

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MINERAL RESOURCES OF THE ARAVAIPA CANYON INSTANT STUDY AREA,
PINAL AND GRAHAM COUNTIES, ARIZONA

by

Medora H. Krieger and Maureen G. Johnson
U.S. Geological Survey, Menlo Park, California 94025

and

Philip R. Bigsby
U.S. Bureau of Mines, Denver, Colorado 80025

U.S. Geological Survey/
Open-File Report 79-291
1979

This report is preliminary and
has not been edited or reviewed
for conformity with Geological
Survey standards and nomenclature.

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U.S. Bureau of Mines, Denver, Colo. 80225

SUMMARY OF MINERAL RESOURCES

The Aravaipa Canyon instant study area comprises a sequence of Precambrian rocks containing no known mineral deposits that is overlain by Tertiary volcanic rocks locally containing zeolites. No mineral commodity has been produced in the area, nor are any minable deposits known. There is no current production from near the area. The closest areas of past production are about 10 km east and 13 km south, but the mineralization is in rocks of different type and age from rocks exposed in the instant study area.

No localities of hydrothermally mineralized or altered rocks are known. Although a few samples are somewhat anomalously high in metal content, none of the rocks sampled contains visible ore minerals. A small geochemical anomaly in the southeast part of the area is suggested by the presence of selected trace elements, but the anomaly is near a major fault and probably reflects transportation of trace metals along the fault from a remote source. Past exploratory drilling centered on an aeromagnetic anomaly for base-metal mineralization in the same area did not reveal any significant value in the Precambrian rocks and the Tertiary volcanic rocks penetrated.

Areas of zeolitized tuff within the instant study area include the west side of Cave Canyon and the western part of Aravaipa Canyon. An estimated 1,130,000 mt of zeolite may exist in one tuff unit on the west side of Cave Canyon, and an additional undetermined amount in other tuff units in Cave Canyon and the western part of Aravaipa Canyon. These zeolite tuff units lie in inaccessible positions in the vertical canyon cliffs and are under as much as 150 m of overburden; therefore, the actual lateral extent is unknown. Any discovery of minable-grade deposits of zeolite in the area would depend on drill core sampling through the overburden and possibly on bulk sampling to establish the quality and quantity of zeolite present. The possibility that zeolite represents a significant resource will depend on mining costs and on the possible future establishment of a sustained market.

INTRODUCTION

A mineral survey of the Aravaipa Canyon instant study area, Arizona (fig. 1), was made in 1978 by the U.S. Geological Survey (U.S.G.S.) and the U.S. Bureau of Mines (U.S.B.M.). The area is located in the table lands across the north end of the Galiuro Mountains in southeastern Arizona about 65-airline km southeast of Globe, and consists of 26.7 km² or about 6,600 acres. The instant study area includes the 4,052 acres Aravaipa Canyon Primitive Area, one of several primitive areas established on U.S. Bureau of Land Management lands in Arizona and Utah by the Secretary of the Interior in 1969, plus an additional 2,545 acres of adjacent land.

Regional Setting

The Aravaipa Canyon Primitive Area, a scenic wilderness gorge of outstanding beauty and historic interest, spectacularly exposes in its canyon walls many important aspects of volcanic geology. The area, located in Pinal and Graham Counties, southeastern Arizona, covers about 16 km² along an approximately 1.6 km-wide stretch of the canyon (fig. 2), and is administrated by the U.S. Bureau of Land Management as the Aravaipa Canyon Primitive Area. The instant study area extends the primitive area boundaries along the plateau to the north and to the south (fig. 2). An area bordering the instant study area, extending about 1.6 km beyond and comprising about 63 km² (16,800 acres) was also studied; it includes land of various ownership (fig. 2) along the plateau above the canyon and at the east and west ends.

Aravaipa Canyon is a narrow steep-walled gorge cut east-west across the north end of the uplifted Galiuro Mountains block. Aravaipa Creek is a perennial stream flowing westward through the canyon. Flat-topped table lands dissected by steep-walled tributary canyons stretch north and south toward the canyon rim. Elevations in the area range from about 810 m where Aravaipa Creek leaves the west end, to 1,130 m away from the canyon rims. The canyon within the primitive area is bounded by steep slopes and vertical cliffs, some of them 120 m high. The 9.7-km-long canyon varies from 200 to 600 m in width between canyon rims and averages about 500 m. Most small side canyons enter over cliffs close to the bottom of the canyon. Large sycamore, ash, cottonwood, and willow trees grow along the creek. Cacti, including saguaro, and mesquite trees grow on grassy slopes between cliffs and on the plateau.

Access to both the west and east entrance is by graded road from major state and U.S. Highways (fig. 3). U.S. Bureau of Land Management Ranger Stations are located at the west entrance and at Klondyke, 15 km east of the east entrance. Driving within the primitive area part of the Aravaipa Canyon instant study area is prohibited; parts of the plateau areas north and south of Aravaipa Canyon can be reached by 4-wheel-drive vehicle. Power and telephone lines terminate within about 0.8 km from either end of the study area. The closest railroad follows the San Pedro River about 27-road km west of the canyon.

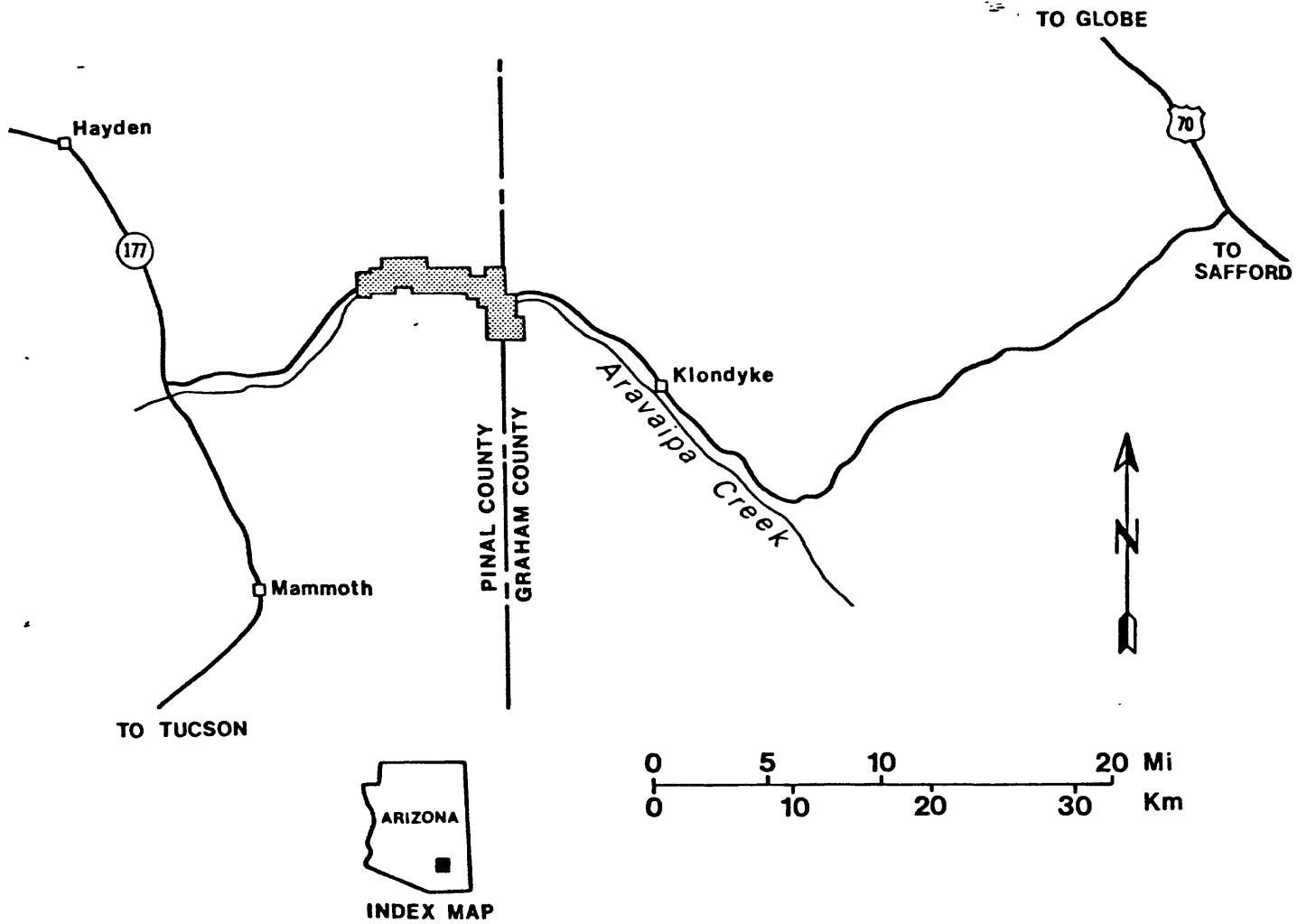


Figure 1.--Index map showing location of the Aravaipa Canyon instant study area, Arizona, (shaded)

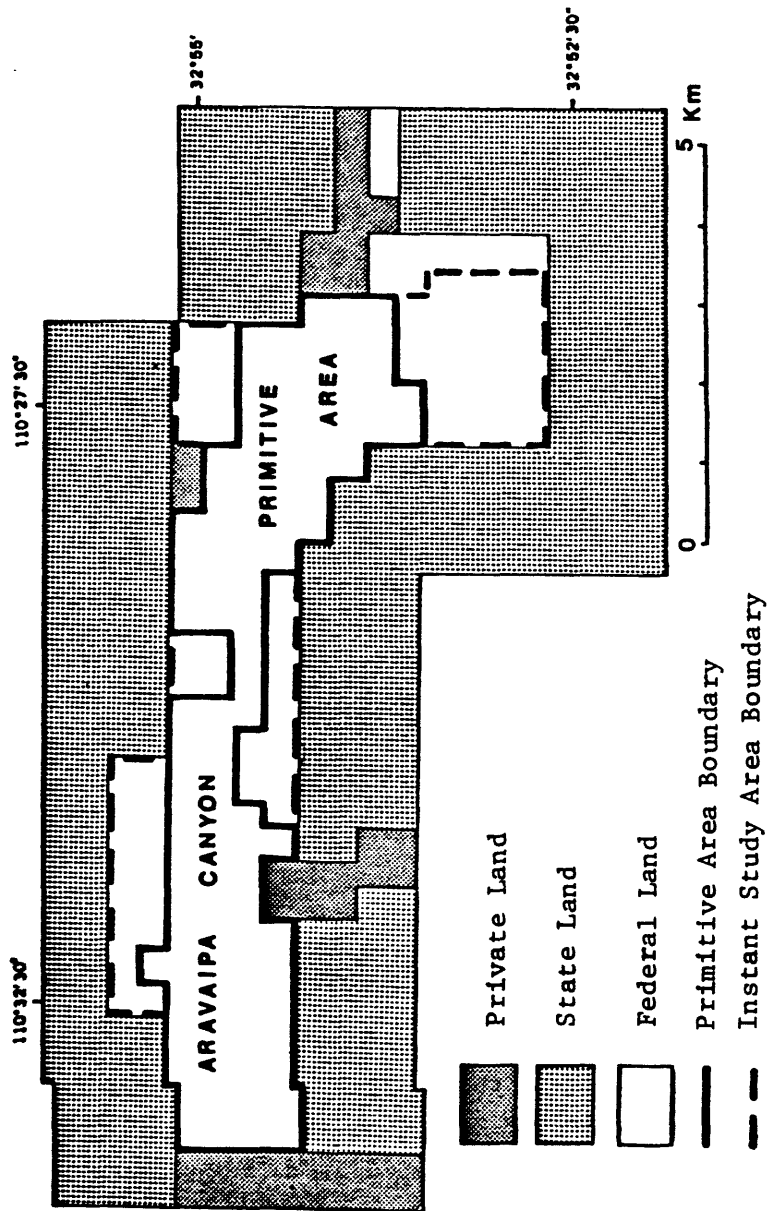


Figure 2.--Map showing land ownership in Aravaipa Canyon area.

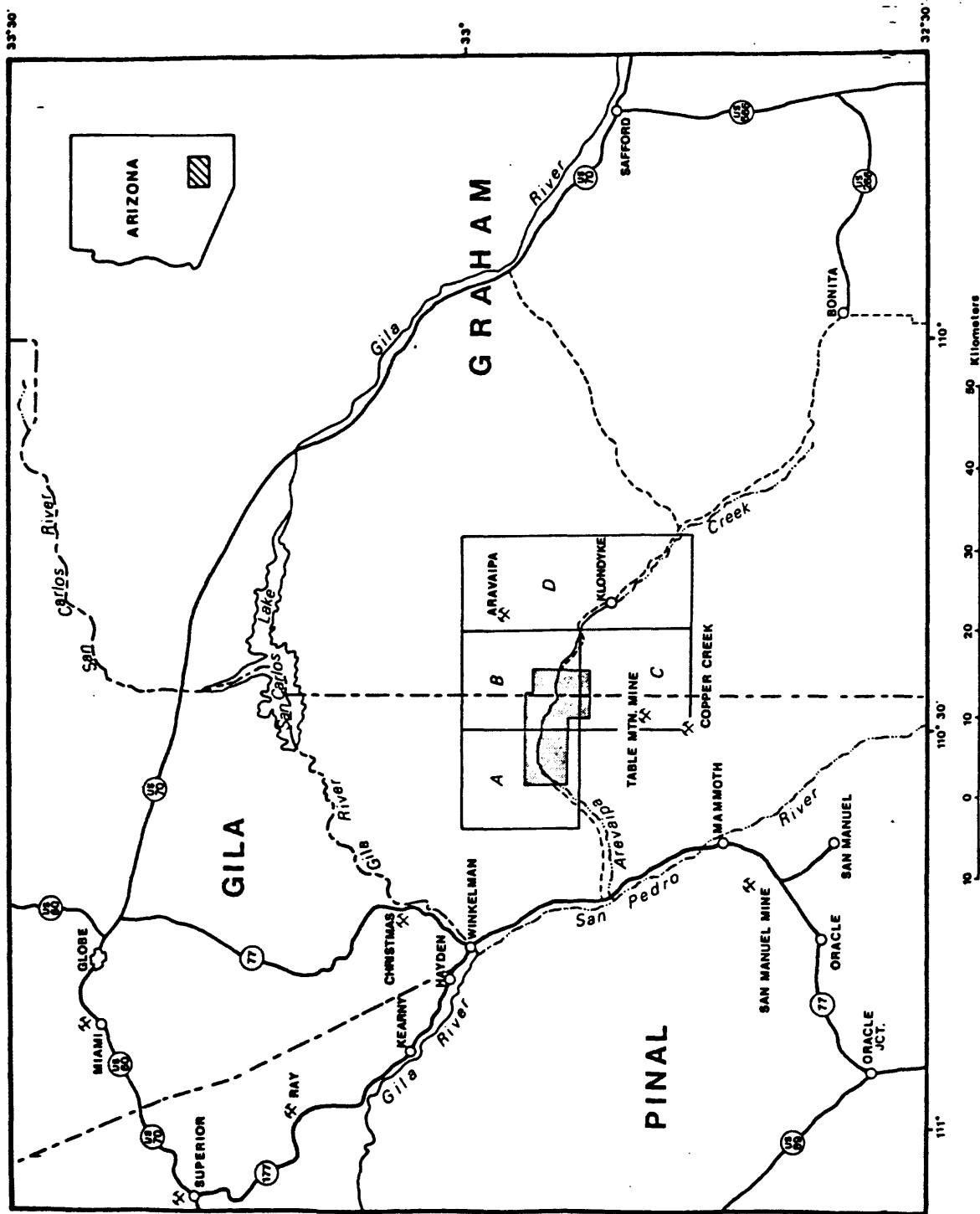


Figure 3.--Map showing location of Aravaipa Canyon area (shaded), access roads, 7-1/2-minute quadrangles: A, Brandsburg Mountain; B, Booger Canyon; C, Oak Grove Canyon; D, east half of Klondyke 15-minute quadrangle, and adjacent mining areas--Aravaipa, Christmas, Copper Creek, Globe-Miami, Ray, San Manuel, and Table Mountain mine.

The Aravaipa Canyon Primitive Area is used and enjoyed by day hikers, backpackers, and horseback riders, but the number of users is limited to protect the fragile environment. Access through the canyon bottom is along Aravaipa Creek, and, in places where the canyon walls narrow, is restricted to the creek itself, especially in the western end. Access up and into side canyons and to the rim top is made through steep rocky drainages.

The climate is warm and dry. Winter temperatures are cool, and summer temperatures are high but rarely oppressive. Total rainfall is about 40 cm per year, of which most is received in July and August, and December to February.

Present Investigation

The field investigation of the instant study area and adjacent land was made during four weeks in March and April of 1978 by the U.S. Geological Survey and two weeks by the U.S. Bureau of Mines in the spring of 1978. This work consisted of reconnaissance in and around the area, examination of potential mineralized areas and a small number of mining claims, and sampling of rock formations, stream sediments, and several prospect workings.

In conjunction with the field investigation, an examination was made of land status records of the U.S. Bureau of Land Management (BLM) in Phoenix, Ariz., and a cursory search was made for mining claim location certificates in records of Pinal and Graham Counties. The U.S. Bureau of Land Management, local residents, and mining companies were contacted regarding mineral activity in the area.

Acknowledgments

The cooperation of officials of the U.S. Bureau of Land Management is gratefully acknowledged, with special thanks extended to Robert Heidemann of the Safford District office. This investigation also benefitted from access allowed across private lands and information supplied by local residents Harold Reeb, Fred Wood, and Bill Salazar.

Previous Studies

The first work specifically covering a part of Aravaipa Canyon was the geologic mapping and detailed description of the Klondyke quadrangle (Simons, 1964), which includes the east half of the area. The geology of the Brandenburg quadrangle, including the west half of the area, was mapped by Krieger (1968b). Creasey and Krieger (1978) published a summary description of the Galiuro Volcanics exposed in southeastern Arizona.

GENERAL GEOLOGY

The remarkable canyon wall exposures along Aravaipa Canyon consist predominantly of Galiuro Volcanics. The Galiuro Volcanics is widespread throughout the Galiuro and Winchester Mountains, and extends southward to the north end of the Little Dragoon Mountains. It consists of a lower sequence dominated by lava flows and an upper sequence dominated by ash-flow tuffs; the entire formation has been summarized by Creasey and Krieger (1978).

Most of the upper sequence of the Galiuro Volcanics but only one member from the lower sequence is exposed in the instant study area. The upper sequence here consists of variously named ash-flow tuffs with intercalated flows, air-fall tuffs, and conglomerates of upper Oligocene and lower Miocene age (table 1). These rocks attain a maximum exposed thickness

Table 1. Potassium-argon ages of ash-flow tuffs in the Galiuro Volcanics, northern Galiuro Mountains (Creasey and Krieger, 1978) and a tuff bed in the Whitetail Conglomerate.

	Biotite	Sanidine
Galiuro Volcanics		
Hells Half Acre Tuff Member	¹ 25.3±0.7	23.1±0.7
Aravaipa Member	26.4±0.7	23.5±0.8
Tuff of Bear Springs Canyon	24.4±0.7	---
Holy Joe Member	27.2±0.8	26.3±0.8
Whitetail Conglomerate		
Tuff bed	² 33.5±0.6	---

¹Ages recalculated using the new decay constants and isotopic abundance recommended by the International Subcommittee on Geochronology, 1976.

²E. H. McKee, 1978, written communication, (K₂O-7.87 percent; ⁴⁰Ar^{rad}3.829x10⁻¹⁰ mole/g; ⁴⁰Ar^{rad}57.6 percent).

of 250 m in the canyon. Rocks underlying the Galiuro Volcanics are exposed only on the west side of the area and include Oligocene Whitetail Conglomerate, Precambrian diabase, Dripping Springs Quartzite, and porphyry of the Pinal Schist. Rocks overlying the Galiuro Volcanics are exposed only on the east side of the area and consist of Miocene(?) Hell Hole Conglomerate. Quaternary alluvial deposits are sparsely distributed on the canyon floor. Large landslides composed of Galiuro Volcanics occurred near the west part of the canyon. Small areas of gravel and sand veneer cover pediment surfaces.

South of Aravaipa Canyon the Galiuro Volcanics dips gently north and northeast. North of the canyon the rocks apparently dip gently south, based on exposures of lower andesite of Virgus Canyon along the northwest border of the Booger Canyon quadrangle and in Aravaipa Canyon. No faults were observed cutting the Galiuro Volcanics, except on the east where the Galiuro Volcanics is in fault contact with the Hell Hole Conglomerate. About 7 km south and west in the area, southwest-facing, high-angle normal faults separate pre-Tertiary rocks, from which the volcanics have been stripped, from late Miocene or early Pliocene basin deposits. Small down-dropped exposures of the volcanics occur west of the faults.

Details of the geology of the Galiuro Volcanics and the older and younger rocks exposed in the area have been published by Krieger (1968b) and Simons (1964). These maps have been combined and constitute Plate 1. Detailed descriptions of the map units are included. More detailed descriptions of the volcanic rocks that cover most of the area and of zeolitization of the nonwelded part of one of the ash-flow tuffs are given by Krieger (1979). Zeolite occurs, mostly as clinoptilolite, in ash-flow and air-fall tuff beds in the Galiuro Volcanics, inside and also south of the west end of the instant study area. Inside the instant study area boundary, the area west of Cave Canyon appears to contain substantial amounts of zeolite in the distal margin of the Aravaipa Member. Most of the western part of the area may also contain significant zeolite alteration in the ash-flow tuff unit of the Hells Half Acre Member.

ECONOMIC APPRAISAL

Mining History

Mining and exploration activity inside the instant study area is limited to 2 adits in Aravaipa Canyon driven in an area covered by a sodium prospecting permit, and exploration drilling by Bear Creek Mining Company west of Turkey Creek. There are no zeolite leases nor applications for leases inside the instant study area.

The only mining activity was apparently for potassium nitrate (saltpeter) at 2 adits in Aravaipa Canyon between Horse Camp and Booger Canyons in 1927. The adits are driven in welded tuff of the Aravaipa Member. One adit is located in the SW-1/4NW-1/4, sec. 15 (sample nos. 1228-1231), the other is in the NW-1/4NW-1/4, sec. 16, T. 6 S., R. 18 E. (sample nos. 1232-1234). The mining was done under a federal sodium prospecting permit issued in April 1927. The work was abandoned when it was ascertained that only a coating of what had probably been bat guano on the surface of the rock had contained the potassium nitrate. The sodium permit was terminated in 1929.

The drill hole exploration activity west of Turkey Creek was mostly in the southeast part of the area where an areomagnetic anomaly was tested for base-metal mineralization (F. Blaine Greenhough and D. C. Bulmer, Bear Creek Mining Company, 1978, written commun.) The drilling was done by the Bear Creek Mining Company, the exploration subsidiary of Kennecott Copper Corporation, during 1970 and 1971, on mining claims inside the instant study area in secs. 24 and 25, T. 6 S., R. 18 E., and sec. 30, T. 6 S., R. 19 E., and outside the instant study area in secs. 22, 23, 26, and 35, T. 6 S., R. 18 E. One of the drill holes (TC-1) was a deep test, in the NE-1/4, sec. 26, T. 6 S., R. 18 E. The exploratory drill hole (TC-1, table 2, location shown on pl. 1) reached a depth of 2,647 ft (807 m) below the surface. The upper 600 ft (183 m) were in the upper sequence of the Galiuro Volcanics, underlain by 910 ft (277 m) of hornblende andesite and 280 ft (86 m) of basaltic andesite of the lower sequence of the volcanics. The top of the hole was close to the top of the Aravaipa Member. The lower 677 ft (206 m) were in Pinal Schist with interbedded sills of diabase from 20 to 177 ft (6 to 54 m) thick. Disseminated magnetite was discovered in multiple diabase intrusives in the Pinal Schist and was believed to be responsible for the anomaly. The Aravaipa Member maintains a dip of about 4° between the drill hole and Aravaipa Canyon to the north. If the underlying members

Table 2.--Core log of Bear Creek Mining Company's drill hole number TC-1, one-fourth mile (0.4 km) west of the Aravaipa Canyon instant study area, NE $\frac{1}{4}$ sec. 26, T. 6 S., R. 18 E.¹

Depth in feet	Lithology
0-20	Tertiary volcanics--white tuff
20-180	Tertiary volcanics--Aravaipa member, upper welded tuff
180-240	Tertiary volcanics--lower tuff of Simons, pink rhyolite tuff
240-270	Tertiary volcanics--Olivine andesite
270-600	Tertiary volcanics--lower tuff of Simons, pink biotite tuff
600-1510	Tertiary volcanics--hornblende andesite
1510-1790	Tertiary volcanics--basaltic andesite
1790-1900	Pinal schist, extremely siliceous, local fine lamination at 60-70° dip, some red slickensided hematite on fractures, probably a metamorphosed siltstone. 1883-1887 ft pebble breccia, fragments largely of siliceous schist unit but also includes some fragments of porphyry.
1900-2073	Diabase--fine grained, massive, no alteration except chlorite on sheared fractures. Local trace disseminated pyrite. Contains estimated 5% disseminated magnetite.
2073-2103	Pinal schist--well bedded siliceous argillite. Thin smears of hematite on fractures. Bedding dips 20-60°.
2103-2187	Diabase as above. Fault at 2113 ft. Stronger fracturing in vicinity of fault, healed with calcite.
2187-2224	Pinal schist--siliceous argillite as above with some thin diabase stringers. Soft red slickensided hematite on fractures. Foliation and bedding dip 50-70°.
2224-2346	Diabase--fine to medium-fine grained. Estimated +5% disseminate magnetite.
2346-2366	Pinal schist, with local thin diabase stringers. Foliation and bedding dip 60°. Irregular spotty patches of epidote and streaks rich in magnetite.
2366-2378	Diabase, with some thin schist inclusions. Local epidote in schists. Magnetite is disseminated. Trace disseminated pyrite.
2378-2397	Pinal schist, extremely fine grain siliceous unit. Bedding dips 55°.
2397-2426	Diabase, with included schist septa. Local epidote in irregular patches. Trace disseminated pyrite. Magnetite is disseminated.
2426-2447	Pinal schist, argillaceous unit. Bedding dips 60°. Local epidote and garnet in irregular patches and along bedding. Trace pyrite.
2447-2467	Diabase, similar to interval 2397-2426.

¹F. Blaine Greenhough, written communication, 1978

Note: Average susceptibility of the volcanic section is 635×10^{-6} cgs units. Average susceptibility plus remanence for the diabase of $25,000 \times 10^{-6}$ cgs units. Average copper content of schist is 50 ppm. Average copper content of diabase is 100 ppm.

maintain the same thickness as in the drill hole, the top of the Precambrian should be 1,800 ft (550 m) below the bottom of the canyon.

Shallow percussion holes to validate their claims were drilled by Bear Creek in surrounding areas to a depth of about 50 ft (15 m). The location of those noted during the course of the study are shown on Plate 1. One of the holes, assumed to have been drilled by Bear Creek, appeared to be more than 200 ft (60 m) deep. The mining claims were subsequently relinquished and the exploration abandoned. Local ranchers reported some drilling in and near Turkey Creek, possibly for uranium, but no information on this drilling was obtained and no holes in or east of Turkey Creek were observed.

Two mining districts and two other mineralized areas are east and south of the area (fig. 3). The Aravaipa mining district, including the Grand Reef and the Aravaipa mine sites, is about 6 miles (10 km) to the east and northeast, along the Santa Teresa Mountains. The Copper Creek mining district is about 8 miles (13 km) to the south on the west flank of the Galiuro Mountains. The Four Mile Creek mineralized area is about 7 miles (11 km) south of the study area. The Aravaipa and the Four Mile Creek mining districts have produced lead, zinc, copper, molybdenum, silver and gold, intermittently for about 100 years from the 1860's to the late 1950's. The total production from the Aravaipa mining district is about 60 million pounds (27 million kg) of totaled lead, zinc, and copper, and about 250,000 troy ounces (7,775 kg) of totaled silver and gold; total production from the Copper Creek mining district is about 20 million pounds (9 million kg) of totaled copper, molybdenite, and lead, and about 200,000 ounces (6,200 kg) of totaled silver and gold. The combined production from the 2 districts represents a value of about \$9 million (Simons, 1964).

Mineral Commodities and Economic Considerations

Zeolite

Zeolites are hydrated alumino-silicate minerals with potential valuable industrial applications due to their cation exchange, reversible-dehydration, and molecular sieve capabilities. These capabilities result from a distinctive open-framework crystal structure enclosing interconnected cavities. The cavities are occupied by cations, chiefly sodium, potassium, and calcium, which balance a residual negative charge on the framework. Held only by electrostatic attraction and not part of the structural framework, cations are relatively free to move throughout the structure, and zeolite can be used to change the ion content of solutions passed through it. Water is also relatively free to move from the cavities, so the high sorptive heats of zeolite can be used to allow zeolite to function as a heat exchanger. The porous framework of the zeolites also allows them to act as molecular sieves to separate mixtures of molecules, depending on the size and shape of the molecules, and the size of the portals connecting the cavities.

The largest current use of the zeolite structure is as molecular sieves, catalysts, and dessicants, and industrial demand for these uses has been largely satisfied by synthetic zeolite. The present uses of natural zeolite in the United States is limited, mostly to the following: of clinoptilolite for removing cesium from radioactive waste, of chabazite and other zeolites for purifying natural gas, and of zeolitic tuff as a pozzolon in cement.

Total U.S. production of natural zeolite in 1977 was about 5,000 tons (4,500 mt) an increase from the several hundred tons (several hundred mt) produced in 1976 R. A. Clifton, 1979)

Although the production of natural zeolite is limited, the recognition of the many potential applications of natural zeolite has taken place only within the last 25 years. Potentially new and increased applications for natural zeolite include uses as fillers in paper, for removal of ammonia from sewage waters and industrial fumes, for upgrading low-BTU natural gas, as solar heat exchangers, and as dietary supplements for poultry and swine (Mumpton, 1977).

Since a sustained market for natural zeolite has not yet been established, no reliable estimate can be made of a representative price value for the commodity. Mumpton and Fishman (1977) have, however, demonstrated that certain potential agricultural uses of zeolite are such that a price of \$50 to \$75 per ton (\$55 to \$83 per mt) might be maintained. This price is quite favorable, considering that the average mining cost of natural zeolite deposits is about \$8 to \$20 per ton (\$9 to \$22 per mt) (A. J. Regis, 1979, pers. commun.).

Other Commodities

The sand and gravel deposit in the Aravaipa Creek bed contains material that would be deleterious as aggregate for high-quality concrete, and is too remote to have any commercial importance. Similarly, common-variety rock for construction purposes is too remote to be quarried economically.

No leases have been issued for parts of the study area for leaseable minerals, oil and gas, coal, and geothermal resources, and there are no known deposits of these resources in or near the study area.

U.S Geological Survey Sampling and Analytical Program

Stream sediment samples for semiquantitative spectrographic analyses of minor elements, and rock samples for both semiquantitative spectrographic analysis and X-ray diffractometer studies of zeolitization were collected for the geochemical investigation and surface alteration survey. Sample locations are shown on Plate 1.

Samples for geochemical studies included unsorted stream sediment samples from side canyons¹ and rock samples, including material from joints in Hells Half Acre Tuff Member. The samples were treated as follows:

¹No samples were collected from Aravaipa Canyon because it drains the Aravaipa mining district in the northeastern part of the Klondyke quadrangle. One sample was collected from the lower part of the Virgus Canyon, which drains the Table Mountain mine area and one from lower Deer Creek (Hell Hole) that heads in the Aravaipa mining area because side canyons were not accessible at the time of the study.

1. The 51 sediment samples consisted of (A) a concentrate of heavy minerals, obtained by panning a 4.5 kg (10 lb) sample, and (B) a 0.45 gr (1 lb) sample from the same site. The concentrates were treated as follows: Separation into magnetic and nonmagnetic fractions, the nonmagnetic fraction was treated with bromoform and the light fraction, discarded. The heavy fraction was separated on the Franz, at 1.0 amp. setting, into magnetic and nonmagnetic fractions; the original magnetic fraction was added to this magnetic fraction. Both fractions were examined with binoculars for major ore mineral content. The 0.45 gr samples were sieved to minus 80 mesh. Replicate semiquantitative spectrographic analyses² were made of each of these fractions; the results are shown in Appendix A.

2. Fifty-three rock samples were collected by the U.S. Geological Survey. Semiquantitative spectrographic analyses of 38 of the U.S. Geological Survey samples were obtained (Appendix B). X-ray diffractometer patterns were obtained of 34 of the tuffaceous rock samples collected by the U.S. Geological Survey³ and of 25 tuff samples collected by the U.S. Bureau of Mines to determine content of glass, zeolite, or clay of nonwelded samples or type of devitrification if welded.

Preliminary Results of Geochemical Investigation

Sporadic high values in both stream sediments and rock samples were detected through semiquantitative spectrographic analyses (Appendices A and B). Elements with apparently anomalous values in some samples include tin, copper, lead, zinc, and molybdenum. One sample (78AR040) showed 1.5 ppm silver. The sporadic high values are scattered throughout the area, and in themselves are probably not indicative of economic mineralization in the area.

However, analysis of the semiquantitative data by Henry Alminas⁴ (1979, oral commun.) indicates a minor anomaly localized along the north-trending fault at the east side of the area in section 26; this anomaly is indicated by the distribution of Ba, Cu, Ni, La, and Y in the different fractions analyzed. The anomaly is interpreted to indicate leakage along the fault from a possible mineralized body at unknown, but great, depth. A similar but lesser anomaly occurs along the main Aravaipa Canyon in the vicinity of Paisano and Booger Canyons and Deer Creek (Hell Hole). Copper values and molybdenum values are somewhat higher than normal over the entire area compared to other areas with similar geology (Henry Alminas, 1979, oral commun.)

- ²Preparation of stream sediment samples and the semiquantitative spectrographic analyses were done in the Branch of Exploration Research, U.S. Geological Survey, Golden, Colo., by R. T. Hopkins, Don Risoli, and D. Siems.

³X-ray diffraction studies of U.S.G.S. samples were done in Western Mineral Resources laboratory, Menlo Park, Calif., by Dennis Wolohan.

⁴Geochemist, Branch of Exploration Research, U.S.G.S., Denver, Colo.

Zeolites

Aravaipa Member and tuff of Bear Springs Canyon

The zeolite clinoptilolite is present in the Aravaipa and tuff of Bear Springs Canyons members in the western part of the area, most of it south of the instant study area boundary. The zeolitization is believed to be due to percolation of ground water above the water table and not to hydrothermal alteration. Zeolitization occurred in the originally glassy nonwelded parts of the members. None occurred in the welded or partly welded recrystallized parts.

Complete zeolitization of the original glass in the Aravaipa Member occurred only at the western distal margin (fig. 4) where the entire 15-m-thick section was nonwelded. To the east, where the light gray slightly welded columnar-jointed tuff developed, only the underlying pink nonwelded section of the member is zeolitized. The horizontal and vertical change in zonation from the interior, densely welded part to the nonwelded distal margin is shown diagrammatically in Figure 5, which has been modified from Krieger (1979) to incorporate data from the present study. At all locations, except at columns 5 and 5A, the original slightly welded top of the Aravaipa Member was eroded before deposition of Hells Half Acre Tuff Member. The Aravaipa Member west of Cave Canyon is altered to clinoptilolite (table 3, nos. 1246-1250) in contrast to the section on the east side of Cave Canyon. There the member consists of nonwelded tuff altered to clinoptilolite at the top, underlain by columnar-jointed tuff with nonwelded tuff altered to mordenite at the bottom (Krieger, 1979, fig. 22). Zeolitization in the tuff of Bear Springs Canyon is similar to, but more extensive than, that in the Aravaipa Member. However, the tuff of Bear Springs Canyon is considerably thinner than the Aravaipa Member and locally was eroded before the Aravaipa Member was erupted.

Total amount of tuff that may contain at least 70 percent clinoptilolite is estimated to be 10 million mt in the Aravaipa Member and 3 million mt in the tuff of Bear Springs Canyon, but is mostly outside the instant study area boundary. Clinoptilolite also occurs in the tuff of Bear Springs Canyon in Parson and upper Virgus Canyons in the southern part of the area (no. 50, table 3), and may also occur in tuff of Oak Springs Canyon in the same area.

Hells Half Acre Tuff Member

The Hells Half Acre Tuff Member consists of three units. The upper unit is an air-fall and water-laid tuff, the middle unit is ash-flow and probable ash-flow tuff, and the lower unit is water-laid tuff and tuffaceous sandstone. The upper unit is widely distributed north and south of Aravaipa Canyon. In canyon walls it forms the top of nearly unbroken inaccessible cliffs composed of the middle unit, and east of Javalina Canyon, the lower unit of the member.

The upper unit has been sporadically zeolitized; of 16 samples X-rayed, 4 are composed largely of clinoptilolite, 2 contain traces of it, the rest are vitric (table 3). The middle unit (fig. 6) is thickest along Aravaipa Canyon between Javalina and Horse Camp Canyons, but laps out against rhyolite-obsidian on the north side of the canyon, against Precambrian

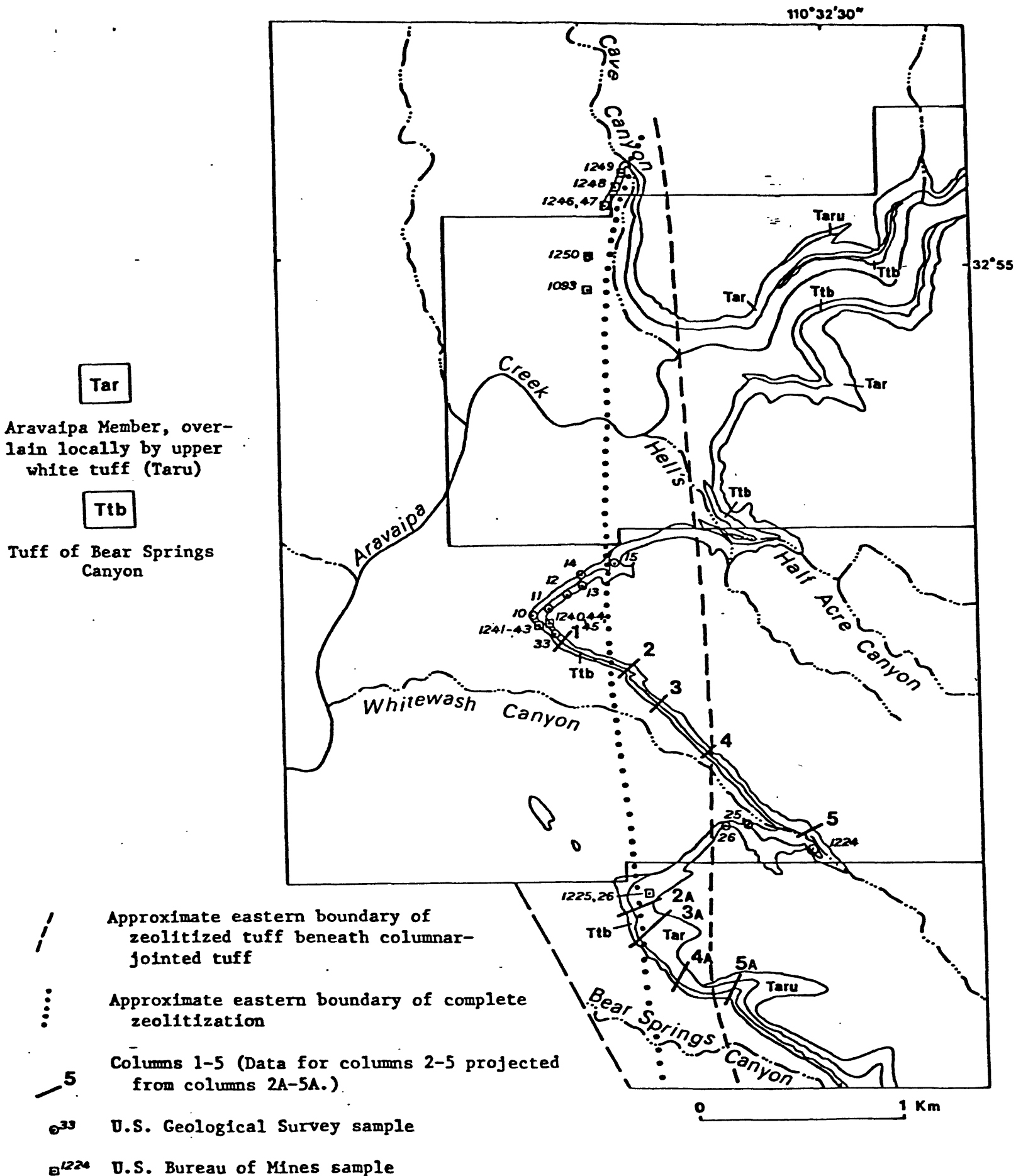


Figure 4.--Distribution of Aravaipa Member and tuff of Bear Springs Canyon in the western part of the area, showing extent of zeolitization and location of columnar sections and samples.

Table 3.—Approximate composition of tuffs in Aravaipa Canyon area.

[Apparent abundance estimated from X-ray diffractometer patterns of bulk samples: ●, more than 50 percent; ○, less than 50 percent; x, present but not abundant; tr, trace; —, looked for but not found. Crystallization: Z, zeolitized; V, vitric; VP, vapor phase, typical of columnar-jointed and upper white tuff zones, characterized by quartz and feldspar with or without cristobalite; D, devitrified, characterized by cristobalite and feldspar with or without quartz. Semiquantitative spectrographic analyses of all specimens except 138, 14, 17A, B, D, 20, 21, 27-29, 72A, H180A-H410A, and U.S. Bureau of Mines samples, are shown in Appendix B]

Hells Half Acre Tuff Member

Sample number---	Upper unit																Middle unit			Lower unit	
	17A	17B	17C	17D	30	31	71	H180A	H410A	1216	1217	1218	1219	1220	1221	1222	H342A	H344	H410	1093	43
Crystallization---	V	V	V	Z	Z	V	Z	V	V	V	V	V	V	Z	V	V	Z	Z	Z	Z	Z
Cristobalite----	tr	tr	tr	tr	—	—	—	—	—	x	—	tr	—	tr	tr	tr	—	—	—	tr	—
Feldspar-----	x	x	x	o	x	tr	x	x	x	x	x	x	x	x	o	x	o	x	x	x	x
Quartz-----	x	o	tr	o	o	x	x	x	x	o	o	x	o	o	o	x	o	o	x	x	o
Biotite-----	—	—	—	—	—	tr	tr	—	—	—	—	—	tr	—	tr	—	x	x	x	tr	—
Clinoptilolite--	tr	tr	—	●	●	—	●	x	—	x	x	tr	—	●	—	—	●	●	●	●	●
Clay-----	—	—	—	—	—	x	—	—	—	o	—	—	—	—	—	o	—	—	—	—	—
Glass-----	●	●	●	—	—	●	—	●	●	●	●	●	●	—	●	o	—	—	—	—	—

Nonwelded distal margins

	Aravaipa Member																Tuff of Bear Springs Canyon member							
Sample number---	11	12	13A	13B	15	33	1225	1226	1240	1244	1245	1246	1247	1248	1249	1250	10	14	50	1224	1241	1242	1243	
Crystallization--	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	Z	
Cristobalite----	tr	tr	tr	tr	-	-	-	-	-	-	-	-	-	-	-	tr	tr	x	x	tr	-	tr	-	
Feldspar-----	x	x	tr	x	x	x	-	x	x	tr	tr	x	x	x	x	x	x	tr	x	x	x	x	x	
Quartz-----	tr	tr	tr	x	x	x	tr	x	tr	tr	tr	x	-	x	tr	tr	tr	x	tr	tr	tr	x	x	
Biotite-----	-	-	-	-	-	tr	tr	tr	tr	tr	-	tr	tr	tr	-	tr	-	-	tr	tr	tr	-	-	
Clinoptilolite--	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Clay-----	-	-	-	-	-	-	tr	-	-	-	-	-	-	-	-	tr	-	-	o	-	-	-	-	
Glass-----	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Welded and partly welded parts

Tro¹

Tuff bed in Whitetail Cg

Hell Hole Cg

	Aravaipa Member											Ttb ²							
Sample number---	26	27	28	29	41	45	72A	72B	72C	72D	75	25	1223	20	21	22	1094	1095	49
Crystallization-	VP	VP	VP	VP	VP	VP	VP	VP	D	D	VP	VP	V	V	Z	Z	Z	Z	Z
Cristobalite----	tr	-	-	o	x	x	o	o	o	o	tr	tr	-	-	-	-	x	-	-
Feldspar-----	o	o	o	o	o	o	o	o	o	o	o	o	tr	x	o	x	o	o	x
Quartz-----	o	o	o	x	o	o	o	o	x	o ³	o	o	tr	tr	o	x	o	o	x
Biotite-----	tr	-	-	-	-	tr	tr	tr	tr	tr	-	tr	-	-	tr	-	x	x	tr
Clinoptilolite--	-	-	-	-	-	-	-	-	-	-	-	-	tr	tr	o	o	o	o	o
Clay-----	-	x	x	-	-	-	-	-	x	-	-	-	o	o	-	tr	-	-	-
Glass-----	-	-	-	-	-	-	-	-	-	-	-	-	-	o	-	-	-	-	-

¹Rhyolite-obsidian member²Tuff of Bear Springs Canyon³Abundance of quartz may indicate later silicification

Table 3 (con'd)

SAMPLE LOCATIONS AND DESCRIPTIONS:

U.S. Geological Survey samples

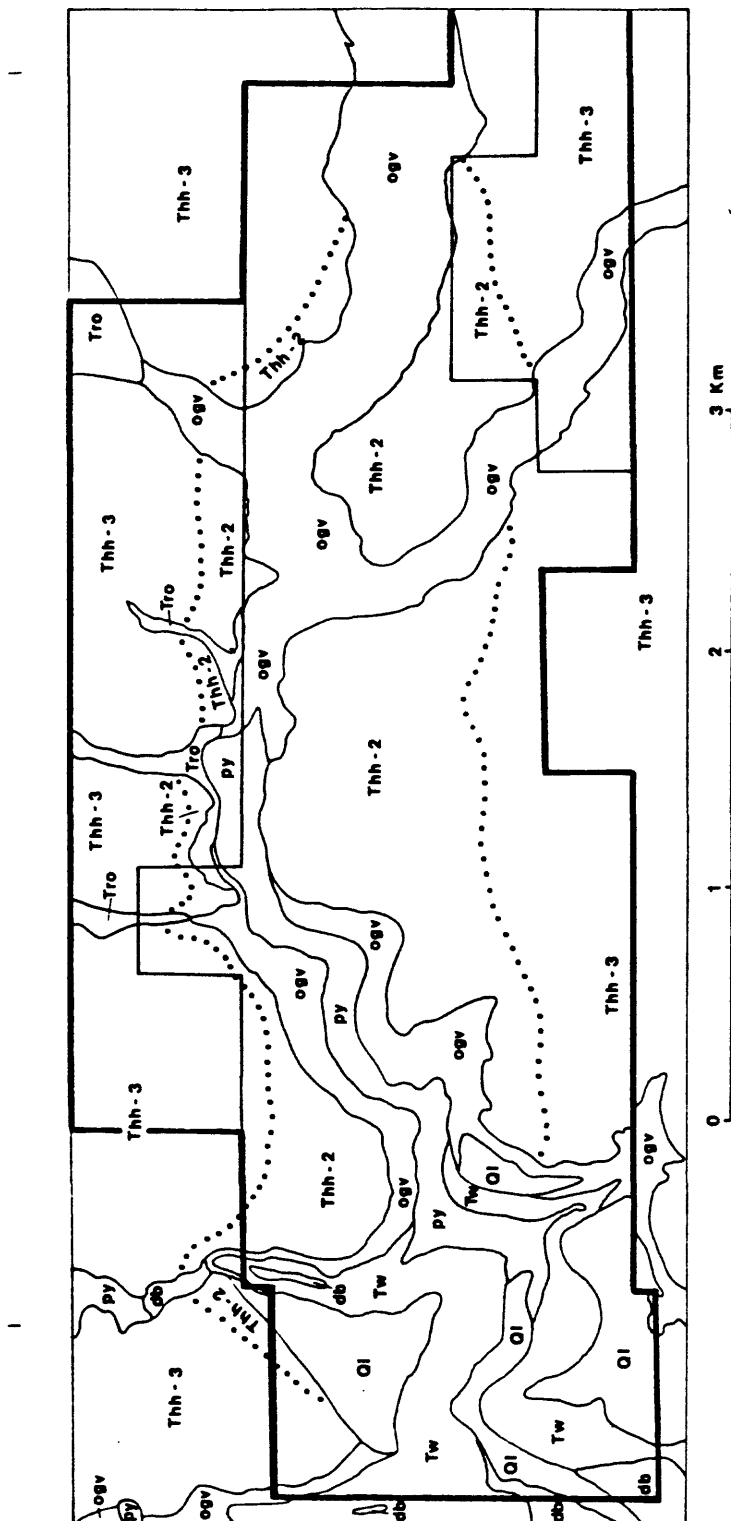
- 10 - Tuff of Bear Springs Canyon, pink tuff, zeolitized, east of Whitewash Canyon, northwest end of Hells Half Acre
- 11 - Aravaipa Member, pink tuff, zeolitized, same as 10
- 12 - Aravaipa Member, pink tuff, zeolitized, same as 10
- 13A,B - Aravaipa Member, overlain by columnar-jointed zone, same as 10, but farther east
- 14 - Tuff of Bear Springs Canyon, beneath 13, no columnar-jointed zone
- 15 - Aravaipa Member, pink tuff, zeolitized, overlain by columnar-jointed zone, east of 13
- 17A-D - Hells Half Acre Tuff Member, upper unit, 25 m section, A (top) to C vitric, D (bottom) zeolitized, Painted Cave Ranch
- 20 - Tuff bed in Whitetail Conglomerate, vitric, north of Wagner Ranch, near west boundary of study area
- 21 - Tuff bed in Whitetail Conglomerate, zeolitized, north of Aravaipa Canyon, west of Cave Canyon
- 22 - Tuff bed in Whitetail Conglomerate, zeolitized, south of Aravaipa Canyon, west of Cave Canyon
- 25 - Tuff of Bear Springs Canyon, pink tuff, zeolitized, overlain by columnar-jointed zone; same location as 26
- 26 - Aravaipa Member, columnar-jointed, vapor phase, Whitewash Canyon near south boundary of study area
- 27-29 - Aravaipa Member, upper white tuff, vapor phase, Whitewash Canyon, south of study area
- 30 - Hells Half Acre Tuff Member, upper unit, zeolitized, east branch Hells Half Acre Canyon
- 31 - Hells Half Acre Tuff Member, upper unit, vitric, east branch Hells Half Acre Canyon
- 33 - Aravaipa Member, pink tuff, zeolitized, top of cliff, northwest end of Hells Half Acre
- 41 - Aravaipa Member, upper white tuff, vapor phase, Horse Camp Canyon
- 43 - Hells Half Acre Tuff Member, lower unit, zeolitized, Horse Camp Canyon, down-dropped block
- 45 - Aravaipa Member, upper white tuff, vapor phase, Virgus Canyon, down-dropped block
- 49 - Hell Hole Conglomerate, concretionary tuffaceous sandstone, zeolitized, west of Turkey Creek
- 50 - Tuff of Bear Springs Canyon, zeolitized, Parsons Canyon
- 71 - Hells Half Acre Tuff Member, upper unit, zeolitized, west of Parsons Canyon, down-dropped block
- 72A-D - Aravaipa Member, upper white tuff, top 3 m, A (bottom) and B, vapor phase; C and D (top) densely welded, devitrified; west Parsons Canyon
- 75 - Aravaipa Member, upper white tuff, vapor phase, west of Parsons Canyon

From Krieger, 1979, figure 29

- H180A - Hells Half Acre Tuff Member, upper unit, vitric, middle branch Hells Half Acre Canyon
- H342A - Hells Half Acre Tuff Member, middle unit, zeolitized, east side Cave Canyon, down-dropped block
- H344 - Hells Half Acre Tuff Member, middle unit, zeolitized, near mouth of Cave Canyon, down-dropped block
- H410 - Hells Half Acre Tuff Member, middle unit, zeolitized, near mouth of Cave Canyon, down-dropped block
- H410A - Hells Half Acre Tuff Member, upper or middle unit, vitric, Horse Camp Canyon, down-dropped block

U.S. Bureau of Mines samples

- 1093 - Hells Half Acre Tuff Member, zeolitized, west side Cave Canyon, landslide breccia, probably from middle unit
- 1094 - Tuff bed in Whitetail Conglomerate, zeolitized, north side Aravaipa Canyon, west of Cave Canyon
- 1095 - Tuff bed in Whitetail Conglomerate, zeolitized, north side Aravaipa Canyon, west of Cave Canyon
- 1216-1218 - Hells Half Acre Tuff Member, upper unit, vitric, Painted Cave Ranch
- 1219 - Hells Half Acre Tuff Member, upper unit, vitric, east side of Cave Canyon
- 1220 - Hells Half Acre Tuff Member, upper unit, zeolitized, east side of Cave Canyon
- 1221 - Hells Half Acre Tuff Member, upper unit, vitric, west of Javalina Canyon
- 1222 - Hells Half Acre Tuff Member, upper unit, vitric?, clay alteration, west side of Javalina Canyon
- 1223 - Rhyolite-obsidian member, vitric?, clay alteration, east side of Javalina Canyon
- 1224 - Tuff of Bear Springs Canyon, pink tuff, zeolitized, overlain by columnar-jointed unit, Whitewash Canyon
- 1225 - Aravaipa Member, pink tuff, zeolitized, east side Bear Springs Canyon
- 1226 - Aravaipa Member, pink tuff, zeolitized, east side Bear Springs Canyon
- 1240 - Aravaipa Member, pink tuff, zeolitized, east side Whitewash Canyon, northwest end of Hells Half Acre
- 1241-1243 - Tuff of Bear Springs Canyon, pink tuff, zeolitized, same location as 1240
- 1244-1245 - Aravaipa Member, pink tuff, zeolitized, same location as 1240
- 1246-1250 - Aravaipa Member, pink tuff, zeolitized, west side Cave Canyon; 1250 from down-dropped block



Landslide composed largely of Hells Half Acre Tuff Member: upper unit south of Aravaipa Canyon, middle unit north of it

Upper unit of Hells Half Acre Tuff Member, largely vitric, see Table 2

Middle unit of Hells Half Acre Tuff Member, covered by upper unit except in inaccessible canyon cliffs

Rhyolite-obsidian member

Older members of the Galiuro Volcanics

Whitetail Conglomerate

Diabase

Porphyry

Q1
Thh-3
Thh-2
Tro
ogv
Tw
db
py

Figure 6.--Probable extent (shown by dotted lines) of massive middle unit of Hells Half Acre Tuff Member beneath upper unit in the Aravaipa Canyon instant study area.

porphyry on the south side of the canyon just east of Javalina Canyon, and in Cave Canyon about 1.3 km north of its mouth. The middle unit is not present south of the canyon beneath the upper unit west of Hells Half Acre Canyon. Its extent up Virgus Canyon and up Aravaipa Canyon east of Horse Camp Canyon is uncertain, but probably not more than a couple of kilometers. Four specimens probably from the middle unit have been X-rayed; all are composed largely of zeolite (table 3). Three of the specimens were from down-dropped blocks, the fourth was from the landslide west of Cave Canyon⁵. This meager information is suggestive that the original glassy part of the middle unit could be completely zeolitized, and the tuff could contain over 50 percent clinoptilolite estimated to be between 170 and 270 million mt; however, 95 percent or more of the middle unit is buried under the sporadically zeolitized upper unit.

The lower unit is exposed along Aravaipa Canyon and forms the base of the cliff of the Hells Half Acre Tuff Member, 60-70 m above the canyon floor. It extends up Virgus Canyon and up Aravaipa Canyon east of Horse Camp Canyon for a kilometer or two. The one specimen X-rayed (table 3) has been zeolitized. It is probable that the whole lower unit has been zeolitized to some extent, at least, based on its general appearance and the fact that it was deposited in water.

U.S. Bureau of Mines Sampling and Analytical Methods

A total of 51 U.S. Bureau of Mines samples were taken from surface exposures, at the few prospects and mining claims in the instant study area, and from outcrops in and near the area. A part of the Hell Hole Conglomerate outcrop area was checked with a geiger counter for radioactivity.

U.S. Bureau of Mines chip samples were taken vertical to bedding in ash-flow tuff exposures across parts of rock material showing uniform texture or color. Chip samples were also taken across quartz veins in Precambrian porphyry, and at prospects in andesite and welded tuff. Grab samples were taken at the prospects by combining several pieces of rock taken at a specific grid interval. A panned concentrate of stream sediment was taken at the mouth of Deer Creek. The sample localities are shown on Plate 1.

All U.S. Bureau of Mines samples were fire-assayed for gold and silver, checked with a geiger counter for radioactivity, and were analyzed by 6-step semiquantitative spectrographic analysis for 42 elements. The samples of

⁵Four additional samples of the middle unit of the Hells Half Acre Tuff were collected from a cliff west of Cave Canyon by the U.S. Bureau of Mines in December 1978, and x-rayed by the U.S. Geological Survey in January 1979. All appear to be composed largely of clinoptilolite.

volcanic tuff were analyzed by X-ray diffraction techniques for zeolite⁶. For each sample the locations and the gold and silver amounts determined by fire assay are shown in Table 4. The results of the spectrographic analyses are not presented in this report but are available on request. The results of the zeolite analyses of volcanic tuff samples are shown in Table 5.

Localities of Mineral Interest

Localities of zeolite mineralization are evident in and near the instant study area, most significantly, the west side of Cave Canyon, and also, the west portion of Aravaipa Canyon in the instant study area.

Other localities of possible mineral interest were investigated, at 2 adits in Aravaipa Canyon, drill holes west of Turkey Creek, claim locations and a prospect near Deer Creek, and quartz veins in Precambrian porphyry in the west end of Aravaipa Canyon but no significant mineral values were found.

West Side Cave Canyon

All of the distal margin of the Aravaipa Member exposed on the west side of Cave Canyon is a homogeneous uniform-textured pink-colored tuff. Four chip samples (nos. 1246, 1248-50) and one specimen (no. 1247) were taken at four locations on the west side of Cave Canyon. Since all samples were taken within uniform-appearing material, the thicknesses sampled were arbitrary. All the analyses indicate, at ± 10 percent accuracy, between 50 and 75 percent clinoptilolite (table 5). Samples numbers 1246, 1248-49 and specimen number 1247 were taken at 3 locations in approximately the same stratigraphic horizon in the west wall exposure along a distance within about 400 ft (120 m) north of the instant study area boundary. Sample number 1250 was taken inside the area from one of the two exposures of distal margin colluvium in the landslide material. The sample (no. 1248) with the highest zeolite content (75 percent) was taken across 12 inches (30 cm) of bed material; the sample (no. 1246) with the lowest zeolite content (50 percent) was across 20 inches (51 cm). The longest sample (no. 1249) was 36 inches (91 cm) and assayed 55 percent clinoptilolite.

⁶X-ray diffraction studies of U.S. Bureau of Mines samples were done in their Salt Lake City Metallurgical Research Center as follows:
"...The initial attempt to determine the zeolite content of the sample by weight loss during thermogravimetric analysis was abandoned when it was discovered that some of the samples contained opal, montmorillonite, and hydrated volcanic glass, all of which lose water over the same temperature interval as the zeolite.

"The method that was finally adopted was to determine how much of the weight loss was regained when the sample was cooled. Assuming that only the zeolite rehydrated and the rehydration was complete, the amount of zeolite in the sample could be calculated. Since the method was time consuming, only three determinations were done in this manner. The results of these determinations were used to standardize X-ray diffraction peak heights so the subsequent samples could be run by XRD.

X-ray diffraction patterns show all of the zeolite present in these samples to be clinoptilolite. The sum of the (020) and (400) peak heights were used to help compensate for preferred orientation of the (010) cleavage plates."

Table 4. Fire assay of all U.S.B.M. samples from the Aravaipa Canyon area, Arizona.

(The analyses were performed at the Reno Metallurgy Research Center, U.S. Bureau of Mines, Reno, Nevada. TRS designates location of sample by township (T) south, range (R) east, Gila and Salt River meridian, and section (S))

Sample	Location TRS	Fire assay troy oz/ton ¹		Remarks
		Au	Ag	
1219	6-18-18	-	0.1	Outcrop-chip-26 in (66 cm)
1220	do.	-	-	Outcrop-chip-17 in (43 cm)
1221	do.	-	-	Outcrop-chip-26 in (66 cm)
1223	6-18-7	-	-	Outcrop-chip-17 in (43 cm)
1222	do.	Tr	-	Outcrop-chip-8 in (20 cm)
1216	do.	Tr	-	Outcrop-chip-13 in (33 cm)
1217	do.	-	-	Do.
1218	do.	-	-	Do.
1249	do.	-	-	Outcrop-chip-36 in (91 cm)
1248	6-17-12	-	-	Outcrop-chip-12 in (30 cm)
1246	do.	-	-	Outcrop-chip-20 in (51 cm)
1247	do.	-	Tr	Outcrop-chip-specimen
1250	6-17-13	-	-	Outcrop-chip-12 in (30 cm)
1093	do.	-	-	Outcrop-chip-36 in (91 cm)
1095	do.	-	-	Outcrop-chip-24 in (61 cm)
1094	do.	-	-	Outcrop-chip-14 in (36 cm)
1240	6-17-24	Tr	-	Outcrop-chip-24 in (61 cm)
1244	do.	-	-	Outcrop-chip-36 in (91 cm)
1245	do.	-	-	Outcrop-chip-24 in (61 cm)
1241	do.	Tr	-	Do.
1242	do.	-	-	Do.
1243	do.	Tr	Tr	Do.
1225	6-18-30	-	Tr	Outcrop-chip-36 in (91 cm)
1226	do.	0.01	.1	Do.
1224	do.	Tr	-	Outcrop-chip-12 in (30 cm)
1213	6-17-13	-	Tr	Outcrop-chip-3 in (8 cm)
1214	do.	-	Tr	Do.
1215	6-18-18	-	Tr	Outcrop-chip-specimen
1238	do.	-	Tr	Outcrop-chip-6 in (15 cm)
1239	do.	-	Tr	Outcrop-chip-8 in (20 cm)
1237	do.	-	Tr	Outcrop-chip-specimen
1236	do.	-	Tr	Do.
1235	do.	-	.1	Do.
1227	6-18-8	.01	-	Talus-grab-every 3 ft (0.9 m)
1232	6-18-16	-	.1	Adit-portal-back-chip-4 ft (1.2 m)
1233	do.	-	Tr	Adit-face-chip-44 in (112 cm)
1234	do.	-	-	Adit-wall-chip-3 ft (0.9 m)
1228	6-18-15	-	-	Adit-face-chip-50 in (127 cm)
1230	do.	.03	-	Adit-portal-back-chip-41 in (104 cm)
1231	do.	.01	0.2	Adit-dump-grab-every 1 ft (0.3 m)
1096	do.	-	-	Outcrop-chip-specimen
1097	6-18-14	-	Tr	Do.
1098	do.	-	-	Do.
1099	do.	.01	Tr	Do.
1251	6-18-13	.01	Tr	Pit-dump-grab-every 1 ft (0.3 m)
1252	do.	-	-	Do.
1253	do.	-	-	Pit-wall-chip-2 ft (0.6 m)
1254	do.	-	.1	Outcrop-chip-1 ft (0.3 m)
1100	do.	-	-	Outcrop-chip-specimen
1255	6-18-14	-	Tr	Stream sediment pan-concentrate

¹ 1 troy oz per ton = 34.3 parts per million

The consistently high zeolite analyses indicate that all the nonwelded distal margin is thoroughly zeolitized. This is supported by similar zeolite analysis results in 5 samples (nos. 1240, 1244-45, 1225-26) taken outside the instant study area at 2 outcrops of the distal margin, 1/4-mile (0.4 km) south of the area boundary in the northeast wall of Whitewash Canyon, and 1 mile (1.6 km) further south in Bear Springs Canyon (table 5), and by samples X-rayed by the U.S. Geological Survey (table 3; fig. 4). In the Whitewash Canyon wall 3 chip samples were taken; 2 (nos. 1244 and 1245, 36 inches (91 cm) and 24 inches (61 cm) long, respectively) near the base of the Aravaipa Member and 1 (no. 1240, 24 inches (61 cm) long) about 30 feet (9 m) above the base. The samples assayed between 60 and 75 percent clinoptilolite. In Bear Springs Canyon 2 chip samples (nos. 1225 and 1226) were taken; each 36 inches (91 cm) over a composite 72 inches (193 cm) at a stratigraphic horizon about 60 feet (18 m) above the base. They assayed 80 and 85 percent clinoptilolite.

The amount of Aravaipa Member distal margin present inside the instant study area is estimated to be about 1,000,000 cubic yards (760,000 m³), a little less than half of the estimated 2,500,000 cubic yard (1,900,000 m³) total volume of distal margin present along the entire west side of Cave Canyon (fig. 4). The total volume present is based on a judged 50-foot (15-m) thickness extending for 1,800 ft (550 m) along the northeast-trending west wall, wedging out to zero thickness 1,500 ft (460 m) to the northwest. A representative average amount for clinoptilolite is 70 percent, which is the weighted average of analyzed values of all 9 distal margin chip samples, including those in Whitewash and Bear Springs Canyons. At 70 percent clinoptilolite, the amount of clinoptilolite in the instant study area is 700,000 cubic yards (540,000 m³), which represents, at a 2.15 specific gravity, about 1,250,000 tons (1,130,000 mt); however, the actual amount present is something less due to the (undetermined) porosity of the rock.

In addition to the zeolitization of the distal margin Aravaipa Member, the analysis of 60 percent clinoptilolite in one sample (no. 1093, table 5) of the landslide composed predominately of Hells Half Acre tuff member in the west side of Cave Canyon shows that this material is also significantly zeolitized, at least at this location. The particular unit of the Hells Half Acre Tuff Member which is the major source of the landslide is probably the ash-flow (middle) unit. The total area covered by the landslide in the Cave Canyon area is about 65 acres (26 ha); the thickness is not known.

A 25-foot- (8-m)-thick layer of air-fall(?) tuff in the Whitetail Conglomerate also crops out to the west of Cave Canyon, at lower elevations, north and south of Aravaipa Creek. The Whitetail Conglomerate is stratigraphically directly beneath the Galiuro Volcanics. Two chip samples (nos. 1094 and 1095) were taken 1,000 ft (305 m) apart north of Aravaipa Creek; they assayed 45 and 50 percent clinoptilolite (table 5) and indicate that the tuff bed in the Whitetail Conglomerate is also zeolitized.

Table 5.--Zeolite analyses from U.S. Bureau of Mines of volcanic tuff samples from Aravaipa Canyon area, Arizona
[All zeolite identifications made were of the mineral clinoptilolite. The analyses were performed by the Salt Lake City Metallurgy Research Center, U.S. Bureau of Mines, Salt Lake City, Utah]

Sample	Rock unit sampled	Percent zeolite (clinoptilolite) by weight ¹	Sample dimensions
1216	Hells Half Acre Tuff Member, air-fall tuff, upper unit	10	13 in (33 cm) chip
1217	do.	5	do.
1218	do.	5	do.
1219	do.	0	26 in (66 cm) chip
1220	do.	² 40	17 in (43 cm) chip
1221	do.	³ 5	26 in (66 cm) chip
1222	do.	0	8 in (20 cm) chip
1093	Hells Half Acre Tuff Member, ash-flow tuff, middle unit	60	36 in (91 cm) chip
1223	Rhyolite-obsidian member	0	17 in (43 cm) chip
1225	Aravaipa Member	80	36 in (91 cm) chip
1226	do.	85	do.
1240	do.	70	24 in (61 cm) chip
1244	do.	75	36 in (91 cm) chip
1245	do.	60	24 in (61 cm) chip
1246	do.	50	20 in (51 cm) chip
1247	do.	65	Specimen, chip
1248	do.	75	12 in (30 cm) chip
1249	do.	55	36 in (91 cm) chip
1250	do.	70	12 in (30 cm) chip
1224	Tuff of Bear Springs Canyon	65	12 in (30 cm) chip
1241	do.	65	24 in (61 cm) chip
1242	do.	70	do.
1243	do.	70	do.
1094	Tuff bed in Whitetail Conglomerate	45	14 in (36 cm) chip
1095	do.	50	24 in (61 cm) chip

¹Estimated from relative X-ray diffraction peak intensity. An error of ± 10 percent is assumed.

²Considerably more than 50 percent of clinoptilolite appeared to be present in split of U.S. Bureau of Mines sample X-rayed by U.S. Geological Survey. As U.S. Bureau of Mines samples were done at $2^\circ/\text{min.}$, X-ray diffraction studies of some of their samples and splits of many of them were done by the U.S. Geological Survey at $1^\circ/\text{min}$ to obtain greater resolution (M. H. Krieger, Everett Shock).

³No trace of clinoptilolite noted in split of U.S. Bureau of Mines samples X-rayed by U.S. Geological Survey.

Western Aravaipa Canyon

The Hells Half Acre Tuff Member is present eastward from the west side of Cave Canyon throughout the west part of the instant study area north and south of Aravaipa Canyon, and although sampling was insufficient, also may contain significant amounts of zeolite. This member occupies a large part of the area; it consists of three units, air-fall and water-laid tuff, ash-flow tuff, and water-laid tuff. The ash-flow tuff crops out in cliff walls, and the air-fall and water-laid tuff occupies cliff tops and most of the surface away from the canyon rims. The top unit is a heterogeneous assemblage including accidental lithic fragments; it was sampled (nos. 1219-1222 and 1216-1218) at five locations east of Cave Canyon. One sample assayed 40 percent clinoptilolite (table 5), but most samples assayed nil or 5 percent clinoptilolite. The ash-flow tuff is the unit more likely to contain significant zeolite; however, it was not analyzed except for that (no. 1093) of the landslide material west of Cave Canyon which assayed 60 percent clinoptilolite (see footnote 5). The total area underlain by the ash-flow tuff unit inside the instant study area is about 645 acres (260 ha), and the thickness ranges between 100 and 160 ft (30 and 50 m); the volume present is therefore between 100 and 170 million cubic yards (75 and 130 million m³).

Aravaipa Canyon, bat guano

Deposits of what was probably bat guano were mined in 1927 at two localities in Aravaipa Canyon, between Horse Camp and Booger Canyons, in the SW-1/4NW-1/4 sec. 15 and the NW-1/4NW-1/4 sec. 16, T. 6 S., R. 18 E. At these localities a substance was reportedly found which contained potassium, would burn when mixed with other materials, and was claimed to have value as fertilizer. A sodium prospecting permit on 2,080 acres (842.4 ha) including secs. 15, 16, and adjoining parts of adjacent sections was obtained in April 1927. Adits were driven where the substance was found; the adit in sec. 15 was 38 ft (12 m) long, 6 ft (1.8 m) high, and 5 ft (1.5 m) wide, and the adit in sec. 16 was 57 ft (17 m) long, 6 ft (1.8 m) high, and 4 ft (1.2 m) wide. The work was reportedly abandoned when it was finally certified that the mined rock did not assay the same as the first-dug material, and it was established that the potassium substance had only coated the surface and lined hollows in the rock. Three chip samples (nos. 1232-1234) were taken from the face, mid-point wall, and portal of the sec. 16 adit, and 3 similarly located chip samples (nos. 1228-1230) plus a grab sample (no. 1231) of the dump were taken at the sec. 15 adit. Anomalous values of up to 0.03 oz Au/ton (no. 1230) and 0.2 oz Ag/ton (no. 1231) were found in 4 of the samples, but no other significant values are shown (table 4).

The actual composition of the potassium substance mined is not known, but it was probably potassium nitrate (saltpeter). Saltpeter is known to form from the combination of potassium in volcanic rocks with nitrate from bat guano (Hutchinson, 1950). The nitrate originates as an enrichment product in bat excreta during the nitrification of ammonia.

No other bat guano deposits are known in the area. Although there are occasional cavelike hollowed-out portions in the walls in the canyons where such deposits might occur, no signs were detected.

West of Turkey Creek

The area west of Turkey Creek was once a target of exploration by the Bear Creek Mining Company, the exploration subsidiary of Kennecott Copper Corporation. This area is, like most of the surroundings, covered by Tertiary volcanics and sediments, but an aeromagnetic anomaly was known in the area. In 1970 Bear Creek located mining claims in and outside of the instant study area, in parts of secs. 22-26, and 35, T. 6 S., R. 18 E., and secs. 19 and 30, T. 6 S., R. 19 E. Numerous shallow holes were drilled over the claims, and one deep hole was drilled in the NE-1/4 sec. 26, T. 6 S., R. 18 E., 1/4 mile (0.4 km) west of the instant study area boundary. The deep hole broke through the volcanics at 1,790 ft (546.0 m) and then penetrated 677 ft (206.5 m) of interlayered Pinal Schist and diabase. The log of the hole is shown in Table 2. The average copper content was reported to be 100 ppm in the diabase and 50 ppm in the schist. The only mineralization encountered and believed to be accountable for the anomaly was amounts of approximately 5 percent magnetite disseminated in the diabase. The exploration was stopped and the mining claims relinquished in 1971.

Deer Creek

One-half mile (0.8 km) north of Deer Creek on the east side of the ridge east of Paisano Canyon a pit is dug 6 ft (1.8 m) deep and 8 ft (2.4 m) across, in what is apparently the upper andesite of Virgus Canyon. Abundant olivine phenocrysts, about 1 to 2 mm or less in size, are altered to iddingsite and show dark rust red in the rock, but no mineralization is present. Chip samples from the northwest wall of the pit (no. 1253) and from outcrop adjacent to the pit (no. 1254) and grab samples (nos. 1251 and 1252) from the dump were analyzed but no significant values were shown (table 4).

Two lode mining claims are located at the mouth of Deer Creek, by Lupe Salazar in 1963. Two specimens were taken from outcrops on the claims, from a welded tuff (no. 1099) north of Deer Creek and from Hell Hole Conglomerate (no. 1100) south of Deer Creek, and a panned concentrate (no. 1255) of stream sediment was taken at the mouth of Deer Creek. The sample analyses showed no significant values (table 4).

Western Aravaipa Canyon, Precambrian Porphyry

The Precambrian porphyry exposed in Aravaipa Canyon westward from a point midway between Javalina and Virgus Canyons contains many thin quartz veins. Mostly the veins are sinuous and erratic and terminate abruptly within the porphyry. Other veins appear ladderlike in outcrop, planar and parallel to faint foliation planes in the porphyry, but also terminate over short distances. Most veins are on the order of 3 inches (8 cm) thick; widest parts of the veins are about 10 inches (25 cm). The quartz is an opaque milky white, with occasional patches of specular hematite. Four specimens (nos. 1215 and 1235-1237) and four 3- to 8-inch chip samples (nos. 1213 1214, 1238-1239) were taken across quartz veins at 6 locations and were assayed with no significant results (table 4). A grab sample (no. 1227) east of Javalina

Canyon taken at 3-foot- (0.9-m)-intervals across a 30- by 50-foot (9- by 15-m) tongue of porphyry talus, containing occasional pieces of vein quartz with hematite, was also assayed with no significant values (table 4).

CONCLUSION

No minable ore deposits are known in the Aravaipa Canyon instant study area. There has been no production of any mineral commodity.

A deposit of about 1,250,000 tons (1,130 000 mt) of the zeolite mineral clinoptilolite appears to exist in the instant study area, west of Cave Canyon, in the distal margin of the Aravaipa Member ash-flow tuff. An additional undetermined amount of zeolite may occur in the air-fall tuff in the Whitetail Conglomerate, and in the Hells Half Acre ash-flow tuff landslide material. The presence of zeolite is further indicated, throughout the western part of the instant study area, in the middle unit (ash-flow tuff) of the Hells Half Acre Tuff Member.

Drilling on the plateaus north and south of the canyon would be necessary to delineate the actual extent of the middle unit and to collect samples for determination by X-ray diffraction and chemical analysis of the amount and quality of zeolite in it and in the lower unit.

Although natural zeolite has great potential value, the zeolite in the instant study area does not appear to constitute a significant resource, because of mining costs that would probably be prohibitive compared with the cost of mining other near-surface deposits elsewhere. The zeolite beds in Cave Canyon and Aravaipa Canyon lie in inaccessible positions, in vertical cliffs of canyonland topography, under large amounts of overburden. Although an estimate of the cost of mining was not made, it could be many times greater than the \$8 to \$20 per ton (\$9 to \$22 per mt) average mining cost for other zeolite deposits.

The area appears to have low mineral potential for metallic minerals. Since the latest known mineralization in the region was previous to the deposition of the upper sequence of the Galiuro Volcanics, any possible ore deposits would occur only below the upper sequence, at depths of at least 600 ft (180 m) in the vicinity of the single deep drill hole, and probably greater elsewhere inside the instant study area. Only sporadic high values for some base and precious metals were discovered in the course of this investigation; the minor geochemical anomaly perceived in the vicinity of the north-trending fault in the eastern part of the area may indicate leakage from an undetermined mineralized area at unknown depth. However, no anomalous values were observed in the only drill hole to penetrate the thickness of the volcanics and sample the underlying Precambrian rocks.

REFERENCES

- Clifton, R. A., 1979, Zeolites: unpub. data for U.S. Bureau of Mines Minerals Yearbook 1977, on file in Washington office, U.S. Bureau of Mines.
- Creasey, S. C., and Krieger, M. H., 1978, The Galiuro Volcanics, Pinal, Graham, and Cochise Counties, Arizona: U.S. Geological Survey Journal of Research, v. 6, p. 115-131.
- Hutchinson, G. E., 1950, The biochemistry of vertebrate excretion: American Museum of Natural History Bulletin, v. 96, 544 p.
- Krieger, M. H., 1968a, Geologic map of the Holy Joe Peak quadrangle, Pinal County, Arizona: U.S. Geological Survey Geologic Quadrangle Map GQ-669, scale 1:24,000.
- _____, 1968b, Geologic map of the Brandenburg Mountain quadrangle, Pinal County, Arizona: U.S. Geological Survey Geologic Quadrangle Map GQ-668, scale 1:24,000.
- _____, 1979, Ash-flow tuffs in the Galiuro Volcanics, northern Galiuro Mountains, Pinal County, Arizona: U.S. Geological Survey Professional Paper 1104 (in press).
- Mumpton, F. A., 1977, Utilization of natural zeolites, in Mumpton, F. A., ed., Mineralogy and geology of natural zeolites: Mineralogical Society of America, Short Course Notes, v. 4, p. 177-204, November 1977.
- Mumpton, F. A., and Fishman, P. H., 1977, The application of natural zeolites in animal science and aquaculture: Journal of Animal Science, v. 45, no. 5, p. 1188-1203.
- Simons, F. S., 1964, Geology of the Klondyke quadrangle, Graham and Pinal Counties, Arizona: U.S. Geological Survey Professional Paper 461, 173 p.

APPENDIX A. COMPUTER LISTING OF GEOCHEMICAL ANALYSES
OF THE STREAM-SEDIMENT SAMPLES WITH
CUMULATIVE FREQUENCY AND HISTOGRAM CALCULATIONS

A476: GEOCHEMICAL SURVEY - 1 S O STATPAC (01/28/79)

DATE 1/ 9/79

TITLE
NONMAGNETIC CONCENTRATES
INPUT ID N M ***** OPTIONS*****
-STATPAC - 51 33 1 0 0 0 0 0 0 0

NUMBER OF SELECTED COLUMNS = 37

SELECTED COLUMN INDICES

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33							

COLUMN IDENTIFIERS

X-COORD.	Y-COORD.	S-FE2	S-MG2	S-CAN	S-TI2	S-MN	S-AG	S-AS	S-AU
S-P	S-NA	S-PF	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO
S-PH	S-NI	S-PH	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y
S-ZN	S-ZR	S-TI							

NUMBER OF SELECTED ROW PAIRS = 1

SELECTED ROW PAIRS

1- 51

SPECIFIC LIMITS OF DETECTION

1-000000	1-00000	0-10000	0-05000	0-00500	20-00000	20-00000	1-00000	500-00000	20-00000
20-00000	50-00000	2-00000	20-00000	10-00000	20-00000	20-00000	10-00000	50-00000	10-00000
50-00000	10-00000	20-00000	200-00000	20-00000	200-00000	200-00000	20-00000	100-00000	20-00000
500-00000	20-00000	200-00000							

THE COMPUTATIONS TO FOLLOW ARE INTENDED TO SUMMARIZE GEOCHEMICAL DATA ENTERED ON USGS STANDARD 10 VARIABLE (G FORMAT), DATA CARDS OR ON A USGS STATPAC TAPE. THE FOLLOWING ALPHA CODES ARE USED WITH THE DATA AS DESCRIBED IN USGS PROGRAM DOCUMENTATION D0092- N = NOT DETECTED, L = LESS THAN, G = GREATER THAN, T = TRACE, H = INTERFERENCE, AND B = BLANK OR NO DATA. THE HISTOGRAMS AND STATISTICS ARE DERIVED ON THE ASSUMPTION THAT THE DATA ARE MORE PROPERLY TREATED ON A LOGARITHMIC, RATHER THAN ARITHMETIC, BASIS. SHOULD THIS NOT BE THE CASE FOR YOUR DATA, OR ANY PART OF IT, IT IS SUGGESTED THAT YOU USE USGS PROGRAMS D0092, D0001, D0036, D0039, AND D0010 WHICH ALLOW GREATER FLEXIBILITY IN COMPUTATIONAL PROCEDURES.

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/21/78)

DATE 1/ 9/79

TITLE
NONMAGNETIC CONCENTRATES

THE LISTING OF DATA ON THE FOLLOWING PAGES IS SUITABLE FOR OPEN-FILE TYPE PUBLICATIONS. USGS PROGRAM 00030 PROVIDES THE SAME TYPE OF LISTING BUT ALLOWS DELETION AND/OR REORDERING OF ELEMENTS AS WELL AS DELETION OF SELECTED SAMPLES. NOTE THAT THE RIGHT-MOST ZERO DIGITS OF EACH DATA VALUE MAY OR MAY NOT BE SIGNIFICANT. IT IS SUGGESTED THAT A FOOTNOTE TO THIS EFFECT BE PLACED ON THE LISTING BEFORE IT IS PLACED ON OPEN-FILE.

DATE 11 9179

TITLE

NONPHASENETIC CONCENTRATES

SAMPLE	X-COORD.	Y-COORD.	S-1FX	S-MG%	S-CAX	S-TIZ	S-MN	S-AG	S-AS	S-AU
BAR001C	*****	*****	0.7000	0.1000	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR002C	*****	*****	0.5000	0.1500	7.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR003C	*****	*****	0.5000	0.1500	7.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR004C	*****	*****	0.7000	0.5000	15.0000	2.0000G	500.0000	1.0000N	500.0000N	20.0000N
BAR005C	*****	*****	0.7000	0.5000	20.0000	0.1500	700.0100	1.0000N	500.0000N	20.0000N
BAR006C	*****	*****	0.5000	0.2000	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR008C	*****	*****	0.7000	0.5000	5.0000	2.0000G	500.0000	1.0000N	500.0000N	20.0000N
BAR009C	*****	*****	0.5000	0.2000	7.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR010C	*****	*****	0.5000	0.0700	5.0000	2.0000G	300.0000	1.0000N	500.0000N	20.0000N
BAR011C	*****	*****	0.5000	0.2000	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR012C	*****	*****	0.5000	0.2000	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR013C	*****	*****	0.5000	0.5000	10.0000	2.0000G	500.0000	1.0000N	500.0000N	20.0000N
BAR014C	*****	*****	0.7000	0.5000	10.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR015C	*****	*****	0.7000	0.2000	7.0000	2.0000G	1000.0000	1.0000N	500.0000N	20.0000N
BAR016C	*****	*****	1.0000	0.5000	10.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR017C	*****	*****	0.5000	0.0700	7.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR018C	*****	*****	1.0000	0.0500	7.0000	0.7000	500.0000	1.0000N	500.0000N	20.0000N
BAR019C	*****	*****	1.5000	0.3000	7.0000	2.0000G	1000.0000	1.0000N	500.0000N	20.0000N
BAR020C	*****	*****	0.7000	0.1500	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR021C	*****	*****	0.7000	0.7000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR022C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR023C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR024C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR025C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR026C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR027C	*****	*****	0.7000	0.5000	3.0000	2.0000	500.0000	1.0000N	500.0000N	20.0000N
BAR028C	*****	*****	0.7000	0.1500	5.0000	0.2000	1000.0000	1.0000N	500.0000N	20.0000N
BAR029C	*****	*****	0.7000	0.1500	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR030C	*****	*****	0.7000	0.1500	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR031C	*****	*****	0.7000	0.1500	5.0000	0.2000	1000.0000	1.0000N	500.0000N	20.0000N
BAR032C	*****	*****	0.7000	0.1500	5.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR033C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR034C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR035C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR036C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR037C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR038C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR039C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR040C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR041C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR042C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR043C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR044C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR045C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR046C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR047C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR048C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR049C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR050C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR051C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR052C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR053C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR054C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR055C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR056C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR057C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR058C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR059C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR060C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR061C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR062C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR063C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR064C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR065C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR066C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR067C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR068C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR069C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR070C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR071C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR072C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR073C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR074C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR075C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR076C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR077C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR078C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR079C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N
BAR080C	*****	*****	0.7000	0.5000	3.0000	2.0000G	700.0100	1.0000N	500.0000N	20.0000N

TABLE
NONNATURAL CONCENTRATIONS

[illegible]

DATE 1/ 9/79

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
NONMAGNETIC CONCENTRATES

SAMPLE	S-ZH	S-7R	S-TH
BAR001C	500.0000H	2000.1000G	200.0100H
BAR002C	500.0000H	2000.1000G	200.0100H
BAR003C	500.0000H	2000.1000G	200.0100H
BAR004C	500.0000H	2000.1000G	200.0100H
BAR005C	500.0000H	2000.1000G	200.0100H
BAR006C	500.0000H	2000.1000G	200.0100H
BAR007C	500.0000H	2000.1000G	200.0100H
BAR008C	500.0000H	2000.1000G	200.0100H
BAR009C	500.0000H	2000.1000G	200.0100H
BAR010C	500.0000H	2000.1000G	200.0100H
BAR011C	500.0000H	2000.1000G	200.0100H
BAR012C	500.0000H	2000.1000G	200.0100H
BAR013C	500.0000H	2000.1000G	200.0100H
BAR014C	500.0000H	2000.1000G	200.0100H
BAR015C	500.0000H	2000.1000G	200.0100H
BAR016C	500.0000H	2000.1000G	200.0100H
BAR017C	500.0000H	2000.1000G	200.0100H
BAR018C	500.0000H	2000.1000G	200.0100H
BAR019C	500.0000H	2000.1000G	200.0100H
BAR020C	500.0000H	2000.1000G	200.0100H
BAR021C	500.0000H	2000.1000G	200.0100H
BAR022C	500.0000H	2000.1000G	200.0100H
BAR023C	500.0000H	2000.1000G	200.0100H
BAR024C	500.0000H	2000.1000G	200.0100H
BAR025C	500.0000H	2000.1000G	200.0100H
BAR026C	500.0000H	2000.1000G	200.0100H
BAR027C	500.0000H	2000.1000G	200.0100H
BAR028C	500.0000H	2000.1000G	200.0100H
BAR029C	500.0000H	2000.1000G	200.0100H
BAR030C	500.0000H	2000.1000G	200.0100H
BAR031C	500.0000H	2000.1000G	200.0100H
BAR032C	500.0000H	2000.1000G	200.0100H
BAR033C	500.0000H	2000.1000G	200.0100H
BAR034C	500.0000H	2000.1000G	200.0100H
BAR035C	500.0000H	2000.1000G	200.0100H
BAR036C	500.0000H	2000.1000G	200.0100H
BAR037C	500.0000H	2000.1000G	200.0100H
BAR038C	500.0000H	2000.1000G	200.0100H
BAR039C	500.0000H	2000.1000G	200.0100H
BAR040C	500.0000H	2000.1000G	200.0100H
BAR041C	500.0000H	2000.1000G	200.0100H
BAR042C	500.0000H	2000.1000G	200.0100H
BAR043C	500.0000H	2000.1000G	200.0100H
BAR044C	500.0000H	2000.1000G	200.0100H
BAR045C	500.0000H	2000.1000G	200.0100H
BAR046C	500.0000H	2000.1000G	200.0100H
BAR047C	500.0000H	2000.1000G	200.0100H
BAR048C	500.0000H	2000.1000G	200.0100H
BAR049C	500.0000H	2000.1000G	200.0100H
BAR050C	500.0000H	2000.1000G	200.0100H
BAR051C	500.0000H	2000.1000G	200.0100H
BAR052C	500.0000H	2000.1000G	200.0100H
BAR053C	500.0000H	2000.1000G	200.0100H
BAR054C	500.0000H	2000.1000G	200.0100H
BAR055C	500.0000H	2000.1000G	200.0100H
BAR056C	500.0000H	2000.1000G	200.0100H
BAR057C	500.0000H	2000.1000G	200.0100H
BAR058C	500.0000H	2000.1000G	200.0100H
BAR059C	500.0000H	2000.1000G	200.0100H
BAR060C	500.0000H	2000.1000G	200.0100H
BAR061C	500.0000H	2000.1000G	200.0100H
BAR062C	500.0000H	2000.1000G	200.0100H
BAR063C	500.0000H	2000.1000G	200.0100H
BAR064C	500.0000H	2000.1000G	200.0100H
BAR065C	500.0000H	2000.1000G	200.0100H
BAR066C	500.0000H	2000.1000G	200.0100H
BAR067C	500.0000H	2000.1000G	200.0100H
BAR068C	500.0000H	2000.1000G	200.0100H
BAR069C	500.0000H	2000.1000G	200.0100H
BAR070C	500.0000H	2000.1000G	200.0100H
BAR071C	500.0000H	2000.1000G	200.0100H
BAR072C	500.0000H	2000.1000G	200.0100H
BAR073C	500.0000H	2000.1000G	200.0100H
BAR074C	500.0000H	2000.1000G	200.0100H
BAR075C	500.0000H	2000.1000G	200.0100H
BAR076C	500.0000H	2000.1000G	200.0100H
BAR077C	500.0000H	2000.1000G	200.0100H
BAR078C	500.0000H	2000.1000G	200.0100H
BAR079C	500.0000H	2000.1000G	200.0100H

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U.S.G.S. STATPAC (01/25/78)

TITLE		S-CAZ	S-TI%	S-MN	S-AG	S-AS	S-AU
NONMAGNETIC CONCENTRATES							
SAMPLE	X-COORD.	Y-COORD.	S-FE%	S-MG%			
BAROFC	*****	*****	0.5000	0.1000	2.0000	200.0100	1.00000 500.00000 20.00000

DATE 11 9/79

A476 (1) CHEMICAL SUPPLY - U S G S STAPAC (01/23/78)

TITLE		NONFACIUTIC CONCENTRATES								
SAMPLE	S-H	S-HA	S-HF	S-HI	S-CD	S-CN	S-CR	S-CH	S-LA	S-MO
BARUSCC	20.00000	500.00000	2.00000	20.00000	50.00000	10.00000	30.0000	10.00000	150.0100	10.00000

A470 GEOCHEMICAL SUMMARY - U.S.G. STATPAC (01/23/79)

DATE 1/ 9/79

TITLE
NONMAGNETIC CONCENTRATIONS

SAMPLE	S-NI	S-PI	S-SH	S-SC	S-SH	S-SR	S-V	S-W	S-Y
BAROPIC	50.00000	10.00000	30.0000	20.0000	20.00000	200.0100	50.0000	100.0100N	500.0000

A476 GEOCHEMICAL SUMMARY - U S S SIAIPAC (01/23/79)

DATE 11 9/79

TITLE
NONFACULTIC CONCENTRATION

SAMPLE	S-20	S-7P	S-TH
BAROPC	500.0100N	2000.1007G	200.0100N

TITLE
NONMAGNETIC CONCLUTPATES

VARIABLE NO. 8 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 9 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 10 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 14 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 15 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 20 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 24 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 29 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 33 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

TITLE
NONMAGNETIC CONCENTRATES

THE FREQUENCY DISTRIBUTIONS AND HISTOGRAMS OF THE FOLLOWING PAGES ARE ON LOGARITHMIC SCALES, AND EMPLOY THE SAME CLASS INTERVALS AS USED IN REPORTING 6-STEP SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES. IMPORTANT NOTE- THE STATISTICS GIVEN BELOW THE HISTOGRAMS ARE DERIVED ONLY FROM DATA VALUES WITHIN THE RANGES OF ANALYTICAL DETERMINATION, AND ARE, THEREFORE, BIASED IF DATA VALUES QUALIFIED WITH U, L, G, T, OR H CODES ARE PRESENT. SEE LATER SECTION OF OUTPUT FOR STATISTICAL ESTIMATES THAT ARE UNBIASED IN THIS REGARD. THE GEOMETRIC MEAN IS AN ESTIMATE OF "CENTRAL TENDENCY," OR OF A CHARACTERISTIC VALUE, OF A FREQUENCY DISTRIBUTION THAT IS APPROXIMATELY SYMMETRICAL ON A LOG SCALE, AND IS THEREFORE USEFUL FOR CHARACTERIZING MANY GEOCHEMICAL DISTRIBUTIONS. THE GEOMETRIC MEAN IS NOT AN ESTIMATE OF GEOCHEMICAL ABUNDANCE AND IS OF NO VALUE IN ESTIMATING RESERVES OR TOTAL AMOUNTS OF ELEMENTS PRESENT. SEE USGS PROFESSIONAL PAPER 574-H FOR FURTHER DISCUSSION. SEE USGS BULLETIN 1147E, PAGE 23, FOR EXPLANATION OF GEOMETRIC DEVIATION.

THE CUMULATIVE FREQUENCY PERCENTS GIVEN BELOW SHOULD BE PLOTTED AGAINST THE "LOWER" LIMITS TO GIVE THE LEPELTIER-TYPE CUMULATIVE CURVE.

GEOMETRIC MEAN = 5.66686e+05
GEOMETRIC DEVIATION = 1.00766e+00

DATE 11 9/79

6670 BIOCHEMICAL SUPPLY - U S G S STATEPAC (01/23/78)

TYPE
CONCENTRATES

APPENDIX A. TABLE FOR COLUMN 2 (Y-CORREL.)

[illegible]

INTEGRAL FOR COLUMN ? (Y-COORD.)

T	P	N	T	G
ANALYTICAL VAL UFS				
S1				

0.00 0.00 0.00

0.00 0.00

MAXIMUM = 3.64760e+00
MINIMUM = 2.63640e+00
GEOMETRIC MEAN = 3.64045e+00
GEOMETRIC DEVIATION = 1.00201e+00

DATE 1/ 9/79

A470. GEOCHEMICAL SURVEY - U.S.G.S. STATPAC (01/23/79)

TITLE
NONPALEOTIC CONCENTRATIONS

FREQUENCY TABLE FOR COLUMN 3 (S-FE%)

LIMITS	FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER	CUM	FREQ	FREQ	FREQ
8.3e-02 - 1.2e-01	0	0.00	0.00	100.00
1.2e-01 - 1.2e-01	0	0.00	0.00	100.00
1.2e-01 - 2.6e-01	0	0.00	0.00	100.00
2.6e-01 - 3.6e-01	1	1.96	100.00	100.00
3.6e-01 - 5.6e-01	12	23.53	98.04	98.04
5.6e-01 - 8.3e-01	21	41.18	74.51	74.51
8.3e-01 - 1.2e+00	7	13.73	33.33	33.33
1.2e+00 - 1.8e+00	6	11.76	19.61	19.61
1.8e+00 - 2.6e+00	2	3.92	7.84	7.84
2.6e+00 - 3.8e+00	0	0.00	3.92	3.92
3.8e+00 - 5.6e+00	2	3.92	3.92	3.92

HISTOGRAM FOR COLUMN 3 (S-FE%)

3.0e-01 XX
5.0e-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
7.0e-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.0e+00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.5e+00 XXXXXXXXXXXXXXXXXXXXXXXX
2.0e+00 XXXX
3.0e+00
5.0e+00 XXXX

N	L	H	U	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	51

MAXIMUM = 5.00000e+00
MINIMUM = 5.00000e-01
GEOMETRIC MEAN = 8.2346e-01
GEOMETRIC DEVIATION = 1.7313e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 4 (S-MGZ)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
3.8e-02	5.6e-02	1	1	1.96	100.00
5.6e-02	8.3e-02	3	4	5.88	98.04
8.3e-02	1.2e-01	5	5	9.80	92.16
1.2e-01	1.8e-01	12	21	23.53	62.55
1.8e-01	2.6e-01	15	36	29.41	58.82
2.6e-01	3.8e-01	2	38	3.92	29.41
3.8e-01	5.6e-01	8	46	15.69	75.49
5.6e-01	8.3e-01	4	50	7.84	9.80
8.3e-01	1.2e+00	1	51	1.96	1.96

HISTOGRAM FOR COLUMN 4 (S-MGZ)

5.0e-02 xx
7.0e-02 xxxxxx
1.0e-01 xxxxxxxxxx
1.5e-01 xxxxxxxxxx
2.0e-01 xxxxxxxxxx
3.0e-01 xxxxx
5.0e-01 xxxxxxxxxx
7.0e-01 xxxxxxxx
1.0e+00 xx

A	L	H	U	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	51

MAXIMUM = 1.00000e+00
MINIMUM = 5.00000e-02
GEOMETRIC MEAN = 2.13403e-01
GEOMETRIC DEVIATION = 2.00064e+00

A47(1101161261 13351Y - 056, 1ATPAC (01/12/15)

NON-CLASSIFIED
DATE 11/11/01 BY 1111

FREQUENCY TABLE FOR (CLIM).
C (5-CP%)

LIMITS	LIMITS		F ₁ -U	F ₂ -U	PERCENT	PERCENT
	LOWER	UPPER				
8.35-02	-	1.20-01	0	0	0.00	0.00
1.20-03	-	1.80-01	0	0	0.00	100.00
1.20-04	-	2.60-01	0	0	0.00	100.00
2.60-01	-	3.80-01	0	0	0.00	100.00
3.80-01	-	5.60-01	0	0	0.00	100.00
5.60-01	-	8.30-01	0	0	0.00	100.00
8.30-01	-	1.20-00	1	1	1.00	100.00
1.20-00	-	1.80-00	1	0	0.00	98.04
1.80-00	-	2.60-00	5	6	9.00	96.04
2.60-00	-	3.80-00	10	16	10.61	88.24
3.80-00	-	5.60-00	13	29	25.49	62.63
5.60-00	-	8.30-00	17	46	33.33	43.14
8.30-00	-	1.20-01	3	49	5.68	9.80
1.20-01	-	1.80-01	1	50	1.06	3.02
1.80-01	-	2.60-01	1	51	1.06	1.06

HISTOGRAM: FOR COLUMN 5 (S-CAX)

[illegible]

ANALYTICAL				
VALUES				
T	H	R	T	G
0	0	0	0	0
0.00	0.00	0.00	0.00	0.00

```

MAXIMUM = 2.00000e+01
MINIMUM = 1.00000e+00
GEOMETRIC MEAN = 4.90150e+00
GEOMETRIC VARIATION = 1.75668e+00

```

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 6 (S-T12)

LIMITS		FREQ	CUM	PERCENT		PERCENT
LOWER	UPPER			FRFQ	CUM	
3.6e-03	5.6e-03	0	0	0.00	100.00	100.00
5.6e-03	6.3e-03	0	0	0.00	100.00	100.00
6.3e-03	1.2e-02	0	0	0.00	100.00	100.00
1.2e-02	1.6e-02	0	0	0.00	100.00	100.00
1.6e-02	2.6e-02	0	0	0.00	100.00	100.00
2.6e-02	3.8e-02	0	0	0.00	100.00	100.00
3.8e-02	5.6e-02	0	0	0.00	100.00	100.00
5.6e-02	8.3e-02	0	0	0.00	100.00	100.00
8.3e-02	1.2e-01	0	0	0.00	100.00	100.00
1.2e-01	1.8e-01	1	1	1.96	100.00	100.00
1.8e-01	2.6e-01	1	2	1.96	98.04	98.04
2.6e-01	3.8e-01	1	3	1.96	96.08	96.08
3.8e-01	5.6e-01	0	3	0.00	94.12	94.12
5.6e-01	8.3e-01	2	5	3.92	90.20	90.20
8.3e-01	1.2e+00	1	6	1.96	88.24	88.24
1.2e+00	1.8e+00	0	6	0.00	88.24	88.24
1.8e+00	2.6e+00	9	15	17.65		

HISTOGRAM FOR COLUMN 6 (S-T12)

1.5e-01 xx
2.0e-01 xx
3.0e-01 xx
5.0e-01
7.0e-01 xxxx
1.0e+00 xx
1.5e+00
2.0e+00 xxxxxxxxxxxxxxxx

H	L	H	T	G	ANALYTICAL
0.00	0.00	0	0	36	VALUES
				15	
			0.00	70.59	

MAXIMUM = 2.00000e+00
MINIMUM = 1.50000e-01
GEOMETRIC MEAN = 1.05580e+00
GEOMETRIC DEVIATION = 2.54080e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN	7 (	S-MN)
LIMITS	FREQ	PERCENT
LOWER - UPPER	CUM	FREQ CUM
1.8e+01 - 2.6e+01	0	0.00
2.6e+01 - 3.8e+01	0	0.00
3.8e+01 - 5.6e+01	0	0.00
5.6e+01 - 8.3e+01	0	0.00
8.3e+01 - 1.2e+02	0	0.00
1.2e+02 - 1.8e+02	0	0.00
1.8e+02 - 2.6e+02	3	5.88
2.6e+02 - 3.8e+02	4	7.84
3.8e+02 - 5.6e+02	10	19.61
5.6e+02 - 8.3e+02	28	54.90
8.3e+02 - 1.2e+03	6	11.76

HISTOGRAM FOR COLUMN 7 (S-MN)

2.0e+02 XXXXXX
3.0e+02 XXXXXXXX
5.0e+02 XXXXXXXXXXXXXXXX
7.0e+02 XX
1.0e+03 XXXXXXXXXXXXXXXX

N	L	H	R	T	G	ANALYTICAL
0.00	0.00	0	0	0	0	VALUES
				0.00	0.00	51

MAXIMUM = 1.00000e+03
MINIMUM = 2.00010e+02
GEOMETRIC MEAN = 5.94031e+02
GEOMETRIC DEVIATION = 1.49558e+00

DATE 1/ 9/70

A47C GEOMETRIC SUMMARY - U S G STATPAC (01/23/75)

TITLE
NONMETRIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 11 (S-H)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		(CUM)	(CUM)	FREQ	FREQ CUM
1.0e+01 -	2.0e+01	5	5	9.80	17.65
2.0e+01 -	3.0e+01	1	6	1.96	7.84
3.0e+01 -	4.0e+01	0	6	0.00	5.88
4.0e+01 -	5.0e+01	0	6	0.00	5.88
5.0e+01 -	6.0e+01	0	6	0.00	5.88
6.0e+01 -	7.0e+01	0	6	0.00	5.88
7.0e+01 -	8.0e+01	0	6	0.00	5.88
8.0e+01 -	9.0e+01	0	6	0.00	5.88
9.0e+01 -	1.0e+02	2	8	3.92	5.98
1.0e+02 -	1.1e+02	0	8	0.00	5.98
1.1e+02 -	1.2e+02	0	8	0.00	5.98
1.2e+02 -	1.3e+02	0	8	0.00	5.98
1.3e+02 -	1.4e+02	0	8	0.00	5.98
1.4e+02 -	1.5e+02	1	9	1.96	1.96

HISTOGRAM FOR COLUMN 11 (S-H)

2.0e+01 XXXXXXXXXX
3.0e+01 YX
5.0e+01
7.0e+01
1.0e+02
1.5e+02
2.0e+02 XXXX
3.0e+02
5.0e+02
7.0e+02 XX

ANALYTICAL		VALUES	
		Q	
16	24	0	0
25.29	47.06	0.00	0.00

MAXIMUM = 7.00010e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 5.18068e+01
GEOMETRIC DEVIATION = 3.97867e+00

TITLE
NONMAGNETIC CONCENTRATIONS

FREQUENCY TABLE FOR COLUMN 12 (S-0A)

LIMITS		FREQ	PERCENT	PERCENT	
LOWER	UPPER			FREQ	CUM
3.8e+01	5.6e+01	0	0.00	0.00	100.00
5.6e+01	6.3e+01	1	1.96	1.96	100.00
8.3e+01	1.2e+02	4	7.84	7.84	98.04
1.2e+02	1.8e+02	6	11.76	11.76	90.20
1.8e+02	2.6e+02	5	9.20	9.20	78.43
2.6e+02	3.8e+02	11	21.57	21.57	68.63
3.8e+02	5.6e+02	8	15.69	15.69	47.06
5.6e+02	6.3e+02	7	13.73	13.73	31.17
6.3e+02	1.2e+03	4	7.84	7.84	17.65
1.2e+03	1.8e+03	1	1.96	1.96	9.80
1.8e+03	2.6e+03	1	1.96	1.96	7.84
2.6e+03	3.8e+03	3	5.88	5.88	5.88

HISTOGRAM FOR COLUMN 12 (S-0A)

```

7.0e+01 xx
1.0e+02 xxxxxxxx
1.5e+02 xxxxxxxxxx
2.0e+02 xxxxxxxxxx
3.0e+02 xxxxxxxxxxxxxxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxxxxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxxxxxxxxxxxxxx
1.0e+03 xxxxxxxxxx
1.5e+03 xx
2.0e+03 xx
3.0e+03 xxxxxx

```

		ANALYTICAL	
		VALUES	
H	L	H	G
C	U	U	0
0.00	0.00	0.00	0.00

MAXIMUM = 3.00010e+03
 MINIMUM = 2.00010e+01
 GEOMETRIC MEAN = 3.82723e+02
 GEOMETRIC DEVIATION = 2.50690e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 13 (S-RE)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
1.8e+00	2.6e+00	4	4	7.84		17.65	
2.6e+00	3.8e+00	0	4	0.00		9.20	
3.8e+00	5.6e+00	4	8	7.84		5.80	
5.6e+00	8.3e+00	1	9	1.96		1.96	

HISTOGRAM FOR COLUMN 13 (S-RE)

2.0e+00 XXXXXXXX
3.0e+00
5.0e+00 XXXXXXXX
7.0e+00 XX

ANALYTICAL		VALUES	
N		T	
21	21	0	0
41.16	41.16	0.00	0.00

MAXIMUM = 7.00000e+00
MINIMUM = 2.00000e+00
GEOMETRIC MEAN = 3.45417e+00
GEOMETRIC DEVIATION = 1.60758e+00

DATE 1/ 9/79

A470 WINTERFEL SUPPLY - H.C. - STAPAC (11/24/79)

TITLE
NONMETALLIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 16 (S-CO)

LIMITS		FREQ		PERCENT	
LOWER - UPPER		COUNT		PERCENT	
8.5e+00 -	1.2e+01	1	1	1.96	3.67
1.2e+01 -	1.8e+01	1	1	0.00	1.56
1.8e+01 -	2.6e+01	1	2	1.96	1.96

HISTOGRAM FOR COLUMN 16 (S-CO)

1.0e+01 XX
1.5e+01
2.0e+01 XX

H	L	H	R	T	ANALYTICAL	
					VALUES	
46	3	0	0	0.00	G	0.00
90.20	5.88				U	

MAXIMUM = 2.00000e+01
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 1.41421e+01
GEOMETRIC DEVIATION = 1.63253e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U.S.G.S. STATPAC (01/23/78)

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 17 (S-CH)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
1.8e+01	2.6e+01	6	6	11.76	11.76
2.6e+01	3.8e+01	9	15	17.65	29.41
3.8e+01	5.6e+01	9	23	17.65	47.06
5.6e+01	8.3e+01	9	31	15.60	62.66
8.3e+01	1.7e+02	4	35	7.84	70.50
1.2e+02	1.3e+02	1	36	1.96	72.46
1.3e+02	2.6e+02	1	37	1.96	74.42
2.6e+02	3.8e+02	1	38	1.96	76.38
3.8e+02	5.6e+02	2	40	3.92	80.30
5.6e+02	8.3e+02	1	41	1.96	82.26

HISTOGRAM FOR COLUMN 17 (S-CH)

2.0e+01 XXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXX
1.5e+02 XX
2.0e+02 XX
3.0e+02 XX
5.0e+02 XXXX
7.0e+02 XX

N	L	H	T	ANALYTICAL
5.86	13.73	0	0.00	VALUES
				41

MAXIMUM = 7.00010e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 5.91508e+01
GEOMETRIC DEVIATION = 2.47826e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 18 (S-CU)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CLIN	FREQ	FREQ	FREQ CUM
8.3e+00 -	1.2e+01	5	5	9.80	9.80
1.2e+01 -	1.8e+01	11	16	21.57	31.37
1.8e+01 -	2.6e+01	17	33	33.33	64.71
2.6e+01 -	3.8e+01	10	43	19.61	84.32
3.8e+01 -	5.6e+01	3	46	5.88	90.20
5.6e+01 -	8.3e+01	0	46	0.00	90.20
8.3e+01 -	1.2e+02	1	47	1.96	92.16
1.2e+02 -	1.8e+02	0	47	0.00	92.16
1.8e+02 -	2.6e+02	1	48	1.96	94.12
2.6e+02 -	3.8e+02	0	48	0.00	94.12
3.8e+02 -	5.6e+02	1	49	1.96	96.08

HISTOGRAM FOR COLUMN 18 (S-CU)

1.0e+01 xxxxxxxxxxxx
1.5e+01 xxxxxxxxxxxx
2.0e+01 xxxxxxxxxxxx
3.0e+01 xxxxxxxxxxxx
5.0e+01 xxxxxxxxxxxx
7.0e+01
1.0e+02 xx
1.5e+02
2.0e+02 xx
3.0e+02
5.0e+02 xx

ANALYTICAL		VALUES	
		T	G
0.00	3.92	0	0
		0.00	0.00

MAXIMUM = 5.00000e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 2.52154e+01
GEOMETRIC DEVIATION = 2.04720e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 19 (S-LA)

LIMITS		FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FREQ	FREQ CUM
3.5e+01	5.0e+01	0	0.00	100.00
5.0e+01	8.3e+01	1	1.96	100.00
8.3e+01	1.2e+02	2	1.96	98.04
1.2e+02	1.8e+02	3	1.96	96.08
1.8e+02	2.6e+02	5	9.80	94.12
2.6e+02	3.8e+02	7	13.73	84.31
3.8e+02	5.0e+02	22	13.73	70.59
5.0e+02	8.3e+02	23	45.10	56.86
8.3e+02	1.2e+03	5	9.80	11.76
1.2e+03	1.8e+03	1	1.96	1.96

HISTOGRAM FOR COLUMN 19 (S-LA)

```

7.0e+01 xx
1.0e+02 xx
1.5e+02 xx
2.0e+02 xxxxxxxxxxxx
3.0e+02 xxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxx
1.0e+03 xxxxxxxxxxxx
1.5e+03 xx
    
```

N	L	H	U	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 1.50010e+03
 MINIMUM = 7.00010e+01
 GEOMETRIC MEAN = 4.93835e+02
 GEOMETRIC DIVIATION = 1.68623e+00

A470 GEOCHEMICAL SUMMARY - U. S. STATPAC (01/23/78)

DATE 1/ 9/79

TITLE

NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 21 (S-NU)

LIMITS		FRFQ		PERCENT	
LOWER - UPPER		CUM		FREQ	PERCENT CUM
3.8e+01 - 5.6e+01	13	13	25.49	7.84	7.84
5.6e+01 - 8.3e+01	4	17	7.84	7.84	7.84

HISTOGRAM FOR COLUMN 21 (S-NU)

5.0e+01 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXX

N	L	H	P	T	G	ANALYTICAL VALUES
16	18	0	0	0	0	17
31.37	35.29			0.00	0.00	

MAXIMUM = 7.00010e+01
MINIMUM = 5.00000e+01
GEOMETRIC MEAN = 5.41196e+01
GEOMETRIC DEVIATION = 1.15850e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 22 (S-NI)

LIMITS	FREQ	FREQ CUM	PERCENT FREQ	PERCENT FREQ CUM
LOWER - UPPER				
0.3e+00 - 1.2e+01	2	2	3.92	15.69
1.2e+01 - 1.8e+01	3	5	5.88	11.76
1.8e+01 - 2.6e+01	1	6	1.96	5.88
2.6e+01 - 3.8e+01	1	7	1.96	3.92
3.8e+01 - 5.6e+01	1	8	1.96	1.96

HISTOGRAM FOR COLUMN 22 (S-NI)

1.0e+01 xxxx
1.5e+01 xxxxxx
2.0e+01 xx
3.0e+01 xx
5.0e+01 xx

N	L	H	U	T	G	ANALYTICAL VALUES
43	0	0	0	0	0	9
84.31	0.00	0	0	0.00	0.00	0.00

MAXIMUM = 5.00000e+01
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 1.78109e+01
GEOMETRIC DEVIATION = 1.73056e+00

DATE 1/ 9/70

A470 CHEMICAL SUMMARY - U.S.G.S. STATPAC (01/23/78)

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 23 (S-Pb)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
1.8e+11	2.6e+01	8	8	15.60	98.04
2.6e+11	3.8e+01	12	20	23.53	82.35
3.8e+11	5.0e+01	15	35	20.41	58.82
5.0e+11	8.3e+01	8	43	15.69	20.41
8.3e+11	1.2e+02	2	45	3.92	13.73
1.2e+02	1.8e+02	0	45	0.00	9.80
1.8e+02	2.6e+02	0	45	0.00	9.80
2.6e+02	3.8e+02	1	46	1.96	9.80
3.8e+02	5.0e+02	2	48	3.92	7.84
5.0e+02	8.3e+02	1	49	1.96	3.92
8.3e+02	1.2e+03	0	49	0.00	1.96
1.2e+03	1.8e+03	1	50	1.96	1.96

HISTOGRAM FOR COLUMN 23 (S-Pb)

```

2.0e+01 XXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXX
1.0e+02 XXXX
1.5e+02
2.0e+02 XX
3.0e+02 XX
5.0e+02 XXXX
7.0e+02 XX
1.0e+03
1.5e+03 XX

```

A	L	H	H	T	G
0	1	0	0	0	0
0.00	1.96			0.00	0.00

ANALYTICAL
VALUES
50

MAXIMUM = 1.50010e+03
 MINIMUM = 2.00000e+01
 GEOMETRIC MEAN = 5.31507e+01
 GEOMETRIC DEVIATION = 2.57608e+00

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 25 (S-SC)

LIMITS		FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FREQ	FREQ CUM
8.3e+00	1.2e+01	0	0.00	04.12
1.2e+01	1.8e+01	3	5.88	94.12
1.8e+01	2.6e+01	9	17.65	18.24
2.6e+01	3.8e+01	5	9.80	70.59
3.8e+01	5.6e+01	16	31.37	10.78
5.6e+01	8.3e+01	15	29.41	29.41

HISTOGRAM FOR COLUMN 25 (S-SC)

1.5e+01 xxxxxx
2.0e+01 xxxxxxxxxxxxxxxxx
3.0e+01 xxxxxxxxxxxxxx
5.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxx
7.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxx

N	L	H	U	T	G	ANALYTICAL VALUES
2	1	0	0	0	0	4R
3.92	1.96			0.00	0.00	

MAXIMUM = 7.00010e+01
MINIMUM = 1.50010e+01
GEOMETRIC MEAN = 4.11373e+01
GEOMETRIC DEVIATION = 1.69477e+00

DATE 11 0/20

A47C GLUCHEMICAL SUMMARY - U S C S STATPAC (01/23/78)

TITLE
NONMAGNETIC CONCENTRATIONS

FREQUENCY TABLE FOR COLUMN 26 (S-SN)

LIMITS		FRFO		PERCENT		PERCENT	
LOWER	UPPER	CUH	CUH	FRFO	PERCENT	FRFO	PERCENT
1.8e+01	2.6e+01	3	4	5.48	17.65	48.43	62.75
2.6e+01	3.8e+01	9	12	21.57	27.53	45.10	57.65
3.8e+01	5.6e+01	11	24	3.92	1.96	17.65	22.53
5.6e+01	8.3e+01	2	26	1.96	1.96	15.69	19.92
8.3e+01	1.2e+02	1	27	1.96	1.96	13.73	17.65
1.2e+02	1.8e+02	1	28	3.92	5.48	9.80	12.57
1.8e+02	2.6e+02	2	30	0.00	0.00	3.92	5.48
2.6e+02	3.8e+02	3	33	0.00	0.00	3.92	5.48
3.8e+02	5.6e+02	0	33	0.00	0.00	3.92	5.48
5.6e+02	8.3e+02	0	33	0.00	0.00	3.92	5.48
8.3e+02	1.2e+03	0	33	0.00	0.00	3.92	5.48
1.2e+03	1.8e+03	1	34	1.96	1.96	3.92	5.48

HISTOGRAM FOR COLUMN 26 (S-SN)

2.0e+01 xxxxx
3.0e+01 xxxxxxxxxxxxxxxxxxxx
5.0e+01 xxxxxxxxxxxxxxxxxxxx
7.0e+01 xx
1.0e+02 xxxxx
1.5e+02 xx
2.0e+02 xx
3.0e+02 xxxxx
5.0e+02 xxxxxx
7.0e+02
1.0e+03
1.5e+03 xx

ANALYTICAL		VALUES	
L	H	T	G
16	0	0	1
31.37	0.00	0.00	1.96

MAXIMUM = 1.50010e+03
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 4.86222e+01
GEOMETRIC DEVIATION = 2.98203e+00

TITLE

NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 27 (S-SR)

LIMITS	FFLG	IRLG	PERCENT	PERCENT
LOWLR - UPPER	CLIP	FFLG	PERCENT	FREQ CUM
1.0e+02 - 2.0e+02	74	74	47.06	88.24
2.0e+02 - 3.0e+02	8	37	15.69	41.18
3.0e+02 - 4.0e+02	4	36	7.14	25.49
4.0e+02 - 5.0e+02	6	42	11.76	17.65
5.0e+02 - 6.0e+02	2	44	2.97	5.88
6.0e+02 - 7.0e+02	1	45	1.96	1.96

HISTOGRAM FOR COLUMN 27 (S-SR)

2.0e+02 xxx
 3.0e+02 xxx
 4.0e+02 xxx
 5.0e+02 xxx
 6.0e+02 xxx
 7.0e+02 xxx
 8.0e+02 xxx
 9.0e+02 xxx
 1.0e+03 xxx
 1.5e+03 xxx

N	L	H	A	T	G
0	6	0	0	0	0
0.00	11.76			0.00	0.00

ANALYTICAL
VALUES
45

MAXIMUM = 1.50010e+03
 MINIMUM = 2.00010e+02
 GEOMETRIC MEAN = 3.09581e+02
 GEOMETRIC DEVIATION = 1.78392e+00

DATE 11/9/70

A476 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/71)

TITLE
NONFACIETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 28 (S-V)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
1.0e+01 -	2.0e+01	0	0	0.00	96.08
2.0e+01 -	3.0e+01	4	4	7.84	96.08
3.0e+01 -	5.0e+01	5	9	9.80	88.24
5.0e+01 -	8.0e+01	11	20	21.57	78.43
8.0e+01 -	1.2e+02	21	41	41.18	56.86
1.2e+02 -	1.8e+02	7	48	13.73	15.69
1.8e+02 -	2.0e+02	1	49	1.96	1.96

HISTOGRAM FOR COLUMN 28 (S-V)

3.0e+01 XXXXXXXX
5.0e+01 XXXXXXXX
7.0e+01 XXXXXXXX
1.0e+02 XXXXXXXX
1.5e+02 XXXXXXXX
2.0e+02 XX

ANALYTICAL		VALUES	
N	L	H	R
0.00	2	0	0
	3.92		

MAXIMUM = 2.00010e+02
MINIMUM = 3.00000e+01
GEOMETRIC MEAN = 8.37816e+01
GEOMETRIC DEVIATION = 1.5674e+00

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
NONMAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 30 (S-Y)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT FREQ CUM
LOWER	UPPER				
1.6e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	0	0	0.00	100.00
3.8e+01	5.0e+01	0	0	0.00	100.00
5.0e+01	6.3e+01	0	0	0.00	100.00
6.3e+01	1.2e+02	0	0	0.00	100.00
1.2e+02	1.8e+02	1	1	1.96	100.00
1.8e+02	2.6e+02	1	2	1.96	98.04
2.6e+02	3.8e+02	7	9	13.73	96.08
3.8e+02	5.0e+02	6	15	11.76	82.35
5.0e+02	6.3e+02	12	27	23.53	70.59
6.3e+02	1.2e+03	15	42	29.41	47.06
1.2e+03	1.8e+03	8	50	15.69	17.65
1.8e+03	2.6e+03	0	50	0.00	1.96
2.6e+03	3.8e+03	1	51	1.96	1.96

HISTOGRAM FOR COLUMN 30 (S-Y)

1.5e+02 xx
2.0e+02 xx
3.0e+02 xxxxxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxxxxxxxxxxxxx
1.0e+03 xxxxxxxxxxxxxxxxxxxxxxx
1.5e+03 xxxxxxxxxxxxxxxxxxxxxxx
2.0e+03
3.0e+03 xx

N	L	H	P	T	G	ANALYTICAL VALUES
0	0	0	0	0	0	51
U.CC	0.00			0.00	0.00	

MAXIMUM = 3.00010e+03
MINIMUM = 1.50010e+02
GEOMETRIC MEAN = 7.30288e+02
GEOMETRIC DEVIATION = 1.82907e+00

DATE 11/2/79

AGALC GEOMETRIC MEAN - 1 5 6 5 STATPC (11/2/79)

TITLE
NONMETRIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 31 (S=2N)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER		(CUM)	FREQ	FREQ CUM
3.8e+02	5.6e+02	0	0	0.00	3.92
5.6e+02	8.3e+02	0	0	0.00	3.92
8.3e+02	1.2e+03	0	0	0.00	3.92
1.2e+03	1.8e+03	0	0	0.00	3.92
1.8e+03	2.6e+03	1	1	1.96	3.92
2.6e+03	3.8e+03	0	1	0.00	1.96
3.8e+03	5.6e+03	0	1	0.00	1.96
5.6e+03	8.3e+03	0	1	0.00	1.96
8.3e+03	1.2e+04	1	2	1.96	1.96

HISTOGRAM FOR COLUMN 31 (S=2N)

2.0e+03 xx
3.0e+03
5.0e+03
7.0e+03
1.0e+04 xx

N	L	H	P	T	ANALYTICAL
40	0.00	0	0	0	VALUES
96.00	0.00	0	0	0.00	2

MAXIMUM = 1.00010e+04
MINIMUM = 2.00010e+03
GEOMETRIC MEAN = 4.47247e+03
GEOMETRIC DEVIATION = 3.12077e+00

TITLE
NONMACHETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 32 (S-2R)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ
1.8e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	0	0	0.00	100.00
3.8e+01	5.6e+01	0	0	0.00	100.00
5.6e+01	8.3e+01	0	0	0.00	100.00
8.3e+01	1.2e+02	0	0	0.00	100.00
1.2e+02	1.8e+02	0	0	0.00	100.00
1.8e+02	2.6e+02	0	0	0.00	100.00
2.6e+02	3.8e+02	0	0	0.00	100.00
3.8e+02	5.6e+02	0	0	0.00	100.00
5.6e+02	8.3e+02	0	0	0.00	100.00
8.3e+02	1.2e+03	0	0	0.00	100.00
1.2e+03	1.8e+03	1	1	1.04	100.00
1.8e+03	2.6e+03	1	2	1.96	98.04

HISTOGRAM FOR COLUMN 32 (S-2R)

1.5e+03 xx
2.0e+03 xx

N	L	H	R	T	G	ANALYTICAL
C	C	C	C	C	C	VALUES
0.00	0.00	0	0	0	49	96.08
				0.00		

MAXIMUM = 2.00010e+03
MINIMUM = 1.50010e+03
GEOMETRIC MEAN = 1.73215e+03
GEOMETRIC DEVIATION = 1.22558e+00

TITLE
NONMAGNETIC CONCENTRATES

IN THE COMPUTATIONS PERFORMED TO PRODUCE THE FOLLOWING TABLE OF GEOMETRIC MEANS AND DEVIATIONS, ALL ELEMENTS ARE IGNORED WHERE ONE OR MORE OF THE UNQUALIFIED DATA VALUES IS LESS THAN THE ANALYTICAL LIMIT OF DETECTION SPECIFIED ON INPUT OR WHERE ANY DATA VALUES ARE QUALIFIED WITH THE G (GREATER THAN) CODE. DATA VALUES QUALIFIED WITH R OR W ARE NOT USED IN THE COMPUTATIONS. WHERE NONE OF THE DATA VALUES FOR AN ELEMENT ARE QUALIFIED THE MEAN AND DEVIATION SHOULD BE THE SAME AS THOSE GIVEN IN THE PRECEDING SECTION. WHERE DATA ARE QUALIFIED WITH THE CODES V, L, OR T, THE ESTIMATES OF GEOMETRIC MEAN AND DEVIATION ARE BASED ON A METHOD BY A. J. COHEN FOR TREATING CENSORED DISTRIBUTIONS. THE APPLICATION OF THIS METHOD TO GEOCHEMICAL PROBLEMS IS DESCRIBED IN SGS PROFESSIONAL PAPER 574-H. THE ESTIMATES ARE UNBIASED IN A STRICT SENSE ONLY WHERE THE DATA ARE DERIVED FROM A LOGNORMAL PARENT POPULATION, BUT EXPERIMENTS HAVE SHOWN THAT LARGE DEPARTURES FROM THIS REQUIREMENT MAY NOT GREATLY INVALIDATE THE RESULTS ACCEPTANCE AND USE OF THE ESTIMATES, HOWEVER, IS THE RESPONSIBILITY OF THE INDIVIDUAL.

ELEMENT	N	L	H	H	T	G	ANALYTICAL VALUES
X-COORD.	0	0	0	0	0	0	51
Y-COORD.	0	0	0	0	0	0	51
S-FE%	0	0	0	0	0	0	51
S-MG%	0	0	0	0	0	0	51
S-CA%	0	0	0	0	0	0	51
S-TI%	0	0	0	0	0	36	15
S-MN	0	0	0	0	0	0	51
S-H	10	24	0	0	0	0	0
S-NA	0	0	0	0	0	0	51
S-IF	21	21	0	0	0	0	9
S-CO	40	3	0	0	0	0	2
S-CP	3	7	0	0	0	0	41
S-CU	0	2	0	0	0	0	49
S-LA	0	0	0	0	0	0	51
S-PB	16	16	0	0	0	0	17
S-NI	43	0	0	0	0	0	8
S-PG	0	1	0	0	0	0	50
S-SC	2	1	0	0	0	0	48
S-SH	16	0	0	0	0	1	34
S-SP	0	0	0	0	0	0	45
S-V	0	2	0	0	0	0	49
S-Y	0	0	0	0	0	0	51
S-ZN	49	0	0	0	0	0	2
S-ZP	0	0	0	0	0	49	2

TITLE

ELEMENT	GEOMETRIC MEAN	GEOMETRIC DEVIATION	REMARKS
X-CORRD.	546686.148438	1.01	51 SAMPLES AND 51 ANALYTICAL VALUES.
Y-CORRD.	*****	1.00	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-FFZ	0.822368	1.73	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-FGZ	0.213403	2.01	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CAZ	4.901503	1.76	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-TTZ	*****	*****	36 GREATER THAN VALUES. NO COMPUTATIONS.
S-MN	594.030914	1.50	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-H	1.903070	10.30	42 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-IA	388.723179	2.51	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-RE	0.580017	3.35	42 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-CO	0.776832	3.83	49 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-CP	41.135003	3.07	10 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-CU	21.984219	2.13	2 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-LA	493.835251	1.89	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-MH	32.403862	1.56	34 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-NI	2.028890	4.07	43 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-IR	51.527221	2.62	1 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-SC	36.919091	1.96	3 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-SN	*****	*****	1 GREATER THAN VALUES. NO COMPUTATIONS.
S-SH	277.681332	1.88	6 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-V	78.327747	1.74	2 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-Y	730.287590	1.83	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-ZN	0.020413	*****	42 NOT DETECTED, LESS THAN, OR TRACE VALUES.
S-ZP	*****	*****	49 GREATER THAN VALUES. NO COMPUTATIONS.
			9 REPORTED VALUES.
			9 REPORTED VALUES.
			2 REPORTED VALUES.
			41 REPORTED VALUES.
			49 REPORTED VALUES.
			17 REPORTED VALUES.
			8 REPORTED VALUES.
			50 REPORTED VALUES.
			48 REPORTED VALUES.
			45 REPORTED VALUES.
			49 REPORTED VALUES.
			2 REPORTED VALUES.

TITLE INPUT ID N M ***** OPTIONS*****
MAGNETIC CONCENTRATES -STATPAC - 51 33 1 0 0 0 0 0 0 0

NUMBER OF SELECTED COLUMNS = 33

SELECTED COLUMN INDICES

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33							

COLUMN IDENTIFIERS

X-COORD.	Y-COORD.	S-FEZ	S-MGX	S-CAZ	S-TIX	S-MN	S-AG	S-AS	S-AU
S-B	S-BA	S-BF	S-HI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO
S-NB	S-NI	S-PR	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y
S-ZN	S-ZR	S-TH							

NUMBER OF SELECTED ROW PAIRS = 1

SELECTED ROW PAIRS

1- 51

SPECIFIED LIMITS OF DETECTION

1.00000	1.00000	0.10000	0.05000	0.10000	0.00500	20.00000	1.00000	500.00000	20.00000
20.00000	50.00000	2.00000	20.00000	50.00000	10.00000	20.00000	10.00000	50.00000	10.00000
50.00000	10.00000	20.00000	200.00000	10.00000	20.00000	200.00000	20.00000	100.00000	20.00000
500.00000	20.00000	200.00000							

THE COMPUTATIONS TO FOLLOW ARE INTENDED TO SUMMARIZE GEOCHEMICAL DATA ENTERED ON USGS STANDARD 10 VARIABLE (G FORMAT), DATA CARDS OR ON A USGS STATPAC TAPE. THE FOLLOWING ALPHA CODES ARE USED WITH THE DATA AS DESCRIBED IN USGS PROGRAM DOCUMENTATION D0092- N = NOT DETECTED, L = LESS THAN, G = GREATER THAN, T = TRACE, H = INTERFERENCE, AND B = BLANK OR NO DATA. THE HISTOGRAMS AND STATISTICS ARE DERIVED ON THE ASSUMPTION THAT THE DATA ARE MORE PROPERLY TREATED ON A LOGARITHMIC, RATHER THAN ARITHMETIC, BASIS. SHOULD THIS NOT BE THE CASE FOR YOUR DATA, OR ANY PART OF IT, IT IS SUGGESTED THAT YOU USE USGS PROGRAMS D0092, D0001, D0036, D0039, AND D0010 WHICH ALLOW GREATER FLEXIBILITY IN COMPUTATIONAL PROCEDURES.

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MAGNETIC CONCENTRATES

THE LISTING OF DATA ON THE FOLLOWING PAGES IS SUITABLE FOR OPEN-FILE TYPE PUBLICATIONS. USGS PROGRAM D0039 PROVIDES THE SAME TYPE OF LISTING BUT ALLOWS DELETION AND/OR REORDERING OF ELEMENTS AS WELL AS DELETION OF SELECTED SAMPLES. NOTE THAT THE RIGHT-MOST ZERO DIGITS OF EACH DATA VALUE MAY OR MAY NOT BE SIGNIFICANT. IT IS SUGGESTED THAT A FOOTNOTE TO THIS EFFECT BE PLACED ON THE LISTING BEFORE IT IS PLACED ON OPEN-FILE.

TITLE
MAGNETIC CONCENTRATES

SAMPLE	X-COORD.	Y-COORD.	S-FEZ	S-MG%	S-CAZ	S-TIZ	S-MN	S-AG	S-AS	S-AU
8AR001C	*****	*****	20.0000	3.0000	7.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR002C	*****	*****	20.0000	2.0000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR003C	*****	*****	30.0000	1.5000	1.5000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR004C	*****	*****	20.0000	1.5000	1.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR005C	*****	*****	30.0000	1.5000	1.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR006C	*****	*****	30.0000	1.5000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR008C	*****	*****	30.0000	1.5000	2.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR009C	*****	*****	20.0000	2.0000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR016C	*****	*****	20.0000	2.0000	5.0000	2.0000G	10001.0000G	1.0000N	500.0000N	20.0000N
8AR018C	*****	*****	20.0000	1.5000	5.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR019C	*****	*****	20.0000	1.5000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR021C	*****	*****	15.0010	2.0000	5.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR022C	*****	*****	20.0000	1.0000	1.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR023C	*****	*****	20.0000	1.5000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR024C	*****	*****	30.0000	1.5000	2.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR027C	*****	*****	20.0000	2.0000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR030C	*****	*****	30.0000	1.5000	1.5000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR032C	*****	*****	30.0000	1.5000	1.5000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR037C	*****	*****	30.0000	2.0000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR039C	*****	*****	20.0000	1.5000	3.0000	2.0000G	10001.0000G	1.0000N	500.0000N	20.0000N
8AR040C	*****	*****	30.0000	1.5000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR044C	*****	*****	30.0000	1.5000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR047C	*****	*****	20.0000	1.5000	5.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR048C	*****	*****	20.0000	2.0000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR050C	*****	*****	20.0000	1.5000	0.7000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR051C	*****	*****	30.0000	2.0000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR052C	*****	*****	30.0000	1.5000	3.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR053C	*****	*****	20.0000	2.0000	5.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR054C	*****	*****	20.0000	2.0000	3.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR055C	*****	*****	20.0000	2.0000	3.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR056C	*****	*****	20.0000	3.0000	7.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR057C	*****	*****	15.0010	3.0000	10.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR059C	*****	*****	30.0000	2.0000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR060C	*****	*****	30.0000	0.7000	1.5000	2.0000G	3000.1000	1.0000N	500.0000N	20.0000N
8AR061C	*****	*****	30.0000	1.0000	1.5000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR062C	*****	*****	20.0000	2.0000	3.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR063C	*****	*****	30.0000	1.0000	1.5000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR064C	*****	*****	20.0000	3.0000	7.0000	2.0000G	5000.0000	1.0000N	500.0000N	20.0000N
8AR065C	*****	*****	20.0000	2.0000	2.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR066C	*****	*****	20.0000	2.0000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR067C	*****	*****	30.0000	1.5000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR068C	*****	*****	15.0010	3.0000	7.0000	2.0000	10001.0000G	1.0000N	500.0000N	20.0000N
8AR069C	*****	*****	15.0010	1.0000	7.0000	2.0000	5000.0000	1.0000N	500.0000N	20.0000N
8AR070C	*****	*****	20.0000	1.5000	3.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR073C	*****	*****	30.0000	1.0000	1.0000	2.0000G	10001.0000G	1.0000N	500.0000N	20.0000N
8AR074C	*****	*****	30.0000	1.5000	2.0000	2.0000G	7000.0000	1.0000N	500.0000N	20.0000N
8AR076C	*****	*****	20.0000	0.7000	1.5000	2.0000G	10001.0000G	1.0000N	500.0000N	20.0000N
8AR077C	*****	*****	20.0000	1.5000	3.0000	2.0000G	10001.0000G	1.0000N	500.0000N	20.0000N
8AR078C	*****	*****	20.0000	3.0000	5.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N
8AR079C	*****	*****	20.0000	3.0000	5.0000	2.0000G	10001.0000	1.0000N	500.0000N	20.0000N

TITLE
MAGNETIC CONCENTRATES

SAMPLE	S-B	S-BA	S-BE	S-BI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO
8AR001C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	200.0100	50.0000	10.0000N
8AR002C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	500.0000	200.0100	300.0000	10.0000N
8AR003C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	500.0000	150.0100	150.0100	10.0000N
8AR004C	20.0000N	200.0100	2.0000N	20.0000N	50.0000N	50.0000	500.0000	200.0100	50.0000L	10.0000N
8AR005C	20.0000N	100.0100	2.0000N	20.0000N	50.0000N	70.0010	700.0100	150.0100	50.0000L	10.0000N
8AR006C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	30.0000	500.0000	150.0100	300.0000	10.0000N
8AR008C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	150.0100	500.0000	10.0000N
8AR009C	20.0000L	700.0100	2.0000N	20.0000N	50.0000N	70.0010	1000.0000	150.0100	200.0100	10.0000N
8AR016C	20.0000L	300.0000	2.0000N	20.0000N	50.0000N	30.0000	1000.0000	150.0100	500.0000	10.0000N
8AR018C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	200.0100	700.0100	10.0000N
8AR019C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	500.0000	200.0100	300.0000	10.0000N
8AR021C	20.0000N	1500.1000	2.0000N	20.0000N	50.0000N	30.0000	1000.0000	100.0100	300.0000	10.0000N
8AR022C	20.0000L	200.0100	2.0000N	20.0000N	50.0000N	70.0010	300.0000	200.0100	50.0000L	10.0000N
8AR023C	20.0000L	700.0100	2.0000N	20.0000N	50.0000N	50.0000	700.0100	200.0100	200.0100	10.0000N
8AR024C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	30.0000	700.0100	150.0100	700.0100	10.0000N
8AR027C	20.0000N	700.0100	2.0000N	20.0000N	50.0000N	30.0000	700.0100	150.0100	700.0100	10.0000N
8AR030C	20.0000N	200.0100	2.0000N	20.0000N	50.0000N	50.0000	700.0100	100.0100	500.0000	10.0000N
8AR032C	20.0000N	200.0100	2.0000N	20.0000N	50.0000N	70.0010	300.0000	100.0100	50.0000	10.0000N
8AR037C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	100.0100	150.0100	10.0000N
8AR039C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	30.0000	700.0100	100.0100	700.0100	10.0000N
8AR040C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	100.0100	500.0000	10.0000N
8AR044C	20.0000N	700.0100	2.0000N	20.0000N	50.0000N	50.0000	700.0100	300.0000	300.0000	10.0000N
8AR047C	20.0000L	300.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	150.0100	50.0000	10.0000N
8AR048C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	50.0000	700.0100	200.0100	200.0100	10.0000N
8AR050C	20.0000N	2000.1000	2.0000N	20.0000N	50.0000N	30.0000	300.0000	150.0100	150.0100	10.0000N
8AR051C	20.0000N	700.0100	2.0000N	20.0000N	50.0000N	30.0000	1000.0000	150.0100	200.0100	10.0000N
8AR052C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	30.0000	1000.0000	150.0100	1000.0000	10.0000N
8AR053C	20.0000N	200.0100	2.0000L	20.0000N	50.0000N	20.0000	700.0100	150.0100	200.0100	10.0000N
8AR054C	20.0000N	500.0000	2.0000L	20.0000N	50.0000N	30.0000	300.0000	300.0000	150.0100	10.0000L
8AR055C	20.0000N	500.0000	2.0000L	20.0000N	50.0000N	20.0000	300.0000	300.0000	150.0100	10.0000N
8AR056C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	100.0100	500.0000	10.0000N
8AR057C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	70.0010	200.0100	10.0000N
8AR059C	30.0000	500.0000	2.0000L	20.0000N	50.0000N	30.0000	700.0100	100.0100	500.0000	10.0000N
8AR060C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	50.0000	100.0100	100.0100	300.0000	10.0000N
8AR061C	100.0100	500.0000	2.0000N	20.0000N	50.0000N	50.0000	200.0100	100.0100	300.0000	10.0000L
8AR062C	50.0000	500.0100	2.0000N	20.0000N	50.0000N	50.0000	1500.1000	100.0100	200.0100	10.0000N
8AR063C	20.0000N	500.0000	2.0000N	20.0000N	50.0000N	50.0000	200.0100	100.0100	200.0100	10.0000N
8AR064C	20.0000L	300.0000	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	100.0100	500.0000	10.0000N
8AR065C	20.0000N	700.0100	2.0000N	20.0000N	50.0000N	30.0000	500.0000	150.0100	300.0000	10.0000N
8AR066C	20.0000L	500.0000	2.0000N	20.0000N	50.0000N	50.0000	1000.0000	100.0100	500.0000	10.0000N
8AR067C	20.0000L	300.0000	2.0000N	20.0000N	50.0000N	30.0000	500.0000	150.0100	500.0000	10.0000N
8AR068C	20.0000N	300.0000	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	100.0100	700.0100	10.0000N
8AR069C	70.0010	500.0000	2.0000L	20.0000N	50.0000N	50.0000	200.0100	100.0100	100.0100	10.0000N
8AR070C	20.0000N	300.0000	2.0000L	20.0000N	50.0000N	20.0000	150.0100	300.0000	150.0100	10.0000N
8AR073C	20.0000N	700.0100	2.0000L	20.0000N	50.0000N	50.0000	500.0000	300.0000	500.0000	10.0000N
8AR074C	20.0000N	500.0000	2.0000L	20.0000N	50.0000N	30.0000	500.0000	300.0000	150.0100	10.0000N
8AR076C	20.0000N	150.0100	2.0000N	20.0000N	50.0000N	30.0000	300.0000	100.0100	1500.1000	10.0000N
8AR077C	20.0000	200.0000	2.0000L	20.0000N	50.0000N	30.0000	300.0000	200.0100	500.0000	10.0000N
8AR078C	20.0000N	200.0100	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	50.0000	500.0000	10.0000N
8AR079C	20.0000N	200.0100	2.0000N	20.0000N	50.0000N	30.0000	1500.1000	50.0000	700.0100	10.0000N

TITLE
MAGNETIC CONCENTRATES

SAMPLE	S-NB	S-NI	S-PB	S-SB	S-SC	S-SM	S-SR	S-V	S-W	S-Y
8AR001C	20.0000L	100.0100	20.0000	200.0100W	150.0100	20.0000L	200.0100	500.0000	100.0100N	200.0100
8AR002C	20.0000N	100.0100	30.0000	200.0100N	100.0100	20.0000L	200.0100	500.0000	100.0100N	200.0100
8AR003C	20.0000N	70.0010	20.0000	200.0100N	100.0100	20.0000N	200.0100N	500.0000	100.0100N	200.0100
8AR004C	20.0000N	50.0000	20.0000	200.0100N	70.0010	20.0000N	200.0100N	500.0000	100.0100N	70.0010
8AR005C	20.0000N	70.0010	20.0000L	200.0100N	100.0100	20.0000N	200.0100N	500.0000	100.0100N	20.0000
8AR006C	20.0000	70.0010	30.0000	200.0100N	150.0100	70.0010	200.0100	500.0000	100.0100N	300.0000
8AR008C	20.0000L	70.0010	70.0010	200.0100N	100.0100	20.0000	200.0100L	500.0000	100.0100N	300.0000
8AR009C	20.0000L	100.0100	50.0000	200.0100N	100.0100	20.0000L	200.0100	700.0100	100.0100N	200.0100
8AR016C	20.0000N	100.0100	50.0000	200.0100N	150.0100	50.0000	200.0100L	500.0000	100.0100N	300.0000
8AR018C	20.0000L	100.0100	50.0000	200.0100N	100.0100	100.0100	200.0100	700.0100	100.0100N	150.0100
8AR019C	20.0000L	70.0010	70.0010	200.0100N	100.0100	20.0000L	200.0100	700.0100	100.0100N	200.0100
8AR021C	20.0000N	150.0100	70.0010	200.0100N	100.0100	20.0000L	200.0100N	500.0000	100.0100N	300.0000
8AR022C	20.0000N	50.0000	20.0000	200.0100N	70.0010	20.0000N	200.0100N	700.0100	100.0100N	70.0010
8AR023C	20.0000L	100.0100	70.0010	200.0100N	100.0100	20.0000L	200.0100	700.0100	100.0100N	300.0000
8AR024C	20.0000L	100.0100	20.0000L	200.0100N	150.0100	30.0000	200.0100N	300.0000	100.0100N	300.0000
8AR027C	20.0000L	150.0100	30.0000	200.0100N	150.0100	20.0000	200.0100L	300.0000	100.0100N	200.0100
8AR030C	20.0000L	100.0100	70.0010	200.0100N	100.0100	30.0000	200.0100N	700.0100	100.0100N	300.0000
8AR032C	20.0000N	70.0010	20.0000	200.0100N	100.0100	20.0000N	200.0100N	700.0100	100.0100N	30.0000
8AR037C	20.0000L	150.0100	30.0000	200.0100N	100.0100	20.0000	200.0100L	700.0100	100.0100N	100.0100
8AR039C	20.0000L	70.0010	50.0000	200.0100N	150.0100	50.0000	200.0100L	300.0000	100.0100N	300.0000
8AR040C	20.0000	100.0100	30.0000	200.0100N	150.0100	30.0000	200.0100N	500.0000	100.0100N	200.0100
8AR044C	20.0000L	200.0100	70.0010	200.0100N	100.0100	20.0000	200.0100N	700.0100	100.0100N	200.0100
8AR047C	20.0000L	30.0000	70.0010	200.0100N	100.0100	50.0000	200.0100	500.0000	100.0100N	300.0000
8AR048C	50.0000	150.0100	30.0000	200.0100N	70.0010	20.0000	200.0100L	700.0100	100.0100N	200.0100
8AR050C	50.0000	100.0100	100.0100	200.0100N	70.0010	20.0000	200.0100N	500.0000	100.0100N	300.0000
8AR051C	50.0000	150.0100	50.0000	200.0100N	100.0100	30.0000	200.0100N	500.0000	100.0100N	500.0000
8AR052C	50.0000	150.0100	50.0000	200.0100N	150.0100	30.0000	200.0100N	500.0000	100.0100N	500.0000
8AR053C	70.0010	70.0010	70.0010	200.0100N	100.0100	20.0000	200.0100L	500.0000	100.0100N	200.0100
8AR054C	70.0010	150.0100	30.0000	200.0100N	70.0010	20.0000L	200.0100L	300.0000	100.0100N	200.0100
8AR055C	70.0010	100.0100	20.0000	200.0100N	70.0010	20.0000L	200.0100L	500.0000	100.0100N	200.0100
8AR056C	50.0000	150.0100	50.0000	200.0100N	100.0100	20.0000	200.0100L	500.0000	100.0100N	300.0000
8AR057C	70.0010	150.0100	70.0010	200.0100N	150.0100	30.0000	200.0100L	500.0000	100.0100N	200.0100
8AR059C	50.0000	70.0010	70.0010	200.0100N	150.0100	100.0100	200.0100	300.0000	100.0100N	300.0000
8AR060C	70.0010	30.0000	50.0000	200.0100N	70.0010	30.0000	200.0100N	500.0000	100.0100N	150.0100
8AR061C	70.0010	50.0000	100.0100	200.0100N	100.0100	30.0000	200.0100	300.0000	100.0100N	200.0100
8AR062C	70.0010	70.0010	100.0100	200.0100N	150.0100	20.0000	200.0100L	500.0000	100.0100N	150.0100
8AR063C	70.0010	50.0000	70.0010	200.0100N	70.0010	20.0000	200.0100N	700.0100	100.0100N	150.0100
8AR064C	70.0010	200.0100	70.0010	200.0100N	150.0100	50.0000	200.0100	300.0000	100.0100N	500.0000
8AR065C	70.0010	150.0100	150.0100	200.0100N	100.0100	20.0000	200.0100N	500.0000	100.0100N	200.0100
8AR066C	50.0000	150.0100	70.0010	200.0100N	100.0100	30.0000	200.0100	500.0000	100.0100N	200.0100
8AR067C	70.0010	100.0100	50.0000	200.0100N	70.0010	20.0000	200.0100N	500.0000	100.0100N	200.0100
8AR068C	50.0000	150.0100	50.0000	200.0100N	150.0100	70.0010	200.0100L	300.0000	100.0100N	200.0100
8AR069C	50.0000L	50.0000	300.0000	200.0100N	50.0000	20.0000L	700.0100	500.0000	100.0100N	100.0100
8AR070C	50.0000	100.0100	30.0000	200.0100N	100.0100	100.0100	200.0100	200.0100	100.0100N	150.0100
8AR073C	50.0000	100.0100	30.0000	200.0100N	100.0100	30.0000	200.0100N	100.0100	100.0100N	500.0000
8AR074C	70.0010	150.0100	50.0000	200.0100N	100.0100	20.0000	200.0100L	200.0100	100.0100N	100.0100
8AR076C	70.0010	50.0000	50.0000	200.0100N	150.0100	100.0100	200.0100L	200.0100	100.0100N	500.0000
8AR077C	70.0010	100.0100	100.0100	200.0100N	100.0100	30.0000	500.0000	200.0100	100.0100N	300.0000
8AR078C	50.0000	100.0100	70.0010	200.0100N	150.0100	50.0000	200.0100	300.0000	100.0100N	300.0000
8AR079C	50.0000	100.0100	50.0000	200.0100N	100.0100	30.0000	200.0100N	300.0000	100.0100N	300.0000

TITLE
MAGNETIC CONCENTRATES

SAMPLE	S-ZN	S-7R	S-TH
BAR001C	1000.0000	1500.1000	200.0100H
BAR002C	2000.1000	1500.1000	200.0100H
BAR003C	1500.1000	2000.1000	200.0100H
BAR004C	1500.1000	2000.1000	200.0100H
BAR005C	500.0000	2000.1000	200.0100H
BAR006C	1500.1000	2000.1000	200.0100H
BAR008C	2000.1000	2000.1000G	200.0100H
BAR009C	1500.1000	1500.1000	200.0100H
BAR016C	1500.1000	2000.1000	200.0100H
BAR018C	1000.0000	1500.1000	200.0100H
BAR019C	2000.1000	1500.1000	200.0100H
BAR021C	500.0000	2000.1000	200.0100H
BAR022C	1500.1000	2000.1000	200.0100H
BAR023C	1000.0000	2000.1000	200.0100H
BAR024C	2000.1000	2000.1000G	200.0100H
BAR027C	1000.0000	2000.1000	200.0100H
BAR030C	2000.1000	2000.1000	200.0100H
BAR032C	1500.1000	1500.1000	200.0100H
BAR037C	1500.1000	2000.1000	200.0100H
BAR039C	1500.1000	2000.1000	200.0100H
BAR040C	2000.1000	2000.1000	200.0100H
BAR044C	1500.1000	2000.1000	200.0100H
BAR047C	1000.0000	1500.1000	200.0100H
BAR048C	1500.1000	2000.1000	200.0100H
BAR050C	2000.1000	2000.1000G	200.0100H
BAR051C	1500.1000	2000.1000G	200.0100H
BAR052C	1000.0000	2000.1000G	200.0100H
BAR053C	500.0000	2000.1000	200.0100H
BAR054C	500.0000	2000.1000	200.0100H
BAR055C	500.0000	2000.1000G	200.0100H
BAR056C	500.0000	2000.1000	200.0100H
BAR057C	500.0000L	1000.0000	200.0100H
BAR059C	1500.1000	2000.1000	200.0100H
BAR060C	3000.1000	2000.1000	200.0100H
BAR061C	3000.1000	2000.1000	200.0100H
BAR062C	700.0100	1500.1000	200.0100H
BAR063C	2000.1000	2000.1000	200.0100H
BAR064C	500.0000L	1500.1000	200.0100H
BAR065C	1500.1000	2000.1000	200.0100H
BAR066C	700.0100	700.0100	200.0100H
BAR067C	1500.1000	2000.1000	200.0100H
BAR068C	500.0000	1500.1000	200.0100H
BAR069C	700.0100	300.0000	200.0100H
BAR070C	1000.0000	2000.1000	200.0100H
BAR073C	3000.1000	2000.1000G	200.0100H
BAR074C	700.0100	2000.1000G	200.0100H
BAR076C	1500.1000	2000.1000	200.0100H
BAR077C	700.0100	1500.1000	200.0100H
BAR078C	700.0100	1500.1000	200.0100H
BAR079C	1500.1000	1500.1000	200.0100H

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MAGNETIC CONCENTRATES

SAMPLF	X-COORD.	Y-COORD.	S-FEZ	S-MGY	S-TAZ	S-TIY	S-MN	S-AG	S-AS	S-AU
BAR080C	*****	*****	20.0000	3.0000	5.0000	2.00006	7000.0000	1.00000	500.0000N	20.0000N

A470 GLUCHEMICAL SUMMARY - U S G S STATPAC (P1/23/78)

DATE 1/ 9/79

TITLE
MAGNETIC CONCENTRATES

SAMPLE	S-H	S-BA	S-DF	S-DI	S-CD	S-CD	S-CR	S-CU	S-LA	S-MO
8AR0806	20.0000L	70.0010	2.0000N	20.0000N	50.0000N	20.0000	1500.1000	30.0000	700.0100	10.0000N

DATE 11 9/79

TITLE

SAMPLE

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE		
MAGNETIC CONCENTRATES		
SAMPLE	S-2N	S-2R S-TH
8AR080C	500.0000L	2000.1000 200.0100W

TITLE
MAGNETIC CONCENTRATES

THE MAX AND MIN 0.20000e+01 FOR VARIABLE NO. 6 ARE THE SAME. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 8 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 9 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 10 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 13 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 14 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 15 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 20 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 24 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 29 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

VARIABLE NO. 33 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

A470 GEOCHEMICAL SUMMARY - U S G S, STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MAGNETIC CONCENTRATES

THE FREQUENCY DISTRIBUTIONS AND HISTOGRAMS ON THE FOLLOWING PAGES ARE ON LOGARITHMIC SCALES, AND EMPLOY THE SAME CLASS INTERVALS AS USED IN REPORTING 6-STEP SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES. IMPORTANT NOTE- THE STATISTICS GIVEN BELOW THE HISTOGRAMS ARE DERIVED ONLY FROM DATA VALUES WITHIN THE RANGES OF ANALYTICAL DETERMINATION, AND ARE, THEREFORE, BIASED IF DATA VALUES QUALIFIED WITH U, L, G, T, OR H CODES ARE PRESENT. SEE LATER SECTION OF OUTPUT FOR STATISTICAL ESTIMATES THAT ARE UNBIASED IN THIS REGARD. THE GEOMETRIC MEAN IS AN ESTIMATE OF "CENTRAL TENDENCY," OR OF A CHARACTERISTIC VALUE, OF A FREQUENCY DISTRIBUTION THAT IS APPROXIMATELY SYMMETRICAL ON A LOG SCALE, AND IS THEREFORE USEFUL FOR CHARACTERIZING MANY GEOCHEMICAL DISTRIBUTIONS. THE GEOMETRIC MEAN IS NOT AN ESTIMATE OF GEOCHEMICAL ABUNDANCE AND IS OF NO VALUE IN ESTIMATING RESERVES OR TOTAL AMOUNTS OF ELEMENTS PRESENT. SEE USGS PROFESSIONAL PAPER 574-B FOR FURTHER DISCUSSION. SEE USGS BULLETIN 1147E, PAGE 23, FOR EXPLANATION OF GEOMETRIC DEVIATION.

THE CUMULATIVE FREQUENCY PERCENTS GIVEN BELOW SHOULD BE PLOTTED AGAINST THE "LOMEP" LIMITS TO GIVE THE LEPELTYIER-TYPE CUMULATIVE CURVE.

GEOMETRIC MEAN = 5.46686e+05
GEOMETRIC DEVIATION = 1.00746e+00

	N	L	H	P	T	G	VAL DEF
	C	O	O	O	O	O	S1

0.00	0.00	0.00	0.00	0.00	0.00
------	------	------	------	------	------

MAXIMUM = 3.64760e+06
 MINIMUM = 3.63640e+06
 GEOMETRIC MEAN = 3.64045e+06
 GEOMETRIC DEVIATION = 1.00291e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 3 (S-FE2)

LIMITS		FREQ	PERCENT	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ	FREQ	FREQ
8.3e-02 -	1.2e-01	0	0.00	0.00	100.00
1.2e-01 -	1.8e-01	0	0.00	0.00	100.00
1.8e-01 -	2.6e-01	0	0.00	0.00	100.00
2.6e-01 -	3.8e-01	0	0.00	0.00	100.00
3.8e-01 -	5.6e-01	0	0.00	0.00	100.00
5.6e-01 -	8.3e-01	0	0.00	0.00	100.00
8.3e-01 -	1.2e+00	0	0.00	0.00	100.00
1.2e+00 -	1.8e+00	0	0.00	0.00	100.00
1.8e+00 -	2.6e+00	0	0.00	0.00	100.00
2.6e+00 -	3.8e+00	0	0.00	0.00	100.00
3.8e+00 -	5.6e+00	0	0.00	0.00	100.00
5.6e+00 -	8.3e+00	0	0.00	0.00	100.00
8.3e+00 -	1.2e+01	0	0.00	0.00	100.00
1.2e+01 -	1.8e+01	4	7.84	7.84	100.00
1.8e+01 -	2.6e+01	28	54.90	62.74	92.16
2.6e+01 -	3.8e+01	19	37.25	100.00	92.16

HISTOGRAM FOR COLUMN 3 (S-FE2)

1.5e+01 XXXXXXXX
2.0e+01 XX
3.0e+01 XX

N	L	H	R	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0.00	0.00	0.00	0.00	51

MAXIMUM = 3.00000e+01
MINIMUM = 1.50010e+01
GEOMETRIC MEAN = 2.27424e+01
GEOMETRIC DEVIATION = 1.25681e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 4 (S-MG%)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM		FREQ	FREQ CUM
3.8e-02	5.6e-02	0	0	0.00	100.00
5.6e-02	8.3e-02	0	0	0.00	100.00
8.3e-02	1.2e-01	0	0	0.00	100.00
1.2e-01	1.8e-01	0	0	0.00	100.00
1.8e-01	2.6e-01	0	0	0.00	100.00
2.6e-01	3.8e-01	0	0	0.00	100.00
3.8e-01	5.6e-01	0	0	0.00	100.00
5.6e-01	8.3e-01	2	2	3.92	100.00
8.3e-01	1.2e+00	5	7	9.80	96.08
1.2e+00	1.8e+00	21	28	41.18	86.27
1.8e+00	2.6e+00	15	43	29.41	45.10
2.6e+00	3.8e+00	7	51	15.69	15.69

HISTOGRAM FOR COLUMN 4 (S-MG%)

7.0e-01 xxxx
1.0e+00 xxxxxxxxxxxx
1.5e+00 xxx
2.0e+00 xxx
3.0e+00 xxx

ANALYTICAL				
N	L	H	T	G
0	0	0	0	0
0.00	0.00	0	0.00	0.00

MAXIMUM = 3.00000e+00
MINIMUM = 7.00000e-01
GEOMETRIC MEAN = 1.69752e+00
GEOMETRIC DEVIATION = 1.42566e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN: 5 (S-CA2)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FREQ	FREQ	CUM
8.3e-02	1.2e-01	0	0.00	100.00	
1.2e-01	1.8e-01	0	0.00	100.00	
1.8e-01	2.6e-01	0	0.00	100.00	
2.6e-01	3.8e-01	0	0.00	100.00	
3.8e-01	5.6e-01	0	0.00	100.00	
5.6e-01	8.3e-01	1	1.96	100.00	
8.3e-01	1.2e+00	3	5.88	98.04	
1.2e+00	1.8e+00	8	15.69	92.16	
1.8e+00	2.6e+00	4	7.84	76.47	
2.6e+00	3.8e+00	21	41.18	68.63	
3.8e+00	5.6e+00	8	15.69	27.45	
5.6e+00	8.3e+00	5	9.80	11.76	
8.3e+00	1.2e+01	1	1.96	1.96	

HISTOGRAM FOR COLUMN: 5 (S-CA2)

```

7.0e-01 XX
1.0e+00 XXXXXX
1.5e+00 XXXXXXXXXXXXXXXX
2.0e+00 XXXXXXXX
3.0e+00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
5.0e+00 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+00 XXXXXXXXXXXXX
1.0e+01 XX

```

N	L	H	B	T	G
0.00	0.00	0	0	0.00	0
					0.00

MAXIMUM = 1.00000e+01
MINIMUM = 7.00000e-01
GEOMETRIC MEAN = 2.86259e+00
GEOMETRIC DEVIATION = 1.79938e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 7 (S-MN)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	CUM	CUM	FREQ	FREQ	FREQ CUM	FREQ CUM
1.8e+01	2.6e+01	0	0	0.00	0.00	100.00	100.00
2.6e+01	3.8e+01	0	0	0.00	0.00	100.00	100.00
3.8e+01	5.6e+01	0	0	0.00	0.00	100.00	100.00
5.6e+01	8.3e+01	0	0	0.00	0.00	100.00	100.00
8.3e+01	1.2e+02	0	0	0.00	0.00	100.00	100.00
1.2e+02	1.8e+02	0	0	0.00	0.00	100.00	100.00
1.8e+02	2.6e+02	0	0	0.00	0.00	100.00	100.00
2.6e+02	3.8e+02	0	0	0.00	0.00	100.00	100.00
3.8e+02	5.6e+02	0	0	0.00	0.00	100.00	100.00
5.6e+02	8.3e+02	0	0	0.00	0.00	100.00	100.00
8.3e+02	1.2e+03	0	0	0.00	0.00	100.00	100.00
1.2e+03	1.8e+03	0	0	0.00	0.00	100.00	100.00
1.8e+03	2.6e+03	0	0	0.00	0.00	100.00	100.00
2.6e+03	3.8e+03	1	1	1.96	1.96	100.00	100.00
3.8e+03	5.6e+03	11	12	21.57	21.57	98.04	98.04
5.6e+03	8.3e+03	12	24	23.53	23.53	76.47	76.47
8.3e+03	1.2e+04	21	45	41.18	41.18	52.94	52.94

HISTOGRAM FOR COLUMN 7 (S-MN)

3.0e+03 XX
5.0e+03 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+03 XXXXXXXXXXXXXXXXXXXXXXXX
1.0e+04 XXXXXXXXXXXXXXXXXXXXXXXX

ANALYTICAL		VALUES	
N	L	H	T
0.00	0	0	0
0.00	0.00	0	0
		0.00	11.76

MAXIMUM = 1.00010e+04
MINIMUM = 3.00010e+03
GEOMETRIC MEAN = 7.47324e+03
GEOMETRIC DEVIATION = 1.37408e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 11 (S-R)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER		CUM	FREQ	FREQ CUM
1.8e+01	2.6e+01	1	1	1.06	9.86
2.6e+01	3.8e+01	1	2	1.06	7.84
3.8e+01	5.6e+01	1	3	1.06	5.88
5.6e+01	8.3e+01	1	4	1.06	3.92
8.3e+01	1.2e+02	1	5	1.06	1.06

HISTOGRAM FOR COLUMN 11 (S-R)

2.0e+01 XX
3.0e+01 XX
5.0e+01 XX
7.0e+01 XX
1.0e+02 XX

N	L	H	H	T	G	ANALYTICAL
38	8	0	0	0	0	VALUES
74.51	15.69			0.00	0.00	5

MAXIMUM = 1.00010e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 4.01800e+01
GEOMETRIC DEVIATION = 1.90540e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 12 (S-BA)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWLR - UPPER		CUM	CUM	FREQ	FREQ CUM
3.8e+01 -	5.6e+01	0	0	0.00	100.00
5.6e+01 -	8.3e+01	1	1	1.96	100.00
8.3e+01 -	1.2e+02	1	2	1.96	98.04
1.2e+02 -	1.8e+02	1	3	1.96	96.08
1.8e+02 -	2.6e+02	8	11	15.69	94.12
2.6e+02 -	3.8e+02	17	28	33.33	78.43
3.8e+02 -	5.6e+02	14	42	27.45	45.10
5.6e+02 -	8.3e+02	7	49	13.73	17.65
8.3e+02 -	1.2e+03	0	49	0.00	3.92
1.2e+03 -	1.8e+03	1	50	1.96	3.92
1.8e+03 -	2.6e+03	1	51	1.96	1.96

HISTOGRAM FOR COLUMN 12 (S-BA)

7.0e+01 XX
1.0e+02 XX
1.5e+02 XX
2.0e+02 XXXXXXXXXXXXXXXX
3.0e+02 XXXXXXXXXXXXXXXX
5.0e+02 XXXXXXXXXXXXXXXX
7.0e+02 XXXXXXXXXXXXXXXX
1.0e+03
1.5e+03 XX
2.0e+03 XX

P.	L	H	S	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 2.00010e+03
MINIMUM = 2.00010e+01
GEOMETRIC MEAN = 3.65698e+02
GEOMETRIC DEVIATION = 1.82177e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (1/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 16 (S-CO)

LIMITS		FFED	FREQ	CUM	PERCENT	PERCENT	PERCENT	CUM
LOWER - UPPER								
8.3e+00	- 1.2e+01	0	0	0	0.00	100.00		
1.2e+01	- 1.8e+01	0	0	0	0.00	100.00		
1.8e+01	- 2.6e+01	4	4	4	7.84	100.00		
2.6e+01	- 3.8e+01	22	26	26	43.14	92.16		
3.8e+01	- 5.6e+01	21	47	47	41.18	49.02		
5.6e+01	- 8.3e+01	4	51	51	7.84	7.84		

HISTOGRAM FOR COLUMN 16 (S-CO)

2.0e+01 XXXXXXXX
3.0e+01 XX
5.0e+01 XX
7.0e+01 XXXXXXXX

N	L	H	R	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0.00	0.00	0.00	0.00	51

MAXIMUM = 7.00010e+01
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 3.83284e+01
GEOMETRIC DEVIATION = 1.41186e+00

DATE 11/01/79

A476 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 17 (S-CR)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
1.8e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	0	0	0.00	100.00
3.8e+01	5.6e+01	0	0	0.00	100.00
5.6e+01	8.3e+01	0	0	0.00	100.00
8.3e+01	1.2e+02	1	1	1.96	100.00
1.2e+02	1.8e+02	2	3	3.92	98.04
1.8e+02	2.6e+02	3	6	5.88	94.12
2.6e+02	3.8e+02	6	12	11.76	82.34
3.8e+02	5.6e+02	10	22	19.61	76.47
5.6e+02	8.3e+02	15	37	29.41	56.86
8.3e+02	1.2e+03	6	43	11.76	27.45
1.2e+03	1.8e+03	8	51	15.69	15.69

HISTOGRAM FOR COLUMN 17 (S-CR)

1.0e+02 xx
1.5e+02 xxxx
2.0e+02 xxxxxx
3.0e+02 xxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxxxxxxxxxxxxxxxxxx
1.0e+03 xxxxxxxxxxxxxxxx
1.5e+03 xxxxxxxxxxxxxxxxxxxx

ANALYTICAL			
N	L	H	U
0	0	0	0
0.00	0.00	0.00	0.00

MAXIMUM = 1.50010e+03
MINIMUM = 1.00010e+02
GEOMETRIC MEAN = 5.86811e+02
GEOMETRIC DEVIATION = 1.95594e+00

DATE 1 / 9 / 79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 1R (S-CU)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
8.3e+00	1.2e+01	0	0	0.00	100.00
1.2e+01	1.8e+01	0	0	0.00	100.00
1.8e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	1	1	1.96	100.00
3.8e+01	5.6e+01	2	3	3.92	98.04
5.6e+01	8.3e+01	1	4	1.96	96.12
8.3e+01	1.2e+02	18	22	35.29	92.16
1.2e+02	1.8e+02	15	37	29.41	56.86
1.8e+02	2.6e+02	9	46	17.65	27.45
2.6e+02	3.8e+02	5	51	9.80	9.80

HISTOGRAM FOR COLUMN 1R (S-CU)

3.0e+01 XX
5.0e+01 XXXX
7.0e+01 XX
1.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.5e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
2.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
3.0e+02 XXXXXXXXXXXXXXXX

ANALYTICAL		VALUES	
N	L	B	T
0.00	0	0	0
0.00	0.00	0	0.00

MAXIMUM = 3.00000e+02
MINIMUM = 3.00000e+01
GEOMETRIC MEAN = 1.33852e+02
GEOMETRIC DEVIATION = 1.59943e+00

DATE 1 / 9 / 79

A470 GEOCHEMICAL SUMMARY - U S G S STAIPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 19 (S-LA)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT FREQ CUM
LOWER - UPPER					
3.8e+01 -	5.6e+01	4	4	7.84	7.84
5.6e+01 -	8.3e+01	0	4	0.00	7.84
8.3e+01 -	1.2e+02	1	5	1.96	9.80
1.2e+02 -	1.8e+02	7	12	13.73	23.53
1.8e+02 -	2.6e+02	8	20	15.69	39.22
2.6e+02 -	3.8e+02	8	28	15.69	54.91
3.8e+02 -	5.6e+02	11	39	21.57	76.48
5.6e+02 -	8.3e+02	8	47	15.69	92.17
8.3e+02 -	1.2e+03	1	48	1.96	94.13
1.2e+03 -	1.8e+03	1	49	1.96	96.09

HISTOGRAM FOR COLUMN 19 (S-LA)

5.0e+01 xxxxxxxx
7.0e+01
1.0e+02 xx
1.5e+02 xxxxxxxxxxxxxxxx
2.0e+02 xxxxxxxxxxxxxxxx
3.0e+02 xxxxxxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxxxxxx
1.0e+03 xx
1.5e+03 xx

ANALYTICAL		VALUES	
P	L	H	T
0	2	0	0
C.00	3.92	0	0.00

MAXIMUM = 1.50010e+03
MINIMUM = 5.00000e+01
GEOMETRIC MEAN = 2.93045e+02
GEOMETRIC DEVIATION = 2.24386e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/73/7P)

TITLE

MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 21 (S-NH)

LIMITS		FREQ		PERCENT	
LOWER - UPPER		CUR		FREQ CUM	
3.8e+01	5.6e+01	11	11	21.57	54.90
5.6e+01	9.3e+01	15	26	29.41	33.33

HISTOGRAM FOR COLUMN 21 (S-NH)

5.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX

ANALYTICAL		VALUES	
P		T	
15.68	29.41	0	0.00

MAXIMUM = 7.00010e+01
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 5.60831e+01
GEOMETRIC DEVIATION = 1.39677e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN: 22 (S-NI)

LIMITS	FREQ	FREQ CUM	PERCENT	PERCENT FREQ CUM
LOWER - UPPER				
6.3e+00 - 1.2e+01	0	0	0.00	100.00
1.2e+01 - 1.8e+01	0	0	0.00	100.00
1.8e+01 - 2.6e+01	0	0	0.00	100.00
2.6e+01 - 3.8e+01	2	2	5.92	100.00
3.8e+01 - 5.6e+01	6	8	11.76	96.08
5.6e+01 - 6.3e+01	11	19	21.57	84.31
6.3e+01 - 1.2e+02	17	36	33.33	62.75
1.2e+02 - 1.8e+02	13	49	25.49	29.41
1.8e+02 - 2.6e+02	2	51	3.92	3.92

HISTOGRAM FOR COLUMN: 22 (S-NI)

3.0e+01 XXXX
5.0e+01 XXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.5e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
2.0e+02 XXXX

N	L	H	B	T	G	ANALYTICAL VALUES
0.00	0	0	0	0.00	0.00	51

MAXIMUM = 2.00010e+02
MINIMUM = 3.00000e+01
GEOMETRIC MEAN = 9.27651e+01
GEOMETRIC DEVIATION = 1.5636e+00

DATE 1/ 7/79

A420 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 23 (S-PB)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
1.8e+01 -	2.6e+01	7	7	13.73	96.08
2.6e+01 -	3.8e+01	9	16	17.45	12.35
3.8e+01 -	5.0e+01	13	29	25.69	64.71
5.0e+01 -	8.3e+01	14	43	27.45	39.22
8.3e+01 -	1.2e+02	4	47	7.84	11.76
1.2e+02 -	1.8e+02	1	48	1.96	3.92
1.8e+02 -	2.6e+02	0	48	0.00	1.96
2.6e+02 -	3.8e+02	1	49	1.96	1.96

HISTOGRAM FOR COLUMN 23 (S-PB)

2.0e+01 XXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXX
1.5e+02 XX
2.0e+02 XX
3.0e+02 XX

N	L	H	B	T	G	ANALYTICAL
0.00	2	0	0	0	0	VALUES
	3.92			0.00	0.00	49

MAXIMUM = 3.00000e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 4.93540e+01
GEOMETRIC DEVIATION = 1.78388e+00

DATE 11/2/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 25 (S-SC)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
8.3e+00	1.2e+01	0	0	0.00	100.00
1.2e+01	1.8e+01	0	0	0.00	100.00
1.8e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	0	0	0.00	100.00
3.8e+01	5.6e+01	1	1	1.96	100.00
5.6e+01	8.3e+01	9	10	17.65	98.04
8.3e+01	1.2e+02	25	35	49.02	80.39
1.2e+02	1.8e+02	16	51	31.37	31.37

HISTOGRAM FOR COLUMN 25 (S-SC)

5.0e+01 XX
7.0e+01 XXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.5e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

N	L	H	H	T	G
P	0	0	0	0	0
0.00	0.00	0	0	0.00	0.00

ANALYTICAL
VALUES
51

MAXIMUM = 1.50010e+02
MINIMUM = 5.00000e+01
GEOMETRIC MEAN = 1.05205e+02
GEOMETRIC DEVIATION = 1.33274e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STAIPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 26 (S-SN)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	CUM	FREQ	CUM	FREQ	CUM	FREQ
1.8e+01	2.6e+01	12	12	23.53	70.59	70.59	70.59
2.6e+01	3.8e+01	13	25	25.40	47.06	47.06	47.06
3.8e+01	5.6e+01	5	30	0.80	21.57	21.57	21.57
5.6e+01	8.3e+01	2	32	3.02	11.76	11.76	11.76
8.3e+01	1.2e+02	4	36	7.84	7.84	7.84	7.84

HISTOGRAM FOR COLUMN 26 (S-SN)

2.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXXXXX
7.0e+01 XXXX
1.0e+02 XXXXXXXX

N		L		H		B		T		G		ANALYTICAL VALUES
5	10	10	10	0	0	0	0	0	0	0	0	
9.00	19.61							0.00		0.00		36

MAXIMUM = 1.00010e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 3.37118e+01
GEOMETRIC DEVIATION = 1.70767e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 27 (S-SR)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ
1.8e+02	2.6e+02	14	14	27.45	31.37
2.6e+02	3.8e+02	1	15	1.96	3.92
3.8e+02	5.6e+02	0	15	0.00	1.96
5.6e+02	8.3e+02	1	16	1.96	1.96

HISTOGRAM FOR COLUMN 27 (S-SP)

2.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
3.0e+02 XX
5.0e+02
7.0e+02 XX

N	L	H	R	T	G	ANALYTICAL
20	15	0	0	0	0	VALUES
39.22	29.41			0.00	0.00	16

MAXIMUM = 7.00010e+02
MINIMUM = 2.00010e+02
GEOMETRIC MEAN = 2.21850e+02
GEOMETRIC DEVIATION = 1.38083e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 28 (S-V)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ CUM		
1.8e+01 -	2.6e+01	0	0	0.00	100.00
2.6e+01 -	3.8e+01	0	0	0.00	100.00
3.8e+01 -	5.6e+01	0	0	0.00	100.00
5.6e+01 -	8.7e+01	0	0	0.00	100.00
8.7e+01 -	1.2e+02	1	1	1.96	100.00
1.2e+02 -	1.8e+02	1	2	1.96	98.04
1.8e+02 -	2.6e+02	6	6	7.84	96.08
2.6e+02 -	3.8e+02	12	18	23.53	98.24
3.8e+02 -	5.6e+02	22	40	43.14	64.71
5.6e+02 -	8.7e+02	11	51	21.57	71.57

HISTOGRAM FOR COLUMN 28 (S-V)

1.0e+02 XX
1.5e+02 XX
2.0e+02 XXXXXXXX
3.0e+02 XXXXXXXXXXXXXXXXXXXXXXXX
5.0e+02 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+02 XXXXXXXXXXXXXXXXXXXXXXXX

ANALYTICAL			
F	L	H	T
0	0	0	0
0.00	0.00	0	0.00
VALUES			
51			
0.00			

MAXIMUM = 7.00010e+02
MINIMUM = 1.00010e+02
GEOMETRIC MEAN = 4.18879e+02
GEOMETRIC DEVIATION = 1.57157e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 30 (S-Y)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	CUM	FREQ	CUM
1.8e+01	2.6e+01	1	1	1.96	100.00	1.96	100.00
2.6e+01	3.8e+01	1	2	1.96	98.04	1.96	98.04
3.8e+01	5.6e+01	0	2	0.00	96.08	0.00	96.08
5.6e+01	8.3e+01	2	4	3.92	92.16	3.92	92.16
8.3e+01	1.2e+02	3	7	5.88	86.27	5.88	86.27
1.2e+02	1.8e+02	5	12	9.50	76.47	9.50	76.47
1.8e+02	2.6e+02	18	30	35.29	41.18	35.29	41.18
2.6e+02	3.8e+02	16	46	31.37	9.80	31.37	9.80
3.8e+02	5.6e+02	5	51	9.80			

HISTOGRAM FOR COLUMN 30 (S-Y)

2.0e+01 XX
3.0e+01 XX
5.0e+01
7.0e+01 XXXX
1.0e+02 XXXXXX
1.5e+02 XXXXXXXXXXXX
2.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
3.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
5.0e+02 XXXXXXXXXXXX

ANALYTICAL		VALUES	
F	L	R	T
0.00	0.00	0	0
		0.00	0.00

MAXIMUM = 5.00000e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 2.04076e+02
GEOMETRIC DEVIATION = 1.87500e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 31 (S-ZN)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FREQ	FREQ	CUM
3.8e+02	5.6e+02	7	13.73	13.73	94.12
5.6e+02	6.3e+02	6	11.76	11.76	80.39
6.3e+02	1.2e+03	7	13.73	13.73	68.63
1.2e+03	1.8e+03	17	33.33	33.33	54.90
1.8e+03	2.6e+03	8	15.69	15.69	21.57
2.6e+03	3.8e+03	3	5.88	5.88	5.88

HISTOGRAM FOR COLUMN 31 (S-ZN)

5.0e+02 XXXXXXXXXXXXXXXX
7.0e+02 XXXXXXXXXXXXXXXX
1.0e+03 XXXXXXXXXXXXXXXX
1.5e+03 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
2.0e+03 XXXXXXXXXXXXXXXXXXXXXXXX
3.0e+03 XXXXXXX

N	L	H	R	T	G	ANALYTICAL
0	3	0	0	0	0	VALUES
0.00	5.88			0.00	0.00	48

MAXIMUM = 3.00010e+03
MINIMUM = 5.00000e+02
GEOMETRIC MEAN = 1.19980e+03
GEOMETRIC DEVIATION = 1.6849e+00

TITLE
MAGNETIC CONCENTRATES

FREQUENCY TABLE FOR COLUMN 32 (S-ZR)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT
LOWER	UPPER			FREQ	FREQ CUM
1.8e+11	2.6e+01	1	0	0.00	100.00
2.6e+11	3.8e+01	0	0	0.00	100.00
3.8e+11	5.6e+01	0	0	0.00	100.00
5.6e+11	8.3e+01	0	0	0.00	100.00
8.3e+11	1.2e+02	0	0	0.00	100.00
1.2e+12	1.8e+02	0	0	0.00	100.00
1.8e+12	2.6e+02	0	0	0.00	100.00
2.6e+12	3.8e+02	1	1	1.96	100.00
3.8e+12	5.6e+02	0	1	0.00	98.04
5.6e+12	8.3e+02	1	2	1.96	96.08
8.3e+12	1.2e+03	1	3	1.96	94.12
1.2e+03	1.8e+03	13	16	25.49	68.63
1.8e+03	2.6e+03	27	43	52.94	

HISTOGRAM FOR COLUMN 32 (S-ZR)

3.0e+02 XX
5.0e+02
7.0e+02 XX
1.0e+03 XX
1.5e+03 XX
2.0e+03 XX

N	L	H	H	T	G	ANALYTICAL
0	0	0	0	0	R	VALUES
0.00	0.00			0.00	15.69	43

MAXIMUM = 2.00010e+03
MINIMUM = 3.00000e+02
GEOMETRIC MEAN = 1.68467e+03
GEOMETRIC DEVIATION = 1.41160e+00

TITLE
MAGNETIC CONCENTRATES

IN THE COMPUTATIONS PERFORMED TO PRODUCE THE FOLLOWING TABLE OF GEOMETRIC MEANS AND DEVIATIONS, ALL ELEMENTS ARE IGNORED WHERE ONE OR MORE OF THE UNQUALIFIED DATA VALUES IS LESS THAN THE ANALYTICAL LIMIT OF DETECTION SPECIFIED ON INPUT OR WHERE ANY DATA VALUES ARE QUALIFIED WITH THE G (GREATER THAN) CODE. DATA VALUES QUALIFIED WITH H OR H ARE NOT USED IN THE COMPUTATIONS. WHERE NONE OF THE DATA VALUES FOR AN ELEMENT ARE QUALIFIED THE MEAN AND DEVIATION SHOULD BE THE SAME AS THOSE GIVEN IN THE PRECEDING SECTION. WHERE DATA ARE QUALIFIED WITH THE CODES N, L, OR T, THE ESTIMATES OF GEOMETRIC MEAN AND DEVIATION ARE BASED ON A METHOD BY A. J. COHEN FOR TREATING CENSORED DISTRIBUTIONS. THE APPLICATION OF THIS METHOD TO GEOCHEMICAL PROBLEMS IS DESCRIBED IN SGS PROFESSIONAL PAPER 574-B. THE ESTIMATES ARE UNBIASED IN A STRICT SENSE ONLY WHERE THE DATA ARE DERIVED FROM A LOGNORMAL PARENT POPULATION. BUT EXPERIMENTS HAVE SHOWN THAT LARGE DEPARTURES FROM THIS REQUIREMENT MAY NOT GREATLY INVALIDATE THE RESULTS ACCEPTANCE AND USE OF THE ESTIMATES, HOWEVER, IS THE RESPONSIBILITY OF THE INDIVIDUAL.

ELEMENT	N	L	H	R	T	G	ANALYTICAL VALUES
X-CORR.	0	0	0	0	0	0	51
Y-CORR.	0	0	0	0	0	0	51
S-FE%	0	0	0	0	0	0	51
S-MC%	0	0	0	0	0	0	51
S-CA%	0	0	0	0	0	0	51
S-MN	0	0	0	0	0	6	45
S-U	38	8	0	0	0	0	5
S-RA	0	0	0	0	0	0	51
S-CO	0	0	0	0	0	0	51
S-CP	0	0	0	0	0	0	51
S-CU	0	0	0	0	0	0	51
S-LA	0	2	0	0	0	0	49
S-PB	8	15	0	0	0	0	28
S-NI	0	0	0	0	0	0	51
S-FH	0	2	0	0	0	0	49
S-FC	0	0	0	0	0	0	51
S-SM	5	10	0	0	0	0	36
S-SR	20	15	0	0	0	0	16
S-V	0	0	0	0	0	0	51
S-Y	0	0	0	0	0	0	51
S-ZH	0	3	0	0	0	0	48
S-ZR	0	0	0	0	0	8	43

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A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (C1/23/78)

TITLE

ELEMENT	GEOMETRIC MEAN	GEOMETRIC DEVIATION	REMARKS
X-COORD.	546646.148438	1.01	51 SAMPLES AND 51 ANALYTICAL VALUES.
Y-COORD.	*****	1.00	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-FE2	22.742377	1.26	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-MC2	1.692518	1.43	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CA2	2.862594	1.40	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-PH	*****	*****	6 GREATER THAN VALUES. NO COMPUTATIONS.
S-M	1.509666	6.81	46 NOT DETECTED, LESS THAN, OR TRACE VALUES. 5 REPORTED VALUES.
S-PA	365.697586	1.82	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CO	38.328437	1.41	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CR	586.810593	1.96	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CU	133.651748	1.60	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-LA	267.101322	2.50	2 NOT DETECTED, LESS THAN, OR TRACE VALUES. 49 REPORTED VALUES.
S-MG	*****	*****	2 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-KT	92.765104	1.56	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-PH	46.921408	1.86	2 NOT DETECTED, LESS THAN, OR TRACE VALUES. 49 REPORTED VALUES.
S-SC	105.205301	1.33	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-IN	24.398685	2.02	15 NOT DETECTED, LESS THAN, OR TRACE VALUES. 36 REPORTED VALUES.
S-SP	137.428408	1.58	35 NOT DETECTED, LESS THAN, OR TRACE VALUES. 16 REPORTED VALUES.
S-V	419.876681	1.57	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-Y	204.975655	1.47	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-ZN	1105.919449	1.83	3 NOT DETECTED, LESS THAN, OR TRACE VALUES. 48 REPORTED VALUES.
S-ZP	*****	*****	8 GREATER THAN VALUES. NO COMPUTATIONS.

A470 GEOCHEMICAL SUMMARY - U S C S STATPAC (C1/23/78)

DATE 1/ 9/79

TITLE INPUT ID N M ***** OPTIONS*****
MESH SAMPLES -STATPAC - 51 33 1 0 0 0 0 0 0 0

NUMBER OF SELECTED COLUMNS = 33

SELECTED COLUMN INDICES

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33							30

COLUMN IDENTIFIERS

X-COORD.	Y-COORD.	S-FEX	S-MCZ	S-CAZ	S-TIX	S-MN	S-AG	S-AS	S-AU
S-H	S-BA	S-RF	S-BI	S-CD	S-CC	S-CR	S-CU	S-LA	S-MO
S-NB	S-NI	S-PB	S-SB	S-SC	S-SN	S-SP	S-V	S-W	S-Y
S-ZN	S-ZR	S-TH							

NUMBER OF SELECTED ROW PAIRS = 1

SELECTED ROW PAIRS

1- 51

SPECIFIED LIMITS OF DETECTION

1.00000	1.00000	0.10000	0.05000	0.10000	0.00500	20.00000	1.00000	500.00000	20.00000
20.00000	50.00000	2.00000	20.00000	50.00000	10.00000	20.00000	10.00000	50.00000	10.00000
50.00000	10.00000	20.00000	200.00000	10.00000	20.00000	200.00000	20.00000	100.00000	20.00000
500.00000	20.00000	200.00000							

THE COMPUTATIONS TO FOLLOW ARE INTENDED TO SUMMARIZE GEOCHEMICAL DATA ENTERED ON USGS STANDARD 10 VARIABLE (G FORMAT), DATA CARDS OR ON A USGS STATPAC TAPE. THE FOLLOWING ALPHA CODES ARE USED WITH THE DATA AS DESCRIBED IN USGS PROGRAM DOCUMENTATION D0092- N = NOT DETECTED, L = LESS THAN, G = GREATER THAN, T = TRACE, H = INTERFERENCE, AND B = BLANK OR NO DATA. THE HISTOGRAMS AND STATISTICS ARE DERIVED ON THE ASSUMPTION THAT THE DATA ARE MORE PROPERLY TREATED ON A LOGARITHMIC, RATHER THAN ARITHMETIC, BASIS. SHOULD THIS NOT BE THE CASE FOR YOUR DATA, OR ANY PART OF IT, IT IS SUGGESTED THAT YOU USE USGS PROGRAMS D0092, D0001, D0076, D0039, AND D0010 WHICH ALLOW GREATER FLEXIBILITY IN COMPUTATIONAL PROCEDURES.

TITLE
MESH SAMPLES

THE LISTING OF DATA ON THE FOLLOWING PAGES IS SUITABLE FOR OPEN-FILE TYPE PUBLICATIONS. USGS PROGRAM 00030 PROVIDES THE SAME TYPE OF LISTING BUT ALLOWS DELETION AND/OR REORDERING OF ELEMENTS AS WELL AS DELETION OF SELECTED SAMPLES. NOTE THAT THE RIGHT-MOST ZERO DIGITS OF EACH DATA VALUE MAY OR MAY NOT BE SIGNIFICANT. IT IS SUGGESTED THAT A FOOTNOTE TO THIS EFFECT BE PLACED ON THE LISTING BEFORE IT IS PLACED ON OPEN-FILE.

TITLE
MESH SAMPLES

SAMPLE	X-COORD.	Y-COORD.	S-FEZ	S-MGX	S-CAZ	S-TIY	S-MN	S-AG	S-AS	S-AU
78AR056	*****	*****	7.0000	1.5000	1.5000	0.3000	1000.0000	0.5000N	200.0100N	10.0000N
78AR057	*****	*****	7.0000	1.0000	1.0000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR059	*****	*****	7.0000	0.7000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR060	*****	*****	5.0000	1.0000	1.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR061	*****	*****	15.0010	1.5000	1.0000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR062	*****	*****	7.0000	1.0000	1.0000	0.5000	1000.0000	0.5000N	200.0100N	10.0000N
78AR063	*****	*****	7.0000	1.0000	1.0000	0.5000	1500.1000	0.5000N	200.0100N	10.0000N
78AR064	*****	*****	5.0000	1.5000	0.7000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR065	*****	*****	20.0000G	1.5000	0.7000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR066	*****	*****	3.0000	1.5000	0.7000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR067	*****	*****	15.0010	1.5000	1.0000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR068	*****	*****	7.0000	1.5000	1.0000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR069	*****	*****	7.0000	1.5000	1.0000	0.5000	1500.1000	0.5000N	200.0100N	10.0000N
78AR070	*****	*****	15.0010	1.5000	1.5000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR073	*****	*****	7.0000	0.7000	0.5000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR079	*****	*****	7.0000	0.7000	0.7000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR080	*****	*****	15.0010	1.5000	1.0000	0.5000	1500.1000	1.5000	200.0100N	10.0000N
78AR084	*****	*****	20.0000	1.5000	1.5000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR087	*****	*****	7.0000	0.7000	0.7000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR088	*****	*****	15.0010	1.5000	1.0000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR090	*****	*****	2.0000	0.7000	1.0000	0.2000	700.0100	0.5000N	200.0100N	10.0000N
78AR091	*****	*****	20.0000G	1.5000	1.5000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR092	*****	*****	15.0010	1.0000	0.7000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR093	*****	*****	10.0000	1.5000	1.5000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR094	*****	*****	15.0010	1.5000	1.5000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR095	*****	*****	7.0000	0.7000	0.7000	0.5000	1500.1000	0.5000N	200.0100N	10.0000N
78AR096	*****	*****	20.0000	1.5000	1.0000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR097	*****	*****	5.0000	0.7000	0.7000	0.5000	1500.1000	0.5000N	200.0100N	10.0000N
78AR098	*****	*****	3.0000	1.0000	0.7000	0.3000	1500.1000	0.5000N	200.0100N	10.0000N
78AR099	*****	*****	10.0000	1.5000	1.5000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR100	*****	*****	3.0000	1.5000	1.5000	0.7000	700.0100	0.5000N	200.0100N	10.0000N
78AR101	*****	*****	3.0000	1.5000	1.5000	1.0000G	1500.1000	0.5000N	200.0100N	10.0000N
78AR102	*****	*****	7.0000	1.5000	1.0000	1.0000G	1500.1000	0.5000N	200.0100N	10.0000N
78AR103	*****	*****	3.0000	3.0000	3.0000	1.0000G	700.0100	0.5000N	200.0100N	10.0000N
78AR104	*****	*****	3.0000	3.0000	2.0000	1.0000G	700.0100	0.5000N	200.0100N	10.0000N
78AR105	*****	*****	5.0000	0.7000	0.3000	0.2000	700.0100	0.5000N	200.0100N	10.0000N
78AR106	*****	*****	1.5000	0.5000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR107	*****	*****	2.0000	1.5000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR108	*****	*****	2.0000	0.7000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR109	*****	*****	3.0000	0.7000	0.7000	0.7000	1000.0000	0.5000N	200.0100N	10.0000N
78AR110	*****	*****	3.0000	0.7000	0.7000	0.7000	1000.0000	0.5000N	200.0100N	10.0000N
78AR111	*****	*****	3.0000	0.7000	0.7000	0.7000	1000.0000	0.5000N	200.0100N	10.0000N
78AR112	*****	*****	1.5000	1.5000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR113	*****	*****	1.5000	3.0000	3.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR114	*****	*****	1.5000	0.7000	1.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR115	*****	*****	2.0000	0.7000	0.7000	0.5000	700.0100	0.5000N	200.0100N	10.0000N
78AR116	*****	*****	2.0000	0.7000	0.7000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR117	*****	*****	3.0000	0.7000	0.7000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR118	*****	*****	3.0000	0.7000	0.7000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR119	*****	*****	3.0000	0.7000	0.7000	0.7000	1500.1000	0.5000N	200.0100N	10.0000N
78AR120	*****	*****	1.5000	1.5000	0.7000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR121	*****	*****	1.5000	3.0000	3.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR122	*****	*****	1.5000	0.7000	1.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR123	*****	*****	1.5000	0.7000	1.0000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
78AR124	*****	*****	2.0000	0.7000	0.7000	0.5000	700.0100	0.5000N	200.0100N	10.0000N
78AR125	*****	*****	1.5000	0.7000	0.7000	0.5000	700.0100	0.5000N	200.0100N	10.0000N
78AR126	*****	*****	1.5000	0.7000	0.7000	0.5000	700.0100	0.5000N	200.0100N	10.0000N
78AR127	*****	*****	1.5000	0.7000	0.7000	0.5000	700.0100	0.5000N	200.0100N	10.0000N
78AR128	*****	*****	3.0000	0.7000	0.7000	1.0000	1500.1000	0.5000N	200.0100N	10.0000N
78AR129	*****	*****	3.0000	1.5000G	1.0000	1.0000G	1500.1000	0.5000N	200.0100N	10.0000N

TITLE
MESH SAMPLES

SAMPLE	S-B	S-PA	S-RF	S-RI	S-CD	S-CO	S-CR	S-CU	S-LA	S-MO
78AR056	20.0000	500.0000	3.0000	10.0000L	20.00000	15.0010	100.0100	150.0100	700.0100	5.0000
78AR057	20.0000	700.0100	3.0000	10.0000L	20.00000	15.0010	100.0100	70.0010	700.0100	5.0000
78AR059	20.0000	700.0100	2.0000	10.0000L	20.00000	10.0000	100.0100	70.0010	700.0100	5.0000
78AR060	20.0000	700.0100	3.0000	10.0000L	20.00000	7.0000	100.0100	20.0000	700.0100	5.0000L
78AR061	20.0000	700.0100	2.0000	10.0000L	20.00000	15.0010	100.0100	70.0010	1000.0000	5.0000L
78AR062	20.0000	700.0100	2.0000	10.0000L	20.00000	15.0010	100.0100	70.0010	700.0100	5.0000L
78AR063	20.0000	700.0100	3.0000	10.0000L	20.00000	10.0000	100.0100	70.0010	700.0100	5.0000L
78AR064	20.0000	700.0100	5.0000	10.0000L	20.00000	30.0000	100.0100	70.0010	700.0100	5.0000
78AR065	10.0000	700.0100	1.0000	10.0000L	20.00000	10.0000	100.0100	100.0000	1000.0000	5.0000L
78AR066	30.0000	300.0000	5.0000	10.0000L	20.00000	10.0000	100.0100	70.0010	300.0000	15.0010
78AR067	15.0010	700.0100	2.0000	10.0000L	20.00000	20.0000	70.0010	70.0010	700.0100	5.0000L
78AR068	30.0000	300.0000	5.0000	10.0000L	20.00000	10.0000	70.0010	70.0010	300.0000	5.0000
78AR069	20.0000	700.0100	1.5000	10.0000L	20.00000	15.0010	100.0100	70.0010	700.0100	5.0000L
78AR070	10.0000	700.0100	1.5000	10.0000L	20.00000	30.0000	100.0100	150.0100	1000.0000	5.0000
78AR073	15.0010	300.0000	5.0000	10.0000L	20.00000	5.0000	100.0000L	30.0000	1000.0000	5.0000L
78AR079	20.0000	300.0000	3.0000	10.0000L	20.00000	7.0000	50.0000	70.0010	700.0100	5.0000
78AR080	20.0000	300.0000	2.0000	10.0000L	20.00000	15.0010	50.0000	70.0010	700.0100	5.0000
78AR084	15.0010	1000.0000	2.0000	10.0000L	20.00000	30.0000	150.0100	70.0010	1000.0000	7.0000
78AR087	20.0000	500.0000	3.0000	10.0000L	20.00000	10.0000	30.0000	50.0000	500.0000	5.0000L
78AR088	15.0010	700.0100	1.5000	10.0000L	20.00000	20.0000	150.0100	100.0100	700.0100	10.0000
78AR093	20.0000	700.0100	2.0000	10.0000L	20.00000	15.0010	70.0010	70.0010	700.0100	5.0000L
78AR094	20.0000	700.0100	1.0000	10.0000L	20.00000	30.0000	70.0010	100.0100	1000.0000	5.0000
78AR095	10.0000	700.0100	2.0000	10.0000L	20.00000	10.0000	70.0010	30.0000	700.0100	5.0000L
78AR097	30.0000	300.0000	3.0000	10.0000L	20.00000	7.0000	15.0010	30.0000	700.0100	5.0000L
78AR077	30.0000	300.0000	5.0000	10.0000L	20.00000	10.0000	70.0010	70.0010	700.0100	5.0000L
78AR078	30.0000	300.0000	5.0000	10.0000L	20.00000	10.0000	70.0010	50.0000	300.0000	5.0000
78AR079	30.0000	300.0000	5.0000	10.0000L	20.00000	7.0000	30.0000	30.0000	300.0000	5.0000
78AR080	30.0000	700.0100	1.5000	10.0000L	20.00000	15.0010	150.0100	30.0000	700.0100	5.0000
78AR001	10.0000	300.0000	1.5000	10.0000L	20.00000	30.0000	70.0010	50.0000	20.0000L	5.0000L
78AR002	10.0000	300.0000	1.5000	10.0000L	20.00000	30.0000	70.0010	50.0000	20.0000L	5.0000L
78AR003	10.0000	300.0000	1.0000L	10.0000L	20.00000	30.0000	150.0100	100.0100	200.0100	5.0000L
78AR004	15.0010	300.0000	1.0000L	10.0000L	20.00000	30.0000	150.0100	100.0100	20.0000L	5.0000L
78AR005	10.0000L	150.0100	1.0000L	10.0000L	20.00000	30.0000	150.0100	70.0010	20.0000L	5.0000L
78AR006	20.0000	300.0000	3.0000	10.0000L	20.00000	15.0010	70.0010	100.0100	30.0000	5.0000L
78AR008	20.0000	300.0000	3.0000	10.0000L	20.00000	5.0000	30.0000	100.0100	20.0000L	5.0000L
78AR009	15.0010	700.0100	2.0000	10.0000L	20.00000	15.0010	30.0000	100.0100	20.0000L	5.0000L
78AR016	10.0000	300.0000	2.0000	10.0000L	20.00000	20.0000	70.0010	30.0000	20.0000L	5.0000L
78AR018	15.0010	500.0000	1.0000	10.0000L	20.00000	30.0000	150.0100	50.0000	50.0000L	5.0000L
78AR019	10.0000	300.0000	1.5000	10.0000L	20.00000	15.0010	50.0000	50.0000	20.0000L	5.0000L
78AR021	15.0010	300.0000	2.0000	10.0000L	20.00000	15.0010	50.0000	50.0000	30.0000L	5.0000L
78AR022	15.0010	300.0000	1.0000L	10.0000L	20.00000	30.0000	30.0000	30.0000	20.0000L	5.0000L
78AR023	15.0010	300.0000	2.0000	10.0000L	20.00000	15.0010	70.0010	30.0000	30.0000L	5.0000L
78AR024	15.0010	500.0000	3.0000	10.0000L	20.00000	15.0010	70.0010	30.0000	30.0000L	5.0000L
78AR027	15.0010	300.0000	3.0000	10.0000L	20.00000	5.0000	30.0000	15.0010	30.0000L	5.0000L
78AR030	10.0000L	300.0000	1.0000	10.0000L	20.00000	30.0000	150.0100	30.0000	50.0000L	5.0000L
78AR032	10.0000L	300.0000	1.0000L	10.0000L	20.00000	50.0000	150.0100	100.0100	20.0000L	5.0000L

TITLE	MESH SAMPLES
1. <u>1950-1951</u>	1. <u>1950-1951</u>
2. <u>1952-1953</u>	2. <u>1952-1953</u>
3. <u>1954-1955</u>	3. <u>1954-1955</u>
4. <u>1956-1957</u>	4. <u>1956-1957</u>
5. <u>1958-1959</u>	5. <u>1958-1959</u>
6. <u>1960-1961</u>	6. <u>1960-1961</u>
7. <u>1962-1963</u>	7. <u>1962-1963</u>
8. <u>1964-1965</u>	8. <u>1964-1965</u>
9. <u>1966-1967</u>	9. <u>1966-1967</u>
10. <u>1968-1969</u>	10. <u>1968-1969</u>
11. <u>1970-1971</u>	11. <u>1970-1971</u>
12. <u>1972-1973</u>	12. <u>1972-1973</u>
13. <u>1974-1975</u>	13. <u>1974-1975</u>
14. <u>1976-1977</u>	14. <u>1976-1977</u>
15. <u>1978-1979</u>	15. <u>1978-1979</u>
16. <u>1980-1981</u>	16. <u>1980-1981</u>
17. <u>1982-1983</u>	17. <u>1982-1983</u>
18. <u>1984-1985</u>	18. <u>1984-1985</u>
19. <u>1986-1987</u>	19. <u>1986-1987</u>
20. <u>1988-1989</u>	20. <u>1988-1989</u>
21. <u>1990-1991</u>	21. <u>1990-1991</u>
22. <u>1992-1993</u>	22. <u>1992-1993</u>
23. <u>1994-1995</u>	23. <u>1994-1995</u>
24. <u>1996-1997</u>	24. <u>1996-1997</u>
25. <u>1998-1999</u>	25. <u>1998-1999</u>
26. <u>2000-2001</u>	26. <u>2000-2001</u>
27. <u>2002-2003</u>	27. <u>2002-2003</u>
28. <u>2004-2005</u>	28. <u>2004-2005</u>
29. <u>2006-2007</u>	29. <u>2006-2007</u>
30. <u>2008-2009</u>	30. <u>2008-2009</u>
31. <u>2010-2011</u>	31. <u>2010-2011</u>
32. <u>2012-2013</u>	32. <u>2012-2013</u>
33. <u>2014-2015</u>	33. <u>2014-2015</u>
34. <u>2016-2017</u>	34. <u>2016-2017</u>
35. <u>2018-2019</u>	35. <u>2018-2019</u>
36. <u>2020-2021</u>	36. <u>2020-2021</u>
37. <u>2022-2023</u>	37. <u>2022-2023</u>
38. <u>2024-2025</u>	38. <u>2024-2025</u>
39. <u>2026-2027</u>	39. <u>2026-2027</u>
40. <u>2028-2029</u>	40. <u>2028-2029</u>
41. <u>2030-2031</u>	41. <u>2030-2031</u>
42. <u>2032-2033</u>	42. <u>2032-2033</u>
43. <u>2034-2035</u>	43. <u>2034-2035</u>
44. <u>2036-2037</u>	44. <u>2036-2037</u>
45. <u>2038-2039</u>	45. <u>2038-2039</u>
46. <u>2040-2041</u>	46. <u>2040-2041</u>
47. <u>2042-2043</u>	47. <u>2042-2043</u>
48. <u>2044-2045</u>	48. <u>2044-2045</u>
49. <u>2046-2047</u>	49. <u>2046-2047</u>
50. <u>2048-2049</u>	50. <u>2048-2049</u>
51. <u>2050-2051</u>	51. <u>2050-2051</u>
52. <u>2052-2053</u>	52. <u>2052-2053</u>
53. <u>2054-2055</u>	53. <u>2054-2055</u>
54. <u>2056-2057</u>	54. <u>2056-2057</u>
55. <u>2058-2059</u>	55. <u>2058-2059</u>
56. <u>2060-2061</u>	56. <u>2060-2061</u>
57. <u>2062-2063</u>	57. <u>2062-2063</u>
58. <u>2064-2065</u>	58. <u>2064-2065</u>
59. <u>2066-2067</u>	59. <u>2066-2067</u>
60. <u>2068-2069</u>	60. <u>2068-2069</u>
61. <u>2070-2071</u>	61. <u>2070-2071</u>
62. <u>2072-2073</u>	62. <u>2072-2073</u>
63. <u>2074-2075</u>	63. <u>2074-2075</u>
64. <u>2076-2077</u>	64. <u>2076-2077</u>
65. <u>2078-2079</u>	65. <u>2078-2079</u>
66. <u>2080-2081</u>	66. <u>2080-2081</u>
67. <u>2082-2083</u>	67. <u>2082-2083</u>
68. <u>2084-2085</u>	68. <u>2084-2085</u>
69. <u>2086-2087</u>	69. <u>2086-2087</u>
70. <u>2088-2089</u>	70. <u>2088-2089</u>
71. <u>2090-2091</u>	71. <u>2090-2091</u>
72. <u>2092-2093</u>	72. <u>2092-2093</u>
73. <u>2094-2095</u>	73. <u>2094-2095</u>
74. <u>2096-2097</u>	74. <u>2096-2097</u>
75. <u>2098-2099</u>	75. <u>2098-2099</u>
76. <u>2100-2101</u>	76. <u>2100-2101</u>
77. <u>2102-2103</u>	77. <u>2102-2103</u>

SAMPLE	S-NR	S-NT	S-NB	S-NT	S-NB	S-SR	S-SC	S-SY	S-SR	S-V	S-W	S-T
78AR056	20.0000L	36.0000	20.0000	100.0100N	15.0010	10.0000N	200.0100	10.0000N	200.0100	150.0100	50.0000N	30.0000
78AR057	20.0000L	26.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	150.0100	50.0000N	30.0000
78AR059	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	100.0100	50.0000N	30.0000
78AR061	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	70.0010	50.0000N	30.0000
78AR062	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	200.0100	10.0000N	200.0100	150.0100	50.0000N	50.0000
78AR063	20.0000L	15.0010	20.0000	100.0100N	10.0000	10.0000N	200.0100	10.0000N	200.0100	100.0100	50.0000N	30.0000
78AR064	20.0000L	30.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR065	20.0000L	70.0010	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	70.0010	50.0000N	30.0000
78AR066	20.0000L	30.0000	20.0000	100.0100N	7.0000	10.0000N	150.0100	10.0000N	150.0100	70.0010	50.0000N	50.0000
78AR067	20.0000L	30.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	150.0100	50.0000N	30.0000
78AR068	20.0000L	30.0000	20.0000	100.0100N	10.0000	10.0000N	200.0100	10.0000N	200.0100	70.0010	50.0000N	50.0000
78AR069	20.0000L	15.0010	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	150.0100	50.0000N	30.0000
78AR070	20.0000L	70.0010	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	200.0100	50.0000N	50.0000
78AR072	20.0000	10.0000	20.0000	100.0100N	7.0000	10.0000N	100.0100L	10.0000N	100.0100L	30.0000	50.0000N	70.0010
78AR073	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	200.0100	10.0000N	200.0100	70.0010	50.0000N	50.0000
78AR074	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	200.0100	50.0000N	50.0000
78AR075	20.0000L	15.0010	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	300.0000	50.0000N	50.0000
78AR076	20.0000L	70.0010	20.0000	100.0100N	15.0010	10.0000N	200.0100	10.0000N	200.0100	150.0100	50.0000N	50.0000
78AR077	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	200.0100	50.0000N	50.0000
78AR078	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	30.0000	50.0000N	30.0000
78AR079	20.0000L	30.0000	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	70.0010	50.0000N	30.0000
78AR080	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	150.0100	50.0000N	30.0000
78AR081	20.0000L	20.0000	20.0000	100.0100N	15.0010	10.0000N	300.0000	10.0000N	300.0000	200.0100	50.0000N	30.0000
78AR082	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	200.0100	10.0000N	200.0100	100.0100	50.0000N	50.0000
78AR083	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	70.0010	50.0000N	30.0000
78AR084	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR085	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR086	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR087	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR088	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR089	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR090	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR091	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR092	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR093	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR094	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR095	20.0000L	20.0000L	20.0000L	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR096	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR097	20.0000L	15.0010	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR098	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR099	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR100	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR101	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR102	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR103	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR104	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR105	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR106	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR107	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR108	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR109	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR110	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR111	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR112	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR113	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR114	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR115	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR116	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR117	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR118	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR119	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR120	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR121	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR122	20.0000L	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR123	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR124	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR125	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR126	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR127	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR128	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR129	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000
78AR130	20.0000	20.0000	20.0000	100.0100N	7.0000	10.0000N	300.0000	10.0000N	300.0000	100.0100	50.0000N	30.0000

TITLE
MESH SAMPLES

SAMPLE	S-ZN	S-ZR	S-TH
78AR056	200.0100N	200.0100	200.0100N
78AR057	200.0100N	300.0000	200.0100N
78AR059	200.0100N	150.0100	200.0100N
78AR060	200.0100N	200.0100	200.0100N
78AR061	200.0100N	700.0100	200.0100N
78AR062	200.0100N	300.0000	200.0100N
78AR063	200.0100N	500.0000	200.0100N
78AR064	200.0100N	300.0000	200.0100N
78AR065	200.0100N	500.0000	200.0100N
78AR066	200.0100N	300.0000	200.0100N
78AR067	200.0100N	500.0000	200.0100N
78AR068	200.0100N	300.0000	200.0100N
78AR069	200.0100N	300.0000	200.0100N
78AR070	200.0100N	300.0000	200.0100N
78AR073	200.0100N	700.0100	200.0100N
78AR039	200.0100N	300.0000	200.0100N
78AR040	200.0100N	700.0100	200.0100N
78AR044	200.0100N	700.0100	200.0100N
78AR047	200.0100N	300.0000	200.0100N
78AR048	200.0100N	500.0000	200.0100N
78AR050	200.0100N	200.0100	200.0100N
78AR051	200.0100N	700.0100	200.0100N
78AR052	200.0100N	700.0100	200.0100N
78AR053	200.0100N	300.0000	200.0100N
78AR054	200.0100N	300.0000	200.0100N
78AR055	200.0100N	200.0100	200.0100N
78AR074	200.0100N	300.0000	200.0100N
78AR076	200.0100N	500.0000	200.0100N
78AR077	200.0100N	300.0000	200.0100N
78AR078	200.0100N	300.0000	200.0100N
78AR079	200.0100N	200.0100	200.0100N
78AR080	200.0100N	500.0000	200.0100N
78AR081	200.0100N	150.0100	100.0100N
78AR082	200.0100N	150.0100	100.0100N
78AR084	200.0100N	150.0100	100.0100N
78AR085	200.0100N	70.0010	100.0100N
78AR086	200.0100N	150.0100	100.0100N
78AR088	200.0100N	100.0100	100.0100N
78AR089	200.0100N	100.0100	100.0100N
78AR016	200.0100N	100.0100	100.0100N
78AR018	200.0100N	150.0100	100.0100N
78AR019	200.0100N	150.0100	100.0100N
78AR021	200.0100N	150.0100	100.0100N
78AR022	200.0100N	70.0010	100.0100N
78AR023	200.0100N	150.0100	100.0100N
78AR024	200.0100N	150.0100	100.0100N
78AR027	200.0100N	150.0100	100.0100N
78AR030	200.0100N	150.0100	100.0100N
78AR032	200.0100N	100.0100	100.0100N

A47U GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MESH SAMPLES

SAMPLE	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU
78AR037	*****	*****	3.0000	1.0000	1.5000	0.7000	700.0100	0.5000N	200.0100N	10.0000N

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

DATE 1/ 9/79

TITLE
MESH SAMPLES

SAMPLE	S-B	S-UA	S-HE	S-HI	S-CD	S-CD	S-CR	S-CU	S-LA	S-MO
78AR037	10.0000	700.0100	1.5000	10.0000N	20.0000N	30.0000	70.0010	30.0000	20.0000	5.0000N

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MESH SAMPLES

SAMPLE	S-NB	S-NI	S-PR	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y
78AR037	20.0000L	30.0000	15.0010	100.0100N	7.7000	10.0000N	700.0100	70.0010	50.0000N	20.0000

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
MESH SAMPLES

SAMPLE	S-ZN	S-ZP	S-TI
78AR037	200.0100N	100.0100	100.0100H

TITLE
MESH SAMPLES

THE MAX AND MIN 0.15000e+01 FOR VARIABLE NO. 8 ARE THE SAME. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 9 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 10 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 14 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 15 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 24 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 26 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 29 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 VARIABLE NO. 31 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
 THE MAX AND MIN 0.10001e+03 FOR VARIABLE NO. 33 ARE THE SAME. THEREFORE THIS VARIABLE WILL BE SKIPPED.

AL70 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/70

TITLE
MESH SAMPLES

THE FREQUENCY DISTRIBUTIONS AND HISTOGRAMS ON THE FOLLOWING PAGES ARE ON LOGARITHMIC SCALES, AND EMPLOY THE SAME CLASS INTERVALS AS USED IN REPORTING 8-STEP SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES. IMPORTANT NOTE- THE STATISTICS GIVEN BELOW THE HISTOGRAMS ARE DEFINED ONLY FROM DATA VALUES WITHIN THE RANGES OF ANALYTICAL DETERMINATION, AND ARE, THEREFORE, BIASED IF DATA VALUES QUALIFIED WITH N, L, G, T, OR H CODES ARE PRESENT. SEE LATER SECTION OF OUTPUT FOR STATISTICAL ESTIMATES THAT ARE UNBIASED IN THIS REGARD. THE GEOMETRIC MEAN IS AN ESTIMATE OF "CENTRAL TENDENCY," OR OF A CHARACTERISTIC VALUE, OF A FREQUENCY DISTRIBUTION THAT IS APPROXIMATELY SYMMETRICAL ON A LOG SCALE, AND IS THEREFORE USEFUL FOR CHARACTERIZING MANY GEOCHEMICAL DISTRIBUTIONS. THE GEOMETRIC MEAN IS NOT AN ESTIMATE OF GEOCHEMICAL ABUNDANCE AND IS OF NO VALUE IN ESTIMATING RESERVES OR TOTAL AMOUNTS OF ELEMENTS PRESENT. SEE USGS PROFESSIONAL PAPER 574-R FOR FURTHER DISCUSSION. SEE USGS BULLETIN 1147E, PAGE 23, FOR EXPLANATION OF GEOMETRIC DEVIATION.

THE CUMULATIVE FREQUENCY PERCENTS GIVEN BELOW SHOULD BE PLOTTED AGAINST THE "LOWER" LIMITS TO GIVE THE LEPELTIER-TYPE CUMULATIVE CURVE.

MAXIMUM = 3.93000e+05
MINIMUM = 5.40720e+05

GEOMETRIC MEAN = 5.46086e+05
GEOMETRIC DEVIATION = 1.00703e+00

DATE 11/9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATEPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 2 (Y-COORD.)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
8.3e+01	1.2e+00	0	0	0.00	100.00
1.2e+00	1.8e+00	0	0	0.00	100.00
1.8e+00	2.6e+00	0	0	0.00	100.00
2.6e+00	3.8e+00	0	0	0.00	100.00
3.8e+00	5.6e+00	0	0	0.00	100.00
5.6e+00	8.3e+00	0	0	0.00	100.00
8.3e+00	1.2e+01	0	0	0.00	100.00
1.2e+01	1.8e+01	0	0	0.00	100.00
1.8e+01	2.6e+01	0	0	0.00	100.00
2.6e+01	3.8e+01	0	0	0.00	100.00
3.8e+01	5.6e+01	0	0	0.00	100.00
5.6e+01	8.3e+01	0	0	0.00	100.00
8.3e+01	1.2e+02	0	0	0.00	100.00
1.2e+02	1.8e+02	0	0	0.00	100.00
1.8e+02	2.6e+02	0	0	0.00	100.00
2.6e+02	3.8e+02	0	0	0.00	100.00
3.8e+02	5.6e+02	0	0	0.00	100.00
5.6e+02	8.3e+02	0	0	0.00	100.00
8.3e+02	1.2e+03	0	0	0.00	100.00
1.2e+03	1.8e+03	0	0	0.00	100.00
1.8e+03	2.6e+03	0	0	0.00	100.00
2.6e+03	3.8e+03	0	0	0.00	100.00
3.8e+03	5.6e+03	0	0	0.00	100.00
5.6e+03	8.3e+03	0	0	0.00	100.00
8.3e+03	1.2e+04	0	0	0.00	100.00
1.2e+04	1.8e+04	0	0	0.00	100.00
1.8e+04	2.6e+04	0	0	0.00	100.00
2.6e+04	3.8e+04	0	0	0.00	100.00
3.8e+04	5.6e+04	0	0	0.00	100.00
5.6e+04	8.3e+04	0	0	0.00	100.00
8.3e+04	1.2e+05	0	0	0.00	100.00
1.2e+05	1.8e+05	0	0	0.00	100.00
1.8e+05	2.6e+05	19	19	37.25	100.00
2.6e+05	3.8e+05	0	19	0.00	62.75
3.8e+05	5.6e+05	32	51	62.75	62.75
5.6e+05	8.3e+05				

HISTOGRAM FOR COLUMN 2 (Y-COORD.)

7.0e+05 XXX
5.0e+05
7.0e+05 XXX

N L H N T G ANALYTICAL
C: 0.00 0 0 0 0.00 C
0.00 0.00 0.00 0.00 0.00 0.00

MAXIMUM = 6.42420e+05
MINIMUM = 3.63830e+05
GEOMETRIC MEAN = 5.14638e+05
GEOMETRIC DEVIATION = 1.31696e+00

DATE 1/ 9/79

A47C GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE

MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 3 (S-FEX)

LIMITS		FRFO	FREQ CUM	PERCENT FREQ	PERCENT CUM
LOWER	UPPER				
8.3e-02	1.2e-01	0	0	0.00	100.00
1.2e-01	1.8e-01	0	0	0.00	100.00
1.8e-01	2.6e-01	0	0	0.00	100.00
2.6e-01	3.8e-01	0	0	0.00	100.00
3.8e-01	5.6e-01	0	0	0.00	100.00
5.6e-01	8.3e-01	0	0	0.00	100.00
8.3e-01	1.2e+00	0	0	0.00	100.00
1.2e+00	1.8e+00	5	5	9.80	100.00
1.8e+00	2.6e+00	5	10	9.80	90.20
2.6e+00	3.8e+00	11	21	21.57	80.39
3.8e+00	5.6e+00	5	26	9.80	58.82
5.6e+00	8.3e+00	12	38	23.53	49.02
8.3e+00	1.2e+01	2	40	3.92	25.49
1.2e+01	1.8e+01	7	47	13.73	21.57
1.8e+01	2.6e+01	2	49	3.92	7.84

HISTOGRAM FOR COLUMN 3 (S-FEX)

1.5e+00 XXXXXXXXXXXX
2.0e+00 XXXXXXXXXXXX
3.0e+00 XXXXXXXXXXXX
5.0e+00 XXXXXXXXXXXX
7.0e+00 XXXXXXXXXXXX
1.0e+01 XXXX
1.5e+01 XXXXXXXXXXXX
2.0e+01 XXXX

ANALYTICAL				
N	L	H	B	T
0	0	0	0	0
0.00	0.00	0	0	0.00

VALUES
2
49

3.92

MAXIMUM = 2.00000e+01
MINIMUM = 1.50000e+00
GEOMETRIC MEAN = 4.96613e+00
GEOMETRIC DEVIATION = 2.17341e+00

DATE 1/ 9/79

A470 GLOUCHESTER SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 4 (S-MG%)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ	PERCENT	FREQ CUM
3.8e-02 -	5.6e-02	0	0	0.00	100.00
5.6e-02 -	8.3e-02	0	0	0.00	100.00
8.3e-02 -	1.2e-01	0	0	0.00	100.00
1.2e-01 -	1.8e-01	0	0	0.00	100.00
1.8e-01 -	2.6e-01	0	0	0.00	100.00
2.6e-01 -	3.8e-01	0	0	0.00	100.00
3.8e-01 -	5.6e-01	1	1	1.96	100.00
5.6e-01 -	8.3e-01	14	15	27.45	98.04
8.3e-01 -	1.2e+00	10	25	19.61	70.59
1.2e+00 -	1.8e+00	24	49	47.06	50.98
1.8e+00 -	2.6e+00	0	49	0.00	3.92
2.6e+00 -	3.8e+00	2	51	3.92	7.92

HISTOGRAM FOR COLUMN 4 (S-MG%)

5.0e-01 XX
7.0e-01 XXXXXXXXXXXXXXXXXXXXXXXX
1.0e+00 XXXXXXXXXXXXXXXXXXXXXXXX
1.5e+00 XXXXXXXXXXXXXXXXXXXXXXXX
2.0e+00
3.0e+00 XXXX

N	L	H	E	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	51

MAXIMUM = 3.00000e+00
MINIMUM = 5.00000e-01
GEOMETRIC MEAN = 1.13019e+00
GEOMETRIC DEVIATION = 1.42648e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 5 (S-CA%)

LIMITS		FREQ	FREQ	PERCENT	PERCENT	FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ	CUM	CUM	FREQ	FREQ
8.3e-02 -	1.2e-01	0	0	0.00	0.00	0.00	0.00	100.00	100.00
1.2e-01 -	1.8e-01	0	0	0.00	0.00	0.00	0.00	100.00	100.00
1.8e-01 -	2.6e-01	0	0	0.00	0.00	0.00	0.00	100.00	100.00
2.6e-01 -	3.8e-01	1	1	1.96	1.96	1.96	1.96	100.00	100.00
3.8e-01 -	5.6e-01	2	2	3.92	3.92	3.92	3.92	98.04	98.04
5.6e-01 -	8.3e-01	18	21	35.29	35.29	35.29	35.29	94.12	94.12
8.3e-01 -	1.2e+00	16	37	31.37	31.37	31.37	31.37	59.82	59.82
1.2e+00 -	1.8e+00	11	48	21.57	21.57	21.57	21.57	27.45	27.45
1.8e+00 -	2.6e+00	1	49	1.96	1.96	1.96	1.96	5.88	5.88
2.6e+00 -	3.8e+00	2	51	3.92	3.92	3.92	3.92	3.92	3.92

HISTOGRAM FOR COLUMN 5 (S-CA%)

3.0e-01 XX
5.0e-01 XXXX
7.0e-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.0e+00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.5e+00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
2.0e+00 XX
3.0e+00 XXXX

ANALYTICAL		VALUES	
N	L	H	T
0.00	0.00	0	0
			51

MAXIMUM = 3.00000e+00
MINIMUM = 3.00000e-01
GEOMETRIC MEAN = 9.67976e-01
GEOMETRIC DEVIATION = 1.54097e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 6 (S-T12)

LIMITS		FREQ		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	FREQ CUM
3.8e-03	5.6e-03	0	0	0.00	100.00
5.6e-03	8.3e-03	0	0	0.00	100.00
8.3e-03	1.2e-02	0	0	0.00	100.00
1.2e-02	1.8e-02	0	0	0.00	100.00
1.8e-02	2.6e-02	0	0	0.00	100.00
2.6e-02	3.8e-02	0	0	0.00	100.00
3.8e-02	5.6e-02	0	0	0.00	100.00
5.6e-02	8.3e-02	0	0	0.00	100.00
8.3e-02	1.2e-01	0	0	0.00	100.00
1.2e-01	1.8e-01	0	0	0.00	100.00
1.8e-01	2.6e-01	2	2	3.92	100.00
2.6e-01	3.8e-01	22	24	43.14	96.08
3.8e-01	5.6e-01	6	30	11.76	52.94
5.6e-01	8.3e-01	11	41	21.57	41.18
8.3e-01	1.2e+00	6	47	11.76	19.61

HISTOGRAM FOR COLUMN 6 (S-T12)

```

2.0e-01 xxxx
3.0e-01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
5.0e-01 xxxxxxxxxxxxxxx
7.0e-01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
1.0e+00 xxxxxxxxxxxxxxx

```

N	L	H	T	G	ANALYTICAL
0.00	0.00	0	0	4	VALUES
			0.00	7.84	47

MAXIMUM = 1.00000e+00
 MINIMUM = 2.00000e-01
 GEOMETRIC MEAN = 4.47530e-01
 GEOMETRIC DEVIATION = 1.62962e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/73/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 7 (S-MN)

LIMITS		FREQ	PERCENT	PERCENT	FREQ	CUM	PERCENT	FREQ	CUM
LOWER - UPPER									
1.8e+01	- 2.6e+01	0	0	0.00	0.00	0	0.00	100.00	100.00
2.6e+01	- 3.8e+01	0	0	0.00	0.00	0	0.00	100.00	100.00
3.8e+01	- 5.6e+01	0	0	0.00	0.00	0	0.00	100.00	100.00
5.6e+01	- 8.3e+01	0	0	0.00	0.00	0	0.00	100.00	100.00
8.3e+01	- 1.2e+02	0	0	0.00	0.00	0	0.00	100.00	100.00
1.2e+02	- 1.8e+02	0	0	0.00	0.00	0	0.00	100.00	100.00
1.8e+02	- 2.6e+02	0	0	0.00	0.00	0	0.00	100.00	100.00
2.6e+02	- 3.8e+02	0	0	0.00	0.00	0	0.00	100.00	100.00
3.8e+02	- 5.6e+02	0	0	0.00	0.00	0	0.00	100.00	100.00
5.6e+02	- 8.3e+02	16	16	31.37	31.37	16	31.37	100.00	100.00
8.3e+02	- 1.2e+03	5	5	9.80	9.80	21	9.80	68.63	68.63
1.2e+03	- 1.8e+03	30	30	58.82	58.82	51	58.82	58.82	58.82

HISTOGRAM FOR COLUMN 7 (S-MN)

7.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.0e+03 XXXXXXXXXXXX
1.5e+03 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

N	L	H	R	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	51

MAXIMUM = 1.50010e+03
MINIMUM = 7.00010e+02
GEOMETRIC MEAN = 1.13502e+03
GEOMETRIC DEVIATION = 1.42012e+00

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

DATE 1/ 9/79

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 11 (S-U)

LIMITS		FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FREQ	FREQ CUM
1.8e+01	2.6e+01	15	29.41	94.12
2.6e+01	3.8e+01	7	13.73	64.71
3.8e+01	5.6e+01	1	1.96	50.98

HISTOGRAM FOR COLUMN 11 (S-H)

2.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXX
5.0e+01 XX

N	L	H	T	G
C	3	0	0	0
0.00	5.88		0.00	0.00

ANALYTICAL
VALUES
ZP

MAXIMUM = 5.00000e+01
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 1.69661e+01
GEOMETRIC DEVIATION = 1.47640e+00

DATE 1 / 9 / 79

A470 GLOCHICAL SURMAY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 12 (S-FA)

LIMITS		FREQ	FREQ	PERCENT	PERCENT	FREQ	CUM	PERCENT	FREQ	CUM
LCMLR - UPPER										
3.8e+01	- 5.6e+01	0	0	0.00	0.00	100.00				
5.6e+01	- 8.3e+01	0	0	0.00	0.00	100.00				
8.3e+01	- 1.2e+02	0	0	0.00	0.00	100.00				
1.2e+02	- 1.8e+02	1	1	1.96	1.96	100.00				
1.8e+02	- 2.6e+02	0	1	0.00	0.00	98.04				
2.6e+02	- 3.8e+02	27	23	43.14	43.14	98.04				
3.8e+02	- 5.6e+02	7	30	13.73	13.73	54.90				
5.6e+02	- 8.3e+02	10	49	37.25	37.25	41.18				
8.3e+02	- 1.2e+03	2	51	3.92	3.92	3.92				

HISTOGRAM FOR COLUMN 12 (S-BA)

1.5e+02 xx
2.0e+02
3.0e+02 xxx
5.0e+02 xxxxxxxxxxxxxxx
7.0e+02 xxx
1.0e+03 xxx

ANALYTICAL		VALUES		G	
H		L		R	
0	0	0	0	0	0
0.00	0.00	0	0	0.00	0.00

MAXIMUM = 1.00000e+03
MINIMUM = 1.50010e+02
GEOMETRIC MEAN = 4.56316e+02
GEOMETRIC DEVIATION = 1.55961e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 13 (S-BE)

LIMITS		FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ	FREQ CUM
1.8e+00 -	2.6e+00	13	13	25.49
2.6e+00 -	3.8e+00	11	24	90.20
3.8e+00 -	5.6e+00	8	32	21.57
				64.71
				43.14

HISTOGRAM FOR COLUMN 13 (S-BE)

2.0e+00 XXXXXXXXXXXXXXXXXXXXXXXX
3.0e+00 XXXXXXXXXXXXXXXXXXXXXXXX
5.0e+00 XXXXXXXXXXXXXXXXXXXXXXXX

LIMITS		H	B	T	G
LOWER - UPPER		CUM	FREQ	FREQ	FREQ CUM
1.0e	7.84	0	0	0.00	0.00

ANALYTICAL
VALUES
46

MAXIMUM = 5.00000e+00
MINIMUM = 1.00000e+00
GEOMETRIC MEAN = 2.26559e+00
GEOMETRIC DEVIATION = 1.63795e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN: 16 (S-CO)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
8.3e+01	1.2e+01	0	0	17.65	08.04
1.2e+01	1.8e+01	14	23	27.45	80.39
1.8e+01	2.6e+01	4	27	7.84	52.94
2.6e+01	3.8e+01	14	41	27.45	45.10
3.8e+01	5.6e+01	1	42	1.96	17.65
5.6e+01	8.3e+01	1	43	1.96	15.69

HISTOGRAM FOR COLUMN: 16 (S-CO)

1.0e+01 XXXXXXXXXXXXXXXXXXXX
1.5e+01 XXXXXXXXXXXXXXXXXXXX
2.0e+01 XXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXX
5.0e+01 XX
7.0e+01 XX

N	L	H	P	T	G	ANALYTICAL
0	1	0	0	0	0	VALUES
0.00	1.96			0.00	0.00	50

MAXIMUM = 7.00010e+01
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 1.61219e+01
GEOMETRIC DEVIATION = 1.83460e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN: 17 (S-CR)

LIMITS		FREQ	FREQ CUM	PERCENT FREQ	PERCENT FREQ CUM
LOWER	UPPER				
1.8e+01	2.6e+01	0	0	0.00	96.08
2.6e+01	3.8e+01	11	11	21.57	96.08
3.8e+01	5.6e+01	5	16	9.80	74.51
5.6e+01	8.3e+01	15	31	29.41	64.71
8.3e+01	1.2e+02	5	36	9.80	35.29
1.2e+02	1.8e+02	10	46	19.61	25.49
1.8e+02	2.6e+02	1	47	1.96	5.88
2.6e+02	3.8e+02	0	47	0.00	3.92
3.8e+02	5.6e+02	0	47	0.00	3.92
5.6e+02	8.3e+02	1	48	1.96	3.92

HISTOGRAM FOR COLUMN 17 (S-CR)

2.0e+01 xxxxxxxxxxxxxxxxxxxxxxxx
5.0e+01 xxxxxxxxxxxx
7.0e+01 xxxxxxxxxxxxxxxxxxxxxxxx
1.0e+02 xxxxxxxxxxxx
1.5e+02 xxxxxxxxxxxxxxxxxxxxxxxx
2.0e+02 xx
3.0e+02
5.0e+02
7.0e+02 xx

N	L	H	P	T	G	ANALYTICAL VALUES
0.00	2	0	0	0.00	0.00	49

MAXIMUM = 7.00010e+02
MINIMUM = 1.50010e+01
GEOMETRIC MEAN = 7.03067e+01
GEOMETRIC DEVIATION = 2.01870e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 18 (S-CU)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
8.3e+00	- 1.2e+01	0	0	0.00		100.00	
1.2e+01	- 1.8e+01	1	1	1.96		100.00	
1.8e+01	- 2.6e+01	2	3	3.92		98.04	
2.6e+01	- 3.8e+01	13	16	25.49		94.12	
3.8e+01	- 5.6e+01	6	22	11.76		68.63	
5.6e+01	- 8.3e+01	19	41	37.25		56.86	
8.3e+01	- 1.2e+02	7	48	13.73		19.61	
1.2e+02	- 1.8e+02	3	51	5.88		5.88	

HISTOGRAM FOR COLUMN 18 (S-CU)

1.5e+01 XX
2.0e+01 XXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXX
1.5e+02 XXXXX

N	L	H	B	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 1.50010e+02
MINIMUM = 1.50010e+01
GEOMETRIC MEAN = 5.50043e+01
GEOMETRIC DEVIATION = 1.73541e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

A470 GLOUCHESTER SUMMARY - U S G S STATPAC (1/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 19 (S-LA)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
3.8e+01	5.0e+01	2	2	3.02	90.70
5.0e+01	8.3e+01	1	3	1.96	86.27
8.3e+01	1.2e+02	0	3	0.00	84.31
1.2e+02	1.8e+02	0	3	0.00	84.31
1.8e+02	2.6e+02	1	4	1.96	84.31
2.6e+02	3.8e+02	6	10	11.76	82.35
3.8e+02	5.0e+02	2	12	3.02	70.59
5.0e+02	8.3e+02	16	28	31.37	66.67
8.3e+02	1.2e+03	6	34	11.76	35.29

HISTOGRAM FOR COLUMN 19 (S-LA)

5.0e+01 XXXX
7.0e+01 XX
1.0e+02
1.5e+02
2.0e+02 XX
3.0e+02 XXXXXXXXXXXXX
5.0e+02 XXXX
7.0e+02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
1.0e+03 XXXXXXXXXXXXXXX

P	L	H	R	T	G	ANALYTICAL VALUES
1	4	0	0	0	2	44
1.96	7.84			0.00	3.92	

MAXIMUM = 1.00000e+03
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 2.43948e+02
GEOMETRIC DEVIATION = 4.34204e+00

DATE 1/ 9/79

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE

MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 20 (S-MO)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	FRFQ	FRFQ	CUM
8.3e+00	1.2e+01	1	1	1.06	13.33
1.2e+01	1.8e+01	1	2	1.96	31.37

HISTOGRAM FOR COLUMN 20 (S-MO)

1.0e+01 XX
1.5e+01 XX

N	L	H	P	T	G	ANALYTICAL
21	13	0	0	0	0	VALUES
41.18	25.49			0.00	0.00	17

MAXIMUM = 1.50010e+01
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 5.89566e+00
GEOMETRIC DEVIATION = 1.36726e+00

DATE 1/ 9/79

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 21 (S-NB)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	- UPPER	CUM	FREQ	FREQ	CUM
3.8e+01	- 5.6e+01	0	0.00	0.00	50.98

HISTOGRAM FOR COLUMN 21 (S-NP)

A	L	H	B	T	G
3	22	0	0	0.00	0.00
5.88	43.14				

ANALYTICAL
VALUES
26

MAXIMUM = 3.00000e+01
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 2.19617e+01
GEOMETRIC DIVIATION = 1.19031e+00

DATE 11/9/70

A470 GELCHEMICAL SUPPLY - U S G S STATFAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 22 (S-NI)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER	UPPER	CUM	CUM	FREQ	FREQ CUM
8.3e+00	1.2e+01	1	1	1.96	100.00
1.2e+01	1.2e+01	11	12	21.57	98.04
1.2e+01	2.6e+01	7	19	13.73	76.47
2.6e+01	3.8e+01	22	41	43.14	62.75
3.8e+01	5.6e+01	3	44	5.88	19.61
5.6e+01	8.3e+01	6	50	11.76	13.73
8.3e+01	1.2e+02	0	50	0.00	1.96
1.2e+02	1.8e+02	1	51	1.96	1.96

HISTOGRAM FOR COLUMN 22 (S-NI)

1.0e+01 XX
1.5e+01 XXXXXXXXXXXXXXXXXXXX
2.0e+01 XXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXX
7.0e+01 XXXXXXXXXXXXX
1.0e+02
1.5e+02 XX

N	L	H	B	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 1.50010e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 2.81011e+01
GEOMETRIC DEVIATION = 1.73261e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 23 (S-PB)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
1.8e+01 -	2.6e+01	12	12	23.53		98.04	
2.6e+01 -	3.8e+01	28	40	54.90		74.51	
3.8e+01 -	5.6e+01	6	46	11.76		19.61	
5.6e+01 -	8.3e+01	0	46	0.00		7.84	
8.3e+01 -	1.2e+02	0	46	0.00		7.84	
1.2e+02 -	1.8e+02	1	47	1.96		7.84	

HISTOGRAM FOR COLUMN 23 (S-PB)

2.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXX
1.0e+02
1.5e+02 XX

ANALYTICAL		VALUES	
N		G	
0		0	
0.00	1.96	0.00	0.00

MAXIMUM = 1.50010e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 2.64367e+01
GEOMETRIC DEVIATION = 1.50368e+00

TITLE

MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 25 (S-SC)

LIMITS	FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER	CUM	CUM	FREQ	FREQ CUM
8-3e+00 - 1.2e+01	7	7	13.73	100.00
1.2e+01 - 1.8e+01	17	24	33.33	86.27

HISTOGRAM FOR COLUMN 25 (S-SC)

1.0e+01 XXXXXXXXXXXXXXXX
1.5e+01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

N	L	H	R	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	51

MAXIMUM = 1.50010e+01
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 9.29189e+00
GEOMETRIC DEVIATION = 1.45437e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN: 27 (S-SR)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	CUM	FREQ	CUM
1.8e+02	2.6e+02	19	19	37.25	98.04		
2.6e+02	3.8e+02	21	40	41.18	60.78		
3.8e+02	5.6e+02	7	47	3.92	19.61		
5.6e+02	8.3e+02	1	48	1.96	15.69		

HISTOGRAM FOR COLUMN 27 (S-SR)

2.0e+02 XX
3.0e+02 XX
5.0e+02 XXXX
7.0e+02 XX

ANALYTICAL VALUES	T				G			
	F	L	H	U	F	L	H	U
0.00	1	0	0	0	0.00	0	0	0.00

MAXIMUM = 7.00010e+02
MINIMUM = 1.00010e+02
GEOMETRIC MEAN = 2.40318e+02
GEOMETRIC DEVIATION = 1.41861e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 28 (S-V)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
1.8e+01 -	2.6e+01	0	0	0.00	100.00
2.6e+01 -	3.8e+01	5	5	9.80	100.00
3.8e+01 -	5.6e+01	2	7	3.92	90.20
5.6e+01 -	8.3e+01	12	19	23.53	86.27
8.3e+01 -	1.2e+02	10	29	19.61	62.75
1.2e+02 -	1.8e+02	11	40	21.57	43.14
1.8e+02 -	2.6e+02	8	48	15.69	21.57
2.6e+02 -	3.8e+02	2	50	3.92	5.88
3.8e+02 -	5.6e+02	0	50	0.00	1.96
5.6e+02 -	8.3e+02	1	51	1.96	

HISTOGRAM FOR COLUMN 28 (S-V)

3.0e+01 XXXXXXXXXX
5.0e+01 XXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXXXXXX
1.5e+02 XXXXXXXXXXXXXXXXXXXX
2.0e+02 XXXXXXXXXXXXXXXXXXXX
3.0e+02 XXXX
5.0e+02
7.0e+02 XX

ANALYTICAL		VALUES	
N	L	M	B
0	0	0	0
0.00	0.00	0.00	0.00

MAXIMUM = 7.00010e+02
MINIMUM = 3.00000e+01
GEOMETRIC MEAN = 1.04951e+02
GEOMETRIC DEVIATION = 1.92569e+00

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 30 (S-Y)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ	FREQ	CUM
1.8e+01 -	2.6e+01	4	4	7.84	100.00
2.6e+01 -	3.8e+01	26	30	50.98	92.16
3.8e+01 -	5.6e+01	13	43	25.40	41.18
5.6e+01 -	8.3e+01	6	49	11.76	15.69
8.3e+01 -	1.2e+02	1	50	1.96	3.92

HISTOGRAM FOR COLUMN 30 (S-Y)

2.0e+01 XXXXXXXX
3.0e+01 XX
5.0e+01 XX
7.0e+01 XXXXXXXXXXXXXXXX
1.0e+02 XX

N	L	H	R	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 1.00010e+02
MINIMUM = 1.50010e+01
GEOMETRIC MEAN = 3.69406e+01
GEOMETRIC DEVIATION = 1.49476e+00

DATE 1/ 9/79

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (11/23/78)

TITLE
MESH SAMPLES

FREQUENCY TABLE FOR COLUMN 32 (S-ZR)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
1.8e+01 -	2.5e+01	0	0	0.00	100.00
2.6e+01 -	3.8e+01	0	0	0.00	100.00
3.8e+01 -	5.6e+01	0	0	0.00	100.00
5.6e+01 -	8.3e+01	2	2	3.92	100.00
8.3e+01 -	1.2e+02	5	7	9.80	96.08
1.2e+02 -	1.8e+02	13	20	25.49	86.27
1.8e+02 -	2.6e+02	5	25	9.80	60.78
2.6e+02 -	3.8e+02	14	39	27.45	50.98
3.8e+02 -	5.6e+02	6	45	11.76	23.53
5.6e+02 -	8.3e+02	6	51	11.76	11.76

HISTOGRAM FOR COLUMN 32 (S-ZR)

7.0e+01 xxxx
1.0e+02 xxxxxxxxxxxx
1.5e+02 xxxxxxxxxxxxxxxxxxxxxxxxxxxx
2.0e+02 xxxxxxxxxxxx
3.0e+02 xxxxxxxxxxxxxxxxxxxxxxxxxxxx
5.0e+02 xxxxxxxxxxxx
7.0e+02 xxxxxxxxxxxx

N	L	H	E	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00			0.00	0.00	51

MAXIMUM = 7.00010e+02
MINIMUM = 7.00010e+01
GEOMETRIC MEAN = 2.40419e+02
GEOMETRIC DIVISION = 1.90327e+00

TITLE
MESH SAMPLES

IN THE COMPUTATIONS PERFORMED TO PRODUCE THE FOLLOWING TABLE OF GEOMETRIC MEANS AND DEVIATIONS, ALL ELEMENTS ARE IGNORED WHERE ONE OR MORE OF THE UNQUALIFIED DATA VALUES IS LESS THAN THE ANALYTICAL LIMIT OF DETECTION SPECIFIED ON INPUT OR WHERE ANY DATA VALUES ARE QUALIFIED WITH THE G (GREATER THAN) CODE. DATA VALUES QUALIFIED WITH B OR H ARE NOT USED IN THE COMPUTATIONS. WHERE NONE OF THE DATA VALUES FOR AN ELEMENT ARE QUALIFIED THE MEAN AND DEVIATION SHOULD BE THE SAME AS THOSE GIVEN IN THE PRECEDING SECTION. WHERE DATA ARE QUALIFIED WITH THE CODES V, L, OR T, THE ESTIMATES OF GEOMETRIC MEAN AND DEVIATION ARE BASED ON A METHOD BY A. J. COHEN FOR TREATING CENSORED DISTRIBUTIONS. THE APPLICATION OF THIS METHOD TO GEOCHEMICAL PROBLEMS IS DESCRIBED IN SGS PROFESSIONAL PAPER 574-H. THE ESTIMATES ARE UNBIASED IN A STRICT SENSE ONLY WHERE THE DATA ARE DERIVED FROM A LOGNORMAL PARENT POPULATION, BUT EXPERIMENTS HAVE SHOWN THAT LARGE DEPARTURES FROM THIS REQUIREMENT MAY NOT GREATLY INVALIDATE THE RESULTS ACCEPTANCE AND USE OF THE ESTIMATES, HOWEVER, IS THE RESPONSIBILITY OF THE INDIVIDUAL.

ELEMENT	N	L	H	B	T	G	ANALYTICAL VALUES
X-COORD.	0	0	0	0	0	0	51
Y-COORD.	0	0	0	0	0	0	51
S-PFX	0	0	0	0	0	2	49
S-MGX	0	0	0	0	0	0	51
S-CAZ	0	0	0	0	0	0	51
S-TIX	0	0	0	0	0	4	47
S-PW	0	0	0	0	0	0	51
S-B	0	3	0	0	0	0	48
S-PA	0	0	0	0	0	0	51
S-EE	1	4	0	0	0	0	46
S-CO	0	1	0	0	0	0	50
S-CR	0	2	0	0	0	0	49
S-CU	0	0	0	0	0	0	51
S-LA	1	4	0	0	0	2	44
S-MO	21	13	0	0	0	0	17
S-MR	3	22	0	0	0	0	26
S-NI	0	0	0	0	0	0	51
S-PB	0	1	0	0	0	0	50
S-SC	0	0	0	0	0	0	51
S-SP	0	1	0	0	0	0	50
S-V	0	0	0	0	0	0	51
S-Y	0	0	0	0	0	0	51
S-ZR	0	0	0	0	0	0	51

A47C GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

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TITLE

ELEMENT	GEOMETRIC MEAN	GEOMETRIC DEVIATION	REMARKS
X-COORD.	546686.000000	1.01	51 SAMPLES AND 51 ANALYTICAL VALUES.
Y-COORD.	518632.781250	1.32	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-FE%	93417020	*****	2 GREATER THAN VALUES. NO COMPUTATIONS.
S-MG%	1.130193	1.49	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-CA%	0.967976	1.54	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-TI%	*****	*****	4 GREATER THAN VALUES. NO COMPUTATIONS.
S-PN	1135.024780	1.42	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-R	*****	*****	25 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-PA	456.316189	1.56	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-RE	*****	*****	14 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CO	*****	*****	7 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CR	*****	*****	1 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CU	55.004290	1.74	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-LA	*****	*****	10 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-MO	*****	*****	15 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-NH	*****	*****	26 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-MJ	28.101059	1.73	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-PR	*****	*****	3 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-SC	*****	*****	27 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-SH	*****	*****	7 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-V	104.951009	1.93	51 SAMPLES AND 51 ANALYTICAL VALUES.
S-Y	*****	*****	1 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-ZR	240.418798	1.90	51 SAMPLES AND 51 ANALYTICAL VALUES.

APPENDIX B. COMPUTER LISTING OF GEOCHEMICAL ANALYSES
OF THE ROCK SAMPLES WITH
CUMULATIVE FREQUENCY AND HISTOGRAM CALCULATIONS

TITLE
ROCK SAMPLES

INPUT ID N M
-STATPAC - 38 33 ***** OPTIONS*****
1 0 0 0 0 0 0 0

NUMBER OF SELECTED COLUMNS = 33

SELECTED COLUMN INDICES

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33							

COLUMN IDENTIFIERS

X-COORD.	Y-COORD.	S-FEZ	S-MGX	S-CAZ	S-TIX	S-MN	S-AG	S-AS	S-AU
S-H	S-BA	S-HE	S-BI	S-CD	S-CO	S-CP	S-CU	S-LA	S-MO
S-FU	S-NI	S-PH	S-SB	S-SC	S-SN	S-SR	S-V	S-W	S-Y
S-ZN	S-ZR	S-TH							

NUMBER OF SELECTED ROW PAIRS = 1

SELECTED ROW PAIRS

1- 38

SPECIFIED LIMITS OF DETECTION.

1.00000	1.00000	0.10000	0.05000	0.10000	0.00500	20.00000	1.00000	500.00000	20.00000
20.00000	50.00000	2.00000	20.00000	50.00000	10.00000	20.00000	10.00000	50.00000	10.00000
50.00000	10.00000	20.00000	200.00000	10.00000	20.00000	200.00000	20.00000	100.00000	20.00000
500.00000	20.00000	200.00000							

THE COMPUTATIONS TO FOLLOW ARE INTENDED TO SUMMARIZE GEOCHEMICAL DATA ENTERED ON USGS STANDARD 10 VARIABLE (G FORMAT), DATA CARDS OR ON A USGS STATPAC TAPE. THE FOLLOWING ALPHA CODES ARE USED WITH THE DATA AS DESCRIBED IN USGS PROGRAM DOCUMENTATION D0092- N = NOT DETECTED, L = LESS THAN, G = GREATER THAN, T = TRACE, H = INTERFERENCE, AND B = BLANK OR NO DATA. THE HISTOGRAMS AND STATISTICS ARE DERIVED ON THE ASSUMPTION THAT THE DATA ARE MORE PROPERLY TREATED ON A LOGARITHMIC, RATHER THAN ARITHMETIC, BASIS. SHOULD THIS NOT BE THE CASE FOR YOUR DATA, OR ANY PART OF IT, IT IS SUGGESTED THAT YOU USE USGS PROGRAMS D0092, D0001, D0036, D0039, AND D0010 WHICH ALLOW GREATER FLEXIBILITY IN COMPUTATIONAL PROCEDURES.

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
ROCK SAMPLES

THE LISTING OF DATA ON THE FOLLOWING PAGES IS SUITABLE FOR OPEN-FILE TYPE PUBLICATIONS. USGS PROGRAM 00039 PROVIDES THE SAME TYPE OF LISTING BUT ALLOWS DELETION AND/OR REORDERING OF ELEMENTS AS WELL AS DELETION OF SELECTED SAMPLES. NOTE THAT THE RIGHT-MOST ZERO DIGITS OF EACH DATA VALUE MAY OR MAY NOT BE SIGNIFICANT. IT IS SUGGESTED THAT A FOOTNOTE TO THIS EFFECT BE PLACED ON THE LISTING BEFORE IT IS PLACED ON OPEN-FILE.

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1 / 9/79

TITLE
ROCK SAMPLES

SAMPLE	X-COORD.	Y-COORD.	S-FE%	S-MG%	S-CA%	S-TI%	S-MN	S-AG	S-AS	S-AU
BAR001PA	*****	*****	7.0000	2.0000	7.0000	0.5000	1000.0000	0.5000N	200.0100N	10.0000N
BAR001RN	*****	*****	7.0000	2.0000	5.0000	0.7000	1000.0000	0.5000N	200.0100N	10.0000N
BAR002RA	*****	*****	7.0000	3.0000	5.0000	0.7000	700.0100	0.5000N	200.0100N	10.0000N
BAR002RIH	*****	*****	7.0000	3.0000	7.0000	0.7000	1000.0000	0.5000N	200.0100N	10.0000N
BAR00LSP	*****	*****	5.0000	1.5000	2.0000	0.5000	500.0000	0.5000N	200.0100N	10.0000N
BAR0007P	*****	*****	3.0000	0.2000	0.1500	0.1500	700.0100	0.5000N	200.0100N	10.0000N
BAR0009R	*****	*****	1.5000	0.1500	0.0700	0.1500	100.0100	0.5000N	200.0100N	10.0000N
BAR010Z	*****	*****	2.0000	0.7000	2.0000	0.2000	1000.0000	0.5000N	200.0100N	10.0000N
BAR011Z	*****	*****	1.0000	0.5000	1.5000	0.1500	200.0100	0.5000N	200.0100N	10.0000N
BAR013Z	*****	*****	0.7000	0.3000	1.5000	0.1000	500.0000	0.5000N	200.0100N	10.0000N
BAR015Z	*****	*****	1.5000	0.3000	1.5000	0.1500	700.0100	0.5000N	200.0100N	10.0000N
BAR017CZ	*****	*****	1.0000	0.5000	2.0000	0.1500	500.0000	0.5000N	200.0100N	10.0000N
BAR018	*****	*****	3.0000	0.3000	0.1500	0.3000	150.0100	0.5000N	200.0100N	10.0000N
BAR019AR	*****	*****	1.5000	0.1500	0.3000	0.1000	700.0100	0.5000N	200.0100N	10.0000N
BAR019BR	*****	*****	1.5000	0.2000	0.7000	0.1500	700.0100	0.5000N	200.0100N	10.0000N
BAR022Z	*****	*****	1.5000	0.3000	1.0000	0.1500	500.0000	0.5000N	200.0100N	10.0000N
BAR025Z	*****	*****	1.0000	0.1000	0.5000	0.1000	700.0100	0.5000N	200.0100N	10.0000N
BAR026Z	*****	*****	1.5000	0.1500	0.2000	0.1500	300.0000	0.5000N	200.0100N	10.0000N
BAR030Z	*****	*****	1.0000	0.5000	1.5000	0.1000	500.0000	0.5000N	200.0100N	10.0000N
BAR031Z	*****	*****	1.0000	0.3000	0.3000	0.1000	700.0100	0.5000N	200.0100N	10.0000N
BAR033Z	*****	*****	1.0000	0.5000	1.5000	0.1000	500.0000	0.5000N	200.0100N	10.0000N
BAR034AR	*****	*****	3.0000	0.7000	0.7000	0.3000	200.0100	0.5000N	200.0100N	10.0000N
BAR034HR	*****	*****	3.0000	0.7000	0.7000	0.3000	150.0100	0.5000N	200.0100N	10.0000N
BAR035R	*****	*****	1.5000	0.5000	0.5000	0.1500	200.0100	0.5000N	200.0100N	10.0000N
BAR036R	*****	*****	0.7000	0.3000	1.5000	0.0700	500.0000	0.5000N	200.0100N	10.0000N
BAR041R	*****	*****	1.5000	0.2000	0.5000	0.1500	500.0000	0.5000N	200.0100N	10.0000N
BAR043R	*****	*****	0.7000	0.5000	1.5000	0.1000	500.0000	0.5000N	200.0100N	10.0000N
BAR045R	*****	*****	1.5000	0.3000	1.0000	0.1500	500.0000	0.5000N	200.0100N	10.0000N
BAR04RP	*****	*****	7.0000	1.5000	3.0000	1.0000	700.0100	0.5000N	200.0100N	10.0000N
BAR049R	*****	*****	1.5000	0.7000	1.5000	0.2000	500.0000	0.5000N	200.0100N	10.0000N
BAR050P	*****	*****	1.5000	0.5000	1.0000	0.1500	300.0000	0.5000N	200.0100N	10.0000N
BAR051R	*****	*****	7.0000	2.0000	3.0000	0.7000	700.0100	0.5000N	200.0100N	10.0000N
BAR057F	*****	*****	2.0000	0.7000	1.5000	0.3000	700.0100	0.5000N	200.0100N	10.0000N
BAR071R	*****	*****	0.5000	0.5000	1.0000	0.0500	700.0100	0.5000N	200.0100N	10.0000N
BAR072RH	*****	*****	1.5000	0.3000	0.3000	0.2000	500.0000	0.5000N	200.0100N	10.0000N
BAR072CP	*****	*****	1.5000	0.5000	0.3000	0.2000	500.0000	0.5000N	200.0100N	10.0000N
BAR072RH	*****	*****	1.5000	0.3000	0.5000	0.2000	700.0100	0.5000N	200.0100N	10.0000N
BAR075P	*****	*****	1.5000	0.3000	0.5000	0.2000	500.0000	0.5000N	200.0100N	10.0000N

TITLE
ROCK SAMPLES

SAMPLE	S-B	S-BA	S-BF	S-BJ	S-CD	S-CN	S-CR	S-CU	S-LA	S-MO
BAR001PA	10.0000L	300.0000	1.0000N	10.0000N	20.0000N	30.0000	200.0000	150.0000	20.0000	5.0000N
BAR001PH	10.0000L	300.0000	1.0000N	10.0000N	20.0000N	50.0000	20.0000	15.0000	20.0000	5.0000N
BAR002RA	20.0000	200.0000	1.0000N	10.0000N	20.0000N	70.0000	200.0000	15.0000	50.0000	5.0000N
BAR002RB	20.0000	300.0000	1.0000N	10.0000N	20.0000N	50.0000	150.0000	15.0000	30.0000	5.0000N
BAR005R	10.0000	300.0000	1.0000N	10.0000N	20.0000N	20.0000	10.0000	15.0000	30.0000	5.0000N
BAR007P	70.0000	500.0000	1.0000L	10.0000N	20.0000N	5.0000	15.0000	5.0000L	70.0000	5.0000N
BAR009A	150.0000	1000.0000	1.0000L	10.0000N	20.0000N	5.0000L	10.0000	5.0000N	70.0000	5.0000N
BAR010Z	10.0000L	200.0000	5.0000	10.0000N	20.0000N	5.0000L	20.0000	15.0000	70.0000	5.0000N
BAR011Z	10.0000L	300.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000	100.0000	5.0000N
BAR013Z	10.0000L	200.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000L	100.0000	5.0000N
BAR015Z	30.0000	200.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000	10.0000	70.0000	5.0000N
BAR017CZ	50.0000	150.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000	10.0000	50.0000	5.0000N
BAR018	150.0000	1000.0000	1.0000L	10.0000N	20.0000N	5.0000N	20.0000	5.0000L	50.0000	5.0000N
BAR019AR	20.0000	50.0000	2.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000L	70.0000	5.0000N
BAR019BR	100.0000	50.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000L	70.0000	5.0000N
BAR022Z	50.0000	1000.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000	70.0000	5.0000N
BAR025Z	20.0000	700.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000	5.0000	50.0000	5.0000N
BAR026Z	10.0000	300.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000N	10.0000	70.0000	5.0000N
BAR030Z	10.0000N	50.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000N	5.0000	50.0000	5.0000N
BAR031Z	20.0000	20.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000L	10.0000	50.0000	7.0000
BAR033Z	10.0000N	200.0000	5.0000	10.0000N	20.0000N	5.0000N	10.0000L	10.0000	70.0000	5.0000N
BAR034AR	100.0000	300.0000	3.0000	10.0000N	20.0000N	5.0000L	50.0000	30.0000	30.0000	5.0000N
BAR034BR	100.0000	200.0000	5.0000	10.0000N	20.0000N	5.0000L	30.0000	20.0000	50.0000	5.0000N
BAR035R	100.0000	70.0000	3.0000	10.0000N	20.0000N	5.0000N	20.0000	30.0000	70.0000	5.0000N
BAR038R	10.0000L	300.0000	10.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000L	70.0000	5.0000N
BAR041R	50.0000	300.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000N	10.0000	100.0000	5.0000N
BAR043R	50.0000	30.0000	7.0000	10.0000N	20.0000N	5.0000N	10.0000L	15.0000	70.0000	5.0000N
BAR045R	20.0000	500.0000	5.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000	100.0000	5.0000N
BAR048R	10.0000N	300.0000	1.5000	10.0000N	20.0000N	30.0000	200.0000	100.0000	70.0000	7.0000
BAR049P	10.0000N	500.0000	2.0000	10.0000N	20.0000N	5.0000L	5.0000L	15.0000	70.0000	5.0000N
BAR050R	10.0000	700.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000L	5.0000	70.0000	5.0000N
BAR051R	10.0000N	1000.0000	1.0000L	10.0000N	20.0000N	30.0000	30.0000	70.0000	50.0000	5.0000N
BAR057R	10.0000	1000.0000	2.0000	10.0000N	20.0000N	5.0000	30.0000	15.0000	50.0000	5.0000N
BAR071R	15.0000	20.0000L	5.0000	10.0000N	20.0000N	5.0000N	10.0000	15.0000	70.0000	5.0000N
BAR072HR	20.0000	1000.0000	3.0000	10.0000N	20.0000N	5.0000N	10.0000L	10.0000	70.0000	5.0000N
BAR072CR	20.0000	1000.0000	2.0000	10.0000N	20.0000N	5.0000N	10.0000L	15.0000	70.0000	5.0000N
BAR072DR	20.0000	1500.0000	7.0000	10.0000N	20.0000N	5.0000L	10.0000L	15.0000	70.0000	5.0000N
BAR075R	50.0000	700.0000	2.0000	10.0000N	20.0000N	5.0000N	10.0000	15.0000	70.0000	5.0000N

A47C GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
ROCK SAMPLES

SAMPLE	S-MB	S-NI	S-PB	S-SR	S-SC	S-SN	S-SR	S-V	S-W	S-Y
BAR001PA	20.00000	150.0100	10.00000	100.01000	30.00000	10.00000	200.0100	200.0100	50.00000	30.00000
BAR001RA	20.00000	100.0100	10.00000	100.01000	30.00000	10.00000	300.0000	200.0100	50.00000	20.00000
BAR002PA	20.00000	70.0010	10.00000	100.01000	20.00000	10.00000	500.0000	150.0100	50.00000	30.00000
BAR002KH	20.00000	100.0100	15.0010	100.01000	30.00000	10.00000	300.0000	200.0100	50.00000	50.00000
BAR005R	20.00000	30.0000	10.0000	100.01000	10.00000	10.00000	700.0100	70.0010	50.00000	30.00000
BAR007R	20.00000	10.0000	15.0010	100.01000	10.00000	10.00000	100.01000	50.00000	50.00000	30.00000
BAR009R	20.00000	5.00000	10.0000	100.01000	5.00000	10.00000	100.01000	20.00000	50.00000	70.0010
BAR010Z	20.00000	15.0010	30.0000	100.01000	5.00000	10.00000	300.0000	30.00000	50.00000	70.0010
BAR011Z	20.00000	5.00000	20.0000	100.01000	5.00000	10.00000	200.0100	30.00000	50.00000	70.0010
BAR013Z	20.00000	5.00000	20.0000	100.01000	5.00000	10.00000	100.01000	20.00000	50.00000	50.00000
BAR015Z	20.00000	5.00000	30.0000	100.01000	7.00000	10.00000	100.01000	30.00000	50.00000	70.0010
BAR017CZ	20.00000	5.00000	50.0000	100.01000	7.00000	10.00000	100.01000	30.00000	50.00000	50.00000
BAR018	20.00000	5.00000	10.0000	100.01000	20.00000	10.00000	100.01000	30.00000	50.00000	50.00000
BAR019AR	20.00000	5.00000	50.0000	100.01000	5.00000	10.00000	100.01000	10.00000	50.00000	50.00000
BAR019UR	20.00000	5.00000	30.0000	100.01000	7.00000	10.00000	1000.0000	10.00000	50.00000	50.00000
BAR022Z	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	100.01000	15.0010	50.00000	50.00000
BAR025Z	20.00000	5.00000	50.0000	100.01000	5.00000	10.00000	100.01000	20.00000	50.00000	30.00000
BAR026Z	20.00000	5.00000	20.0000	100.01000	5.00000	10.00000	200.0100	30.00000	50.00000	20.00000
BAR030Z	20.00000	5.00000	20.0000	100.01000	5.00000	10.00000	100.0100	20.00000	50.00000	50.00000
BAR031Z	30.0000	5.00000	50.0000	100.01000	7.00000	10.00000	100.0100	20.00000	50.00000	50.00000
BAR033Z	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	150.0100	20.00000	50.00000	30.00000
BAR034AP	20.00000	20.0000	30.0000	100.01000	10.00000	10.00000	300.0000	100.0100	50.00000	70.0010
BAR034PR	20.00000	20.0000	20.0000	100.01000	10.00000	10.00000	100.0100	100.0100	50.00000	20.00000
BAR035P	20.00000	15.0010	20.0000	100.01000	10.00000	10.00000	100.01000	70.0010	50.00000	50.00000
BAR038R	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	300.0000	30.00000	50.00000	50.00000
BAR041R	20.00000	5.00000	30.0000	100.01000	7.00000	10.00000	100.0100	20.00000	50.00000	50.00000
BAR043P	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	200.0100	20.00000	50.00000	50.00000
BAR045R	20.00000	5.00000	30.0000	100.01000	7.00000	10.00000	150.0100	20.00000	50.00000	50.00000
BAR046P	20.00000	100.0100	30.0000	100.01000	20.00000	10.00000	300.0000	100.0100	50.00000	50.00000
BAR049R	20.00000	15.0010	30.0000	100.01000	5.00000	10.00000	1000.0000	70.0010	50.00000	20.00000
BAR050R	20.00000	5.00000	20.0000	100.01000	5.00000	10.00000	1000.0000	30.00000	50.00000	30.00000
BAR051R	20.00000	100.0100	20.0000	100.01000	20.00000	10.00000	700.0100	150.0100	50.00000	30.00000
BAR057R	20.00000	15.0010	30.0000	100.01000	7.00000	10.00000	100.0100	50.00000	50.00000	30.00000
BAR071R	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	200.0100	10.00000	50.00000	20.00000
BAR0721R	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	100.0100	20.00000	50.00000	30.00000
BAR072CR	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	100.0100	20.00000	50.00000	50.00000
BAR072CP	20.00000	5.00000	50.0000	100.01000	5.00000	10.00000	100.0100	30.00000	50.00000	30.00000
BAR0751	20.00000	5.00000	30.0000	100.01000	5.00000	10.00000	100.0100	20.00000	50.00000	30.00000

TITLI
ROCK SAMPLES

SAMPLE	S-ZH	S-ZR	S-TH
8AR001PA	200.0100N	100.0100	100.0100N
8AR001LR	200.0100N	70.0010	100.0100N
8AR002FA	200.0100N	100.0100	100.0100N
8AR002PB	200.0100N	200.0100	100.0100N
8AR005R	200.0100N	70.0010	100.0100N
8AR007R	200.0100N	150.0100	100.0100N
8AR009R	200.0100N	150.0100	100.0100N
8AR01UZ	200.0100N	200.0100	100.0100N
8AR011Z	200.0100N	150.0100	100.0100N
8AR013Z	200.0100N	150.0100	100.0100N
8AR015Z	200.0100N	150.0100	100.0100N
8AR017CZ	200.0100N	100.0100	100.0100N
8AR018	200.0100N	200.0100	100.0100N
8AR019AR	200.0100N	150.0100	100.0100N
8AR019ER	200.0100N	200.0100	100.0100N
8AR022Z	200.0100N	150.0100	100.0100N
8AR025Z	200.0100N	150.0100	100.0100N
8AR026Z	200.0100N	100.0100	100.0100N
8AR030Z	200.0100N	150.0100	100.0100N
8AR031Z	200.0100N	150.0100	100.0100N
8AR033Z	200.0100N	150.0100	100.0100N
8AR034AR	200.0100N	100.0100	100.0100N
8AR034OR	200.0100N	150.0100	100.0100N
8AR035F	200.0100N	70.0010	100.0100N
8AR038F	200.0100N	70.0010	100.0100N
8AR041R	200.0100N	150.0100	100.0100N
8AR043R	200.0100N	150.0100	100.0100N
8AP045F	200.0100N	150.0100	100.0100N
8AR048K	200.0100N	300.0000	100.0100N
8AR049R	200.0100N	200.0100	100.0100N
8AR050P	200.0100N	150.0100	100.0100N
8AR051F	200.0100N	150.0100	100.0100N
8AR057F	200.0100N	150.0100	100.0100N
8AR071F	200.0100N	30.0000	100.0100N
8AR072HR	200.0100N	200.0100	100.0100N
8AR072CR	200.0100N	150.0100	100.0100N
8AR072DR	200.0100N	200.0100	100.0100N
2AR075P	200.0100N	150.0100	100.0100N

TITLE
ROCK SAMPLES

VARIABLE NO. 8 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 9 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 10 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 14 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 15 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
THE MAX AND MIN 0.70000e+01 FOR VARIABLE NO. 20 ARE THE SAME. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 24 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 26 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 29 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 31 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.
VARIABLE NO. 33 CONTAINS NO VALID DATA POINTS. THEREFORE THIS VARIABLE WILL BE SKIPPED.

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

DATE 1/ 9/79

TITLE
ROCK SAMPLES

THE FREQUENCY DISTRIBUTIONS AND HISTOGRAMS ON THE FOLLOWING PAGES ARE ON LOGARITHMIC SCALES, AND EMPLOY THE SAME CLASS INTERVALS AS USED IN REPORTING 6-STEP SEMIQUANTITATIVE SPECTROGRAPHIC ANALYSES. IMPORTANT NOTE- THE STATISTICS GIVEN BELOW THE HISTOGRAMS ARE DERIVED ONLY FROM DATA VALUES WITHIN THE RANGES OF ANALYTICAL DETERMINATION, AND ARE, THEREFORE, BIASED IF DATA VALUES QUALIFIED WITH "L, G, T, OR H CODES ARE PRESENT. SEE LATER SECTION OF OUTPUT FOR STATISTICAL ESTIMATES THAT ARE UNBIASED IN THIS REGARD. THE GEOMETRIC MEAN IS AN ESTIMATE OF "CENTRAL TENDENCY," OR OF A CHARACTERISTIC VALUE, OF A FREQUENCY DISTRIBUTION THAT IS APPROXIMATELY SYMMETRICAL ON A LOG SCALE, AND IS THEREFORE USEFUL FOR CHARACTERIZING MANY GEOCHEMICAL DISTRIBUTIONS. THE GEOMETRIC MEAN IS NOT AN ESTIMATE OF GEOCHEMICAL ABUNDANCE AND IS OF NO VALUE IN ESTIMATING RESERVES OR TOTAL AMOUNTS OF ELEMENTS PRESENT. SEE USGS PROFESSIONAL PAPER 574-B FOR FURTHER DISCUSSION. SEE USGS BULLETIN 1147E, PAGE 23, FOR EXPLANATION OF GEOMETRIC DEVIATION.

THE CUMULATIVE FREQUENCY PERCENTS GIVEN BELOW SHOULD BE PLOTTED AGAINST THE "LOWER" LIMITS TO GIVE THE LEPELTIER-TYPE CUMULATIVE CURVE.

151

MINIMUM = 5.37510e+05

GEOMETRIC MEAN = 5.44390e+05
GEOMETRIC DEVIATION = 1.00643e+00

0.00

0.00

0.00

0.00

MAXIMUM = 3.64351e+06
MINIMUM = 3.64740e+06
GEOMETRIC MEAN = 3.64058e+06
GEOMETRIC DEVIATION = 1.00122e+00

DATE 1/ 9/79

A47L GLOCHEMICAL SURVEY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 3 (S-FE2)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT	PERCENT	FREQ CUM
LOWER - UPPER							
8.3e-02	- 1.2e-01	0	0	0.00			100.00
1.2e-01	- 1.8e-01	0	0	0.00			100.00
1.8e-01	- 2.6e-01	0	0	0.00			100.00
2.6e-01	- 3.8e-01	1	1	2.63			100.00
3.8e-01	- 5.6e-01	0	1	0.00			97.37
5.6e-01	- 8.3e-01	3	4	7.19			92.57
8.3e-01	- 1.2e+00	6	10	15.79			89.47
1.2e+00	- 1.8e+00	15	25	39.47			73.68
1.8e+00	- 2.6e+00	7	27	5.26			34.21
2.6e+00	- 3.8e+00	4	31	10.53			28.95
3.8e+00	- 5.6e+00	1	32	2.63			18.42
5.6e+00	- 8.3e+00	6	38	15.79			15.79

HISTOGRAM FOR COLUMN 3 (S-FE2)

3.0e-01 xxx
5.0e-01
7.0e-01 xxxxxxxx
1.0e+00 xxxxxxxxxxxxxxxx
1.5e+00 xx
2.0e+00 xxxxx
3.0e+00 xxxxxxxxxxxxxxxx
5.0e+00 xxx
7.0e+00 xxxxxxxxxxxxxxxxxxxxxxxx

ANALYTICAL		VALUES	
		38	
G	L	H	T
0	0	0	0
0.00	0.00	0	0.00

MAXIMUM = 7.00000e+00
MINIMUM = 3.00000e-01
GEOMETRIC MEAN = 1.82565e+00
GEOMETRIC DEVIATION = 2.14800e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 4 (S-MGZ)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
3.8e-02 -	5.0e-02	0	0	0.00	100.00
5.0e-02 -	6.3e-02	0	0	0.00	100.00
6.3e-02 -	1.2e-01	1	1	2.63	100.00
1.2e-01 -	1.8e-01	3	4	7.89	97.37
1.8e-01 -	2.6e-01	3	7	7.89	89.47
2.6e-01 -	3.8e-01	10	17	26.32	81.58
3.8e-01 -	5.0e-01	9	26	23.68	55.26
5.0e-01 -	8.3e-01	5	31	13.16	31.58
8.3e-01 -	1.2e+00	0	31	0.00	18.42
1.2e+00 -	1.8e+00	2	33	5.26	18.42
1.8e+00 -	2.6e+00	3	36	7.89	13.16
2.6e+00 -	3.8e+00	2	38	5.26	5.26

HISTOGRAM FOR COLUMN 4 (S-MGZ)

1.0e-01 xxx
1.5e-01 xxxxxxxx
2.0e-01 xxxxxxxx
3.0e-01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
5.0e-01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
7.0e-01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
1.0e+00
1.5e+00 xxxxx
2.0e+00 xxxxxxxx
3.0e+00 xxxxx

N	L	H	P	T	G
0	0	0	0	0	0
0.00	0.00	0	0	0.00	0.00

ANALYTICAL
VALUES
38

MAXIMUM = 3.00000e+00
MINIMUM = 1.00000e-01
GEOMETRIC MEAN = 4.3109e-01
GEOMETRIC DEVIATION = 2.35619e+00

TITLE

ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 5 (S-CAZ)

LIMITS		FREQ	CUM	PERCENT	FREQ	CUM	PERCENT
LOWER	UPPER						
8.3e-02	1.2e-01	0	0	0.00	0.00	100.00	100.00
1.2e-01	1.8e-01	2	2	5.26	2.63	94.74	94.74
1.8e-01	2.6e-01	1	3	2.63	10.53	92.11	92.11
2.6e-01	3.8e-01	4	7	10.53	13.16	81.58	81.58
3.8e-01	5.6e-01	5	12	13.16	7.89	68.42	68.42
5.6e-01	8.3e-01	3	15	7.89	13.16	60.53	60.53
8.3e-01	1.2e+00	5	20	13.16	21.05	47.37	47.37
1.2e+00	1.8e+00	2	22	5.26	7.89	26.32	26.32
1.8e+00	2.6e+00	3	31	7.89	5.26	18.42	18.42
2.6e+00	3.8e+00	2	33	5.26	13.16	13.16	13.16
3.8e+00	5.6e+00	2	35	5.26	7.89	7.89	7.89
5.6e+00	8.3e+00	2	37	5.26			

HISTOGRAM FOR COLUMN 5 (S-CAZ)

```

1.5e-01 XXXXX
2.0e-01 XXX
3.0e-01 XXXXXXXXXXXXX
5.0e-01 XXXXXXXXXXXXXXX
7.0e-01 XXXXXXXXX
1.0e+00 XXXXXXXXXXXXXXX
1.5e+00 XXXXXXXXXXXXXXX
2.0e+00 XXXXXXXXX
3.0e+00 XXXXX
5.0e+00 XXXXX
7.0e+00 XXXXX

```

T		L		H		R		ANALYTICAL	
C		C		C		C		C	VALUES
0.00		0.00		0.00		0.00		0.00	FR

MAXIMUM = 7.00000e+00
 MINIMUM = 7.00000e-02
 GEOMETRIC MEAN = 9.29768e-01
 GEOMETRIC DIVIATION = 2.94480e+00

DATE 1/ 9/79

A470 GLOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 6 (S-TIZ)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	FREQ	FREQ CUM
3.6e-03 -	5.6e-03	0	0	0.00	100.00
5.6e-03 -	8.3e-03	0	0	0.00	100.00
8.3e-03 -	1.2e-02	0	0	0.00	100.00
1.2e-02 -	1.8e-02	0	0	0.00	100.00
1.8e-02 -	2.6e-02	0	0	0.00	100.00
2.6e-02 -	3.8e-02	0	0	0.00	100.00
3.8e-02 -	5.6e-02	1	1	2.63	100.00
5.6e-02 -	8.3e-02	1	2	2.63	97.37
8.3e-02 -	1.2e-01	7	9	18.42	94.74
1.2e-01 -	1.8e-01	12	21	31.58	76.32
1.8e-01 -	2.6e-01	6	27	15.79	44.74
2.6e-01 -	3.8e-01	4	31	10.53	28.95
3.8e-01 -	5.6e-01	2	33	5.26	18.42
5.6e-01 -	8.3e-01	4	37	10.53	13.16
8.3e-01 -	1.2e+00	1	38	2.63	2.63

HISTOGRAM FOR COLUMN 6 (S-TIZ)

5.0e-02 xxx
7.0e-02 xxx
1.0e-01 xxxxxxxxxxxxxxxxx
1.5e-01 xxxxxxxxxxxxxxxxx
2.0e-01 xxxxxxxxxxxxxxxxx
3.0e-01 xxxxxxxxxxxxx
5.0e-01 xxxxx
7.0e-01 xxxxxxxxxxxxx
1.0e+00 xxx

n	L	H	T	G
0	0	0	0	0
0.00	0.00	0.00	0.00	0.00

ANALYTICAL
VALUES
38

MAXIMUM = 1.00000e+00
MINIMUM = 5.00000e-02
GEOMETRIC MEAN = 1.96528e-01
GEOMETRIC DEVIATION = 2.03096e+00

DATE 1/ 9/79

A470 CFCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 7 (S-MU)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	CUM	CUM	FREQ	FREQ	FREQ	CUM
1.8e+01	2.6e+01	0	0	0.00	0.00	100.00	
2.6e+01	3.8e+01	0	0	0.00	0.00	100.00	
3.8e+01	5.6e+01	0	0	0.00	0.00	100.00	
5.6e+01	8.3e+01	0	0	0.00	0.00	100.00	
8.3e+01	1.2e+02	1	1	2.63	2.63	100.00	
1.2e+02	1.8e+02	2	3	5.26	7.89	97.57	
1.8e+02	2.6e+02	3	6	7.89	10.53	92.11	
2.6e+02	3.8e+02	2	8	5.26	15.79	54.21	
3.8e+02	5.6e+02	14	22	36.84	52.63	78.95	
5.6e+02	8.3e+02	12	34	31.58	84.21	42.11	
8.3e+02	1.2e+03	4	38	10.53	94.74	10.53	

HISTOGRAM FOR COLUMN 7 (S-MU)

1.0e+02 xxx
1.5e+02 xxxxx
2.0e+02 xxxxxxxx
5.0e+02 xxxxx
5.0e+02 xx
7.0e+02 xx
1.0e+03 xxxxxxxxxxxxx

E		L		H		U		T		ANALYTICAL	
C	C	U	U	O	O	U	U	C	C	VALUES	VALUES
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38	38

MAXIMUM = 1.00000e+03
MINIMUM = 1.00010e+02
GEOMETRIC MEAN = 4.87307e+02
GEOMETRIC DEVIATION = 1.75832e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S C S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 11 (S-H)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	FREQ	FREQ	CUM
1-Re+11 -	4-ne+01	0	6	21.05	71.05
2-Re+11 -	5-Re+01	1	9	2.63	50.00
3-Re+11 -	5.6e+01	5	14	13.16	47.37
5.6e+11 -	8.3e+01	1	15	2.63	74.21
8.3e+11 -	1.2e+02	4	19	10.53	31.58
1.2e+12 -	1.8e+02	2	21	5.26	21.05

HISTOGRAM FOR COLUMN 11 (S-P)

2.0e+01 xxxxxxxxxxxxxxxxxxxx
3.0e+01 xxx
5.0e+01 xxxxxxxxxxxxxxxxxxxx
7.0e+01 xxx
1.0e+02 xxxxxxxxxxxxxxxx
1.5e+02 xxxxx

N	L	H	P	T	G	ANALYTICAL VALUES
5	6	0	0	0	0	27
13.16	15.74			0.00	0.00	

MAXIMUM = 1.50010e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 3.23148e+01
GEOMETRIC DEVIATION = 2.43983e+00

DATE 1/ 0/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 12 (S-BA)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT FREQ CUM
LOWER	UPPER				
3.6e+01	5.6e+01	3	3	7.89	97.37
5.6e+01	8.3e+01	1	4	2.63	89.47
8.3e+01	1.2e+02	0	4	0.00	86.84
1.2e+02	1.8e+02	1	5	2.63	86.84
1.8e+02	2.6e+02	6	11	15.79	84.21
2.6e+02	5.8e+02	10	21	26.32	68.42
3.6e+02	5.6e+02	3	24	7.89	42.11
5.6e+02	8.3e+02	3	27	7.89	34.21
8.3e+02	1.2e+03	7	34	18.42	26.32
1.2e+03	1.8e+03	1	35	2.63	7.89

HISTOGRAM FOR COLUMN 12 (S-BA)

5.0e+01 xxxxxxxx
7.0e+01 xxx
1.0e+02
1.5e+02 xxx
2.0e+02 xxxxxxxxx
3.0e+02 xxxxxxxxx
5.0e+02 xxxxxxxxx
7.0e+02 xxxxxxxxx
1.0e+03 xxxxxxxxx
1.5e+03 xxx

N	L	H	B	T	G
0	1	0	0	0	0
0.00	2.63			0.00	0.00

MAXIMUM = 1.50010e+03
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 2.93147e+02
GEOMETRIC DEVIATION = 2.92631e+00

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 13 (S-BE)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	CUM	FREQ	CUM
1.8e+00	2.6e+00	5	5	13.16		76.52	
2.6e+00	3.8e+00	10	15	26.32		63.16	
3.8e+00	5.6e+00	5	20	13.16		36.84	
5.6e+00	8.3e+00	7	27	18.42		23.68	
8.3e+00	1.2e+01	1	28	2.63		5.26	

HISTOGRAM FOR COLUMN 13 (S-BE)

2.0e+00 xxxxxxxxxxxxxxxx
3.0e+00 xxxxxxxxxxxxxxxxxxxxxxxx
5.0e+00 xxxxxxxxxxxxxxxxxxxxxxxx
7.0e+00 xxxxxxxxxxxxxxxxxxxxxxxx
1.0e+01 xxx

N	L	H	H	T	G	ANALYTICAL
5	4	0	0	0	0	VALUES
13.16	10.53			0.00	0.00	29

MAXIMUM = 1.00000e+01
MINIMUM = 1.50000e+00
GEOMETRIC MEAN = 3.81489e+00
GEOMETRIC DEVIATION = 1.67255e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 16 (S-CO)

LIMITS		FREQ	FREQ CUM	PERCENT	PERCENT FREQ CUM
LOWER - UPPER					
8.3e+00 -	1.2e+01	0	0	0.00	23.68
1.2e+01 -	1.8e+01	0	0	0.00	23.68
1.8e+01 -	2.4e+01	1	1	2.63	23.68
2.4e+01 -	3.8e+01	3	4	7.89	21.05
3.8e+01 -	5.6e+01	2	6	5.26	13.16
5.6e+01 -	8.3e+01	1	7	2.63	7.89

HISTOGRAM FOR COLUMN 16 (S-CO)

2.0e+01 xxx
7.0e+01 xxxxxxxx
5.0e+01 xxxxx
7.0e+01 xxx

ANALYTICAL VALUES		T		G	
N	L	H	H	T	G
23	6	0	0	0	0
60.53	15.79			0.00	0.00

MAXIMUM = 7.00010e+01
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 2.37439e+01
GEOMETRIC DEVIATION = 2.60308e+00

DATE 1/ 9/79

A4710 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/79)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 17 (S-CR)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	CUM	FREQ	CUM
1.8e+01	2.6e+01	4	4	10.53		55.26	
2.6e+01	3.8e+01	2	6	5.26		44.74	
3.8e+01	5.6e+01	1	7	2.63		39.67	
5.6e+01	8.3e+01	1	8	2.63		36.84	
8.3e+01	1.2e+02	0	8	0.00		34.21	
1.2e+02	1.8e+02	1	9	2.63		34.21	
1.8e+02	2.6e+02	3	12	7.89		31.58	
2.6e+02	3.8e+02	1	13	2.63		23.68	

HISTOGRAM FOR COLUMN 17 (S-CR)

2.0e+01 XXXXXXXXXXXX
3.0e+01 XXXXX
5.0e+01 XXX
7.0e+01 XXX
1.0e+02
1.5e+02 XXX
2.0e+02 XXXXXXXX
3.0e+02 XXX

N	L	H	R	T	G	ANALYTICAL VALUES
7.89	14	0	0	0	0	21
	36.84			0.00	0.00	

MAXIMUM = 3.00000e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 3.13980e+01
GEOMETRIC DEVIATION = 3.34864e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 1P (S-CU)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
8.3e+00 - 1.2e+01		7	7	18.42		81.58	
1.2e+01 - 1.6e+01		12	19	31.58		63.16	
1.6e+01 - 2.6e+01		2	21	5.26		31.58	
2.6e+01 - 3.8e+01		2	23	5.26		26.32	
3.8e+01 - 5.6e+01		0	23	0.00		21.05	
5.6e+01 - 8.3e+01		1	24	2.63		21.05	
8.3e+01 - 1.2e+02		1	25	2.63		18.42	
1.2e+02 - 1.8e+02		1	26	2.63		15.79	

HISTOGRAM FOR COLUMN 1P (S-CU)

1.0e+01 XXXXXXXXXXXXXXXXXXXX
1.5e+01 XXXXXXXXXXXXXXXXXXXX
2.0e+01 XXXXX
3.0e+01 XXXXX
5.0e+01
7.0e+01 XXX
1.0e+02 XXX
1.5e+02 XXX

H		L		H		P		T		ANALYTICAL	
1		6		0		0		0		VALUES	
2.63	15.79							0.00		G	0.00

MAXIMUM = 1.50010e+02
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 1.46989e+01
GEOMETRIC DEVIATION = 2.24286e+00

DATE 1/ 9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 19 (S-LA)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
3.1e+01 -	5.6e+01	9	0	23.68		100.00	
5.6e+01 -	1.3e+01	20	29	52.63		76.32	
8.3e+01 -	1.2e+02	4	33	10.53		23.68	

HISTOGRAM FOR COLUMN 19 (S-LA)

5.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXXXXXXXXXXXXX
1.0e+02 XXXXXXXXXXXXXXXX

N		L		H		H		T		G	
0		0		0		0		0		0	
0.00		0.00		0		0		0.00		0.00	

ANALYTICAL
VALUES
38

MAXIMUM = 1.00010e+02
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 5.87646e+01
GEOMETRIC DEVIATION = 1.47850e+00

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 21 (S-HR)

LIFITS		FRFQ	PERCENT	PERCENT
LOWER - UPPER	FRFQ	CUM	FRFQ	FRFQ CUM
2.1e+11 - 5.0e+01	0	0	0.00	14.21

HISTOGRAM FOR COLUMN 21 (S-HR)

N	L	H	U	T	G	ANALYTICAL VALUES
23.68	47.11	0	0	0.00	0.00	13

MAXIMUM = 3.00000e+01
 MINIMUM = 2.00000e+01
 GEOMETRIC MEAN = 2.06336e+01
 GEOMETRIC DEVIATION = 1.11902e+00

DATE 11/9/79

A470 GEOCHEMICAL SUMMARY - U S G S STATFAC (01/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 22 (S-NI)

LIMITS		FREQ	FREQ	PERCENT	PERCENT
LOWER - UPPER		CUM	CUM	UPPER	FREQ CUM
8.3e+00 -	1.2e+01	1	1	2.63	44.74
1.2e+01 -	1.3e+01	4	5	10.53	42.11
1.3e+01 -	2.6e+01	2	7	5.26	31.58
2.6e+01 -	3.8e+01	1	8	2.63	26.32
3.8e+01 -	5.0e+01	0	8	0.00	23.68
5.0e+01 -	8.3e+01	1	9	2.63	21.05
8.3e+01 -	1.2e+02	4	13	10.53	10.53
1.2e+02 -	1.8e+02	1	14	2.63	

HISTOGRAM FOR COLUMN 22 (S-NI)

1.0e+01 xxx
1.5e+01 xxxxxxxxxxxx
2.0e+01 xxxxx
3.0e+01 xxx
5.0e+01
7.0e+01 xxx
1.0e+02 xxxxxxxxxxxx
1.5e+02 xxx

N	L	H	U	T	G	ANALYTICAL
2	19	0	0	0	0	VALUES
5.26	50.00			0.00	0.00	17

MAXIMUM = 1.50010e+02
MINIMUM = 5.00000e+00
GEOMETRIC MEAN = 2.54682e+01
GEOMETRIC DEVIATION = 3.20803e+00

DATE 1/ 9/79

A470 (LOCHEMICAL SUMMARY - U S G S STATPAC (C1/23/78)

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 25 (S-SC)

LIMITS		FREQ		PERCENT	
LOWER	UPPER	CUM	FREQ	FREQ	CUM
8.3e+00	1.2e+01	5	5	13.16	84.74
1.2e+01	1.8e+01	0	5	0.00	81.58
1.8e+01	2.6e+01	4	9	10.53	71.58
2.6e+01	3.5e+01	3	12	7.49	71.05

HISTOGRAM FOR COLUMN 25 (S-SC)

1.0e+01 XXXXXXXXXXXXXXXX
1.5e+01
2.0e+01 XXXXXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXXXXX

N	L	H	U	T	G	ANALYTICAL
0.00	5.26	0	0	0.00	0	VALUES
					0	36
					0.00	

MAXIMUM = 3.000000e+01
MINIMUM = 5.000000e+00
GEOMETRIC MEAN = 2.03515e+00
GEOMETRIC DEVIATION = 1.81886e+00

DATE 1/ 9/79

A470 GLOCHERICAL SUMMARY - U S G S STATPAC (01/23/78)

TITLE

ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 27 (S-SR)

LIMITS		FREQ		PERCENT		PERCENT	
LOWER - UPPER		CUM		FREQ		FREQ CUM	
1.8e+02 -	2.6e+02	5	5	13.16		78.95	
2.6e+02 -	3.8e+02	4	9	10.53		65.79	
3.8e+02 -	5.6e+02	3	12	7.89		55.26	
5.6e+02 -	8.5e+02	3	15	7.89		47.57	
8.5e+02 -	1.2e+03	3	18	7.89		39.47	

HISTOGRAM FOR COLUMN 27 (S-SR)

2.0e+02 XXXXXXXXXXXXXXXX
3.0e+02 XXXXXXXXXXXXXXXX
5.0e+02 XXXXXXXXXXXXXXXX
7.0e+02 XXXXXXXXXXXXXXXX
1.0e+03 XXXXXXXXXXXXXXXX

N		L		H		U		ANALYTICAL	
S		3		0		0		VALUES	
13.16		7.89						0.00	0.00

MAXIMUM = 1.00000e+03
MINIMUM = 1.00010e+02
GEOMETRIC MEAN = 2.43122e+02
GEOMETRIC DEVIATION = 2.25059e+00

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN: 28 (S-V)

LIMITS		FREQ		PERCENT	
LOWER	UPPER	FREQ	CUM	FREQ	PERCENT
1.0e+01	2.0e+01	11	11	28.95	97.37
2.0e+01	3.0e+01	9	20	23.68	68.42
3.0e+01	4.0e+01	3	23	7.89	44.74
4.0e+01	5.0e+01	3	26	7.89	36.84
5.0e+01	6.0e+01	3	29	7.89	28.95
6.0e+01	7.0e+01	2	31	5.26	21.05
7.0e+01	8.0e+01	3	34	7.89	15.79

HISTOGRAM FOR COLUMN 28 (S-V)

2.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
3.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
4.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
5.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
6.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
7.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
8.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
9.0e+01 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

N	L	H	"	T	G	ANALYTICAL
C	1	0	0	0	0	VALUES
0.00	2.63			0.00	0.00	37

MAXIMUM = 2.00010e+02
MINIMUM = 1.00000e+01
GEOMETRIC MEAN = 3.85174e+01
GEOMETRIC DEVIATION = 2.32613e+00

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 30 (S-Y)

LIMITS		FREQ	CUM	PERCENT	PERCENT	FREQ	CUM
LOWLR	UPPER						
1.8e+01	2.6e+01	5	5	13.16			
2.6e+01	3.8e+01	13	18	34.21			
3.8e+01	5.6e+01	15	33	39.47			
5.6e+01	8.3e+01	5	38	13.16			

HISTOGRAM FOR COLUMN 30 (S-Y)

2.0e+01 XXXXXXXXXXXXX
3.0e+01 XXXXXXXXXXXXX
5.0e+01 XXXXXXXXXXXXX
7.0e+01 XXXXXXXXXXXXX

U	L	H	B	T	C
0	0	0	0	0	0
0.00	0.00	0	0	0.00	0.00

ANALYTICAL
VALUES
38

MAXIMUM = 7.00010e+01
MINIMUM = 2.00000e+01
GEOMETRIC MEAN = 3.88903e+01
GEOMETRIC DEVIATION = 1.48380e+00

TITLE
ROCK SAMPLES

FREQUENCY TABLE FOR COLUMN 32 (S-ZR)

LIMITS		FREQ	FPER	CUM	PERCENT	FREQ	PERCENT	FREQ	CUM
LOWER	UPPER								
1.8e+01	2.6e+01	0	0	0	0.00	0.00	0.00	100.00	
2.6e+01	3.8e+01	1	1	1	2.63	2.63	100.00		
3.8e+01	5.6e+01	0	1	1	0.00	0.00	97.37		
5.6e+01	8.3e+01	4	5	5	10.53	10.53	87.27		
8.3e+01	1.2e+02	5	10	10	13.16	13.16	86.84		
1.2e+02	1.8e+02	20	30	30	52.63	52.63	73.68		
1.8e+02	2.6e+02	7	37	37	18.42	18.42	21.05		
2.6e+02	3.8e+02	1	38	38	2.63	2.63	2.63		

HISTOGRAM FOR COLUMN 32 (S-ZR)

3.0e+01 xxx
5.0e+01
7.0e+01 xxxxxxxxxxxxxx
1.0e+02 xxxxxxxxxxxxxx
1.5e+02 xxx
2.0e+02 xxx
3.0e+02 xxx

N	L	H	B	T	G	ANALYTICAL
0	0	0	0	0	0	VALUES
0.00	0.00	0	0	0.00	0.00	3R

MAXIMUM = 3.00000e+02
MINIMUM = 3.00000e+01
GEOMETRIC MEAN = 1.35098e+02
GEOMETRIC DEVIATION = 1.51471e+00

TITLE
ROCK SAMPLES

IN THE COMPUTATIONS PERFORMED TO PRODUCE THE FOLLOWING TABLE OF GEOMETRIC MEANS AND DEVIATIONS, ALL ELEMENTS ARE IGNORED WHERE ONE OR MORE OF THE UNQUALIFIED DATA VALUES IS LESS THAN THE ANALYTICAL LIMIT OF DETECTION SPECIFIED ON INPUT OR WHERE ANY DATA VALUES ARE QUALIFIED WITH THE G (GREATER THAN) CODE. DATA VALUES QUALIFIED WITH R OR H ARE NOT USED IN THE COMPUTATIONS. WHERE NONE OF THE DATA VALUES FOR AN ELEMENT ARE QUALIFIED THE MEAN AND DEVIATION SHOULD BE THE SAME AS THOSE GIVEN IN THE PRECEDING SECTION. WHERE DATA ARE QUALIFIED WITH THE CODES N, L, OR T, THE ESTIMATES OF GEOMETRIC MEAN AND DEVIATION ARE BASED ON A METHOD BY A. J. COHEN FOR TREATING CENSORED DISTRIBUTIONS. THE APPLICATION OF THIS METHOD TO GEOCHEMICAL PROBLEMS IS DESCRIBED IN SGS PROFESSIONAL PAPER 574-B. THE ESTIMATES ARE UNBIASED IN A STRICT SENSE ONLY WHERE THE DATA ARE DERIVED FROM A LOGNORMAL PARENT POPULATION, BUT EXPERIMENTS HAVE SHOWN THAT LARGE DEPARTURES FROM THIS REQUIREMENT MAY NOT GREATLY INVALIDATE THE RESULTS ACCEPTANCE AND USE OF THE ESTIMATES, HOWEVER, IS THE RESPONSIBILITY OF THE INDIVIDUAL.

ELEMENT	N	L	H	R	T	G	ANALYTICAL VALUES
X-COORD.	0	0	0	0	0	0	38
Y-COORD.	0	0	0	0	0	0	38
S-FEX	0	0	0	0	0	0	38
S-MGX	0	0	0	0	0	0	38
S-CAZ	0	0	0	0	0	0	38
S-TIX	0	0	0	0	0	0	38
S-MN	0	0	0	0	0	0	38
S-R	5	6	0	0	0	0	27
S-BA	0	1	0	0	0	0	37
S-RE	5	4	0	0	0	0	29
S-CO	23	6	0	0	0	0	9
S-CR	3	14	0	0	0	0	21
S-CU	1	6	0	0	0	0	31
S-IA	0	0	0	0	0	0	38
S-UH	9	16	0	0	0	0	13
S-NI	2	19	0	0	0	0	17
S-PH	0	3	0	0	0	0	35
S-SC	0	2	0	0	0	0	36
S-SR	5	3	0	0	0	0	30
S-V	0	1	0	0	0	0	37
S-Y	0	0	0	0	0	0	38
S-ZR	0	0	0	0	0	0	38

TITLE

ELEMENT	GEOMETRIC MEAN	GEOMETRIC DEVIATION	REMARKS
X-COORD.	544396.023438	1.01	38 SAMPLES AND 78 ANALYTICAL VALUES.
Y-COORD.	*****	1.00	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-FE%	1.825652	2.15	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-MG%	0.481198	2.36	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-LAZ	*****	*****	1 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-TL%	0.196528	2.03	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-MN	487.507377	1.76	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-H	*****	*****	6 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-UA	*****	*****	2 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-DE	78045249	*****	1 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CO	*****	*****	2 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CF	*****	*****	8 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-CU	*****	*****	5 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-LA	*****	*****	5 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-PH	*****	*****	13 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-NI	*****	*****	3 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-PH	*****	*****	5 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-SC	*****	*****	24 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-SR	*****	*****	12 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-V	*****	*****	3 VALUES LESS THAN SPECIFIED LIMIT OF DETECTION. NO COMPUTATIONS.
S-Y	38.899327	1.48	38 SAMPLES AND 38 ANALYTICAL VALUES.
S-ZR	135.097878	1.51	38 SAMPLES AND 38 ANALYTICAL VALUES.