

1068 Brooklawn Court  
Troy, Michigan 48084  
March 20, 1979

Dr. John R. Halsey  
Michigan History Division  
Department of State  
Lansing, Michigan 48918

Dear Dr. Halsey:

Please find enclosed a preliminary draft, stage I report on a Neutron Activation Analysis of Glass Trade Beads. I must apologize for the period of time this project has taken, but we experienced delays in the collection of samples as well as in the scheduling for laboratory testing.

Stage I of this study includes classification information on fifty specimens and their laboratory test results. Stage II will synthesize interpretations and comments on these results and will be added as soon as possible. The report binder has been set up so that new material may be added or corrections may be made as they occur.

I would like for those who have participated in this study to have the opportunity of reviewing these results; also, to add descriptive information and contribute comments, corrections, criticisms or interpretations for the stage II refinements if they wish. I am also sending this report to Dr. Robert Brill at the Corning Museum of Glass for his review.

Samples were submitted to me in many stages of classification and I have attempted to bring them all up to an equal descriptive level. Since I am the sole researcher on this study and am neither an archaeologist nor a glass historian my discussion may lack the polish that a professional in these fields could give this report. I have, however, tried to be as precise as possible. All errors are my responsibility, with the exception of the lab data sheets and the loss of one bead specimen while being tested at the Phoenix Laboratory.

I would greatly appreciate your comments to this report as soon as possible and will give personal credit to anyone wishing to contribute statements for the final stages.

Thank you for your participation and support of this study.

Sincerely,

*Tyra Lee Lewis*

Tyra Lee Lewis  
Project Coordinator and Researcher

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NEUTRON ACTIVATION ANALYSIS OF GLASS TRADE BEADS

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INTERPRETATIONS AND COMMENTS (TO BE ADDED)

This study evolved in 1975, as a research branch of a project sponsored by the Grand Rapids Public Museum entitled: Beads: Their Use By Upper Great Lakes Indians. Initial funding to research and structure the testing of samples came from the Michigan Council for the Arts and the Grand Rapids Museum Association. In 1976, a grant was provided by the Phoenix Memorial Laboratory at the University of Michigan, Ann Arbor, to test some 50 samples as a unique application of the Phoenix Project theme "Peaceful Applications of Atomic Energy." Specimens were collected, classified and photographed and testing was completed in 1978.

This profile represents a comprehensive rather than a controlled sampling of types, time periods and geographic locations. The chronological span of specimens ranges from the 16th to the 19th century. Fifty beads were tested; forty-six of the specimens represent nineteen different North American archaeological sites, two represent a South American site and two are from Venetian sample bead cards. Beads were analyzed for thirty-six different elements.

Glass beads continue to appear on archaeological sites in great quantities and varieties and continue as well to be elusive in regard to origin and frustrating in regard to classification. Information obtained through the more critical examination of analysis will add some interesting facts about particular specimens but at the same time will subtract some of what we thought we had gained through visual comparisons and classifications.

It was because of a special interest in this particular artifact and a need for additional contributions in comparative testings and studies that this analysis was pursued.

Tyra Lee Lewis  
Project Coordinator and Researcher

## Acknowledgement

We would like to acknowledge the Michigan Council for the Arts, the Grand Rapids Museum Association and the Phoenix Memorial Laboratory for their support of this project.

Project Sponsor: Grand Rapids Public Museum  
Gordon L. Olson, Assistant Director, represented the museum as Project Director for this study.

Project Coordinator and Researcher: Tyra L. Lewis

Testing Director: John D. Jones, Manager, Phoenix Memorial Laboratory

This study was made possible through the cooperation of individuals and institutions who provided specimens for testing. These participants are listed within this report. In addition to those contributing samples, assistance was also provided by: The Corning Museum of Glass and Library, Mrs. Virginia Wright; Cranbrook Institute of Science, Library and Staff; Cranbrook Academy of Art; Tania Marcotti; Roderick Sprague; Kenneth Kidd; Lynn Davis; Patrick Martin; Tom Meyers and Russell Lewis.

Sites and Participants:

Old Birch Island Cemetery.....Museum of Anthropology, University  
of Michigan, Ann Arbor  
Dr. Christopher Peebles  
Katherine Spielmann

Sturgeon Fort.....National Historic Parks and Sites  
Nottingham House Branch, Parks Canada, Ottawa  
Fort Wedderburn Karlis Karklins

Fig Springs.....Department of Anthropology, Uni-  
Nueva Cadiz versity of Florida, Gainesville  
Professor Charles Fairbanks

Lasanen.....The Museum, Michigan State Uni-  
Fletcher versity, East Lansing  
Battle Point Dr. Charles Cleland  
Fort St. Joseph Patrick E. Martin  
Charles Hulse  
Fort St. Joseph Museum, Niles, Mich.

Factory Hollow.....Charles Wray  
Dutch Hollow West Rush, New York  
Feugle  
Power House  
Dann  
Rochester Junction  
Huntoon  
Honeoye

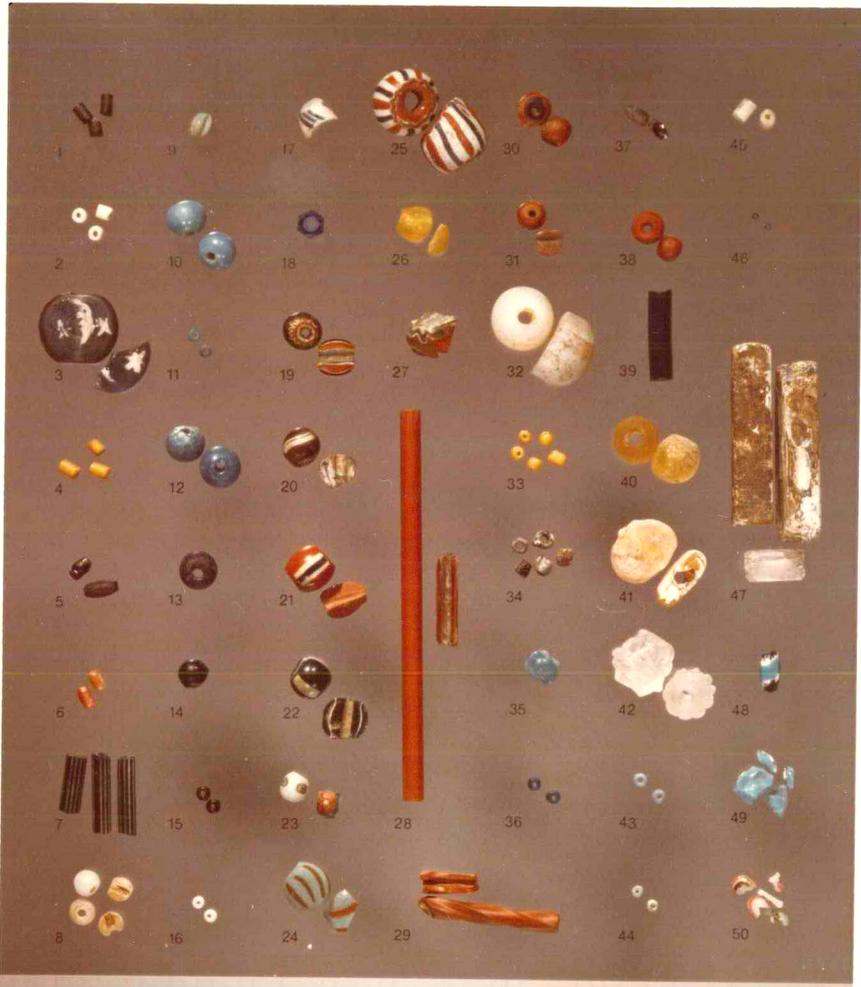
Keller.....Gerald B. Fenstermaker  
Lancaster, Pennsylvania

Rock Island II.....Department of Anthropology,  
Lawrence, University, Appleton, Wis.  
Professor Ronald J. Mason

Venetian Bead Cards,.....Illinois State Museum, Springfield  
Frost Collection Judi Johnson

SPECIMEN NUMBER ON PHOTOGRAPH - SITE - OCCUPATION DATES - LOCATION

- 1 - Old Birch Island Cemetery, 1750-1800 (estimated)...McGregor Bay,
- 2 - " " Manitoulin District, Ontario, Canada.
- 3 - " " " "
- 4 - Sturgeon Fort, 1776-1780...Peter Pond National Historic Site,
- 5 - " " Prince Albert, Saskatchewan, Canada.
- 6 - " " " "
- 7 - Nottingham House, 1802-1806...On English Island, Lake Athabasca,
- 8 - " " Alberta, Canada.
- 9 - " " " "
- 10- Fort Wedderburn, 1817-1818...Old Fort Point, Lake Athabasca,
- 11- " " Alberta, Canada.
- 12- Fig Springs (Co-1), 1620-1660...Columbia County, Florida.
- 13- " " " "
- 14- " " " "
- 15- Lasanen, late 17th century burial...St. Ignace, Michigan.
- 16- Fletcher - Ottawa cemetery, 1730-1750...Bay City, Michigan.
- 17- Fort St. Joseph, 1700-1781...Niles, Michigan.
- 18- Battle Point, early 19th century Indian cemetery...Grand River,  
Ottawa County, Michigan.
- 19- Factory Hollow, 1590-1615...West Bloomfield, New York.
- 20- " " " "
- 21- Dutch Hollow, 1600-1625...Avon, New York.
- 22- " " " "
- 23- Feugle, 1600-1625...Avon, New York.
- 24- Power House, 1645-1660...Lima, New York.
- 25- " " " "
- 26- " " " "
- 27- " " " "
- 28- Dann, 1660-1675...Honeoye Falls, New York.
- 29- " " " "
- 30- Rochester Junction, 1675-1687...Honeoye Falls, New York.
- 31- " " " "
- 32- Huntoon, 1710-1730...Canandaigua, New York.
- 33- Honeoye, 1750-1779...Honeoye, New York.
- 34- " " " "
- 35- Keller, 1550-1575...Lancaster County, Pennsylvania.
- 36- Rock Island II, 1650-1770 \*...Rock Island State Park, Door County,  
37- " " Wisconsin.
- 38- " " " "
- 39- " 1675-1700 \* \* Dates indicate chronological
- 40- " 1675-1730 \* span at Rock Island II only.
- 41- " " " "
- 42- " " " "
- 43- " 1675-1770 \* " "
- 44- " 1760-1770 \* " "
- 45- " " " "
- 46- " " " "
- 47- Nueva Cadiz, 1518-1545...Venezuela, South America.
- 48- " " " "
- 49- Venetian Bead Card, 1848-1937...Stephen and Dan Frost of New York City.
- 50- " " " "



GLASS TRADE BEADS FROM NORTH AMERICAN ARCHEOLOGICAL SITES.  
 NEUTRON ACTIVATION CHEMICAL ANALYSIS CONDUCTED BY THE UNIVERSITY OF MICHIGAN,  
 PHOENIX MEMORIAL LABORATORY, FORD NUCLEAR REACTOR, ANN ARBOR, MICHIGAN.  
 STUDY PREPARED AND PHOTOGRAPHED BY TYRA LEWIS, 1976-1977.



## Statement on Bead Classifications

Bead type samples and fragments tested were photographed and numbered as shown on the color print included in this report. \*In order to clarify the title strip on this photo, it should read; forty-six specimens are from North American archaeological sites; two are from a South American site and two are from Venetian sample bead cards.

Specimens have been classified using Kenneth and Martha Kidds' system with variables indicated by an asterisk (\*). Additional descriptive information on shape, manufacture, size, color, diaphaneity, structure and physical characteristics accompanies each bead.

### Shape

Basic Shapes: tubular, barrel, round, circular and oval

Modified Shapes:

flat (pressed on marver or with pincher-style flat paddles)

disk " " " "

corn " " " "

melon (pressed with pincher-style mold)

raspberry-mulberry (rolled over textured marver or pressed with  
pincher-style mold)

faceted (cut; pressed with pincher-style flat paddles or pressed  
in pincher-style mold)

twisted

### Manufacture

Drawn and wound types represented.

### Size

Scale is provided on the photograph. Individual specimen size or type range is given.

### Color

Munsell Book of Color

### Diaphaneity

Opaque, translucent and transparent with additional notations under specific light conditions.

Statement on Bead Classifications (cont.)

Structure

Simple - Bead with one layer of glass.

Compound - Bead with two or multiple concentric layers of glass.

Complex - Bead with surface decorations consisting of glass rod stripes, applied designs or impregnated millefiori pieces.

\* If a bead is of simple structure, no explanation is recorded. Compound and complex examples have notations.

Physical Characteristics

Presence of bubbles, patina, striations, etc.

Comparative Types

Beads that visually classify as alike:

5 and 37

12 and 35

31 and 38 (\* exception - some specimens have matt appearance to glass)

4 and 33 ( examples of untumbled and tumbled )

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
1	21803 1501	Old Birch Island 1750-1800 (estimated)	Ia2	tubular drawn	4.5mm length 3mm diameter	N 1/0 5P 2/1 with back light	Opaque; appears black but glass shows purple tint at edges with light. Untumbled with patina.
2	21802 1502	"	Iva type	tubular to barrel drawn	3.5mm length 2mm diameter	N 9.25	Compound construction; opaque white inner layer with thin clear outside layer. Rounded edges.
3	21787 1503	"	WIIICl * design is slightly different and runs parallel to perfor- ation.	disk wound flattened	18mm length 15.5mm width 5.5mm thickness	7.5PB 2/2 7.5PB 5/10 with back light	Complex construction. Semi-transparent blue glass with thin white design applied to both sides. Side A; Man-in-Moon face flanked on both sides by a five pointed star. Side B; Comet flanked on both sides by a five or six pointed star.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
4	1N1A1-4 1504	Sturgeon Fort 1776-1780	Ia type Ia7 * color and glass	tubular drawn	3.0-4.5mm length 2.0-3.0mm diameter	10YR 6/5	Opaque to slightly translucent; a chalky-white patina covers most specimens. The ends of most beads appear to consist of unaltered breaks, though some have been rounded by tumbling. Numerous linear bubbles in glass.
5	1N1A2-18 1505	"	Wic type	oval wound	5.0-8.0mm length 3.0-4.0mm diameter	N 1/0 5P 2/1 on edges with back light.	Opaque; appears black but shows purple tint at edges. Shows winding and patina.
6	1N1A2-20 1506	"	Wic type Wic6 * color	oval wound	5.0-5.5mm length 2.75-3.0mm diameter	2.5R 5/10	Semi-transparent; the specimens are very thin and fragile. Small bubbles are present in glass.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS-- COMMENTS
7	8R3F4-5 1507	Nottingham House 1802-1806	Ib type	tubular drawn	13.4-18.0mm length 4.0-4.7mm diameter	7.5PB 3/4 body N 10/0 stripes	Complex construction. Transparent; body is decorated with 9-13 thin, straight, opaque white stripes. Ends are slightly rounded.
8	8R1A2-15 1508	"	Wib type	round wound	4.6-5.1mm length 5.6-6.8mm diameter	N 8/0	Translucent; wind marks are evident in the glass. A white patina covers most specimens.
9	8R1A2-21 1509	"	WIIe type	melon wound with surface impression	5.8mm length 5.2mm diameter	2.5B 7/4	Opaque; beads have 6-8 rounded ridges running parallel to the axis of the perforation.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
10	4R1B11-8 1510	Fort Wedderburn II 1817-1818	W1b type	round wound	7.3-8.1mm length 8.6-9.5mm diameter	10B 6/6	Opaque to slightly translucent. The glass contains several bubbles and is swirled.
11	4R1D3-11 1511	"	I1a type	circular drawn	1.8-2.0mm length 2.7-2.9mm diameter	5B 5/7	Transparent; the glass contains numerous bubbles.
12	3CF 1512	Fig Springs Site Co-1 1620-1660	I1a 40 * color	round drawn	8.0mm length 8.0mm diameter	10B 4/6	Opaque to slightly translucent. Striations run the length of the bead. Itchtucknee Plain Type.
13	4CF 1513	"	I1a55	round drawn	7.0mm length 8.0mm diameter	7.5PB 2/2	Transparent; Itchtucknee Plain Type.
14	5CF 1514	"	I1a55* color	round drawn	7.0mm length 6.0mm diameter	2.5P 2/2	Transparent; glass is free of bubbles. Small hole. Itchtucknee Plain Type.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
15	20MA21 1515	Lasanen late 17th century burial	IIa7 *	circular drawn	1.5mm length 2.5mm diameter	N 1/0 10RP 2/1 with back light	Opaque; appears black but shows translucent purple tint with back light.
16	20BY28 1516	Fletcher Ottawa cemetary 1730-1750	IVa type	circular to round drawn	1.5mm length 2.0mm diameter	N 9.25	Compound construction. Opaque; has translucent cast with back light.
17	1C 1517	Niles Fort St. Joseph 1700-1781	IIb'7 * add pale blue core. IVb' type	oval drawn	17mm length 8mm diameter	10B 8/2 core N 9.25 wht. base 7.5PB 2/10 stripes	Complex construction. Opaque; white bead with pale blue core. Surface has 3 sets of 3 blue spiral stripes.
18	200T50 1518	Battle Point early 19th century Indian cemetary	IIIIf2	barrel drawn with cut facets	6mm length 5mm diameter	7.5PB 3/10 outside	Compound construction; transparent dark blue outer layer with translucent light blue core. Bead has 18 facets.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
19	7-11 1519	Factory Hollow 1590-1615	IVk4	round drawn 4 inner layers have ridge impressions	7mm length 8mm diameter	7.5PB 2/4 outside 7.5R 5/6 red 5B 5/7 core	Compound construction of 5 layers: outside transparent dark blue; next opaque white; next opaque red; next opaque white; core transparent light blue. "Star" type
20	7-13 1520	"	IIb 13 * color	round drawn	8mm length 8mm diameter	1ORP 2/1 1ORP 5/6 with back light	Complex construction. Transparent bead with 3 sets of 3 opaque white, spiral stripes. (9 stripes)
21	7-8 1521	Dutch Hollow 1600-1625	IIbb1	round drawn	10mm length 10mm diameter	7.5R 3/8 bead 7.5PB 3/4 blue stripe	Complex construction. Opaque bead with 3 sets of narrow blue stripe over a wide white stripe.
22	7-10 1522	"	IVb30 * translucent	round drawn	9mm length 9mm diameter	7.5PB 2/6	Complex construction. Translucent blue bead with opaque white middle layer and 3 opaque white, wide stripes on outside. Other bead is opaque.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
23 blue-red bead tested	7-6A 1523	Feugle 1600-1625	IVg1 * shape	round drawn	6mm length 7mm diameter	5B 5/8 bead 2.5R 5/6 design	Complex construction. Transparent blue outer layer, opaque white middle layer and trans- parent blue core. Surface designs consist of 3 red on white star- type designs or eyes. "Flush Eye" type.
24	8-1 1524	Power House 1645-1660	IIb type	flat drawn round reheated flattened	10mm length 10mm width 5mm thickness	5BG 6/2 bead 7.5R 3/6 stripes	Complex construction. Opaque to slightly translucent bead with 7 opaque red stripes. Linear bubbles in glass.
25	8-2 1525	"	IVnn4	round drawn 3 inner layers have ridge impressions	12mm length 14mm diameter	7.5R 3/6 red 7.5PB 3/4 blue	Complex construction. Outside layer opaque white; next opaque red; opaque white; core opaque red. 12 alter- nating red-blue stripes are applied to white outside layer: 6 opaque red and 6 transparent blue. "Star" type.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
26	8-3 1526	Power House 1645-1660	WIIal	corn wound flattened	8mm length 5mm-8mm taper 2.5mm-4mm thickness	2.5Y 6/12	Transparent; numerous bubbles in glass. Bead has a very small hole and rough surface texture. "Corn Bead" type.
27	8-5 1527	"	IIIml *	oval drawn 6 inner layers have ridge impressions	35mm length 23mm diameter	7.5PB 3/4 outside 7.5R 3/6 red 5B 5/7 inner layer and core	Compound construction. 7 layers outside to core: transparent dark blue (PB); opaque white; opaque red; opaque white; transparent light blue (B); opaque white; transparent light blue (B) core. Ends have been ground. "Star" type

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
28	8-18 1528	Dann 1660-1675	IIIa4 * add clear surface layer	tubular drawn	9cm length 5mm diameter	7.5R 3/6 outside 5B 5/7 core	Compound construction. Thin clear outside layer; opaque red middle layer; transparent blue core. "Cornaline d' Aleppo" type.
29	8-18A 1529	"	IC'1	tubular square in cross section drawn twisted	3.5cm length 5mm diameter	7.5R 3/6	Opaque bead with medium twist. Glass has dark streaks. Striations run the length of the bead.
30	9-3 1530	Rochester Junction 1675-1687	IVa5 * add clear surface layer	round drawn	6mm length 8mm diameter	7.5R 4/6 outside 10GY 6/6 core	Compound construction. Thin clear outside layer; opaque red middle layer; transparent green core. "Cornaline d' Aleppo" type.
31	9-3A 1530	"	IIa1	round drawn	5mm length 5mm diameter	7.5R 3/6	Opaque bead; shows dark swirls in glass.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
32	9-12 1532	Huntoon 1710-1730	Wib5 * color	round wound	13mm length 14mm diameter	N.8.75 10B 9/3 5Y 9/6 with back light	Translucent; gives off blue cast with no back light but has a golden cast with back light.
33	9-15 1533	Honeoye 1750-1779	IIa20* glass	round drawn	2.5-3.0mm length 3mm diameter	10YR 5/10	Opaque to slightly translucent.
34	9-16 1534	"	WIIf type	tubular to barrel appears trapezoidal in cross section  wound mold pressed facets	4.0-4.5mm length 3.5-4.0mm diameter 3-5mm sides	2.5RP 2/2	Appears opaque black but shows translucent purple at edges. Most beads have 4 irregular facets, some in the shape of a trapezoid or a parallel- ogram. Most specimens have one long protruding corner or edge suggest- ing that a mold was used to press facets. Patina.
35	IGBF 1535	Keller 1550-1575	IIa40 * color	round drawn	7mm length 8mm diameter	10B 5/8	Opaque to slightly translucent. Striations run the length of the bead.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
36	8 1536	Rock Island II 1650-1770 * *Dates indicate chronological span at Rock Island II.	Iia55/56	round to circular drawn	2.5mm length 3mm diameter	5PB 2/8	Transparent seed bead.
37	1 1537	"	Wic type	oval wound	6mm length 2mm diameter	N 1/0 5P 2/1 at edges with back light	Opaque; appears black and shows purple tint at edges with back light. Shows winding and patina.
38	12 1538	"	Iia1	round drawn	5mm length 7mm diameter	7.5R 4/6	Opaque bead; has dark swirls in glass.
39	10 1539	" 1675-1700 *	Ia19/20 * color	tubular drawn	20mm length 5mm diameter	5PB 2/6	Transparent; ends are slightly rounded.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
40	2 1540	Rock Island II 1675-1730 * *Dates indicate chronological span at Rock Island II.	Wib7/c5 * color and glass	round to oval wound	12mm length 10mm diameter	10YR 4/6 10YR 6/10 with back light	Translucent to slightly transparent. Glass shows winding and some patina.
41	11 1541	"	WIIb type	disk wound flattened	15mm length 12mm width 5mm thickness	10YR 5/10	Translucent with frosty white patina. Shows winding.
42	13 1542	"	WIIId1	raspberry mulberry wound with surface impression	15mm length 10mm diameter	N 8/0	Transparent; nodes run in diagonal rows along length of bead. 3 to 4 nodes per row with approximately 30 nodes per specimen. Surface has texture similar to hobnail glass.
43	9 1543	" 1675-1770 *	IIa46/47	round to circular drawn	2mm length 2.5mm diameter	2.5PB 6/4	Opaque seed bead.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
44	3 1544	Rock Island II 1760-1770 *Dates indicate chronological span at Rock Island II	IIa24 *	round drawn	2mm length 2mm diameter	10GY 4/4	Opaque seed bead, has patina.
45	5 1545	"	IIIa type	tubular drawn	5mm length 3mm diameter	N 8.75	Compound construction. Bead has shiny, clear outside coating over opaque white base.
46	4 1546	"	IIa26 * size	round drawn	1mm length 1mm diameter	7.5G 4/6	Transparent, very small seed bead.
47 short specimen tested	1-CF 1547	Nueva Cadiz 1518-1545	Ic type	tubular square in cross section drawn	40mm length 8.5mm sides	N 8/0	Transparent; specimen shows striations run- ning length of glass. Beads have 4 sides. Heavy patina.
48	2-CF 1548	"	IIIc'4 * no twist and color	tubular square in cross section drawn	8mm fragment length 4mm sides	5B 6/10 outside 5PB 2/6 core	Compound construction. Outside layer trans- parent blue (B); middle opaque white; core transparent dark blue (PB) Bead has 4 sides.

COMPARATIVE BEAD CLASSIFICATION CHART

PHOTO NUMBER	SPECIMEN NUMBER ANALYSIS NUMBER	SITE	KIDDS' TYPE AND NUMBER (* NOTE VARIABLE)	SHAPE AND MANUFACTURE	SIZE	MUNSELL COLOR	GLASS - COMMENTS
49	683 1549	Venice Bead Card Stephen & Dan Frost 1848-1937  The last two fragment specimens were taken from two Venetian sample bead cards in the Stephen A. Frost & Son Collection. In 1848 Stephen Frost began his career in New York City, traveling throughout the U.S. dealing in trade goods. His son, Dan, continued the business until 1937.	no number	fragments submitted, classification information incomplete at this time.	7.5B 7/6	Opaque blue bead with black and white stripe surface pattern.	
50	Xa 1550	"	"	"	"	1ORP 6/12 pink N8.75 white	Translucent pink (RP) outer layer; middle layer of foil; core of translucent white. Some green glass from decoration is also evident.

VENICE



NEW YORK

49

661		672		683		694	
662		673		684		695	
663		674		685		696	
664		675		686		697	
665		676		687		698	
666		677		688		699	
667		678		689		700	
668		679		690		701	
669		680		691		702	
670		681		692		703	
671		682		693		704	

## Neutron Activation Analysis Statement

All samples were analyzed by instrumental neutron activation analysis. Samples were irradiated at two different times in the two megawatt Ford Nuclear Reactor at the University of Michigan Phoenix Laboratory. The first irradiation was of short duration in a pneumatic tube system, and counting was done immediately after irradiation. The second irradiation was for 20 hours at a neutron flux of approximately  $1.5 \times 10^{13}$  n/cm<sup>2</sup>/sec. After the 20 hours of irradiation, samples were counted on two different occasions. Activity was measured using a gamma-ray spectrometer using a high resolution lithium drifted germanium detector coupled to a computerized analysis system.

### Laboratory Results

Sample Identification Number: Last two digits equal bead number on photograph. Example: 1503 = bead #3.

Result: Amount of element detected.

(<): Element not detected (Amount would have had to be greater than amount presented).

+/-: Standard deviation error associated with the count.  
Element amounts given in parts per million (PPM) with the exception of potassium (K) which is given in percent (%).

### Elements

Ti - Titanium	Se - Selenium
Mg - Magnesium	Hg - Mercury
Cu - Copper	Th - Thorium
Na - Sodium	Cr - Chromium
V - Vanadium	Hf - Hafnium
Cl - Chlorine	Ba - Barium
Al - Aluminum	Nd - Neodymium
Mn - Manganese	Ag - Silver
Ca - Calcium	Cs - Cesium
K - Potassium	Ni - Nickel
Sm - Samarium	Tb - Terbium
Lu - Lutetium	Sc - Scandium
U - Uranium	Rb - Rubidium
Cd - Cadmium	Fe - Iron
Au - Gold	Zn - Zinc
Br - Bromine	Co - Cobalt
La - Lanthanum	Eu - Europium
Ce - Cerium	Sb - Antimony

## Explanation of Results Table

The following table shows a condensed version of the neutron activation analysis results as a group. It was prepared by the researcher for general comparative reference.

The range of element amounts detected was from a low of 0.0436 (#41-Au) to a high of 194175. (#40-K) expressed in PPM. In order to group the data for analysis 8 categories were established based on the total distribution of all amounts detected.

Each category was assigned a number 1 through 8. (1) represents the lowest range of elements detected and (8) represents the highest range of elements detected.

The numbers (1 through 8) were assigned on the basis of the number of digit places in the result:

### EXAMPLE

<u>Category</u>	<u>(Digit Places)</u> Scientific Notation Equivalent	<u>Example Results</u> (#1503)
1	----- $10^{-2}$ -----	Sc 0.0544
2	----- $10^{-1}$ -----	Th 0.1625
3	----- 10 -----	V 4.9393
4	----- $10^1$ -----	Ni 54.2167
5	----- $10^2$ -----	Ti 511.2331
6	----- $10^3$ -----	Na 4115.5437
7	----- $10^4$ -----	Ca 66047.9222
8	----- $10^5$ -----	K 122880.

For exact element amounts detected in each sample refer to the fifty individual laboratory data sheets.

Specimens were analyzed for 36 different elements. Two were not detected: uranium (U) and terbium (Tb).

The total number of elements determined in each bead, from the possible 36, is also shown on the table.

Sample #33 was lost during testing and reads incomplete.

Sample #26 is the only sample not showing sodium (na).

Sample #50 is the only sample showing selenium (se).

Note: In the results, potassium (K) was expressed as (%), however, to correspond on the table it was converted to PPM.



SAMPLE	1501,	43.26 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	9636	223 <	529.2262	0.0000		5
PPM MG	1831	241	3207.2345	611.2526		32
PPM CU	2720	312	176.0706	31.0998		36
PPM NA	3007	1479	3293.0675	157.7888		727
PPM V	3808	-81 <	1.9316	0.0000		0
PPM CL	2203	26 <	616.7339	0.0000		0
PPM AL	2367	7354	804.4834	12.3186		22848
PPM MN	2737	10801	1860.6922	23.6522		41060
PPM CR	104	110	3996.8008	534.0733		116

SAMPLE	1501,	43.26 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	3296	89 <	2.0722	0.0000		2

SAMPLE	1501,	43.26 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	266	-676 <	0.1169	0.0000		0
PPM LU	20980	-339 <	0.6573	0.0000		0
PPM U	14580	126 <	19.1959	0.0000		1
PPM CD	8393	-311 <	143.3190	0.0000		0
PPM AU	3820	-160 <	0.2700	0.0000		0
PPM BR	1228	290	32.2993	4.3428		68
PPM LA	179	202	8.2461	0.7972		228

SAMPLE	1501,	43.26 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	40595	1131	3.6924	0.6670		32
PPM SE	23788	498 <	3.8783	0.0000		10
PPM HG	26410	2438	6.7981	0.4738		225
PPM TH	25760	1114	0.7195	0.1059		48
PPM CR	19716	1121	13.4341	1.7390		64
PPM HF	15025	407 <	0.4619	0.0000		11
PPM BA	12541	489 <	288.6222	0.0000		19
PPM ND	10800	338 <	52.8879	0.0000		11
PPM AS	7920	-363 <	1.7805	0.0000		0
PPM CS	8473	-1095 <	0.5377	0.0000		0
PPM NI	6493	401	54.5459	11.3051		25
PPM TB	7096	191 <	0.2519	0.0000		5
PPM SC	9792	13349	1.2251	0.0142		18198
PPM RB	5920	-182 <	24.5079	0.0000		0
PPM FE	6978	4163	4274.8700	109.4567		2484
PPM ZN	10450	1918	105.9320	6.2849		352
PPM CO	3855	17419	26.6289	0.3383		78709
PPM EU	4438	-167 <	0.2489	0.0000		0
PPM SB	1342	31241	64.3234	1.0856		727273

SAMPLE	1502,	34.73 MG,	300 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM TI	12155	-338 <	739.8966	0.0000	0
PPM MG	4108	849	14073.5315	1219.4197	175
PPM CU	6544	99 <	266.3215	0.0000	1
PPM NA	4635	28916	80195.9448	1353.2132	180396
PPM V	5134	737	6.1217	0.6373	106
PPM CL	2424	2325	8083.1930	295.6899	2230
PPM AL	2576	30222	4118.1140	39.2027	354569
PPM MN	1759	2136	466.9933	13.9835	2594
PPM CA	180	1398	63271.5864	1974.9815	10858

SAMPLE	1502,	34.73 MG,	600 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
% K	5124	394	3.7712	0.7300	30

SAMPLE	1502,	344.73 MG,	1800 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM SM	478043	-5147 <	0.6013	0.0000	0
PPM LU	437155	-733 <	0.3762	0.0000	0
PPM U	366867	645 <	12.1109	0.0000	1
PPM CD	392947	1659 <	122.4295	0.0000	7
PPM AU	223159	3040	0.3569	0.0560	41
PPM BR	22918	-388 <	9.8807	0.0000	0
PPM LA	1	-0 <	0.0377	0.0000	0

SAMPLE	1502,	34.73 MG,	3000 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM CE	1657755	-189 <	24.3594	0.0000	0
PPM SE	1375484	-945 <	36.6145	0.0000	0
PPM HG	1496893	-4571 <	19.7373	0.0000	0
PPM TH	1589680	643 <	4.7172	0.0000	0
PPM CR	1267452	-489 <	78.1860	0.0000	0
PPM HF	890190	3674 <	4.4107	0.0000	15
PPM BA	725629	-1590 <	2722.3595	0.0000	0
PPM ND	628033	3526 <	499.9287	0.0000	20
PPM AG	374224	-4372 <	15.1605	0.0000	0
PPM CS	389695	-61870 <	4.5181	0.0000	0
PPM NI	290331	-4499 <	424.9802	0.0000	0
PPM TB	252090	1555 <	1.8593	0.0000	10
PPM SC	336888	2113 <	0.3088	0.0000	13
PPM RB	261635	-1693 <	201.6470	0.0000	0
PPM FE	312719	2485 <	3329.5128	0.0000	20
PPM ZN	526069	2354 <	232.2435	0.0000	11
PPM CO	291975	-16522 <	4.7897	0.0000	0
PPM EU	390069	-357 <	2.7325	0.0000	0
PPM SB	257947	2745172	7040.3633	111.7338	29215185

SAMPLE	1503,	90.41 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	37279	927	511.2331	107.9673	23	
PPM MG	7381	348 <	2561.1227	0.0000	16	
PPM CU	10808	223 <	131.2671	0.0000	5	
PPM NA	12449	3863	4115.5437	150.5385	1199	
PPM V	16966	1548	4.9393	0.4350	141	
PPM CL	7313	216 <	552.5407	0.0000	6	
PPM AL	7520	78249	4095.8333	33.9535	814216	
PPM MN	5576	38201	3208.2817	27.3912	261714	
PPM CR	403	3739	66047.9222	1414.0107	35374	

SAMPLE	1503,	90.41 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	17149	3342	12.2880	0.7474	651	

SAMPLE	1503,	90.41 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	347	68 <	0.0637	0.0000	13	
PPM LU	15960	-83 <	0.2757	0.0000	0	
PPM U	11299	-82 <	8.1907	0.0000	0	
PPM CD	4853	-134 <	51.1984	0.0000	0	
PPM AU	1759	2492	1.1216	0.0317	3530	
PPM BR	655	-105 <	6.6828	0.0000	0	
PPM LA	55	20 <	0.7332	0.0000	7	

SAMPLE	1503,	90.41 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	22970	25 <	1.1052	0.0000	0	
PPM SE	11664	59 <	1.3015	0.0000	0	
PPM HG	12150	145 <	0.6864	0.0000	2	
PPM TH	11745	526	0.1625	0.0342	24	
PPM CR	9286	-151 <	2.5853	0.0000	0	
PPM HF	7025	-110 <	0.1515	0.0000	0	
PPM BA	55	35 <	9.8133	0.0000	22	
PPM ND	5170	145 <	17.5524	0.0000	4	
PPM AG	4333	254 <	0.6316	0.0000	15	
PPM CS	4077	424	0.2533	0.0401	44	
PPM NI	4441	833	54.2167	4.7517	156	
PPM TB	4446	20 <	0.0956	0.0000	0	
PPM SC	6432	1238	0.0544	0.0038	238	
PPM RB	3829	725	23.5843	2.2197	137	
PPM FE	4950	310 <	162.0783	0.0000	19	
PPM ZN	7020	721	19.0581	2.3378	74	
PPM CO	1430	22261	16.2834	0.1920	346540	
PPM EU	1099	-2 <	0.0598	0.0000	0	
PPM SB	330	2722	2.6816	0.0691	22452	



SAMPLE	1505,	57.88 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	69008	645 <	1054.6109	0.0000	6	
PPM MG	13810	553	5500.4319	1200.3405	32	
PPM CU	19831	1274	537.3531	61.3948	32	
PPM NA	19604	4458	7418.7463	283.0452	1014	
PPM V	19575	456 <	3.2560	0.0000	11	
PPM CL	12778	274 <	1102.1837	0.0000	6	
PPM AL	19087	3534	288.9469	12.4819	654	
PPM MN	45832	23399	3069.6086	39.9455	11946	
PPM CA	712	152	4127.8262	800.0868	32	

SAMPLE	1505,	57.88 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	18521	59 <	3.6501	0.0000	0	

SAMPLE	1505,	57.88 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	62814	499 <	1.3013	0.0000	4	
PPM LU	22925	-345 <	0.5179	0.0000	0	
PPM U	15921	75 <	15.3612	0.0000	0	
PPM CD	9872	156 <	116.2410	0.0000	2	
PPM AU	5107	45 <	0.2380	0.0000	0	
PPM BR	1404	231	19.2607	3.3730	38	
PPM LA	269	291	8.8914	0.7235	315	

SAMPLE	1505,	57.88 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	54775	1115	2.7197	0.5769	23	
PPM SE	34828	-308 <	3.5051	0.0000	0	
PPM HG	37449	1302	2.7091	0.4098	45	
PPM TH	38335	1185	0.5720	0.0960	37	
PPM CR	30128	875	7.8374	1.5806	25	
PPM HF	19705	1128	0.6800	0.0871	65	
PPM BA	16303	980	403.9514	55.5038	59	
PPM ND	14085	330 <	45.1107	0.0000	8	
PPM AG	7735	266 <	1.3153	0.0000	9	
PPM CS	9846	-2030 <	0.4331	0.0000	0	
PPM NI	6417	129 <	38.1455	0.0000	3	
PPM TB	6786	255 <	0.1841	0.0000	10	
PPM SC	9462	13199	0.9054	0.0105	18413	
PPM RB	5665	-56 <	17.9215	0.0000	0	
PPM FE	6678	5875	4509.0221	87.4836	5169	
PPM ZN	10500	3791	156.5090	5.3103	1369	
PPM CO	5220	6281	7.1766	0.1404	7558	
PPM EU	6193	225 <	0.2195	0.0000	8	
PPM SB	1830	55228	84.9887	1.3970	1666739	

SAMPLE	1506,	30.64 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	3646	53 <	461.3174	0.0000	1	
PPM MG	1254	225	4227.6005	730.5230	40	
PPM CU	2038	43 <	171.4559	0.0000	1	
PPM NA	1695	7907	24856.6131	496.0181	36885	
PPM V	1955	18 <	1.9613	0.0000	0	
PPM CL	799	979	3857.9687	185.6309	1200	
PPM AL	744	11296	1744.6804	21.3018	171505	
PPM MN	569	432	107.0556	7.8719	328	
PPM CA	19	173	8874.9043	720.0740	1575	

SAMPLE	1506,	30.64 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	1693	430	4.6652	0.3294	115	

SAMPLE	1506,	30.64 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	113483	-2394 <	3.3032	0.0000	0	
PPM LU	70365	-295 <	1.7148	0.0000	0	
PPM U	57816	272 <	55.5153	0.0000	1	
PPM CB	45215	646 <	468.6010	0.0000	9	
PPM PU	24642	123955	167.2667	1.8455	523523	
PPM BR	2600	217 <	37.7877	0.0000	18	
PPM LA	477	121	6.9865	1.4121	31	

SAMPLE	1506,	30.64 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	162430	-1388 <	8.6514	0.0000	0	
PPM SE	122384	340 <	12.3940	0.0000	1	
PPM HG	132628	-940 <	6.6667	0.0000	0	
PPM TH	137865	1408 <	1.5768	0.0000	14	
PPM CR	109568	472 <	26.0892	0.0000	2	
PPM HF	70885	220 <	1.4130	0.0000	1	
PPM BA	56808	-162 <	864.9132	0.0000	0	
PPM ND	47808	430 <	156.6462	0.0000	4	
PPM AG	19570	-41 <	3.9423	0.0000	0	
PPM CS	31185	-9549 <	1.4521	0.0000	0	
PPM NI	16128	237 <	113.9324	0.0000	3	
PPM TB	15952	-332 <	0.5320	0.0000	0	
PPM SC	21012	1877	0.2432	0.0196	168	
PPM RB	18059	217 <	60.2409	0.0000	3	
PPM FE	22835	481 <	1022.6792	0.0000	10	
PPM ZN	36939	780 <	69.9112	0.0000	16	
PPM CO	21905	-333 <	1.4913	0.0000	0	
PPM EU	26295	445 <	0.8511	0.0000	8	
PPM SB	8017	258652	751.8953	12.0176	8344874	

SAMPLE	1507,	61.37 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	31185	-277 <	669.3547	0.0000	0	
PPM MG	9756	1121	10515.9780	1013.4283	129	
PPM CU	14664	411 <	225.0749	0.0000	12	
PPM NA	13875	46918	73638.0608	1214.9474	158652	
PPM V	15402	1923	9.0392	0.6207	240	
PPM CL	7312	4430	8715.9028	283.4773	2684	
PPM AL	7696	77849	6003.1178	49.8032	787483	
PPM NH	4938	18344	2269.6147	24.0233	68145	
PPM CR	304	2274	58242.5890	1592.4095	17010	

SAMPLE	1507,	61.37 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	15127	525 <	3.1126	0.0000	18	

SAMPLE	1507,	61.37 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	109823	9 <	1.6229	0.0000	0	
PPM LU	65335	-227 <	0.8268	0.0000	0	
PPM U	52123	13 <	26.4821	0.0000	0	
PPM CD	47487	-197 <	239.8115	0.0000	0	
PPM RU	26230	938	0.6353	0.1118	34	
PPM BR	4875	282 <	25.7653	0.0000	16	
PPM LA	674	212	6.1136	0.8586	67	

SAMPLE	1507,	61.37 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	316669	3444	7.9261	1.3022	37	
PPM SE	251240	167 <	8.8615	0.0000	0	
PPM HG	270828	-900 <	4.7541	0.0000	0	
PPM TH	280760	1048 <	1.1229	0.0000	4	
PPM CR	221076	-48 <	18.4925	0.0000	0	
PPM HF	159640	2296	1.3055	0.2289	33	
PPM BA	133636	-215 <	661.7491	0.0000	0	
PPM ND	119997	586 <	123.7831	0.0000	3	
PPM AG	80266	-812 <	3.9778	0.0000	0	
PPM CS	102613	-13933 <	1.3132	0.0000	0	
PPM NI	83623	8051	771.9659	29.8415	775	
PPM TB	91062	-148 <	0.6329	0.0000	0	
PPM SC	125279	19017	1.2303	0.0247	2887	
PPM RB	86879	-425 <	65.8132	0.0000	0	
PPM FE	107837	6020	4357.5601	244.7418	336	
PPM ZN	159700	5278	205.5093	16.0245	174	
PPM CO	49010	519377	559.6837	5.4088	5504029	
PPM EU	43284	467 <	0.5447	0.0000	5	
PPM SB	15210	386082	560.3427	8.9333	9800086	

SAMPLE	1508,	113.16 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	19068	0	<	502.3142	0.0000	0
PPM MG	3470	327		2881.0705	551.4128	31
PPM CU	5392	21	<	125.8738	0.0000	0
PPM NA	4477	8877		12215.2674	292.6626	17601
PPM V	5227	994		4.5206	0.3602	189
PPM CL	2476	1684		2959.7422	139.8746	1145
PPM AL	2040	31161		2347.1800	27.2457	475984
PPM MN	1487	4039		434.6423	8.7631	10971
PPM CR	66	397		9441.0840	535.7241	2388

SAMPLE	1508,	113.16 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	6992	2213		14.7083	0.8888	700

SAMPLE	1508,	113.16 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	1027589	-21480	<	2.6899	0.0000	0
PPM LU	962765	3466	<	1.7220	0.0000	12
PPM U	814513	2686	<	57.0143	0.0000	9
PPM CD	884537	-318	<	560.3119	0.0000	0
PPM AU	512820	993	<	1.2307	0.0000	2
PPM BR	72982	-147	<	53.7553	0.0000	0
PPM LA	1	-0	<	0.1151	0.0000	0

SAMPLE	1508,	113.16 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	1901340	6111	<	8.0063	0.0000	20
PPM SE	1627068	-3047	<	12.2215	0.0000	0
PPM HG	1769310	-689	<	6.5855	0.0000	0
PPM TH	1906704	-678	<	1.5860	0.0000	0
PPM CR	1530972	-5020	<	26.3717	0.0000	0
PPM HF	1203965	-524	<	1.5742	0.0000	0
PPM BA	1	-7	<	1.5514	0.0000	0
PPM ND	1	-9	<	0.3062	0.0000	0
PPM AG	1	-175	<	0.0120	0.0000	0
PPM CS	1	-70	<	0.0035	0.0000	0
PPM NI	527769	-4843	<	175.8084	0.0000	0
PPM TB	456075	1662	<	0.7673	0.0000	6
PPM SC	606612	-2708	<	0.1272	0.0000	0
PPM RB	424950	-2401	<	78.8530	0.0000	0
PPM FE	507390	-3151	<	1301.3352	0.0000	0
PPM ZN	837910	2	<	89.9416	0.0000	0
PPM CO	418990	-12031	<	1.7606	0.0000	0
PPM EU	499586	-1061	<	1.0017	0.0000	0
PPM SB	772485	2586534		2035.8958	32.3173	8660567

SAMPLE	1509,	54.81 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	16819	88	<	551.0566	0.0000	0
PPM MG	4949	267	<	3464.4562	0.0000	14
PPM CU	7903	30296		13494.1128	129.3447	116139
PPM NA	4380	28281		49699.7192	839.6693	182606
PPM V	4522	981		5.1632	0.3915	213
PPM CL	2034	2363		5205.5748	183.8273	2745
PPM AL	2656	26944		2326.3884	22.7328	273336
PPM MN	2031	569		78.8255	7.0828	159
PPM CR	66	627		17981.0096	789.9105	5957

SAMPLE	1509,	54.81 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	4836	320	<	1.9777	0.0000	21

SAMPLE	1509,	54.81 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	1525	19	<	0.2171	0.0000	0
PPM LU	28580	-469	<	0.6156	0.0000	0
PPM U	20866	-341	<	19.0202	0.0000	0
PPM CD	11544	-207	<	132.8251	0.0000	0
PPM AU	5346	2610		2.0006	0.0716	1274
PPM BR	1871	101	<	17.9778	0.0000	5
PPM LA	243	156		5.0407	0.6456	100

SAMPLE	1509,	54.81 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	130040	758	<	4.3281	0.0000	4
PPM SE	57248	-211	<	4.7423	0.0000	0
PPM HG	57919	367	<	2.4649	0.0000	2
PPM TH	54860	1263		0.6438	0.1208	29
PPM CR	43468	968	<	9.1956	0.0000	22
PPM HF	27720	-159	<	0.4946	0.0000	0
PPM BA	100	47	<	21.4159	0.0000	22
PPM ND	20961	21	<	58.0622	0.0000	0
PPM AG	15601	2838		9.5750	0.4605	516
PPM CS	17721	-1543	<	0.6126	0.0000	0
PPM NI	15039	1947		209.0309	14.1171	252
PPM TB	17829	-387	<	0.3143	0.0000	0
PPM SC	27258	1191		0.0863	0.0122	52
PPM RB	15754	-81	<	31.4631	0.0000	0
PPM FE	18971	1676		1358.3673	116.5602	148
PPM ZN	28770	3087		134.5978	7.9624	331
PPM CO	6185	106150		128.0785	1.2888	1821798
PPM EU	4669	260	<	0.2015	0.0000	14
PPM SB	1485	38921		63.2491	1.0549	1020097

SAMPLE 1510, 112.01 MG, 300 SEC.

ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM TI	22566	500 <	312.1481	0.0000	11
PPM MG	7474	414	2127.8633	459.7224	23
PPM CU	11152	17043	3714.5661	45.0874	26046
PPM NA	13589	5070	4359.8358	135.6325	1892
PPM V	16940	1448	3.7292	0.3498	124
PPM CL	6266	3544	3820.3371	134.5625	2004
PPM AL	6392	126234	5333.3428	42.3438	2492964
PPM MN	2065	5050	342.3330	6.1420	12350
PPM CA	294	1816	25483.8701	723.8092	11217

SAMPLE 1510, 112.01 MG, 600 SEC.

ELEMENT	BKG	AREA	RESULT	+/-	CRIT
% K	18367	2121	6.2947	0.5045	245

SAMPLE 1510, 112.01 MG, 1800 SEC.

ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM SM	78845	389 <	0.7544	0.0000	2
PPM LU	31495	44 <	0.3169	0.0000	0
PPM U	23049	139 <	9.8401	0.0000	1
PPM CD	16538	-494 <	77.7460	0.0000	0
PPM RU	8172	1987	0.7493	0.0388	483
PPM BR	1774	183 <	8.5786	0.0000	19
PPM LA	278	322	5.0931	0.3877	373

SAMPLE 1510, 112.01 MG, 3000 SEC.

ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM CE	85005	5859	7.3883	0.3804	404
PPM SE	61076	749 <	2.3967	0.0000	9
PPM HG	65182	36 <	1.2793	0.0000	0
PPM TH	67970	4815	1.2010	0.0673	341
PPM CR	52672	640 <	4.9520	0.0000	8
PPM HF	38085	3054	0.9514	0.0634	245
PPM BA	32337	379 <	178.6464	0.0000	4
PPM ND	28458	354 <	33.0861	0.0000	4
PPM AG	20434	21801	35.9921	0.3821	23259
PPM CS	22909	-2458 <	0.3407	0.0000	0
PPM NI	19944	-546 <	34.6414	0.0000	0
PPM TB	25497	-2594 <	0.1838	0.0000	0
PPM SC	53268	-8561 <	0.0381	0.0000	0
PPM RB	14100	449 <	14.5691	0.0000	14
PPM FE	17718	3946	1564.9602	58.6405	879
PPM ZN	25770	90882	1938.8629	25.3356	320511
PPM CO	8585	59862	35.3436	0.3713	417409
PPM EU	8931	443 <	0.1364	0.0000	22
PPM SB	2557	79691	63.3699	1.0305	2483635

SAMPLE 1511, 19.36 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	7452	177	<	1040.7870	0.0000	4
PPM MG	2992	182	<	7644.1872	0.0000	11
PPM CU	4368	9403		11857.1395	170.1889	20242
PPM NA	3277	18588		92479.6732	1622.7173	105436
PPM V	3289	427		6.3626	0.9090	55
PPM CL	1482	2575		16059.6714	525.6600	4474
PPM AL	1736	19201		4693.5175	49.5614	212372
PPM MN	1122	563		220.8093	16.1645	283
PPM CR	85	641		52042.6032	2288.7053	4834

SAMPLE 1511, 19.36 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	3591	0	<	4.8311	0.0000	0

SAMPLE 1511, 19.36 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	63887	825	<	3.9308	0.0000	11
PPM LU	19665	268	<	1.4529	0.0000	4
PPM U	13495	-86	<	43.8816	0.0000	0
PPM CD	5846	332	<	268.3293	0.0000	19
PPM AU	3181	190	<	0.5812	0.0000	11
PPM BR	1274	183		45.7291	9.5415	26
PPM LR	144	123		11.2600	1.4962	105

SAMPLE 1511, 19.36 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	26974	73	<	5.5914	0.0000	0
PPM SE	15704	344	<	7.0474	0.0000	8
PPM HG	16560	145	<	3.7392	0.0000	1
PPM TH	16715	312	<	0.8715	0.0000	6
PPM CR	13204	228	<	14.3810	0.0000	4
PPM HF	8515	479		0.8633	0.1710	27
PPM BA	7447	25	<	497.7421	0.0000	0
PPM ND	6340	347	<	90.7003	0.0000	19
PPM AG	4680	-97	<	3.0644	0.0000	0
PPM CS	5040	-668	<	0.9284	0.0000	0
PPM NI	4045	433		131.6094	20.3743	46
PPM TB	4585	-211	<	0.4532	0.0000	0
PPM SC	6450	3076		0.6308	0.0201	1467
PPM RB	3945	-102	<	44.7799	0.0000	0
PPM FE	4794	1001		2296.8453	174.8658	209
PPM ZN	6810	1184		146.0987	11.1868	206
PPM CO	2400	16142		55.1402	0.7028	108568
PPM EU	2194	144	<	0.3925	0.0000	9
PPM SB	892	17114		78.7366	1.3929	328351

SAMPLE 1512, 96.27 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	28215	276	<	573.9942	0.0000	3
PPM MG	11775	1618		12367.1062	949.1406	222
PPM CU	18615	14539		5117.6945	77.0341	11355
PPM NA	13177	92767		116773.2375	2105.3763	653086
PPM V	12452	1000		4.4003	0.5112	80
PPM CL	6214	7145		12660.9253	390.7563	8215
PPM AL	7424	63497		4648.1468	46.8768	543086
PPM MN	5499	1422		142.7077	8.4156	368
PPM CA	304	1516		34390.4284	1100.5051	7560

SAMPLE 1512, 96.27 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	11543	569		1.9648	0.3897	28

SAMPLE 1512, 96.27 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	66791	1125	<	0.8085	0.0000	19
PPM LU	23490	221	<	0.3199	0.0000	2
PPM U	16888	-153	<	9.9273	0.0000	0
PPM CD	8481	215	<	64.9285	0.0000	5
PPM AU	4333	966		0.4284	0.0326	215
PPM BR	2983	1143		57.4618	3.2434	438
PPM LA	630	246		4.5304	0.5452	96

SAMPLE 1512, 96.27 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	38285	1459		2.1400	0.2925	56
PPM SE	23880	423	<	1.7461	0.0000	7
PPM HG	25249	-81	<	0.9277	0.0000	0
PPM TH	23910	2235		0.6486	0.0469	209
PPM CR	17952	1553		8.3632	0.7601	134
PPM HF	15469	1055		0.3824	0.0466	72
PPM BA	13707	518	<	135.5603	0.0000	20
PPM ND	13423	182	<	26.4798	0.0000	2
PPM AG	14049	667		1.2812	0.2331	32
PPM CS	13995	647		0.3630	0.0679	30
PPM NI	13981	1219		74.5104	7.5556	106
PPM TB	17212	-418	<	0.1758	0.0000	0
PPM SC	23718	13145		0.5421	0.0080	7286
PPM PB	13540	246	<	16.6128	0.0000	4
PPM FE	16199	6749		3114.2357	70.7798	2812
PPM ZN	22530	2974		73.8261	4.0706	393
PPM CO	3265	109672		75.3392	0.7559	3683904
PPM EU	1309	278		0.0995	0.0143	59
PPM SB	570	2844		2.6313	0.0683	14190

SAMPLE	1513,	113.59 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	35535	710 <	545.7364	0.0000	14	
PPM MG	13519	2152	13940.6400	898.7951	343	
PPM CU	20167	151 <	197.8076	0.0000	1	
PPM NA	15900	84758	90423.5142	1634.5615	451819	
PPM V	16770	1725	6.4332	0.5090	177	
PPM CL	7630	5606	8419.1293	280.7662	4119	
PPM AL	9560	84760	5258.5796	51.8567	751491	
PPM MN	6876	11796	1003.3058	13.7872	20236	
PPM CR	503	3434	66022.1325	1570.5367	23444	

SAMPLE	1513,	113.59 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	16372	418 <	1.7492	0.0000	11	

SAMPLE	1513,	113.59 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	75156	2136	1.2155	0.1532	61	
PPM LU	30750	-50 <	0.3107	0.0000	0	
PPM U	23580	-273 <	9.9960	0.0000	0	
PPM CD	15147	225 <	73.4438	0.0000	3	
PPM AU	3595	1687	0.6374	0.0389	331	
PPM BR	5323	1501	63.9795	3.5372	423	
PPM LA	818	317	4.9496	0.5262	123	

SAMPLE	1513,	113.59 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	104935	3389	4.2144	0.4093	109	
PPM SE	79812	-634 <	2.7009	0.0000	0	
PPM HG	82350	717 <	1.4176	0.0000	6	
PPM TH	79595	4448	1.0941	0.0713	249	
PPM CR	62060	1899	8.6671	1.1599	58	
PPM HF	56940	1019 <	0.3417	0.0000	18	
PPM BA	50832	-62 <	220.7220	0.0000	0	
PPM ND	49284	453 <	42.8997	0.0000	4	
PPM AG	51988	1463	2.3817	0.3766	41	
PPM CS	57649	855 <	0.5321	0.0000	13	
PPM NI	59328	2304	119.3567	12.9055	89	
PPM TB	69480	-272 <	0.2988	0.0000	0	
PPM SC	97356	23850	0.8336	0.0123	5843	
PPM RB	59490	109 <	29.4356	0.0000	0	
PPM FE	74051	9964	3896.6970	114.2059	1341	
PPM ZN	104020	4050	85.1939	6.9980	158	
PPM CO	12360	529339	303.1838	2.9756	22669885	
PPM EU	2354	483	0.1465	0.0162	99	
PPM SB	1500	1676	1.3142	0.0489	1873	

SAMPLE	1514,	85.83 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	65983	2027	1665.0064	215.5083	62	
PPM MG	13838	1121	9610.5235	1082.2443	91	
PPM CU	20656	-291 <	264.9264	0.0000	0	
PPM NA	18824	48170	68010.8675	1257.0676	123265	
PPM V	20519	2320	11.4506	0.7498	262	
PPM CL	12083	3046	6054.0356	291.7526	768	
PPM AL	11800	54729	4493.6165	46.3365	253836	
PPM MN	12478	64155	7221.5441	61.8099	329850	
PPM CA	475	1869	47555.3678	1429.1269	7354	

SAMPLE	1514,	85.83 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
Z K	20810	170 <	2.6085	0.0000	1	

SAMPLE	1514,	85.83 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	90030	-1360 <	1.0531	0.0000	0	
PPM LU	40365	587 <	0.4720	0.0000	9	
PPM U	32661	478 <	15.6561	0.0000	7	
PPM CD	23276	322 <	120.4115	0.0000	4	
PPM AU	13572	1286	0.6465	0.0617	122	
PPM BR	8554	858	48.4201	5.4809	86	
PPM LA	765	459	9.4880	0.7237	275	

SAMPLE	1514,	85.83 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	236940	4106	6.7563	0.8030	71	
PPM SE	190556	-220 <	5.5191	0.0000	0	
PPM HS	198360	1117 <	2.9097	0.0000	6	
PPM TH	192855	6997	2.2776	0.1456	254	
PPM CR	147012	2248	13.5784	2.3405	34	
PPM HF	138850	20748	8.4351	0.1686	3100	
PPM BA	122233	1776	493.6234	98.9916	26	
PPM ND	121630	36 <	89.1064	0.0000	0	
PPM AG	128182	171 <	3.5927	0.0000	0	
PPM CS	143748	1310 <	1.1110	0.0000	12	
PPM NI	147451	3045	208.7625	26.6631	63	
PPM TB	173218	1521 <	0.6238	0.0000	13	
PPM SC	240611	34477	1.5948	0.0245	4940	
PPM RB	152999	338 <	62.4174	0.0000	1	
PPM FE	189575	8338	4315.4471	230.7668	367	
PPM ZN	263660	10287	286.4121	15.0075	401	
PPM CO	39780	1375041	1059.4796	10.1642	47529658	
PPM EU	6963	942	0.3782	0.0360	127	
PPM SB	5700	2442	2.5342	0.1019	1046	

SAMPLE	1515,	34.07 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	34672	480 <	1797.3337	0.0000	7	
PPM MG	6193	273 <	7961.8924	0.0000	12	
PPM CU	9263	101 <	447.8260	0.0000	1	
PPM NA	9404	9875	35124.1442	793.6158	10370	
PPM V	10990	1173	14.5849	1.3747	125	
PPM CL	6396	573	2869.0405	424.8796	51	
PPM AL	6127	31294	6473.0140	71.5938	159836	
PPM MN	6664	38075	10797.0832	99.8370	217543	
PPM CA	190	451	28909.0463	1681.7200	1071	

SAMPLE	1515,	34.07 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	11437	4 <	4.8785	0.0000	0	

SAMPLE	1515,	34.07 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	81486	1773	3.3667	0.5478	39	
PPM LU	33695	419 <	1.0889	0.0000	5	
PPM U	25506	40 <	35.0834	0.0000	0	
PPM CD	17116	62 <	260.3593	0.0000	0	
PPM AU	9256	158 <	0.5730	0.0000	3	
PPM BR	3107	598	85.0517	9.6688	115	
PPM LA	747	375	19.5351	1.7459	188	

SAMPLE	1515,	34.07 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	43815	1687	6.9951	0.8844	65	
PPM SE	26556	-128 <	5.2020	0.0000	0	
PPM HG	27459	610 <	2.7333	0.0000	14	
PPM TH	28445	373 <	0.6453	0.0000	5	
PPM CR	21428	1137	17.3013	2.2972	60	
PPM HF	15774	604	0.6186	0.1311	23	
PPM BA	13558	33 <	380.9692	0.0000	0	
PPM ND	11182	424 <	68.3246	0.0000	16	
PPM AG	8212	287 <	2.3018	0.0000	10	
PPM CS	8284	-1029 <	0.6752	0.0000	0	
PPM NI	6939	38 <	67.3692	0.0000	0	
PPM TB	7195	305 <	0.3220	0.0000	13	
PPM SC	9444	21478	2.5029	0.0213	48847	
PPM RE	5270	-255 <	29.3738	0.0000	0	
PPM FE	6102	6581	8580.7011	149.9999	7098	
PPM ZN	9550	1843	129.2775	7.6599	356	
PPM CO	3500	9896	19.2089	0.2901	27980	
PPM EU	4218	-180 <	0.3082	0.0000	0	
PPM SB	1267	29133	76.1629	1.2910	669875	

SAMPLE	1516,	21.61 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	4779	159 <		1057.5816	0.0000	5
PPM MG	1369	82 <		5950.6967	0.0000	5
PPM CU	2080	-167 <		336.8024	0.0000	0
PPM NA	1635	6559		36781.0095	825.1410	26312
PPM V	1827	363		7.1159	0.9186	72
PPM CL	975	513		4049.6434	322.6715	270
PPM AL	848	11156		3641.3335	48.9192	147028
PPM MN	595	2351		1051.0818	25.4802	9289
PPM CR	9	340		34360.0278	1959.3244	12844

SAMPLE	1516,	21.61 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	1960	79 <		3.2085	0.0000	3

SAMPLE	1516,	21.61 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	391962	-1497 <		8.7240	0.0000	0
PPM LU	340950	-1670 <		5.4608	0.0000	0
PPM U	283482	-135 <		185.0605	0.0000	0
PPM CD	295707	2191 <		1700.8729	0.0000	16
PPM AU	169582	1248 <		3.8658	0.0000	9
PPM BR	18602	439 <		142.8763	0.0000	10
PPM LA	4734	211 <		26.5087	0.0000	9

SAMPLE	1516,	21.61 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	1401130	2082 <		35.9925	0.0000	3
PPM SE	1153692	-1313 <		53.8940	0.0000	0
PPM HG	1247229	-701 <		28.9558	0.0000	0
PPM TH	1329265	-3182 <		6.9348	0.0000	0
PPM CR	1060312	-2818 <		114.9347	0.0000	0
PPM HF	728050	4238		6.8432	1.3823	25
PPM BA	591957	-579 <		3951.9830	0.0000	0
PPM ND	509980	2688 <		724.0664	0.0000	14
PPM AG	281052	-2150 <		21.1182	0.0000	0
PPM CS	319531	-62950 <		6.5758	0.0000	0
PPM NI	221958	-3418 <		597.2757	0.0000	0
PPM TB	195862	-41 <		2.6343	0.0000	0
PPM SC	257610	3528		0.6482	0.0939	48
PPM RB	206320	-364 <		287.8239	0.0000	0
PPM FE	250163	1750 <		4786.5047	0.0000	12
PPM ZN	421029	-2117 <		333.9407	0.0000	0
PPM CO	238235	-14560 <		6.9540	0.0000	0
PPM EU	283183	-282 <		3.9502	0.0000	0
PPM SB	174577	2358953		9722.8775	154.3240	31875100

SAMPLE	1517,	112.34 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	17643	49	<	389.3206	0.0000	0
PPM MG	6116	974		6379.7709	579.4586	155
PPM CU	8600	108	<	130.8939	0.0000	1
PPM NA	7492	34851		37594.2656	700.9340	162119
PPM V	7463	951		3.5861	0.3467	121
PPM CL	3503	1789		2716.6276	131.5616	914
PPM AL	4072	40566		2544.7515	26.8401	404126
PPM MN	2601	6735		579.2177	9.3480	17440
PPM CR	161	1697		32989.5795	977.1066	17887

SAMPLE	1517,	112.34 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
Z K	7770	191	<	1.2209	0.0000	5

SAMPLE	1517,	112.34 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	1000812	-11123	<	2.6815	0.0000	0
PPM LU	955930	-472	<	1.7620	0.0000	0
PPM U	806499	1506	<	60.3866	0.0000	3
PPM CD	879488	-3907	<	564.1542	0.0000	0
PPM AU	512199	1839	<	1.2999	0.0000	7
PPM BR	76674	995	<	55.7010	0.0000	13
PPM LA	17253	179	<	9.6993	0.0000	2

SAMPLE	1517,	112.34 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	1540770	1280	<	7.2603	0.0000	1
PPM SE	700016	512	<	8.0768	0.0000	0
PPM HG	763906	95	<	4.3598	0.0000	0
PPM TH	826700	50	<	1.0522	0.0000	0
PPM CR	661540	729	<	17.4662	0.0000	1
PPM HF	499305	1196	<	1.0214	0.0000	3
PPM BR	437701	-2062	<	653.7816	0.0000	0
PPM ND	589005	5518		231.2579	33.6180	52
PPM AG	326002	-1045	<	4.3748	0.0000	0
PPM CS	238374	-6467	<	1.0927	0.0000	0
PPM NI	221026	-466	<	114.6523	0.0000	0
PPM TB	195426	-384	<	0.5062	0.0000	0
PPM SC	259182	1224	<	0.0838	0.0000	6
PPM RB	177250	-92	<	51.3232	0.0000	0
PPM FE	214734	830	<	853.1351	0.0000	3
PPM ZN	353140	149	<	58.8360	0.0000	0
PPM CO	180770	12205		7.1849	0.2676	824
PPM EU	195992	-776	<	0.6323	0.0000	0
PPM SB	256920	708540		561.7722	8.9425	1954028

SAMPLE	1518,	84.46 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	25377	532 <	620.5964	0.0000	11	
PPM MG	8217	1196	10419.8303	893.6775	174	
PPM CU	13295	-796 <	216.2053	0.0000	0	
PPM NA	7297	73501	105458.8306	1909.1045	740359	
PPM V	5499	353	1.7705	0.3839	23	
PPM CL	3458	3258	6580.4287	239.4253	3070	
PPM AL	4248	5285	440.9725	9.0957	6575	
PPM MN	5151	12943	1480.5482	18.8823	32522	
PPM CA	180	1730	44732.6248	1319.6183	16627	

SAMPLE	1518,	84.46 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	4522	691	2.7197	0.3077	106	

SAMPLE	1518,	84.46 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	124649	2054	1.5745	0.2729	34	
PPM LU	63115	-261 <	0.6045	0.0000	0	
PPM U	48685	165 <	19.8950	0.0000	1	
PPM CD	33610	189 <	147.1045	0.0000	1	
PPM AU	18175	479 <	0.3286	0.0000	13	
PPM BR	6298	699	40.1522	4.8097	78	
PPM LA	1305	371	7.8045	0.8615	105	

SAMPLE	1518,	84.46 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	87650	3079	5.1487	0.5038	108	
PPM SE	48764	588 <	2.8409	0.0000	7	
PPM HG	51426	-350 <	1.5075	0.0000	0	
PPM TH	49395	3537	1.1700	0.0761	253	
PPM CR	37584	488 <	5.5501	0.0000	6	
PPM HF	31999	2438	1.0072	0.0769	186	
PPM BA	27900	452 <	220.1200	0.0000	7	
PPM ND	26136	324 <	42.0565	0.0000	4	
PPM AG	25398	134 <	1.6284	0.0000	1	
PPM CS	28354	332 <	0.5024	0.0000	4	
PPM NI	28017	3768	262.5211	12.6414	507	
PPM TB	33376	-370 <	0.2788	0.0000	0	
PPM SC	46032	5385	0.2531	0.0107	630	
PPM RB	28444	2114	73.6131	6.1728	157	
PPM FE	35520	1197	629.5730	100.8083	40	
PPM ZN	49600	3312	93.7039	6.6134	221	
PPM CO	5940	245040	191.8677	1.8747	10108519	
PPM EU	1925	115 <	0.0843	0.0000	7	
PPM SB	937	3247	3.4242	0.0872	11252	

SAMPLE	1519,	53.86 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	33071	1	< 1110.4554	0.0000	0	
PPM MG	6902	1552	21203.4198	1387.6143	349	
PPM CU	11448	3606	2268.7684	79.4884	1136	
PPM NA	9352	34590	77826.0509	1454.9312	127937	
PPM V	11407	653	5.1360	0.8644	37	
PPM CL	5739	2903	7294.2690	342.7524	924	
PPM AL	6056	42267	5530.3508	58.3099	294997	
PPM MN	4836	28207	5059.7519	49.6194	164523	
PPM CA	199	1499	60780.5520	1910.2718	11291	

SAMPLE	1519,	53.86 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	11116	311	< 3.0426	0.0000	9	

SAMPLE	1519,	53.86 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	131207	-1515	< 2.0284	0.0000	0	
PPM LU	69920	1348	1.0934	0.2246	26	
PPM U	55917	484	< 33.6346	0.0000	4	
PPM CD	43329	-311	< 261.8897	0.0000	0	
PPM AU	23742	961	0.7907	0.1296	39	
PPM BR	8489	1016	91.5562	8.7989	122	
PPM LA	2133	165	< 7.1764	0.0000	13	

SAMPLE	1519,	53.86 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	113790	1271	< 4.1205	0.0000	14	
PPM SE	74516	629	< 5.5043	0.0000	5	
PPM HG	77823	441	< 2.9066	0.0000	3	
PPM TH	75655	2492	1.2927	0.1450	92	
PPM CR	58008	1115	< 10.8061	0.0000	21	
PPM HF	50055	1084	0.7023	0.1466	23	
PPM BA	45274	369	< 439.3816	0.0000	3	
PPM ND	44149	-201	< 85.6445	0.0000	0	
PPM AG	45292	329	< 3.4070	0.0000	2	
PPM CS	50530	675	< 1.0508	0.0000	9	
PPM NI	52069	2477	270.6226	25.6318	118	
PPM TB	61191	-434	< 0.5914	0.0000	0	
PPM SC	84041	9963	0.7344	0.0227	1181	
PPM RB	52674	503	< 58.4235	0.0000	5	
PPM FE	55886	9689	7991.2667	228.5271	1425	
PPM ZN	91060	4315	191.4388	13.9107	204	
PPM CO	11930	472843	580.5862	5.6127	18741031	
PPM EU	3041	151	< 0.1658	0.0000	7	
PPM SB	1747	7151	11.8258	0.2439	29271	

SAMPLE	1520,	116.71 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	58113	-540 <	678.7838	0.0000	0	
PPM MG	13882	542 <	3471.3176	0.0000	21	
PPM CU	19232	978	283.9629	41.3463	50	
PPM NA	20070	31363	32564.9421	622.2010	49010	
PPM V	21190	1327	4.8166	0.5456	83	
PPM CL	11641	1900	2777.1524	185.1391	310	
PPM AL	15287	63342	3824.7346	38.5514	262459	
PPM MN	13702	53216	4405.2730	38.9734	206681	
PPM CA	845	1684	31511.0863	1056.4130	3356	

SAMPLE	1520,	116.71 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	21209	576 <	1.9366	0.0000	16	

SAMPLE	1520,	116.71 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	137448	710 <	0.9583	0.0000	4	
PPM LU	76920	-248 <	0.4849	0.0000	0	
PPM U	60655	-219 <	16.2639	0.0000	0	
PPM CD	45567	438 <	123.9651	0.0000	4	
PPM AU	25542	950	0.3626	0.0623	35	
PPM BR	8632	1341	55.7902	4.1651	208	
PPM LA	2565	365	5.5606	0.8248	52	

SAMPLE	1520,	116.71 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	43490	3155	3.8186	0.2615	229	
PPM SE	24160	-281 <	1.4487	0.0000	0	
PPM HG	25042	-310 <	0.7621	0.0000	0	
PPM TH	23805	3367	0.8060	0.0395	476	
PPM CR	17944	2905	12.9041	0.6633	470	
PPM HF	15135	2162	0.6464	0.0395	309	
PPM BA	13504	228 <	110.9920	0.0000	4	
PPM ND	13059	47 <	21.5456	0.0000	0	
PPM AG	13338	38 <	0.8552	0.0000	0	
PPM CS	12672	771	0.3568	0.0537	47	
PPM NI	13014	624	31.4616	5.8950	30	
PPM TB	14814	414 <	0.1346	0.0000	12	
PPM SC	20412	23954	0.8149	0.0074	28110	
PPM RB	11454	128 <	12.6091	0.0000	1	
PPM FE	14130	7755	2951.7308	57.2852	4256	
PPM ZN	18440	4492	91.9689	3.3075	1094	
PPM CO	2825	83110	47.0935	0.4796	2445052	
PPM EU	1275	383	0.1131	0.0121	115	
PPM SB	532	2891	2.2063	0.0567	15710	

SAMPLE 1521, 110.62 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	28699	430 <		503.7853	0.0000	6
PPM MG	7755	1170		7782.7441	664.7375	177
PPM CU	11655	18855		5775.9533	72.6374	30503
PPM NA	10650	30973		33930.5109	640.3376	90078
PPM V	12138	1200		4.5954	0.4433	119
PPM CL	5804	1619		2496.7059	148.2249	452
PPM AL	7111	62994		4013.1292	40.4878	558043
PPM MN	4403	15409		1345.7967	15.8143	53926
PPM CR	399	1245		24579.0478	883.7550	3885

SAMPLE 1521, 110.62 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	12243	618		1.8571	0.3504	31

SAMPLE 1521, 110.62 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	158376	-230 <		1.0856	0.0000	0
PPM LU	90080	-273 <		0.5547	0.0000	0
PPM U	71577	-115 <		18.7513	0.0000	0
PPM CD	55550	-342 <		144.4095	0.0000	0
PPM AU	31284	4998		2.0236	0.0300	798
PPM BR	10939	642		28.1913	4.7279	38
PPM LA	2745	525		8.4414	0.9198	100

SAMPLE 1521, 110.62 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	137119	3389		4.3275	0.4787	84
PPM SE	64368	402 <		2.4912	0.0000	3
PPM HG	67342	-896 <		1.3167	0.0000	0
PPM TH	63090	4328		1.0931	0.0656	297
PPM CR	49252	2471		11.5806	1.0767	124
PPM HF	36230	3726		1.1753	0.0634	383
PPM BA	31909	701 <		179.6940	0.0000	15
PPM ND	30168	369 <		34.4903	0.0000	5
PPM AG	29016	6392		10.6854	0.3139	1408
PPM CS	29916	735 <		0.3940	0.0000	18
PPM NI	30226	1773		94.3147	9.5533	104
PPM TB	35955	-501 <		0.2209	0.0000	0
PPM SC	52958	21291		0.7642	0.0099	8560
PPM RB	26740	834		22.1735	4.4260	26
PPM FE	31980	51502		20682.0440	137.5205	82941
PPM ZN	44890	12138		262.2006	6.1142	3282
PPM CO	7105	188080		112.4411	1.1063	4978760
PPM EU	4185	186 <		0.0946	0.0000	8
PPM SB	1342	23701		19.0837	0.3284	418582

SAMPLE	1522,	77.45 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	33583	470 <	778.1647	0.0000	7	
PPM MS	8992	1545	14678.7004	1057.2727	265	
PPM CU	13760	2015	881.6261	55.4461	295	
PPM NA	12622	43863	68630.5834	1269.4248	152429	
PPM V	14059	1057	5.7814	0.6736	79	
PPM CL	6513	2864	6308.2047	270.1984	1259	
PPM AL	6632	68326	6217.0188	62.2243	703927	
PPM MN	5380	21313	2658.6541	28.3125	84432	
PPM CA	275	1741	49091.5456	1470.4506	11022	

SAMPLE	1522,	77.45 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	13866	714	3.0646	0.5353	37	

SAMPLE	1522,	77.45 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	176046	-3798 <	1.6351	0.0000	0	
PPM LU	101625	-531 <	0.8433	0.0000	0	
PPM U	80761	877 <	28.6195	0.0000	10	
PPM CD	63695	141 <	220.8843	0.0000	0	
PPM AU	35275	3586	2.0848	0.1167	365	
PPM BR	12798	856	53.7084	7.3371	57	
PPM LA	3537	-159 <	6.4155	0.0000	0	

SAMPLE	1522,	77.45 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	173840	3757	6.8515	0.7687	81	
PPM SE	113128	52 <	4.7144	0.0000	0	
PPM HG	116887	191 <	2.4762	0.0000	0	
PPM TH	111050	4957	1.7882	0.1229	221	
PPM CR	35156	2344	15.6901	1.9908	65	
PPM HF	75350	2386	1.0750	0.1257	76	
PPM BA	66384	1149 <	369.8175	0.0000	20	
PPM ND	65596	84 <	72.5616	0.0000	0	
PPM AG	68152	1339	3.1970	0.6296	26	
PPM CS	76396	286 <	0.8981	0.0000	1	
PPM NI	77553	2779	211.1405	21.6175	100	
PPM TB	92227	-199 <	0.5047	0.0000	0	
PPM SC	126102	18736	0.9604	0.0196	2784	
PPM RB	78524	807 <	49.5834	0.0000	8	
PPM FE	101327	5987	3433.9254	188.2932	354	
PPM ZN	137620	8432	260.1630	12.2334	517	
PPM CO	19330	709271	605.6292	5.8322	26025109	
PPM EU	4378	234 <	0.1381	0.0000	13	
PPM SB	2422	9027	10.3813	0.2055	33644	

SAMPLE 1523, 81.41 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	30503	778	<	705.6584	0.0000	20
PPM MG	8728	1415		12789.6667	977.3909	229
PPM CU	14167	23636		9938.4576	115.3222	39494
PPM NA	10672	52943		78808.2299	1443.4066	262646
PPM V	11339	1026		5.3388	0.5797	93
PPM CL	5323	3516		7367.5874	276.2765	2322
PPM AL	5968	54810		4744.6005	48.4669	503374
PPM MN	4641	13122		1557.2594	19.5624	37101
PPM CA	161	1566		42009.0983	1285.4488	15232

SAMPLE 1523, 81.41 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
Z K	11361	299	<	2.0349	0.0000	8

SAMPLE 1523, 81.41 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	194670	69	<	1.6362	0.0000	0
PPM LU	110880	281	<	0.8397	0.0000	1
PPM U	89055	240	<	28.7642	0.0000	1
PPM CD	67325	60	<	216.0894	0.0000	0
PPM AU	37606	1415		0.7868	0.1102	53
PPM BR	11622	622		37.1432	6.6107	33
PPM LA	3546	113	<	6.1133	0.0000	4

SAMPLE 1523, 81.41 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	77610	137	<	2.2522	0.0000	0
PPM SE	29832	-165	<	2.3070	0.0000	0
PPM HG	29520	215	<	1.1859	0.0000	2
PPM TH	27485	1865		0.6400	0.0588	127
PPM CR	21112	1000		6.3681	0.9507	47
PPM HF	13865	838		0.3592	0.0520	51
PPM BA	12060	23	<	150.4148	0.0000	0
PPM ND	11241	4	<	28.6687	0.0000	0
PPM AG	10210	1330		3.0211	0.2445	173
PPM CS	10435	-150	<	0.3169	0.0000	0
PPM NI	10147	607		43.8748	7.5062	36
PPM TB	11749	-314	<	0.1720	0.0000	0
PPM SC	16302	10688		0.5212	0.0081	7008
PPM RB	9395	-284	<	16.3805	0.0000	0
PPM FE	10920	13178		7190.7595	88.5096	15903
PPM ZN	15170	2652		77.8523	4.0382	464
PPM CD	3215	54413		44.2019	0.4652	920925
PPM EU	2156	181	<	0.0925	0.0000	15
PPM SB	817	11675		12.7735	0.2366	166837

SAMPLE	1524,	80.00 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	33263	266 <	749.7742	0.0000	2	
PPM MG	9416	1337	12297.6453	1013.3715	190	
PPM CU	14519	2913	1233.9038	56.8691	584	
PPM NA	11730	47737	72311.2579	1331.1085	194273	
PPM V	12350	1498	7.9323	0.6254	182	
PPM CL	6233	2869	6117.7926	259.3567	1321	
PPM AL	6528	60286	5310.6061	53.7663	556740	
PPM MN	5550	19820	2369.4508	25.9591	69359	
PPM CA	285	1673	45670.4521	1393.9953	9821	

SAMPLE	1524,	80.00 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	12509	887	3.6857	0.5070	63	

SAMPLE	1524,	80.00 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	194118	-544 <	1.6631	0.0000	0	
PPM LU	110730	-526 <	0.8558	0.0000	0	
PPM U	85279	327 <	28.8211	0.0000	1	
PPM CD	63118	-889 <	212.9896	0.0000	0	
PPM PU	34879	3030	1.7237	0.1123	253	
PPM BR	11648	398 <	30.6740	0.0000	14	
PPM LA	3132	165 <	5.8523	0.0000	9	

SAMPLE	1524,	80.00 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	87130	2765	4.8810	0.5294	88	
PPM SE	35716	24 <	2.5680	0.0000	0	
PPM HG	35779	-93 <	1.3282	0.0000	0	
PPM TH	33125	3004	1.0491	0.0664	272	
PPM CR	25572	1219	7.8996	1.0653	58	
PPM HF	17665	2723	1.1877	0.0626	420	
PPM BA	15070	460 <	171.0092	0.0000	14	
PPM ND	14557	275 <	33.1773	0.0000	5	
PPM AG	14215	2305	5.3281	0.2982	374	
PPM CS	14224	530 <	0.3762	0.0000	20	
PPM NI	14548	66 <	41.4536	0.0000	0	
PPM TB	17280	-426 <	0.2120	0.0000	0	
PPM SC	24012	16511	0.8194	0.0102	11353	
PPM RB	12940	589	21.6534	4.2870	27	
PPM FE	16001	10580	5874.8759	92.9284	6996	
PPM ZN	22760	4297	128.3572	5.1696	811	
PPM CB	3840	94099	77.7877	0.7870	2305891	
PPM EU	2299	88 <	0.0972	0.0000	3	
PPM SB	765	9535	10.6160	0.2028	118345	

SAMPLE	1525,	89.46 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	22863	376 <	556.2405	0.0000	6	
PPM MG	6137	936	7698.8791	724.2612	143	
PPM CU	9352	8083	3061.7835	56.1733	6986	
PPM NA	8535	24333	32961.5437	632.5534	69373	
PPM V	9494	1489	7.0509	0.4985	234	
PPM CL	4654	1579	3010.9769	170.1232	536	
PPM AL	4984	55335	4359.0176	44.4144	614358	
PPM MN	3672	12503	1350.2805	16.9789	42572	
PPM CR	123	1118	27292.4338	955.2443	10162	

SAMPLE	1525,	89.46 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	10353	290 <	1.7682	0.0000	8	

SAMPLE	1525,	89.46 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	198227	1089 <	1.5034	0.0000	6	
PPM LU	114050	206 <	0.7783	0.0000	0	
PPM U	88812	196 <	26.4624	0.0000	0	
PPM CD	65763	648 <	194.4599	0.0000	6	
PPM AU	37260	1951	0.9467	0.1016	92	
PPM BR	13065	753	40.9530	6.3968	43	
PPM LA	3753	-118 <	5.7258	0.0000	0	

SAMPLE	1525,	89.46 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	143210	2660	4.2001	0.6031	49	
PPM SE	70712	75 <	3.2284	0.0000	0	
PPM HG	73678	-1014 <	1.7028	0.0000	0	
PPM TH	68600	4246	1.3261	0.0843	263	
PPM CR	53580	2196	12.7261	1.3782	90	
PPM HF	40275	2341	0.9131	0.0807	136	
PPM BA	33871	1084	289.0836	50.6003	35	
PPM ND	33718	-431 <	45.0797	0.0000	0	
PPM AG	30627	3310	6.8421	0.3823	358	
PPM CS	33840	199 <	0.5180	0.0000	1	
PPM NI	33196	1090	71.6972	12.1970	36	
PPM TB	39010	-357 <	0.2845	0.0000	0	
PPM SC	56064	16907	0.7503	0.0121	5099	
PPM RB	33100	-213 <	27.9015	0.0000	0	
PPM FE	39990	21363	10608.0697	128.6927	11412	
PPM ZN	55580	8357	223.2380	7.3097	1257	
PPM CG	9935	252441	186.6152	1.8228	6414339	
PPM EU	4972	193 <	0.1273	0.0000	7	
PPM SB	1927	30384	30.2515	0.5120	479080	

SAMPLE	1526,	99.20 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	2343	692	614.9836	49.8999	204	
PPM MG	819	-52 <	1364.7014	0.0000	0	
PPM CU	1007	429	178.9834	15.8961	183	
PPM NA	1275	121 <	264.8849	0.0000	11	
PPM V	1657	404	2.0959	0.2360	99	
PPM CL	591	51 <	232.0749	0.0000	4	
PPM AL	424	13954	1198.9884	15.8337	459231	
PPM MN	85	649	79.6680	3.3899	4955	
PPM CA	1	76	2061.7035	240.5768	5776	

SAMPLE	1526,	99.20 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	2528	0 <	1.7931	0.0000	0	

SAMPLE	1526,	99.20 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	74225	-1586 <	0.1178	0.0000	0	
PPM LU	74950	262 <	0.0779	0.0000	1	
PPM U	60214	633 <	2.1181	0.0000	7	
PPM CD	59768	308 <	20.7199	0.0000	2	
PPM RU	36391	1712	0.0875	0.0100	81	
PPM BR	4511	51 <	1.9082	0.0000	1	
PPM LA	1449	308	0.7846	0.1062	65	

SAMPLE	1526,	99.20 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	67355	607 <	2.0174	0.0000	5	
PPM SE	46724	63 <	1.9960	0.0000	0	
PPM HG	50571	-736 <	1.0907	0.0000	0	
PPM TH	51430	749 <	0.3489	0.0000	11	
PPM CR	40508	688 <	4.2351	0.0000	12	
PPM HF	26800	5608	2.3140	0.0753	1173	
PPM BA	21393	0 <	194.8286	0.0000	0	
PPM ND	18283	73 <	35.0603	0.0000	0	
PPM AG	8905	8989	16.8589	0.2644	9074	
PPM CS	10449	-2144 <	0.2280	0.0000	0	
PPM NI	6790	319 <	20.4290	0.0000	15	
PPM TB	8577	-1486 <	0.1404	0.0000	0	
PPM SC	18114	-1490 <	0.0295	0.0000	0	
PPM RB	6705	58 <	13.1657	0.0000	1	
PPM FE	7992	744	390.5155	49.0794	69	
PPM ZN	13269	7546	165.5764	3.7140	4291	
PPM CO	7785	-347 <	0.3146	0.0000	0	
PPM EU	8778	-220 <	0.1776	0.0000	0	
PPM SB	2535	81142	73.4873	1.1021	2597248	

SAMPLE	1527,	58.99 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	25580	-156 <	1115.4196	0.0000	0	
PPM MG	6545	1006	17002.7297	1572.3660	155	
PPM CU	9568	5358	3759.1654	92.4248	3000	
PPM NP	7979	32080	84680.9384	1778.4591	128979	
PPM V	8899	1102	9.6141	0.8753	136	
PPM CL	4784	1643	5539.4149	310.2024	564	
PPM RL	4552	42839	6189.9747	69.5548	403159	
PPM NN	3655	17883	3691.5864	42.9054	87497	
PPM CR	171	1205	54970.9124	1927.3599	8491	

SAMPLE	1527,	58.99 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	12095	1 <	6.5546	0.0000	0	

SAMPLE	1527,	58.99 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	62861	6389	0.9977	0.0411	649	
PPM LU	35810	422 <	0.0908	0.0000	5	
PPM U	31981	313 <	2.6140	0.0000	3	
PPM CD	25597	35 <	22.8373	0.0000	0	
PPM AU	15408	13486	1.1647	0.0192	11804	
PPM BR	10861	2467	25.1399	1.1839	560	
PPM LA	1187	742	3.1799	0.1885	464	

SAMPLE	1527,	58.99 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	83375	502 <	3.7736	0.0000	3	
PPM SE	42244	-425 <	3.1920	0.0000	0	
PPM HG	42358	723 <	1.6791	0.0000	12	
PPM TH	41770	1655	0.9185	0.1157	66	
PPM CR	32132	631 <	6.3453	0.0000	12	
PPM HF	25490	694 <	0.5170	0.0000	19	
PPM BR	22482	327 <	335.8346	0.0000	5	
PPM ND	22054	3 <	64.7295	0.0000	0	
PPM AG	21613	1858	5.8600	0.4841	160	
PPM CS	23503	-290 <	0.5739	0.0000	0	
PPM NI	23377	1142	101.6712	13.9670	56	
PPM TB	27747	-394 <	0.4235	0.0000	0	
PPM SC	38430	12135	0.9563	0.0179	3832	
PPM RB	21710	761	43.9367	8.6766	27	
PPM FE	26562	24347	21490.3779	213.4221	22317	
PPM ZN	38380	3102	114.4603	7.6347	251	
PPM CO	5920	171991	220.3529	2.1445	4996774	
PPM EU	2375	232	0.1581	0.0348	23	
PPM SB	915	11115	16.9281	0.2979	135020	

SAMPLE 1528, 65.55 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	32197	135	<	1125.7191	0.0000	1
PPM MS	7815	1043		15863.9261	1524.4449	139
PPM CU	12248	8696		5490.5260	104.3946	6174
PPM NA	10432	34230		81313.7335	1706.1764	112317
PPM V	11245	1778		13.9593	0.9017	281
PPM CL	5648	2108		6395.9144	320.5692	787
PPM AL	5944	56133		7299.1704	80.0414	530160
PPM MN	4216	23194		4308.7770	46.9409	127600
PPM CR	218	1406		57721.4084	1917.1351	9068

SAMPLE 1528, 65.55 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	15579	581	<	6.6903	0.0000	22

SAMPLE 1528, 65.55 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	544122	5911		0.8309	0.1043	64
PPM LU	582690	2734	<	0.3295	0.0000	13
PPM U	482751	446	<	9.1737	0.0000	0
PPM CD	511967	2467	<	91.6735	0.0000	12
PPM AU	318667	14490		1.1321	0.0467	659
PPM BR	60281	3534		32.4223	2.3239	207
PPM LA	15696	1404		5.4168	0.5048	126

SAMPLE 1528, 65.55 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	462280	4277		10.7956	1.7242	40
PPM SE	366064	32	<	8.4403	0.0000	0
PPM HG	393282	290	<	4.5955	0.0000	0
PPM TH	414980	2369	<	1.4975	0.0000	14
PPM CR	329220	1280	<	18.2373	0.0000	5
PPM HF	217210	3631		2.2673	0.2937	61
PPM BA	174699	1046	<	840.3867	0.0000	6
PPM ND	149242	1917		161.0765	33.3115	25
PPM AG	68647	249	<	3.4657	0.0000	1
PPM CS	96453	-23207	<	1.0442	0.0000	0
PPM NI	58009	620	<	89.9472	0.0000	7
PPM TE	55358	459	<	0.5402	0.0000	4
PPM SC	76044	22225		1.5762	0.0225	6496
PPM RB	60495	582	<	59.5648	0.0000	6
PPM FE	73542	16916		13436.9894	243.6754	3861
PPM ZN	123410	3196		106.1365	11.8816	83
PPM CO	70695	35474		40.9005	0.5381	17800
PPM EU	80530	354	<	0.8110	0.0000	2
PPM SB	29565	760207		1041.9277	15.2262	19547258

SAMPLE	1529,	35.84 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	17805	343 <	1524.1937	0.0000	7	
PPM MG	4344	335	9319.1408	1928.4304	26	
PPM CU	6264	14231	16433.6691	223.9679	32331	
PPM NA	5129	17549	76245.4745	1663.1398	60044	
PPM V	6698	195 <	5.5036	0.0000	6	
PPM CL	3003	945	5244.0707	377.7798	297	
PPM AL	2792	31220	7424.9382	86.4119	349100	
PPM MN	2303	10645	3616.8352	48.7940	49204	
PPM CA	95	703	52785.1328	2298.7622	5202	

SAMPLE	1529,	35.84 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	8001	205 <	8.7852	0.0000	5	

SAMPLE	1529,	35.84 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	140099	-1031 <	0.4483	0.0000	0	
PPM LU	132655	963 <	0.2884	0.0000	7	
PPM U	117526	884 <	8.3366	0.0000	7	
PPM CD	46805	25 <	50.8076	0.0000	0	
PPM AU	34042	1034375	148.6050	1.5926	31429753	
PPM BR	6493	1834	30.7863	1.5404	518	
PPM LA	756	700	4.9412	0.2697	648	

SAMPLE	1529,	35.84 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	54759	2371	10.9461	1.1037	103	
PPM SE	29380	-298 <	4.3840	0.0000	0	
PPM HG	29596	463 <	2.3114	0.0000	7	
PPM TH	28870	1977	1.8060	0.1605	135	
PPM CR	22176	801	10.0037	1.8971	29	
PPM HF	17195	1017	1.1615	0.1543	60	
PPM BA	14287	620	489.6348	97.5718	27	
PPM ND	13833	121 <	84.4642	0.0000	1	
PPM AG	12204	2074	10.7664	0.6226	352	
PPM CS	13360	-329 <	0.7130	0.0000	0	
PPM NI	12694	716	104.9193	16.9922	40	
PPM TB	15048	-341 <	0.5140	0.0000	0	
PPM SC	21666	7842	1.0172	0.0224	2838	
PPM RB	11584	219 <	47.8169	0.0000	4	
PPM FE	13440	22486	32667.8986	299.0437	37621	
PPM ZN	19510	4381	266.0309	9.8931	984	
PPM CO	3770	70244	148.1265	1.5084	1308812	
PPM EU	2612	212 <	0.2695	0.0000	17	
PPM SB	862	17933	44.9535	0.7395	373077	

SAMPLE	1530,	23.36 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	16808	227 <	2285.1769	0.0000		3
PPM MG	3580	480	20486.4857	2803.2353		64
PPM CU	5392	3741	6627.9922	179.9561		2596
PPM NA	5122	15419	102781.0544	2271.8379		46417
PPM V	6205	238 <	8.1294	0.0000		9
PPM CL	3100	867	7381.6082	574.0050		242
PPM AL	2624	28318	10332.7919	121.8810		305606
PPM NH	2405	13343	6955.5537	86.9276		74027
PPM CA	66	394	45388.6931	2585.7459		2352

SAMPLE	1530,	23.36 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	7848	333 <	13.3500	0.0000		14

SAMPLE	1530,	23.36 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	49751	546 <	0.4104	0.0000		6
PPM LU	43400	210 <	0.2539	0.0000		1
PPM U	35595	515 <	7.0921	0.0000		7
PPM CD	34847	-72 <	67.3074	0.0000		0
PPM AU	20443	2922	0.6475	0.0346		418
PPM BR	4192	148 <	7.8268	0.0000		5
PPM LA	1061	362	3.9219	0.4088		124

SAMPLE	1530,	23.36 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	52520	584 <	7.5671	0.0000		6
PPM SE	31428	-115 <	6.9558	0.0000		0
PPM HG	33097	-238 <	3.7494	0.0000		0
PPM TH	33790	410 <	1.2018	0.0000		5
PPM CR	26580	-140 <	14.5782	0.0000		0
PPM HF	17175	461 <	1.0725	0.0000		12
PPM BA	14413	-215 <	679.6871	0.0000		0
PPM ND	12492	261 <	123.1793	0.0000		5
PPM AG	7939	370 <	3.3006	0.0000		17
PPM CS	9180	-1451 <	0.9077	0.0000		0
PPM NI	7123	-163 <	88.8404	0.0000		0
PPM TB	7110	253 <	0.5432	0.0000		9
PPM SC	10380	8486	1.6888	0.0276		6938
PPM RB	6025	186 <	53.0187	0.0000		6
PPM FE	7620	6328	14104.9199	268.0185		5255
PPM ZN	11480	3182	296.4779	11.8071		882
PPM CO	4945	13989	45.2590	0.6164		39574
PPM EU	5268	175 <	0.5853	0.0000		6
PPM SB	1552	46120	177.3760	2.7168		1370525

SAMPLE	1531,	32.59 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	15466	23	< 1571.5270	0.0000	0	
PPM MG	3871	593	18141.3415	2130.4293	91	
PPM CU	5760	7659	9726.4605	172.1633	10184	
PPM NA	4470	18910	90351.8121	1953.6622	79997	
PPM V	5159	1163	18.3654	1.2627	262	
PPM CL	2528	659	4021.6640	362.1630	172	
PPM AL	2496	27152	7101.4235	84.2545	295365	
PPM MN	1776	9480	3542.2160	49.2081	50603	
PPM CA	75	789	65150.3776	2663.4467	8191	

SAMPLE	1531,	32.59 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	6741	474	10.9388	2.0152	33	

SAMPLE	1531,	32.59 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	34224	4934	1.3961	0.0561	711	
PPM LU	28029	-86	< 0.1467	0.0000	0	
PPM U	24138	47	< 4.2147	0.0000	0	
PPM CD	19266	-113	< 35.9209	0.0000	0	
PPM SO	11830	3439	0.5492	0.0206	1000	
PPM BR	13585	1338	24.7202	2.2607	132	
PPM LA	558	725	5.6320	0.2788	942	

SAMPLE	1531,	32.59 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM DE	67195	836	< 6.1333	0.0000	10	
PPM SE	48060	-374	< 6.1616	0.0000	0	
PPM HG	50337	-89	< 3.3124	0.0000	0	
PPM TH	49505	1497	1.5039	0.2269	45	
PPM CR	38476	174	< 12.5646	0.0000	1	
PPM HF	32560	3882	4.3756	0.2412	463	
PPM BA	29151	-49	< 691.8689	0.0000	0	
PPM ND	27810	-274	< 131.5125	0.0000	0	
PPM AG	28494	1384	7.9010	0.9876	67	
PPM CS	35001	324	< 1.2667	0.0000	3	
PPM NI	36517	-30	< 143.6312	0.0000	0	
PPM TB	48690	-331	< 1.0146	0.0000	0	
PPM SC	67674	12126	1.7297	0.0405	2173	
PPM RB	9200	41	< 46.8938	0.0000	0	
PPM FE	12005	11706	18702.5641	254.9175	11414	
PPM ZN	14850	511873	34187.8116	403.8354	17644050	
PPM CO	1945	4615	10.7023	0.2132	10950	
PPM EU	2194	41	< 0.2719	0.0000	1	
PPM SB	720	10689	29.4667	0.5205	158687	

SAMPLE	1532,	108.58 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	6391	-234	<	304.0016	0.0000	0
PPM MG	1936	13	<	1903.5728	0.0000	0
PPM CU	2743	-150	<	93.8619	0.0000	0
PPM NA	2752	1819		2608.6305	110.1873	1202
PPM V	3145	1288		6.1048	0.3187	527
PPM CL	1365	397		727.1858	79.5047	115
PPM AL	1136	23692		1855.1481	22.3312	491612
PPM MN	493	515		57.7575	3.5924	538
PPM CA	171	2852		70684.4655	1806.4762	47567

SAMPLE	1532,	108.58 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	4526	1923		13.3200	0.7897	817

SAMPLE	1532,	108.58 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	275736	362	<	0.2077	0.0000	0
PPM LU	171500	355	<	0.1089	0.0000	1
PPM U	136926	-162	<	3.0249	0.0000	0
PPM CD	130828	-495	<	28.0306	0.0000	0
PPM AU	61672	-406	<	0.0558	0.0000	0
PPM BR	10471	2324		12.8927	0.6312	516
PPM LA	1845	-211	<	0.4722	0.0000	0

SAMPLE	1532,	108.58 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	81010	293	<	2.0209	0.0000	1
PPM SE	20644	-255	<	1.2138	0.0000	0
PPM HG	19660	204	<	0.6223	0.0000	2
PPM TH	16890	749		0.2258	0.0400	33
PPM CR	13052	-261	<	2.2011	0.0000	0
PPM HF	6750	446		0.1681	0.0320	29
PPM BA	5913	234	<	93.9150	0.0000	9
PPM ND	5107	205	<	16.9940	0.0000	8
PPM AG	3816	129	<	0.4968	0.0000	4
PPM CS	3577	1412		0.6152	0.0308	557
PPM NI	3622	-40	<	13.6670	0.0000	0
PPM TB	3537	-171	<	0.0827	0.0000	0
PPM SC	4290	2899		0.1241	0.0036	1959
PPM RB	2245	9581		300.5264	5.3581	40889
PPM FE	2658	3091		1482.2660	36.7432	3595
PPM ZN	3770	1554		31.1625	1.5079	641
PPM CO	1475	2223		1.5473	0.0448	3350
PPM EU	1363	182		0.0674	0.0146	24
PPM SB	570	7514		6.2173	0.1172	99053

SAMPLE	1533	81.30 MG	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	4735	118 <	349.8799	0.0000	3	
PPM MG	1204	180	2207.3999	462.2122	27	
PPM CU	1840	722	367.5478	25.9889	283	
PPM NA	1785	3296	6312.8629	186.2064	6086	
PPM V	2397	85 <	1.4583	0.0000	3	
PPM CL	845	1373	3358.8045	148.0484	2231	
PPM AL	736	14133	1481.7392	19.6013	271388	
PPM MN	433	1574	235.7574	6.9853	5722	
PPM CA	9	220	7282.0965	515.6492	5378	

SAMPLE	1533	81.30 MG	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	2763	240 <	2.2862	0.0000	21	

SAMPLE LOST DURING TESTING

SAMPLE	1534,	45.24 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	61259	745	<	2247.8665	0.0000	9
PPM MG	10026	181	<	10320.8083	0.0000	3
PPM CU	14519	321	<	515.0641	0.0000	7
PPM NA	13942	18461		63542.2114	1416.9389	24445
PPM V	17017	400	<	6.9313	0.0000	9
PPM CL	9841	1403		6167.9352	496.5845	200
PPM AL	9535	26954		5078.4195	62.3582	76195
PPM MN	11857	69249		18639.8310	171.4904	404438
PPM CR	313	612		36404.3365	1909.6708	1197

SAMPLE	1534,	45.24 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	21609	0	<	11.4088	0.0000	0

SAMPLE	1534,	45.23 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	43296	4647		0.9481	0.0447	499
PPM LU	35420	325	<	0.1193	0.0000	3
PPM U	28858	-153	<	3.3604	0.0000	0
PPM CD	26603	357	<	30.4115	0.0000	5
PPM AU	15826	399	<	0.0683	0.0000	10
PPM BR	4101	2195		29.2443	1.0683	1175
PPM LA	1080	638		4.6939	0.2457	650

SAMPLE	1534,	45.24 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	41610	2626		9.6047	0.7695	166
PPM SE	25956	-390	<	3.2651	0.0000	0
PPM HS	26842	2436		5.5572	0.3910	221
PPM TH	27175	1502		1.0870	0.1226	83
PPM CR	21228	377	<	6.7300	0.0000	7
PPM HF	14450	982		0.8885	0.1125	67
PPM BA	12501	237	<	326.9710	0.0000	4
PPM ND	10516	186	<	58.3848	0.0000	3
PPM AS	7749	-28	<	1.6945	0.0000	0
PPM CS	7969	-937	<	0.4369	0.0000	0
PPM NI	6192	306	<	42.7918	0.0000	15
PPM TB	6795	140	<	0.2743	0.0000	3
PPM SC	9444	16309		1.6759	0.0169	28164
PPM RB	5284	13	<	25.6508	0.0000	0
PPM FE	5862	6839		7871.3097	132.7192	7979
PPM ZN	9960	2022		97.2631	5.3890	410
PPM CO	3775	12168		20.3277	0.2849	39221
PPM EU	3872	336		0.2985	0.0577	29
PPM SR	1140	32399		65.3339	1.0198	949425

SAMPLE	1535,	46.87 MG,	300. SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	13249	-123	<	1011.7581	0.0000	0
PPM MG	5021	445		9465.9482	1604.0568	39
PPM CU	7760	9937		8774.6026	142.5075	12725
PPM NA	5114	37487		124541.8841	2589.9484	274790
PPM V	4896	544		5.9732	0.8110	60
PPM CL	2509	4188		17771.1876	601.9910	6991
PPM AL	2864	23587		4239.4904	52.2006	194255
PPM MN	2235	923		239.8048	14.7336	381
PPM CA	95	576		33071.3425	1587.5672	3492

SAMPLE	1535,	46.87 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	5885	230	<	5.7676	0.0000	9

SAMPLE	1535,	46.87 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	20717	1119		0.2203	0.0291	60
PPM LU	14015	392	<	0.0727	0.0000	11
PPM U	11425	258	<	2.0571	0.0000	6
PPM CD	8943	16	<	17.0840	0.0000	0
PPM AU	5467	1207		0.1362	0.0093	266
PPM BR	3477	4045		52.0275	1.1487	4706
PPM LA	755	238		1.2869	0.1704	75

SAMPLE	1535,	46.87 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	25565	1007		3.5538	0.5755	40
PPM SE	13128	347	<	2.2446	0.0000	9
PPM HG	13833	117	<	1.2102	0.0000	1
PPM TH	13450	1160		0.8103	0.0844	100
PPM CR	10256	-208	<	4.5231	0.0000	0
PPM HF	7979	287	<	0.3651	0.0000	10
PPM BA	6957	-62	<	235.8531	0.0000	0
PPM ND	6381	258	<	43.9686	0.0000	10
PPM AG	6066	755		2.9970	0.3282	94
PPM CS	6084	-123	<	0.3688	0.0000	0
PPM NI	5805	810		90.7612	9.1452	113
PPM TB	6934	-406	<	0.2674	0.0000	0
PPM SC	9702	5515		0.5470	0.0123	3135
PPM RB	5175	179	<	24.5041	0.0000	6
PPM FE	6336	2842		3157.2292	107.0238	1275
PPM ZN	9390	1254		58.2228	4.8399	167
PPM CO	2100	32099		51.7592	0.5714	490641
PPM EU	1452	163	<	0.1543	0.0000	13
PPM SB	510	5816		11.1483	0.2223	66325

SAMPLE	1536,	28.96 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	7265	27	<	1214.6898	0.0000	0
PPM MG	2650	254		8744.4848	1878.4081	24
PPM CU	4231	-160	<	436.1309	0.0000	0
PPM NA	3105	15924		85621.5943	1870.4185	81666
PPM V	3332	418		7.4282	1.0896	52
PPM CL	1507	1454		9985.5176	464.8388	1403
PPM AL	1568	20220		5951.2821	73.8157	260745
PPM MN	1156	1161		488.1853	20.8358	1166
PPM CR	38	692		64303.0883	2732.8939	12602

SAMPLE	1536,	28.96 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	4400	202	<	8.0808	0.0000	9

SAMPLE	1536,	28.96 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	53634	-0	<	0.3442	0.0000	0
PPM LU	47580	-1210	<	0.2167	0.0000	0
PPM U	39325	389	<	6.1990	0.0000	4
PPM CD	35816	170	<	55.1136	0.0000	1
PPM RU	22050	21	<	0.1273	0.0000	0
PPM BR	11680	996		20.7418	2.3472	25
PPM LA	954	299		2.6176	0.3100	94

SAMPLE	1536,	28.96 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	74630	1324		7.5623	1.5746	23
PPM SE	54704	85	<	7.3965	0.0000	0
PPM HG	58180	1253	<	4.4643	0.9690	27
PPM TH	57405	922	<	1.2626	0.0000	15
PPM CR	44144	-247	<	15.1423	0.0000	0
PPM HF	35700	258	<	1.2456	0.0000	2
PPM BA	31356	-453	<	807.4029	0.0000	0
PPM ND	29376	478	<	152.0925	0.0000	8
PPM AG	27130	-464	<	4.9379	0.0000	0
PPM CS	31005	-256	<	1.3419	0.0000	0
PPM NI	30294	2520		456.9958	33.0727	210
PPM TB	35032	-175	<	0.9690	0.0000	0
PPM SC	48005	6159		0.9887	0.0374	790
PPM RB	31424	-442	<	97.2595	0.0000	0
PPM FE	37704	2277		4093.9399	359.8045	138
PPM ZN	54120	2423		182.1109	18.0008	108
PPM CO	9535	251532		656.5570	6.3256	6638018
PPM EU	5428	-197	<	0.4792	0.0000	0
PPM SB	1822	37124		115.1687	1.7859	756417

SAMPLE	1537,	74.01 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	21543	-263 <	816.1509	0.0000	0	
PPM MG	2848	27 <	3379.4704	0.0000	0	
PPM CU	3872	887	496.0213	38.8478	203	
PPM NA	3810	3270	6879.9780	224.4736	2807	
PPM V	4573	477	3.3169	0.4948	50	
PPM CL	3197	321	862.6197	161.2274	32	
PPM AL	2752	5378	619.3817	12.1004	10510	
PPM MN	3527	23166	3811.6385	41.3122	152159	
PPM CA	47	39	1418.0727	338.0819	32	

SAMPLE	1537,	74.01 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	6111	88 <	3.7215	0.0000	1	

SAMPLE	1537,	74.01 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	134208	305 <	0.2129	0.0000	1	
PPM LU	135065	1126 <	0.1430	0.0000	9	
PPM U	110893	-602 <	4.0935	0.0000	0	
PPM CD	107909	1254 <	37.3946	0.0000	15	
PPM AU	67122	16888	1.2196	0.0246	4249	
PPM BR	8495	1247	10.1657	0.8064	183	
PPM LA	2394	110 <	0.7890	0.0000	5	

SAMPLE	1537,	74.01 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	124160	-727 <	3.6691	0.0000	0	
PPM SE	90260	755 <	3.7156	0.0000	6	
PPM HG	96822	4620	6.4419	0.4449	220	
PPM TH	100860	-129 <	0.6545	0.0000	0	
PPM CR	81164	-1876 <	8.0284	0.0000	0	
PPM HF	55750	-2 <	0.6087	0.0000	0	
PPM BA	46174	-555 <	383.1653	0.0000	0	
PPM ND	38241	619 <	67.8738	0.0000	10	
PPM AG	20524	51584	129.6744	0.9311	129649	
PPM CS	22617	-5238 <	0.4487	0.0000	0	
PPM NI	14341	204 <	39.7074	0.0000	3	
PPM TB	25222	-8301 <	0.3219	0.0000	0	
PPM SC	70950	-50981 <	0.0780	0.0000	0	
PPM RB	14164	491 <	25.5917	0.0000	17	
PPM FE	17964	4251	2990.7334	105.4027	1006	
PPM ZN	28820	4130	121.4687	5.5258	592	
PPM CO	15360	9756	9.9626	0.1871	6197	
PPM EU	17270	238 <	0.3333	0.0000	3	
PPM SB	5572	160317	195.2180	2.8865	4641441	

SAMPLE	1538,	14.73 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	7865	282 <	2484.1510	0.0000	10	
PPM MG	1930	303	20508.7386	3270.5708	48	
PPM CU	2967	5148	14464.4829	285.9293	8932	
PPM NA	2354	7889	83396.7081	1985.4490	26439	
PPM V	2618	471	16.4560	1.9456	85	
PPM CL	1254	350	4725.7422	558.5405	98	
PPM AL	1032	14464	8369.7717	110.6025	202720	
PPM MN	884	4451	3679.6449	67.5530	22411	
PPM CA	19	383	69971.3611	3846.9358	7720	

SAMPLE	1538,	14.73 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	3627	103 <	14.4371	0.0000	3	

SAMPLE	1538,	14.73 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	22901	27 <	0.4431	0.0000	0	
PPM LU	18705	156 <	0.2687	0.0000	1	
PPM U	14557	304 <	7.5207	0.0000	6	
PPM CD	12298	61 <	63.6661	0.0000	0	
PPM AU	7434	771	0.2813	0.0332	80	
PPM BR	4979	388	15.8990	3.0032	30	
PPM LA	360	207	3.5654	0.4103	119	

SAMPLE	1538,	14.73 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	36805	762 <	10.0509	0.0000	16	
PPM SE	22820	458 <	9.4051	0.0000	9	
PPM HG	24219	481 <	5.0892	0.0000	10	
PPM TH	23739	846	1.9804	0.3485	30	
PPM CR	19095	-759 <	19.6026	0.0000	0	
PPM HF	15045	1514	4.2071	0.3583	152	
PPM BA	13338	-326 <	1037.1229	0.0000	0	
PPM ND	11988	273 <	191.3868	0.0000	6	
PPM AG	11304	550	6.9469	1.3756	27	
PPM CS	13122	-45 <	1.7194	0.0000	0	
PPM NI	13041	217 <	190.2947	0.0000	4	
PPM TB	16155	216 <	1.2956	0.0000	3	
PPM SC	23382	5612	1.7713	0.0539	1347	
PPM RB	4530	197 <	72.9903	0.0000	9	
PPM FE	5663	6470	22870.6510	397.8356	7392	
PPM ZN	8300	150566	22249.4263	267.5138	2731357	
PPM CO	1980	3921	20.1180	0.4373	7765	
PPM EU	2007	-132 <	0.5758	0.0000	0	
PPM SB	907	11312	68.9946	1.2103	141032	

SAMPLE 1539, 46.36 MG, 300 SEC.					
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM TI	13035	703	1336.7361	223.8788	38
PPM MG	5345	707	15204.6019	1747.1097	94
PPM CU	7744	85 <	367.7274	0.0000	1
PPM NA	6990	25418	85374.3965	1815.7264	92428
PPM V	7386	1895	21.0364	1.0804	486
PPM CL	3334	1997	8567.2091	392.8928	1196
PPM AL	3384	54677	10052.8499	110.1092	883444
PPM MN	1988	1552	407.6612	15.8765	1243
PPM CA	66	1103	64026.0014	2256.8910	18433

SAMPLE 1539, 46.36 MG, 600 SEC.					
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
Z K	10844	1 <	7.8996	0.0000	0

SAMPLE 1539, 46.36 MG, 1800 SEC.					
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM SM	85638	7361	1.4674	0.0609	633
PPM LU	79915	1337	0.1791	0.0394	22
PPM U	68305	57 <	5.1945	0.0000	0
PPM CD	64795	1011 <	46.3079	0.0000	16
PPM AU	40414	377 <	0.1092	0.0000	4
PPM BR	15132	2540	33.0831	1.7402	426
PPM LA	1620	1365	7.4728	0.2999	1150

SAMPLE 1539, 46.36 MG, 3000 SEC.					
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM CE	105180	3334	11.9005	1.1759	106
PPM SE	78588	886 <	5.5357	0.0000	10
PPM HG	84699	-1078 <	3.0187	0.0000	0
PPM TH	83785	3914	2.7641	0.2092	183
PPM CR	65368	2273	21.9459	2.5252	79
PPM HF	50660	1659	1.4647	0.2021	54
PPM BA	43398	583 <	593.0704	0.0000	8
PPM ND	40410	749 <	111.3766	0.0000	14
PPM AG	34263	-709 <	3.4651	0.0000	0
PPM CS	38992	-1420 <	0.9397	0.0000	0
PPM NI	35793	1630	184.6522	21.9697	74
PPM TB	41076	198 <	0.6553	0.0000	1
PPM SC	54672	27339	2.7415	0.0294	13671
PPM RB	36085	-334 <	65.0916	0.0000	0
PPM FE	43811	7103	7977.6574	255.0232	1152
PPM ZN	63070	2114	99.2455	12.0445	71
PPM CD	13960	264294	430.8591	4.1479	5003676
PPM EU	9289	407 <	0.3909	0.0000	18
PPM SB	3030	78215	151.5741	2.2760	2019005

SAMPLE	1540,	97.22 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	6385	152 <	339.3654	0.0000	4	
PPM MG	1996	928	9516.8106	637.1127	431	
PPM CU	3120	39 <	111.7248	0.0000	0	
PPM NA	3030	3294	5275.9136	165.6004	3581	
PPM V	3468	1836	9.7190	0.3920	972	
PPM CL	1501	432	883.7570	93.2396	124	
PPM AL	1320	26418	2316.1798	27.4342	528720	
PPM MN	561	881	110.3497	4.8425	1384	
PPM CA	180	3220	89130.1320	2200.2839	57602	

SAMPLE	1540,	97.22 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	4868	2510	19.4175	1.0531	1294	

SAMPLE	1540,	97.22 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	12563	1024	0.0974	0.0111	83	
PPM LU	6405	-232 <	0.0840	0.0000	0	
PPM U	4617	9 <	0.6521	0.0000	0	
PPM CD	2887	-168 <	4.7022	0.0000	0	
PPM AU	1723	106 <	0.0109	0.0000	7	
PPM BR	1423	168 <	1.1068	0.0000	20	
PPM LA	144	150	0.3917	0.0448	155	

SAMPLE	1540,	97.22 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	21315	312 <	1.1600	0.0000	5	
PPM SE	9328	68 <	0.9130	0.0000	0	
PPM HG	9873	-122 <	0.4934	0.0000	0	
PPM TH	9360	140 <	0.1524	0.0000	2	
PPM CR	6892	185 <	1.7898	0.0000	5	
PPM HF	5130	137 <	0.1414	0.0000	4	
PPM BA	4765	-283 <	94.2386	0.0000	0	
PPM ND	4216	-37 <	17.2588	0.0000	0	
PPM AG	3559	-81 <	0.5361	0.0000	0	
PPM CS	3226	2285	1.1118	0.0362	1618	
PPM NI	3267	209 <	14.5040	0.0000	13	
PPM TB	2907	78 <	0.0838	0.0000	2	
PPM SC	4056	3390	0.1621	0.0041	2833	
PPM RB	1985	9635	337.5342	5.9832	46767	
PPM FE	1998	1091	584.3138	29.8399	596	
PPM ZN	3330	832	18.6248	1.4609	208	
PPM CO	1140	1947	1.5136	0.0455	3325	
PPM EU	1177	98 <	0.0671	0.0000	8	
PPM SB	457	3519	3.2519	0.0751	27097	

SAMPLE	1541,	54.99 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	4966	-99 <	529.6431	0.0000	0	
PPM MG	1336	166 <	3130.7007	0.0000	21	
PPM CU	2007	68 <	158.8266	0.0000	2	
PPM NA	2054	1006	2848.6819	166.7626	493	
PPM V	2541	1119	10.4725	0.5713	493	
PPM CL	1007	280	1012.6959	132.7897	78	
PPM AL	768	18176	2817.3613	35.4018	430165	
PPM MN	221	957	211.9236	7.7983	4144	
PPM CA	114	1613	78935.9686	2427.0243	22823	

SAMPLE	1541,	54.99 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	3753	1021	13.9642	1.1133	278	

SAMPLE	1541,	54.99 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	29526	1545	0.2598	0.0296	81	
PPM LU	22760	795	0.0902	0.0181	28	
PPM U	18927	-335 <	2.3983	0.0000	0	
PPM CD	17836	-241 <	20.5364	0.0000	0	
PPM AU	8532	439	0.0436	0.0094	23	
PPM BR	2548	366	4.0222	0.5936	53	
PPM LA	306	75 <	0.3882	0.0000	18	

SAMPLE	1541,	54.99 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	27180	-698 <	2.3148	0.0000	0	
PPM SE	12588	439 <	1.8736	0.0000	15	
PPM HG	13338	-78 <	1.0130	0.0000	0	
PPM TH	13060	272 <	0.3180	0.0000	6	
PPM CR	10132	-152 <	3.8320	0.0000	0	
PPM HF	7600	-178 <	0.3038	0.0000	0	
PPM BA	304	-69 <	43.1255	0.0000	0	
PPM ND	6115	-340 <	36.6923	0.0000	0	
PPM AG	4144	-8 <	1.0219	0.0000	0	
PPM CS	4014	4123	3.5469	0.0780	4235	
PPM NI	3672	75 <	27.1699	0.0000	2	
PPM TE	3145	204 <	0.1540	0.0000	13	
PPM SC	4506	1570	0.1327	0.0066	547	
PPM RB	2525	11995	742.9134	12.6505	56982	
PPM FE	2796	295	279.3285	52.6530	31	
PPM ZN	4150	532	21.0483	2.7198	68	
PPM CO	1675	1160	1.5943	0.0747	803	
PPM EU	1804	36 <	0.1463	0.0000	1	
PPM SB	495	8721	14.2482	0.2602	153648	

SAMPLE	1542,	14.54 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	3228	106 <		1618.1592	0.0000	3
PPM MG	572	100 <		7811.6287	0.0000	17
PPM CU	871	93 <		398.3431	0.0000	10
PPM NA	757	527		5643.8558	400.1653	367
PPM V	1011	23 <		5.3291	0.0000	1
PPM CL	396	117		1600.3913	313.0776	35
PPM AL	336	5039		2953.9824	52.1988	75570
PPM MN	204	1213		1015.8919	32.6170	7213
PPM CA	38	375		69405.0635	3937.8502	3701

SAMPLE	1542,	14.54 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	1125	316		16.3455	2.0820	89

SAMPLE	1542,	14.54 MG,	1900 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	35064	124 <		0.5557	0.0000	0
PPM LU	28985	31 <		0.3415	0.0000	0
PPM U	24241	-499 <		10.0649	0.0000	0
PPM CD	23325	418 <		88.7943	0.0000	7
PPM AU	13032	356 <		0.2014	0.0000	10
PPM BR	2541	269		11.1849	2.2049	28
PPM LA	692	-182 <		2.1848	0.0000	0

SAMPLE	1542,	14.54 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	31735	-23 <		9.4571	0.0000	0
PPM SE	16928	19 <		8.2114	0.0000	0
PPM HG	17775	211 <		4.4196	0.0000	3
PPM TH	16935	462 <		1.3687	0.0000	13
PPM CR	13424	-312 <		16.6689	0.0000	0
PPM HF	10139	-175 <		1.3257	0.0000	0
PPM BA	255	-60 <		149.8218	0.0000	0
PPM ND	7722	188 <		155.8142	0.0000	5
PPM AG	4927	214 <		4.2111	0.0000	9
PPM CS	4293	318		1.0346	0.2209	24
PPM NI	4293	-25 <		111.0261	0.0000	0
PPM TB	4149	-205 <		0.6691	0.0000	0
PPM SC	4950	800		0.2557	0.0243	129
PPM RB	3440	958		224.4000	15.8389	267
PPM FE	4182	8 <		1086.5605	0.0000	0
PPM ZN	6780	-225 <		57.7244	0.0000	0
PPM CO	3005	829		4.3090	0.3244	229
PPM EU	3278	-187 <		0.7434	0.0000	0
PPM SB	945	16855		104.1460	1.7266	300625

SAMPLE	1543,	27.76 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	8943	399 <	1405.0026	0.0000	18	
PPM MG	2909	163 <	9104.8336	0.0000	9	
PPM CU	4144	178 <	450.3235	0.0000	8	
PPM NA	3299	13829	77571.2900	1720.1535	57969	
PPM V	3833	402	7.4527	1.2077	42	
PPM CL	1794	837	5996.6780	403.3299	391	
PPM AL	1592	22768	6990.9045	84.9166	325617	
PPM MN	1054	2032	891.3644	25.4495	3917	
PPM CA	57	765	74159.4104	3045.3973	10267	

SAMPLE	1543,	27.76 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	5364	1 <	9.3003	0.0000	0	

SAMPLE	1543,	27.76 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	188520	57816	19.2724	0.1695	17731	
PPM LU	63170	687 <	0.2643	0.0000	7	
PPM U	60993	-5500 <	8.4020	0.0000	0	
PPM CD	27439	469 <	50.4419	0.0000	8	
PPM PU	18463	547 <	0.1261	0.0000	16	
PPM BR	19330	2601	56.6687	3.2403	350	
PPM LA	153	-152 <	0.5514	0.0000	0	

SAMPLE	1543,	27.76 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	1294010	-1551 <	31.5434	0.0000	0	
PPM SE	1052720	1446 <	33.7846	0.0000	2	
PPM HG	1143783	6010	22.3421	3.9876	32	
PPM TH	1210470	-2401 <	6.0370	0.0000	0	
PPM CR	963672	-85 <	73.6467	0.0000	0	
PPM HF	661170	4358	6.4258	1.2034	29	
PPM BA	537012	-710 <	3477.1172	0.0000	0	
PPM ND	464355	2576 <	629.2347	0.0000	14	
PPM AG	254844	-1683 <	15.7508	0.0000	0	
PPM CS	289804	-50269 <	4.2704	0.0000	0	
PPM NI	207387	-1291 <	401.1344	0.0000	0	
PPM TB	189346	-866 <	2.3460	0.0000	0	
PPM SC	251814	4444	0.7442	0.0348	73	
PPM RB	198025	-794 <	254.2047	0.0000	0	
PPM FE	241013	2351	4409.7113	925.4465	23	
PPM ZN	398180	2666 <	230.2859	0.0000	18	
PPM CO	234750	105911	288.3454	3.1464	47783	
PPM EU	253654	-153 <	3.3946	0.0000	0	
PPM SB	153150	2114837	6844.4073	99.8195	29203627	

SAMPLE	1544,	23.24 MG,	300 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	6028	62	<	1379.7012	0.0000	1
PPM MG	1441	-122	<	7688.9105	0.0000	0
PPM CU	1864	3010		5360.4036	133.7460	4861
PPM NA	1560	2959		19826.1570	600.8561	5613
PPM V	1836	304		6.7320	1.0256	50
PPM CL	825	117	<	1166.1980	0.0000	17
PPM AL	712	13461		4937.0684	66.0114	254492
PPM MN	399	1011		529.7441	20.1533	2562
PPM CA	1	89		10305.7162	1112.1962	7921

SAMPLE	1544,	23.24 MG,	600 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	2529	121	<	7.6554	0.0000	6

SAMPLE	1544,	23.24 MG,	1800 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	178362	55460		22.0894	0.1971	17245
PPM LU	59770	421	<	0.3078	0.0000	3
PPM U	58846	-5814	<	9.9188	0.0000	0
PPM CD	26851	62	<	59.6217	0.0000	0
PPM AG	18009	285	<	0.1496	0.0000	5
PPM BR	18050	3406		88.6763	3.8421	643
PPM LA	90	-105	<	0.5123	0.0000	0

SAMPLE	1544,	23.24 MG,	3000 SEC.			
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	199129	-577	<	14.7922	0.0000	0
PPM SE	143868	1090	<	14.9330	0.0000	8
PPM HG	156654	-1038	<	8.1851	0.0000	0
PPM TH	161280	428	<	2.6346	0.0000	1
PPM CR	129080	-1432	<	32.2291	0.0000	0
PPM HF	85780	-25	<	2.4034	0.0000	0
PPM BA	70276	-872	<	1504.6055	0.0000	0
PPM ND	59220	959	<	268.8269	0.0000	16
PPM AG	26829	4407		35.2806	1.4256	724
PPM CS	34024	-7130	<	1.7514	0.0000	0
PPM NI	22801	-534	<	159.2858	0.0000	0
PPM TB	21919	-1307	<	0.9559	0.0000	0
PPM SC	32004	-1644	<	0.1669	0.0000	0
PPM RB	22745	-283	<	103.1707	0.0000	0
PPM FE	27048	1544		3459.2995	379.0500	88
PPM ZN	46690	2416		226.3036	20.9256	125
PPM CO	27160	-1733	<	2.5010	0.0000	0
PPM EU	30261	13	<	1.4036	0.0000	0
PPM SB	9607	277460		1072.6120	15.7611	8013329

SAMPLE	1545,	89.73 MG,	300 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM TI	20196	743	729.9362	142.6353	27
PPM MG	6346	1080	12000.1080	1036.2050	184
PPM CU	9928	275 <	214.9543	0.0000	8
PPM NA	7882	38914	67530.1797	1405.2985	192121
PPM V	8865	1061	6.0853	0.5731	127
PPM CL	3919	3126	6928.7683	267.1724	2493
PPM AL	4464	52018	4941.3308	54.4493	606154
PPM MN	2847	2576	349.5902	10.4001	2331
PPM CA	209	2084	62500.6223	1778.2656	20780

SAMPLE	1545,	89.73 MG,	600 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
% K	10709	802	6.7222	0.9434	50

SAMPLE	1545,	89.73 MG,	1800 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM SM	229308	-690 <	0.2301	0.0000	0
PPM LU	142175	647 <	0.1231	0.0000	3
PPM U	123061	-3513 <	3.7351	0.0000	0
PPM CD	93841	-257 <	28.8283	0.0000	0
PPM AU	68197	237 <	0.0757	0.0000	1
PPM BR	71675	11788	79.5203	1.9933	1939
PPM LA	585	-199 <	0.3265	0.0000	0

SAMPLE	1545,	89.73 MG,	3000 SEC.		
ELEMENT	BKG	AREA	RESULT	+/-	CRIT
PPM CE	888465	610 <	8.0870	0.0000	0
PPM SE	301772	-195 <	5.5988	0.0000	0
PPM HS	327136	235 <	3.0621	0.0000	0
PPM TH	347190	-1187 <	1.0007	0.0000	0
PPM CR	270576	-1171 <	12.0794	0.0000	0
PPM HF	223890	-185 <	1.0049	0.0000	0
PPM BA	1	-96 <	2.3216	0.0000	0
PPM ND	1	-0 <	0.4518	0.0000	0
PPM AS	1	-128 <	0.0153	0.0000	0
PPM CS	1	-17 <	0.0039	0.0000	0
PPM NI	441	14 <	5.8740	0.0000	0
PPM TB	66384	185 <	0.4301	0.0000	1
PPM SC	86214	168 <	0.0709	0.0000	0
PPM RB	57600	-429 <	42.4621	0.0000	0
PPM FE	68658	68 <	708.6026	0.0000	0
PPM ZN	112930	-446 <	37.9722	0.0000	0
PPM CO	55510	-901 <	0.9251	0.0000	0
PPM EU	57937	-463 <	0.5025	0.0000	0
PPM SB	52004	100046	100.1706	1.5105	192470

SAMPLE	1546,	5.85 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	4933	178 <	4962.2110	0.0000	6	
PPM MG	747	76 <	22121.7626	0.0000	8	
PPM CU	1120	1864	13187.3387	405.0538	3102	
PPM NA	622	1299	34576.6556	1357.3410	2713	
PPM V	569	76 <	9.9963	0.0000	10	
PPM CL	298	107	3637.7463	691.8105	38	
PPM AL	336	1638	2386.6348	69.0209	7985	
PPM MN	272	662	1378.0126	64.6214	1611	
PPM CA	9	26	11960.2918	2729.2305	75	

SAMPLE	1546,	5.85 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	701	15 <	16.1766	0.0000	0	

SAMPLE	1546,	5.85 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	143183	-19382 <	2.7901	0.0000	0	
PPM LU	72410	620 <	1.3514	0.0000	9	
PPM U	58540	212 <	39.7863	0.0000	1	
PPM CD	50501	2335	723.6529	71.5487	108	
PPM AU	30915	891	0.8541	0.1712	26	
PPM BR	3620	-96 <	29.2409	0.0000	0	
PPM LA	3	-19 <	0.4682	0.0000	0	

SAMPLE	1546,	5.85 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	54335	-182 <	30.7330	0.0000	0	
PPM SE	30852	784 <	27.5207	0.0000	20	
PPM HG	33750	-517 <	15.1185	0.0000	0	
PPM TH	32005	349 <	4.6709	0.0000	4	
PPM CR	25356	-408 <	56.8619	0.0000	0	
PPM HF	17455	-164 <	4.3174	0.0000	0	
PPM BA	60	-93 <	187.3813	0.0000	0	
PPM ND	13023	117 <	502.1665	0.0000	1	
PPM AG	7969	748	23.7890	2.9717	70	
PPM CS	7380	-568 <	3.2522	0.0000	0	
PPM NI	6871	-366 <	348.4657	0.0000	0	
PPM TB	6192	-185 <	2.0253	0.0000	0	
PPM SC	8640	27 <	0.3456	0.0000	0	
PPM RB	5780	-184 <	207.3954	0.0000	0	
PPM FE	6726	29 <	3418.4386	0.0000	0	
PPM ZN	10279	954	317.7405	39.4385	71	
PPM CO	4740	2521	32.5693	1.1428	1341	
PPM EU	4999	-72 <	2.2774	0.0000	0	
PPM SB	1612	30482	468.1295	7.3533	576397	

SAMPLE 1547, 117.55 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	37966	-484	<	680.9514	0.0000	0
PPM MG	10768	1373		11645.2005	1010.5290	175
PPM CU	16175	-64	<	209.1728	0.0000	0
PPM NA	12494	69948		92657.8816	1896.6479	391606
PPM V	11645	687		3.0077	0.4867	41
PPM CL	6526	3781		6397.1830	246.6768	2191
PPM AL	6839	42753		3100.0729	35.8295	267264
PPM MN	6834	19377		2007.3124	23.5415	54941
PPM CA	323	1640		37544.4295	1194.0370	8327

SAMPLE 1547, 117.55 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
Z K	14669	588		3.7621	0.8067	24

SAMPLE 1547, 117.55 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	129365	-9001	<	0.1320	0.0000	0
PPM LU	70605	1036	<	0.0666	0.0000	15
PPM U	57217	-117	<	1.9696	0.0000	0
PPM CD	49439	1548		23.8817	3.4906	48
PPM AU	29268	1025		0.0492	0.0084	36
PPM BR	3438	-161	<	1.4191	0.0000	0
PPM LB	16	-29	<	0.0461	0.0000	0

SAMPLE 1547, 117.55 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	50820	1070		1.5054	0.3206	23
PPM SE	27956	321	<	1.3040	0.0000	4
PPM HG	30145	-207	<	0.7112	0.0000	0
PPM TH	30300	624	<	0.2262	0.0000	13
PPM CR	23628	974		3.7088	0.5990	40
PPM HF	17470	195	<	0.2150	0.0000	2
PPM BA	14850	385	<	137.0927	0.0000	10
PPM ND	13401	-330	<	25.3491	0.0000	0
PPM AG	9571	-5	<	0.7243	0.0000	0
PPM CS	7785	365	<	0.1662	0.0000	17
PPM NI	7830	8	<	18.5043	0.0000	0
PPM TB	7605	271	<	0.1116	0.0000	10
PPM SC	10344	12072		0.4774	0.0060	14089
PPM RB	5734	614		17.7896	2.3216	66
PPM FE	7188	3356		1486.5390	45.7926	1567
PPM ZN	10850	1915		35.4649	2.1332	338
PPM CO	4045	8949		5.7536	0.0911	19798
PPM EU	4080	329		0.1125	0.0227	27
PPM SB	1365	24755		18.9199	0.3020	448945

SAMPLE	1548,	72.62 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	40287	408 <	1136.2454	0.0000	4	
PPM MG	8910	140 <	6063.2822	0.0000	2	
PPM CU	12271	17678	10074.9756	135.3097	25467	
PPM NA	10215	38847	83297.3029	1736.6283	147733	
PPM V	10914	1238	8.7734	0.7838	140	
PPM CL	5908	2884	7898.4840	337.2596	1408	
PPM AL	6200	32997	3871.8143	45.2460	175507	
PPM MN	5856	27902	4678.7533	49.3146	132944	
PPM CR	275	697	25828.5977	1234.0411	1767	

SAMPLE	1548,	72.62 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	13193	579	5.9965	1.2423	25	

SAMPLE	1548,	72.62 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	4122	-504 <	0.0384	0.0000	0	
PPM LU	1985	-196 <	0.0183	0.0000	0	
PPM U	1408	62 <	0.5098	0.0000	3	
PPM CD	1045	71 <	3.8225	0.0000	5	
PPM AU	937	-303 <	0.0107	0.0000	0	
PPM BR	377	3 <	0.7761	0.0000	0	
PPM LA	1	-59 <	0.0258	0.0000	0	

SAMPLE	1548,	72.62 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	222210	2173 <	5.0003	0.0000	21	
PPM SE	145636	-114 <	4.8081	0.0000	0	
PPM HG	151168	440 <	2.5732	0.0000	1	
PPM TH	146795	3585	1.6163	0.1748	88	
PPM CR	113420	1003 <	9.6692	0.0000	9	
PPM HF	98525	-663 <	0.8242	0.0000	0	
PPM BA	880	-63 <	54.8196	0.0000	0	
PPM ND	83052	690 <	101.8432	0.0000	6	
PPM AG	80532	4555	11.6698	0.7496	258	
PPM CS	90436	-671 <	0.9127	0.0000	0	
PPM NI	91750	3962	286.5289	22.5021	171	
PPM TB	106915	-151 <	0.6742	0.0000	0	
PPM SC	150846	6635	0.4247	0.0254	292	
PPM RB	93765	838 <	66.9059	0.0000	7	
PPM FE	116177	11431	8196.0571	257.7968	1125	
PPM ZH	162630	9937	297.8445	12.9329	607	
PPM CO	31610	797595	830.0755	7.8748	20125207	
PPM EU	8756	403 <	0.2423	0.0000	19	
PPM SB	4440	37341	46.1964	0.7189	314043	

SAMPLE 1549, 115.70 MG, 300 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM TI	30624	855		651.4282	135.5806	24
PPM MG	11005	370	<	4226.8781	0.0000	12
PPM CU	17863	20041		7168.9103	95.8898	22485
PPM NA	9389	107164		144226.5635	2928.5142	1223147
PPM V	7259	-586	<	1.7743	0.0000	0
PPM CL	3971	576		990.1337	119.1493	84
PPM AL	5416	19783		1457.4268	18.7176	72261
PPM MN	5125	918		96.6185	8.2205	164
PPM CR	237	388		9024.4899	600.9372	635

SAMPLE 1549, 115.70 MG, 600 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
% K	7415	133	<	2.6205	0.0000	2

SAMPLE 1549, 115.70 MG, 1800 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM SM	129888	-11413	<	0.1345	0.0000	0
PPM LU	74850	314	<	0.0699	0.0000	1
PPM U	60633	869	<	2.0852	0.0000	12
PPM CD	51331	2483		38.9398	3.8558	120
PPM AU	33003	2011		0.0990	0.0093	123
PPM BR	18778	47	<	3.3533	0.0000	0
PPM LA	621	-191	<	0.2611	0.0000	0

SAMPLE 1549, 115.70 MG, 3000 SEC.						
ELEMENT	BKG	AREA		RESULT	+/-	CRIT
PPM CE	1975259	9845		14.0794	2.0151	49
PPM SE	1694416	-1988	<	10.2827	0.0000	0
PPM HG	1846039	-1430	<	5.6380	0.0000	0
PPM TH	1979010	281	<	1.8518	0.0000	0
PPM CR	1581464	1512	<	22.6333	0.0000	1
PPM HF	1200670	4796	<	1.8035	0.0000	19
PPM BR	991044	-1900	<	1133.1015	0.0000	0
PPM ND	871947	1862	<	206.8323	0.0000	4
PPM RG	634032	-4154	<	5.9583	0.0000	0
PPM CS	559143	-40406	<	1.4228	0.0000	0
PPM NI	478872	-4617	<	146.1858	0.0000	0
PPM TB	417856	-1529	<	0.8358	0.0000	0
PPM SC	549066	1079	<	0.1386	0.0000	2
PPM RB	398330	-3994	<	86.4696	0.0000	0
PPM FE	471276	668	<	1437.8143	0.0000	1
PPM ZN	788720	-2295	<	77.7426	0.0000	0
PPM CO	415560	-19379	<	1.9598	0.0000	0
PPM EU	490380	-1320	<	1.1321	0.0000	0
PPM SB	779452	2803649		2177.0514	31.7465	10084582

SAMPLE	1550,	59.80 MG,	300 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM TI	25349	16 <	1095.3497	0.0000	0	
PPM NG	6006	141 <	6053.3700	0.0000	3	
PPM CU	8711	450	311.4429	66.3073	23	
PPM NA	4927	52292	136164.4592	2800.7271	554994	
PPM V	3663	329	2.8314	0.5442	30	
PPM CL	2333	415	1380.2306	178.5436	74	
PPM AL	2396	11672	1663.6886	23.9646	47043	
PPM MN	2771	2290	466.3214	14.9968	1892	
PPM CA	57	276	12420.3031	847.3234	1336	

SAMPLE	1550,	59.80 MG,	600 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
% K	4644	58 <	4.0195	0.0000	1	

SAMPLE	1550,	59.80 MG,	1800 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM SM	128492	-4670 <	0.2507	0.0000	0	
PPM LU	71580	-635 <	0.1326	0.0000	0	
PPM U	58635	-240 <	3.9919	0.0000	0	
PPM CD	49142	2562	77.7579	6.9383	134	
PPM AU	32508	1985	0.1901	0.0179	121	
PPM BR	17166	-142 <	6.2069	0.0000	0	
PPM LA	1	-70 <	0.0314	0.0000	0	

SAMPLE	1550,	59.80 MG,	3000 SEC.			
ELEMENT	BKG	AREA	RESULT	+/-	CRIT	
PPM CE	1305075	986 <	14.7053	0.0000	1	
PPM SE	1080708	5726	18.8119	3.4267	30	
PPM HG	1169487	-5465 <	8.6833	0.0000	0	
PPM TH	1224555	-1314 <	2.8187	0.0000	0	
PPM CR	974240	-2174 <	34.3747	0.0000	0	
PPM HF	836305	3197 <	2.9160	0.0000	12	
PPM BA	689989	-809 <	1829.4731	0.0000	0	
PPM ND	592645	2021 <	329.9595	0.0000	7	
PPM AG	577980	1859047	5783.8736	29.0113	5979542	
PPM CS	289669	-36755 <	1.9819	0.0000	0	
PPM NI	247945	-17712 <	203.5859	0.0000	0	
PPM TB	1047609	-540490 <	2.5596	0.0000	0	
PPM SC	2174238	-2061530 <	0.5332	0.0000	0	
PPM RB	193940	-711 <	116.7835	0.0000	0	
PPM FE	235253	-39 <	1966.1555	0.0000	0	
PPM ZN	395810	1110 <	106.5836	0.0000	3	
PPM CO	183765	-10157 <	2.5227	0.0000	0	
PPM EU	196179	-14 <	1.3860	0.0000	0	
PPM SB	120022	1469683	2208.0093	32.2191	17996435	