

EPIDOTE

MAJOR CONSTITUENTS

SiO₂ 72.60Al₂O₃ 13.50Fe₂O₃ 1.40

FeO 1.10

MgO .58

CaO .56

Na₂O 2.40K₂O 6.40H₂O+ .80H₂O- .07TH₂O

LOI

TiO₂ .420P₂O₅ .150

MnO .030

ZrO₂CO₂ < .05SO₃

Cl

F .020

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 100.080

TRACE ELEMENTS

As

4.00

Au*

B

Ba

951.00

Be

Bi

Ce

196.00

Co

Cr

Cu

2.00

F

200.00

Ga

17.00

Hs*

La

101.00

Li

Mo

Nb

5.00

Nd

Ni

Pb

23.00

Rb

188.00

Sb

Sc

Sn

Sr

113.00

Ta

Te*

Th

5.00

Tl

U

2.00

V

W

Y

9.00

Yb

Zn

29.00

Zr

376.00

AUTHOR
NUMBER: 7

RECORD NO: 10

AUTHOR: MUTSCHLER DATE: 1982
 MAJOR GROUP: ELK SECOND GROUP: RM LAT: 38.78 N
 LONG: 106.86 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 13.60
 -MAX: MIOC -MAX: 14.20
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK FRESH
 K-FELDSPAR-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 71.40
 Al2O3 14.60
 Fe2O3 1.00
 FeO .40
 MgO .48
 CaO .57
 Na2O 1.50
 K2O 6.60

 H2O+ 1.60
 H2O- .36
 TH2O
 LOI
 TiO2 .300
 P2O5 .180
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .110
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.150

TRACE ELEMENTS

As		Ta	
As	8.00	Te*	
Au*		Th	1.00
B		Tl	
Ba	1281.00	U	3.00
Be	1.00	V	18.60
Bi		W	
Ce	155.00	Y	14.00
Co	1.90	Yb	1.00
Cr	3.60	Zn	100.00
Cu	12.00	Zr	201.00
F	1100.00		
Ga	2.00		
Hg*			
La	86.00		
Li			
Mo	1.00		
Nb	13.00		
Nd	49.80		
Ni	1.90		
Pb	18.00		
Rb	300.00	AUTHOR	
Sb		NUMBER: M609	
Sc	2.60		
Sn		RECORD NO:	60
Sr	131.00		

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	77.00	As	5.50
Al2O3	13.20	As	
Fe2O3	1.50	Au*	
FeO	.24	B	
MnO	1.10	Ba	773.00
CaO	.12	Be	9.80
Na2O	.38	Bi	
K2O	3.70	Ce	25.00
H2O+	1.80	Co	
H2O-	.23	Cr	
TH2O		Cu	35.00
LOI		F	1900.00
TiO2	.210	Ga	32.00
P2O5	.090	Hg*	
MnO	.290	La	17.00
ZrO2		Li	
CO2 <	.05	Mo	7.00
SO3		Nb	130.00
Cl		Nd	
F	.190	Ni	
S		Pb	451.00
Cr2O3		Rb	570.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	24.00
SrO		Sr	8.00
TOTAL	100.100		

AUTHOR
 NUMBER: I-754
 RECORD NO: 73

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.89 N
 MAJOR GROUP: ELK SECOND GROUP: RR LONG: 107.05 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.00
 -MAX: MIOC -MAX: 17.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 SANIDINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	79.00	As	1.60 Ta
Al2O3	12.00	As	7.00 Te*
Fe2O3	2.10	Au*	2.13 Th 27.00
FeO	.45	B	Tl 4.65
MgO	.30	Ba	1556.00 U 14.00
CaO	.05	Be	8.00 V
Na2O	.20	Bi	W 36.00
K2O	3.80	Ce	35.00 Y 36.00
H2O+	1.85	Co	Yb
H2O-	.10	Cr	Zn 392.00
TH2O		Cu	21.00 Zr 96.00
LOI		F	1000.00
TiO2	.050	Ga	6.00
P2O5	.040	Hg*	
MnO	.150	La	25.00
ZrO2		Li	5.00
CO2	.30	Mo	23.00
SO3		Nb	210.00
Cl		Nd	
F	.100	Ni	
S	.060	Pb	403.00
Cr2O3		Rb	379.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	25.00
SrO		Sr	19.00
TOTAL	100.550		

AUTHOR
 NUMBER: PYR-12
 RECORD NO: 74

AUTHOR: WHITE +

DATE: 1981

LAT: 38.89 N

MAJOR GROUP: ELK SECOND GROUP: RR

LONG: 107.05 W FLAGS
3K

ROCK NAME: RHYOLITE PORPH-AV.4 CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN: 17.00
-MAX: 17.00

METHOD: KAR

MINERALS

OCCUR-PETROG.
PLUG

ALTERATION
ALTERED

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 79.00
Al2O3 10.30
Fe2O3 .21
FeO .32
MgO .05
CaO .70
Na2O 2.91
K2O 5.38

H2O+
H2O-
TH2O
LOI
TiO2 .150
P2O5
MnO .040

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.060

TRACE ELEMENTS

Ag
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: T.5-10

RECORD NO: 75

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.89 N
 MAJOR GROUP: ELK SECOND GROUP: RR LONG: 107.05 W FLAGS
 ROCK NAME: RHYOLITE BRECCIA CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.00
 -MAX: MIOC -MAX: 17.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 65.80
 Al2O3 15.30
 Fe2O3 2.35
 FeO .45
 MgO .95
 CaO 3.85
 Na2O 1.80
 K2O 4.00
 H2O+ .20
 H2O- 2.60
 TH2O
 LOI
 TiO2 .350
 P2O5 .370
 MnO .580

ZrO2
 CO2 .10
 SO3
 Cl
 F .140
 S 1.200
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.040

TRACE ELEMENTS

As	.40	Ta	
As	62.00	Te*	
Au*	1.53	Th	
B		Tl	1.86
Ba	1352.00	U	11.00
Be	6.00	V	
Bi		W	5.00
Ce	101.00	Y	27.00
Co		Yb	
Cr		Zn	135.00
Cu	9.00	Zr	187.00
F	1400.00		
Ga			
Hg*			
La	57.00		
Li	35.00		
Mo	2.00		
Nb	17.00		
Nd			
Ni			
Pb	19.00		
Rb	372.00	AUTHOR	
Sb		NUMBER:	PYR-14
Sc			
Sn	6.00	RECORD NO:	76
Sr	386.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EM LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK QUARTZ-MAGNET.-S
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 79.00
 Al2O3 4.10
 Fe2O3 8.50
 FeO 4.20
 MgO .10
 CaO .10
 Na2O .40
 K2O 2.60

 H2O+ .11
 H2O- .20
 TH2O
 LOI
 TiO2 .400
 P2O5 .010
 MnO .060

 ZrO2
 CO2 .10
 SO3
 Cl
 F .025
 S .040
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.945

TRACE ELEMENTS

As	.20	Ta	
As	2.00	Te*	
Au*	.98	Th	5.00
B		Tl	1.50
Ba	53.00	U	2.00
Be	1.00	V	
Bi		W	8.00
Ce	3.00	Y	
Co		Yb	
Cr		Zn	123.00
Cu	13.00	Zr	68.00
F	250.00		
Ga	15.00		
Hg*			
La	6.00		
Li	12.00		
Mo	250.00		
Nb	1.00		
Nd			
Ni			
Pb	35.00		
Rb	109.00	AUTHOR	
Sb		NUMBER:	PYR-15
Sc			
Sn	10.00	RECORD NO:	87
Sr	25.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK ARGILLIC
 FLOW

MAJOR CONSTITUENTS

SiO2 74.60
 Al2O3 11.60
 Fe2O3 1.40
 FeO 1.65
 MgO .35
 CaO .25
 Na2O 1.10
 K2O 5.50

 H2O+ 1.35
 H2O- .45
 TH2O
 LOI
 TiO2 .110
 P2O5 .090
 MnO .150

 ZrO2
 CO2 1.40
 SO3
 Cl
 F .098
 S .190
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.288

TRACE ELEMENTS

Ag	.20	Ta	
As	2.00	Te*	
Au*	2.68	Th	25.00
B		Tl	2.10
Ba	108.00	U	10.00
Be	4.00	V	
Bi		W	8.00
Ce	20.00	Y	4.00
Co		Yb	
Cr		Zn	111.00
Cu	5.00	Zr	143.00
F	980.00		
Ga			
Hg*			
La	13.00		
Li	45.00		
Mo	49.00		
Nb	42.00		
Nd			
Ni			
Pb	21.00		
Rb	295.00	AUTHOR	
Sb		NUMBER:	PYR-4
Sc			
Sn	3.00	RECORD NO:	80
Sr	39.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK QUARTZ-SERICITE-X
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 11.20
 Fe2O3 3.40
 FeO .65
 MgO .30
 CaO .40
 Na2O .20
 K2O 4.10

 H2O+ 1.60
 H2O- .05
 TH2O
 LOI
 TiO2 .110
 P2O5 .080
 MnO .060

 ZrO2
 CO2 .50
 SO3
 Cl
 F .360
 S 1.730
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.840

TRACE ELEMENTS

As	.80	Ta	
As	53.00	Te*	
Au*	2.02	Th	32.00
B		Tl	3.65
Ba	81.00	U	22.00
Be	4.00	V	
Bi		W	25.00
Ce	23.00	Y	3.00
Co		Yb	
Cr		Zn	116.00
Cu	7.00	Zr	142.00
F	3600.00		
Ga	12.00		
Hg*			
La	14.00		
Li	20.00		
Mo	40.00		
Nb	59.00		
Nd			
Ni			
Pb	20.00		
Rb	552.00	AUTHOR	
Sb		NUMBER:	PYR-5
Sc			
Sn	55.00	RECORD NO:	81
Sr	5.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.40
 Al2O3 13.00
 Fe2O3 .80
 FeO .70
 MgO .30
 CaO .50
 Na2O 3.30
 K2O 5.20

 H2O+ .10
 H2O- .05
 TH2O
 LOI
 TiO2 .170
 P2O5 .120
 MnO .040

 ZrO2
 CO2 .30
 SO3
 Cl
 F .068
 S .350
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.398

TRACE ELEMENTS

As	.20	Ta	
As		Te*	
Au*	.30	Th	37.00
B		Tl	1.07
Ba	166.00	U	13.00
Be	7.00	V	
Bi		W	10.00
Ce	86.00	Y	18.00
Co		Yb	
Cr		Zn	34.00
Cu	17.00	Zr	168.00
F	680.00		
Ga	7.00		
Hg*			
La	39.00		
Li	10.00		
Mo	11.00		
Nb	38.00		
Nd			
Ni			
Pb	18.00		
Rb	298.00	AUTHOR	
Sb		NUMBER:	PYR-6
Sc			
Sn	2.00	RECORD NO:	82
Sr	51.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE AFLITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH
 APLITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	74.20	Ag	.20
Al2O3	12.80	As	
Fe2O3	1.40	Au*	.55
FeO	1.00	B	
MgO	.50	Ba	261.00
CaO	.95	Be	8.00
Na2O	3.50	Bi	
K2O	4.60	Ce	132.00
H2O+	.10	Co	
H2O-	.10	Cr	
TH2O		Cu	8.00
LOI		F	960.00
TiO2	.300	Ga	11.00
P2O5	.160	Hg*	
MnO	.050	La	75.00
ZrO2		Li	25.00
CO2	.30	Mo	45.00
SO3		Nb	47.00
Cl		Nd	
F	.096	Ni	
S	.400	Pb	12.00
Cr2O3		Rb	229.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	2.00
SrO		Sr	88.00
TOTAL	100.456		

Ta
 Te*
 Th 22.00
 Tl 1.12
 U 11.00
 V
 W 6.00
 Y 25.00
 Yb
 Zn 61.00
 Zr 228.00
 AUTHOR
 NUMBER: FYR-7
 RECORD NO: 83

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH
 PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	76.50	As	.20	Ta	
Al2O3	12.80	As	2.00	Te*	
Fe2O3	.60	Au*	.67	Th	36.00
FeO	.75	B		Tl	1.71
MgO	.25	Ba	177.00	U	12.00
CaO	.50	Be	6.00	V	
Na2O	3.15	Bi		W	5.00
K2O	4.80	Ce	91.00	Y	17.00
H2O+	.15	Co		Yb	
H2O-	.05	Cr		Zn	64.00
TH2O		Cu	28.00	Zr	135.00
LOI		F	530.00		
TiO2	.160	Ga	24.00		
P2O5	.140	Hg*			
MnO	.040	La	48.00		
ZrO2		Li	5.00		
CO2	.40	Mo	94.00		
SO3		Nb	48.00		
Cl		Nd			
F	.053	Ni			
S	.090	Pb	19.00		
Cr2O3		Rb	217.00	AUTHOR	
NiO		Sb		NUMBER:	PYR-8
BaO		Sc			
Rb2O		Sn	3.00	RECORD NO:	84
SrO		Sr	50.00		
TOTAL	100.433				

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE QUENCH CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH
 APLITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	76.40	As	.20
Al2O3	12.60	As	Te*
Fe2O3	.70	Au*	Th
FeO	.75	B	Tl
MgO	.15	Ba	U
CaO	.50	Be	V
Na2O	2.95	Bi	W
K2O	4.90	Ce	Y
H2O+	.25	Co	Yb
H2O-	.15	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.020	Ga	
P2O5	.150	Hg*	
MnO	.050	La	
ZrO2		Li <	5.00
CO2	.60	Mo	25.00
SO3		Nb	25.00
Cl		Nd	
F	.035	Ni	
S	.030	Pb	35.00
Cr2O3		Rb	163.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	2.00
SrO		Sr	36.00
TOTAL	100.235		

46.00
 15.00
 5.00
 10.00
 75.00
 122.00
 AUTHOR
 NUMBER: PYR-9
 RECORD NO: 85

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK FRESH
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.20
 Al2O3 12.70
 Fe2O3 1.10
 FeO .85
 MgO .30
 CaO .50
 Na2O 2.80
 K2O 5.10
 H2O+ .40
 H2O- .15
 TH2O
 LOI
 TiO2 .110
 P2O5 .110
 MnO .080

ZrO2
 CO2 .50
 SO3
 Cl
 F .092
 S .080
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.072

TRACE ELEMENTS

As	.20	Ta	
As		Te*	
Au*	.72	Th	
B		Tl	1.41
Ba		U	18.00
Be	8.00	V	
Bi		W	4.00
Ce		Y	
Co		Yb	
Cr		Zn	
Cu	6.00	Zr	
F	920.00		
Ga			
Hg*			
La			
Li	5.00		
Mo	450.00		
Nb	55.00		
Nd			
Ni			
Pb			
Rb			
Sb			
Sc			
Sn	3.00		
Sr			

AUTHOR
 NUMBER: PYR-11

3.00 RECORD NO: 86

LAT: 38.88 N

MAJOR GROUP: ELK SECOND GROUP: EMK LONG: 107.04 W FLAGS
2D

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
-MAX: MIOC -MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION
QUARTZ-SERICITE-W

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2	75.82
Al2O3	11.65
Fe2O3	1.24
FeO	
MnO	.26
CaO	.81
Na2O	3.35
K2O	5.09

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.240
P2O5	
MnO	.055

ZrO2	
CO2	
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.515

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba		U	
Be		V	
Bi		W	
Ce		Y	21.00
Co		Yb	
Cr		Zn	
Cu		Zr	148.00
F			
Ga			
Hg*			
La			
Li			
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	308.00	AUTHOR	
Sb		NUMBER:	KEYST DH-3
Sc			
Sn		RECORD NO:	453
Sr	39.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMLP LONG: 107.04 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK ARGILLIC
 QUARTZ-MAGNETITE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.30
 Al2O3 11.80
 Fe2O3 2.30
 FeO 1.80
 MgO .40
 CaO .35
 Na2O 2.05
 K2O 5.90

 H2O+ .85
 H2O- .20
 TH2O
 LOI
 TiO2 .260
 P2O5 .130
 MnO .120

 ZrO2
 CO2 1.00
 SO3
 Cl
 F .110
 S .060
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.630

TRACE ELEMENTS

As	.20	Ta	
As		Te*	
Au*	.43	Th	20.00
B		Tl	
Ba	189.00	U	8.00
Be	4.00	V	
Bi		W	5.00
Ce	117.00	Y	26.00
Co		Yb	
Cr		Zn	231.00
Cu	14.00	Zr	190.00
F	1100.00		
Ga	7.00		
Hg*			
La	64.00		
Li	10.00		
Mo	64.00		
Nb	62.00		
Nd			
Ni			
Pb	13.00		
Rb	255.00	AUTHOR	
Sb		NUMBER:	PYR-10
Sc			
Sn	2.00	RECORD NO:	79
Sr	49.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMLA LONG: 107.04 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK QUARTZ-MAGNET.-S
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.90
 Al2O3 7.80
 Fe2O3 6.10
 FeO 3.00
 MgO .15
 CaO .15
 Na2O 1.55
 K2O 4.30

H2O+ .40
 H2O- .15
 TH2O
 LOI
 TiO2 .070
 P2O5 .030
 MnO .050

ZrO2
 CO2 .70
 SO3
 Cl
 F .019
 S .050
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.419

TRACE ELEMENTS

Ag	.20	Ta	
As	2.00	Te*	
Au*	1.43	Th	24.00
B		Tl	6.50
Ba	77.00	U	4.00
Be	2.00	V	
Bi		W	3.00
Ce	3.00	Y	
Co		Yb	
Cr		Zn	54.00
Cu	27.00	Zr	99.00
F	190.00		
Ga	19.00		
Hg*			
La	3.00		
Li <	5.00		
Mo	83.00		
Nb <	1.00		
Nd			
Ni			
Pb	14.00		
Rb	194.00	AUTHOR	
Sb		NUMBER:	PYR-1
Sc			
Sn	3.00	RECORD NO:	78
Sr	19.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.88 N
 MAJOR GROUP: ELK SECOND GROUP: EMLB LONG: 107.04 W FLAGS
 ROCK NAME: RHYOLITE--ORE CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 17.30
 -MAX: MIOC -MAX: 17.70
 METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
 STOCK POTASSIC
 SILICIFICATION
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.60
 Al2O3 11.30
 Fe2O3 .40
 FeO .40
 MgO .20
 CaO .20
 Na2O 1.80
 K2O 5.30

H2O+ .40
 H2O- .30
 TH2O
 LOI
 TiO2 .010
 P2O5 .040
 MnO .050

ZrO2
 CO2 .40
 SO3
 Cl
 F .055
 S .160
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.615

TRACE ELEMENTS

Ag	.20	Ta	
As		Te*	
Au*	1.10	Th	52.00
B		Tl	2.04
Ba	129.00	U	11.00
Be	3.00	V	
Bi		W	3.00
Ce	15.00	Y	4.00
Co		Yb	
Cr		Zn	76.00
Cu	21.00	Zr	86.00
F	550.00		
Ga	14.00		
Hg*			
La	9.00		
Li <	5.00		
Mo	1700.00		
Nb	15.00		
Nd			
Ni			
Pb	16.00		
Rb	284.00		
Sb			
Sc			
Sn	2.00		
Sr	36.00		

AUTHOR
 NUMBER: FYR-3

RECORD NO: 77

AUTHOR: MUTSCHLER DATE: 1968 LAT: 38.97 N
 MAJOR GROUP: ELK SECOND GROUP: MSA LONG: 107.12 W FLAGS
 ROCK NAME: FELSITE CODE: 1240
 AGE: STRAT-MIN: MIDC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 77.10
 Al2O3 12.80
 Fe2O3 .36
 FeO .12
 MgO .10
 CaO .49
 Na2O 3.80
 K2O 4.00

 H2O+ .59
 H2O- .11
 TH2O
 LOI
 TiO2 .200
 P2O5
 MnO .030

 ZrO2
 CO2 .08
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.780

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	20.00	U	
Be	5.00	V	
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr	3.00	Zn	
Cu	2.00	Zr	70.00
F			
Ga	20.00		
Hg*			
La			
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	200.00		
Rb		AUTHOR	
Sb		NUMBER: L48	
Sc			
Sn		RECORD NO:	44
Sr	50.00		

AUTHOR: MUTSCHLER DATE: 1982
 LAT: 38.62 N
 MAJOR GROUP: ELK SECOND GROUP: MSB LONG: 107.33 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 ALKALI FELDSPAR-PHENO
 BIOTITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.90
 Al2O3 14.00
 Fe2O3
 FeO 1.40
 MgO .24
 CaO 1.80
 Na2O 2.50
 K2O 3.50

 H2O+ 1.10
 H2O- .63
 TH2O
 LOI
 TiO2 .290
 P2O5 .090
 MnO .020

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.520

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	654.00	U	
Be	1.30	V	20.60
Bi		W	
Ce	60.90	Y	17.30
Co		Yb	2.40
Cr	1.80	Zn	27.60
Cu		Zr	178.00
F			
Ga	9.30		
Hg*			
La	28.50		
Li			
Mo	1.10		
Nb	6.00		
Nd	28.60		
Ni	1.20		
Pb	11.60		
Rb		AUTHOR	
Sb		NUMBER: M608	
Sc	1.50		
Sn		RECORD NO:	45
Sr	515.00		

AUTHOR: MUTSCHLER DATE: 1968 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: MSE LONG: 107.03 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.40
 Al2O3 14.60
 Fe2O3 .90
 FeO .64
 MnO .44
 CaO .35
 Na2O 4.20
 K2O 1.60

H2O+ 1.70
 H2O- .24
 TH2O
 LOI
 TiO2 .130
 P2O5 .070
 MnO .020

ZrO2
 CO2 .08
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.370

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	300.00	U	
Be	1.50	V	
Bi		W	
Ce		Y	20.00
Co	3.00	Yb	2.00
Cr		Zn	
Cu	10.00	Zr	150.00
F			
Ga	10.00		
Hg*			
La	30.00		

Li	
Mo	
Nb	10.00
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	5.00
Sn	
Sr	200.00

AUTHOR
 NUMBER: 394
 RECORD NO: 46

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.00 N
 MAJOR GROUP: ELK SECOND GROUP: MSE LONG: 107.02 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.84
 Al2O3 14.66
 Fe2O3 .38
 FeO .64
 MgO .83
 CaO .21
 Na2O 3.49
 K2O 2.30
 H2O+ 1.44
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .120
 MnO .046

ZrO2
 CO2
 SO3
 Cl
 F .062
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.078

TRACE ELEMENTS

Ag	.07	Ta	
As	2.00	Te*	
Au*	1.20	Th	
B		Tl	.70
Ba	647.00	U	2.30
Be	2.00	V	
Bi		W	2.00
Ce		Y	8.00
Co		Yb	
Cr		Zn	32.00
Cu	3.00	Zr	135.00
F	620.00		
Ga			
Hg*			
La			
Li	7.00		
Mo <	1.00		
Nb	27.00		
Nd			
Ni			
Pb <	1.00		
Rb	171.00	AUTHOR	
Sb		NUMBER:	E1
Sc			
Sn	6.00	RECORD NO:	47
Sr	204.00		

AUTHOR: MUTSCHLER DATE: 1968
 LAT: 39.10 N
 MAJOR GROUP: ELK SECOND GROUP: MSL LONG: 107.12 W FLAGS
 ROCK NAME: FELSITE CODE: 1240
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 71.10
 Al2O3 14.00
 Fe2O3 1.30
 FeO 1.00
 MgO .64
 CaO 1.30
 Na2O 3.80
 K2O 4.50

H2O+ .41
 H2O- .13
 TH2O
 LOI
 TiO2 .460
 P2O5 .180
 MnO .050

ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.970

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	700.00	U	
Be	1.00	V	10.00
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	5.00	Zr	70.00
F			
Ga	7.00		
Hg*			
La	70.00		
Li			
Mo	10.00		
Nb	30.00		
Nd			
Ni			
Pb	70.00		
Rb		AUTHOR	
Sb		NUMBER: 351	
Sc	3.00		
Sn	7.00	RECORD NO:	48
Sr	50.00		

AUTHOR: ERNST

DATE: 1980

LAT: 38.75 N

MAJOR GROUP: ELK SECOND GROUP: MSP LONG: 106.73 W FLAGS
2D

ROCK NAME: MICROGRANITE

CODE: 1440

AGE: STRAT-MIN: OLIG
-MAX:ISOTOPIC-MIN: 26.20
-MAX:

METHOD: FSTR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ

PLUG

K-FELDSPAR

ALBITE

BIOTITE

MAJOR CONSTITUENTS

SiO2 74.61

Al2O3 13.62

Fe2O3 1.37

FeO

MgO .15

CaO .87

Na2O 4.47

K2O 4.01

H2O+

H2O-

TH2O .77

LOI

TiO2 .090

P2O5 .120

MnO .010

ZrO2

CO2

SO3

Cl

F .019

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.109

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

1215.00

U

1.90

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

194.00

Ga

Hg*

La

Li

11.40

Mo

Nb

Nd

Ni

Pb

Rb

82.50

AUTHOR

Sb

NUMBER: 229F

Sc

Sn

RECORD NO:

49

Sr

481.00

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.66 N
 MAJOR GROUP: ELK SECOND GROUP: MSS LONG: 107.26 W FLAGS
 ROCK NAME: FELSITE CODE: 1240
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.50
 Al2O3 14.50
 Fe2O3 .27
 FeO .48
 MgO .04
 CaO 1.00
 Na2O 2.80
 K2O 4.30

H2O+ .83
 H2O- .17
 TH2O
 LOI
 TiO2 .130
 P2O5 .010
 MnO

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.080

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	10.70	Tl	
Ba	2100.00	U	
Be	1.60	V	
Bi		W	
Ce		Y	14.90
Co		Yb	2.70
Cr	1.50	Zn	17.80
Cu		Zr	38.30
F			
Ga	17.70		
Hg*			
La			
Li	62.30		
Mo	1.00		
Nb	9.30		
Nd			
Ni			
Pb	20.70		
Rb			
Sb			
Sc	1.70		
Sn			
Sr	263.00		

AUTHOR
 NUMBER: M926

RECORD NO: 50

AUTHOR: CUNNINGHAM DATE: 1976 LAT: 38.95 N
 MAJOR GROUP: ELK SECOND GROUP: ITL LONG: 106.75 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 31.20
 -MAX: OLIG -MAX: 34.80
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 SANIDINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 71.50
 Al2O3 15.00
 Fe2O3 1.10
 FeO .80
 MgO .44
 CaO 1.80
 Na2O 3.30
 K2O 4.40
 H2O+ 1.20
 H2O- .29
 TH2O
 LOI
 TiO2 .270
 P2O5 .160
 MnO .010

ZrO2
 CO2 .06
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.330

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: I-294

RECORD NO: 295

AUTHOR: CUNNINGHAM DATE: 1976 LAT: 38.95 N
 MAJOR GROUP: ELK SECOND GROUP: ITL LONG: 106.75 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 31.20
 -MAX: OLIG -MAX: 34.80
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 SANIDINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 70.40
 Al2O3 15.20
 Fe2O3 1.20
 FeO .80
 MgO .64
 CaO 2.00
 Na2O 3.10
 K2O 4.20

 H2O+ 1.20
 H2O- 1.10
 TH2O
 LOI
 TiO2 .260
 P2O5 .150
 MnO .050

 ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.400

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: I-206

 RECORD NO: 296

AUTHOR: CUNNINGHAM DATE: 1976
 LAT: 38.95 N
 MAJOR GROUP: ELK SECOND GROUP: ITL LONG: 106.75 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 31.20
 -MAX: OLIG -MAX: 34.80
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 SANIDINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 14.50
 Fe2O3 1.20
 FeO .68
 MgO .32
 CaO 1.80
 Na2O 3.20
 K2O 4.20
 H2O+ .86
 H2O- .24
 TH2O
 LOI
 TiO2 .290
 P2O5 .130
 MnO .090
 ZrO2
 CO2 .04
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.950

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La
 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: I-325
 RECORD NO: 297

AUTHOR: MUTSCHLER DATE: 1968 LAT: 38.99 N
 MAJOR GROUP: ELK SECOND GROUP: PSS LONG: 107.06 W FLAGS
 ROCK NAME: GRANODIORITE CODE: 1490
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 27.90
 -MAX: OLIG -MAX: 30.10
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK QUARTZ-SERICITE-S
 SILICIFICATION-S

MAJOR CONSTITUENTS

SiO2 78.90
 Al2O3 7.70
 Fe2O3 2.20
 FeO .40
 MgO .62
 CaO 2.40
 Na2O .28
 K2O 3.30

 H2O+ 1.70
 H2O- .31
 TH2O
 LOI
 TiO2 .160
 P2O5 .150
 MnO .300

ZrO2
 CO2 .80
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.220

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	500.00	U	
Be	1.00	V	15.00
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu	100.00	Zr	100.00
F			
Ga	7.00		
Hg*			
La			
Li			
Mo	700.00		
Nb			
Nd			
Ni			
Pb	7.00		
Rb			
Sb			
Sc			
Sn			
Sr	100.00		

AUTHOR
 NUMBER: 143

RECORD NO: 441

AUTHOR: MUTSCHLER DATE: 1968
 MAJOR GROUP: ELK SECOND GROUP: SNS LAT: 39.12 N
 LONG: 107.04 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ DIKE FRESH
 K-FELDSPAR
 ALBITE APLITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	79.60	As	Ta
Al2O3	11.40	As	Te*
Fe2O3	.18	Au*	Th
FeO	.28	B	Tl
MnO	.17	Ba	U
CaO	.65	Be	V
Na2O	3.30	Bi	W
K2O	4.10	Ce	Y
			20.00
H2O+	.24	Co	Yb
H2O-	.05	Cr	Zn
TH2O		Cu	Zr
LOI		F	150.00
TiO2	.060	Ga	.70
P2O5	.020	Hg*	15.00
MnO		La	
ZrO2		Li	
CO2 <	.05	Mo	
SO3		Nb	15.00
Cl		Nd	
F		Ni	
S		Pb	50.00
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	70.00
TOTAL	100.100		

AUTHOR
 NUMBER: 387
 RECORD NO: 464

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.48 N
 MAJOR GROUP: ELK SECOND GROUP: TDU LONG: 106.53 W FLAGS
 ROCK NAME: MICROGRANITE CODE: 1440
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10
 -MAX: EOC -MAX: 40.30
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE-PHENO
 PERTHITE-PHENO PORPHYRITIC
 BIOTITE-PHENO
 FLUORITE
 GARNET
 TOPAZ

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.60	As	Ta
Al2O3	13.60	As	4.00 Te*
Fe2O3	.56	Au*	Th
FeO	.08	B	8.00 Tl
MgO	.08	Ba	41.00 U
CaO	.43	Be	5.00 9.00 V
Na2O	4.30	Bi	1.90 W
K2O	4.40	Ce	30.00 Y
			25.00
H2O+	.72	Co	Yb
H2O-	.04	Cr	1.20 Zn
TH2O		Cu	66.00 Zr
LOI		F	43.00
TiO2	.020	Ga	
P2O5		Hg*	
MnO	.140	La	
		Li	107.00
ZrO2		Mo	2.00
CO2	.04	Nb	37.00
SO3		Nd	
Cl		Ni	
F	.210	Pb	27.00
S		Rb	251.00
Cr2O3		Sb	
NiO		Sc	7.30
BaO		Sn	4.00
Rb2O		Sr	12.00
SrO			
TOTAL	100.220		

AUTHOR
 NUMBER: M632
 RECORD NO: 61

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.48 N
 MAJOR GROUP: ELK SECOND GROUP: TDU LONG: 106.53 W FLAGS
 ROCK NAME: MICROGRANITE CODE: 1440
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10
 -MAX: EOCE -MAX: 40.30
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE-PHENO
 PERTHITE-PHENO PORPHYRITIC
 BIOTITE-PHENO
 FLUORITE
 GARNET
 TOPAZ

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.80	As	Ta
Al2O3	13.80	As	7.00 Te*
Fe2O3	.52	Au*	Th
FeO	.12	B	3.00 Tl
MnO	.10	Ba	41.00 U
CaO	.39	Be	5.00 5.00 V
Na2O	4.10	Bi	1.50 W
K2O	4.40	Ce	25.00 Y
			24.00
H2O+	.45	Co	Yb
H2O-	.14	Cr	1.70 Zn
TH2O		Cu	2.60 57.00 Zr
LOI		F	21.80 41.00
TiO2	.040	Ga	26.00
P2O5		Hg*	
MnO	.130	La	15.00
ZrO2		Li	146.00
CO2 <	.05	Mo	1.00
SO3		Nb	26.00
Cl		Nd	
F	.210	Ni	1.10
S		Pb	27.00
Cr2O3		Rb	263.00
NiO		Sb	
BaO		Sc	7.00
Rb2O		Sn	4.00
SrO		Sr	13.00
TOTAL	100.250		

AUTHOR
 NUMBER: M626
 RECORD NO: 62

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.48 N
 MAJOR GROUP: ELK SECOND GROUP: TDU LONG: 106.53 W FLAGS
 ROCK NAME: MICROGRANITE CODE: 1440
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10
 -MAX: EOCE -MAX: 40.30
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE-PHENO
 FERTHITE-PHENO PORPHYRITIC
 BIOTITE-PHENO
 FLUORITE
 GARNET
 TOPAZ

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	75.90	Ag		Ta	
Al2O3	13.80	As	18.00	Te*	
Fe2O3	.47	Au*		Th	3.00
FeO	.12	B		Tl	
MnO	.16	Ba	43.00	U	13.00
CaO	.78	Be	3.00	V	1.60
Na2O	4.40	Bi		W	
K2O	4.40	Ce	27.00	Y	37.00
H2O+	.39	Co		Yb	1.80
H2O-	.07	Cr		Zn	84.00
TH2O		Cu	54.90	Zr	45.00
LOI		F	100.00		
TiO2	.010	Ga	16.00		
P2O5		Hg*			
MnO	.060	La	14.00		
ZrO2		Li	107.00		
CO2	.04	Mo	1.30		
SO3		Nb	30.10		
Cl		Nd			
F	.010	Ni			
S		Pb	11.00		
Cr2O3		Rb	266.00	AUTHOR	
NiO		Sb		NUMBER:	M625
BaO		Sc	8.30		
Rb2O		Sn	5.00	RECORD NO:	63
SrO		Sr	15.00		
TOTAL	100.610				

20

CODE: 1440

METHOD: KAR

TOF-AZ

Y

La

14.20

AUTHOR: ERNST

DATE: 1980

LAT: 38.48 N

MAJOR GROUP: ELK SECOND GROUP: TDL LONG: 106.53 W FLAGS
2D

ROCK NAME: MICROGRANITE

CODE: 1440

AGE: STRAT-MIN: OLIG
-MAX: EOCE

ISOTOPIC-MIN: 37.10

-MAX: 40.30

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

PLUG

SANIDINE-PHENO

PERTHITE-PHENO

PORPHYRITIC

FLUORITE

MAJOR CONSTITUENTS

SiO2 75.18

Al2O3 13.60

Fe2O3 1.19

FeO

MgO .09

CaO .06

Na2O .68

K2O 6.61

H2O+

H2O-

TH2O 2.39

LOI

TiO2 .070

P2O5 .010

MnO .020

ZrO2

CO2

SO3

Cl

F .044

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 99.944

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

118.00

U

2.50

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

441.00

Ga

Hg*

La

Li

11.50

Mo

Nb

Nd

Ni

Pb

Rb

263.00

AUTHOR

Sb

NUMBER: 258B

Sc

Sn

RECORD NO:

66

Sr

29.80

DATE: 1980

MAJOR GROUP: ELK SECOND GROUP: TDX LAT: 38.48 N
LONG: 106.53 W FLAGS
20

ROCK NAME: MICROGRANITE BRECCIA CODE: 1440

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AGE:  STRAT-MIN: OLIG      ISOTOPIC-MIN:  37.10
      -MAX:  EOCCE          -MAX:  40.30
                                METHOD:  KAR

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MINERALS	OCCUR-PETROG.	ALTERATION
PIPE		

BRECCIA

MAJOR CONSTITUENTS

SiO ₂	75.90
Al ₂ O ₃	12.28
Fe ₂ O ₃	1.44
FeO	
MnO	.30
CaO	.19
Na ₂ O	2.75
K ₂ O	4.82

H2O+	
H2O-	
TH2O	1.47
LOI	
TiO2	.140
P2O5	.010
MnO	.140

ZrO2	
CO2	
SO3	
Cl	
F	.135
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.575

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	231.00	U	3.90
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	1347.00		
Ga			
Hg*			
La			
Li	31.30		
Mo			
Nb	34.00		
Nd			
Ni			
Pb			
Rb	274.00	AUTHOR	
Sb	51.90	NUMBER:	261C
Sc			
Sn		RECORD NO:	68
Sr			

AUTHOR: ERNST

DATE: 1980

LAT: 38.48 N

MAJOR GROUP: ELK SECOND GROUP: TDX LONG: 106.53 W FLAGS
2D

ROCK NAME: MICROGRANITE BRECCIA CODE: 1440

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10

-MAX: EOCCE -MAX: 40.30

METHOD: KAR

MINERALS

OCCUR-PETROG.
PIPE

ALTERATION

BRECCIA

MAJOR CONSTITUENTS

SiO2 71.41
Al2O3 13.71
Fe2O3 3.10
FeO
MgO .66
CaO 1.14
Na2O 2.73
K2O 4.06

H2O+
H2O-
TH2O 2.68
LOI
TiO2 .330
P2O5 .110
MnO .110

ZrO2
CO2
SO3
Cl
F .116
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.156

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	582.00	U	4.80
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	
F	1162.00		
Ga			
Hg*			
La			
Li	52.70		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	180.00	AUTHOR	
Sb		NUMBER: 249C	
Sc			
Sn		RECORD NO:	69
Sr	128.00		

AUTHOR: ERNST

DATE: 1980

LAT: 38.48 N

MAJOR GROUP: ELK SECOND GROUP: TDS LONG: 106.53 W FLAGS
2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10

-MAX: EOCE -MAX: 40.30

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

SILL

SANIDINE-PHENO

PERTHITE-PHENO

PORPHYRITIC

BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 74.71

Al2O3 13.27

Fe2O3 1.63

FeO

MgO .23

CaO .39

Na2O 3.57

K2O 4.37

H2O+

H2O-

TH2O 2.05

LOI

TiO2 .070

P2O5 .130

MnO .090

ZrO2

CO2

SO3

Cl

F .085

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.595

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

111.00

U

5.30

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

851.00

Ga

Hg*

La

Li

141.00

Mo

Nb

16.00

Nd

Ni

Pb

Rb

286.00

Sb

AUTHOR

NUMBER: 252D

Sc

Sn

RECORD NO:

70

Sr

39.80

AUTHOR: ERNST

DATE: 1980

LAT: 38.48 N

MAJOR GROUP: ELK SECOND GROUP: TDT LONG: 106.53 W FLAGS
2D

ROCK NAME: RHYOLITE TUFF CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 37.10

-MAX: EOC -MAX: 40.30

METHOD: KAR

MINERALS

OCCUR-PETROG.
TUFF

ALTERATION

QUARTZ
SANIDINE
ALBITE
BIOTITE
FLUORITE

MAJOR CONSTITUENTS

SiO2 75.41
Al2O3 12.93
Fe2O3 1.01
FeO
MgO .23
CaO .21
Na2O 2.27
K2O 5.47H2O+
H2O-
TH2O 2.45
LOI
TiO2 .060
P2O5 .030
MnO .150ZrO2
CO2
SO3
Cl
F .141
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.361

TRACE ELEMENTS

As
As
Au*
B
Ba 215.00
Be
Bi
Ce

Co
Cr
Cu
F 1413.00
Ga
Hg*
La

Ta
Te*
Th
Tl
U 3.50
V
W
Y

Yb
Zn
ZrLi 68.40
Mo
Nb
Nd
Ni
Pb
Rb 292.00
Sb
Sc
Sn
Sr 22.00AUTHOR
NUMBER: 251E

RECORD NO: 71

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	77.30	Ag	.20	Ta	
Al2O3	12.30	As <	2.00	Te*	
Fe2O3	.30	Au*		Th	24.00
FeO	.25	B		Tl	
MgO	.15	Ba	28.00	U	16.00
CaO	.50	Be	1.00	V	
Na2O	1.90	Bi		W	12.00
K2O	6.20	Ce	68.00	Y	17.00
H2O+	.70	Co		Yb	
H2O-	.25	Cr		Zn	72.00
TH2O		Cu	7.00	Zr	107.00
LOI		F	1150.00		
TiO2	.050	Ga	16.00		
P2O5	.040	Hg*			
MnO	.040	La	40.00		
ZrO2		Li <	2.00		
CO2	.10	Mo	720.00		
SO3		Nb	80.00		
Cl		Nd			
F	.115	Ni			
S	.110	Pb	20.00		
Cr2O3		Rb	383.00	AUTHOR	
NiO		Sb		NUMBER:	79FM957
BaO		Sc			
Rb2O		Sn	10.00	RECORD NO:	390
SrO		Sr	15.00		
TOTAL	100.305				

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEU LONG: 105.83 W FLAGS
 ROCK NAME: GRANITE CODE: 1420

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ	STOCK	
ALKALI FELDSPAR		
ALBITE		
BIOTITE		

MAJOR CONSTITUENTS

SiO2 77.00
 Al2O3 12.30
 Fe2O3 .50
 FeO .55
 MgO .10
 CaO .75
 Na2O 3.00
 K2O 4.50

 H2O+ .55
 H2O- .15
 TH2O
 LOI
 TiO2 .350
 P2O5 .030
 MnO .040

ZrO2
 CO2 .10
 SO3
 Cl
 F .380
 S .080
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.380

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*		Th	23.00
B		Tl	
Ba	29.00	U	17.00
Be	1.00	V	
Bi		W	11.00
Ce	108.00	Y	28.00
Co		Yb	
Cr		Zn	9.00
Cu	5.00	Zr	99.00
F	3800.00		
Ga	24.00		
Hg*			
La	58.00		
Li	7.00		
Mo	11.00		
Nb	69.00		
Nd			
Ni			
Pb	33.00		
Rb	452.00	AUTHOR	
Sb		NUMBER:	79FM960
Sc			
Sn	17.00	RECORD NO:	391
Sr	11.00		

[illegible]

MAJOR CONSTITUENTS

SiO ₂	74.10
Al ₂ O ₃	12.40
Fe ₂ O ₃	.61
FeO	1.40
MnO	.17
CaO	.28
Na ₂ O	.71
K ₂ O	6.33

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.190
P2O5	
MnO	1.180

ZrO2	
CO2	
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	97.370

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

AUTHOR
NUMBER: T.9

RECORD NO: 392

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEU LONG: 105.86 W FLAGS
 ROCK NAME: QUARTZ-SERICITE-PYR CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK QUARTZ-SERICITE-W
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 11.50
 Fe2O3 3.23
 FeO 1.20
 MgO .18
 CaO .51
 Na2O .08
 K2O 3.68

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .180
 P2O5
 MnO .190

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 95.850

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.9

 RECORD NO: 393


```
AUTHOR: WHITE +           DATE: 1981
                                LAT:   39.76 N
MAJOR GROUP: FRR    SECOND GROUP: HEU    LONG: 105.83 W    FLAGS
                                                3K
ROCK NAME: K-FELDSPAR          CODE: 0010
AGE:   STRAT-MIN: OLIG        ISOTOPIC-MIN: 26.00
      -MAX: OLIG              -MAX: 27.00
                                METHOD: KAR
MINERALS                OCCUR-PETROG.    ALTERATION
STOCK                      POTASSIC-S
PORPHYRITIC
```

MAJOR CONSTITUENTS

SiO2	76.50
Al2O3	11.20
Fe2O3	.74
FeO	1.90
MgO	.11
CaO	.93
Na2O	.60
K2O	7.29

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.150
P2O5	
MnO	.090

ZrO2	
CO2	
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.510

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.9

RECORD NO: 395

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEU LONG: 105.83 W FLAGS
 ROCK NAME: VEIN SILICIFICATION CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK SILICIFICATION-S
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 83.50
 Al2O3 6.70
 Fe2O3 .27
 FeO 1.09
 MgO .04
 CaO 1.37
 Na2O .24
 K2O 4.08

 H2O+
 H2O-
 TH2O
 LOI
 TiO2 .110
 P2O5
 MnO .050

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.450

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.9

RECORD NO: 396

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEU LONG: 105.83 W FLAGS
 ROCK NAME: PERVASIVE SILICIFIC CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK SILICIFICATION-X
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 94.00
 Al2O3 .80
 Fe2O3 .57
 FeO 1.24
 MgO
 CaO .44
 Na2O
 K2O .24

 H2O+
 H2O-
 TH2O
 LOI
 TiO2 .090
 P2O5
 MnO .050

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.430

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: T.9

RECORD NO: 397

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEU LONG: 105.83 W FLAGS
 ROCK NAME: LOWER ARGILLIC CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK ARGILLIC
 PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 74.60
 Al2O3 12.30
 Fe2O3 .53
 FeO .92
 MgO .07
 CaO .65
 Na2O .34
 K2O 6.13

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .140
 P2O5
 MnO .300

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 95.980

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.9

RECORD NO: 398

AUTHOR: MUTSCHLER + DATE: 1981
LAT: 39.76 N
MAJOR GROUP: FRR SECOND GROUP: HEUH LONG: 105.83 W FLAGS
ROCK NAME: GRANITE CODE: 1420
AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHEND STOCK FRESH
ALKALI FELDSPAR
ALBITE

MAJOR CONSTITUENTS

SiO2 76.00
Al2O3 12.30
Fe2O3 .20
FeO .60
MgO .75
CaO .90
Na2O 3.10
K2O 6.40

H2O+ .41
H2O- .10
TH2O
LOI
TiO2 .010
P2O5 .060
MnO .060

ZrO2
CO2 .20
SO3
Cl
F .170
S .070
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 101.330

TRACE ELEMENTS

As .20 Ta
As 7.00 Te*
Au* Th 25.00
B Tl
Ba 46.00 U 25.00
Be 4.00 V
Bi W 40.00
Ce 59.00 Y 18.00

Co Yb
Cr Zn 45.00
Cu 8.00 Zr 74.00
F 1700.00
Ga 25.00
Hs*
La 34.00

Li 21.00
Mo 44.00
Nb 160.00
Nd
Ni
Pb 34.00
Rb 621.00 AUTHOR
Sb NUMBER: HN-4
Sc
Sn 12.00 RECORD NO: 387
Sr 5.00

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUH LONG: 105.83 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.50
 Al2O3 12.10
 Fe2O3 .37
 FeO .39
 MgO .13
 CaO .61
 Na2O 3.61
 K2O 5.00

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .080
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.820

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.5-9
 RECORD NO: 388

AUTHOR: MUTSCHLER + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUH LONG: 105.83 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK SILICIFICATION-X

MAJOR CONSTITUENTS

SiO2 95.80
 Al2O3 .50
 Fe2O3 .50
 FeO .75
 MgO .10
 CaO .20
 Na2O .10
 K2O .15

 H2O+ .55
 H2O- .06
 TH2O
 LOI
 TiO2 .100
 P2O5 .010
 MnO .050

 ZrO2
 CO2 .20
 SO3
 Cl
 F .120
 S .360
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.550

TRACE ELEMENTS

As	.20	Ta	
As	6.00	Te*	
Au*	16.10	Th	1.00
B		Tl	.53
Ba	3.00	U	1.00
Be <	1.00	V	
Bi		W	5.00
Ce	9.00	Y	
Co		Yb	
Cr		Zn	228.00
Cu	10.00	Zr	6.00
F	1200.00		
Ga			
Hg*			
La	9.00		
Li	5.00		
Mo	110.00		
Nb <	5.00		
Nd			
Ni			
Pb	73.00		
Rb	23.00	AUTHOR	
Sb		NUMBER:	HN-11
Sc			
Sn	5.00	RECORD NO:	389
Sr			

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUP LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR

 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK ARGILLIC
 ALKALI FELDSPAR-PHENO QUARTZ-SERICITE
 ALBITE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.20
 Al2O3 13.20
 Fe2O3 .65
 FeO .40
 MgO .45
 CaO .80
 Na2O .50
 K2O 5.60

H2O+ 1.65
 H2O- .22
 TH2O
 LOI
 TiO2 .010
 P2O5 .060
 MnO .320

ZrO2
 CO2 .70
 SO3
 Cl
 F .410
 S .160
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.330

TRACE ELEMENTS

As	.20	Ta	
As	3.00	Te*	
Au*	.75	Th	29.00
B		Tl	5.20
Ba	41.00	U	30.00
Be	3.00	V	
Bi		W	28.00
Ce	70.00	Y	33.00
Co		Yb	
Cr		Zn	192.00
Cu	13.00	Zr	80.00
F	4100.00		
Ga	4.00		
Hg*			
La	44.00		
Li	51.00		
Mo	800.00		
Nb	180.00		
Nd			
Ni			
Pb	37.00		
Rb	789.00	AUTHOR	
Sb		NUMBER:	HN-6
Sc			
Sn	30.00	RECORD NO:	385
Sr	6.00		

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUP LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 ALKALI FELDSPAR-PHENO
 PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.20
 Al2O3 12.00
 Fe2O3 .36
 FeO .48
 MgO .10
 CaO .63
 Na2O 3.00
 K2O 5.34

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .100
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O .070
 SrO
 TOTAL 97.310

TRACE ELEMENTS

As		Ta
As		Te*
Au*		Th
B		Tl
Ba	10.00	U
Be		V
Bi		W
Ce		Y
Co		Yb
Cr		Zn
Cu		Zr
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.5-8

RECORD NO: 386
 6.00

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUU LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK ARGILLIC
 ALKALI FELDSPAR-PHENO QUARTZ-SERICITE
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 12.50
 Fe2O3 .40
 FeO .60
 MgO .55
 CaO .85
 Na2O 2.95
 K2O 5.80

 H2O+ .69
 H2O- .15
 TH2O
 LOI
 TiO2 .010
 P2O5 .040
 MnO .230

 ZrO2
 CO2 .10
 SO3
 Cl
 F .175
 S .050
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.195

TRACE ELEMENTS

As	1.60	Ta	
As	4.00	Te*	
Au*	1.52	Th	33.00
B		Tl	2.72
Ba	70.00	U	19.00
Be	3.00	V	
Bi		W	18.00
Ce	71.00	Y	22.00
Co		Yb	
Cr		Zn	296.00
Cu	7.00	Zr	86.00
F	1750.00		
Ga	2.00		
Hg*			
La	44.00		
Li	42.00		
Mo	97.00		
Nb	120.00		
Nd			
Ni			
Pb	222.00		
Rb	497.00	AUTHOR	
Sb		NUMBER:	HN-10
Sc			
Sn	8.00	RECORD NO:	383
Sr	6.00		

AUTHOR: BOOKSTROM DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUU LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.00
 Al2O3 12.30
 Fe2O3 .73
 FeO .76
 MgO .12
 CaO .76
 Na2O 3.17
 K2O 5.14

 H2O+
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5
 MnO .040

 ZrO2
 CO2
 SO3
 Cl
 F .530
 S
 Cr2O3
 NiO
 BaO
 Rb2O .050
 SrO
 TOTAL 98.750

TRACE ELEMENTS

As		Ta
As		Te*
Au*		Th
B		Tl
Ba	10.00	U
Be		V
Bi		W
Ce		Y
Co		Yb
Cr		Zn
Cu		Zr
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr	260.00	

AUTHOR
 NUMBER: T.5-7

RECORD NO: 384

AUTHOR: RANTA

DATE: 1974

LAT: 39.76 N

MAJOR GROUP: FRR SECOND GROUP: HEUR LONG: 105.83 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN: 26.00
-MAX: 27.00

METHOD: KAR

MINERALS

OCCUR-PETROG.
STOCKALTERATION
ARGILLIC-M
QUARTZ-SERICITE

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.40

Al2O3 14.60

Fe2O3 .57

FeO .17

MgO .11

CaO 1.97

Na2O .26

K2O 6.19

H2O+ 2.64

H2O-

TH2O

LOI

TiO2

P2O5

MnO

ZrO2

CO2 < .20

SO3

Cl

F

S .360

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.470

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: T.3-19

RECORD NO: 381

AUTHOR: WHITE + DATE: 1981 LAT: 39.76 N
 MAJOR GROUP: FRR SECOND GROUP: HEUR LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.00
 -MAX: OLIG -MAX: 27.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.00
 Al2O3 12.20
 Fe2O3 .53
 FeO .50
 MnO .10
 CaO .75
 Na2O 2.32
 K2O 5.80

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5
 MnO .080

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O .050
 SrO
 TOTAL 97.480

TRACE ELEMENTS

As		Ta
As		Te*
Au*		Th
B		Tl
Ba	10.00	U
Be		V
Bi		W
Ce		Y
Co		Yb
Cr		Zn
Cu		Zr
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.5-6
 RECORD NO: 382
 18.00

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.66 N
 MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: CENO ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-S
 ALKALI FELDSPAR-PHENO PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 75.80
 Al2O3 13.30
 Fe2O3 .15
 FeO .10
 MgO .10
 CaO .05
 Na2O .40
 K2O 1.15

 H2O+ 8.00
 H2O- .60
 TH2O
 LOI
 TiO2 .100
 P2O5 .270
 MnO .010

 ZrO2
 CO2 .05
 SO3
 Cl
 F .145
 S 1.660
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.885

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*		Th	2.00
B		Tl	
Ba	159.00	U	4.00
Be <	.50	V	
Bi		W	7.00
Ce	142.00	Y	12.00
Co		Yb	
Cr		Zn	33.00
Cu	7.00	Zr	141.00
F	1450.00		
Ga	4.00		
Hg*			
La	82.00		
Li <	2.00		
Mo	2.00		
Nb	37.00		
Nd			
Ni			
Pb	63.00		
Rb	4.00	AUTHOR	
Sb		NUMBER:	79FM946
Sc			
Sn <	5.00	RECORD NO:	375
Sr	143.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.66 N
 MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: CENO ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC
 ALKALI FELDSPAR-PHENO PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 76.40
 Al2O3 12.70
 Fe2O3 .70
 FeO .25
 MnO .20
 CaO .55
 Na2O 3.00
 K2O 4.70

 H2O+ .55
 H2O- .20
 TH2O
 LOI
 TiO2 .050
 P2O5 .070
 MnO .040

 ZrO2
 CO2 .20
 SO3
 Cl
 F .039
 S .020
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.669

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*		Th	12.00
B		Tl	
Ba	78.00	U	8.00
Be	.50	V	
Bi		W	3.00
Ce	85.00	Y	23.00
Co		Yb	
Cr		Zn	32.00
Cu	5.00	Zr	90.00
F	390.00		
Ga	15.00		
Hg*			
La	41.00		
Li	10.00		
Mo	4.00		
Nb	41.00		
Nd			
Ni			
Pb	15.00		
Rb	242.00	AUTHOR	
Sb		NUMBER:	79FM947
Sc			
Sn <	5.00	RECORD NO:	376
Sr	49.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 39.66 N
 MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: CENO ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-S
 ALKALI FELDSPAR-PHENO PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 75.20
 Al2O3 14.00
 Fe2O3 .65
 FeO .20
 MgO .30
 CaO .10
 Na2O 2.20
 K2O 4.50

 H2O+ 1.45
 H2O- .55
 TH2O
 LOI
 TiO2 .450
 P2O5 .080
 MnO .030

 ZrO2
 CO2 .30
 SO3
 Cl
 F .051
 S .060
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.121

TRACE ELEMENTS

Ag	.20	Ta	
As	2.00	Te*	
Au*		Th	3.00
B		Tl	
Ba	562.00	U	5.00
Be	1.00	V	
Bi		W	5.00
Ce	111.00	Y	14.00
Co		Yb	
Cr		Zn	20.00
Cu	3.00	Zr	162.00
F	510.00		
Ga	25.00		
Hg*			
La	66.00		
Li <	2.00		
Mo	3.00		
Nb	32.00		
Nd			
Ni			
Pb	38.00		
Rb	202.00		
Sb			
Sc			
Sn <	5.00		
Sr	143.00		

AUTHOR
 NUMBER: 79FM948

RECORD NO: 377

AUTHOR: KING

DATE: 1971

LAT: 39.66 N

MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: CENO ISOTOPIC-MIN:
-MAX: -MAX:

METHOD:

MINERALS
QUARTZ-PHENO
ALKALI FELDSPAR-PHENO

OCCUR-PETROG.
PLUG
PORPHYRITIC

ALTERATION
ARGILLIC-S
QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 70.60
Al2O3 16.50
Fe2O3 2.50
FeO .40
MgO .47
CaO .27
Na2O 1.30
K2O 4.80

H2O+ 1.60
H2O- .46
TH2O
LOI
TiO2 .290
P2O5 .150
MnO .060

ZrO2
CO2 < .05
SO3
Cl
F .100
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.550

TRACE ELEMENTS

As
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 22-120

RECORD NO: 378

AUTHOR: KING DATE: 1971 LAT: 39.66 N
 MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: CENO ISOTOPIE-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-S
 ALKALI FELDSPAR-PHENO PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 71.20
 Al2O3 16.40
 Fe2O3 3.10
 FeO .36
 MnO .40
 CaO .14
 Na2O .14
 K2O 4.40

 H2O+ 2.20
 H2O- .23
 TH2O
 LOI
 TiO2 .420
 P2O5 .060
 MnO .050

 ZrO2
 CO2 .20
 SO3
 Cl
 F .050
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.350

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 22-1040

 RECORD NO: 379

AUTHOR: KING DATE: 1971 LAT: 39.66 N
 MAJOR GROUP: FRR SECOND GROUP: LVN LONG: 105.74 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: CENO ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-S
 ALKALI FELDSPAR-PHENO PORPHYRITIC QUARTZ-SERICITE

MAJOR CONSTITUENTS

SiO2 75.00
 Al2O3 14.70
 Fe2O3 1.80
 FeO .32
 MgO .23
 CaO .46
 Na2O .15
 K2O 4.40

 H2O+ 1.90
 H2O- .08
 TH2O
 LOI
 TiO2 .250
 P2O5 .060
 MnO .050

 ZrO2
 CO2 .20
 SO3
 Cl
 F .050
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.650

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 22-1930

 RECORD NO: 380

AUTHOR: PHAIR + J. DATE: 1975 LAT: 39.67 N
 MAJOR GROUP: FRR SECOND GROUP: MON LONG: 105.83 W FLAGS
 ROCK NAME: CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 75.40
 Al2O3 13.10
 Fe2O3 .76
 FeO .76
 MgO .30
 CaO 1.70
 Na2O 2.90
 K2O 4.00

 H2O+ .47
 H2O- .02
 TH2O
 LOI
 TiO2 .210
 P2O5 .070
 MnO .100

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.840

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	24.80
B	Tl	
Ba	U	12.20
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hs*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: 412+34

 RECORD NO: 408

AUTHOR: PHAIR + J. DATE: 1975 LAT: 39.62 N
 MAJOR GROUP: FRR SECOND GROUP: BMS LONG: 105.95 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: EOCENE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 76.80
 Al2O3 12.20
 Fe2O3 1.70
 FeO .08
 MgO .09
 CaO .12
 Na2O 3.40
 K2O 5.00

 H2O+ .38
 H2O- .10
 TH2O
 LOI
 TiO2 .110
 P2O5 .100
 MnO .040

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.170

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	58.00
B	Tl	
Ba	U	5.80
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: P1106

 RECORD NO: 407

AUTHOR: BRADDOCK DATE: 1969 LAT: 39.77 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.63 W FLAGS
 ROCK NAME: BOSTONITE PORPHYRY CODE: 0750
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ DIKE
 ALKALI FELDSPAR PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 70.80
 Al2O3 16.50
 Fe2O3 .85
 FeO .14
 MnO .14
 CaO .28
 Na2O 4.60
 K2O 6.20

 H2O+
 H2O-
 TH2O .78
 LOI
 TiO2 .100
 P2O5 .020
 MnO .010

ZrO2
 CO2
 SO3
 Cl .010
 F .090
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.520

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	300.00	U	
Be	30.00	V	20.00
Bi		W	
Ce		Y	30.00
Co		Yb	5.00
Cr		Zn	
Cu	10.00	Zr	500.00
F			
Ga	50.00		
Hg*			
La			
Li			
Mo			
Nb	70.00		
Nd			
Ni			
Pb	50.00		
Rb		AUTHOR	
Sb		NUMBER: 1-111	
Sc			
Sn		RECORD NO:	399
Sr	70.00		

AUTHOR: HOBLITT + L. DATE: 1975
 LAT: 40.07 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.32 W FLAGS
 ROCK NAME: CODE: 0010
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 71.70
 Al2O3 14.20
 Fe2O3 .59
 FeO .22
 MgO .45
 CaO .38
 Na2O 4.00
 K2O 4.40

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .200
 P2O5 .023
 MnO .026

ZrO2
 CO2 .20
 SO3
 Cl
 F .080
 S .010
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 96.479

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.4
 RECORD NO: 400

AUTHOR: PHAIR + J. DATE: 1975 LAT: 39.75 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.51 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 70.00
 Al2O3 13.20
 Fe2O3 2.10
 FeO 5.00
 MgO .24
 CaO 1.40
 Na2O 2.00
 K2O 5.20

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .160
 P2O5 .140
 MnO .160

ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.700

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	14.40
B	Tl	
Ba	U	4.90
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P310
 RECORD NO: 401

AUTHOR: PHAIR + J. DATE: 1975 LAT: 39.77 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.53 W FLAGS
 ROCK NAME: QUARTZ BOSTONITE CODE: 0760
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 70.80
 Al2O3 14.60
 Fe2O3 1.90
 FeO 2.80
 MgO .06
 CaO .06
 Na2O 2.10
 K2O 7.30

 H2O+
 H2O-
 TH2O
 LOI .08
 TiO2 .080
 P2O5 .080
 MnO .200

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.060

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	28.10
B	Tl	
Ba	U	13.80
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: P36
 RECORD NO: 402

AUTHOR: PHAIR + J. DATE: 1975 LAT: 39.77 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.53 W FLAGS
 ROCK NAME: QUARTZ BOSTONITE CODE: 0760
 AGE: STRAT-MIN: EOCENE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 15.60
 Fe2O3 .90
 FeO .11
 MgO .04
 CaO .37
 Na2O 5.60
 K2O 4.60

 H2O+ .33
 H2O- .10
 TH2O
 LOI
 TiO2 .100
 P2O5 .060
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.260

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	36.80
B	Tl	
Ba	U	7.00
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: P832

RECORD NO: 403

AUTHOR: PHAIR + J. DATE: 1975
 LAT: 39.75 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.63 W FLAGS
 ROCK NAME: QUARTZ BOSTONITE CODE: 0760
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE ALTERED

MAJOR CONSTITUENTS

SiO2 70.60
 Al2O3 16.40
 Fe2O3 2.70
 FeO 1.20
 MgO .06
 CaO .02
 Na2O .28
 K2O 5.40

H2O+
 H2O-
 TH2O
 LOI 3.20
 TiO2 .180
 P2O5 .060
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.130

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	76.00
B	Tl	
Ba	U	13.90
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P586
 RECORD NO: 404

AUTHOR: PHAIR + J. DATE: 1975 LAT: 40.12 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.38 W FLAGS
 ROCK NAME: QUARTZ BOSTONITE CODE: 0760
 AGE: STRAT-MIN: EOCCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 70.40
 Al2O3 15.40
 Fe2O3 1.60
 FeO 1.00
 MnO .03
 CaO .60
 Na2O 5.70
 K2O 4.70

H2O+
 H2O-
 TH2O
 LOI .18
 TiO2 .050
 P2O5 .030
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.720

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	48.90
B	Tl	
Ba	U	22.50
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P269
 RECORD NO: 405

AUTHOR: RICE DATE: 1983 LAT: 39.77 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.53 W FLAGS
 ROCK NAME: QUARTZ BOSTONITE CODE: 0760
 AGE: STRAT-MIN: EOCCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 72.64
 Al2O3 16.48
 Fe2O3 .50
 FeO .09
 MgO .06
 CaO .17
 Na2O 3.95
 K2O 6.25

 H2O+
 H2O-
 TH2O .89
 LOI
 TiO2 .090
 P2O5 .010
 MnO .010

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.140

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	190.00
B		Tl	
Ba	155.00	U	52.00
Be		V	
Bi		W	11.00
Ce		Y	12.00
Co		Yb	
Cr	4.00	Zn	57.00
Cu	22.00	Zr	940.00
F			
Ga			
Hg*			
La			
Li			
Mo <	3.00		
Nb	82.00		
Nd			
Ni	4.00		
Pb	64.00		
Rb	326.00	AUTHOR	
Sb		NUMBER:	78
Sc			
Sn		RECORD NO:	442
Sr	32.00		

AUTHOR: JENKINS DATE: 1979 LAT: 40.12 N
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: 105.38 W FLAGS
 ROCK NAME: BOSTONITE CODE: 0750
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 72.15
 Al2O3 15.45
 Fe2O3 .81
 FeO 1.62
 MgO .16
 CaO .13
 Na2O 3.51
 K2O 5.37

 H2O+ .20
 H2O- .16
 TH2O
 LOI
 TiO2 .030
 P2O5 .020
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.660

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: SD-10

 RECORD NO: 506

AUTHOR: GABLE DATE: 1983 LAT:
 MAJOR GROUP: FRR SECOND GROUP: EBO LONG: FLAGS
 ROCK NAME: BOSTONITE CODE: 0750
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE ALTERED

MAJOR CONSTITUENTS

SiO2 70.10
 Al2O3 16.10
 Fe2O3 1.80
 FeO .16
 MgO .19
 CaO .49
 Na2O 5.10
 K2O 4.70

 H2O+ .83
 H2O- .27
 TH2O
 LOI
 TiO2 .120
 P2O5 .040
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.950

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	1.00	V	30.00
Bi		W	
Ce	200.00	Y	20.00
Co		Yb	2.00
Cr	3.00	Zn	
Cu	1.00	Zr	200.00
F			
Ga	20.00		
Hg*			
La	200.00		
Li			
Mo	3.00		
Nb	50.00		
Nd	100.00		
Ni			
Pb	70.00		
Rb		AUTHOR	
Sb		NUMBER: 55	
Sc			
Sn		RECORD NO:	507
Sr	200.00		

AUTHOR: BRADDOCK DATE: 1969 LAT: 39.82 N
 MAJOR GROUP: FRR SECOND GROUP: ALC LONG: 105.63 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ DIKE FRESH
 ORTHOCLASE
 OLIGOCLASE APLITIC

MAJOR CONSTITUENTS

SiO2 76.40
 Al2O3 12.40
 Fe2O3 1.40
 FeO .72
 MgO .18
 CaO .64
 Na2O 2.30
 K2O 5.90

H2O+
 H2O-
 TH2O .50
 LOI
 TiO2 .080
 P2O5 .020
 MnO

ZrO2
 CO2
 SO3
 Cl .020
 F .010
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.570

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	2000.00	U	
Be	7.00	V	20.00
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu	50.00	Zr	70.00
F			
Ga	20.00		
Hg*			
La			
Li			
Mo			
Nb			
Nd			
Ni			
Pb	15.00		
Rb		AUTHOR	
Sb		NUMBER:	4-165A
Sc			
Sn		RECORD NO:	462
Sr	1500.00		

AUTHOR: PHAIR + J. DATE: 1975
 LAT: 40.10 N
 MAJOR GROUP: FRR SECOND GROUP: JIM LONG: 105.38 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 72.20
 Al2O3 15.60
 Fe2O3 .80
 FeO 1.60
 MgO .14
 CaO 1.60
 Na2O 3.60
 K2O 4.00

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .020
 P2O5 .060
 MnO .050

ZrO2
 CO2 .30
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.970

TRACE ELEMENTS

Ag	Ta	
As	Te*	
Au*	Th	4.50
B	Tl	
Ba	U	1.80
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: P523

RECORD NO: 406

AUTHOR: SEGERSTROM+Y. DATE: 1972
 MAJOR GROUP: HAH SECOND GROUP: LAT: 40.82 N
 LONG: 106.90 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: PLIO -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 14.80
 Fe2O3 .91
 FeO .72
 MgO .38
 CaO 1.10
 Na2O 3.70
 K2O 4.00
 H2O+ .91
 H2O- .39
 TH2O
 LOI
 TiO2 .190
 P2O5 .100
 MnO .030
 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.680

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1500.00	U	
Be	3.00	V	15.00
Bi		W	
Ce		Y <	3.00
Co		Yb	
Cr	3.00	Zn	
Cu	5.00	Zr	100.00
F			
Ga	15.00		
Hg*			
La			
Li			
Mo	3.00		
Nb	10.00		
Nd			
Ni			
Pb	50.00		
Rb			
Sb			
Sc	1.00		
Sn			
Sr	500.00		

AUTHOR
 NUMBER: T.5-2

RECORD NO: 409

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	74.83	As	1.50
Al2O3	12.63	As	9.20
Fe2O3	.85	Au*	22.00
FeO	.33	B	
MgO	.06	Ba	363.00
CaO	.37	Be	3.00
Na2O	1.26	Bi	.90
K2O	8.13	Ce	
H2O+	.58	Co	4.00
H2O-		Cr	14.00
TH2O		Cu	500.00
LOI		F	1070.00
TiO2	.180	Ga	
P2O5	.070	Hg*	25.00
MnO	.008	La	
ZrO2		Li	12.00
CO2	.10	Mo	3.00
SO3		Nb	22.00
Cl		Nd	
F	.107	Ni	2.00
S		Pb	10.00
Cr2O3		Rb	113.00
NiO		Sb <	.50
BaO		Sc	
Rb2O		Sn	1.80
SrO		Sr	105.00
TOTAL	99.505		

120.00

.50

11.00

29.00

2.00

Yb

Zn

Zr

210.00

12.00

444

AUTHOR

NUMBER: 74

RECORD NO:

AUTHOR: IZETT DATE: 1968 LAT: 39.10 N
 MAJOR GROUP: RAB SECOND GROUP: SPE LONG: 106.17 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO WELDED TUFF
 SANIDINE-PHENO
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 79.30
 Al2O3 11.10
 Fe2O3 .23
 FeO .18
 MgO .18
 CaO .54
 Na2O 2.60
 K2O 4.30

 H2O+ 1.10
 H2O- .72
 TH2O
 LOI
 TiO2 .140
 P2O5 .020
 MnO .020

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.480

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.8-6

 RECORD NO: 410

AUTHOR: HAIL

DATE: 1968

LAT: 40.35 N

MAJOR GROUP: RAB SECOND GROUP:

LONG: 106.52 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
PLUTON

ALTERATION

MAJOR CONSTITUENTS

SiO2 75.20
Al2O3 13.70
Fe2O3 .71
FeO .02
MgO .19
CaO .44
Na2O 3.90
K2O 4.40

H2O+
H2O-
TH2O 1.30
LOI
TiO2 .030
P2O5 .010
MnO .070

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.020

TRACE ELEMENTS

As
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: T.3-1

RECORD NO: 411

LAT: 40.32 N

LONG: 106.47 W FLAGS

CODE: 3010

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
PLUTON

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	74.60
Al ₂ O ₃	14.00
Fe ₂ O ₃	.27
FeO	.28
MnO	.10
CaO	.53
Na ₂ O	4.40
K ₂ O	4.20

H2O+	
H2O-	
TH2O	1.20
LOI	
TiO2	.020
P2O5	.010
MnO	.090

ZrO2		
CO2	<	.05
SO3		
Cl		
F		
S		
Cr2O3		
NiO		
BaO		
Rb2O		
SrO		
TOTAL		99.750

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.3-2

RECORD NO: 412

AUTHOR: HAIL DATE: 1968 LAT: 40.37 N
 MAJOR GROUP: RAB SECOND GROUP: LONG: 106.42 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUTON

MAJOR CONSTITUENTS

SiO2 72.30
 Al2O3 14.20
 Fe2O3 1.80
 FeO .06
 MgO .13
 CaO .73
 Na2O 4.00
 K2O 4.60

 H2O+
 H2O-
 TH2O 1.80
 LOI
 TiO2 .340
 P2O5 .020
 MnO .040

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.070

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.3-3

 RECORD NO: 413

LAT: 40.38 N

LONG: 106.38 W FLAGS

CODE: 3010

ISOTOPIC-MIN:
-MAX:

METHOD:

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	71.30
Al ₂ O ₃	15.00
Fe ₂ O ₃	1.80
FeO	.06
MgO	.31
CaO	1.10
Na ₂ O	4.10
K ₂ O	5.10

H2O+	
H2O-	
TH2O	.53
LOI	
TiO2	.290
P2O5	.110
MnO	.090

ZrO2		
CO2	<	.05
SO3		
Cl		
F		
S		
Cr2O3		
NiO		
BaO		
Rb2O		
SrO		
TOTAL		99.840

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.3-4

RECORD NO: 414

AUTHOR: HAIL

DATE: 1968

LAT: 40.35 N

MAJOR GROUP: RAB SECOND GROUP:

LONG: 106.40 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOCISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLOW BRECCIA

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 73.90Al₂O₃ 12.70Fe₂O₃ 1.70

FeO .07

MgO .20

CaO .93

Na₂O 3.70K₂O 4.20H₂O+H₂O-TH₂O 1.90

LOI

TiO₂ .310P₂O₅ .050

MnO .080

ZrO₂CO₂ < .05SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.790

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hs*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: T.3-6

RECORD NO:

415

AUTHOR: LIPMAN DATE: 1975 LAT: 37.47 N
 MAJOR GROUP: SAJ SECOND GROUP: HIN LONG: 106.57 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DOME
 SANIDINE-PHENO
 PLAGIOCLASE-PHENO PORPHYRITIC
 BIOTITE-PHENO DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 76.20
 Al2O3 13.20
 Fe2O3 .65
 FeO .32
 MgO .08
 CaO .23
 Na2O 4.40
 K2O 4.30

 H2O+ .31
 H2O- .14
 TH2O
 LOI
 TiO2 .060
 P2O5
 MnO .100

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.040

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	28.00	U	
Be	18.00	V	
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	4.00	Zr	130.00
F			
Ga	30.00		
Hg*			
La	70.00		
Li			
Mo			
Nb	110.00		
Nd			
Ni	70.00		
Pb	30.00		
Rb		AUTHOR	
Sb		NUMBER:	T.11-12
Sc			
Sn		RECORD NO:	156
Sr	16.00		

AUTHOR: LIPMAN		DATE: 1975			
				LAT: 38.62 N	
MAJOR GROUP: SAJ		SECOND GROUP: HIN		LONG: 106.62 W	FLAGS
ROCK NAME: OBSIDIAN		CODE: 2500			
AGE: STRAT-MIN: MIOC		ISOTOPIC-MIN: 21.90			
-MAX: MIOC		-MAX:			
		METHOD: KAR			
MINERALS		OCCUR-PETROG.		ALTERATION	
		FLOW BRECCIA			

MAJOR CONSTITUENTS

SiO2	75.90
Al2O3	13.00
Fe2O3	.32
FeO	.44
MgO	.15
CaO	.68
Na2O	4.80
K2O	4.09
H2O+	.16
H2O-	.04
TH2O	
LOI	
TiO2	.110
P2O5	.020
MnO	.140

ZrO2		
CO2	<	.05
SO3		
Cl		
F		
S		
Cr2O3		
NiO		
BaO		
Rb2O		
SrO		
TOTAL		99.900

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	30.00	U	
Be	7.00	V	
Bi		W	
Ce	100.00	Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	3.00	Zr	100.00
F			
Ga	200.00		
Hg*			
La	70.00		
Li			
Mo	7.00		
Nb	50.00		
Nd			
Ni			
Pb	300.00		
Rb		AUTHOR	
Sb		NUMBER:	T.11-11
Sc			
Sn	30.00	RECORD NO:	157
Sr	10.00		

AUTHOR: LIPMAN DATE: 1975 LAT: 37.49 N
 MAJOR GROUP: SAJ SECOND GROUP: HIN LONG: 106.65 W FLAGS

ROCK NAME: RHYOLITE CODE: 3010

AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 OCCUR-PETROG. ALTERATION
 FLOW
 PORPHYRITIC
 AUGITE-PHENO

MAJOR CONSTITUENTS

SiO2 70.00
 Al2O3 15.20
 Fe2O3 2.20
 FeO .20
 MgO .34
 CaO 1.20
 Na2O 4.00
 K2O 5.50

H2O+ .55
 H2O- .15
 TH2O
 LOI
 TiO2 .420
 P2O5 .060
 MnO .120

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.990

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	5.00	V	20.00
Bi		W	
Ce	500.00	Y	20.00
Co		Yb	2.00
Cr	5.00	Zn	
Cu	7.00	Zr	200.00
F			
Ga	10.00		
Hg*			
La	150.00		
Li			
Mo	5.00		
Nb	20.00		
Nd			
Ni			
Pb	15.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	200.00		

AUTHOR
 NUMBER: T.11-19

RECORD NO: 158

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	73.51	As	Ta
Al2O3	12.86	As	Te*
Fe2O3	.35	Au*	Th
FeO	.42	B	Tl
MgO	.15	Ba	U
CaO	.60	Be	V
Na2O	4.38	Bi	W
K2O	4.32	Ce	Y
H2O+	3.26	Co	Yb
H2O-	.24	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2		Ga	
P2O5	.010	Hg*	
MnO	.020	La	
ZrO2	.02	Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	100.140		

AUTHOR

NUMBER: T.23-16

RECORD NO: 160

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XD LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: MAFIC ROCK CODE: 0010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO DIKE
SANIDINE-PHENO
PLAGIOCLASE-PHENO
DIOPSIDE-PHENO

MAJOR CONSTITUENTS

SiO2 54.40
Al2O3 12.30
Fe2O3 3.50
FeO 3.50
MgO 5.10
CaO 7.00
Na2O 2.20
K2O 3.20

H2O+ 2.70
H2O- .98
TH2O
LOI
TiO2 1.400
P2O5 .550
MnO .260

ZrO2
CO2 2.80
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.890

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co 30.00 Yb
Cr 300.00 Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni 100.00
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 136

RECORD NO: 182

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XY LONG: 107.61 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLUG QUARTZ-SERICITE-M
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC
 BIOTITE-PHENO

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	74.30	As	Ta
Al2O3	13.60	As	Te*
Fe2O3	1.00	Au*	Th
FeO	.40	B	Tl
MgO	.31	Ba	U
CaO	.40	Be	V
Na2O	2.30	Bi	W
K2O	5.10	Ce	Y
H2O+	1.50	Co	Yb
H2O-	.51	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.240	Ga	
P2O5	.060	Hg*	
MnO	.020	La	
ZrO2		Li	
CO2	.08	Mo	7.00
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	46.00
Cr2O3		Rb	
NiO		Sb	3.00
BaO		Sc	
Rb2O		Sn <	10.00
SrO		Sr	100.00
TOTAL	99.820		

20.00

185A

180

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XOD LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO DIKE QUARTZ-SERICITE-W
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.30
Al2O3 11.40
Fe2O3 .54
FeO .12
MnO .07
CaO .13
Na2O 1.40
K2O 6.20

H2O+ .70
H2O- .02
TH2O
LOI
TiO2 .070
P2O5
MnO .030

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.030

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 163

RECORD NO: 175

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.59 N
 MAJOR GROUP: SAJ SECOND GROUP: XOD LONG: 107.59 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE-W
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 66.60
 Al2O3 15.50
 Fe2O3 2.70
 FeO .32
 MgO .84
 CaO 1.10
 Na2O 1.70
 K2O 8.00
 H2O+ 1.60
 H2O- .43
 TH2O
 LOI
 TiO2 .640
 P2O5 .240
 MnO .150

ZrO2
 CO2 .09
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.910

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 231

RECORD NO: 176

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XOD LAT: 37.59 N
LONG: 107.58 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO DIKE QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.90
Al2O3 13.20
Fe2O3 .06
FeO .16
MgO .58
CaO .11
Na2O
K2O 3.60

H2O+ 2.10
H2O- .71
TH2O
LOI
TiO2 .370
P2O5 .020
MnO .040

ZrO2
CO2 .09
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.940

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 266

RECORD NO: 177

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XOD LAT: 37.59 N
LONG: 107.58 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO DIKE QUARTZ-SERICITE-W
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO₂ 77.70
Al₂O₃ 11.40
Fe₂O₃
FeO .76
MgO .28
CaO .18
Na₂O .18
K₂O 8.20

H₂O+ 1.00
H₂O- .11
TH₂O
LOI
TiO₂ .130
P₂O₅ .020
MnO .040

ZrO₂
CO₂ .05

SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 100.050

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR
NUMBER: 267B

RECORD NO: 178

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XD LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-W
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.60
Al2O3 12.20
Fe2O3 .39
FeO .24
MnO .15
CaO .09
Na2O 1.00
K2O 6.70

H2O+ 1.80
H2O- .17
TH2O
LOI
TiO2 .150
P2O5
MnO

ZrO2
CO2 .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.540

TRACE ELEMENTS

Ag Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hf*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 1A

RECORD NO: 161

AUTHOR: SCHMITT + R. DATE: 1977 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: X0 LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-W
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.20
 Al2O3 11.50
 Fe2O3 .26
 FeO .28
 MnO .07
 CaO .18
 Na2O 1.10
 K2O 7.10

 H2O+ 1.00
 H2O- .13
 TH2O
 LOI
 TiO2 .130
 P2O5
 MnO .020

 ZrO2
 CO2 .06
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.030

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: 1B

RECORD NO: 162

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10
METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-W
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.50
Al2O3 12.20
Fe2O3 .06
FeO .16
MgO .06
CaO .08
Na2O 1.80
K2O 7.30

H2O+ 1.30
H2O-
TH2O
LOI
TiO2 .120
P2O5
MnO .020

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.650

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 125A

RECORD NO: 163

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XO LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLUG QUARTZ-SERICITE-W
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.40
 Al2O3 12.50
 Fe2O3 .20
 FeO .12
 MgO .07
 CaO .02
 Na2O 2.80
 K2O 6.30

H2O+ .63
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5
 MnO

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.240

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 185B

RECORD NO: 164

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XO LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	79.80	As	1.00	Ta	
Al2O3	12.60	As	300.00	Te*	
Fe2O3	.40	Au*	.10	Th	
FeO	.16	B		Tl	
MgO	.12	Ba	30.00	U	
CaO	.38	Be		V	10.00
Na2O	.13	Bi		W	
K2O	3.20	Ce		Y	
H2O+	2.60	Co		Yb	
H2O-	.08	Cr	10.00	Zn	40.00
TH2O		Cu	70.00	Zr	
LOI		F			
TiO2	.220	Ga			
P2O5		Hg*			
MnO		La			
ZrO2		Li			
CO2 <	.05	Mo	300.00		
SO3		Nb			
Cl		Nd			
F		Ni			
S		Pb	1800.00		
Cr2O3		Rb		AUTHOR	
NiO		Sb		NUMBER: 7	
BaO		Sc			
Rb2O		Sn	10.00	RECORD NO: 165	
SrO		Sr			
TOTAL	99.740				

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.40
Al2O3 13.60
Fe2O3 .56
FeO .40
MgO .23
CaO .14
Na2O .09
K2O 3.90

H2O+ 1.80
H2O- .09
TH2O
LOI
TiO2 .220
P2O5 .030
MnO

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.510

TRACE ELEMENTS

As	.50	Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	70.00	U	
Be		V	10.00
Bi	10.00	W	
Ce		Y	
Co		Yb	
Cr	5.00	Zn	50.00
Cu	15.00	Zr	
F			
Ga			
Hg*			
La			
Li			
Mo	10.00		
Nb			
Nd			
Ni			
Pb	100.00		
Rb			
Sb			
Sc			
Sn	20.00		
Sr			

AUTHOR
NUMBER: 17

RECORD NO: 166

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XO LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	79.90	As		Ta	
Al2O3	11.90	As		Te*	
Fe2O3	.94	Au*		Th	
FeO	.24	B		Tl	
MgO	.18	Ba	50.00	U	
CaO	.17	Be		V	10.00
Na2O	.16	Bi		W	
K2O	3.80	Ce		Y	
H2O+	1.70	Co		Yb	
H2O-	.07	Cr	5.00	Zn	85.00
TH2O		Cu	30.00	Zr	
LOI		F			
TiO2	.130	Ga			
P2O5		Hg*			
MnO		La			
ZrO2		Li			
CO2 <	.05	Mo	70.00		
SO3		Nb			
Cl		Nd			
F		Ni			
S		Pb	30.00		
Cr2O3		Rb		AUTHOR	
NiO		Sb		NUMBER: 32	
BaO		Sc			
Rb2O		Sn	10.00	RECORD NO:	167
SrO		Sr			
TOTAL	99.240				

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XO LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	79.20	As	Ta
Al2O3	13.20	As	Te*
Fe2O3	.52	Au*	Th
FeO	.12	B	Tl
MgO	.31	Ba	U
CaO	.14	Be	V
Na2O	.15	Bi	W
K2O	4.00	Ce	Y
H2O+	1.80	Co	Yb
H2O-	.02	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.130	Ga	
P2O5	.020	Hg*	
MnO		La	
ZrO2		Li	
CO2 <	.05	Mo	7.00
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	50.00
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	10.00
SrO		Sr	
TOTAL	99.660		

10.00 10.00
 AUTHOR
 NUMBER: 38
 RECORD NO: 168

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10
METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.40
Al2O3 13.40
Fe2O3 .66
FeO .24
MgO .55
CaO .61
Na2O .37
K2O 3.60

H2O+ 1.70
H2O- .10
TH2O
LOI
TiO2 .150
P2O5 .040
MnO .020

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.890

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*	.20	Th	
B		Tl	
Ba	300.00	U	
Be		V	10.00
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	40.00
Cu	15.00	Zr	
F			
Ga			
Hg*			
La			
Li			
Mo			
Nb			
Nd			
Ni			
Pb	50.00		
Rb		AUTHOR	
Sb	300.00	NUMBER:	63
Sc			
Sn	10.00	RECORD NO:	169
Sr	200.00		

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 79.20
Al2O3 13.20
Fe2O3 .14
FeO .24
MgO .31
CaO .07
Na2O .03
K2O 3.80

H2O+ 1.70
H2O- .12
TH2O
LOI
TiO2 .160
P2O5 .050
MnO .040

ZrO2
CO2 .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.110

TRACE ELEMENTS

As 10.00 Ta
As Te*
Au* Th
B Tl
Ba 2000.00 U
Be V 10.00
Bi W
Ce Y

Co Yb
Cr Zn 50.00
Cu 20.00 Zr
F
Ga
Hg*
La

Li
Mo < 5.00
Nb
Nd
Ni
Pb 48.00
Rb
Sb
Sc
Sn < 10.00
Sr 100.00

AUTHOR
NUMBER: 123

RECORD NO: 170

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10
METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 78.40
Al2O3 13.40
Fe2O3 .57
FeO .32
MgO .41
CaO .14
Na2O .12
K2O 3.80

H2O+ 2.10
H2O- .12
TH2O
LOI
TiO2 .280
P2O5 .150
MnO .020

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.880

TRACE ELEMENTS

Ag
As
Au*
B
Ba 150.00
Be
Bi
Ce
Co
Cr 5.00
Cu 10.00
F
Ga
Hs*
La
Ta
Te*
Th
Tl
U
V 70.00
W
Y
Yb
Zn 40.00
Zr

Li
Mo 10.00
Nb
Nd
Ni
Pb 30.00
Rb
Sb
Sc
Sn < 10.00
Sr

AUTHOR
NUMBER: 21
RECORD NO: 171

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10
METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.90
Al2O3 13.00
Fe2O3 2.30
FeO .16
MgO .55
CaO .12
Na2O .16
K2O 3.80

H2O+ 1.60
H2O- .05
TH2O
LOI
TiO2 .360
P2O5 .070
MnO

ZrO2
CO2 < .05

SO3

Cl

F

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 99.120

TRACE ELEMENTS

As Ta
As Te*
Au* .04 Th
B Tl
Ba 200.00 U
Be V 70.00
Bi W
Ce Y

Co Yb
Cr 10.00 Zn 60.00
Cu 15.00 Zr

F
Ga
Hs*
La

Li
Mo < 5.00

Nb

Nd

Ni

Pb 50.00

Rb

Sb

Sc

Sn < 10.00

Sr

AUTHOR
NUMBER: 37

RECORD NO: 172

AUTHOR: SCHMITT + R. DATE: 1977

MAJOR GROUP: SAJ SECOND GROUP: XO LAT: 37.60 N
LONG: 107.61 W FLAGS

ROCK NAME: PORPHYRY CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
-MAX: MIOC -MAX: 10.10

METHOD: FSTR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
SANIDINE-PHENO ARGILLIC-S
NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.30
Al2O3 14.40
Fe2O3 .47
FeO .16
MgO .33
CaO .43
Na2O .11
K2O 4.00

H2O+ 2.30
H2O- .22
TH2O
LOI
TiO2 .410
P2O5 .060
MnO .030

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.270

TRACE ELEMENTS

As 2.00 Ta
As Te*
Au* .10 Th
B Tl
Ba 2000.00 U
Be V 7.00
Bi W
Ce Y
Co Yb
Cr 10.00 Zn 300.00
Cu 70.00 Zr
F
Ga
Hs*
La

Li
Mo 70.00
Nb
Nd
Ni
Pb 150.00
Rb
Sb 100.00
Sc
Sn 15.00
Sr 100.00

AUTHOR
NUMBER: 46

RECORD NO: 173

AUTHOR: SCHMITT + R. DATE: 1977
 LAT: 37.60 N
 MAJOR GROUP: SAJ SECOND GROUP: XO LONG: 107.61 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 9.00
 -MAX: MIOC -MAX: 10.10
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-S
 SANIDINE-PHENO
 NA-PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 80.30
 Al2O3 12.00
 Fe2O3 1.20
 FeO .12
 MgO .06
 CaO .12
 Na2O .05
 K2O .61

 H2O+ 2.70
 H2O- .10
 TH2O
 LOI
 TiO2 .270
 P2O5 .140
 MnO .040

 ZrO2
 CO2 < .05
 SO3
 Cl
 F .750
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.510

TRACE ELEMENTS

As	15.00	Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	150.00	U	
Be		V	30.00
Bi		W	
Ce		Y	
Co		Yb	
Cr	7.00	Zn	85.00
Cu	15.00	Zr	
F			
Ga			
Hg*			
La			
Li			
Mo	5.00		
Nb			
Nd			
Ni			
Pb	100.00		
Rb			
Sb			
Sc			
Sn <	10.00		
Sr	300.00		

AUTHOR
 NUMBER: 88

RECORD NO: 174

LAT: 37.98 N

MAJOR GROUP: SAJ SECOND GROUP: LRI LONG: 107.57 W FLAGS
20

ROCK NAME: SILICIFIED BRECCIA CODE: 0020

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 15.40
-MAX: MIOC -MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLUG

ALTERATION
SILICIFICATION-X

BRECCIA

MAJOR CONSTITUENTS

SiO2	98.63
Al2O3	.31
Fe2O3	.45
FeO	
MnO	.20
CaO	
Na2O	.01
K2O	

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.320
P2O5	.020
MnO	.010

ZrO2	
CO2	
SO3	
Cl	
F	.001
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.951

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	506.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	10.00
Cu		Zr	172.00
F	11.00		
Ga			
Hg*			
La			

Li	17.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	11.00	AUTHOR	
Sb		NUMBER:	11
Sc			
Sn		RECORD NO:	187
Sr	28.00		

AUTHOR
NUMBER: 11

RECORD NO: 187

LAT: 38.03 N

MAJOR GROUP: SAJ SECOND GROUP: LRI LONG: 107.51 W FLAGS
20

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLUG

ALTERATION

FORPHYRITIC

MAJOR CONSTITUENTS

SiO ₂	75.95
Al ₂ O ₃	13.06
Fe ₂ O ₃	.81
FeO	
MnO	.33
CaO	.68
Na ₂ O	1.95
K ₂ O	4.75

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.100
P2O5	.020
MnO	.100

ZrO2	
CO2	
SO3	
Cl	
F	.096
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	97.846

TRACE ELEMENTS

As			Ta	
As			Te*	
Au*			Th	
B			Tl	
Ba	514.00		U	
Be			V	
Bi			W	
Ce			Y	
Co			Yb	
Cr			Zn	24.00
Cu			Zr	130.00
F	965.00			
Ga				
Hg*				
La				
Li	121.00			
Mo				
Nb				
Nd				
Ni				
Pb				
Rb	511.00	AUTHOR		
Sb		NUMBER:	36	
Sc				
Sn		RECORD NO:		190
Sr	45.00			

DATE: 1981

LAT: 38.03 N

MAJOR GROUP: SAJ SECOND GROUP: LRI LONG: 107.51 W FLAGS
20

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
PLUG

ALTERATION

PORPHYRYTIC

MAJOR CONSTITUENTS

SiO ₂	75.51
Al ₂ O ₃	13.62
Fe ₂ O ₃	.95
FeO	
MgO	.34
CaO	.44
Na ₂ O	3.35
K ₂ O	4.61

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	574.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	23.00
Cu		Zr	133.00
F	590.00		
Ga			
Hg*			
La			

ZrO2	
CO2	
SO3	
Cl	
F	.059
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.089

Li	93.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	483.00	AUTHOR	
Sb		NUMBER:	37
Sc			
Sn		RECORD NO:	191
Sr	51.00		

AUTHOR: ERNST DATE: 1981
 LAT: 38.02 N
 MAJOR GROUP: SAJ SECOND GROUP: LRI LONG: 107.47 W FLAGS
 2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.09
 Al2O3 12.79
 Fe2O3 .86
 FeO
 MnO .59
 CaO 2.21
 Na2O .16
 K2O 5.49

H2O+
 H2O-
 TH2O
 LOI
 TiO2 .130
 P2O5 .040
 MnO .100

ZrO2
 CO2
 SO3
 Cl
 F .160
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.620

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	536.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	38.00
Cu		Zr	126.00
F	1600.00		
Ga			
Hg*			
La			
Li	62.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	359.00	AUTHOR	
Sb		NUMBER:	41
Sc			
Sn		RECORD NO:	194
Sr	102.00		

LAT: 38.07 N

MAJOR GROUP: SAJ SECOND GROUP: LRI LONG: 107.37 W FLAGS
2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
PLUG

ALTERATION

PORPHYRYTIC

MAJOR CONSTITUENTS

SiO ₂	76.91
Al ₂ O ₃	13.16
Fe ₂ O ₃	1.09
FeO	
Mn ₂ O	.33
CaO	.36
Na ₂ O	3.20
K ₂ O	4.14

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.130
P2O5	.020
MnO	.060

ZrO2	
CO2	
SO3	
Cl	
F	.066
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.466

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	506.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	24.00
Cu		Zr	147.00
F	660.00		
Ga			
Hg*			
La			
Li	70.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	389.00	AUTHOR	
Sb		NUMBER:	50
Sc			
Sn		RECORD NO:	198
Sr	49.00		

AUTHOR: LIPMAN DATE: 1976
 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: VITROPHYRE CODE: 4000
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 18.50
 -MAX: MIOC -MAX: 18.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 72.00
 Al2O3 12.60
 Fe2O3 .56
 FeO .16
 MgO .06
 CaO 1.10
 Na2O 3.70
 K2O 3.90

 H2O+ 3.40
 H2O- 2.60
 TH2O
 LOI
 TiO2 .080
 P2O5 .030
 MnO .050

ZrO2
 CO2 .02
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.260

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 72L-47

RECORD NO: 199

AUTHOR: LIPMAN DATE: 1976
 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 18.50
 -MAX: MIOC -MAX: 18.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.30
 Al2O3 13.00
 Fe2O3 .75
 FeO .08
 MgO .06
 CaO .70
 Na2O 3.40
 K2O 4.70
 H2O+ 1.40
 H2O- .79
 TH2O
 LOI
 TiO2 .080
 P2O5 .030
 MnO .030

ZrO2
 CO2 .02
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.340

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 72L-34

RECORD NO: 200

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.06 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.43 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 18.50
 -MAX: MIOC -MAX: 18.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 76.80
 Al2O3 13.00
 Fe2O3 .35
 FeO .50
 MgO .10
 CaO .10
 Na2O 3.70
 K2O 4.35

 H2O+ .54
 H2O- .10
 TH2O
 LOI
 TiO2
 P2O5 .010
 MnO .040

 ZrO2
 CO2 .60
 SO3
 Cl
 F .076
 S .010
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.276

TRACE ELEMENTS

As	.20	Ta	
As <	2.00	Te*	
Au*		Th	34.00
B		Tl	
Ba	408.00	U	185.00
Be	7.00	V	
Bi		W	20.00
Ce	106.00	Y	7.00
Co		Yb	
Cr		Zn	77.00
Cu	3.00	Zr	174.00
F	760.00		
Ga	14.00		
Hg*			
La	70.00		
Li	65.00		
Mo	1.00		
Nb	71.00		
Nd			
Ni			
Pb	18.00		
Rb	398.00	AUTHOR	
Sb		NUMBER:	NELLIE
Sc			
Sn	7.00	RECORD NO:	201
Sr	142.00		

AUTHOR: ERNST

DATE: 1981

LAT: 38.06 N

MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.43 W FLAGS
2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 18.50
-MAX: MIOC -MAX: 18.50

METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ-PHENO FLUG
SANIDINE-PHENO
PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.11
Al2O3 13.97
Fe2O3 1.03
FeO
MgO .44
CaO .70
Na2O 1.75
K2O 4.57H2O+
H2O-
TH2O
LOI
TiO2 .170
P2O5 .030
MnO .100ZrO2
CO2
SO3
Cl
F .088
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 97.958

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba 588.00 U
Be V
Bi W
Ce Y

Co Yb
Cr Zn 22.00
Cu Zr 160.00
F 885.00
Ga
Hg*
La

Li 93.00
Mo
Nb
Nd
Ni
Pb
Rb 446.00
Sb
Sc
Sn
Sr 72.00AUTHOR
NUMBER: 22

RECORD NO: 204

DATE: 1981

LAT: 38.06 N

MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.42 W FLAGS
2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

```
AGE:   STRAT-MIN:  MIOC      ISOTOPIC-MIN:  18.50
      -MAX:  MIOC      -MAX:  18.50
```

METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	PLUG	
SANIDINE-PHENO		

FORPHYRITIC

MAJOR CONSTITUENTS

SiO ₂	72.91
Al ₂ O ₃	13.89
Fe ₂ O ₃	1.60
FeO	
MgO	.59
CaO	1.92
Na ₂ O	2.39
K ₂ O	4.57

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	673.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	13.00
Cu		Zr	289.00
F	798.00		
Ga			
Hg*			
La			

ZrO2	
CO2	
SO3	
Cl	
F	.080
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.390

Li	41.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	282.00	AUTHOR	
Sb		NUMBER:	25
Sc			
Sn		RECORD NO:	205
Sr	628.00		

LAT: 38.07 N

MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.42 W FLAGS
2D

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

```
AGE:   STRAT-MIN:  MIOC      ISOTOPIC-MIN:  18.50
      -MAX:  MIOC      -MAX:  18.50
```

METHOD: KAR

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ-PHENO	PLUG	
SANIDINE-PHENO		
BIOTITE-PHENO	PORPHYRITIC	

MAJOR CONSTITUENTS

SiO ₂	73.40
Al ₂ O ₃	14.42
Fe ₂ O ₃	1.77
FeO	
MnO	.51
CaO	.59
Na ₂ O	3.21
K ₂ O	4.86

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.290
P2O5	.070
MnO	.080

ZrO2	
CO2	
SO3	
Cl	
F	.090
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.290

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	657.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	22.00
Cu		Zr	212.00
F	900.00		
Ga			
Hg*			
La			
Li	37.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	282.00	AUTHOR	
Sb		NUMBER:	29
Sc			
Sn		RECORD NO:	207
Sr	151.00		

LAT: 38.06 N

MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.43 W FLAGS
20

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

```
AGE:   STRAT-MIN:  MIOC      ISOTOPIC-MIN:  18.50
      -MAX:  MIOC      -MAX:  18.50
```

METHOD: KAR

MINERALS
QUARTZ-PHENO
SANIDINE-PHENO

OCCUR-PETROG.
PLUG

ALTERATION

PORPHYRYTIC

MAJOR CONSTITUENTS

SiO ₂	74.10
Al ₂ O ₃	12.51
Fe ₂ O ₃	1.31
FeO	
MgO	.45
CaO	.55
Na ₂ O	2.93
K ₂ O	4.72

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.160
P2O5	.030
MnO	.090

ZrO2	
CO2	
SO3	
Cl	
F	.212
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	97.062

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	577.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	21.00
Cu		Zr	156.00
F	2116.00		
Ga			
Hg*			
La			
Li	94.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	440.00	AUTHOR	
Sb		NUMBER:	35
Sc			
Sn		RECORD NO:	211
Sr	102.00		

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 77.20
 Al2O3 12.80
 Fe2O3 .66
 FeO .16
 MgO .11
 CaO .25
 Na2O 3.90
 K2O 4.60

H2O+ .34
 H2O- .14
 TH2O
 LOI
 TiO2 .120
 P2O5 .040
 MnO .040

ZrO2
 CO2 .01
 SO3
 Cl
 F .070
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.440

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: S110B

RECORD NO: 470

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: VITROPHYRE CODE: 4000
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG

MAJOR CONSTITUENTS

SiO2 72.60
 Al2O3 12.60
 Fe2O3 .70
 FeO .12
 MgO .22
 CaO 1.10
 Na2O 3.30
 K2O 3.80

 H2O+ 3.50
 H2O- 2.40
 TH2O
 LOI
 TiO2 .100
 P2O5 .040
 MnO .070

 ZrO2
 CO2 .01
 SO3
 Cl
 F .120
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.680

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: S110A

RECORD NO: 471

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: VITROPHYRE CODE: 4000
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG

MAJOR CONSTITUENTS

SiO2 75.30
 Al2O3 13.10
 Fe2O3 .70
 FeO .20
 MgO .20
 CaO .37
 Na2O 3.70
 K2O 4.80

H2O+ .68
 H2O- .55
 TH2O
 LOI
 TiO2 .150
 P2O5 .030
 MnO .040

ZrO2
 CO2 .02
 SO3
 Cl
 F .070
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.910

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: S106B

RECORD NO: 472

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: LRIN LONG: 107.41 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 75.70
 Al2O3 12.30
 Fe2O3 .74
 FeO .16
 MgO .33
 CaO .73
 Na2O 2.80
 K2O 4.60

 H2O+ 1.50
 H2O- .87
 TH2O
 LOI
 TiO2 .120
 P2O5 .050
 MnO .050

 ZrO2
 CO2 .01
 SO3
 Cl
 F .080
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.040

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: S106A

RECORD NO: 473

AUTHOR: LIPMAN DATE: 1976 LAT: 37.99 N
 MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.39 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 65.20
 Al2O3 16.80
 Fe2O3 1.80
 FeO 1.30
 MgO .62
 CaO 1.70
 Na2O 4.60
 K2O 6.00

 H2O+ .55
 H2O- .09
 TH2O
 LOI
 TiO2 .690
 P2O5 .220
 MnO .090

ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.760

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: 73L-55D

RECORD NO: 212

LAT: 37.99 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.39 W FLAGS

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	62.40
Al ₂ O ₃	15.90
Fe ₂ O ₃	2.40
FeO	1.80
MgO	1.00
CaO	2.50
Na ₂ O	3.80
K ₂ O	6.10

H2O+	1.10
H2O-	.23
TH2O	
LOI	
TiO2	.930
P2O5	.340
MnO	.090

ZrO2	
CO2	1.30
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.890

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 73L-54B

RECORD NO: 213

AUTHOR: LARSEN + C. DATE: 1956 LAT: 37.99 N
 MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.39 W FLAGS

ROCK NAME: GRANITE CODE: 1420

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:

MINERALS	OCCUR-PETROG.	ALTERATION
QUARTZ	DIKE	
ORTHOCLASE-PHENO		
PLAGIOCLASE	PORPHYRITIC	
BIOTITE		
PYROXENE		

MAJOR CONSTITUENTS

SiO2	75.19
Al2O3	12.91
Fe2O3	.88
FeO	.68
MnO	
CaO	.68
Na2O	3.72
K2O	5.30
H2O+	.47
H2O-	.21
TH2O	
LOI	
TiO2	.180
P2O5	
MnO	.030
ZrO2	
CO2	.10
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.350

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: T.21-59

RECORD NO: 214


```

AUTHOR: ERNST          DATE: 1981
                                LAT: 37.97 N
MAJOR GROUP: SAJ    SECOND GROUP: LAG    LONG: 107.41 W    FLAGS
                                                2D
ROCK NAME: GRANITE          CODE: 1420
AGE:  STRAT-MIN: MIOC      ISOTOPIC-MIN:
      -MAX: MIOC          -MAX:
                                METHOD:
MINERALS          OCCUR-PETROG.      ALTERATION
                                STOCK

```

MAJOR CONSTITUENTS

SiO ₂	66.99
Al ₂ O ₃	17.05
Fe ₂ O ₃	3.26
FeO	
MnO	.86
CaO	.81
Na ₂ O	3.24
K ₂ O	6.08

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.710
P2O5	.180
MnO	.090

ZrO2	
CO2	
SO3	
Cl	
F	.075
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.345

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	825.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	45.00
Cu		Zr	392.00
F	752.00		
Ga			
Hg*			
La			
Li	18.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	192.00	AUTHOR	
Sb		NUMBER:	5
Sc			
Sn		RECORD NO:	216
Sr	280.00		

LAT: 37.97 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.41 W FLAGS
2D

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	67.42
Al ₂ O ₃	17.20
Fe ₂ O ₃	2.86
FeO	
MgO	.78
CaO	1.07
Na ₂ O	3.17
K ₂ O	6.15

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.630
P2O5	.140
MnO	.130

ZrO2	
CO2	
SO3	
Cl	
F	.097
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.647

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	840.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	53.00
Cu		Zr	398.00
F	965.00		
Ga			
Hg*			
La			
Li	17.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	184.00	AUTHOR	
Sb		NUMBER:	7
Sc			
Sn		RECORD NO:	218
Sr	254.00		

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.40 W FLAGS
20

CODE: 1420

ISOTOPIC-MIN:
-MAX:

METHOD:

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	67.58
Al ₂ O ₃	17.16
Fe ₂ O ₃	3.71
FeO	
MgO	.82
CaO	1.17
Na ₂ O	3.36
K ₂ O	5.81

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.650
P2O5	.150
MnO	.130

ZrO2	
CO2	
SO3	
Cl	
F	.098
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.638

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	890.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	39.00
Cu		Zr	399.00
F	980.00		
Ga			
Hg*			
La			
Li	12.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	182.00	AUTHOR	
Sb		NUMBER:	10
Sc			
Sn		RECORD NO:	220
Sr	305.00		

DATE: 1981

LAT: 37.95 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.44 W FLAGS
20

ROCK NAME: GRANITE CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	69.70
Al ₂ O ₃	15.84
Fe ₂ O ₃	2.47
FeO	
MnO	.64
CaO	.80
Na ₂ O	2.93
K ₂ O	5.82

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.510
P2O5	.090
MnO	.090

ZrO2	
CO2	
SO3	
Cl	
F	.066
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.956

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	612.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	48.00
Cu		Zr	351.00
F	660.00		
Ga			
Hg*			
La			
Li	16.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	190.00	AUTHOR	
Sb		NUMBER:	56
Sc			
Sn		RECORD NO:	221
Sr	154.00		

LAT: 37.95 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.44 W FLAGS
20

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	66.08
Al ₂ O ₃	16.35
Fe ₂ O ₃	4.30
FeO	
MgO	1.31
CaO	1.18
Na ₂ O	2.64
K ₂ O	6.47

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.860
P2O5	.220
MnO	.100

ZrO2	
CO2	
SO3	
Cl	
F	.082
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.592

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	788.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	99.00
Cu		Zr	362.00
F	820.00		
Ga			
Hg*			
La			
Li	27.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	238.00	AUTHOR	
Sb		NUMBER:	57
Sc			
Sn		RECORD NO:	222
Sr	228.00		

LAT: 37.95 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.44 W FLAGS
2D

ROCK NAME: GRANITE CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	63.85
Al ₂ O ₃	16.91
Fe ₂ O ₃	4.38
FeO	
MgO	1.24
CaO	2.12
Na ₂ O	2.83
K ₂ O	5.54

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.890
P2O5	.230
MnO	.140

ZrO2	
CO2	
SO3	
Cl	
F	.100
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.230

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	778.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	62.00
Cu		Zr	367.00
F	1000.00		
Ga			
Hg*			
La			
Li	37.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	172.00	AUTHOR	
Sb		NUMBER:	58
Sc			
Sn		RECORD NO:	223
Sr	335.00		

DATE: 1981

LAT: 37.95 N

MAJOR GROUP: SAJ SECOND GROUP: LAG LONG: 107.44 W FLAGS
20

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC--MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	66.34
Al ₂ O ₃	15.76
Fe ₂ O ₃	4.60
FeO	
MgO	1.35
CaO	2.08
Na ₂ O	3.35
K ₂ O	5.73

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	805.00	U	
Be		V	
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	69.00
Cu		Zr	359.00
F	1290.00		
Ga			
Hg*			
La			

H2O+	
H2O-	
TH2O	
LOI	
TiO2	.930
P2O5	.260
MnO	.170

ZrO2	
CO2	
SO3	
Cl	
F	.129
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.699

Li	36.00		
Mo			
Nb			
Nd			
Ni			
Pb			
Rb	177.00	AUTHOR	
Sb		NUMBER:	59
Sc			
Sn		RECORD NO:	224
Sr	367.00		

AUTHOR
NUMBER: 59

RECORD NO: 224

AUTHOR: LIPMAN DATE: 1976 LAT: 37.91 N
 MAJOR GROUP: SAJ SECOND GROUP: LSP LONG: 107.44 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.50
 -MAX: MIOC -MAX: 22.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 71.60
 Al2O3 13.80
 Fe2O3 1.50
 FeO .64
 MgO .55
 CaO 1.30
 Na2O 3.00
 K2O 5.00

 H2O+ .90
 H2O- .20
 TH2O
 LOI
 TiO2 .280
 P2O5 .050
 MnO .060

 ZrO2
 CO2 .50
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.380

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 73L-34

 RECORD NO: 183

DATE: 1976

LAT: 37.92 N

MAJOR GROUP: SAJ SECOND GROUP: LSP LONG: 107.43 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN: 22.50
-MAX: 22.50

METHOD: KAR

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	76.30
Al ₂ O ₃	12.60
Fe ₂ O ₃	1.00
FeO	.08
MgO	.09
CaO	.74
Na ₂ O	3.70
K ₂ O	5.10

H2O+	.43
H2O-	.05
TH2O	
LOI	
TiO2	.170
P2O5	.040
MnO	

ZrO2	
CO2	.04
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.340

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 72L-12

RECORD NO: 184

AUTHOR: LARSEN + C. DATE: 1956
 MAJOR GROUP: SAJ SECOND GROUP: LSP LAT: 37.92 N
 LONG: 107.20 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.50
 -MAX: MIOC -MAX: 22.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO WELDED TUFF
 SANIDINE-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 75.62
 Al2O3 12.96
 Fe2O3 1.00
 FeO .31
 MgO .03
 CaO .39
 Na2O 3.80
 K2O 5.20

 H2O+ .48
 H2O- .29
 TH2O
 LOI
 TiO2 .210
 P2O5
 MnO .040

 ZrO2 .02
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .010
 Rb2O
 SrO
 TOTAL 100.360

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.24-2
 RECORD NO: 185

AUTHOR: LARSEN + C. DATE: 1956
 MAJOR GROUP: SAJ SECOND GROUP: LSP LAT: 37.91 N
 LONG: 107.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.50
 -MAX: MIOC -MAX: 22.50
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO WELDED TUFF
 ORTHOCLASE-PHENO
 ALBITE

MAJOR CONSTITUENTS

SiO2 74.72
 Al2O3 12.80
 Fe2O3 .59
 FeO .83
 MgO .04
 CaO .62
 Na2O 2.20
 K2O 6.32

 H2O+ .94
 H2O- .55
 TH2O
 LOI
 TiO2 .440
 P2O5 .020
 MnO .130

 ZrO2 .02
 CO2 .20
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .010
 Rb2O
 SrO .010
 TOTAL 100.440

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: T.21-58
 RECORD NO: 186

AUTHOR: MUTSCHLER DATE: 1982 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: SHI LONG: 107.73 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-M
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	76.40	As	4.60 Ta
Al2O3	13.70	As	29.00 Te*
Fe2O3	1.30	Au*	Th
FeO	.30	B	Tl
MgO	.55	Ba	U 5.00
CaO	.10	Be	V
Na2O	.20	Bi	W 5.00
K2O	3.80	Ce	Y 9.00
H2O+	2.20	Co	Yb
H2O-	.15	Cr	Zn 33.00
TH2O		Cu	Zr 149.00
LOI		F	1100.00
TiO2	.550	Ga	14.00
P2O5	.090	Hg*	
MnO	.040	La	55.00
ZrO2		Li	15.00
CO2	.30	Mo	4.00
SO3		Nb	14.00
Cl		Nd	
F	.110	Ni	
S	.420	Pb	39.00
Cr2O3		Rb	343.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	10.00
SrO		Sr	13.00
TOTAL	100.210		

AUTHOR
 NUMBER: 79FM931
 RECORD NO: 254

AUTHOR: MUTSCHLER DATE: 1982 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: SHI LONG: 107.73 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: PLIO ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-M
 ALKALI FELDSPAR-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 77.60
 Al2O3 12.80
 Fe2O3 .70
 FeO .25
 MgO .30
 CaO .10
 Na2O .20
 K2O 6.00

 H2O+ 1.50
 H2O- .10
 TH2O
 LOI
 TiO2 .100
 P2O5 .070
 MnO .090

 ZrO2
 CO2 .10
 SO3
 Cl
 F .095
 S .260
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.265

TRACE ELEMENTS

As	.30	Ta	
As <	2.00	Te*	
Au*		Th	22.00
B		Tl	
Ba	63.00	U	26.00
Be	2.00	V	
Bi		W	6.00
Ce	52.00	Y	6.00
Co		Yb	
Cr		Zn	44.00
Cu	36.00	Zr	109.00
F	950.00		
Ga	15.00		
Hg*			
La	44.00		
Li	5.00		
Mo	8.00		
Nb	51.00		
Nd			
Ni			
Pb	22.00		
Rb	589.00		
Sb			
Sc			
Sn	5.00		
Sr	36.00		

AUTHOR
 NUMBER: 79FM943

RECORD NO: 255

AUTHOR: LIPMAN DATE: 1976 LAT: 37.98 N
 MAJOR GROUP: SAJ SECOND GROUP: SPI LONG: 107.77 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 12.70
 -MAX: MIOC -MAX: 16.70
 METHOD: FSTR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE-W
 FELDSPAR-PHENO
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.10
 Al2O3 12.80
 Fe2O3 .67
 FeO .20
 MgO .04
 CaO .81
 Na2O 3.40
 K2O 5.10

 H2O+ .91
 H2O- .29
 TH2O
 LOI
 TiO2 .090
 P2O5 .020
 MnO .070

 ZrO2
 CO2 .20
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.700

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 74L-3

 RECORD NO: 252

AUTHOR: RANSOME DATE: 1901 LAT: 38.90 N
 MAJOR GROUP: SAJ SECOND GROUP: SNI LONG: 107.71 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: MIDC ISOTOPIC-MIN: 22.60
 -MAX: MIDC -MAX: 22.60
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG ARGILLIC-M
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.61
 Al2O3 13.97
 Fe2O3
 FeO 3.36
 MgO
 CaO .31
 Na2O .04
 K2O .06
 H2O+ 4.18
 H2O- .58
 TH2O
 LOI
 TiO2 .600
 P2O5 .330
 MnO
 ZrO2
 CO2
 SO3
 Cl
 F
 S 3.030
 Cr2O3
 NiO
 BaO .040
 Rb2O
 SrO
 TOTAL 100.110

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La
 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.127-II
 RECORD NO: 256

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.87 N
 MAJOR GROUP: SAJ SECOND GROUP: CMM LONG: 106.92 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.69
 Al2O3 13.85
 Fe2O3 1.51
 FeO .18
 MnO .40
 CaO .89
 Na2O 3.11
 K2O 5.46

 H2O+ .49
 H2O- .70
 TH2O
 LOI
 TiO2 .250
 P2O5 .050
 MnO .040

 ZrO2
 CO2
 SO3
 Cl .030
 F .050
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.700

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	700.00	U	
Be	2.00	V	20.00
Ri		W	
Ce		Y	40.00
Co		Yb	3.00
Cr	2.00	Zn	
Cu	6.00	Zr	200.00
F			
Ga	10.00		
Hs*			
La	100.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	60.00		
Rb		AUTHOR	
Sb		NUMBER: T.6-2	
Sc	8.00		
Sn		RECORD NO:	242
Sr	100.00		

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.76 N
 MAJOR GROUP: SAJ SECOND GROUP: CMM LONG: 106.77 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.50
 Al2O3 13.70
 Fe2O3 .60
 FeO .52
 MgO .11
 CaO .67
 Na2O 3.60
 K2O 5.10

 H2O+ 3.10
 H2O- .10
 TH2O
 LOI
 TiO2 .180
 P2O5 .020
 MnO .080

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.330

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	310.00	U	
Be		V	
Bi		W	
Ce		Y	30.00
Co	10.00	Yb	3.00
Cr	2.00	Zn	
Cu	10.00	Zr	170.00
F			
Ga	10.00		
Hg*			
La			
Li			
Mo	14.00		
Nb	30.00		
Nd			
Ni			
Pb	40.00		
Rb		AUTHOR	
Sb		NUMBER:	T.41
Sc			
Sn		RECORD NO:	243
Sr	61.00		

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: CMM LONG: 106.92 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.70
 Al2O3 13.70
 Fe2O3 1.60
 FeO .20
 MgO .30
 CaO .72
 Na2O 3.40
 K2O 5.70

H2O+
 H2O-
 TH2O .78
 LOI
 TiO2 .260
 P2O5 .060
 MnO .060

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.530

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	30.00	Tl	
Ba	700.00	U	
Be	1.50	V	15.00
Bi		W	
Ce		Y	30.00
Co		Yb	3.00
Cr	1.50	Zn	
Cu	7.00	Zr	150.00
F			
Ga	7.00		
Hg*			
La	70.00		
Li			
Mo			
Nb	15.00		
Nd			
Ni			
Pb	15.00		
Rb			
Sb			
Sc	7.00		
Sn			
Sr	150.00		

AUTHOR
 NUMBER: T.4,2

RECORD NO: 244

AUTHOR: LARSEN + C.		DATE: 1956		LAT:		N	
MAJOR GROUP: SAJ		SECOND GROUP: CMM		LONG:		W FLAGS	
ROCK NAME: RHYOLITE				CODE: 3010			
AGE: STRAT-MIN: OLIG		ISOTOPIC-MIN:					
-MAX: OLIG		-MAX:					
		METHOD:					
MINERALS		OCCUR-PETROG.		ALTERATION			
SANIDINE-PHENO		WELDED TUFF					
PLAGIOCLASE-PHENO		VITROPHYRIC					

MAJOR CONSTITUENTS

SiO ₂	70.84
Al ₂ O ₃	13.53
Fe ₂ O ₃	1.16
FeO	.52
MnO	
CaO	.86
Na ₂ O	3.51
K ₂ O	5.57

H2O+	3.13
H2O-	
TH2O	
LOI	
TiO2	.220
P2O5	
MnO	.090

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL

As
As
Aux*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

TRACE ELEMENTS

Ta
TeX*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: T.21-48
RECORD NO: 245

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.87 N
 MAJOR GROUP: SAJ SECOND GROUP: CWP LONG: 106.98 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 70.90
 Al2O3 14.10
 Fe2O3 2.40
 FeO .30
 MgO .58
 CaO 1.60
 Na2O 3.60
 K2O 4.60

 H2O+ 1.20
 H2O- .42
 TH2O
 LOI
 TiO2 .450
 P2O5 .120
 MnO .040

ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.410

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1300.00	U	
Be	1.00	V	28.00
Bi		W	
Ce		Y	30.00
Co	2.00	Yb	2.80
Cr	3.00	Zn	
Cu	7.60	Zr	340.00
F			
Ga	15.00		
Hg*			
La	55.00		
Li			
Mo			
Nb			
Nd			
Ni			
Pb	38.00		
Rb		AUTHOR	
Sb		NUMBER: T.14-2	
Sc	6.00		
Sn		RECORD NO:	241
Sr	480.00		

AUTHOR: LIPMAN DATE: 1976 LAT: N
 MAJOR GROUP: SAJ SECOND GROUP: HD LONG: W FLAGS
 ROCK NAME: OBSIDIAN CODE: 2500
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DOME

MAJOR CONSTITUENTS

SiO2 76.50
 Al2O3 12.30
 Fe2O3 .05
 FeO .72
 MgO .16
 CaO .49
 Na2O 3.50
 K2O 4.60

 H2O+ .50
 H2O- .01
 TH2O
 LOI
 TiO2 .130
 P2O5 .020
 MnO .100

 ZrO2
 CO2 .04
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.120

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: DS-453

RECORD NO: 263

AUTHOR: LIPMAN

DATE: 1976

MAJOR GROUP: SAJ SECOND GROUP: HCP LAT: N
LONG: W FLAGS

ROCK NAME: QUARTZ LATITE CODE: 1980

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
-MAX: OLIG -MAX:

METHOD:

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO2 71.30
Al2O3 15.40
Fe2O3 1.40
FeO .40
MgO .29
CaO 1.80
Na2O 3.80
K2O 4.40

H2O+ .27
H2O- .02
TH2O
LOI
TiO2 .280
P2O5 .150
MnO .070

ZrO2
CO2 .03
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.610

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 69L-13

RECORD NO: 262

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.89 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF ALTERED

MAJOR CONSTITUENTS

SiO2 73.53
 Al2O3 12.87
 Fe2O3 .88
 FeO .64
 MgO .56
 CaO .07
 Na2O .63
 K2O 8.92

 H2O+ .70
 H2O- .40
 TH2O
 LOI
 TiO2 .190
 P2O5
 MnO .090

 ZrO2
 CO2 .20
 SO3
 Cl
 F
 S .020
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO .050
 TOTAL 99.750

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-51

RECORD NO: 225

AUTHOR: LARSEN + C. DATE: 1956
 MAJOR GROUP: SAJ SECOND GROUP: BCR LAT: 37.86 N
 LONG: 106.89 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF ALTERED

MAJOR CONSTITUENTS

SiO2 76.26
 Al2O3 11.30
 Fe2O3 .52
 FeO .34
 MgO .02
 CaO .23
 Na2O 2.81
 K2O 6.77

H2O+ .14
 H2O- .39
 TH2O
 LOI
 TiO2 .150
 P2O5 .010
 MnO .050

ZrO2
 CO2 .10
 SO3
 Cl
 F
 S .260
 Cr2O3
 NiO
 BaO .490
 Rb2O
 SrO
 TOTAL 99.840

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-52

RECORD NO: 226

AUTHOR: LARSEN + C. DATE: 1956 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.89 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 77.36
 Al2O3 11.37
 Fe2O3 .31
 FeO .36
 MgO .14
 CaO .30
 Na2O 1.38
 K2O 7.28

 H2O+ .26
 H2O- .55
 TH2O
 LOI
 TiO2 .160
 P2O5 .030
 MnO .030

 ZrO2
 CO2 .06
 SO3
 Cl
 F
 S .330
 Cr2O3
 NiO
 BaO .050
 Rb2O
 SrO
 TOTAL 99.970

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-53

RECORD NO: 227

AUTHOR: LARSEN + C. DATE: 1956 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.89 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 ORTHOCLASE-PHENO WELDED TUFF
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 72.96
 Al2O3 14.14
 Fe2O3 1.24
 FeO .28
 MgO .36
 CaO .24
 Na2O 1.14
 K2O 8.39

 H2O+ .93
 H2O-
 TH2O
 LOI
 TiO2 .180
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 99.860

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-54

RECORD NO: 228

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 38.10 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 107.10 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 ORTHOCLASE-PHENO WELDED TUFF
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 74.07
 Al2O3 13.38
 Fe2O3 .97
 FeO .33
 MgO
 CaO .76
 Na2O 3.72
 K2O 5.60
 H2O+ .44
 H2O- .18
 TH2O
 LOI
 TiO2 .200
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.650

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-47
 RECORD NO: 230

AUTHOR: LIPMAN

DATE: 1975

LAT: 37.48 N

MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.67 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN: 26.70
-MAX: 27.80

METHOD: KAR

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 72.40Al₂O₃ 14.00Fe₂O₃ 1.00

FeO .44

MgO .43

CaO 1.50

Na₂O 2.70K₂O 5.30H₂O+ .74H₂O- .96TH₂O

LOI

TiO₂ .250P₂O₅

MnO .070

ZrO₂CO₂ < .05SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.840

TRACE ELEMENTS

Ag Ta

As Te*

Au* Th

B Tl

Ba 680.00 U

Be V

Bi W

Ce Y 30.00

Co Yb

Cr 2.00 Zn

Cu 8.00 Zr 220.00

F

Ga 20.00

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb 60.00

Rb

Sb

Sc 5.00

Sn

Sr 56.00

AUTHOR
NUMBER: T.6-19

RECORD NO: 231

AUTHOR: LIPMAN

DATE: 1975

LAT: 37.67 N

MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.70 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN: 26.70
-MAX: 27.80

METHOD: KAR

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 70.20
Al₂O₃ 14.90
Fe₂O₃ 2.20
FeO .16
MgO .43
CaO 1.90
Na₂O 3.10
K₂O 4.80

H₂O+ .69
H₂O- .91
TH₂O
LOI
TiO₂ .290
P₂O₅ .060
MnO .050

ZrO₂
CO₂ < .05
SO₃
Cl
F
S
Cr₂O₃
NiO
BaO
Rb₂O
SrO
TOTAL 99.740

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	2400.00	U	
Be		V	
Bi		W	
Ce		Y	30.00
Co		Yb	
Cr	2.00	Zn	
Cu	8.00	Zr	330.00
F			
Ga	20.00		
Hg*			
La			
Li			
Mo			
Nb			
Nd			
Ni			
Pb	90.00		
Rb			
Sb			
Sc	6.00		
Sn			
Sr	140.00		

AUTHOR
NUMBER: T.6-17

RECORD NO: 232

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 107.00 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 FELDSPAR-PHENO WELDED TUFF
 VITROPHYRIC

MAJOR CONSTITUENTS

SiO2 71.70
 Al2O3 13.00
 Fe2O3 .80
 FeO .85
 MgO .22
 CaO .78
 Na2O 3.40
 K2O 4.70
 H2O+ 4.00
 H2O- .37
 TH2O
 LOI
 TiO2 .190
 P2O5
 MnO .110
 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.170

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	40.00	Tl	
Ba	250.00	U	
Be	2.00	V	8.00
Bi		W	
Ce		Y	40.00
Co		Yb	3.00
Cr	2.00	Zn	
Cu	3.00	Zr	180.00
F			
Ga	14.00		
Hg*			
La	80.00		
Li			
Mo	4.00		
Nb	20.00		
Nd			
Ni	2.00		
Pb	20.00		
Rb		AUTHOR	
Sb		NUMBER: T.2-1	
Sc	5.00		
Sn		RECORD NO:	233
Sr	96.00		

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.88 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.92 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 75.40
 Al2O3 12.66
 Fe2O3 .88
 FeO .12
 MgO .20
 CaO .12
 Na2O .40
 K2O 9.05

 H2O+ .23
 H2O- .55
 TH2O
 LOI
 TiO2 .190
 P2O5 .010
 MnO .020

 ZrO2
 CO2 .02
 SO3
 Cl .020
 F .020
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.890

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be		V	7.00
Bi		W	
Ce		Y	30.00
Co		Yb	3.00
Cr	2.00	Zn	
Cu	2.00	Zr	200.00
F			
Ga	9.00		
Hg*			
La	100.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	30.00		
Rb		AUTHOR	
Sb		NUMBER:	T.2-3
Sc			
Sn		RECORD NO:	234
Sr	100.00		

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.87 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.93 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELED TUFF SILICIFICATION

MAJOR CONSTITUENTS

SiO2 73.61
 Al2O3 13.99
 Fe2O3 .93
 FeO .18
 MgO .20
 CaO .35
 Na2O 2.18
 K2O 7.18
 H2O+ .45
 H2O- .50
 TH2O
 LOI
 TiO2 .210
 P2O5 .020
 MnO .020
 ZrO2
 CO2
 SO3
 Cl .010
 F .040
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.870

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	500.00	U	
Be		V	6.00
Bi		W	
Ce		Y	30.00
Co		Yb	3.00
Cr	4.00	Zn	
Cu	10.00	Zr	200.00
F			
Ga	9.00		
Hg*			
La	100.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	80.00		
Rb		AUTHOR	
Sb		NUMBER: T.2-4	
Sc			
Sn		RECORD NO:	235
Sr	60.00		

AUTHOR: RATTE + S. DATE: 1967 LAT: 37.88 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.93 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF SILICIFICATION

MAJOR CONSTITUENTS

SiO2 76.03
 Al2O3 12.03
 Fe2O3 1.00
 FeO .18
 MgO .04
 CaO .19
 Na2O 1.01
 K2O 8.88

 H2O+ .15
 H2O- .07
 TH2O
 LOI
 TiO2 .200
 P2O5 .030
 MnO .020

 ZrO2
 CO2
 SO3
 Cl .020
 F .010
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.860

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	500.00	U	
Be		V	6.00
Bi		W	
Ce		Y	30.00
Co		Yb	3.00
Cr	4.00	Zn	
Cu	10.00	Zr	200.00
F			
Ga	9.00		
Hg*			
La	100.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	80.00		
Rb			
Sb			
Sc			
Sn			
Sr	60.00		

AUTHOR
 NUMBER: T.2-5

RECORD NO: 236

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.87 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.97 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.80
 Al2O3 14.20
 Fe2O3 1.00
 FeO .28
 MgO .18
 CaO .20
 Na2O .89
 K2O 9.50
 H2O+ .90
 H2O- .21
 TH2O
 LOI
 TiO2 .260
 P2O5 .060
 MnO .010

ZrO2
 CO2 .08
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.570

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1100.00	U	
Be		V	14.00
Bi		W	
Ce	1.00	Y	34.00
Co	1.00	Yb	4.00
Cr	1.00	Zn	
Cu	3.00	Zr	170.00
F			
Ga	15.00		
Hg*			
La	69.00		
Li			
Mo			
Nb	10.00		
Nd			
Ni			
Pb	28.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	110.00		

AUTHOR
 NUMBER: T.2-10
 RECORD NO: 237

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.87 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.92 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 14.20
 Fe2O3 1.30
 FeO .44
 MgO .18
 CaO .22
 Na2O .86
 K2O 9.10
 H2O+ 1.20
 H2O- .26
 TH2O
 LOI
 TiO2 .280
 P2O5 .080
 MnO .010

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.580

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	30.00	Tl	
Ba	860.00	U	
Be	1.00	V	20.00
Bi		W	
Ce	1.00	Y	34.00
Co	1.00	Yb	3.60
Cr	1.00	Zn	
Cu	13.00	Zr	210.00
F			
Ga	14.00		
Hg*			
La	52.00		
Li			
Mo			
Nb	10.00		
Nd			
Ni			
Pb	49.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	90.00		

AUTHOR
 NUMBER: T.2-11
 RECORD NO: 238

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.93 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 71.28
 Al2O3 13.86
 Fe2O3 1.66
 FeO .18
 MnO .04
 CaO .20
 Na2O .57
 K2O 11.35

 H2O+ .17
 H2O- .12
 TH2O
 LOI
 TiO2 .270
 P2O5 .070
 MnO .020

 ZrO2
 CO2 .01
 SO3
 Cl .010
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.810

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be		V	30.00
Bi		W	
Ce		Y	30.00
Co		Yb	3.00
Cr	3.00	Zn	
Cu	10.00	Zr	200.00
F			
Ga	9.00		
Hg*			
La	100.00		
Li			
Mo			
Nb	20.00		
Nd			
Ni			
Pb	300.00		
Rb			
Sb			
Sc	8.00		
Sn			
Sr	100.00		

AUTHOR
 NUMBER: T.2-12
 RECORD NO: 239

AUTHOR: RATTE + S. DATE: 1967
 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: BCR LONG: 106.95 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 26.70
 -MAX: OLIG -MAX: 27.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO DIKE

MAJOR CONSTITUENTS

SiO2 72.00
 Al2O3 15.20
 Fe2O3 .38
 FeO .15
 MgO .12
 CaO .27
 Na2O 1.10
 K2O 9.10
 H2O+ 1.20
 H2O- .32
 TH2O
 LOI
 TiO2 .220
 P2O5 .050
 MnO .010

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.170

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	980.00	U	
Be	1.00	V	10.00
Bi		W	
Ce		Y	33.00
Co		Yb	3.40
Cr		Zn	
Cu	4.00	Zr	260.00
F			
Ga	16.00		
Hg*			
La	64.00		
Li			
Mo			
Nb	24.00		
Nd			
Ni			
Pb	38.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	100.00		

AUTHOR
 NUMBER: T.2-15
 RECORD NO: 240

AUTHOR: LIPMAN

DATE: 1975

LAT: 38.33 N

MAJOR GROUP: SAJ SECOND GROUP: LFC LONG: 107.30 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 27.80
-MAX: 27.80

METHOD: KAR

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO2 70.40
Al2O3 14.20
Fe2O3 3.60
FeO .36
MgO 1.40
CaO 2.70
Na2O 2.90
K2O 4.10

H2O+ 1.60
H2O-
TH2O
LOI
TiO2 .400
P2O5 .190
MnO .090

ZrO2
CO2 .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 101.990

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.6-13

RECORD NO: 257

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	70.60	As	Ta
Al2O3	16.10	As	Te*
Fe2O3	1.70	Au*	Th
FeO	.16	B	Tl
MnO	.26	Ba	U
CaO	1.40	Be	V
Na2O	4.20	Bi	W
K2O	4.90	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O	.78	Cu	Zr
LOI		F	
TiO2	.300	Ga	
P2O5	.080	Hg*	
MnO	.080	La	
ZrO2		Li	
CO2	.06	Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	100.620		

AUTHOR
 NUMBER: T.1-11
 RECORD NO: 258

AUTHOR: LIPMAN DATE: 1976 LAT: N
 MAJOR GROUP: SAJ SECOND GROUP: SCL LONG: W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 71.60
 Al2O3 14.50
 Fe2O3 1.60
 FeO .36
 MgO .42
 CaO 1.00
 Na2O 2.70
 K2O 4.90

 H2O+ 1.10
 H2O- .82
 TH2O
 LOI
 TiO2 .310
 P2O5 .090
 MnO .030

 ZrO2
 CO2 .02
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.450

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: 72L-54A

RECORD NO: 251

AUTHOR: LEEDY

DATE: 1971

LAT: 37.90 N

MAJOR GROUP: SAJ SECOND GROUP: SBH LONG: 107.66 W FLAGS

ROCK NAME: RHYODACITE

CODE: 3000

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLOWALTERATION
QUARTZ-SERICITE

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.60
Al2O3 16.60
Fe2O3 .48
FeO .56
MgO .11
CaO .13
Na2O .07
K2O .77

H2O+ 4.50
H2O- .20
TH2O
LOI
TiO2 .660
P2O5 .320
MnO .040

ZrO2
CO2 .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.090

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	500.00	U	
Be		V	100.00
Bi		W	
Ce		Y	
Co		Yb	
Cr		Zn	
Cu		Zr	150.00
F			
Ga			
Hg*			
La	70.00		
Li			
Mo			
Nb	10.00		
Nd			
Ni			
Pb	10.00		
Rb			
Sb			
Sc	7.00		
Sn			
Sr	3000.00		

AUTHOR
NUMBER: RM1-7E

RECORD NO: 500

AUTHOR: LEEDY DATE: 1971 LAT: 37.90 N
 MAJOR GROUP: SAJ SECOND GROUP: SBH LONG: 107.66 W FLAGS
 ROCK NAME: RHYODACITE CODE: 3000
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW QUARTZ-SERICITE
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 71.30
 Al2O3 17.00
 Fe2O3 .12
 FeO .40
 MgO .80
 CaO .14
 Na2O .08
 K2O 4.50

 H2O+ 3.20
 H2O- 1.00
 TH2O
 LOI
 TiO2 .780
 P2O5 .060
 MnO .060

ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.490

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B	30.00	Tl	
Ba	3000.00	U	
Be	1.00	V	70.00
Bi		W	
Ce		Y	30.00
Co		Yb	
Cr	10.00	Zn	
Cu		Zr	200.00
F			
Ga			
Hg*			
La	70.00		
Li			
Mo			
Nb	10.00		
Nd			
Ni			
Pb	15.00		
Rb			
Sb			
Sc	15.00		
Sn			
Sr	200.00		

AUTHOR
 NUMBER: RM1-7D

RECORD NO: 501

AUTHOR: LEEDY

DATE: 1971

LAT: 37.90 N

MAJOR GROUP: SAJ SECOND GROUP: SBH LONG: 107.66 W FLAGS

ROCK NAME: RHYODACITE

CODE: 3000

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLOW

ALTERATION
SILICIFICATION-X

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 96.70

Al2O3 1.40

Fe2O3

FeO .41

MgO .08

CaO .07

Na2O .03

K2O .05

H2O+ .41

H2O- .07

TH2O

LOI

TiO2 .680

P2O5 .020

MnO .030

ZrO2

CO2 .05

SO3

Cl

F

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.000

TRACE ELEMENTS

As 1.00

As

Au*

B

Ba 20.00

Be

Bi

Ce

Co

Cr 20.00

Cu 5.00

F

Ga

Hg*

La

Li

Mo

Nb 30.00

Nd

Ni

Pb 150.00

Rb

Sb 100.00

Sc 20.00

Sn

Sr

Ta

Te*

Th

Tl

U

V 70.00

W

Y 15.00

Yb

Zn

Zr 200.00

AUTHOR

NUMBER: RM3-4

RECORD NO: 503

AUTHOR: LEEDY DATE: 1971 LAT: 37.90 N
 MAJOR GROUP: SAJ SECOND GROUP: SBH LONG: 107.66 W FLAGS
 ROCK NAME: RHYODACITE CODE: 3000
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW SILICIFICATION-X
 PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 93.20
 Al2O3 2.60
 Fe2O3
 FeO .12
 MgO .08
 CaO .12
 Na2O .09
 K2O .53

 H2O+ 1.50
 H2O- .04
 TH2O
 LOI
 TiO2 .700
 P2O5 .130
 MnO .030

 ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.190

TRACE ELEMENTS

As .70 Ta
 As Te*
 Au* Th
 B Tl
 Ba 300.00 U
 Be V 70.00
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr 200.00
 F
 Ga
 Hg*
 La 100.00

 Li
 Mo
 Nb
 Nd
 Ni
 Pb 500.00
 Rb
 Sb
 Sc 7.00
 Sn
 Sr 1000.00

AUTHOR
 NUMBER: RM3-11
 RECORD NO: 504

AUTHOR: OLSON + DATE: 1968
 LAT: 38.43 N
 MAJOR GROUP: SAJ SECOND GROUP: SSM LONG: 107.17 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 28.00
 -MAX: OLIG -MAX: 28.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE
 PLAGIOCLASE
 BIOTITE VITROPHYRIC
 HORNBLende

MAJOR CONSTITUENTS

SiO2 70.00
 Al2O3 15.10
 Fe2O3 1.10
 FeO .45
 MgO .40
 CaO 1.20
 Na2O 3.20
 K2O 3.80
 H2O+
 H2O-
 TH2O 3.30
 LOI
 TiO2 .260
 P2O5 .010
 MnO .070

ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.940

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zr
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-10
 RECORD NO: 248

LAT: N
LONG: W FLAGS

CODE: 3010

```
ISOTOPIC-MIN: 28.00
      -MAX: 28.00
METHOD: KAR
```

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	74.90
Al ₂ O ₃	13.10
Fe ₂ O ₃	.91
FeO	.44
MgO	.19
CaO	.89
Na ₂ O	3.20
K ₂ O	4.90

H2O+	.57
H2O-	.26
TH2O	
LOI	
TiO2	.230
P2O5	.050
MnO	.050

ZrO2	
CO2	.03
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.720

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 72L-25B

RECORD NO: 249

TRACE ELEMENTS

SiO2	72.80
Al2O3	13.00
Fe2O3	2.30
FeO	.64
MgO	1.00
CaO	2.30
Na2O	2.30
K2O	2.70

As
As
Aux*
B
Ba
Be
Bi
Ce

Ta
Te*
Th
Tl
U
V
W
Y

H2O+	1.30
H2O-	.26
TH2O	
LOI	
TiO2	.430
P2O5	.230
MnO	.040

Co
Cr
Cu
F
Ga
Hg*
La

Yb
Zn
Zr

ZrO2	
CO2	1.10
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.400

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 73L-53
RECORD NO: 250

DATE: 1976

MAJOR GROUP: SAJ SECOND GROUP: SDM LAT: N
LONG: W FLAGS

ROCK NAME: RHYOLITE CODE: 3010

```
AGE:   STRAT-MIN: OLIG      ISOTOPIC-MIN:    28.00
      -MAX: OLIG          -MAX:
```

METHOD: KAR

MINERALS

OCCUR-PETROG.	ALTERATION
WELDED TUFF	

MAJOR CONSTITUENTS

SiO2	70.00
Al2O3	15.10
Fe2O3	1.60
FeO	.68
MnO	.38
CaO	1.80
Na2O	3.40
K2O	5.00

H2O+	.60
H2O-	.24
TH2O	
LOI	
TiO2	.450
P2O5	.170
MnO	.070

ZrO2	
CO2	.06
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.550

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 72L-25A

RECORD NO: 247

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.50 N
 MAJOR GROUP: SAJ SECOND GROUP: KBM LONG: 106.97 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF SILICIFICATION-M

MAJOR CONSTITUENTS

SiO2 80.60
 Al2O3 8.70
 Fe2O3 1.20
 FeO .20
 MgO .39
 CaO .83
 Na2O 1.50
 K2O 3.50

 H2O+ 1.30
 H2O- 1.10
 TH2O
 LOI
 TiO2 .260
 P2O5 .070
 MnO

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.700

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	365.00	U	
Be		V	15.40
Bi		W	
Ce	56.60	Y	16.90
Co	1.10	Yb	2.40
Cr		Zn	15.80
Cu	3.60	Zr	137.00
F			
Ga	2.80		
Hg*			
La	29.50		
Li			
Mo			
Nb	9.30		
Nd			
Ni			
Pb	13.50		
Rb		AUTHOR	
Sb		NUMBER: M600	
Sc	1.30		
Sn		RECORD NO:	259
Sr	185.00		

AUTHOR: OLSON + DATE: 1968 LAT: 38.42 N
 MAJOR GROUP: SAJ SECOND GROUP: KBM LONG: 107.30 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO WELDED TUFF
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO VITROPHYRIC

MAJOR CONSTITUENTS

SiO2 71.10
 Al2O3 13.60
 Fe2O3 1.30
 FeO .24
 MnO .20
 CaO 1.00
 Na2O 3.20
 K2O 5.80

H2O+
 H2O-
 TH2O .60
 LOI
 TiO2 .230
 P2O5 .030
 MnO .080

ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 97.430

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-7

RECORD NO: 260

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	72.30	As	Ta
Al2O3	14.50	As	Te*
Fe2O3	1.60	Au*	Th
FeO	.08	B	Tl
MgO	.28	Ba	U
CaO	1.20	Be	V
Na2O	3.50	Bi	W
K2O	5.20	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O	.84	Cu	Zr
LOI		F	
TiO2	.270	Ga	
P2O5	.080	Hg*	
MnO	.040	La	
ZrO2		Li	
CO2	.20	Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	100.090		

AUTHOR
NUMBER: T.7-8

RECORD NO: 261

AUTHOR: LIPMAN

DATE: 1975

LAT: 37.45 N

MAJOR GROUP: SAJ SECOND GROUP: PF

LONG: 106.62 W FLAGS

ROCK NAME: VITROPHYRE

CODE: 4000

AGE: STRAT-MIN: OLIG

ISOTOPIC-MIN:

-MAX: OLIG

-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
PLUG

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 71.10Al₂O₃ 14.00Fe₂O₃ 1.80

FeO .48

MgO .48

CaO 1.50

Na₂O 3.80K₂O 4.50H₂O+ .82H₂O- .78TH₂O

LOI

TiO₂ .420P₂O₅ .110

MnO .060

ZrO₂CO₂ < .05SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.900

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

1000.00

U

Be

5.00

V

20.00

Bi

W

Ce

100.00

Y

20.00

Co

Yb

2.00

Cr

15.00

Zn

Cu

1.00

Zr

150.00

F

Ga

15.00

Hg*

La

70.00

Li

Mo

3.00

Nb

15.00

Nd

Ni

Pb

15.00

Rb

Sb

Sc

3.00

Sn

Sr

500.00

AUTHOR

NUMBER: T.9-29

RECORD NO:

266

AUTHOR: STEVEN + R. DATE: 1960
 MAJOR GROUP: SAJ SECOND GROUP: PF LAT: 37.45 N
 LONG: 106.62 W FLAGS
 ROCK NAME: VITROPHYRE CODE: 4000
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG

MAJOR CONSTITUENTS

SiO2 70.90
 Al2O3 14.30
 Fe2O3 1.30
 FeO .51
 MgO .61
 CaO 1.60
 Na2O 3.70
 K2O 4.60

H2O+
 H2O-
 TH2O 2.50
 LOI
 TiO2 .280
 P2O5 .260
 MnO .040

ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.650

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.3-6

RECORD NO: 267

AUTHOR: STEVEN + R. DATE: 1960
 LAT: 37.44 N
 MAJOR GROUP: SAJ SECOND GROUP: PF LONG: 106.60 W FLAGS
 ROCK NAME: ILLITIC ROCK CODE: 0020
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DOME ARGILLIC-X

MAJOR CONSTITUENTS

SiO2 72.14
 Al2O3 14.87
 Fe2O3 .81
 FeO .04
 MnO .79
 CaO .04
 Na2O .20
 K2O 5.49

 H2O+ 2.48
 H2O- 1.37
 TH2O
 LOI
 TiO2 .600
 P2O5 .280
 MnO .020

 ZrO2
 CO2 .01
 SO3 .48
 Cl
 F .100
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.720

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: T.7-5

RECORD NO: 268

AUTHOR: STEVEN + R. DATE: 1960
 MAJOR GROUP: SAJ SECOND GROUP: PF LAT: 37.44 N
 LONG: 106.60 W FLAGS
 ROCK NAME: KAOLINITIC ROCK CODE: 0020
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DOME ARGILLIC-X

MAJOR CONSTITUENTS

SiO2 73.73
 Al2O3 17.30
 Fe2O3 .06
 FeO .09
 MgO .01
 CaO .11
 Na2O .01
 K2O .09

H2O+ 6.07
 H2O- .15
 TH2O
 LOI
 TiO2 .600
 P2O5 .490
 MnO

ZrO2
 CO2 .01
 SO3 .63
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .130
 Rb2O
 SrO
 TOTAL 99.480

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.7-6
 RECORD NO: 269

AUTHOR: STEVEN + R. DATE: 1960
 MAJOR GROUP: SAJ SECOND GROUP: PF LAT: 37.44 N
 LONG: 106.60 W FLAGS
 ROCK NAME: QUARTZ ROCK CODE: 0020
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DOME SILICIFICATION-X
 ALUNITIC

MAJOR CONSTITUENTS

SiO2 80.43
 Al2O3 .33
 Fe2O3
 FeO 10.58
 MgO
 CaO
 Na2O .02
 K2O .01
 H2O+ .42
 H2O- .06
 TH2O
 LOI
 TiO2 .430
 P2O5
 MnO
 ZrO2
 CO2 .02
 SO3
 Cl
 F
 S 9.340
 Cr2O3
 NiO
 BaO .170
 Rb2O
 SrO
 TOTAL 101.810

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce
 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La
 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr
 Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y
 Yb
 Zn
 Zr

AUTHOR
 NUMBER: T.7-8

RECORD NO: 270

AUTHOR: LIPMAN DATE: 1975 LAT: 37.33 N
 MAJOR GROUP: SAJ SECOND GROUP: PTM LONG: 106.27 W FLAGS
 ROCK NAME: PUMICE CODE: 2930
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.10
 -MAX: OLIG -MAX: 29.80
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 70.20
 Al2O3 15.60
 Fe2O3 1.30
 FeO .62
 MgO .29
 CaO 1.10
 Na2O 4.10
 K2O 4.90

 H2O+ .49
 H2O- .19
 TH2O
 LOI
 TiO2 .380
 P2O5 .070
 MnO .090

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.380

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	2100.00	U	
Be		V	
Bi		W	
Ce		Y	40.00
Co		Yb	
Cr		Zn	
Cu	15.00	Zr	300.00
F			
Ga	20.00		
Hg*			
La			
Li			
Mo			
Nb			
Nd			
Ni	12.00		
Pb	40.00		
Rb		AUTHOR	
Sb		NUMBER: T.4-19	
Sc	8.00		
Sn		RECORD NO:	264
Sr	150.00		

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 38.47 N
 MAJOR GROUP: SAJ SECOND GROUP: PTM LONG: 106.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLAGIOCLASE-PHENO WELDED TUFF
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 70.80
 Al2O3 14.48
 Fe2O3 2.14
 FeO .16
 MgO .14
 CaO 1.24
 Na2O 3.24
 K2O 6.58

H2O+ .57
 H2O- .13
 TH2O
 LOI
 TiO2 .450
 P2O5 .110
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 100.040

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-56

RECORD NO: 265

AUTHOR: BURBANK DATE: 1932 LAT: 39.32 N
 MAJOR GROUP: SAJ SECOND GROUP: BZM LONG: 106.13 W FLAGS
 ROCK NAME: ANDESITE CODE: 0190
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SILICIFICATION

MAJOR CONSTITUENTS

SiO2 88.73
 Al2O3 .97
 Fe2O3 3.50
 FeO 3.56
 MnO .05
 CaO .24
 Na2O
 K2O

 H2O+ .69
 H2O- .02
 TH2O
 LOI
 TiO2 1.500
 P2O5 .200
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.460

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.78-4

RECORD NO: 272

AUTHOR: BURBANK DATE: 1932 LAT: 38.35 N
 MAJOR GROUP: SAJ SECOND GROUP: BZF LONG: 106.15 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO FLOW
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 71.57
 Al2O3 16.84
 Fe2O3 .63
 FeO .07
 MgO .29
 CaO .31
 Na2O 3.05
 K2O 5.56

 H2O+ 1.06
 H2O- .28
 TH2O
 LOI
 TiO2 .340
 P2O5
 MnO

 ZrO2 .05
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.050

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: P.27

RECORD NO: 271

AUTHOR: BURBANK DATE: 1932 LAT: 38.25 N
 MAJOR GROUP: SAJ SECOND GROUP: BZM LONG: 106.12 W FLAGS
 ROCK NAME: ANDESITE CODE: 0190
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SILICIFICATION

MAJOR CONSTITUENTS

SiO2 95.18
 Al2O3 1.20
 Fe2O3 .77
 FeO 2.27
 MgO
 CaO
 Na2O
 K2O

 H2O+ .40
 H2O-
 TH2O
 LOI
 TiO2 .250
 P2O5 .060
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 100.130

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.78-7

RECORD NO: 273

TRACE ELEMENTS

SiO ₂	93.17
Al ₂ O ₃	2.52
Fe ₂ O ₃	.19
FeO	1.92
MnO	.03
CaO	.05
Na ₂ O	
K ₂ O	.15

As
As
Au*
E
Es
Es
Bi
Ce

Ta
Te*
Th
Ti
U
V
W
Y

H20+	1.03
H20-	.09

Co
Cr

Yb
Zn

TH20
LOI

Cu
F

Zr

TiO2	.630
P2O5	.100

Ga
Hsg*

MnO

La

Zr02

Li

C02

Mo

503 .20

Nb

C1

Nd

F

Ni

5

Pb

Cr203

File

NiO

Sb

BaO .070

Sc

Rb20

Sm

SrO

Sr

TOTAL 100.150

AUTHOR
NUMBER: F.78-8

RECORD NO: 274

AUTHOR: BURBANK DATE: 1932 LAT: 38.27 N
 MAJOR GROUP: SAJ SECOND GROUP: BZM LONG: 106.11 W FLAGS
 ROCK NAME: CODE: 0010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 ARGILLIC
 SILICIFICATION

MAJOR CONSTITUENTS

SiO2 82.57
 Al2O3 11.44
 Fe2O3 .16
 FeO .65
 MgO
 CaO
 Na2O
 K2O 1.89
 H2O+ 2.98
 H2O- .43
 TH2O
 LOI
 TiO2 .350
 P2O5 .090
 MnO

ZrO2
 CO2
 SO3 .12
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .060
 Rb2O
 SrO
 TOTAL 100.740

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.78-9
 RECORD NO: 275

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 38.28 N
 MAJOR GROUP: SAJ SECOND GROUP: EIL LONG: 106.42 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLAGIOCLASE-PHENO FLOW
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 70.93
 Al2O3 15.87
 Fe2O3 .85
 FeO .33
 MnO .08
 CaO 1.28
 Na2O 4.21
 K2O 5.33

 H2O+ 1.19
 H2O- .15
 TH2O
 LOI
 TiO2 .300
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.520

Ag
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

TRACE ELEMENTS

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: T.21-29

RECORD NO: 276

DATE: 1956

LAT: 38.42 N
LONG: 107.38 W FLAGS

CODE: 1980

ISOTOPIC-MIN:
-MAX:

METHOD:

OCCUR-PETROG.	ALTERATION
WELDED TUFF	

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y

Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.13-1
RECORD NO: 277

AUTHOR: LARSEN + C. DATE: 1956 LAT: 36.83 N
 MAJOR GROUP: SAJ SECOND GROUP: EIL LONG: 106.47 W FLAGS
 ROCK NAME: QUARTZ LATITE CODE: 1980
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW
 SANIDINE-PHENO
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 73.39
 Al2O3 14.82
 Fe2O3 .67
 FeO .44
 MnO .34
 CaO 1.87
 Na2O 4.40
 K2O 4.20

 H2O+ .04
 H2O- .40
 TH2O
 LOI
 TiO2 .140
 P2O5
 MnO .040

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.750

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: T.21-25

RECORD NO: 278

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 37.75 N
 MAJOR GROUP: SAJ SECOND GROUP: EIL LONG: 106.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO FLOW
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO
 HORNBLende

MAJOR CONSTITUENTS

SiO2 71.57
 Al2O3 15.10
 Fe2O3 1.04
 FeO .29
 MgO .36
 CaO 1.19
 Na2O 3.88
 K2O 5.80

H2O+ .46
 H2O- .26
 TH2O
 LOI
 TiO2 .150
 P2O5 .060
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.160

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-27
 RECORD NO: 279

AUTHOR: SPENCER DATE: 1930 LAT: 38.08 N
 MAJOR GROUP: SAJ SECOND GROUP: EIL LONG: 107.29 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 ORTHOCLASE-PHENO
 BIOTITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.54
 Al2O3 14.70
 Fe2O3 .80
 FeO
 MgO .24
 CaO .53
 Na2O 4.00
 K2O 5.88

H2O+
 H2O-
 TH2O
 LOI .43
 TiO2
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.120

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.338

RECORD NO: 452

AUTHOR: LIPMAN

DATE: 1968

LAT: 37.75 N

MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.60 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLOW

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 71.10
Al₂O₃ 14.30
Fe₂O₃ .35
FeO .06
MgO .19
CaO 2.70
Na₂O 4.60
K₂O 4.40

H₂O+ .51
H₂O- .17
TH₂O
LOI
TiO₂ .190
P₂O₅ .020
MnO .040

ZrO₂
CO₂ .70
SO₃
Cl
F
S
Cr₂O₃
NiO
BaO
Rb₂O
SrO
TOTAL 99.330

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1500.00	U	
Be	1.50	V	
Bi		W	
Ce	200.00	Y	15.00
Co		Yb	1.50
Cr	3.00	Zn	
Cu	3.00	Zr	150.00
F			
Ga	15.00		
Hg*			
La	100.00		

Li
Mo
Nb 10.00
Nd
Ni
Pb 20.00
Rb
Sb
Sc
Sn
Sr 300.00

AUTHOR
NUMBER: T.1-4

RECORD NO: 280

AUTHOR: MERTZMAN DATE: 1971
 LAT: 37.75 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.40 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 70.66
 Al2O3 15.37
 Fe2O3 .69
 FeO .48
 MgO .26
 CaO 1.50
 Na2O 4.94
 K2O 4.87

H2O+
 H2O-
 TH2O 1.36
 LOI
 TiO2 .250
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.380

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 26

RECORD NO: 281

AUTHOR: MERTZMAN DATE: 1971 LAT: 37.75 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.40 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 70.75
 Al2O3 15.06
 Fe2O3 .41
 FeO .21
 MgO .20
 CaO 1.12
 Na2O 4.58
 K2O 5.02

H2O+
 H2O-
 TH2O .87
 LOI
 TiO2 .220
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.470

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 27

RECORD NO: 282

AUTHOR: MERTZMAN DATE: 1971 LAT: 37.75 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.40 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 71.77
 Al2O3 15.51
 Fe2O3 1.81
 FeO .27
 MgO .53
 CaO 1.68
 Na2O 4.37
 K2O 4.96

H2O+
 H2O-
 TH2O 1.39
 LOI
 TiO2 .300
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 102.620

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce
 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La
 Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

Yb
 Zn
 Zr
 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 28

RECORD NO: 283

AUTHOR: MERTZMAN DATE: 1971 LAT: 37.75 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.40 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 73.78
 Al2O3 14.30
 Fe2O3 .44
 FeO .19
 MgO .13
 CaO 1.18
 Na2O 4.53
 K2O 4.41

H2O+
 H2O-
 TH2O .87
 LOI
 TiO2 .210
 P2O5
 MnO .030

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.070

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 30

RECORD NO: 285

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 37.76 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.40 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLAGIOCLASE-PHENO DIKE
 BIOTITE
 AUGITE

MAJOR CONSTITUENTS

SiO2 71.21
 Al2O3 15.24
 Fe2O3 1.46
 FeO .33
 MgO .20
 CaO 1.56
 Na2O 4.41
 K2O 4.75

H2O+ .64
 H2O- .44
 TH2O
 LOI
 TiO2 .240
 P2O5 .100
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO .030
 TOTAL 100.610

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-26
 RECORD NO: 286

AUTHOR: LIPMAN

DATE: 1968

LAT: 37.78 N

MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.30 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
DIKE

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 71.40
 Al₂O₃ 15.20
 Fe₂O₃ 1.30
 FeO .06
 MgO .18
 CaO 1.40
 Na₂O 4.60
 K₂O 4.50

H₂O⁺ .28
 H₂O⁻ .26
 TH₂O
 LOI
 TiO₂ .190
 P₂O₅ .040
 MnO .110

ZrO₂
 CO₂ < .05
 SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.570

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	3.00	V	
Bi		W	
Ce	100.00	Y	15.00
Co		Yb	1.50
Cr		Zn	
Cu	1.00	Zr	200.00
F			
Ga	15.00		
Hg*			
La	100.00		

Li

Mo

Nb 10.00

Nd

Ni

Pb 30.00

Rb

Sb

Sc

Sn

Sr 300.00

AUTHOR
NUMBER: T.1-5

RECORD NO: 287

AUTHOR: MERTZMAN DATE: 1971 LAT: 37.78 N
 MAJOR GROUP: SAJ SECOND GROUP: EIS LONG: 106.30 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 72.21
 Al2O3 15.51
 Fe2O3 1.04
 FeO .16
 MgO .23
 CaO 1.16
 Na2O 4.53
 K2O 4.88

H2O+
 H2O-
 TH2O 1.05
 LOI
 TiO2 .200
 P2O5
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.990

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 64

RECORD NO: 288

AUTHOR: LARSEN + C. DATE: 1956 LAT: 38.40 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.30 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO WELDED TUFF
 FLAGIOCLASE-PHENO
 TRIDYMITE

MAJOR CONSTITUENTS

SiO2 73.14
 Al2O3 13.96
 Fe2O3 1.44
 FeO .14
 MgO .15
 CaO .64
 Na2O 3.35
 K2O 5.40

H2O+
 H2O-
 TH2O 1.56
 LOI
 TiO2 .220
 P2O5 .090
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S .050
 Cr2O3
 NiO
 BaO .060
 Rb2O
 SrO
 TOTAL 100.200

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-44
 RECORD NO: 289

AUTHOR: LARSEN + C. DATE: 1956
 LAT: 37.86 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.20 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 72.02
 Al2O3 15.28
 Fe2O3 .97
 FeO .74
 MgO .26
 CaO 2.00
 Na2O 3.79
 K2O 4.35

 H2O+ .40
 H2O- .45
 TH2O
 LOI
 TiO2 .220
 P2O5 .020
 MnO .110

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.610

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.24.1

 RECORD NO: 290

AUTHOR: LARSEN + C. DATE: 1956
 MAJOR GROUP: SAJ SECOND GROUP: OL LAT: 37.00 N
 LONG: 106.25 W FLAGS
 ROCK NAME: RHYDLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

MAJOR CONSTITUENTS

SiO2 75.79
 Al2O3 11.63
 Fe2O3 1.99
 FeO .25
 MgO .49
 CaO 1.70
 Na2O 2.76
 K2O 3.47

H2O+ .73
 H2O- .46
 TH2O
 LOI
 TiO2 .350
 P2O5 .040
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 99.660

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.21-57

RECORD NO: 291

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.50 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.00 W FLAGS
 ROCK NAME: RHYODACITE CODE: 3000
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 DIKE

MAJOR CONSTITUENTS

SiO2 74.40
 Al2O3 14.50
 Fe2O3 .69
 FeO 1.10
 MnO .30
 CaO 1.70
 Na2O 3.80
 K2O 2.50

 H2O+ .59
 H2O- .06
 TH2O
 LOI
 TiO2 .170
 P2O5 .070
 MnO .020

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.950

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	2.00	V	15.00
Bi		W	
Ce		Y	7.00
Co	3.00	Yb	
Cr		Zn	
Cu	7.00	Zr	100.00
F			
Ga	10.00		
Hg*			
La			
Li			
Mo			
Nb	3.00		
Nd			
Ni			
Pb	20.00		
Rb			
Sb			
Sc	3.00		
Sn			
Sr	200.00		

AUTHOR
 NUMBER: G-5

RECORD NO: 292

AUTHOR: STEVEN + DATE: 1977
 LAT: 38.07 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.00 W FLAGS
 ROCK NAME: PERLITE CODE: 2730
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 12.50
 Fe2O3 .62
 FeO .44
 MgO .20
 CaO .72
 Na2O 3.50
 K2O 4.30

 H2O+ 4.00
 H2O- .30
 TH2O
 LOI
 TiO2 .140
 P2O5 .030
 MnO .090

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.290

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.49

 RECORD NO: 293

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.03 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.00 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG
 DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 79.20
 Al2O3 12.00
 Fe2O3 .22
 FeO .16
 MnO .03
 CaO .68
 Na2O 1.50
 K2O 4.80

 H2O+ 1.50
 H2O- .39
 TH2O
 LOI
 TiO2 .060
 P2O5 .030
 MnO .010

 ZrO2
 CO2 .01
 SO3
 Cl
 F 1.040
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.630

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: G325C

RECORD NO: 474

AUTHOR: ZIELINSKI DATE: 1983 LAT: 38.03 N
 MAJOR GROUP: SAJ SECOND GROUP: OL LONG: 107.00 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 SILL
 DEVITRIFIED

MAJOR CONSTITUENTS

SiO2 77.20
 Al2O3 12.70
 Fe2O3 .69
 FeO .12
 MgO .07
 CaO .39
 Na2O 4.10
 K2O 4.70

 H2O+ .64
 H2O- .15
 TH2O
 LOI
 TiO2 .090
 P2O5 .040
 MnO .070

ZrO2
 CO2 .01
 SO3
 Cl
 F .190
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.160

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: G324I

RECORD NO: 475

AUTHOR: LARSEN + C. DATE: 1956 LAT: 37.66 N
 MAJOR GROUP: SAJ SECOND GROUP: XX LONG: 107.86 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 ALKALI FELDSPAR-PHENO
 NA-PLAGIOCLASE PORPHYRITIC
 BIOTITE-PHENO
 HORNBLENDE
 AUGITE

MAJOR CONSTITUENTS

SiO2 70.73
 Al2O3 14.22
 Fe2O3 1.59
 FeO .59
 MgO
 CaO .72
 Na2O 4.96
 K2O 5.57

 H2O+ 1.16
 H2O- .32
 TH2O
 LOI
 TiO2 .340
 P2O5 .030
 MnO .110

 ZrO2 .04
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO .010
 Rb2O
 SrO
 TOTAL 100.390

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.27-13

 RECORD NO: 294

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	68.20	As	6.00	Ta	
Al2O3	16.20	As	10.00	Te*	
Fe2O3	3.35	Au*		Th	
FeO	.25	B		Tl	
MgO	1.25	Ba	886.00	U	7.00
CaO	.05	Be	2.00	V	
Na2O	.15	Bi		W	3.00
K2O	4.50	Ce	77.00	Y	30.00
H2O+	4.35	Co		Yb	
H2O-	.30	Cr		Zn	2077.00
TH2O		Cu	69.00	Zr	156.00
LOI		F	3400.00		
TiO2	.450	Ga			
P2O5	.090	Hg*			
MnO	.050	La	43.00		
ZrO2		Li	2.00		
CO2	.10	Mo	3.00		
SO3		Nb	8.00		
Cl		Nd			
F	.340	Ni			
S	.630	Pb	673.00		
Cr2O3		Rb	292.00	AUTHOR	
NiO		Sb		NUMBER:	79FM956
BaO		Sc			
Rb2O		Sn	9.00	RECORD NO:	155
SrO		Sr	21.00		
TOTAL	100.260				

AUTHOR: MUTSCHLER DATE: 1982
 MAJOR GROUP: SAW SECOND GROUP: OH LAT: 38.62 N
 LONG: 106.58 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE-M

MAJOR CONSTITUENTS

SiO2 75.84
 Al2O3 10.86
 Fe2O3 .50
 FeO 1.66
 MgO .61
 CaO 1.68
 Na2O .17
 K2O 6.65

 H2O+ .67
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .080
 MnO .360

ZrO2
 CO2
 SO3
 Cl
 F .059
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.199

TRACE ELEMENTS

Ag	.20	Ta	
As	1.00	Te*	
Au*	.80	Th	
B		Tl	
Ba	382.00	U	18.20
Be	1.00	V	
Bi		W	3.00
Ce		Y	8.00
Co		Yb	
Cr		Zn	92.00
Cu	4.00	Zr	90.00
F	595.00		
Ga			
Hg*			
La			
Li	13.00		
Mo	2.00		
Nb	15.00		
Nd			
Ni			
Pb	87.00		
Rb	210.00	AUTHOR	
Sb		NUMBER:	E5
Sc			
Sn	2.40	RECORD NO:	140
Sr	62.00		

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	73.52	As	.40	Ta	
Al2O3	11.86	As	1.00	Te*	
Fe2O3	.49	Au*	1.10	Th	
FeO	.36	B		Tl	
MgO	.30	Ba	376.00	U	2.70
CaO	.82	Be	1.00	V	
Na2O	.10	Bi		W	2.00
K2O	7.42	Ce		Y	12.00
H2O+	.84	Co		Yb	
H2O-		Cr		Zn	68.00
TH2O		Cu	37.00	Zr	100.00
LOI		F	510.00		
TiO2	.120	Ga			
P2O5	.050	Hg*			
MnO	.044	La			
ZrO2		Li	6.00		
CO2		Mo	2.00		
SO3		Nb	17.00		
Cl		Nd			
F		Ni			
S		Pb	115.00		
Cr2O3		Rb	189.00	AUTHOR	
NiO		Sb		NUMBER:	E6
BaO		Sc			
Rb2O		Sn	.80	RECORD NO:	141
SrO		Sr	59.00		
TOTAL	95.924				

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: WIM LONG: 106.48 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 36.60

-MAX: EOCE -MAX: 39.20

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

ARGILLIC-W

SANIDINE-PHENO

QUARTZ-SERICITE-W

ALBITE-PHENO

PORPHYRITIC

BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 75.20

Al2O3 13.90

Fe2O3 .52

FeO .30

MgO .23

CaO 1.25

Na2O 3.09

K2O 5.40

H2O+ .70

H2O-

TH2O

LOI

TiO2

P2O5

MnO

ZrO2

CO2 .60

SO3

Cl

F .089

S .046

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 101.325

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: MM-1-996.7

RECORD NO: 312

AUTHOR: RANTA DATE: 1974 LAT: 38.98 N
 MAJOR GROUP: SAW SECOND GROUP: WIM LONG: 106.48 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 36.60
 -MAX: EOCE -MAX: 39.20
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 SANIDINE-PHENO
 ALBITE-PHENO PORPHYRITIC
 BIOTITE-PHENO APLITIC

MAJOR CONSTITUENTS

SiO2 75.60
 Al2O3 13.60
 Fe2O3 .42
 FeO .47
 MgO .22
 CaO .65
 Na2O 3.78
 K2O 5.74

H2O+ .39
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2 .20
 SO3
 Cl
 F
 S .046
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.116

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: W-272

RECORD NO: 313

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW

SECOND GROUP: WIM

LONG: 106.48 W FLAGS

ROCK NAME: GRANITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 35.60
-MAX: 38.00

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

ORTHOCLASE

PLAGIOCLASE

PORPHYRITIC

BIOTITE

MAJOR CONSTITUENTS

SiO2 73.10

Al2O3 14.40

Fe2O3 .51

FeO .31

MgO .19

CaO .92

Na2O 3.79

K2O 4.91

H2O+ .53

H2O-

TH2O

LOI

TiO2

P2O5

MnO

ZrO2

CO2 .30

SO3

Cl

F .280

S .113

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 99.353

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: MM-1-2203

RECORD NO: 314

AUTHOR: RANTA DATE: 1974 LAT: 38.98 N
 MAJOR GROUP: SAW SECOND GROUP: WIM LONG: 106.48 W FLAGS
 ROCK NAME: GRANITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 35.60
 -MAX: OLIG -MAX: 38.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 ORTHOCLASE
 PLAGIOCLASE PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 74.70
 Al2O3 15.30
 Fe2O3 .20
 FeO .20
 MgO .18
 CaO .57
 Na2O 4.57
 K2O 4.75

 H2O+ .48
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2 < .20
 SO3
 Cl
 F
 S .011
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.161

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: MM-1-1922
 RECORD NO: 315

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: WWP LONG: 106.48 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
SANIDINE
PLAGIOCLASE-PHENO
BIOTITE-PHENO

OCCUR-PETROG.
STOCK
PORPHYRITIC

ALTERATION
QUARTZ-SERICITE-S

MAJOR CONSTITUENTS

SiO₂ 76.80
Al₂O₃ 13.20
Fe₂O₃ .73
FeO .11
MgO .21
CaO .20
Na₂O .20
K₂O 6.19

H₂O+ 1.73
H₂O-
TH₂O
LOI
TiO₂
P₂O₅
MnO

ZrO₂
CO₂ < .30
SO₃
Cl
F
S .240
Cr₂O₃
NiO
BaO
Rb₂O
SrO
TOTAL 99.910

TRACE ELEMENTS

Ag
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: W-112

RECORD NO: 317

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: WWP LONG: 106.48 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
SANIDINE-PHENO
PLAGIOCLASE-PHENO
BIOTITE-PHENO

OCCUR-PETROG.
STOCK

ALTERATION
ARGILLIC-W
QUARTZ-SERICITE-W

MAJOR CONSTITUENTS

SiO2 77.20
Al2O3 15.50
Fe2O3 .61
FeO .10
MgO .31
CaO .31
Na2O 3.98
K2O 4.88

H2O+ .75
H2O-
TH2O
LOI
TiO2
P2O5
MnO

ZrO2
CO2 < .20
SO3
Cl
F
S .184
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 104.024

TRACE ELEMENTS

Ag
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: W-157

RECORD NO: 318

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: WWP LONG: 106.48 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:

-MAX: OLIG -MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

QUARTZ-PHENO

STOCK

ARGILLIC-W

SANIDINE-PHENO

QUARTZ-SERICITE-W

PLAGIOCLASE-PHENO

PORPHYRITIC

BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 75.10

Al2O3 14.10

Fe2O3 .26

FeO .20

MgO .11

CaO .44

Na2O 3.92

K2O 5.11

H2O+ .62

H2O-

TH2O

LOI

TiO2

P2O5

MnO

ZrO2

CO2 .20

SO3

Cl

F

S .048

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 100.108

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: W-85

RECORD NO: 320

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: WWP LONG: 106.48 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
SANIDINE-PHENO
PLAGIOCLASE-PHENO
BIOTITE-PHENO

OCCUR-PETROG.
STOCK

ALTERATION
QUARTZ-SERICITE-S

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 73.30
Al2O3 14.70
Fe2O3 .51
FeO .07
MnO .16
CaO 1.31
Na2O .20
K2O 7.71

H2O+ 1.40
H2O-
TH2O
LOI
TiO2
P2O5
MnO

ZrO2
CO2 .70
SO3
Cl
F
S .330
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.390

TRACE ELEMENTS

As
As
Au*
B
Ba
Be
Bi
Ce
Ta
Te*
Th
Tl
U
V
W
Y

Co
Cr
Cu
F
Ga
Hg*
La
Yb
Zn
Zr

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: W-90

RECORD NO: 316

AUTHOR: RANTA DATE: 1974 LAT: 38.98 N
 MAJOR GROUP: SAW SECOND GROUP: WWP LONG: 106.48 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK ARGILLIC-W
 ORTHOCLASE-PHENO PORPHYRITIC QUARTZ-SERICITE-W
 ALBITE-PHENO
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 71.00
 Al2O3 14.50
 Fe2O3 .97
 FeO .47
 MgO .41
 CaO 1.58
 Na2O 3.18
 K2O 5.70

 H2O+ .92
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

 ZrO2
 CO2 1.20
 SO3
 Cl
 F
 S .493
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.423

TRACE ELEMENTS

Ag
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: 68-6-142

 RECORD NO: 319

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	73.50	As	Ta
Al2O3	13.10	As	Te*
Fe2O3	1.22	Au*	Th
FeO		B	Tl
MgO	.23	Ba	U
CaO	.85	Be	V
Na2O	2.80	Bi	W
K2O	5.00	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.190	Ga	
P2O5	.060	Hg*	
MnO	.052	La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	AUTHOR
NiO		Sb	NUMBER: 76
BaO		Sc	
Rb2O		Sn	RECORD NO:
SrO		Sr	152
TOTAL	97.002		

AUTHOR: HOLTZCLAW

DATE: 1973

LAT: 39.02 N

MAJOR GROUP: SAW SECOND GROUP: GZ

LONG: 106.59 W FLAGS
2D

ROCK NAME: QUARTZ LATITE PORPH. CODE: 1980

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
K-FELDSPAR-PHENO
PLAGIOCLASE
BIOTITE

OCCUR-PETROG.
STOCK
PORPHYRITIC

ALTERATION
QUARTZ-SERICITE-M

MAJOR CONSTITUENTS

SiO2 74.00
Al2O3 13.30
Fe2O3 1.00
FeO
MgO .40
CaO .03
Na2O .52
K2O 6.10

H2O+
H2O-
TH2O
LOI
TiO2 .190
P2O5 .130
MnO .005

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 95.675

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hs*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 32

RECORD NO: 153

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	69.50	As	Ta
Al2O3	15.80	As	Te*
Fe2O3	2.14	Au*	Th
FeO		B	Tl
MgO	.61	Ba	U
CaO	1.15	Be	V
Na2O	3.70	Bi	W < 2.00
K2O	3.80	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn 55.00
TH2O		Cu	Zr
LOI		F	
TiO2	.280	Ga	
P2O5	.090	Hg*	
MnO	.050	La	
ZrO2		Li	
CO2		Mo < 2.00	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	10.00
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	97.120		

AUTHOR
 NUMBER: 17

 RECORD NO: 154

LAT: 39.08 N

LONG: 106.62 W FLAGS

CODE: 3010

ISOTOPIC-MIN:
-MAX:

METHOD:

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	74.80
Al ₂ O ₃	13.80
Fe ₂ O ₃	.78
FeO	.20
MnO	
CaO	.84
Na ₂ O	3.40
K ₂ O	5.00

H2O+	.63
H2O-	.20
TH2O	
LOI	
TiO2	.150
P2O5	.100
MnO	.030

ZrO2		
CO2	<	.05
SO3		
Cl		
F		
S		
Cr2O3		
NiO		
BaO		
Rb2O		
SrO		
TOTAL		99.980

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	1.50	V	7.00
Bi		W	
Ce	100.00	Y	30.00
Co		Yb	3.00
Cr		Zn	
Cu	1.00	Zr	50.00
F			
Ga	15.00		
Hg*			
La	70.00		
Li			
Mo			
Nb	15.00		
Nd			
Ni			
Pb	30.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	300.00		

AUTHOR
NUMBER: T.6-16

RECORD NO: 310

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	73.20	As		Ta	
Al2O3	14.80	As		Te*	
Fe2O3	1.20	Au*		Th	
FeO	.40	B		Tl	
MgO	.23	Ba	2000.00	U	
CaO	2.00	Be	2.00	V	15.00
Na2O	2.70	Bi		W	
K2O	3.90	Ce	150.00	Y	30.00
H2O+	.87	Co		Yb	3.00
H2O-	.23	Cr	3.00	Zn	
TH2O		Cu	5.00	Zr	200.00
LOI		F			
TiO2	.240	Ga	15.00		
P2O5	.090	Hg*			
MnO	.060	La	150.00		
ZrO2		Li			
CO2	.05	Mo			
SO3		Nb	10.00		
Cl		Nd	100.00		
F		Ni			
S		Pb	20.00		
Cr2O3		Rb		AUTHOR	
NiO		Sb		NUMBER:	T.6-15
BaO		Sc	7.00		
Rb2O		Sn		RECORD NO:	311
SrO		Sr	1000.00		
TOTAL	99.970				

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.68 N
 MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.25 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.70
 -MAX: OLIG -MAX: 31.90
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 ORTHOCLASE
 ALBITE
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	77.60	As	.20 Ta
Al2O3	12.40	As <	2.00 Te*
Fe2O3	.80	Au*	Th 14.00
FeO	.40	B	Tl
MgO	.20	Ba	257.00 U 13.00
CaO	.55	Be	7.00 V
Na2O	3.15	Bi	W 8.00
K2O	3.90	Ce	80.00 Y 15.00
H2O+	.25	Co	Yb
H2O-	.50	Cr	Zn 13.00
TH2O		Cu	1.00 Zr 81.00
LOI		F	1400.00
TiO2	.050	Ga	38.00
P2O5	.050	Hg*	
MnO	.040	La	43.00
ZrO2		Li	70.00
CO2	.10	Mo <	1.00
SO3		Nb	55.00
Cl		Nd	
F	.140	Ni	
S	.010	Pb	17.00
Cr2O3		Rb	384.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	7.00
SrO		Sr	84.00
TOTAL	100.140		

AUTHOR
NUMBER: 505
RECORD NO: 132

AUTHOR: MUTSCHLER DATE: 1982
 LAT: 38.68 N
 MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.25 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.70
 -MAX: OLIG -MAX: 31.90
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 ORTHOCLASE
 ALBITE
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	77.40	Ag	.20
Al2O3	12.80	As <	2.00
Fe2O3	.55	Au*	
FeO	.50	B	
MgO	.20	Ba	307.00
CaO	.70	Be	6.00
Na2O	3.30	Bi	
K2O	4.20	Ce	62.00
H2O+	.14	Co	
H2O-	.40	Cr	
TH2O		Cu	1.00
LOI		F	1400.00
TiO2	.050	Ga	30.00
P2O5	.020	Hg*	
MnO	.040	La	31.00
ZrO2		Li	81.00
CO2		Mo <	1.00
SO3		Nb	45.00
Cl		Nd	
F	.140	Ni	
S	.010	Pb	9.00
Cr2O3		Rb	335.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	6.00
SrO		Sr	104.00
TOTAL	100.450		

Ta
 Te*
 Th 11.00
 Tl
 U 10.00
 V
 W 6.00
 Y 15.00
 Yb
 Zr 38.00
 Zr 82.00

AUTHOR
 NUMBER: 506
 RECORD NO: 133

AUTHOR: MUTSCHLER DATE: 1982 LAT: 38.68 N
 MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.25 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.70
 -MAX: OLIG -MAX: 31.90
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 ORTHOCLASE
 ALBITE
 BIOTITE

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	78.70	Ag	.20
Al2O3	12.00	As	2.00
Fe2O3	.30	Au*	
FeO	.25	B	
MnO	.05	Ba	105.00
CaO	.20	Be	4.00
Na2O	3.75	Bi	
K2O	3.45	Ce	57.00
H2O+	.12	Co	
H2O-	.25	Cr	
TH2O		Cu	1.00
LOI		F	1025.00
TiO2	.050	Ga	39.00
P2O5	.040	Hg*	
MnO	.030	La	18.00
ZrO2		Li	37.00
CO2		Mo <	1.00
SO3		Nb	150.00
Cl		Nd	
F	.102	Ni	
S	.020	Pb	12.00
Cr2O3		Rb	594.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	22.00
SrO		Sr	17.00
TOTAL	99.312		

Ta
 Te*
 Th 14.00
 Tl
 U 15.00
 V
 W 18.00
 Y 13.00
 Yb
 Zn 28.00
 Zr 60.00
 AUTHOR
 NUMBER: 507
 RECORD NO: 134

AUTHOR: MUTSCHLER

DATE: 1982

LAT: 38.68 N

MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.25 W FLAGS

ROCK NAME: GRANITE

CODE: 1420

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN: 29.70

-MAX: 31.90

METHOD: KAR

MINERALS

OCCUR-PETROG.
STOCK

ALTERATION

QUARTZ
ORTHOCLASE
ALBITE
BIOTITE

MAJOR CONSTITUENTS

SiO₂ 78.10
Al₂O₃ 12.70
Fe₂O₃ .20
FeO .40
MgO .10
CaO .10
Na₂O 3.60
K₂O 4.20H₂O+ .15
H₂O- .15
TH₂O
LOI
TiO₂ .050
P₂O₅ .010
MnO .030ZrO₂
CO₂ .10
SO₃
Cl
F .094
S .010
Cr₂O₃
NiO
BaO
Rb₂O
SrO
TOTAL 99.994

TRACE ELEMENTS

As .20 Ta
As < 2.00 Te*
Au* Th 9.00
B Tl
Ba 78.00 U 9.00
Be 10.00 V
Bi W 18.00
Ce 56.00 Y 5.00
Co Yb
Cr Zn 14.00
Cu 3.00 Zr 61.00
F 940.00
Ga 32.00
Hg*
La 28.00Li 158.00
Mo < 1.00
Nb 110.00
Nd
Ni
Pb 36.00
Rb 806.00
Sb
Sc
Sn 15.00
Sr 19.00AUTHOR
NUMBER: 509A

RECORD NO: 135

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	75.90	Ag	.20	Ta	
Al2O3	13.40	As	3.00	Te*	
Fe2O3	1.60	Au*		Th	12.00
FeO	.25	B		Tl	
MgO	.15	Ba	76.00	U	14.00
CaO	.50	Be	8.00	V	
Na2O	3.35	Bi		W	10.00
K2O	4.40	Ce	64.00	Y	2.00
H2O+	.03	Co		Yb	
H2O-	.35	Cr		Zn	26.00
TH2O		Cu	1.00	Zr	59.00
LOI		F	690.00		
TiO2	.050	Ga	33.00		
P2O5	.010	Hg*			
MnO	.060	La	28.00		
ZrO2		Li	125.00		
CO2 <	.05	Mo <	1.00		
SO3		Nb	100.00		
Cl		Nd			
F	.069	Ni			
S	.010	Pb	24.00		
Cr2O3		Rb	702.00	AUTHOR	
NiO		Sb		NUMBER:	509B
BaO		Sc			
Rb2O		Sn	16.00	RECORD NO:	136
SrO		Sr	22.00		
TOTAL	100.179				

DATE: 1957

LAT: 38.65 N

CODE: 1420

ISOTOPIC-MIN: 29.70

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- MAX:      31.90

```

OCCUR-PETROG.

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y

Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

```
Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr
```

AUTHOR
NUMBER: P.29

RECORD NO: 137

TRACE ELEMENTS

SiO ₂	75.30
Al ₂ O ₃	13.70
Fe ₂ O ₃	.63
FeO	.52
MnO	.22
CaO	.78
Na ₂ O	4.00
K ₂ O	4.40

As	Ta	
As	Te*	
Aux*	Th	22.00
B	Tl	
Ba	U	6.90
Be	V	
Bi	W	
Ce	Y	

H2O+	.50
H2O-	.06
TH2O	
LOI	
TiO2	.190
P2O5	.030
MnO	.050

Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

ZrO2		
CO2	<	.05
SO3		
Cl		
F		
S		
Cr2O3		
NiO		
BaO		
Rb2O		
SrO		
TOTAL	100.430	

Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb	AUTHOR	
Sb	NUMBER:	PR-1
Sc		
Sn	RECORD NO:	138
Sr		

AUTHOR: THOMPSON + P. DATE: 1973

MAJOR GROUP: SAW SECOND GROUP: ANT LAT: 38.65 N
LONG: 107.25 W FLAGS
2D

ROCK NAME: GRANITE CODE: 1420

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.70
-MAX: OLIG -MAX: 31.90
METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
QUARTZ STOCK
ORTHOCLASE
PLAGIOCLASE
BIOTITE
MUSCOVITE

MAJOR CONSTITUENTS

SiO2 80.00
Al2O3 14.20
Fe2O3 .86
FeO
MgO .18
CaO .27
Na2O 3.70
K2O 4.50

H2O+
H2O-
TH2O
LOI
TiO2
P2O5 .120
MnO .040

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 103.870

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 11

RECORD NO: 139

AUTHOR: TOULMIN DATE: 1983 LAT: 38.50 N
 MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.30 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 73.50
 Al2O3 13.90
 Fe2O3 .52
 FeO .72
 MgO .12
 CaO .69
 Na2O 3.70
 K2O 5.10

 H2O+ .28
 H2O- .13
 TH2O
 LOI
 TiO2 .160
 P2O5 .040
 MnO .040

 ZrO2
 CO2 .06
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.960

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 7788

RECORD NO: 476

AUTHOR: TOULMIN DATE: 1983 LAT: 38.50 N
 MAJOR GROUP: SAW SECOND GROUP: ANT LONG: 106.30 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 73.50
 Al2O3 13.70
 Fe2O3 .49
 FeO .76
 MgO .23
 CaO .87
 Na2O 3.80
 K2O 4.60

H2O+ .31
 H2O- .08
 TH2O
 LOI
 TiO2 .170
 P2O5 .070
 MnO .050

ZrO2
 CO2 .06
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.690

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 7721

RECORD NO: 477

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	77.15	As	Ta
Al2O3	13.24	As	Te*
Fe2O3	.70	Au*	Th
FeO		B	Tl
MgO	.02	Ba	U
CaO	.21	Be	V
Na2O	4.17	Bi	W
K2O	4.48	Ce	Y
H2O+		Co	Yb
H2O-		Cr	Zn
TH2O	.17	Cu	Zr
LOI	.43	F	
TiO2	.060	Ga	
P2O5	.020	Hs*	
MnO		La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sr	
SrO		Sr	
TOTAL	100.650		

AUTHOR
NUMBER: 1

RECORD NO: 495

AUTHOR: PHAIR + J. DATE: 1975
 LAT: 39.08 N
 MAJOR GROUP: SAW SECOND GROUP: TW LONG: 106.48 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 71.03
 Al2O3 15.20
 Fe2O3 1.70
 FeO 1.30
 MgO 1.00
 CaO 2.80
 Na2O 4.10
 K2O 3.00

H2O+ .40
 H2O- .04
 TH2O
 LOI
 TiO2 .430
 P2O5 .110
 MnO .060

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 101.220

TRACE ELEMENTS

As	Ta	
As	Te*	
Au*	Th	10.00
B	Tl	
Ba	U	2.10
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: ME-2

RECORD NO: 149

AUTHOR: PHAIR + J. DATE: 1975
 LAT: 39.08 N
 MAJOR GROUP: SAW SECOND GROUP: TW LONG: 106.41 W FLAGS
 ROCK NAME: QUARTZ MONZONITE CODE: 2330
 AGE: STRAT-MIN: EOCE ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 70.10
 Al2O3 14.60
 Fe2O3 1.70
 FeO 1.40
 MgO 1.00
 CaO 2.40
 Na2O 4.10
 K2O 3.30

H2O+ .55
 H2O- .13
 TH2O
 LOI
 TiO2 .360
 P2O5 .160
 MnO .050

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.900

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th 6.10
 B Tl
 Ba U 2.40
 Be
 Bi
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 72-1
 RECORD NO: 151

TRACE ELEMENTS

SiO ₂	72.47
Al ₂ O ₃	14.43
Fe ₂ O ₃	.91
FeO	.99
MnO	.54
CaO	2.19
Na ₂ O	3.78
K ₂ O	3.36

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y

H2O+	.49
H2O-	.11
TH2O	
LOI	
TiO2	.200
P2O5	.090
MnO	.050

Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	

ZrO2	
CO2	.01
SO3	
Cl	.020
F	.040
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	99.680

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: T.2-4
RECORD NO: 306

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: TW

LONG: 106.48 W FLAGS

ROCK NAME: QUARTZ MONZONITE CODE: 2330

AGE: STRAT-MIN: EOCE
-MAX: EOCE

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
ORTHOCLASE-PHENO
PLAGIOCLASE-PHENO
BIOTITE

OCCUR-PETROG.
STOCK

ALTERATION

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 70.50
Al2O3 15.90
Fe2O3 1.24
FeO .95
MgO .53
CaO 2.17
Na2O 4.21
K2O 4.13

H2O+
H2O-
TH2O
LOI
TiO2
P2O5
MnO

ZrO2
CO2 < .30
SO3
Cl
F
S .003
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.933

TRACE ELEMENTS

Ag
As
Au*
B
Ba
Be
Bi
Ce

Co
Cr
Cu
F
Ga
Hf*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

Ta
Te*
Th
Tl
U
V
W
Y

Yb
Zn
Zr

AUTHOR
NUMBER: W-115R

RECORD NO: 307

AUTHOR: RANTA

DATE: 1974

LAT: 38.98 N

MAJOR GROUP: SAW SECOND GROUP: TW

LONG: 106.48 W FLAGS

ROCK NAME: QUARTZ MONZONITE CODE: 2330

AGE: STRAT-MIN: EOCE
-MAX: EOCEISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
ORTHOCLASE-PHENO
PLAGIOCLASE-PHENO
BIOTITEOCCUR-PETROG.
STOCK
PORPHYRITICALTERATION
QUARTZ-SERICITE-W

MAJOR CONSTITUENTS

SiO2 71.00
Al2O3 14.80
Fe2O3 .67
FeO .60
MnO .33
CaO 1.61
Na2O 4.37
K2O 4.02H2O+ .42
H2O-
TH2O
LOI
TiO2
P2O5
MnOZrO2
CO2 < .30
SO3
Cl
F
S .021
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 98.141As
As
Au*
B
Ba
Be
Bi
CeCo
Cr
Cu
F
Ga
Hg*
LaLi
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

TRACE ELEMENTS

Ta
Te*
Th
Tl
U
V
W
YYb
Zn
ZrAUTHOR
NUMBER: W-117

RECORD NO: 308

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	70.10	As	Ta
Al2O3	16.30	As	Te*
Fe2O3	1.30	Au*	Th
FeO	.52	B	Tl
MgO	.56	Ba	U
CaO	1.86	Be	V
Na2O	3.98	Bi	W
K2O	5.22	Ce	Y
H2O+	.57	Co	Yb
H2O-		Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2		Ga	
P2O5		Hg*	
MnO		La	
ZrO2		Li	
CO2 <	.30	Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S	.640	Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	101.350		

AUTHOR
 NUMBER: WIN 3
 RECORD NO: 309

AUTHOR: BRYANT DATE: 1979 LAT: 39.13 N
 MAJOR GROUP: SAW SECOND GROUP: ASP LONG: 106.83 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN:
 -MAX: CRET -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE-W
 PLAGIOCLASE-PHENO PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 72.40
 Al2O3 15.40
 Fe2O3 .67
 FeO .48
 MgO .14
 CaO 1.30
 Na2O 3.40
 K2O 4.20

 H2O+ 1.00
 H2O- .11
 TH2O
 LOI
 TiO2 .100
 P2O5 .030
 MnO .140

 ZrO2
 CO2 .50
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.870

TRACE ELEMENTS

As		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	3000.00	U	
Be	2.00	V	
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr	7.00	Zn	
Cu	1.50	Zr	70.00
F			
Ga	20.00		
Hg*			
La			
Li			
Mo			
Nb	10.00		
Nd			
Ni			
Pb	30.00		
Rb			
Sb			
Sc			
Sn			
Sr	1500.00		

AUTHOR
 NUMBER: T.5-6

RECORD NO: 302

AUTHOR: BRYANT DATE: 1979
 LAT: 39.10 N
 MAJOR GROUP: SAW SECOND GROUP: ASP LONG: 106.80 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: CRET ISOTOPIC-MIN: 67.40
 -MAX: CRET -MAX: 70.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 ALBITE
 K-FELDSPAR
 BIOTITE

MAJOR CONSTITUENTS

SiO2 73.40
 Al2O3 14.70
 Fe2O3 .87
 FeO .48
 MgO .15
 CaO 1.90
 Na2O 2.90
 K2O 3.40

 H2O+ .56
 H2O- .44
 TH2O
 LOI
 TiO2 .120
 P2O5 .180
 MnO .120

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.270

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	1.00	V	7.00
Bi		W	
Ce		Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	1.00	Zr	50.00
F			
Ga	10.00		
Hg*			
La			
Li			
Mo	3.00		
Nb	10.00		
Nd			
Ni			
Pb	7.00		
Rb		AUTHOR	
Sb		NUMBER: T.5-7	
Sc	3.00		
Sn		RECORD NO:	303
Sr	300.00		

AUTHOR: PHAIR + J. DATE: 1975 LAT: N
 MAJOR GROUP: SDC SECOND GROUP: CPS LONG: W FLAGS

ROCK NAME: CODE: 0010

AGE: STRAT-MIN: ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 73.90
 Al2O3 13.80
 Fe2O3 .85
 FeO .32
 MgO .18
 CaO .82
 Na2O 4.00
 K2O 4.40

 H2O+ .65
 H2O- .25
 TH2O
 LOI
 TiO2 .210
 P2O5 .030
 MnO .050

ZrO2
 CO2 .20
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.660

TRACE ELEMENTS

Ag	Ta	
As	Te*	
Au*	Th	14.10
B	Tl	
Ba	U	1.70
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: WM647

RECORD NO: 416

AUTHOR: MUTSCHLER DATE: 1982
 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUE LONG: 105.50 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO STOCK
 K-FELDSPAR-PHENO
 ALBITE PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.32
 Al2O3 14.28
 Fe2O3 1.72
 FeO .46
 MgO .73
 CaO .88
 Na2O 3.57
 K2O 5.14
 H2O+ .67
 H2O-
 TH2O
 LOI
 TiO2 .400
 P2O5 .180
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F .135
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 102.505

TRACE ELEMENTS

Ag .08 Ta
 As 2.00 Te*
 Au* .60 Th
 B Tl 1.04
 Ba 548.00 U 6.00
 Be 3.00 V
 Bi W 20.00
 Ce Y 12.00
 Co Yb
 Cr Zn 7.00
 Cu 68.00 Zr 170.00
 F 1350.00
 Ga
 Hg*
 La

Li 10.00
 Mo 28.00
 Nb 33.00
 Nd
 Ni
 Pb 3.00
 Rb 123.00
 Sb
 Sc
 Sn .30
 Sr 202.00

AUTHOR
 NUMBER: Q-3

RECORD NO: 418

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	76.24	As	Ta
Al2O3	13.38	As	Te*
Fe2O3	.38	Au*	Th
FeO	.65	B	Tl
MgO	.53	Ba	U
CaO	.01	Be	V
Na2O	2.49	Bi	W
K2O	4.39	Ce	Y
H2O+	.97	Co	Yb
H2O-	.45	Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.120	Ga	
P2O5	.060	Hg*	
MnO	.060	La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S	.070	Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	99.800		

AUTHOR

NUMBER: SI-172

RECORD NO: 419

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEL LONG: 105.50 W FLAGS
 ROCK NAME: GRANITE PORPHYRY CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE
 K-FELDSPAR-PHENO
 ALBITE PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 72.10
 Al2O3 13.42
 Fe2O3 1.49
 FeO 1.09
 MgO .74
 CaO 1.03
 Na2O 3.88
 K2O 5.02

 H2O+ .67
 H2O-
 TH2O
 LOI
 TiO2 .330
 P2O5 .160
 MnO .040

ZrO2
 CO2
 SO3
 Cl
 F .111
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.081

TRACE ELEMENTS

As	.20	Ta	
As	1.00	Te*	
Au*	.62	Th	
B		Tl	1.48
Ba	714.00	U	5.30
Be	3.00	V	
Bi		W	12.00
Ce		Y <	5.00
Co		Yb	
Cr		Zn	32.00
Cu	138.00	Zr	155.00
F	1115.00		
Ga			
Hg*			
La			
Li	8.00		
Mo	3.00		
Nb	31.00		
Nd			
Ni			
Pb	13.00		
Rb	131.00	AUTHOR	
Sb		NUMBER:	Q-7
Sc			
Sn	1.40	RECORD NO:	440
Sr	195.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEG LONG: 105.50 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG QUARTZ-SERICITE-S
 PORPHYRITIC

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	79.42	As	.50 Ta
Al2O3	12.54	As	1.00 Te*
Fe2O3	.54	Au*	2.60 Th
FeO	.12	B	Tl 3.05
MgO	.29	Ba	32.00 U 4.00
CaO	.09	Be	3.00 V
Na2O	.15	Bi	W 8.00
K2O	3.58	Ce	Y < 5.00
H2O+	1.62	Co	Yb
H2O-		Cr	Zn 9.00
TH2O		Cu	19.00 Zr 110.00
LOI		F	1630.00
TiO2	.150	Ga	
P2O5	.070	Hs*	
MnO	.020	La	
ZrO2		Li	9.00
CO2		Mo	2.00
SO3		Nb	47.00
Cl		Nd	
F	.163	Ni	
S		Pb	3.00
Cr2O3		Rb	152.00
NiO		Sb	
BaO		Sc	
Rb2O		Sn	17.00
SrO		Sr	5.00
TOTAL	98.753	AUTHOR NUMBER: Q-9 RECORD NO: 426	

AUTHOR: RANTA

DATE: 1974

LAT: 36.70 N

MAJOR GROUP: SDC SECOND GROUP: QUEG LONG: 105.50 W FLAGS

ROCK NAME: RHYOLITE PORPHYRY CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00

-MAX: OLIG -MAX: 25.00

METHOD: KAR

MINERALS

OCCUR-PETROG.

ALTERATION

PLUG

QUARTZ-SERICITE-M

ARGILLIC

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 74.60

Al2O3 13.80

Fe2O3 .13

FeO .15

MgO .24

CaO .36

Na2O 1.23

K2O 9.37

H2O+ .53

H2O-

TH2O

LOI

TiO2

P2O5

MnO

ZrO2

CO2 .20

SO3

Cl

F

S .750

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 101.360

TRACE ELEMENTS

As

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR

NUMBER: T.3-20

RECORD NO: 427

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 ALBITE

MAJOR CONSTITUENTS

SiO2 76.83
 Al2O3 12.62
 Fe2O3 .64
 FeO .53
 MgO .17
 CaO .47
 Na2O 3.59
 K2O 4.60

 H2O+ .30
 H2O-
 TH2O
 LOI
 TiO2 .130
 P2O5 .070
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F .117
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.087

TRACE ELEMENTS

As	.10	Ta	
As <	1.00	Te*	
Au*	.65	Th	
B		Tl	.82
Ba	40.00	U	12.10
Be	4.00	V	
Bi		W	5.00
Ce		Y	7.00
Co		Yb	
Cr		Zn	31.00
Cu	9.00	Zr	125.00
F	1170.00		
Ga			
Hg*			
La			
Li	4.00		
Mo	10.00		
Nb	45.00		
Nd			
Ni			
Pb	5.00		
Rb	96.00	AUTHOR	
Sb		NUMBER:	Q-4A
Sc			
Sn	2.80	RECORD NO:	429
Sr	24.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 ALBITE

MAJOR CONSTITUENTS

SiO2 72.51
 Al2O3 13.87
 Fe2O3 1.32
 FeO .56
 MgO .91
 CaO .96
 Na2O 3.51
 K2O 5.22
 H2O+ .74
 H2O-
 TH2O
 LOI
 TiO2 .350
 P2O5 .200
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F .145
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.315

TRACE ELEMENTS

As	.20	Ta	
As	2.00	Te*	
Au*	1.20	Th	
B		Tl	1.41
Ba	805.00	U	5.70
Be	3.00	V	
Bi		W	10.00
Ce		Y	10.00
Co		Yb	
Cr		Zn	24.00
Cu	540.00	Zr	190.00
F	1450.00		
Ga			
Hg*			
La			
Li	5.00		
Mo	78.00		
Nb	38.00		
Nd			
Ni			
Pb	2.00		
Rb	160.00	AUTHOR	
Sb		NUMBER:	Q-4B
Sc			
Sn	.50	RECORD NO:	430
Sr	163.00		

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 ALBITE

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	77.30	Ag	.60	Ta	
Al2O3	12.60	As	5.00	Te*	
Fe2O3	.80	Au*	2.45	Th	10.00
FeO	.30	B		Tl	2.90
MgO	.45	Ba	368.00	U	5.00
CaO	1.15	Be	3.00	V	
Na2O	2.30	Bi		W	5.00
K2O	3.80	Ce	78.00	Y	9.00
H2O+	.29	Co		Yb	
H2O-	.07	Cr		Zn	47.00
TH2O		Cu	19.00	Zr	101.00
LOI		F	2500.00		
TiO2	.130	Ga	17.00		
P2O5	.080	Hg*			
MnO	.040	La	50.00		
ZrO2		Li	28.00		
CO2	.20	Mo	86.00		
SO3		Nb	30.00		
Cl		Nd			
F	.250	Ni			
S	.340	Pb	25.00		
Cr2O3		Rb	232.00	AUTHOR	
NiO		Sb		NUMBER:	Q-1
BaO		Sc			
Rb2O		Sn	8.00	RECORD NO:	431
SrO		Sr	100.00		
TOTAL	100.100				

AUTHOR: MUTSCHLER DATE: 1982 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 ALBITE

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	76.23	As	.70	Ta	
Al2O3	12.46	As	1.00	Te*	
Fe2O3	.62	Au*	1.20	Th	
FeO	.42	B		Tl	1.56
MnO	.20	Ba	168.00	U	7.20
CaO	.62	Be	3.00	V	
Na2O	3.20	Bi		W	7.00
K2O	5.41	Ce		Y	8.00
H2O+	.25	Co		Yb	
H2O-		Cr		Zn	142.00
TH2O		Cu	46.00	Zr	115.00
LOI		F	1920.00		
TiO2	.200	Ga			
P2O5	.050	Hg*			
MnO	.030	La			
ZrO2		Li	6.00		
CO2		Mo	72.00		
SO3		Nb	35.00		
Cl		Nd			
F	.192	Ni			
S		Pb	35.00		
Cr2O3		Rb	177.00	AUTHOR	
NiO		Sb		NUMBER:	Q-2
BaO		Sc			
Rb2O		Sn	.90	RECORD NO:	432
SrO		Sr	65.00		
TOTAL	99.882				

AUTHOR: ISHIHARA DATE: 1967
 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 PLAGIOCLASE-PHENO PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 13.29
 Fe2O3 1.03
 FeO .40
 MgO .31
 CaO .66
 Na2O 3.71
 K2O 4.54

 H2O+ .41
 H2O- .14
 TH2O
 LOI
 TiO2 .230
 P2O5 .050
 MnO .040

 ZrO2
 CO2
 SO3
 Cl
 F
 S .010
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.920

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: SI-188

 RECORD NO: 433

AUTHOR: ISHIHARA DATE: 1967
 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ STOCK
 K-FELDSPAR
 PLAGIOCLASE PORPHYRITIC
 BIOTITE

MAJOR CONSTITUENTS

SiO2 76.28
 Al2O3 12.99
 Fe2O3 .73
 FeO .29
 MgO .20
 CaO .52
 Na2O 4.18
 K2O 4.08
 H2O+ .18
 H2O- .16
 TH2O
 LOI
 TiO2 .150
 P2O5 .050
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F
 S .010
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.870

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: SI-238

RECORD NO: 434

AUTHOR: CLARK + R. DATE: 1972 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 STOCK

MAJOR CONSTITUENTS

SiO2 73.22
 Al2O3 11.98
 Fe2O3 1.36
 FeO .45
 MgO .52
 CaO 1.16
 Na2O 3.29
 K2O 5.51

 H2O+ .67
 H2O- .18
 TH2O
 LOI
 TiO2 .280
 P2O5 .040
 MnO .010

 ZrO2
 CO2 .10
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.770

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.72

RECORD NO: 436

AUTHOR: CLARK + R. DATE: 1972
 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG

MAJOR CONSTITUENTS

SiO2 75.04
 Al2O3 11.66
 Fe2O3 .27
 FeO .44
 MgO .11
 CaO 1.08
 Na2O 2.68
 K2O 6.89

 H2O+ .46
 H2O- .64
 TH2O
 LOI
 TiO2 .150
 P2O5 .040
 MnO

 ZrO2
 CO2 .30
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.760

TRACE ELEMENTS

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

 Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

 Yb
 Zn
 Zr

AUTHOR
 NUMBER: P.72

RECORD NO: 437

AUTHOR: CLARK + R. DATE: 1972 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEA LONG: 105.50 W FLAGS
 ROCK NAME: APLITE-CHILL CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 PLUG

MAJOR CONSTITUENTS

SiO2 75.18
 Al2O3 12.53
 Fe2O3 .09
 FeO .58
 MgO .18
 CaO .12
 Na2O 2.18
 K2O 8.31

 H2O+ .63
 H2O- .06
 TH2O
 LOI
 TiO2 .250
 P2O5
 MnO .010

 ZrO2
 CO2 .09
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.210

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.72

RECORD NO: 438

AUTHOR: ISHIHARA DATE: 1967 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEC LONG: 105.50 W FLAGS
 ROCK NAME: APLITE CODE: 0290
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 K-FELDSPAR
 PLAGIOCLASE
 BIOTITE

MAJOR CONSTITUENTS

SiO2 78.10
 Al2O3 11.74
 Fe2O3 1.08
 FeO .05
 MgO .06
 CaO .07
 Na2O 3.62
 K2O 4.40

H2O+ .46
 H2O- .14
 TH2O
 LOI
 TiO2 .150
 P2O5 .030
 MnO .020

ZrO2
 CO2
 SO3
 Cl
 F
 S .070
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.990

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: SI-180
 RECORD NO: 421

AUTHOR: ISHIHARA DATE: 1967 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEC LONG: 105.50 W FLAGS
 ROCK NAME: GRANITE CODE: 1420
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO
 K-FELDSPAR-PHENO
 PLAGIOCLASE-PHENO
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 76.61
 Al2O3 12.82
 Fe2O3 .74
 FeO .22
 MgO .14
 CaO .53
 Na2O 4.05
 K2O 4.40

H2O+ .15
 H2O- .12
 TH2O
 LOI
 TiO2 .150
 P2O5 .030
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F
 S .010
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.020

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: SI-240

RECORD NO: 423

486

AUTHOR: ISHIHARA DATE: 1967
 LAT: 36.70 N
 MAJOR GROUP: SDC SECOND GROUP: QUEV LONG: 105.50 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN: 22.00
 -MAX: OLIG -MAX: 25.00
 METHOD: KAR
 OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO WELDED TUFF ARGILLIC-M
 SANIDINE-PHENO QUARTZ-SERICITE
 BIOTITE-PHENO

MAJOR CONSTITUENTS

SiO2 77.76
 Al2O3 13.32
 Fe2O3 .62
 FeO .14
 MgO .24
 CaO .01
 Na2O 2.32
 K2O 3.55
 H2O+ 1.04
 H2O- .49
 TH2O
 LOI
 TiO2 .130
 P2O5 .010
 MnO .010

ZrO2
 CO2
 SO3
 Cl
 F
 S .050
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.690

TRACE ELEMENTS

Ag	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: SI-135
 RECORD NO: 420

AUTHOR: MC CALLUM DATE: 1983 LAT: 40.75 N
 MAJOR GROUP: SFE SECOND GROUP: LONG: 105.50 W FLAGS

ROCK NAME: RHYODACITE CODE: 3000

AGE: STRAT-MIN: ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2 70.60
 Al2O3 14.80
 Fe2O3 1.10
 FeO .28
 MgO .13
 CaO 1.60
 Na2O 4.00
 K2O 4.10

 H2O+ 1.60
 H2O- .42
 TH2O
 LOI
 TiO2 .240
 P2O5 .760
 MnO .040

 ZrO2
 CO2 .03
 SO3
 Cl
 F .090
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.790

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: CB108

RECORD NO: 478

AUTHOR: MC CALLUM DATE: 1983 LAT: 40.75 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.50 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

MAJOR CONSTITUENTS

SiO2 73.10
 Al2O3 14.70
 Fe2O3 .94
 FeO .32
 MgO .22
 CaO .18
 Na2O 4.60
 K2O 2.45

 H2O+ 1.50
 H2O- .29
 TH2O
 LOI
 TiO2 .100
 P2O5 .040
 MnO .060

ZrO2
 CO2
 SO3
 Cl
 F .050
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.550

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: CB71A

RECORD NO: 479

AUTHOR: MC CALLUM DATE: 1983 LAT: 40.75 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.50 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

MAJOR CONSTITUENTS

SiO2 72.20
 Al2O3 15.30
 Fe2O3 .80
 FeO .36
 MgO .30
 CaO .13
 Na2O 3.60
 K2O 4.40

 H2O+ 1.40
 H2O- .24
 TH2O
 LOI
 TiO2 .070
 P2O5 .040
 MnO .050

ZrO2
 CO2
 SO3
 Cl
 F .070
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.960

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: CB60B

 RECORD NO: 480

491

AUTHOR: MC CALLUM DATE: 1983 LAT: 40.37 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 106.10 W FLAGS
 ROCK NAME: RHYODACITE CODE: 3000

AGE: STRAT-MIN: ISOTOPIC-MIN:
 -MAX: -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

PORPHYRITIC

MAJOR CONSTITUENTS

SiO2	77.60
Al2O3	12.90
Fe2O3	.80
FeO	.36
MgO	.32
CaO	.11
Na2O	.25
K2O	3.35
H2O+	2.10
H2O-	.14
TH2O	
LOI	
TiO2	.090
P2O5	.050
MnO	.040
ZrO2	
CO2	.06
SO3	
Cl	
F	.070
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	98.240

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hg*	
La	
Li	
Mo	
Nb	
Nd	
Ni	
Pb	
Rb	
Sb	
Sc	
Sn	
Sr	

AUTHOR
 NUMBER: PV3-1
 RECORD NO: 486

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 72.06
 Al2O3 13.55
 Fe2O3 2.14
 FeO .67
 MgO .06
 CaO .27
 Na2O 2.80
 K2O 4.55

 H2O+ 3.15
 H2O-
 TH2O
 LOI
 TiO2 .270
 P2O5
 MnO

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.520

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-3

 RECORD NO: 321

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 77.59
 Al2O3 12.45
 Fe2O3 .85
 FeO .25
 MgO .03
 CaO .19
 Na2O 4.23
 K2O 4.57

H2O+ .35
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 100.510

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-4

RECORD NO: 322

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 75.44
 Al2O3 11.97
 Fe2O3 1.07
 FeO .31
 MnO .06
 CaO .54
 Na2O 3.00
 K2O 5.14
 H2O+ 3.00
 H2O-
 TH2O
 LOI
 TiO2 .080
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.610

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y
 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-5

RECORD NO: 323

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 77.01
 Al2O3 12.60
 Fe2O3 .48
 FeO .40
 MgO .03
 CaO .12
 Na2O 4.43
 K2O 4.35

H2O+ .18
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO

TOTAL 99.600

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-6

RECORD NO: 324

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 75.35
 Al2O3 13.31
 Fe2O3 1.24
 FeO .19
 MgO .04
 CaO .36
 Na2O 3.95
 K2O 5.00

H2O+ .39
 H2O-
 TH2O
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.830

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-8

RECORD NO: 325

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	70.00	As	Ta
Al2O3	15.46	As	Te*
Fe2O3	2.27	Au*	Th
FeO	.12	B	Tl
MgO	.09	Ba	U
CaO	.89	Be	V
Na2O	3.63	Bi	W
K2O	6.58	Ce	Y
H2O+	1.15	Co	Yb
H2O-		Cr	Zn
TH2O		Cu	Zr
LOI		F	
TiO2	.210	Ga	
P2O5		Hg*	
MnO		La	
ZrO2		Li	
CO2		Mo	
SO3		Nb	
Cl		Nd	
F		Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	100.400		

AUTHOR
NUMBER: T.1-11

RECORD NO: 327

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 77.83
 Al2O3 11.71
 Fe2O3 .88
 FeO .37
 MnO .03
 CaO .17
 Na2O 3.31
 K2O 4.67

 H2O+ .57
 H2O-
 TH2O
 LOI
 TiO2 .070
 P2O5
 MnO

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.610

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-13
 RECORD NO: 328

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 77.35
 Al2O3 11.83
 Fe2O3 1.11
 FeO .48
 MgO .19
 CaO .43
 Na2O 3.11
 K2O 4.65

 H2O+ 1.30
 H2O-
 TH2O
 LOI
 TiO2 .120
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.570

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: T.1-14
 RECORD NO: 329

AUTHOR: CORBETT DATE: 1968 LAT: 40.50 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.85 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 71.20
 Al2O3 13.60
 Fe2O3 .90
 FeO 1.10
 MnO .20
 CaO .70
 Na2O 4.60
 K2O 5.90

 H2O+ 2.20
 H2O-
 TH2O
 LOI
 TiO2 .200
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.600

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 46

 RECORD NO: 333

AUTHOR: CORBETT

DATE: 1968

LAT: 40.50 N

MAJOR GROUP: SPE SECOND GROUP:

LONG: 105.85 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIG

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 72.60
Al₂O₃ 14.10
Fe₂O₃ 1.70
FeO .10
MgO
CaO .40
Na₂O 4.20
K₂O 5.60

H₂O+ .70
H₂O-
TH₂O
LOI
TiO₂ .200
P₂O₅
MnO

ZrO₂
CO₂
SO₃
Cl
F
S
Cr₂O₃
NiO
BaO
Rb₂O
SrO
TOTAL 99.600

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 47

RECORD NO: 334

AUTHOR: CORBETT DATE: 1968 LAT: 40.46 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.85 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 73.30
 Al2O3 14.30
 Fe2O3 .70
 FeO .40
 MgO
 CaO .60
 Na2O 3.80
 K2O 5.20

 H2O+ 1.10
 H2O-
 TH2O
 LOI
 TiO2 .200
 P2O5 .100
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.700

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 133

 RECORD NO: 336

AUTHOR: CORBETT DATE: 1968 LAT: 40.45 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.80 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 78.00
 Al2O3 11.80
 Fe2O3 .30
 FeO .30
 MgO
 CaO .10
 Na2O 2.20
 K2O 5.50

 H2O+ .80
 H2O-
 TH2O
 LOI
 TiO2 .200
 P2O5 .100
 MnO

 ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.300

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: 165

 RECORD NO: 338

AUTHOR: CORBETT

DATE: 1968

LAT: 40.45 N

MAJOR GROUP: SPE SECOND GROUP:

LONG: 105.80 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: OLIG
-MAX: OLIGISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS

OCCUR-PETROG.
WELDED TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 71.50Al₂O₃ 14.10Fe₂O₃ .60

FeO .30

MgO

CaO .40

Na₂O 5.20K₂O 4.10H₂O+ 3.30H₂O-TH₂O

LOI

TiO₂P₂O₅ .100

MnO

ZrO₂CO₂SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.600

As

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

TRACE ELEMENTS

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR

NUMBER: 174

RECORD NO: 339

TRACE ELEMENTS

SiO ₂	73.40
Al ₂ O ₃	14.30
Fe ₂ O ₃	1.10
FeO	.20
MnO	
CaO	
Na ₂ O	5.10
K ₂ O	5.00

As
As
Au*
B
Ba
Be
Bi
Ce

Ta
Te*
Th
Tl
U
V
W
Y

H2O+	.20
H2O-	
TH2O	
LOI	
TiO2	
P2O5	
MnO	

Co
Cr
Cu
F
Ga
Hg*
La

Yb
Zn
Zr

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: 175

RECORD NO: 340

TOTAL 99.300

AUTHOR: WAHLSTROM DATE: 1944 LAT: 40.43 N
 MAJOR GROUP: SPE SECOND GROUP: LONG: 105.83 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ
 SANIDINE
 TOPAZ

MAJOR CONSTITUENTS

SiO2 76.61
 Al2O3 12.00
 Fe2O3 1.29
 FeO .36
 MgO .09
 CaO .98
 Na2O 3.46
 K2O 4.20
 H2O+ 1.20
 H2O-
 TH2O
 LOI
 TiO2 .220
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.410

As
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce
 Co
 Cr
 Cu
 F
 Ga
 Hs*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

TRACE ELEMENTS

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y
 Yb
 Zn
 Zr

AUTHOR
 NUMBER: T.1-10
 RECORD NO: 326

ALTERATION

300.00

LAT: 37.59 N

LONG: 104.98 W FLAGS

ROCK NAME: GRANITE PORPHYRY CODE: 1420

AGE: STRAT-MIN: OLIG
-MAX: EOCE

ISOTOPIC-MIN:
-MAX:

METHOD:

MINERALS
QUARTZ-PHENO
ANORTHOCLASE-PHENO
OLIGOCLASE-PHENO
BIOTITE-PHENO
HORNBLLENDE-PHENO

OCCUR-PETROG.
FLUG

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	72.50
Al ₂ O ₃	14.60
Fe ₂ O ₃	.35
FeO	.16
MnO	.26
CaO	1.30
Na ₂ O	4.70
K ₂ O	4.20

H2O+	.64
H2O-	.16
TH2O	
LOI	
TiO2	1.200
P2O5	.020
MnO	.020

ZrO2	
CO2	.20
SO3	
Cl	
F	
S	
Cr2O3	
NiO	
BaO	
Rb2O	
SrO	
TOTAL	100.310

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	1000.00	U	
Be	3.00	V	10.00
Bi		W	
Ce		Y	10.00
Co		Yb	
Cr	15.00	Zn	
Cu	5.00	Zr	50.00
F			
Ga	50.00		
Hg*			
La			
Li			
Mo			
Nb	50.00		
Nd			
Ni	5.00		
Pb	20.00		
Rb		AUTHOR	
Sb		NUMBER:	16
Sc			
Sn		RECORD NO:	146
Sr	700.00		

517

AUTHOR: EPIS + C. DATE: 1974

MAJOR GROUP: TNM SECOND GROUP: GP LAT: N
LONG: W FLAGS

ROCK NAME: TUFF CODE: 3880

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 29.00
 -MAX: OLIG -MAX: 29.00
 METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.00
Al2O3 14.50
Fe2O3 .75
FeO .20
MnO .39
CaO .90
Na2O 3.90
K2O 5.20

H2O+ 1.00
H2O- .49
TH2O
LOI
TiO2 .280
P2O5 .080
MnO

ZrO2
CO2 < .05
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.740

TRACE ELEMENTS

As Ta
As Te*
Au* Th
B Tl
Ba U
Be V
Bi W
Ce Y

Co Yb
Cr Zn
Cu Zr
F
Ga
Hg*
La

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: W170630

RECORD NO: 341

AUTHOR: EPIS + C. DATE: 1974 LAT: N
 MAJOR GROUP: TNM SECOND GROUP: TR LONG: W FLAGS
 ROCK NAME: TUFF CODE: 3880
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 76.00
 Al2O3 12.50
 Fe2O3 1.00
 FeO .20
 MgO .14
 CaO .65
 Na2O 3.40
 K2O 4.60

 H2O+ .62
 H2O- .48
 TH2O
 LOI
 TiO2 .160
 P2O5 .020
 MnO .030

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.850

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: W170642

RECORD NO: 343

AUTHOR: EPIS + C. DATE: 1974
 MAJOR GROUP: TNM SECOND GROUP: EG LAT: N
 LONG: W FLAGS
 ROCK NAME: TUFF CODE: 3880
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.00
 Al2O3 13.10
 Fe2O3 1.10
 FeO .20
 MgO .62
 CaO 1.10
 Na2O 2.70
 K2O 4.80

 H2O+ 3.00
 H2O- 1.00
 TH2O
 LOI
 TiO2 .180
 P2O5 .030
 MnO .060

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.940

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hs*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: W170624
 RECORD NO: 344

AUTHOR: EPIS + C.

DATE: 1974

MAJOR GROUP: TNM

SECOND GROUP: EG

LAT:

N

LONG:

W FLAGS

ROCK NAME: TUFF

CODE: 3880

AGE: STRAT-MIN: OLIG

ISOTOPIC-MIN:

-MAX: OLIG

-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

WELDED TUFF

MAJOR CONSTITUENTS

SiO2 75.30

Al2O3 12.70

Fe2O3 1.00

FeO .24

MgO .16

CaO .65

Na2O 3.40

K2O 4.80

H2O+ .77

H2O- .53

TH2O

LOI

TiO2 .190

P2O5 .020

MnO .050

ZrO2

CO2 < .05

SO3

Cl

F

S

Cr2O3

NiO

BaO

Rb2O

SrO

TOTAL 99.860

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: W170643

RECORD NO:

345

AUTHOR: EFIS + C. DATE: 1974 LAT: N
 MAJOR GROUP: TNM SECOND GROUP: SR LONG: W FLAGS
 ROCK NAME: TUFF CODE: 3880
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN:
 -MAX: OLIG -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 71.90
 Al2O3 14.20
 Fe2O3 1.60
 FeO .16
 MgO .29
 CaO .87
 Na2O 3.30
 K2O 5.30

 H2O+ 1.10
 H2O- .68
 TH2O
 LOI
 TiO2 .400
 P2O5 .080
 MnO .020

 ZrO2
 CO2 .09
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.990

TRACE ELEMENTS

As Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: W170619
 RECORD NO: 346

AUTHOR: EPIS + C. DATE: 1974 LAT: N
 MAJOR GROUP: TNM SECOND GROUP: WM LONG: W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 35.00
 -MAX: OLIG -MAX: 36.00
 METHOD: KAR
 MINERALS OCCUR-PETROG. ALTERATION
 WELDED TUFF

MAJOR CONSTITUENTS

SiO2 72.20
 Al2O3 14.30
 Fe2O3 1.10
 FeO .32
 MgO .25
 CaO .78
 Na2O 3.30
 K2O 5.70

 H2O+ 1.00
 H2O- .63
 TH2O
 LOI
 TiO2 .380
 P2O5 .050
 MnO .020

 ZrO2
 CO2 .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.080

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

 Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

 Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: W170620
 RECORD NO: 347

AUTHOR: VAN ALSTINE DATE: 1969
 LAT: 38.60 N
 MAJOR GROUP: TNM SECOND GROUP: WM LONG: 106.45 W FLAGS
 ROCK NAME: WELDED TUFF CODE: 4060

AGE: STRAT-MIN: OLIG ISOTOPIC-MIN: 35.00
 -MAX: OLIG -MAX: 37.00
 METHOD: KAR

MINERALS OCCUR-PETROG. ALTERATION
 SANIDINE-PHENO
 CRISTOBALITE
 TRIDYMIT
 BIOTITE
 GARNET

MAJOR CONSTITUENTS

SiO2 72.70
 Al2O3 13.60
 Fe2O3 1.20
 FeO .28
 MgO .32
 CaO .25
 Na2O 2.00
 K2O 8.00

 H2O+ .72
 H2O- .48
 TH2O
 LOI
 TiO2 .460
 P2O5 .080
 MnO .020

ZrO2
 CO2 < .05
 SO3
 Cl
 F .040
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.200

TRACE ELEMENTS

Ag		Ta	
As		Te*	
Au*		Th	
B		Tl	
Ba	3000.00	U	
Be	1.50	V	15.00
Bi		W	
Ce	300.00	Y	20.00
Co		Yb	2.00
Cr		Zn	
Cu	1.50	Zr	2000.00
F			
Ga	10.00		
Hg*			
La	150.00		
Li			
Mo			
Nb	15.00		
Nd	100.00		
Ni	100.00		
Pb	10.00		
Rb			
Sb			
Sc	5.00		
Sn			
Sr	500.00		

AUTHOR
 NUMBER: 159510
 RECORD NO: 348

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.00	As	Ta
Al2O3	12.95	As	Te*
Fe2O3	1.01	Au*	Th
FeO	.20	B	Tl
MnO	.20	Ba	U
CaO	.31	Be	V
Na2O	4.05	Bi	W
K2O	4.03	Ce	Y
H2O+	.66	Co	Yb
H2O-	1.15	Cr	Zn
TH2O		Cu	Zr
LOI		F	1800.00
TiO2	.050	Ga	
P2O5	.010	Hg*	
MnO	.130	La	
ZrO2		Li	
CO2	.01	Mo	
SO3		Nb	
Cl		Nd	
F	.180	Ni	
S		Pb	
Cr2O3		Rb	
NiO		Sb	
BaO		Sc	
Rb2O		Sn	
SrO		Sr	
TOTAL	99.940		

AUTHOR
 NUMBER: WM316
 RECORD NO: 116

AUTHOR: PHAIR + J. DATE: 1975
 MAJOR GROUP: WET SECOND GROUP: AN LAT: 38.15 N
 LONG: 105.32 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG

MAJOR CONSTITUENTS

SiO2 75.10
 Al2O3 13.30
 Fe2O3 .59
 FeO .15
 MgO .26
 CaO .24
 Na2O 3.60
 K2O 4.20

 H2O+ .40
 H2O- 1.10
 TH2O
 LOI
 TiO2 .060
 P2O5
 MnO .140

 ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.190

TRACE ELEMENTS

Ag	Ta	
As	Te*	
Au*	Th	23.50
B	Tl	
Ba	U	22.00
Be	V	
Bi	W	
Ce	Y	
Co	Yb	
Cr	Zn	
Cu	Zr	
F		
Ga		
Hg*		
La		
Li		
Mo		
Nb		
Nd		
Ni		
Pb		
Rb		
Sb		
Sc		
Sn		
Sr		

AUTHOR
 NUMBER: WM482

 RECORD NO: 117

AUTHOR: PHAIR + J. DATE: 1975
 MAJOR GROUP: WET SECOND GROUP: RO LAT: 38.12 N
 LONG: 105.35 W FLAGS
 ROCK NAME: RHYOLITE PORPHYRY CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO PLUG

MAJOR CONSTITUENTS

SiO2 76.90
 Al2O3 12.70
 Fe2O3 .53
 FeO .11
 MgO .07
 CaO .21
 Na2O 3.80
 K2O 4.10

H2O+ .34
 H2O- .90
 TH2O
 LOI
 TiO2 .060
 P2O5 .020
 MnO .160

ZrO2
 CO2 < .05
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.950

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th 23.50
 B Tl
 Ba U 22.00
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: WM431
 RECORD NO: 111

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	75.68	As	.30	Ta	
Al2O3	13.66	As	4.00	Te*	
Fe2O3	.60	Au*	.40	Th	
FeO	.21	B		Tl	2.30
MgO	.20	Ba	20.00	U	17.10
CaO	.29	Be	10.00	V	
Na2O	2.85	Bi	2.00	W	3.00
K2O	4.43	Ce		Y	36.00
H2O+	1.32	Co		Yb	
H2O-		Cr		Zn	71.00
TH2O		Cu	2.00	Zr	135.00
LOI		F	2040.00		
TiO2	.020	Ga			
P2O5	.070	Hg*	20.00		
MnO	.150	La			
ZrO2		Li	17.00		
CO2	.03	Mo <	1.00		
SO3		Nb	220.00		
Cl		Nd			
F	.204	Ni			
S		Pb	55.00		
Cr2O3		Rb	345.00	AUTHOR	
NiO		Sb	1.00	NUMBER:	W9
BaO		Sc			
Rb2O		Sn	5.80	RECORD NO:	112
SrO		Sr	15.00		
TOTAL	99.714				

AUTHOR: CROSS DATE: 1896
 MAJOR GROUP: WET SECOND GROUP: RO LAT: 38.08 N
 LONG: 105.34 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION

MAJOR CONSTITUENTS

SiO2 70.87
 Al2O3 15.18
 Fe2O3 2.18
 FeO .12
 MgO .60
 CaO 1.58
 Na2O 3.47
 K2O 5.04

H2O+
 H2O-
 TH2O 1.08
 LOI
 TiO2
 P2O5
 MnO

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.120

Ag
 As
 Au*
 B
 Ba
 Be
 Bi
 Ce

Co
 Cr
 Cu
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

TRACE ELEMENTS

Ta
 Te*
 Th
 Tl
 U
 V
 W
 Y

Yb
 Zn
 Zr

AUTHOR
 NUMBER: F.324
 RECORD NO: 113

AUTHOR: MUTSCHLER + DATE: 1983

MAJOR GROUP: WET SECOND GROUP: SL LAT: 38.14 N
LONG: 105.45 W FLAGS

ROCK NAME: RHYOLITE GLASS CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
-MAX: MIOC -MAX:

METHOD:

MINERALS

OCCUR-PETROG.
FLOW

ALTERATION

GLASSY

MAJOR CONSTITUENTS

SiO2 71.83
Al2O3 13.28
Fe2O3 .53
FeO .17
MgO .05
CaO .50
Na2O 3.14
K2O 5.31

H2O+ 4.30
H2O-
TH2O
LOI
TiO2 .120
P2O5 .030
MnO .210

ZrO2
CO2
SO3
Cl
F .086
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 99.556

TRACE ELEMENTS

As	.02	Ta	
As	1.00	Te*	
Au*	.50	Th	
B		Tl	.90
Ba	20.00	U	5.70
Be	5.00	V	
Bi	.80	W <	2.00
Ce		Y	34.00
Co		Yb	
Cr		Zn	66.00
Cu	5.00	Zr	105.00
F	865.00		
Ga			
Hg*	20.00		
La			
Li	12.00		
Mo	1.00		
Nb	57.00		
Nd			
Ni			
Pb	37.00		
Rb	240.00	AUTHOR	
Sb <	1.00	NUMBER: 1	
Sc			
Sn	5.60	RECORD NO:	88
Sr	10.00		

AUTHOR: MUTSCHLER + DATE: 1983
 MAJOR GROUP: WET SECOND GROUP: SL LAT: 38.14 N
 LONG: 105.45 W FLAGS
 ROCK NAME: RHYOLITE GLASS CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW
 GLASSY

MAJOR CONSTITUENTS

SiO2 71.81
 Al2O3 12.83
 Fe2O3 .12
 FeO .29
 MgO .05
 CaO .74
 Na2O 3.78
 K2O 4.35
 H2O+ 4.34
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .030
 MnO .210
 ZrO2
 CO2 .03
 SO3
 Cl
 F .198
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 98.838

TRACE ELEMENTS

As	.20	Ta	
As <	1.00	Te*	
Au*	.30	Th	.80
B		Tl	
Ba	32.00	U	5.90
Be	6.00	V	
Bi	.50	W <	2.00
Ce		Y	28.00
Co		Yb	
Cr		Zn	62.00
Cu	2.00	Zr	100.00
F	1980.00		
Ga			
Hg*	10.00		
La			
Li	21.00		
Mo <	1.00		
Nb	57.00		
Nd			
Ni			
Pb	39.00		
Rb	148.00	AUTHOR	
Sb	1.00	NUMBER: 2	
Sc			
Sn	5.00	RECORD NO:	89
Sr	13.00		

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.15 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS

ROCK NAME: RHYOLITE GLASS CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 FLOW
 GLASSY

MAJOR CONSTITUENTS

SiO2 75.42
 Al2O3 12.90
 Fe2O3 .18
 FeO .30
 MgO .05
 CaO .61
 Na2O 2.96
 K2O 5.91

 H2O+ .57
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .070
 MnO .220

ZrO2
 CO2 .03
 SO3
 Cl
 F .120
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.400

TRACE ELEMENTS

Ag	.30	Ta	
As <	1.00	Te*	
Au*	.30	Th	
B		Tl	2.00
Ba	57.00	U	6.10
Be	6.00	V	
Bi	1.00	W <	2.00
Ce		Y	41.00
Co		Yb	
Cr		Zn	62.00
Cu	1.00	Zr	100.00
F	1205.00		
Ga			
Hg*	10.00		
La			
Li	14.00		
Mo	1.00		
Nb	46.00		
Nd			
Ni			
Pb	24.00		
Rb	140.00	AUTHOR	
Sb <	1.00	NUMBER:	3
Sc			
Sn	6.50	RECORD NO:	90
Sr	10.00		

AUTHOR: MUTSCHLER + DATE: 1983
 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS
 ROCK NAME: HIGH-K RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 76.01
 Al2O3 13.02
 Fe2O3 .42
 FeO .16
 MgO .05
 CaO .22
 Na2O 1.51
 K2O 7.52

 H2O+ 1.07
 H2O-
 TH2O
 LOI
 TiO2 .070
 P2O5 .040
 MnO .210

ZrO2
 CO2
 SO3
 Cl
 F .062
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.362

TRACE ELEMENTS

As	12.00	Ta	
As	2.00	Te*	
Au*	.30	Th	
B		Tl	3.80
Ba	48.00	U	4.60
Be	4.00	V	
Bi	.50	W	2.00
Ce		Y	36.00
Co		Yb	
Cr		Zn	130.00
Cu	4.00	Zr	98.00
F	620.00		
Ga			
Hg*	40.00		
La			
Li	19.00		
Mo <	1.00		
Nb	52.00		
Nd			
Ni			
Pb	70.00		
Rb	315.00	AUTHOR	
Sb	4.00	NUMBER:	6
Sc			
Sn	4.80	RECORD NO:	91
Sr	18.00		

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.15 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.47 W FLAGS
 ROCK NAME: HIGH-K RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW
 SANIDINE-PHENO
 GARNET

MAJOR CONSTITUENTS

SiO2 75.57
 Al2O3 13.36
 Fe2O3 .16
 FeO .26
 MgO .08
 CaO .20
 Na2O 1.52
 K2O 8.01

 H2O+ .93
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .040
 MnO .130

 ZrO2
 CO2 .05
 SO3
 Cl
 F .046
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.416

TRACE ELEMENTS

As	5.40	Ta	
As	3.00	Te*	
Au*	1.10	Th	
B		Tl	3.50
Ba	151.00	U	5.90
Be	5.00	V	
Bi	.60	W	2.00
Ce		Y	33.00
Co		Yb	
Cr		Zn	58.00
Cu	38.00	Zr	100.00
F	456.00		
Ga			
Hg*	25.00		
La			
Li	15.00		
Mo	1.00		
Nb	53.00		
Nd			
Ni			
Pb	240.00		
Rb	245.00	AUTHOR	
Sb <	1.00	NUMBER:	7
Sc			
Sn	5.60	RECORD NO:	92
Sr	30.00		

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS
 ROCK NAME: HIGH-K RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHEND PIPE
 SANIDINE-PHEND

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.93	As	4.80 Ta
Al2O3	13.46	As	5.00 Te*
Fe2O3	.03	Au*	.40 Th
FeO	.34	B	Tl 3.10
MgO	.03	Ba	57.00 U 5.20
CaO	.31	Be	4.00 V
Na2O	2.45	Bi	.60 W 2.00
K2O	6.16	Ce	Y 29.00
H2O+	.35	Co	Yb
H2O-		Cr	Zn 135.00
TH2O		Cu	2.00 Zr 100.00
LOI		F	2910.00
TiO2	.050	Ga	
P2O5	.040	Hg*	100.00
MnO	.130	La	
ZrO2		Li	38.00
CO2	.05	Mo	1.00
SO3		Nb	56.00
Cl		Nd	
F	.291	Ni	
S		Pb	42.00
Cr2O3		Rb	212.00 AUTHOR
NiO		Sb	2.00 NUMBER: 8
BaO		Sc	
Rb2O		Sn	6.00 RECORD NO: 93
SrO		Sr	10.00
TOTAL	99.621		

AUTHOR: MUTSCHLER + DATE: 1983
 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.43 W FLAGS
 ROCK NAME: HIGH-K RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO
 SANIDINE-PHENO

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	75.14	As	13.00 Ta
Al2O3	12.88	As	3.00 Te*
Fe2O3	.40	Au*	.50 Th
FeO	.31	B	Tl 6.50
MgO	.05	Ba	U 5.10
CaO	.17	Be	V
Na2O	1.02	Bi <	W < 2.00
K2O	9.46	Ce	Y 49.00
H2O+	.68	Co	Yb
H2O-		Cr	Zn 143.00
TH2O		Cu	Zr 100.00
LOI		F	675.00
TiO2	.050	Ga	
P2O5	.030	Hg*	30.00
MnO	.081	La	
ZrO2		Li	4.00
CO2	.06	Mo	1.00
SO3		Nb	42.00
Cl		Nd	
F	.067	Ni	
S		Pb	75.00
Cr2O3		Rb	390.00 AUTHOR
NiO		Sb	4.00 NUMBER: 9
BaO		Sc	
Rb2O		Sn	5.40 RECORD NO: 94
SrO		Sr	9.00
TOTAL	100.398		

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.43 W FLAGS
 ROCK NAME: HIGH-K RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DOME
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 77.22
 Al2O3 11.91
 Fe2O3 .12
 FeO .39
 MgO .04
 CaO .31
 Na2O .53
 K2O 8.98

 H2O+ .52
 H2O-
 TH2O
 LOI
 TiO2 .040
 P2O5 .040
 MnO .053

 ZrO2
 CO2 .10
 SO3
 Cl
 F .051
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.304

TRACE ELEMENTS

As	22.00	Ta	
As	4.00	Te*	
Au*	1.20	Th	
B		Tl	5.70
Ba	174.00	U	5.30
Be	3.00	V	
Bi	7.00	W	2.00
Ce		Y	39.00
Co		Yb	
Cr		Zn	81.00
Cu	7.00	Zr	93.00
F	515.00		
Ga			
Hg*	25.00		
La			
Li	40.00		
Mo	2.00		
Nb	45.00		
Nd			
Ni			
Pb	61.00		
Rb	352.00	AUTHOR	
Sb	10.00	NUMBER: 10	
Sc			
Sn	4.00	RECORD NO:	95
Sr	12.00		

AUTHOR: MUTSCHLER + DATE: 1983

MAJOR GROUP: WET SECOND GROUP: SL LAT: 38.14 N
LONG: 105.45 W FLAGS

ROCK NAME: HIGH-K RHYOLITE TUFF CODE: 3010

AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
-MAX: MIOC -MAX:

METHOD:

MINERALS

OCCUR-PETROG.
TUFF

ALTERATION

MAJOR CONSTITUENTS

SiO2 75.02
Al2O3 12.63
Fe2O3 .16
FeO .48
MgO .43
CaO .94
Na2O .69
K2O 9.02

H2O+ .50
H2O-
TH2O
LOI
TiO2 .050
P2O5 .060
MnO .088

ZrO2
CO2
SO3
Cl
F .025
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.093

TRACE ELEMENTS

As .80 Ta
As 2.00 Te*
Au* .60 Th
B Tl 1.50
Ba 697.00 U 2.00
Be 1.00 V
Bi .60 W < 2.00
Ce Y < 5.00

Co Yb
Cr Zn 81.00
Cu Zr 68.00

F 250.00
Ga
Hg* 50.00
La

Li 10.00
Mo 2.00
Nb 9.00

Nd
Ni
Pb 61.00
Rb 201.00 AUTHOR
Sb 1.00 NUMBER: 11

Sc
Sn 2.00 RECORD NO: 96
Sr 73.00

AUTHOR: MUTSCHLER + DATE: 1983
 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW ARGILLIC-W
 SANIDINE-PHENO
 GARNET
 TOPAZ

MAJOR CONSTITUENTS

SiO2 75.32
 Al2O3 13.60
 Fe2O3 .23
 FeO .28
 MgO .04
 CaO .29
 Na2O 2.50
 K2O 6.21
 H2O+ 1.02
 H2O-
 TH2O
 LOI
 TiO2 .060
 P2O5 .040
 MnO .160

ZrO2
 CO2
 SO3
 Cl
 F .277
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.027

TRACE ELEMENTS

Ag	.10	Ta	
As	1.00	Te*	
Au*	.40	Th	
B		Tl	2.50
Ba	48.00	U	4.90
Be	4.00	V	
Bi	.60	W	3.00
Ce		Y	31.00
Co		Yb	
Cr		Zn	58.00
Cu	3.00	Zr	105.00
F	2770.00		
Ga			
Hg*	30.00		
La			
Li	25.00		
Mo	2.00		
Nb	53.00		
Nd			
Ni			
Pb	85.00		
Rb	244.00	AUTHOR	
Sb	2.00	NUMBER:	12
Sc			
Sn	6.00	RECORD NO:	97
Sr	9.00		

AUTHOR: MUTSCHLER + DATE: 1983
 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW ARGILLIC-W
 SANIDINE-PHENO

MAJOR CONSTITUENTS

SiO2 76.81
 Al2O3 13.08
 Fe2O3 .26
 FeO .30
 MgO .05
 CaO .27
 Na2O 2.40
 K2O 5.41

H2O+ .94
 H2O-
 TH2O
 LOI
 TiO2 .080
 P2O5 .050
 MnO .180

ZrO2
 CO2
 SO3
 Cl
 F .210
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.040

TRACE ELEMENTS

As .90 Ta
 As 2.00 Te*
 Au* .50 Th
 B Tl 2.30
 Ba 36.00 U 5.90
 Be 5.00 V
 Bi .70 W 4.00
 Ce Y 33.00

Co
 Cr
 Cu 4.00 Yb
 F 2100.00 Zn 145.00
 Ga
 Hg* 40.00 Zr 98.00
 La

Li 21.00
 Mo 1.00
 Nb 54.00
 Nd
 Ni
 Pb 105.00
 Rb 162.00 AUTHOR
 Sb 3.00 NUMBER: 13
 Sc
 Sn 5.10 RECORD NO: 98
 Sr 8.00

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	75.74	As	1.40	Ta	
Al2O3	13.10	As	14.00	Te*	
Fe2O3	.93	Au*	3.20	Th	
FeO	.33	B		Tl	3.00
MgO	.11	Ba	74.00	U	4.20
CaO	.46	Be	5.00	V	
Na2O	.20	Bi <	.50	W	
K2O	7.11	Ce		Y	38.00
H2O+	1.22	Co		Yb	
H2O-		Cr		Zn	85.00
TH2O		Cu	4.00	Zr	100.00
LOI		F	405.00		
TiO2	.060	Ga			
P2O5	.050	Hg*	20.00		
MnO	.045	La			
ZrO2		Li	25.00		
CO2	.40	Mo <	1.00		
SO3		Nb	57.00		
Cl		Nd			
F	.040	Ni			
S		Pb	50.00		
Cr2O3		Rb	196.00	AUTHOR	
NiO		Sb	3.00	NUMBER:	14
BaO		Sc			
Rb2O		Sn	5.50	RECORD NO:	99
SrO		Sr	12.00		
TOTAL	99.795				

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.14 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO FLOW ARGILLIC-W
 SANIDINE-PHENO
 GARNET
 TOPAZ

MAJOR CONSTITUENTS

SiO2 77.05
 Al2O3 13.65
 Fe2O3 .38
 FeO .10
 MgO .03
 CaO .21
 Na2O .88
 K2O 6.01

 H2O+ 1.44
 H2O-
 TH2O
 LOI
 TiO2 .080
 P2O5 .020
 MnO .140

ZrO2
 CO2
 SO3
 Cl
 F .037
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 100.027

TRACE ELEMENTS

As	.20	Ta	
As <	1.00	Te*	
Au*	.70	Th	
B		Tl	3.10
Ba	47.00	U	4.60
Be	4.00	V	
Bi <	.50	W	2.00
Ce		Y	39.00
Co		Yb	
Cr		Zn	90.00
Cu	3.00	Zr	105.00
F	375.00		
Ga			
Hg*	100.00		
La			
Li	22.00		
Mo	1.00		
Nb	50.00		
Nd			
Ni			
Pb	46.00		
Rb	250.00	AUTHOR	
Sb	2.00	NUMBER:	15
Sc			
Sn	5.40	RECORD NO:	100
Sr	12.00		

AUTHOR: MUTSCHLER + DATE: 1983 LAT: 38.17 N
 MAJOR GROUP: WET SECOND GROUP: SL LONG: 105.47 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO DIKE QUARTZ-SERICITE-M
 SANIDINE-PHENO
 GARNET

MAJOR CONSTITUENTS		TRACE ELEMENTS	
SiO2	81.50	As	10.00 Ta
Al2O3	10.91	As	5.00 Te*
Fe2O3	.52	Au*	25.00 Th
FeO	.45	B	Tl .80
MgO	.39	Ba	30.00 U 2.00
CaO	.21	Be	2.00 V
Na2O	.02	Bi	4.00 W 3.00
K2O	3.11	Ce	Y
H2O+	.79	Co	Yb
H2O-		Cr	Zn 31.00
TH2O		Cu	8.00 Zr 100.00
LOI		F	2110.00
TiO2	.040	Ga	
P2O5	.030	Hg*	20.00
MnO	.025	La	
ZrO2		Li	19.00
CO2	.06	Mo <	1.00
SO3		Nb	56.00
Cl		Nd	
F	.211	Ni	
S		Pb	260.00
Cr2O3		Rb	103.00 AUTHOR
NiO		Sb <	1.00 NUMBER: 16
BaO		Sc	
Rb2O		Sn	8.50 RECORD NO: 101
SrO		Sr	13.00
TOTAL	98.266		

AUTHOR: MUTSCHLER + DATE: 1983
 MAJOR GROUP: WET SECOND GROUP: SL LAT: 38.16 N
 LONG: 105.45 W FLAGS
 ROCK NAME: RHYOLITE CODE: 3010
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 MINERALS OCCUR-PETROG. ALTERATION
 QUARTZ-PHENO ALUNITIC-M

MAJOR CONSTITUENTS

SiO2 62.10
 Al2O3 6.95
 Fe2O3 12.93
 FeO .43
 MgO .27
 CaO .09
 Na2O .15
 K2O 4.01

H2O+ 3.87
 H2O-
 TH2O
 LOI
 TiO2 .150
 P2O5 .160
 MnO .022

ZrO2
 CO2
 SO3
 Cl
 F .088
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 91.220

TRACE ELEMENTS

As 53.00 Ta
 As 250.00 Te*
 Au* 40.00 Th
 B Tl 1.10
 Ba 164.00 U 2.30
 Be 2.00 V
 Bi 6.00 W 6.00
 Ce Y

Co Yb
 Cr Zn 395.00
 Cu 135.00 Zr
 F 880.00
 Ga
 Hg* 220.00
 La

Li 20.00
 Mo 7.00
 Nb
 Nd
 Ni
 Pb 650.00
 Rb 92.00 AUTHOR
 Sb 13.00 NUMBER: 19
 Sc
 Sn 1.00 RECORD NO: 104
 Sr 22.00

MAJOR CONSTITUENTS		TRACE ELEMENTS			
SiO2	69.62	As	15.00	Ta	
Al2O3	13.45	As	12.00	Te*	
Fe2O3	4.61	Au*	6.70	Th	
FeO	.11	B		Tl	2.70
MgO	.03	Ba	363.00	U	11.20
CaO	.08	Be	2.00	V	
Na2O	.20	Bi	2.00	W	6.00
K2O	9.86	Ce		Y	90.00
H2O+	.97	Co		Yb	
H2O-		Cr		Zn	790.00
TH2O		Cu	29.00	Zr	74.00
LOI		F	168.00		
TiO2	.080	Ga			
P2O5	.130	Hg*	120.00		
MnO	.007	La			
ZrO2		Li	11.00		
CO2		Mo	2.00		
SO3		Nb	32.00		
Cl		Nd			
F	.017	Ni			
S		Pb	1650.00		
Cr2O3		Rb	286.00	AUTHOR	
NiO		Sb	2.00	NUMBER:	20
BaO		Sc			
Rb2O		Sn	.80	RECORD NO:	105
SrO		Sr	29.00		
TOTAL	99.164				

AUTHOR: CROSS

DATE: 1896

MAJOR GROUP: WET SECOND GROUP: SL

LAT: 38.14 N

LONG: 105.45 W FLAGS

ROCK NAME: PITCHSTONE

CODE: 2830

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN:

-MAX: MIOC

-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

FLOW
GLASSY

MAJOR CONSTITUENTS

SiO₂ 71.56Al₂O₃ 13.10Fe₂O₃ .66

FeO .28

MgO .14

CaO .74

Na₂O 3.77K₂O 4.06H₂O+H₂O-TH₂O 5.52

LOI

TiO₂P₂O₅

MnO .160

ZrO₂CO₂SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.990

Ag

As

Au*

B

Ba

Be

Bi

Ce

Co

Cr

Cu

F

Ga

Hs*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

TRACE ELEMENTS

Ta

Te*

Th

Tl

U

V

W

Y

Yb

Zn

Zr

AUTHOR

NUMBER: F.324

RECORD NO: 107

AUTHOR: CROSS DATE: 1896
 MAJOR GROUP: WET SECOND GROUP: SL LAT: 38.14 N
 LONG: 105.45 W FLAGS
 ROCK NAME: PITCHSTONE CODE: 2830
 AGE: STRAT-MIN: MIOC ISOTOPIC-MIN:
 -MAX: MIOC -MAX:
 METHOD:
 OCCUR-PETROG. ALTERATION
 FLOW
 GLASSY

MAJOR CONSTITUENTS

SiO2 73.11
 Al2O3 13.16
 Fe2O3 .62
 FeO .23
 MgO .19
 CaO .54
 Na2O 2.85
 K2O 5.10

H2O+
 H2O-
 TH2O 4.05
 LOI
 TiO2
 P2O5
 MnO .140

ZrO2
 CO2
 SO3
 Cl
 F
 S
 Cr2O3
 NiO
 BaO
 Rb2O
 SrO
 TOTAL 99.990

TRACE ELEMENTS

Ag Ta
 As Te*
 Au* Th
 B Tl
 Ba U
 Be V
 Bi W
 Ce Y

Co Yb
 Cr Zn
 Cu Zr
 F
 Ga
 Hg*
 La

Li
 Mo
 Nb
 Nd
 Ni
 Pb
 Rb
 Sb
 Sc
 Sn
 Sr

AUTHOR
 NUMBER: P.324
 RECORD NO: 108

DATE: 1896

MAJOR GROUP: WET SECOND GROUP: SL

LAT: 38.15 N
LONG: 105.43 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: MIOC
-MAX: MIOC

ISOTOPIC-MIN:
-MAX:

MINERALS

OCCUR-PETROG.

ALTERATION

MAJOR CONSTITUENTS

SiO ₂	75.20
Al ₂ O ₃	12.96
Fe ₂ O ₃	.37
FeO	.27
MnO	.12
CaO	.29
Na ₂ O	2.02
K ₂ O	8.38

H2O+	
H2O-	
TH2O	.58
LOI	
TiO2	
P2O5	
MnO	.030

ZrO2
CO2
SO3
Cl
F
S
Cr2O3
NiO
BaO
Rb2O
SrO
TOTAL 100.220

TRACE ELEMENTS

As	Ta
As	Te*
Au*	Th
B	Tl
Ba	U
Be	V
Bi	W
Ce	Y
Co	Yb
Cr	Zn
Cu	Zr
F	
Ga	
Hs*	
La	

Li
Mo
Nb
Nd
Ni
Pb
Rb
Sb
Sc
Sn
Sr

AUTHOR
NUMBER: F.324

RECORD NO: 109

AUTHOR: CROSS

DATE: 1896

LAT: 38.14 N

MAJOR GROUP: WET SECOND GROUP: SL

LONG: 105.45 W FLAGS

ROCK NAME: RHYOLITE

CODE: 3010

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN:

-MAX: MIOC

-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

MAJOR CONSTITUENTS

SiO₂ 75.39Al₂O₃ 13.65Fe₂O₃ .38

FeO .18

MgO .15

CaO .51

Na₂O 1.84K₂O 6.81H₂O+H₂O-TH₂O 1.13

LOI

TiO₂P₂O₅

MnO .140

ZrO₂CO₂SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 100.180

TRACE ELEMENTS

Ag

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

Cu

Zr

F

Ga

Hg*

La

Li

Mo

Nb

Nd

Ni

Pb

Rb

Sb

Sc

Sn

Sr

AUTHOR

NUMBER: F.324

RECORD NO:

110

MAJOR CONSTITUENTS		TRACE ELEMENTS		
SiO2	74.70	As	Ta	
Al2O3	12.20	As	Te*	
Fe2O3	1.64	Au*	Th	
FeO		B	Tl	
MgO	.07	Ba	U	
CaO	.55	Be	V	
Na2O	2.42	Bi	W	
K2O	5.55	Ce	Y	
H2O+		Co	Yb	
H2O-		Cr	Zn	50.00
TH2O		Cu	Zr	
LOI		F		
TiO2	.160	Ga		
P2O5		Hg*		
MnO	.003	La		
ZrO2		Li		
CO2		Mo		
SO3		Nb		
Cl		Nd		
F		Ni		
S		Pb		
Cr2O3		Rb	AUTHOR	
NiO		Sb	NUMBER:	T.2
BaO		Sc		
Rb2O	.021	Sn	RECORD NO:	465
SrO	.004	Sr		
TOTAL	97.318			

MAJOR CONSTITUENTS		TRACE ELEMENTS		
SiO2	74.10	As	Ta	
Al2O3	12.90	As	Te*	
Fe2O3	.75	Au*	Th	
FeO		B	Tl	
MgO	.06	Ba	U	
CaO	.47	Be	V	
Na2O	3.88	Bi	W	
K2O	3.50	Ce	Y	
H2O+		Co	Yb	
H2O-		Cr	Zn	40.00
TH2O		Cu	Zr	
LOI		F		
TiO2	.100	Ga		
P2O5		Hg*		
MnO	.071	La		
ZrO2		Li		
CO2		Mo		
SO3		Nb		
Cl		Nd		
F		Ni		
S		Pb		
Cr2O3		Rb	AUTHOR	
NiO		Sb	NUMBER: T.1	
BaO		Sc		
Rb2O	.022	Sn	RECORD NO:	466
SrO	.007	Sr		
TOTAL	95.860			

AUTHOR: IZETT

DATE: 1968

MAJOR GROUP: ZMT

SECOND GROUP: TRF

LAT:

N

LONG:

W

FLAGS

2D

ROCK NAME: RHYOLITE GLASS

CODE: 3010

AGE: STRAT-MIN: MIOC

ISOTOPIC-MIN:

-MAX: MIOC

-MAX:

METHOD:

MINERALS

OCCUR-PETROG.

ALTERATION

TUFF

HOLOHYALINE

MAJOR CONSTITUENTS

SiO₂ 73.80Al₂O₃ 11.90Fe₂O₃ .58

FeO

MgO .06

CaO .62

Na₂O 2.41K₂O 5.46H₂O+H₂O-TH₂O 4.40

LOI

TiO₂ .080P₂O₅

MnO .048

ZrO₂CO₂SO₃

Cl

F

S

Cr₂O₃

NiO

BaO

Rb₂O

SrO

TOTAL 99.358

TRACE ELEMENTS

As

Ta

As

Te*

Au*

Th

B

Tl

Ba

U

Be

V

Bi

W

Ce

Y

Co

Yb

Cr

Zn

29.00

Cu

Zr

F

Ga

Hs*

La

Li

4.00

Mo

Nb

Nd

Ni

Pb

50.00

Rb

Sb

Sc

Sn

Sr

80.00

AUTHOR

NUMBER: P.50

RECORD NO:

468

MAJOR CONSTITUENTS		TRACE ELEMENTS		
SiO2	72.00	As	Ta	
Al2O3	10.90	As	Te*	
Fe2O3	3.30	Au*	Th	
FeO		B	Tl	
MgO	.11	Ba	U	
CaO	.94	Be	V	
Na2O	1.58	Bi	W	
K2O	5.89	Ce	Y	
H2O+		Co	Yb	
H2O-		Cr	Zn	120.00
TH2O		Cu	Zr	
LOI		F		
TiO2	.030	Ga		
P2O5		Hg*		
MnO	.074	La		
ZrO2		Li	11.00	
CO2		Mo		
SO3		Nb		
Cl		Nd		
F		Ni		
S		Pb	50.00	
Cr2O3		Rb		AUTHOR
NiO		Sb		NUMBER: P.51
BaO		Sc		
Rb2O		Sn		RECORD NO: 469
SrO		Sr	80.00	
TOTAL	94.824			