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GEOLOGICAL SURVEY

Spectrographic analyses of insoluble-residue samples, Harrison 1° x 2° quadrangle, Missouri and Arkansas: Drill holes nos. 7, 9, and 10

by

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INTRODUCTION

Geochemical studies of the Harrison 1° x 2° quadrangle, Missouri and Arkansas, were begun in 1983 as part of a multidisciplinary study of the quadrangle by the U.S. Geological Survey, the Missouri Division of Geology and Land Survey, and the Arkansas Geological Commission. The purpose of the study was to assess the mineral resource potential of the area by integrated geologic, geochemical, and geophysical studies.

The geochemical work has been directed at the characterization of the sedimentary rocks in the quadrangle through spectrographic analyses of dilute-hydrochloric-acid insoluble-residue samples of whole rock from widely spaced drill holes. Drill holes have been selected for study from the sample libraries of the Missouri Division of Geology and Land Survey and the Arkansas Geological Commission. None of the holes are company confidential and none intersect economically significant mineralized ground.

The analytical results for drill hole no. 7 (Arkansas I.D., Layne Western #1 Huntsville W.W. Madison Co. 2284), drill hole no. 9 (Arkansas I.D., Scheel Green Forest, Carroll Co. 2295), and drill hole no. 10 (Arkansas I.D., Tyson Food Co. Berryville Water Well, Carroll Co. 2270) are given in this report. Drill hole no. 7 is located in sec. 3, T. 16 N., R. 26 W. in Madison County, Arkansas; drill hole no. 9 is located in sec. 4, T. 19 N., R. 23 W. in Carroll County, Arkansas; and drill hole no. 10 is located in sec. 30, T. 20 N., R. 24 W. in Carroll Co., Arkansas. Data for the insoluble-residue samples in drill holes 7, 9, and 10 are listed in tables 1, 2, and 3, respectively. State I.D., well name and/or well county number, county, and location allow identification and the ability to locate samples in Arkansas at the Arkansas Geologic Commission, Little Rock, Arkansas.

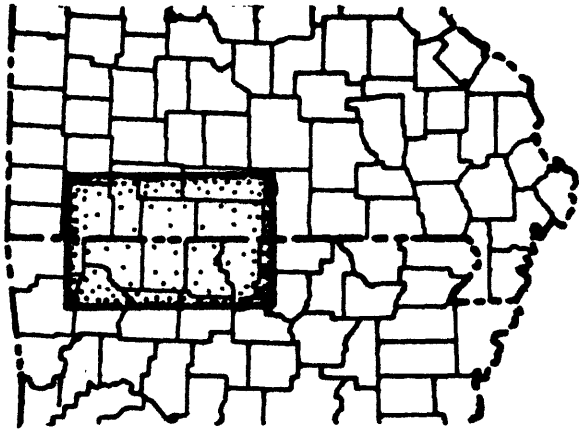
PREPARATION AND ANALYSIS OF SAMPLES

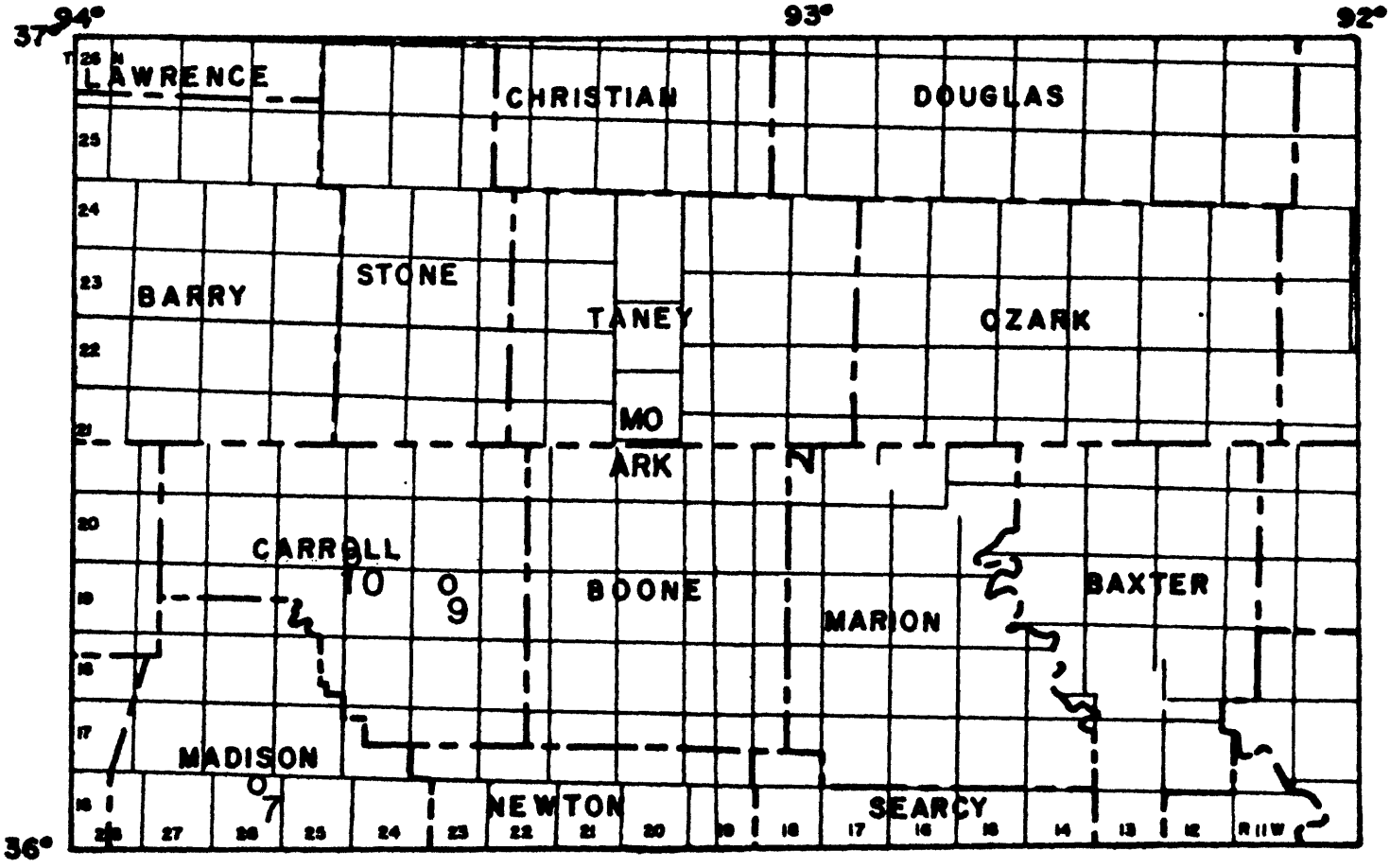
Insoluble residues were prepared by dissolving approximately 80 grams of crushed carbonate rock in repeated applications of 1:5 hydrochloric acid until the carbonate was removed. The samples were then filtered and dried overnight at 50°C.

The samples were then pulverized to minus 140 mesh (0.105 mm) in a vertical grinder equipped with ceramic plates. Some insoluble-residue samples contained only a few milligrams of material, and these were hand ground in an agate mortar and pestle. A hand magnet was passed over the insoluble-residue samples before grinding to remove filings or chips of drill bit that might have been present.

Each sample was analyzed semiquantitatively for 31 elements using a six-step D.C.-arc optical-emission spectrographic method (Grimes and Marranzino, 1968).

The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, and 0.15) and are approximate geometric midpoints of the concentration ranges. The precision is shown to be within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals on each side of the reported value 96 percent of the time (Motooka and Grimes, 1976).





HARRISON 1°X2° QUADRANGLE

Locations of drill holes discussed in this report

The visual lower limits of determination for the 31 elements that were determined spectrographically for this report are as follows:

For those given in percent:

Calcium	0.05
Iron	0.05
Magnesium	0.02
Titanium	0.002

For those given in ppm:

Antimony	100	Molybdenum	5
Arsenic	200	Nickel	5
Barium	20	Niobium	20
Beryllium	1	Scandium	5
Bismuth	10	Silver	0.5
Boron	10	Strontium	100
Cadmium	20	Thorium	100
Chromium	10	Tin	10
Cobalt	5	Tungsten	50
Copper	5	Vanadium	10
Gold	10	Yttrium	10
Lanthanum	20	Zinc	200
Lead	10	Zirconium	10
Manganese	10		

DESCRIPTION OF DATA TABLES

Samples from drill holes 7 and 9 are identified by an seven-character code and drill hole no. 10 samples are identified by an eight-character code, beginning with the letter H, signifying Harrison. The letter R either follows this number or appears at the end of the character code, and signifies insoluble residue. The next number signifies the USGS drill-hole number; for drill hole no. 10, the next two numbers signify the USGS drill-hole number. The last four digits identify the depth of the sample from the drill-hole collar. Most samples are composites of 50-foot intervals, some are composites of thicker intervals (to as much as 100 feet), dependent upon the original sample interval and upon the amount of sample material available for analysis.

The stratigraphic unit of the sample is identified by a coded number in the last column (tables 1 through 3) following the thorium column. The code and formation names are as follows:

Code	Formation
17	Gunter Sandstone member of the Gasconade Formation
30	Chattanooga Shale
31	Undifferentiated Mississippian units
32	Undifferentiated Pennsylvanian units
40	Undifferentiated Ordovician units
41	Undifferentiated Cambrian units

EXPLANATION OF DATA

The columns in tables 1 through 3 have headings of sample, elements, and formation. The letter S over the columns signifies emission-spectrographic data.

Iron, magnesium, calcium, and titanium are reported in percent (%); all other elements are in parts per million. Other symbols shown on the tables are:

N = Not detected at the limit of determination shown;
< = Detected, but below the limit of determination shown; and
> = Greater than the limit of determination shown.

Because of the formatting used in the computer program that produced tables 1-3, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant zeros to the right of the significant digits. The analyst did not determine these elements to the accuracy suggested by the extra zeros.

RASS

Upon completion of all analytical work, the information from the samples is entered into a computer-based file called RASS (Rock Analysis Storage System). This RASS file contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and placed in a standard form (STATPAC) for computerized statistical manipulation or publication (VanTrump and Miesch, 1977).

ACKNOWLEDGMENTS

The authors wish to thank the Missouri Division of Geology and Land Survey--Dr. Wallace B. Howe, former Director, and Dr. J. Hadley Williams, Director--and the Arkansas Geological Commission, Dr. Norman F. Williams, State Geologist, for making these drill-hole samples available from their sample libraries.

REFERENCES

Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

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Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.

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TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
H70050R	10.00	1.00	<.05	.500	500	N	N	N	300	300
H70100R	3.00	.30	<.05	.300	100	N	N	N	70	150
H70150R	5.00	1.00	.05	1.000	100	N	N	N	200	200
H70200R	3.00	.70	<.05	.700	100	N	N	N	100	200
H70250R	5.00	.70	.07	.700	100	N	N	N	100	150
H70300R	5.00	1.00	<.05	1.000	50	N	N	N	200	200
H70350R	7.00	1.00	<.05	1.000	50	N	N	N	200	200
H70400R	7.00	1.50	<.05	1.000	50	.7	N	N	200	200
H70450R	5.00	1.50	.05	.500	70	1.0	N	N	200	150
H70500R	7.00	.15	.50	.100	10	<.5	N	N	100	50
H70550R	1.00	.10	.70	.070	10	N	N	N	100	50
H70600R	.07	.02	1.00	.005	<10	N	N	N	100	<20
H70650R	1.00	.02	.30	.003	<10	N	N	N	100	<20
H70700R	.10	.15	1.00	.015	10	N	N	N	70	50
H70750R	.10	.50	1.00	.100	70	N	N	N	70	100
H70810R	2.00	1.00	2.00	.150	200	N	N	N	70	100
H70850R	10.00	1.50	.07	.500	100	N	N	N	150	300
H70900R	2.00	.20	<.05	.150	15	N	N	N	100	100
H70950R	1.50	.30	<.05	.100	<10	N	N	N	100	30
H71000R	1.00	.07	<.05	.030	15	N	N	N	30	20
H71050R	<.05	.02	<.05	.010	<10	N	N	N	70	20
H71100R	.70	.10	<.05	.100	<10	N	N	N	150	100
H71200R	5.00	1.50	.05	.500	50	N	N	N	150	300
H71300R	2.00	1.00	.05	.200	15	N	N	N	100	150
H71400R	1.00	.30	.05	.100	10	N	N	N	70	200
H71500R	1.00	.20	.05	.100	<10	N	N	N	100	100
H71600R	2.00	.70	.07	.300	30	N	N	N	50	200
H71650R	.70	.15	<.05	.050	<10	N	N	N	70	100
H71700R	3.00	.70	.10	.500	20	N	N	N	70	200
H71750R	5.00	.70	.10	.500	15	N	N	N	70	200
H71800R	1.50	.30	.10	.100	10	N	N	N	50	100
H71900R	.70	.15	.07	.100	10	N	N	N	50	70
H72010R	1.00	.50	<.05	.150	10	N	N	N	100	200
H72050R	.20	.05	<.05	.030	<10	N	N	N	30	50
H72150R	.70	.20	.05	.100	<10	N	N	N	100	150
H72250R	1.00	.10	.05	.100	10	N	N	N	50	100
H72350R	.20	.02	.05	.010	10	N	N	N	50	20
H72450R	.15	.10	<.05	.050	<10	N	N	N	70	70
H72500R	.10	.02	<.05	.007	<10	N	N	N	30	30
H72590R	.50	.10	.05	.030	<10	N	N	N	50	50
H72650R	.10	.02	<.05	.007	<10	N	N	N	10	N
H72750R	.50	.10	.10	.050	<10	N	N	N	50	100
H72850R	1.00	.20	<.05	.100	<10	N	N	N	70	70
H72950R	1.50	.50	.15	.100	<10	<.5	N	N	70	30
H73050R	7.00	.70	.50	.150	20	.5	N	N	100	70

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H70050R	2.0	N	N	20	150	50	N	<5	<20	100	100
H70100R	1.0	N	N	5	50	15	N	N	N	20	10
H70150R	2.0	N	N	10	100	50	50	<5	<20	70	20
H70200R	1.0	N	N	5	70	15	N	N	N	50	<10
H70250R	1.0	N	N	<5	100	10	30	<5	<20	15	<10
H70300R	2.0	N	N	10	150	15	30	N	<20	70	<10
H70350R	2.0	N	N	10	100	30	50	N	N	70	20
H70400R	1.5	N	N	50	150	50	N	5	<20	300	100
H70450R	1.5	N	N	10	300	70	N	10	N	100	30
H70500R	N	N	N	20	20	20	N	10	N	100	30
H70550R	N	N	N	<5	20	<5	N	<5	N	10	N
H70600R	N	N	N	N	<10	<5	N	N	N	5	N
H70650R	N	N	N	5	<10	<5	N	N	N	15	N
H70700R	N	N	N	N	<10	<5	N	5	N	10	N
H70750R	N	N	N	5	<10	10	N	5	N	50	N
H70810R	N	N	N	15	<10	5	N	<5	N	100	N
H70850R	1.5	N	N	20	100	70	N	50	N	70	50
H70900R	<1.0	N	N	<5	15	10	N	5	N	10	N
H70950R	N	N	N	N	10	15	N	5	N	15	<10
H71000R	N	N	N	N	10	<5	N	N	N	7	N
H71050R	N	N	N	N	10	<5	N	N	N	7	N
H71100R	N	N	N	N	10	5	N	<5	N	10	N
H71200R	1.0	N	N	200	100	70	<20	15	<20	150	30
H71300R	1.0	N	N	10	50	70	N	7	N	20	30
H71400R	<1.0	N	N	5	20	50	N	5	N	20	20
H71500R	N	N	N	N	15	20	N	<5	N	20	10
H71600R	1.5	N	N	10	50	50	N	30	N	30	50
H71650R	N	N	N	<5	15	20	N	10	N	10	<10
H71700R	1.0	N	N	10	50	70	N	20	<20	50	50
H71750R	1.0	N	N	<5	50	50	N	20	N	20	50
H71800R	N	N	N	<5	20	20	N	30	N	15	10
H71900R	N	N	N	<5	20	15	N	20	N	10	<10
H72010R	<1.0	N	N	5	20	20	N	10	N	20	20
H72050R	N	N	N	5	10	5	N	<5	N	7	<10
H72150R	N	N	N	N	10	15	N	7	N	15	200
H72250R	N	N	N	7	10	200	N	10	N	10	15
H72350R	N	N	N	N	10	15	N	10	N	10	N
H72450R	N	N	N	N	10	20	N	5	N	10	<10
H72500R	N	N	N	N	<10	5	N	5	N	10	N
H72590R	N	N	N	N	10	50	N	10	N	10	10
H72650R	N	N	N	N	<10	<5	N	<5	N	10	N
H72750R	N	N	N	<5	10	10	N	10	N	15	<10
H72850R	<1.0	N	N	5	10	20	N	7	N	15	15
H72950R	1.0	N	N	5	15	50	N	70	N	15	30
H73050R	1.0	N	N	10	20	70	N	50	N	20	100

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H70050R	N	15	N	<100	200	<50	20	200	150	N	32
H70100R	N	7	N	N	100	<50	10	N	100	N	32
H70150R	N	15	N	<100	200	<50	20	200	200	N	32
H70200R	N	10	N	N	100	<50	15	N	150	N	32
H70250R	N	7	N	<100	100	<50	20	200	700	N	32
H70300R	N	10	N	<100	200	<50	20	N	300	N	32
H70350R	N	10	N	<100	200	<50	20	N	200	N	32
H70400R	N	15	N	<100	300	<50	20	N	100	N	32
H70450R	N	10	N	N	200	<50	20	N	150	N	32
H70500R	N	5	N	N	50	<50	10	N	150	N	31
H70550R	N	N	N	N	30	<50	N	N	50	N	31
H70600R	N	N	N	N	15	<50	N	N	N	N	31
H70650R	N	N	N	N	10	<50	N	N	N	N	31
H70700R	N	N	N	N	20	<50	N	N	N	N	31
H70750R	N	5	N	N	50	<50	N	300	30	N	31
H70810R	N	7	N	N	70	<50	N	N	50	N	31
H70850R	N	15	N	N	200	<50	20	N	150	N	30
H70900R	N	5	N	N	50	<50	N	N	100	N	40
H70950R	N	5	N	N	50	<50	N	N	100	N	40
H71000R	N	<5	N	N	30	<50	N	N	30	N	40
H71050R	N	N	N	N	10	<50	N	N	20	N	40
H71100R	N	<5	N	N	30	<50	N	N	200	N	40
H71200R	N	10	N	N	100	<50	10	N	200	N	40
H71300R	N	7	N	N	100	<50	N	N	50	N	40
H71400R	N	5	N	<100	50	<50	N	N	70	N	40
H71500R	N	<5	N	N	30	<50	N	N	50	N	40
H71600R	N	7	N	100	50	<50	N	<200	100	N	40
H71650R	N	N	N	N	20	<50	N	N	30	N	40
H71700R	N	7	N	N	70	<50	N	N	150	N	40
H71750R	N	7	N	N	50	<50	N	N	200	N	40
H71800R	N	5	N	N	30	50	N	<200	30	N	40
H71900R	N	<5	N	N	30	50	N	<200	20	N	40
H72010R	N	N	N	N	50	<50	N	N	50	N	40
H72050R	N	N	N	N	15	<50	N	N	30	N	40
H72150R	N	N	N	N	30	<50	N	N	50	N	40
H72250R	N	N	N	N	20	150	N	N	50	N	40
H72350R	N	N	N	N	10	<50	N	N	N	N	40
H72450R	N	N	N	N	50	<50	N	N	N	N	40
H72500R	N	N	N	N	15	<50	N	N	N	N	40
H72590R	N	N	N	N	30	<50	N	N	N	N	40
H72650R	N	N	N	N	15	<50	N	N	20	N	17
H72750R	N	N	N	N	20	<50	N	N	15	N	41
H72850R	N	N	N	N	70	<50	N	N	30	N	41
H72950R	N	5	N	N	50	100	N	N	50	N	41
H73050R	N	7	N	N	70	<50	N	N	100	N	41

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Fe-pct.	Mg-pct.	Ca-pct.	Ti-pct.	Mn-ppm	Ag-ppm	As-ppm	Au-ppm	B-ppm	Ba-ppm
	s	s	s	s	s	s	s	s	s	s
H73100R	7.00	1.50	<.05	.500	30	.7	N	N	200	200
H73190R	5.00	1.00	.05	.500	20	N	N	N	100	500
H73280R	.30	.02	<.05	.030	<10	N	N	N	15	N

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H73100R	2.0	N	N	20	50	70	N	30	<20	50	70
H73190R	1.0	N	N	7	20	30	50	30	<20	20	50
H73280R	N	N	N	N	<10	<5	N	<5	N	7	N

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H7, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H73100R	N	10	N	<100	100	<50	15	<200	200	N	41
H73190R	N	7	N	N	50	<50	20	N	300	N	41
H73280R	N	N	N	N	10	50	N	N	150	N	41

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H9, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
H9R0050	.20	.20	N	.300	10	N	N	N	30	100
H9R0100	.50	.50	<.05	.500	10	N	N	N	100	150
H9R0150	.05	.02	.10	.020	N	N	N	N	50	20
H9R0200	<.05	<.02	.05	.005	N	N	N	N	70	<20
H9R0250	<.05	<.02	<.05	<.002	N	N	N	N	50	<20
H9R0300	<.05	<.02	<.05	.002	N	N	N	N	70	<20
H9R0350	.15	.03	.15	.020	<10	N	N	N	70	30
H9R0400	.15	.15	.30	.070	10	N	N	N	70	70
H9R0450	.50	.30	.30	.100	20	N	N	N	100	70
H9R0500	.50	.15	.30	.070	15	N	N	N	70	70
H9R0550	1.00	.30	<.05	.150	50	N	N	N	70	100
H9R0600	3.00	1.00	N	.300	20	<.5	N	N	200	150
H9R0650	3.00	.70	<.05	.200	20	<.5	N	N	150	100
H9R0700	1.50	.50	<.05	.150	10	N	N	N	100	70
H9R0750	.30	.15	<.05	.050	N	N	N	N	50	50
H9R0790	.05	.15	<.05	.070	N	N	N	N	50	100
H9R0880	1.50	.15	N	.150	N	N	N	N	30	100
H9R0930	2.00	.70	<.05	.200	20	<.5	N	N	150	150
H9R0980	1.00	.50	N	.150	20	N	N	N	100	100
H9R1030	1.50	.30	<.05	.150	15	N	N	N	100	100
H9R1080	2.00	.70	<.05	.300	30	N	N	N	150	150
H9R1130	1.50	.30	<.05	.200	15	N	N	N	70	100
H9R1180	2.00	.30	<.05	.300	20	N	N	N	70	150
H9R1230	1.50	.50	N	.150	15	N	N	N	50	100
H9R1280	1.00	.30	<.05	.150	10	N	N	N	50	100
H9R1330	1.00	.50	.15	.200	15	N	N	N	50	100
H9R1380	1.00	.20	<.05	.100	10	N	N	N	50	70
H9R1450	.70	.20	<.05	.100	10	N	N	N	50	100
H9R1510	.20	.05	N	.030	N	N	N	N	10	30

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H9, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H9R0050	<1.0	N	N	N	30	5	N	N	N	10	N
H9R0100	<1.0	N	N	N	70	5	N	N	N	10	N
H9R0150	N	N	N	N	N	N	N	N	N	5	N
H9R0200	N	N	N	N	N	N	N	N	N	<5	N
H9R0250	N	N	N	N	N	N	N	N	N	N	N
H9R0300	N	N	N	N	N	N	N	N	N	N	N
H9R0350	N	N	N	N	N	N	N	N	N	7	N
H9R0400	N	N	N	N	N	<5	N	N	N	10	N
H9R0450	<1.0	N	N	10	<10	5	N	N	N	30	N
H9R0500	N	N	N	5	N	<5	N	N	N	15	N
H9R0550	1.0	N	N	10	30	30	N	15	N	30	10
H9R0600	1.5	N	N	7	70	20	30	7	N	30	30
H9R0650	1.5	N	N	7	50	50	N	15	N	30	50
H9R0700	<1.0	N	N	N	20	10	N	<5	N	10	N
H9R0750	N	N	N	N	N	<5	N	N	N	5	N
H9R0790	N	N	N	N	N	5	N	N	N	7	N
H9R0880	<1.0	N	N	5	15	10	20	N	N	20	N
H9R0930	1.0	N	N	7	50	150	N	7	N	30	30
H9R0980	<1.0	N	N	5	20	15	N	5	N	15	10
H9R1030	N	N	N	5	20	10	N	15	N	30	10
H9R1080	1.5	N	N	10	70	30	N	15	N	30	30
H9R1130	N	N	N	5	30	15	N	<5	N	20	10
H9R1180	N	N	N	7	50	20	N	20	N	30	30
H9R1230	N	N	N	5	30	15	N	15	N	20	15
H9R1280	<1.0	N	N	N	30	10	N	7	N	15	N
H9R1330	N	N	N	5	30	15	N	5	N	20	10
H9R1380	N	N	N	N	20	7	N	7	N	15	10
H9R1450	N	N	N	N	15	7	N	N	N	10	N
H9R1510	N	N	N	N	N	N	N	N	N	<5	N

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H9, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H9R0050	N	N	N	N	20	<50	N	N	150	N	32
H9R0100	N	<5	N	N	30	<50	15	N	300	N	32
H9R0150	N	N	N	N	<10	<50	N	N	10	N	31
H9R0200	N	N	N	200	N	<50	N	N	N	N	31
H9R0250	N	N	N	300	N	<50	N	N	N	N	31
H9R0300	N	N	N	N	<10	<50	N	N	N	N	31
H9R0350	N	N	N	N	10	<50	N	N	N	N	31
H9R0400	N	N	N	N	20	<50	N	N	20	N	31
H9R0450	N	5	N	N	30	<50	N	<200	30	N	31
H9R0500	N	N	N	N	20	<50	N	N	50	N	31
H9R0550	N	7	N	N	50	<50	N	<200	70	N	30
H9R0600	N	5	N	N	100	<50	N	N	70	N	40
H9R0650	N	<5	N	N	50	<50	N	N	100	N	40
H9R0700	N	N	N	N	30	<50	N	N	50	N	40
H9R0750	N	N	N	N	10	<50	N	N	30	N	40
H9R0790	N	N	N	N	10	<50	N	N	100	N	40
H9R0880	N	N	N	N	20	<50	N	N	200	N	40
H9R0930	N	N	N	N	70	<50	N	N	100	N	40
H9R0980	N	N	N	N	50	<50	N	N	70	N	40
H9R1030	N	N	N	N	50	<50	N	<200	70	N	40
H9R1080	N	<5	N	N	70	<50	N	N	100	N	40
H9R1130	N	N	N	N	30	<50	N	N	100	N	40
H9R1180	N	N	N	N	50	<50	N	N	200	N	40
H9R1230	N	N	N	N	30	<50	N	N	70	N	40
H9R1280	N	N	N	N	50	<50	N	N	70	N	40
H9R1330	N	N	N	N	50	<50	N	N	70	N	40
H9R1380	N	N	N	N	30	<50	N	N	30	N	40
H9R1450	N	N	N	N	30	<50	N	N	50	N	40
H9R1510	N	N	N	N	10	<50	N	N	20	N	40

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H10, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
H10R0200	3.00	.30	<.05	.150	<10	<.5	N	N	70	70
H10R0250	.70	.70	.10	.200	10	N	N	N	70	150
H10R0300	1.00	.20	.10	.100	<10	N	N	N	70	100
H10R0400	.70	.20	.05	.100	<10	N	N	N	50	70
H10R0500	.50	.15	<.05	.050	N	N	N	N	30	50
H10R0600	.70	.07	<.05	.030	N	N	N	N	30	50
H10R0700	.10	.05	<.05	.020	N	N	N	N	15	30
H10R0800	.05	.02	<.05	.005	N	N	N	N	20	<20
H10R0900	.05	.03	.05	.010	N	N	N	N	30	30
H10R1000	.20	.05	<.05	.030	N	N	N	N	50	30
H10R1080	.07	.03	N	.015	N	N	N	N	10	<20
H10R1130	<.05	<.02	N	.007	N	N	N	N	<10	<20
H10R1200	.05	.02	<.05	.007	N	N	N	N	<10	<20
H10R1310	2.00	.30	.05	.100	10	<.5	N	N	70	50

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H10, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H10R0200	<1	N	N	10	10	100	N	15	N	30	30
H10R0250	1	N	N	5	15	15	N	5	N	20	20
H10R0300	N	N	N	N	10	10	N	5	N	10	10
H10R0400	N	N	N	N	10	10	N	15	N	15	<10
H10R0500	N	N	N	N	N	7	N	<5	N	10	N
H10R0600	N	N	N	N	N	<5	N	<5	N	10	N
H10R0700	N	N	N	N	N	20	N	N	N	<5	N
H10R0800	N	N	N	N	N	N	N	N	N	N	N
H10R0900	N	N	N	N	N	5	N	N	N	N	N
H10R1000	N	N	N	N	N	N	N	<5	N	N	N
H10R1080	N	N	N	N	N	7	N	N	N	N	N
H10R1130	N	N	N	N	N	N	N	N	N	N	N
H10R1200	N	N	N	N	N	N	N	N	N	N	N
H10R1310	1	N	N	15	<10	20	N	5	N	30	20

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H10, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H10R0200	N	N	N	N	20	<50	N	N	50	N	31
H10R0250	N	N	N	N	30	<50	N	N	100	N	40
H10R0300	N	N	N	N	20	<50	N	N	30	N	40
H10R0400	N	N	N	N	20	<50	N	N	30	N	40
H10R0500	N	N	N	N	10	<50	N	N	15	N	40
H10R0600	N	N	N	N	<10	<50	N	N	20	N	40
H10R0700	N	N	N	N	<10	<50	N	N	10	N	40
H10R0800	N	N	N	N	N	<50	N	N	N	N	40
H10R0900	N	N	N	N	N	<50	N	N	N	N	40
H10R1000	N	N	N	N	15	<50	N	N	N	N	40
H10R1080	N	N	N	N	<10	<50	N	N	30	N	40
H10R1130	N	N	N	N	N	<50	N	N	30	N	17
H10R1200	N	N	N	N	N	<50	N	N	10	N	41
H10R1310	N	N	N	N	70	<50	N	N	30	N	41