ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT

IMPACTS OF URANIUM MINING AND MILLING ON SURFACE AND POTABLE WATERS IN THE GRANTS MINERAL BELT, NEW MEXICO

September 1975

NATIONAL ENFORCEMENT INVESTIGATIONS CENTER - Denver, Colorado
and
REGION VI - Dallas, Texas

CONTENTS

TABLES

FIGURES

ABBREVIATIONS

AEC	Atomic Energy Commission
gpm	gallons per minute
kg	kilograms
km	kilometers
l/min	liters per minute
m^3/day	cubic meters per day
mg/l	milligrams per liter
NEIC	National Enforcement Investigations Center
NMEIA	New Mexico Environmental Improvement Agency
NRC	Nuclear Regulatory Commission
ORP-LVF	Office of Radiation Programs-Las Vegas Facility
pCi/l	picocuries per liter
RIP	resin in pulp (ion-exchange process)
USPHS	United States Public Health Service

I. INTRODUCTION

BACKGROUND

The United States experienced its first uranium "boom" in the early 1950's as a result of cold-war activities and the fabrication of large numbers of nuclear weapons. During that time, most of the currently-known uranium deposits were discovered by massive exploration by the U.S. government and private citizens. Many uranium mills were built at various sites throughout the west to treat the uranium ores to produce a uranium oxide called *yellow cake*.

This uranium milling was not without environmental damage. Among the first recognized water-pollution problems was in the Animas River Basin of Colorado and New Mexico. A mill at Durango, Colorado was contributing abnormally high concentrations of radium to the water supply of Aztec, New Mexico. To control radiochemical pollution resulting from uranium milling in this area, the Colorado River Basin Enforcement Conference was convened in 1960 by the states composing the Colorado River Basin. Federal, State, and industry cooperative efforts resulted in pollution control by which streams in the Colorado River Basin contained near background levels of pollutants resulting from uranium milling. Other uranium milling areas, most notably the Grants Mineral Belt, were not situated on interstate streams and thus not subject to Federal pollution control before the Federal Water Pollution Control Act Amendments were passed in 1972. Little pollution control effort was expended toward mine and mill discharges within this area.

The Grants Mineral Belt [Fig. 1], stretching west from just northwest of Albuquerque, New Mexico to the New Mexico-Arizona state line, contains almost half of the United States uranium reserves. A second uranium "boom" now underway promises to make the Grants Mineral Belt the

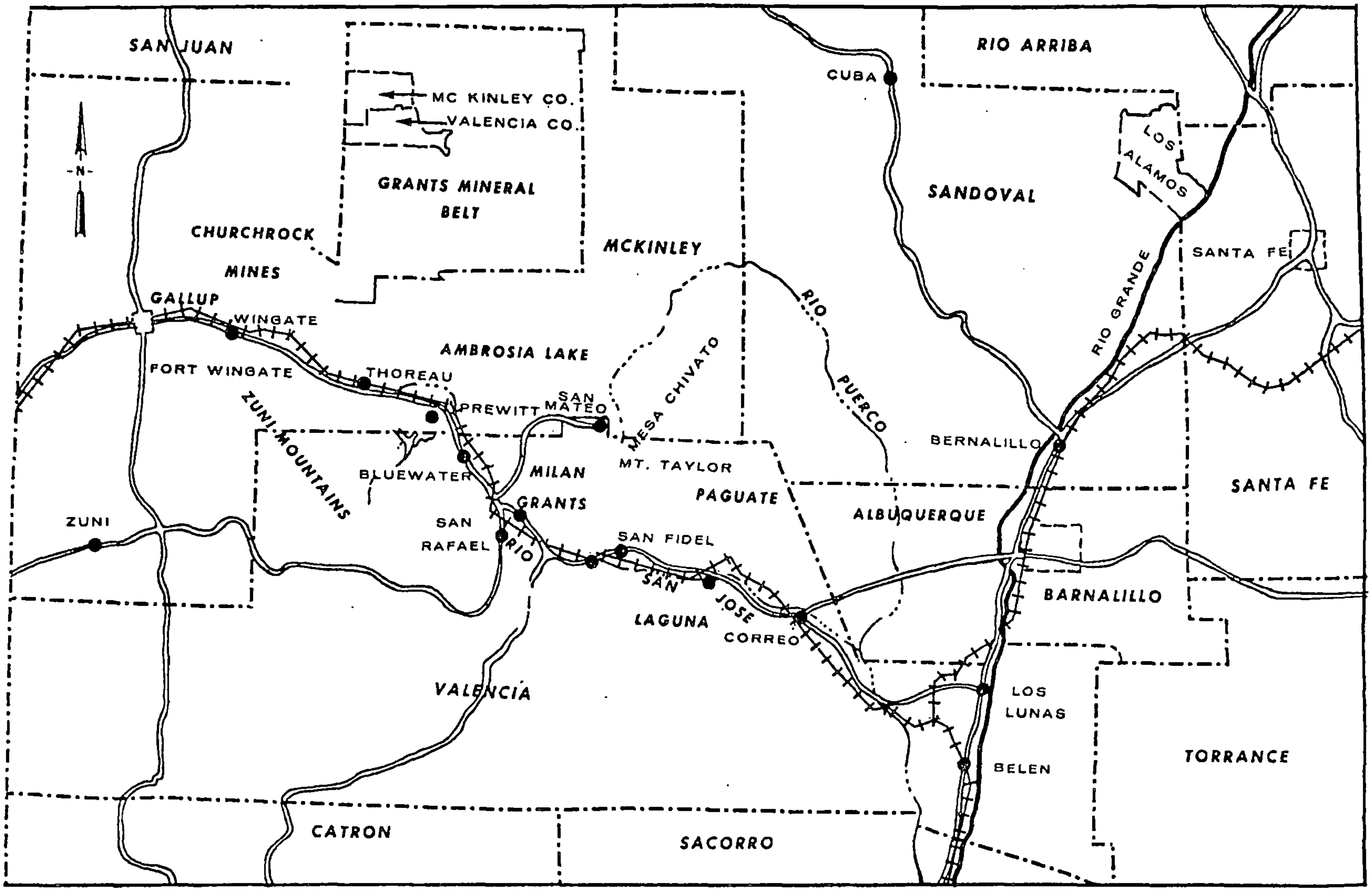

FIGURE 1. Location and General Features of the Grants Mineral Belt in Northwestern New MEXICO

foremost uranium mining and milling site in the United States. This "boom" results from the demand for nuclear fuel elements in nuclear power plants (Guccione, Aug. 1974).

1975 WATER QUALITY INVESTIGATION

The New Mexico Environmental Improvement Agency (NMEIA) realized that little information was available on the water discharges from mining and milling in the Grants Mineral Belt, and the subsequent effect on ground and surface water resources of the area. On September 25, 1974 NMEIA requested EPA Region VI to conduct a survey of water-pollution sources and surface and ground-water quality in the Grants Mineral Belt. The National Enforcement Investigations Center (NEIC) and the Office of Radiation Programs-Las Vegas Facility (ORP-LVF) were subsequently asked by Region VI to conduct a survey in cooperation with the NMEIA.

Studies conducted from February 24 to March 6, 1975 included industrial waste source evaluation, potable water sampling, and limited stream surveys by NEIC, and ground-water evaluations by ORP-LVF. NMEIA provided assistance to both NEIC and ORP-LVF during the survey. The three mining areas evaluated in the Grants Mineral Belt were [Fig. 1]:

Area	Approximate Location
Ambrosia Lake	32 km (20 mi) N of Milan, N. Mex.
Churchrock	32 km (20 mi) NE of Gallup, N. Mex.
Paguate	16 km (10 mi) N of Laguna, N. Mex.

The mill sites are:

Kerr-McGee	near Ambrosia Lake
United Nuclear-Homestake Partners	8 km (5 mi) N of Milan
Anaconda	11 km (7 mi) W of Milan

United Nuclear Corporation operates an ion-exchange plant in the old "Phillips" mill near Ambrosia Lake. No conventional milling is currently done at this site.

As stated in a February 14, 1975 letter from the Director of NMEIA, the primary tasks of the study were to:

1. Assess the impacts of waste discharges from uranium mining and milling on surface and ground waters of the Grants Mineral Belt.
2. Determine if discharges comply with all applicable regulations, standards, permits and licenses.
3. Evaluate the adequacy of company water quality monitoring networks, self-monitoring data, analytical procedures and reporting requirements.
4. Determine the composition of potable waters at uranium mines and mills.
5. Develop priorities for subsequent monitoring and other follow-up studies.

During the survey, samples were collected from wells, industrial discharges, drinking water supplies, and surface streams. The samples were appropriately preserved to determine the radiochemical, nutrient, and metals content and shipped to the NEIC and ORP-LVF laboratories for analyses (Appendix A). NEIC custody procedures were maintained during the collection and analyses of the samples (Appendix B).

This report presents the findings of analyses of surface water streams, potable water supplies, and industrial discharges. Appendix C contains raw data for all samples collected during the survey and analyzed by NEIC. The NEIC analysis, when combined with the ORP-LVF report, will present an overall study of water quality in the Grants Mineral Belt.

II. SUMMARY AND CONCLUSIONS

Task: *Assess the impacts of waste discharges from uranium mining and milling on surface and ground waters of the Grants Mineral Belt.*

1. Radium concentrations in Arroyo del Puerto, a perennial stream, exceed New Mexico Water Quality Criteria as a result of discharges from the Kerr-McGee ion-exchange plant and Sections 30W and 35 mines and from the United Nuclear-Homestake Partners ion-exchange plant. Selenium and vanadium concentrations exceed EPA 1972 Water Quality Criteria for use of the water for irrigation and livestock watering, and render the stream unfit for use as a domestic water source.

2. Rainfall and runoff at the Anaconda Jackpile Mine erode uranium- and selenium-rich minerals into Rio Paguate. This erosion can be mitigated by waste stabilization and runoff control.

Task: *Determine if discharges comply with all applicable regulations, standards, permits, and licenses.*

1. At the time of sampling, the effluent from the Kerr-McGee ion-exchange plant contained dissolved-radium 226 at concentrations in excess of the applicable NPDES permit and New Mexico uranium-milling license conditions. This radium discharge was partly responsible for violations of New Mexico Water Quality Standards for Arroyo del Puerto, a perennial stream. The discharge also contained uranium at concentrations in excess of NPDES permit criteria. No treatment other than settling is currently in operation.

2. The Kerr-McGee Section 30W mine discharge contained dissolved radium-226 at concentrations in excess of the applicable NPDES permit condition. No treatment other than settling is currently in operation. This radium discharge also was partly responsible for violation of New Mexico Water Quality Standards in Arroyo del Puerto.

3. Kerr-McGee Nuclear Corporation has not applied for a discharge permit for their Section 35 mine, although the effluent reaches Arroyo del Puerto, a perennial stream. The discharge contains an average of 51 pCi/l of dissolved radium-226. No radium-removal treatment is currently in operation.

4. Sampling at the United Nuclear Corportion Churchrock mine was conducted when the operation was inactive due to a power failure and subsequent mine flooding. Indications are that the present treatment facility is inadequate to meet existing NPDES permit conditions.

5. Approximatley 15 percent of the total flow through the United Nuclear-Homestake Partners ion-exchange plant is discharged to Arroyo del Puerto, with the balance of the flow returning to the mines for <u>in situ</u> leaching. The discharge to Arroyo del Puerto is not regulated by an NPDES permit, and it contributes to the violation of New Mexico Water Quality Standards for radium-226 in this perennial stream. Uranium is lost from the ion-exchange facility. The facility is currently violating conditions of the applicable State license.

Task: Determine the composition of potable waters at uranium mines and mills.

1. Four industry potable water supply systems, obtained from mine waters, exceeded 1962 U. S. Public Health Service Drinking

Water Standards for selenium. Three such potable systems exceeded both the existing USPHS and proposed EPA Interim Primary Drinking Water Standards for radium. Such mine water is supplied as potable to families of miners at the United Nuclear Corporation Churchrock mine. These conditions are considered intolerable as they bear on the long-term health of those using the supplies. Non-potable systems at the Kerr-McGee mill and Churchrock mine have high radium and selenium concentrations, and are not adequately marked as non-potable.

III. RECOMMENDATIONS

ACTION REQUIRED

1. Procedures be initiated to require United Nuclear Corporation to immediately provide potable water which meets Federal Drinking Water Standards for their Ambrosia Lake and Churchrock operations.

2. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately provide potable water supplies which meet Federal Drinking Water Standards at their mill and Sections 35 and 36 mines; the mill and Churchrock mine non-potable water supplies be clearly marked.

3. NMEIA initiate appropriate action to insure safe industrial potable water supplies at the United Nuclear Corporation's Ambrosia Lake and Churchrock operations and at the Kerr-McGee Nuclear Corporation's mill and Section 35 and 36 mines.

4. NMEIA should conduct periodic sampling of potable water supplies at operating uranium mines and mills throughout the State.

5. Improved mining practices should be adopted to reduce the amount of radium leached from ore solids by ground water present in operating mines.

6. Procedures should be initiated to require Anaconda Company to improve its present efforts at stabilizing waste and ore piles at the Jackpile Mine in order to prevent water erosion from transporting uranium and selenium into Rio Paguate.

7. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to reduce the dissolved radium-226 concentration in the Section 30W mine discharge to applicable NPDES permit conditions.

8. Procedures be initiated to require Kerr-McGee Nuclear Corporation to file an application for discharge from their Section 35 mine. The permit should provide limits on total suspended solids, radium-226 and uranium, consistent with the permit conditions for the Section 30W mine.

9. Procedures be initiated to require Kerr-McGee Nuclear Corporation to immediately install necessary treatment systems to ensure that effluent from their ion-exchange plant meet applicable NPDES permit and State uranium milling license conditions. The Company should develop operating schedules to guard against undetected uranium breakthrough and subsequent discharge of uranium to Arroyo del Puerto.

10. United Nuclear-Homestake Partners should install pumps and pipelines necessary to achieve complete recycle of ion-exchange discharge. If unable to achieve complete recycle, it will be necessary to issue an NPDES permit. The Company should immediately install necessary treatment facilities to comply with the applicable State uranium milling license.

ADDITIONAL STUDIES REQUIRED

Resampling should be scheduled at the United Nuclear Corporation Churchrock mine during periods of normal operation.

IV. DESCRIPTION OF STUDY AREA

LOCATION

The Grants Mineral Belt extends west from a point slightly northwest of Albuquerque, New Mexico, north of the towns of Grants and Gallup, almost to the New Mexico-Arizona state line [Fig. 1]. The Belt extends about 48 km (30 mi) north from the routes of U.S. 66 and the Atchison, Topeka and Santa Fe railroad. Some mining is conducted in Valencia County, but the bulk of the Grants Mineral Belt is in southern McKinley County.

The principal centers of population in the area are the towns of Grants and Gallup, and the villages of Churchrock, Wingate, Milan, and Laguna. Population in the area has increased rapidly since 1950, with the development of extensive uranium mining and milling operations.

With the exception of the volcanically formed Mt. Taylor area, most of the area is plateau topography underlain by sedimentary rocks. Streams have incised steep-walled valleys in the area, with broad valleys in those areas underlain by easily erodable sediments.

The eastern half of the Grants Mineral Belt, including the Ambrosia Lake district, is tributary to Rio San Jose. The western portion is in the valley of the Rio Puerco, a tributary to the Little Colorado River.

CLIMATE

The Grants Mineral Belt area is semi-arid to arid, with an average annual temperature of about 10°C (50°F). Maximum summer temperatures rarely exceed 38°C (100°F) with minimum temperatures occasionally below -18°C (0°F). The humidity in the area is usually low, and moderate to strong winds are common during the spring. Precipitation is largely influenced by elevation, with a positive correlation between increasing elevation and increasing precipitation. Annual average precipitation at the Grants Airport is 21 cm (8.3 in), approximately 70% of which occurs May through September.

INDUSTRY

Industry in the Grants Mineral Belt used to be largely centered around farming and ranching, with limited tourism. Since 1950, the economic base of the Grants Mineral Belt area has completely shifted to industry, based on the mining and milling of uranium ore to produce yellow cake.

Underground mining operations in the Grants Mineral Belt are by the room and pillar method, which consists of driving a number of parallel development drifts in the ore horizon. A series of parallel sluicer drifts are driven at right angles, leaving a grid of ore pillars to support the overlying rock, or "roof." As the pillars are mined (robbed), the roof is rock-bolted and supported by timbers as necessary to prevent subsidence. The mined area (stope) is then abandoned.

The ore horizon in underground mines in the Grants Mineral Belt is composed of the Westwater Canyon member of the Jurassic Morrison formation, which is the main aquifer of the Grants Mineral Belt area. Therefore, large quantities of ground water must be pumped from each mine to prevent mine flooding. Ore bodies are dewatered by drilling "long holes" from the development drifts into the ore horizon, and permitting ground water to flow from the long holes into the drifts and then be pumped to the surface for discharge. Water flow is by gravity to sumps near the mine shaft, with positive pumpage to the surface. This water passes through settling basins at each mine to remove solids and then is either pumped to an ion-exchange plant for removal of contained uranium, or is discharged directly to surface water courses. Some of the ion-exchange water is recycled to the mines for use in solution mining or is used as a potable water supply for workers in the mines and mills.

Where the physical and economic situations permit, most mining companies now collect underground mine water in a single location for ion-exchange treatment to recover uranium which is dissolved in the mine water. Recovery is accomplished by using specific resins which are extremely selective in the removal of dissolved uranium. The mine water is passed through the resin column where the resin becomes *loaded* until it reaches its capacity for uranium (*breakthrough*). Flow is then diverted to another barren resin column and the loaded resin is *stripped* or eluted with a sodium chloride brine. The pregnant sodium chloride brine is then treated in one of the uranium mills to precipitate yellow cake. The barren solution is returned and reused for subsequent elution steps.

Experience has shown that a carefully operated ion-exchange plant will yield an effluent containing less than 1 mg/l uranium in solution (USEPA, April 1975). The greatest operating difficulty has been in monitoring for breakthrough of the uranium, or the loading of ion-exchange resins. Both United Nuclear Corporation and United Nuclear-Homestake Partners return a portion of the ion-exchange effluent, or *tailings*, to abandoned mines in the Ambrosia Lake area. This barren water is used to leach the ore which remained behind in ore pillars and rock which was not of ore grade. By this practice, uranium resources are recovered which would otherwise be lost.

The Anaconda Company operates its Jackpile-Paguate mine mostly as an open-pit operation. From 1953 to the present, the operation has yielded approximately 10 million tons of uranium ore with an average grade of 0.25% uranium oxide (Graves, Aug. 1974). Mining is accomplished with power shovels loading off-highway trucks. Ore is transported from the mine to Anaconda's mill by rail.

No surface discharge of water is reported from the Jackpile mine. Rainfall collects in pits and seeps or evaporates. However, intense summer thunderstorms erode piles of waste and ore.

Three uranium mills are currently operating in the Grants Mineral Belt, and several other mills are in the design or construction phase. The three operating mills practice different techniques for uranium recovery. All three operate on the basis of zero discharge of waste to surface waters by utilizing evaporation, seepage and, in one case, subsurface injection. To solubilize the uranium, two of the mills acid leach the ore while the third uses an alkaline leach circuit. Uranium is concentrated by solvent extraction at two of the mills. In all three mills, uranium is precipitated as yellow cake, a complex uranium oxide. Ammonia is used in precipitating or purifying the yellow cake at all three mills. Details on milling techniques at the three facilities are provided in the August 1974 issue of *Mining Engineering* (Vol. 26, no. 8).

V. REGULATIONS

The discharge of wastes to surface or ground waters from uranium mining and milling operations are subject to a number of regulations. Applicable portions of each regulation are discussed below.

NEW MEXICO WATER QUALITY STANDARDS

Water Quality Standards were adopted by the New Mexico Water Quality Control Commission under the authority of Paragraph C, Section 75-39-4 of the New Mexico Water Quality Act (Chapter 326, Laws of 1973, as amended). The NMEIA has held that general standards do apply to receiving waters in the Grants Mineral Belt. The general standard that governs these radioactive discharges follows:

> Radioactivity - The radioactivity of surface waters shall be maintained at the lowest practical level and shall in no case exceed the standards set forth in Part 4 of New Mexico Environmental Inprovement Board Radiation Protection Regulations, adopted June 16, 1973.

These regulations set a maximum concentration of 30 pCi/l of dissolved radium-226.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

Congress, with the passage of the *Federal Water Pollution Control Act Amendments of 1972* (PL92-500, Oct. 18, 1972) established the requirement for NPDES permits for discharge of pollutants to waters of the United States. Discharge of pollutants without a valid NPDES permit is illegal.

To date, three permits have been written covering four sources in the area studied.

Permit No.	Outfall No.	Source
NM0020532	001	Kerr-McGee Nuclear Corp. Sec. 30W Mine
NM0020532	002	Kerr-McGee Nuclear Corp. Ion Exchange Facility
NM0020524	001	Kerr-McGee Nuclear Corp. Churchrock Mine
NM0020401	001	United Nuclear Corp. Churchrock Mine

The first three sources are currently pending adjudication with respect to the need for an NPDES permit to discharge to Puertecito Creek or Rio Puerco.

Specific numerical limits are set for the concentration of total suspended solids (TSS), total uranium, and dissolved radium-226 [Table 1]. In addition, each permit contains the following statement: ,

> Provision shall be made to assure the elimination of all seepage, overflow or other sources which may result in any direct or indirect discharge to surface waters other than that authorized by this permit.

URANIUM-MILLING LICENSES

U.S. Regulation 10CFR20 provides that all persons "who receive, possess, use or transfer ... source material" shall be controlled by general or specific license issued by the U.S. Atomic Energy Commission (now called the Nuclear Regulatory Commission) or any state conducting a licensing program. Source materials are defined as ores which contain more than 0.05% of combined uranium and thorium. Under the regulation, all ion-exchange plants and uranium mills are licensed by the New Mexico Environmental Improvement Agency.

The regulations set forth the maximum concentration of various radionuclides which are permitted in effluents to "unrestricted areas." An unrestricted area is defined as any area to which access is not

Table 1

SUMMARY OF NPDES PERMIT CRITERIA

Company/Discharge	Period of Limitation	Parameter† TSS (mg/l) Daily Avg.	TSS (mg/l) Daily Max.	Total Uranium (mg/l) Daily Avg.	Total Uranium (mg/l) Daily Max.	Dissolved Radium-226 (pCi/l) Daily Avg.	Dissolved Radium-226 (pCi/l) Daily Max.	pH Range
Kerr-McGee Corporation								
Churchrock Mine	1/28/75-6/30/77	20	30	-	2	-	30	6.0-9.5
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
Section 30W Mine (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	2	-	150	6.0-9.0
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
Ion-Exchange Plant (Ambrosia Lake)	1/28/75-12/31/75	20	30	-	1	-	100	6.0-9.0
	1/1/76-6/30/77	20	30	-	1	-	30	6.0-9.0
	7/1/77-1/27/80	20	30	-	1	-	3.3	6.0-9.0
United Nuclear Corporation								
Churchrock Mine	1/28/75-12/31/75	100	200	-	2	-	30	6.0-9.5
	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.5
	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0

† *In addition to these parameters, the companies are required to monitor flow, temperature, total molybdenum, total selenium and total vanadium.*

controlled by the licensee to protect individuals from exposure to radiation and radioactive materials. Personnel badge monitoring is not required in unrestricted areas. The maximum allowable concentration of radium-226 in a water effluent to an unrestricted area is 30 pCi/l. All uranium mills and ion-exchange plants are controlled by this regulation from the initial start-up of the facility.

POTABLE WATER REQUIREMENTS

Congress, with the passage of the *Safe Drinking Water Act* (PL93-523, Dec. 16, 1974) extended Federal control over many potable water supply systems. Previously, only those systems used in interstate commerce were required to meet USPHS Drinking Water Standards. The latest issue of the USPHS Standards set a limit of 3 pCi/l for radium-226, and 0.01 mg/l for selenium.

The Safe Drinking Water Act applies to all public systems supplying water to fifteen service connections or at least 25 individuals unless the system is exempted by four specific criteria. The industrial potable water supply systems in the Grants Mineral Belt are thus covered by the Safe Drinking Water Act.

As required by Sections 1412, 1414, 1415, and 1450 of the Safe Drinking Water Act, the EPA Administrator, on March 14, 1975, proposed *Interim Primary Drinking Water Standards*. These proposed regulations include a limit of 0.01 mg/l selenium. The Interim Primary Drinking Water Standards are to be promulgated within 180 days of the enactment of the Act, and they become effective 18 months after their promulgation, or Dec. 1977. The EPA has proposed standards of 5 pCi/l radium (226 and 228) and 15 pCi/l gross alpha (exclusive of uranium) under the Act (Appendix D quotes the *EPA Water Quality Criteria, 1972* on selenium).

The New Mexico Environmental Improvement Agency (Sections 4 and 12, Chapter 277, New Mexico Laws of 1971) is vested with authority to maintain, administer, and enforce the "Regulations Governing Water Supplies and Sewage Disposal" adopted in 1937 by the former New Mexico State Board of Public Health.

Section 1 of the aforementioned 1937 Water Supply Regulations states:

> No person, firm, corporation, public utility, city, town, village or other public body or institution shall furnish or supply or continue to furnish or supply water used or intended to be used for human consumption or for domestic uses or purposes, which is impure, unwholesome, unpotable, polluted or dangerous to health, to any person in any county, city, village, district, community, hotel, temporary or permanent resort, institution or industrial camp.

It is from this and other sections of the 1937 regulations that the NMEIA has authority to regulate public water supply systems. However, individual residential sources used for private consumption are not covered by the 1937 regulations. Therefore, the NMEIA can only advise as to the quality of the water in the case of such residential sources.

NUISANCE SUITS

New Mexico is given specific authority to take enforcement action against a polluter under the Nuisance statute (40A-8-1 through 40A-8-10, 1953 Compilation). A section titled Polluting Water (40A-8-2) allows the New Mexico Environmental Improvement Agency to seek remedial action against any wastewater discharger that pollutes any water of the state whether it is public or private, surface or subsurface water. In 1973 the NMEIA successfully prosecuted the City of Hobbs for polluting ground water by land disposal of the city's sewage effluent. The court order required the City to remove the polluted water and supply potable water to affected parties.

VI. WASTE SOURCE EVALUATION

Five companies are currently engaged in mining and/or milling operations in the Grants Mineral Belt, and several other companies are presently in design or construction phases. The results of waste-source evaluations at each of the operating companies are presented below.

KERR-MCGEE NUCLEAR CORPORATION

Kerr-McGee operates mines in both the Ambrosia Lake and Churchrock Mining Districts of the Grants Mineral Belt. Water from five of the Ambrosia Lake mines (Sections 17, 22, 24, 30 and 33)* is pumped to an ion-exchange plant at the Kerr-McGee mill [Fig. 2]. The majority of ion-exchange discharge (also referred to in the mining industry as tailings) is used in the mill as process water and non-potable water. A small remainder receives additional ion-exchange treatment for potable water use within the mill. Excess ion-exchange tailings are discharged into Arroyo del Puerto. The NPDES permit** and State uranium milling license for this discharge requires that the radium 226 concentration not exceed 100 pCi/l and 30 pCi/l, respectively. The data [Table 2] shows that this discharge contained an average of 151 pCi/l radium-226 during the survey. This exceeds both the NPDES permit immediate limitations and the State license. This latter license has been in effect since the time of the construction of the ion-exchange plant. The

* *The names of mines are based on the section in which they are located; all of these are in T14N, R9W, McKinley County, New Mexico.*

** *Kerr-McGee has requested an adjudicatory hearing on its permits for the ion-exchange plant and Section 30W mine. The company contends that an NPDES permit is not required to discharge to Arroyo del Puerto. The Kerr-McGee State license is effective for the Kerr-McGee ion-exchange plant.*

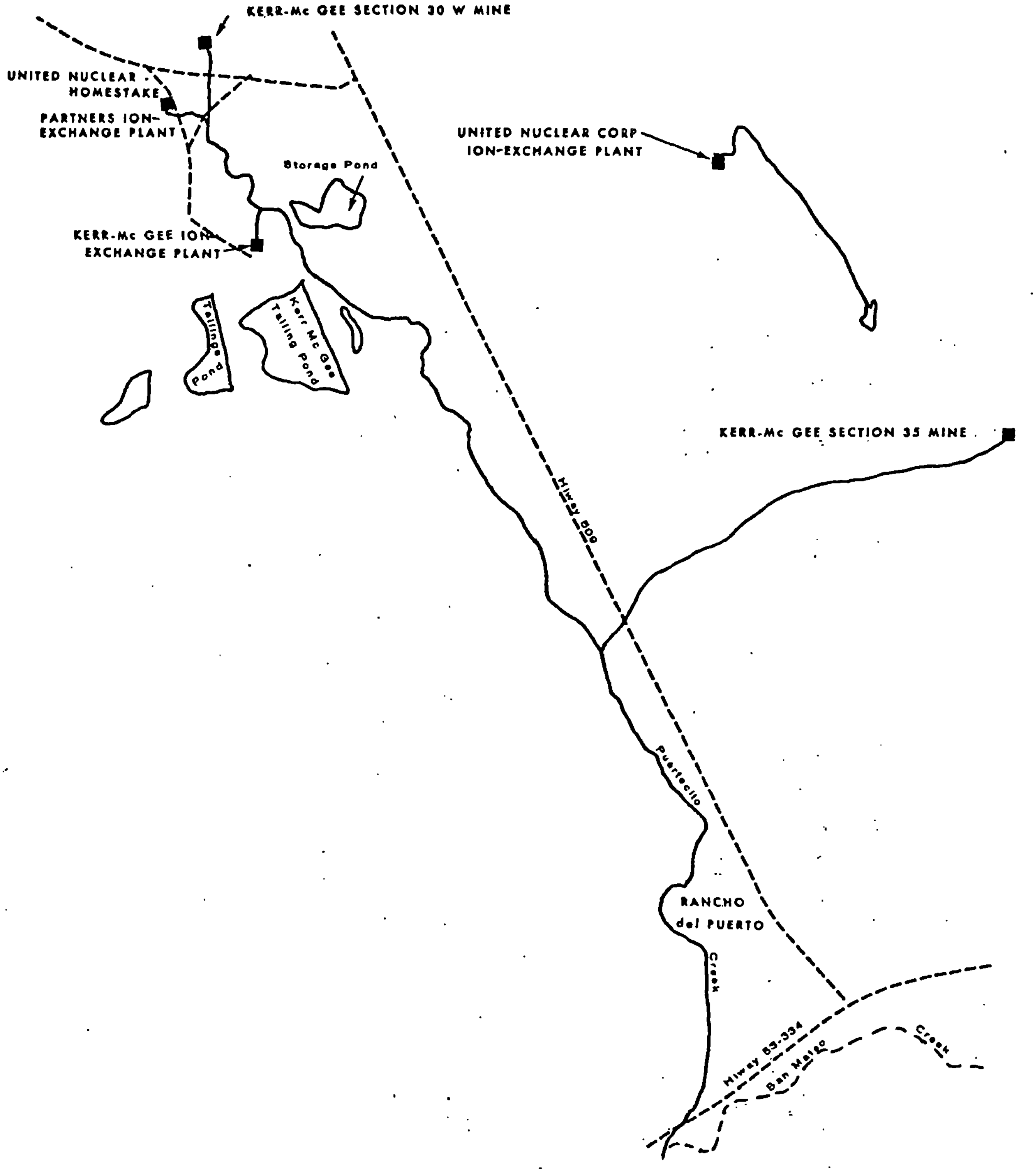

Figure 2. Ambrosia Lake Mining District Surface Water Discharges

Table 8

SUMMARY OF ANALYTICAL DATA FOR INDUSTRIAL DISCHARGES
GRANTS MINERAL BELT SURVEY
February 26-March 6, 1975

Station Description	Average Flow (mgd)	Number Composite Samples	Gross Alpha (pCi/l)			Radium 226 (pCi/l)			Uranium (mg/l)			Total Suspended Solids (mg/l)			Selenium (mg/l)			Vanadium (mg/l)		
			Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Kerr-McGee I-X Tailings Bypass	0.64	3	600	430	510	157	148	151	4.2	1.3	2.5	31	16	25	0.07	0.03	0.05	1.0	0.7	0.9
Kerr-McGee Sec 30W Mine Dischg	1.36	3	1,400	1,300	1,400	174	154	163	6.7	5.9	6.2	26	17	22	0.04	0.03	0.03	0.8	0.7	0.7
Kerr-McGee Sec 19 Mine Discharge	0.15	1	--	--	72	-	-	9.3	-	-	0.23	-	-	16	-	-	<0.01	-	-	0.6
Kerr-McGee Sec 35 Mine Discharge	3.77	3	3,000	2,400	2,700	68	32	51	26	14	19	120	86	100	0.08	0.04	0.07	1.0	0.6	0.8
Kerr-McGee Sec 36 Mine West Discharge	2.07	3	850	570	680	178	101	131	3.4	2.6	3.0	44	33	38	0.01	<0.01	<0.01	1.0	0.8	0.9
Kerr-McGee Sec 36 Mine East Discharge	0.14	3	580	510	560	72	59	65	2.5	2.3	2.4	32	27	29	0.03	<0.01	0.01	0.8	0.4	0.6
Kerr-McGee Seepage below Tailings Pond	-	1	-	-	144,000	-	-	65	-	-	160	-	-	38	-	-	0.70	-	-	5.6
Ranchers Exploration-Johnny M Mine Discharge	0.46	1	-	-	20	-	-	1.6	-	-	0.12	-	-	7	-	-	<0.01	-	-	<0.3
United Nuclear Corp. Ion-Exchange Discharge	0.08	3	2,300	1,400	1,800	39	14.3	31	11	5.9	7.8	7	3	5	0.12	0.02	0.08	0.5	<0.3	0.3
United Nuclear-Homestake Partners Ion Exchange Discharge	0.60	3	970	760	830	111	101	108	5.8	2.3	3.7	16	7	10	0.33	0.30	0.32	0.5	<0.3	0.3
United Nuclear-Homestake Partners Tailings Pile Decant		1	-	-	29,000	-	-	52	-	-	150	-	-	5	-	-	0.92	-	-	6.8
Anaconda Co. Injection Well Feed	0.16	1	-	-	62,500	-	-	53	-	-	130	-	-	3	-	-	0.03	-	-	6.3
United Nuclear Corp. Churchrock Mine Discharge	2.06	3	870	730	810	27.3	19.8	23.3	7.6	6.5	7.2	71	33	50	0.06	<0.01	0.04	0.5	0.4	0.4
Kerr-McGee Churchrock Mine Discharge	2.18	3	240	210	230	8.7	6.8	7.9	0.97	0.72	0.81	58	38	47	0.01	0.01	0.01	0.9	0.7	0.8

concentration of radium in the ion-exchange discharge could be reduced to meet permit conditions with the relatively simple addition of barium chloride. The New Mexico Water Quality Standards for Arroyo del Puerto, a perennial stream, limits radium concentrations to a maximum of 30 pCi/l. The Kerr-McGee ion-exchange discharge to Arroyo del Puerto contributes to violations of these standards (see Section VII. *STREAM SURVEYS*).

The NPDES permit for the Kerr-McGee ion-exchange discharge limits uranium to a daily maximum concentration of 1 mg/l. During the three days of composite sampling, the uranium concentration in the discharge ranged from 1.3 to 4.2 mg/l for an average of 2.5 mg/l, or 2.5 times the permitted maximum concentration. This violation of the permitted level probably resulted from overloading of the resin and failure to switch resin columns. The Company should adopt a regeneration cycle that will prevent resin saturation by uranium (breakthrough) which results in permit violation.

Selenium is an extremely toxic substance which behaves very similarly to arsenic. It is present in the ore of the Grants Mineral Belt, and thus it could reasonably be expected to be present in water from processing plants. The Kerr-McGee ion-exchange tailings contained from 0.03 to 0.07 mg/l, an average of 0.05 mg/l. These tailings also contained almost 1 mg/l vanadium, which has been shown to be toxic to plants when present in irrigation water. The high selenium and vanadium concentration precludes the use of Arroyo del Puerto for irrigation (discussed in Section VII).

Mine water from other Kerr-McGee Ambrosia Lake mines (Sections 19, 30W, 35, and 36) does not receive ion-exchange treatment. Section 19 Mine, currently under development, discharges approximately 378 l/min (100 gpm) of wastewater which contains 9.3 pCi/l of radium on the land surface. Since this discharge does not reach a surface water course, the Company has not applied for an NPDES permit.

The NPDES permit for the Kerr-McGee Section 30W mine imposes immediate limits on the radium-226 content of this discharge. The initial maximum limit is 150 pCi/l, with a final limit of 3.3 pCi/l [Table 1]. During the survey, this discharge contained an average concentration of 163 pCi/l of radium-226 [Table 2] which exceeds permit conditions. The discharge enters Arroyo del Puerto upstream of the Kerr-McGee ion-exchange discharge and contributes to the water quality standards violation in Arroyo del Puerto (see Section VII). The 30W discharge also contained selenium and vanadium [Table 2] and contributes to the high concentration of these elements in Arroyo del Puerto.

The uranium concentration of Section 30W mine discharge is limited to 2 mg/l daily maximum by the NPDES permit. During the survey, the uranium concentration of this discharge ranged from 5.9 to 6.7 mg/l, for an average of 6.2 mg/l, a violation of the NPDES permit conditions. The company reportedly plans to pipe this discharge to their ion-exchange plant.

During the Grants Mineral Belt survey, 14,300 m^3/day (3.77 mgd) of water was discharged from Kerr-McGee Section 35 mine settling ponds into a marshy area south of the mine. Company officials claim this discharge does not reach any surface water and therefore an NPDES discharge permit is not required. Visual observations by NEIC personnel showed that this discharge, estimated at several hundred gallons per minute, does enter Arroyo del Puerto. The flow rate was highly variable, depending on climatic conditions. The radium concentration in this wastewater ranged from 32 to 69 (average 51) pCi/l which exceeds limitations currently specified in permits for similar discharges. The radium concentrations can be reduced to less than 30 pCi/l with the addition of a barium chloride treatment system. Gross alpha concentrations were high, ranging from 2,400 to 3,000 pCi/l. ORP-LVF conducted analyses for the alpha emitters other than radium contained in this discharge. The analyses indicated that lead-210 may be significant in this and other discharges; however, the data are not available at this time. Uranium, selenium, and vanadium are also present in this discharge [Table 2] and contribute to high values in Arroyo del Puerto. Suspended solids in the Section 35 mine discharge were high, ranging from 86 to 120 mg/l with an average of 100 mg/l. Analysis of incoming mine water from long holes within the area indicates that the radium concentrations in natural ground water are less than 10 pCi/l. However, water moves over the entire floor of the drift, and it is subject to agitation by passage of haulage trains and during mucking. Accordingly, the suspended solids concentration in the mine water is high, producing a high dissolved radium concentration. The suspended solids and radium concentrations in the effluent could be greatly lowered by improved housekeeping in the mining operations, such as providing drainage channels along the sides of the mine workings.

Section 36 mine has two discharges, identified as the east and west discharges in relation to the mine shaft. Samples from each discharge were collected and analyzed. Except for a minor amount of water used by drilling rigs in the area, the entire mine pumpage receives treatment in sedimentation basins before discharge into a large closed basin over the San Mateo fault. During the survey, all the water was sinking into the subsurface and moving as ground water. Survey results [Table 2] show the west discharge contained an average of 131 pCi/l radium-226 compared to 65 pCi/l in the east discharge. These concentrations exceed license criteria (10 CFR20) for discharge to an unrestricted environment. The discharge also contained from 0.4 to 1.0 mg/l vanadium, which precludes use of this water for crop irrigation on acid soils, or long-term use on any soil (Committee on Water Quality Criteria, 1972).

Company officials stated that the Section 35 and 36 mine discharges will be diverted to a new set of treatment ponds for biological removal of radium 226, utilizing algal growth and radium incorporation. If necessary, radium-226 concentrations can be further reduced by barium chloride treatment. These new ponds, to be constructed sometime during 1975, will discharge into the closed basin currently receiving the Section 36 mine discharge. The increased flow into this closed basin may result in a surface discharge to San Mateo Creek. In this case, an NPDES permit will be required which should specify an immediate radium-226 limit of 30 pCi/l.

Kerr-McGee Nuclear Corporation is developing a new mine in the Churchrock mining district. The mine water receives treatment in two sedimentation ponds. Some of the effluent from the pond is used in the mine change-house for non-potable uses such as showers and commodes, and the remainder is discharged into Rio Puerco. The immediate NPDES permit limitations for this discharge include 100 mg/l daily average and 200 mg/l daily maximum total suspended solids concentration, 2 mg/l daily maximum uranium concentration and 30 pCi/l dissolved radium-226. The lack of ongoing mining activities in the mine is reflected in the relatively low radiochemical concentration in the water from this mine [Table 2], with an average radium-226 concentration of 7.9 pCi/l.

The Kerr-McGee Nuclear Corporation mill near Ambrosia Lake removes uranium from the ore by an acid leach technique, followed by solvent extraction to concentrate the uranium, and by ammonia precipitation of yellow cake. A molybdenum byproduct recovery is also practiced at the Kerr-McGee mill. Approximately 75% of the mill water is recycled, while the other 25% is lost through seepage and evaporation. Because of dissolved solids buildup, it is thought to be impossible to practice 100% recycle without dissolved solids removal techniques. Process water for the Kerr-McGee mill is obtained from the Kerr-McGee ion-exchange treatment plant. Tailings are discharged to a single large tailings pond on the company property. Seepage from the pond is collected in a catchment basin and is then pumped to a pond upgradient from the tailings pond. Overflow from this pond is pumped upstream to another pond.

In this way, all seepage from the evaporating ponds should be captured by the catchment basin. However, physical inspection of the area indicated that a quantity of seepage is lost to the subsurface, with a portion of the seepage possibly appearing in the flow in Arroyo del Puerto. This will require control under proposed NMEIA ground-water regulations, or regulations to be proposed under the U.S. Safe Drinking Water Act.

An 8-hr composite was collected from the catchment basin and analyzed to determine the quality of waste which might enter the ground water. The sample contained 144,000 pCi/l and 65 pCi/l, respectively, of gross alpha and radium-226. The radium concentration exceeds the AEC license criteria (30 pCi/l) for discharge to a nonrestricted environment. The gross imbalance which exists between gross alpha and radium indicates high concentrations of other alpha emitters. Identification and quantification of these emitters, and the effect on ground water, is discussed in the report by ORP-LVF. This water is extremely high in sulfate (15,000 mg/l) due to the use of sulphuric acid for leaching the Kerr-McGee ore. Suspended solids concentration in the seepage was approximately 38 mg/l. Selenium was present in 0.70 mg/l concentration, or 70 times the drinking water standard. Vanadium was present in the seepage at a concentration of 5.6 mg/l.

RANCHERS EXPLORATION AND DEVELOPMENT CORPORATION

Ranchers Exploration is currently developing the Johnny M. mine. Mine water is treated in two settling ponds before being discharged into San Mateo Creek. An NPDES permit application was filed by Ranchers Exploration, however the permit had not been issued at the time of the survey. The data [Table 2] show that the gross alpha and radium-226 concentrations were 20 and 1.6 pCi/l, respectively. This reflects the lack of ongoing mining activities in the operation. Uranium concentration in the water was 0.12 mg/l, while the suspended solids concentration was 7 mg/l.

UNITED NUCLEAR CORPORATION

United Nuclear Corporaton has three mines (two active and one on standby) in the Ambrosia Lake area. All mine water is pumped to an ion-exchange plant for uranium recovery. Over 99% of the ion-exchange effluent is used for solution mining. The remainder is either used as potable water or is discharged into a holding pond for use in sand backfill operations. There was no discharge from the pond at the time of the survey. Although an application has been filed, company officials stated that wastewater does not reach Arroyo del Puerto; therefore an NPDES permit is not required.

Samples were collected from the ion-exchange effluent at a point ahead of its return to the underground mines. The ion-exchange effluent contained an average of 31 pCi/l radium-226 and 1,800 pCi/l of gross alpha. Suspended solids concentration in the ion-exchange discharge were from 3 to 7 mg/l. As shown in Table 2, selenium concentration ranged from 0.02 to 0.12 mg/l, for an average of 0.08 mg/l.

United Nuclear Corporation also operates an underground mine in the Churchrock mining district. The NPDES permit limits the radium-226 concentration to a maximum of 30 pCi/l. Other NPDES permit criteria include 100 mg/l of suspended solids daily average, 200 mg/l suspended solids daily maximum, and 2 mg/l uranium daily maximum. A power failure at the mine during the last week in February resulted in flooding of work areas. During the survey, company personnel were pumping out the mine and repairing underground equipment. Composite samples collected during the clean-up operations contained an average radium-226 concentration of 23.3 pCi/l. After the survey, NMEIA personnel collected a grab sample on 14 March 1975 following the resumption of mining activities. This sample contained 57 pCi/l of radium-226 which exceeds the permit limitation. The composite samples contained from 33 to 71 mg/l suspended solids concentration, while the later grab sample contained 320 mg/l suspended solids. Uranium was present in the discharge at an average concentration of 7.2 mg/l. Additional sampling is suggested to check for NPDES compliance, once the mine returns to typical operation.

UNITED NUCLEAR-HOMESTAKE PARTNERS

The United Nuclear-Homestake Partners joint venture operates four underground mines (Sections 15, 23, 25 and 32) in the Ambrosia Lake mining district. Uranium in the mine water is removed in an ion-exchange plant. About 85% of the effluent is recycled through the mines and used for in situ leaching (solution mining). The remaining 15% (0.08 mgd) of the ion-exchange effluent is discharged into Arroyo del Puerto upstream of the Kerr-McGee mill. An NPDES application has recently been filed for this discharge. During this survey, the radium-226 concentration in this discharge exceeded 100 pCi/l. The radium-226 concentration in this discharge can be reduced to 30 pCi/l or less with the addition of a barium chloride treatment system. These high concentrations exceed the NPDES permit issued for similar discharges and the State uranium milling license currently in effect for this facility. This discharge contributes to the violation of the New Mexico Water Quality Standards for Arroyo del Puerto (see Section VII).

Suspended solids concentration in the United Nuclear-Homestake Partners ion-exchange discharge are low, ranging from 7 to 10 mg/l. Selenium concentrations range from 0.30 to 0.33 mg/l, more than 30 times the drinking water standard for selenium. These concentrations would pose a health hazard if the water were used for a potable supply.

The presence of a large supply of clear water suggests an attractive alternative to plant personnel bringing their own drinking water to the plant. Uranium concentrations averaged 3.7 mg/l, indicating a need for closer monitoring of resin loading, or more frequent resin regeneration.

The United Nuclear-Homestake Partners Uranium mill recovers uranium by alkaline leaching of the ore, followed by ammonia precipitation of yellow cake. No ion-exchange or solvent extraction is practiced. Tailings-pile decant water is recycled through the mill. Seepage from the pile also enters ground water as determined by visual observation and ORP-LVF sampling. A sample of the decant, which is indicative of the quality of the seepage, contained 29,000 pCi/l and 52 pCi/l, respectively, of gross alpha and radium-226. The radium concentrations exceed the 10CFR20 criteria for discharge to a nonrestricted environment. The seepage also was found to contain 0.92 mg/l of selenium, or 92 times the drinking water standard. This is indicative of the geochemistry of selenium, which is found to be highly mobile in alkaline solutions. Results of the seepage on ground water are discussed in the ORP-LVF report.

Additional samples have been collected from a number of wells in the area downgradient from the United Nuclear-Homestake Partners tailings pond and are currently undergoing analyses. Problems of interlaboratory agreement are being resolved by appropriate Analytical Quality Control (AQC) programs. AQC data for the NEIC determinations are included in Appendix A. Results to date indicate that alkaline leaching of uranium milling tailings or uranium ore produces water high in a mobile form of selenium, and it presents definite problems of groundwater pollution. Seepage control measures should be required at this facility. Additional laboratory analysis of existing samples, and additional sampling to define the extent of the problem are planned for the near future.

ANACONDA COMPANY

The Anaconda Company operates the world's largest open pit uranium mine, the Jackpile Mine on the Laguna Indian Reservation. There is no discharge of mine water to Rio Paguate or Rio Maquino. Precipitation runoff from the disturbed land surface, however, adds radiochemical-bearing solids to these streams. Stream samples [Table 3] show a definite increase in radium-226 and selenium concentrations downstream from the mining operation. The data show the need for stabilization of waste material and improved handling of storm runoff.

The Anaconda Company uranium mill at Bluewater uses a Resin In Pulp (RIP) ion-exchange process on an acid leach operation (Anon, Aug. 1974). In this circuit, baskets of ion-exchange beads are agitated in a crushed slurry ore. The beads, when loaded, are eluted with a dilute solution of sulfuric acid and sodium chloride. Uranium is precipitated in two steps, with the addition of calcium hydroxide during the first step and magnesium hydroxide during the second step. This precipitate is then washed with ammonium sulfate to remove sodium and produce a saleable yellow cake.

Process wastes from the Anaconda mill are discharged into a 70-acre tailings pond constructed on a highly permeable basalt flow. The water which does not seep from this pond is decanted, filtered to remove suspended solids, and fed at a rate of 1,100 l/min (300 gpm) to an injection well. A sample of the well feed, which is indicative of the seepage to the ground water, contained 62,500 pCi/l and 53 pCi/l, respectively, of gross alpha and radium-226 [Table 2]. Vanadium was present in a concentration of 6.3 mg/l. The well feed contained 150 mg/l uranium, which corresponds to a uranium loss of 245 kg (540 lb)/day. At present values of yellow cake, this would have a market value of $8,100 to $10,800/day. This uranium could be recovered by the installation of an ion-exchange plant between the present filter and injection well.

VII. STREAM SURVEYS

When the mines and mills were evaluated, selected stream stations were sampled to determine the effect of mine and mill discharges on water quality. The New Mexico Water Quality Standards limit the radium concentration in surface streams to a maximum of 30 pCi/l. Data on the samples collected from surface streams are provided in Table 3.

ARROYO DEL PUERTO

Arroyo del Puerto receives waste from the United Nuclear-Homestake Partners and Kerr-McGee ion-exchange plants and from Kerr-McGee Section 30W and 35 mines. There is no flow in the creek upstream of these discharges.

Radium-226 concentrations of samples collected downstream from the Kerr-McGee mill were from 45 to 50 pCi/l. These concentrations not only violate the New Mexico Water Quality Standards, but exceed the AEC criteria (30 pCi/l) for radium in water discharged to an unrestricted environment. Radium concentrations in Arroyo del Puerto decreased near the mouth to levels ranging from 6.1 to 7.2 pCi/l. This decrease is due to the adsorption of radium on sediment and/or vegetation. During periods of heavy run-off, the radium concentration can be expected to increase due to scouring of the stream bed.

The selenium concentration of Arroyo del Puerto downstream from the Kerr-McGee mill was 0.15 mg/l, decreasing to 0.04 mg/l near the mouth. Vanadium concentrations in Arroyo del Puerto near the Kerr-McGee mill averaged 0.8 mg/l, increasing to 1.1 mg/l near the mouth. Selenium and

Table 3

SUMMARY OF ANALYTICAL DATA
FOR
SURFACE WATER SAMPLING

Station Description	Number of Samples	Gross Alpha (pCi/l)			Radium-226 (pCi/l)			Uranium (mg/l)			Selenium (mg/l)			Vanadium (mg/l)		
		Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
Arroyo del Puerto downstream of Kerr-McGee Mill	3	1,700	1,400	1,500	50	45	47	12	5.0	7.7	0.16	0.13	0.15	1.0	0.6	0.8
Arroyo del Puerto near the mouth	3	1,500	750	1,100	7.2	6.1	6.5	6.6	4.7	5.8	0.07	0.01	0.04	1.9	0.5	1.1
San Mateo Creek at Highway 53 Bridge	1	-	-	1,000	-	-	1.09	-	-	4.7	-	-	0.02	-	-	<0.3
Rio Puerco downstream of Churchrock Mines	3	500	470	490	2.60	0.97	2.04	5.0	3.8	4.2	0.07	0.03	0.04	0.6	0.5	0.6
Rio Puerco upstream of Wingate Plant	3	510	720	440	1.63	0.36	0.81	4.8	3.7	4.2	0.01	0.01	0.01	0.9	0.3	0.6
Rio Puerco at Highway 666 Bridge	3	350	210	260	0.42	0.09	0.22	2.5	1.7	2.0	<0.01	<0.01	<0.01	0.6	0.3	0.5
Rio Paguate at Paguate	1	-	-	2.8	-	-	0.11	-	-	<0.02	-	-	<0.01	-	-	0.6
Rio Moquino upstream of Jackpile Mine	1	-	-	11.2	-	-	0.17	-	-	<0.02	-	-	<0.01	-	-	1.8
Rio Paguate at Jackpile Ford	1	-	-	270	-	-	4.8	-	-	1.2	-	-	<0.05	-	-	0.5
Rio Paguate at Paguate Reservoir Discharge	1	-	-	230	-	-	1.94	-	-	1.1	-	-	<0.01	-	-	0.6
Rio San Jose at Interstate Bridge	1	-	-	38	-	-	0.37	-	-	0.10	-	-	<0.01	-	-	0.3

vanadium have harmful effects when present in high concentrations in water used for irrigation or livestock watering. The 1972 EPA Water Quality Criteria (Committee on Water Quality Criteria, 1972) suggests that irrigation waters not exceed 0.02 mg/l selenium and 0.1 mg/l vanadium, while livestock waters should not exceed 0.05 mg/l selenium and 0.1 mg/l vanadium. On this basis, Arroyo del Puerto is rendered unfit for irrigation and livestock watering by the uranium mining discharges throughout its entire length. This is contrary to New Mexico Water Quality Standards which require that discharges not render a water unfit for a beneficial use.

The flow of Arroyo del Puerto enters San Mateo Creek where the entire flow enters the aquifer within three miles of the confluence. This recharge adds a large loading of radium and selenium to the ground water. Ground-water evaluations by ORP-LVF will address this question.

RIO PUERCO

The Rio Puerco receives drainage from Kerr-McGee and United Nuclear Corporation Churchrock mines. Samples collected downstream from these discharges contained a maximum radium-226 concentration of 2.6 pCi/l [Table 3]. The concentration decreased to 0.4 pCi/l at the town of Gallup. These concentrations meet the New Mexico Water Quality Criteria of 30 pCi/l, as well as the PHS Drinking Water Standard of 3 pCi/l for radium-226. Selenium concentrations downstream from the mine discharges ranged from 0.03 to 0.07 mg/l for an average of 0.04 mg/l, or four times PHS Drinking Water Standards. The selenium concentration decreased downstream to 0.01 mg/l at the Wingate plant and to less than detection limits at Gallup.

RIO PAGUATE, RIO MOQUINO, RIO SAN JOSE

The Rio Paquate and Rio Moquino flow through the Anaconda open pit mines on the Laguna Indian Reservation. The combined flow enters Rio San Jose near Laguna, New Mexico. Samples collected from these three streams had radium concentrations of less than 5 pCi/l, which is less than the Water Quality Standard of 30 pCi/l set by the State of New Mexico. An increase in the selenium concentration of Rio Paguate was noted downstream from the Jackpile Mine. However, the concentration of selenium at Paguate reservoir and in Rio San Jose were less than detection limits.

VIII. INDUSTRIAL WATER SUPPLIES

The majority of the mines and mills in the Grants Mineral Belt use mine water as a potable supply. The present PHS Drinking Water Standards specify that the radium concentrations not exceed 3 pCi/l, and the selenium not exceed 0.01 mg/l. The *Safe Drinking Water Act* (Public Law 92-523, Dec. 16, 1974) requires establishment of national drinking water standards. The proposed standards limit selenium to 0.01 mg/l. Also, EPA has proposed standards of 5 pCi/l for radium-226 and -228 and 15 pCi/l for gross alpha (40 CFR 141).

Data from potable water supplies in the Grants Mineral Belt are summarized in Table 4. All but one of the water-supply systems contain radium-226 in concentrations greater than the PHS Drinking Water Standard of 3.0 pCi/l. Severe violations of the 0.01 mg/l selenium standard are also present. Kerr-McGee Nuclear Corporation supplies water to mill workers and to several mobile homes within the area; the source is ion-exchange water from the mines, subsequently treated for radium removal. As shown in Table 4, the radium concentration in this water was at an acceptable level of 0.5 pCi/. The selenium in the water supply was 0.05 mg/l, or 5 times the drinking water standard. Treatment or an alternate source of supply will be required to meet the selenium standards.

Kerr-McGee operates a dual water supply system within the mill and the office facility -- a potable system described above, and a non-potable system used for washing and sanitary facilities. The latter uses ion-exchange tailings without further treatment. Radium concentrations in this water are extremely high, averaging over 150 pCi/l. Company personnel are largely uninformed about the existence of the dual water supply system and have admitted to drinking from the non-potable

Table 4

SUMMARY OF DATA FOR INDUSTRY POTABLE WATER SUPPLIES

Description	Gross Alpha (pCi/l)	Radium 226 (pCi/l)	Selenium (mg/l)
Kerr-McGee - Mill Water Supply	510	0.5	0.05
Kerr-McGee - Sec. 35 and 36 Mines	3,000	43	0.05
Kerr-McGee - Churchrock Mine†	120	6.5	0.01
United Nuclear Corporation - Ambrosia Lake Area	1,500	23.5	0.11
United Nuclear Corporation - Churchrock	620	12.6	0.06
United Nuclear Corporation - Mobile Home Supply at the Churchrock Mine	1,110	39.7	0.06

† *Reportedly used only for showers, stools, etc. and not for drinking water.*

source. Warning signs should be posted on the non-potable water system to prevent subsequent potable use of this radioactive water.

Water from the Kerr-McGee Section 35 mine is treated by ion-exchange and used for a potable system for workers in Section 35 and 36 mines. This water contained a radium concentration of 43 pCi/l and a gross alpha concentration of 3,000 pCi/l. This exceeds existing and proposed standards for radiochemistry in the potable supply. The selenium in this supply was 0.02 mg/l, twice the level which constitutes grounds for rejection as a water supply under Drinking Water Standards.

Clarified water from the settling ponds at the Kerr-McGee Churchrock mine are pumped into the Kerr-McGee change house for use in sanitary facilities. The water contained concentrations of radium-226 approximately twice the Drinking Water Standards. It also contained selenium at a concentration of 0.01 mg/l, or the concentration which constitutes grounds for rejection as a potable water supply. The supply is not intended as potable, but it is not adequately marked as non-potable.

United Nuclear Corporation maintains a potable water supply system for its Churchrock mine as well as for mobile homes within the area. Water from the mine is pumped into a holding pond on Sunday, when mining activities are not under way. Water from this holding pond is then passed through a filter for removal of suspended solids. No further treatment is given. A sample collected from a water fountain within the United Nuclear Corporation change-house contained 12.6 pCi/l radium-226 and 0.06 mg/l selenium. These levels exceed PHS Drinking Water Standards and proposed standards under the Safe Drinking Water Act. The system is supplied to a number of private trailers in the area, and it clearly will come under the provision of the Safe Drinking Water Act.

A sample was collected on March 5, 1975 from one of the mobile homes supplied by the United Nuclear Corporation Churchrock mine water-supply system. The sample contained 39.7 pCi/l radium-226 and 0.06 mg/l selenium. The trailer was occupied by the wife and three children of one of the uranium miners. These concentrations grossly exceed the proposed and present drinking water standards and pose a health hazard to the employees and their families. The United Nuclear Corporation should take immediate action to improve the quality of this domestic supply or locate an alternate source of water.

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Appendix A

ANALYTICAL QUALITY CONTROL
FIELD AND LABORATORY PROCEDURES

ANALYTICAL QUALITY CONTROL
FIELD AND LABORATORY PROCEDURES

WASTE SOURCE EVALUATIONS

Mining and milling operations operated by five companies were investigated during the Grants Mineral Belt survey. Information was obtained through in-plant surveys, review of NPDES permit applications, and interviews with industry personnel, on water pollution control practices at each site.

Sampling was conducted in accord with a previously prepared Study Plan (attached). Sampling proceeded as planned, except that conditions at United Nuclear Corporation's Churchrock mine were atypical due to power failure and subsequent mine flooding. Daily composite samples were collected manually into large cleaned containers on an equal volume basis. The composite sample was then returned to a central sample preparation site where individual samples were prepared in accord with Table 4 of the Study Plan. Company sample splits were prepared where requested. Filtering was done through a 0.45 μ filter, using stainless steel pressure filtering equipment.

Where available, industry flow-measurement equipment was used. In other cases, various standard flow measurement techniques such as "V" notch weirs and stage recorders were used.

The samples were maintained under custody procedures and transported to the NEIC laboratory in NEIC vehicles.

STREAM SURVEYS

Limited stream surveys were conducted to determine the effects of mining and milling discharges on surface waters of the Grants Mineral Belt. Sampling was generally in accord with the Study Plan, except where there was no flow. Sampling in the Paguate area was restricted to one-time grab sampling. Sample preparation was in accord with the discussion in the previous section.

INDUSTRY WATER SUPPLIES

Grab samples were collected from industry potable and non-potable (sanitary) water supplies, in accord with the Study Plan. Sampling sites were at water fountains, faucets, or showers. The source was permitted to run for a time before sample collection. Samples were subsequently split and preserved, as discussed in the section on waste source evaluation.

ANALYTICAL PROCEDURES AND QUALITY CONTROL

Samples collected during this survey were, for the most part, analyzed according to procedures outlined in the EPA Manual, *Methods for Chemical Analysis of Water and Wastes, 1971*. Gross alpha and radium-226 levels were measured according to procedures described in *Standard Methods for Water and Wastewater Analysis, 13th Ed.* Uranium was measured by the fusion/fluorescence procedure described as Method #D2907-701 in the *ASTM Manual, Part 31, 1975*. Selenium was analyzed by a fluorometric procedure developed by Crenshaw and Lakin (Journal Research U.S. Geological Survey, 2 (4), 483 (1974)); the fusion step was omitted, however, since the samples were non-geological in origin. These analytical procedures are summarized below.

Parameter	Method	Reference
Co, Cu, Fe V, Mo	Atomic Absorption[1]	EPA Methods for Chemical Analysis, 1971
Na	Atomic Emission[1]	EPA Methods for Chemical Analysis, 1971
As	Colorimetric	EPA Methods for Chemical Analysis, 1971
TSS, TDS	Gravimetric	EPA Methods for Chemical Analysis, 1971
SO_4	Turbidimetric	EPA Methods for Chemical Analysis, 1971
Cl	Titrimetric	EPA Methods for Chemical Analysis, 1971
NH_3	Automated Colorimetric	EPA Methods for Chemical Analysis, 1971
$NO_2 + NO_3$	Automated Cadmium Reduction	EPA Methods for Chemical Analysis, 1971
Gross	Internal Proportional Counting	Standard Methods, Section 302.4.a.
Radium-226	Radon emanation[2]	Standard Methods, Section 305
Uranium	Fusion/Fluorescence[1]	ASTM, D290F
Se	Fluorometric	Crenshaw and Lakin, J. Res. U.S. Geol. Survey, Vol. 2, No. 4, July-August, 1974, p. 483-487

1 *Digestion of samples per Sec. 4.1.4. EPA Methods*

2 *$RaSo_4/BaSO_4$ precipitate collected by centrifugation, dissolved in diethylenetriamine pentaacetic acid, and placed directly in bubbler.*

Reliability of the analytical results was documented through an active Analytical Quality Control (AQC) Program. As part of this program, replicate analyses were normally performed with every tenth sample to ascertain the reproducibility of the results. In addition, every tenth sample was spiked with a known amount of the constituents to be measured and reanalyzed to determine the percent recovery. These results were evaluated in regard to past AQC data on the precision, accuracy, and detection limits of each test. As an example, AQC results for Ra-226 and Se are tabulated on the following page.

Parameter	Radium-226	Selenium
Detection Limit	0.05 pCi/l	0.005 mg/l
Percent Difference in Duplicate Measurements	0-1 pCi/l: 0-52% 22% Avg.†	0-0.1; 0-30%, 21% Avg.
	1-200 pCi/l: 0-8%, 5% Avg.	0.1-1.0: 9-32%, 15% Avg.
Percent Recovery from Spiked Samples	1-200 pCi/l: 79-104%, 93% Avg.	0-0.1 mg/l: 60-134%, 109% Avg.

† *0-1 pCi/l represents the concentration range being considered, 0-52% represents the range of the percent difference between duplicates, and 22% represents the average of these variations.*

On the basis of these findings, all analytical results reported for the survey were found to be acceptable with respect to the precision and accuracy control of this laboratory.

STUDY PLAN

NEW MEXICO URANIUM MINING AND MILLING
WATER QUALITY INVESTIGATIONS

OBJECTIVES

1. Determine the impact of previous and existing discharges to ground and surface waters of the Grants-Mineral Belt and establish a data base for future National Pollutant Discharge Elimination System (NPDES) permits and uranium mining and milling license guidelines due to expanded mining and milling activities.

2. Determine whether the discharges from uranium mines and mills comply with existing and proposed NPDES permits and uranium-milling licenses.

3. Determine the composition of potable waters at uranium mines and mills.

4. Determine if NPDES non-filers exist in the study area.

5. Evaluate the adequacy of company monitoring networks, self-monitoring data, analytical procedures and reporting requirements.

BACKGROUND

Uranium ore was discovered in the Grants Mineral Belt in 1950 resulting in the construction of four processing mills, three of which are still operating. The early mining started in the shallow deposits of the Bluewater area and has progressed into the Ambrosia Lake area where shaft mines of greater than 1000 ft have been developed. Ground water from the overlying Dakoata aquifer and Westwater Canyon member of the Morrison Formation is pumped from these mines and discharged to surface waters. The industry is currently experiencing a major expansion with design and/or construction of three new mills and numerous mines.

Since the discovery of ore and the construction of uranium mills, only a limited amount of company data has been developed on the chemical and radiochemical characteristics of the mining and milling wastes. The surface discharges from the mines receives only minimal treatment and companies have not made a concerted effort to prevent seepage from mill tailings ponds from entering subsurface water.

The NMEIA requested EPA, Region VI (letter dated September 25, 1974) to conduct a "definitive survey of the Grants Mineral Belt". Through meetings and subsequent correspondence, it was decided that the study will be conducted jointly by New Mexico Environmental Improvement Agency (NMEIA), National Field Investigations Center (NFIC) and Office of Radiation Programs-Las Vegas Facility (ORP).

The three uranium mills (Kerr-McGee, United Nuclear-Homestake Partners and Anaconda) and three mine (Kerr-McGee, United Nuclear and United Nuclear-Homestake Partners) water treatment facilities (ion exchange units or IX) operate under AEC licenses. These licenses have been transferred to NMEIA. The licenses require meeting conditions set forth in 10 CFR 20 of which the most significant is that liquid waste discharged to areas with controlled access have radium 226 levels equal to or less than 30 picocuries per liter (pCi/l).

NPDES permits have been issued for the Kerr-McGee mine discharges at Ambrosia Lake (ion exchange unit and Section 30W mine) and Churchrock, and the United Nuclear Corporation mine at Churchrock. The permit limitations are summarized in Table 1. Kerr-McGee has requested adjudicatory hearings on their permits.

General New Mexico Water Quality Standards for perennial reaches of streams, including those formed by wastewater discharges, apply to the streams in the study area. The most significant provision of these standards is that radium 226 concentrations must be less than 30 pCi/l.

REQUIRED STUDIES

A. Reconnaissance Survey

A reconnaissance survey was conducted by personnel of NMEIA, ORP and NFIC during the period January 27-31, 1975. Company officials were contacted to obtain existing data and facility inspections were conducted at each of the mills and mines. A number of mine discharges, which are not covered by an NPDES permit, are believed to be reaching San Mateo Creek and its tributaries. Seepage from the Anaconda, Kerr-McGee and United Nuclear-Homestake Partners mill tailings piles has an extremely high potential of degrading water in the study area. Potable water supplies at the mines and mills is, for the most part, obtained from mine water treated by sedimentation followed in a few cases by selective ion exchange units which may not remove radium and most heavy metals, if present, from the mine water.

B. Industrial Waste Survey

Effluent monitoring of mine wastewaters will be conducted. Samples will also be collected of the mill tailings pond water to ascertain the type of pollutants which can enter the ground water.

Operating (active) mine discharges will be sampled for three consecutive days with 24-hour composite samples being collected. Mines currently under development and mill tailing piles will be monitored for 8 hours one day [Table 2 lists the stations and parameters which will be measured during the survey].

C. Stream Surveys

In conjunction with the industrial survey, selected stream stations will be sampled to determine possible water quality violations [Table 3]. These stations are located in San Mateo Creek upstream and downstream from the Johnny M Mine discharge and downstream from the confluence of Puertecito Creek; Puertecite Creek upstream of all discharges (upstream of United Nuclear-Homestake Partners IX discharge), downstream from Kerr-McGee Mill, and near the mouth at Rancho del Puerto; Rio Puerco downstream of United Nuclear and Kerr-McGee mines, upstream of Wingate plant, and in Gallup at Highway 666 Bridge; Rio Moquino upstream of Jackpile Mine; Rio Paguate at Paguate, at the Jackpile Mine Ford and at the Paguate Reservoir discharge; and the Rio San Jose at I-40 bridge east of Laguna.

The Rio Moquino, Rio Paguote and Rio San Jose are influenced by storm run-off of tailings and ore piles. These streams will be sampled during run-off.

D. Ground-Water Survey

Ground-water related activities will emphasize definition of the hydrogeologic environment and sampling of selected wells and springs to characterize existing water quality and relate it to uranium mining and milling waste discharge.

A separate study plan for this portion of the study has been prepared by ORP.

LOGISTICS

All industrial, stream and well samples will be sent to the NFIC laboratory for analysis. Industrial samples will be split with the appropriate company. All samples will be field split for radiochemical analysis with ORP. Alpha and radium 226 screening tests at NFIC will be considered for further analyses by ORP for Th-230, Pb-210, Po-210, Th-228, and possibly Ra-228. All samples will be collected and analyzed following established NFIC Chain-of-Custody procedures. The size of sample and preservative required are summarized in Table 4.

TIME SCHEDULE*

January 27-31, 1975	Reconnaissance Survey
February 3-21, 1975	Develop sampling schedule and notify industries
February 24-25, 1975	Start setting up flow monitoring equipment
February 26-March 8, 1975	Sample industries and streams
February 24-March 14, 1975	Sample ground water

PERSONNEL

A. Field Survey

NFIC	1 Supervisory Engineer (coordinator) 1 Geologist 3 Technicians
NMEIA	3 Technicians

*Report on the study findings will be completed within 2-3 weeks following receipt of final analytical data.

ORP	1 Hydro-Geologist 1 Health Physicist 1 Technician
Region VII (Kerr Water Lab)	1 Technician (part-time)

B. Report Preparation

NFIC	1 Engineer 1 Geologist 1 Technician (limited time)
NMEIA	1 Hydro-Geologist 1 Health Physicist
ORP	1 Hydro-Geologist 1 Health Physicist 1 Nuclear Chemist

EQUIPMENT

Gaging equipment

Peristaltic pump

Sampling and metering equipment

Pressure filtering units

Vehicles

4 Four-Wheel drive - 2 Denver and 2 Albuquerque (NFIC)

1 Sedan - Albuquerque (NFIC)

1 Van - Las Vegas (ORP)

1 Panel Truck - Kerr Center, Ada (ORP)

TABLE 1

SUMMARY OF NPDES PERMIT CRITERIA

Company/Discharge	Period of Limitation	Parameters[1/] TSS-mg/l Daily Avg.	TSS-mg/l Daily Max.	Total Uranium-mg/l Daily Avg.	Total Uranium-mg/l Daily Max.	Dissolved Radium 226-pCi/l Daily Avg.	Dissolved Radium 226-pCi/l Daily Max.	pH Range
Kerr-McGee Corp.	1/28/75-6/30/77	20	30	-	2	-	30	6.0-9.5
-Churchrock Mine Discharge	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
-Section 30W Mine	1/28/75-12/31/75	20	30	-	2	-	150	6.0-9.0
Discharge	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.0
(Ambrosia Lake)	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0
-Ion Exchange	1/28/75-12/31/75	20	30	-	1	-	100	6.0-9.0
Discharge	1/1/76-6/30/77	20	30	-	1	-	30	6.0-9.0
(Ambrosia Lake)	7/1/77-1/27/80	20	30	-	1	-	3.3	6.0-9.0
United Nuclear	1/28/75-12/31/75	100	200	-	2	-	30	6.0-9.5
Corporation	1/1/76-6/30/77	20	30	-	2	-	30	6.0-9.5
-Churchrock Mine Discharge	7/1/77-1/27/80	20	30	-	2	-	3.3	6.0-9.0

1/ In addition to these parameters, the companies are required to monitor flow, temperature, total molybdenum, total selenium and total vanadium.

TABLE 2, Page 2

Station Number	Station Description	Number Days Sampled	Type Sample	Flow By	Analysis Required 2/															
					TSS	SO_4	Cl	Cu	Fe	Mo	Na	NH_3 & NO_3	Se	V	As	Mn	Co	U-Nat	Gross Alpha	Ra_{226}
9016	United Nuclear Corp. IX Discharge	4/	24-Hr. Comp. 8-Hr. Comp.	Weir or Gage	X		X			X	X	X	X	X		X		X	X	X
9017	United Nuclear Corp. Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9018	United Nuclear-Homestake Partners IX Discharge	3	24-Hr. Comp.	Calculate from company meters	X		X			X	X	X	X	X		X		X	X	X
9019	United Nuclear-Homestake Partners Tailings Pile Decant	1	8-Hr. Comp.	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9021	Anaconda Co. Injection Well Feed	1	24-Hr. Comp.	Company Meter	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9023	United Nuclear Churchrock Mine	3	24-Hr. Comp.	Parshall	X		X			X	X	X	X	X		X		X	X	X
9024	United Nuclear Churchrock Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9025	Kerr-McGee Churchrock Mine	3	24-Hr. Comp.	Weir & Recorder	X		X			X	X	X	X	X		X		X	X	X
9026	Kerr-McGee Churchrock Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X

1/ pH, conductivity and temperature will be measured periodically at all stations.
2/ Additional radiochemical (Th-230, pb-210, Po210, Th 228, Ra 228) will be required if gross alpha and radium 226 analysis indicate these compounds are present.
3/ Two separate discharges, sample will be flow composited from both sources.
4/ Three 24-hour composite samples will be collected if discharging; if however, all water is being used for solutions mining (i.e., recycled to the mines) then one 8-hr. composite will be collected.

TABLE 2
INDUSTRIAL SAMPLING[1/]

Station Number	Station Description	Number Days Sampled	Type Sample	Flow By	Analysis Required[2/] TSS	SO_4	Cl	Cu	Fe	Mo	Na	NH_3 & NO_3	Se	V	As	Mn	Co	U-Nat	Gross Alpha	Ra_{226}
9001	Kerr-McGee Ion Exchange Tailings By-Pass	3	24-Hr. Comp.	Parshall	X		X			X	X	X	X	X		X		X	X	X
9003	Kerr-McGee Sec. 30 W Mine Water	3	24-Hr. Comp.	Gage in Control Str.	X		X			X	X	X	X	X		X		X	X	X
9005	Kerr-McGee Sec. 19 Mine Water	1	8-Hr. Comp.	Bucket and Stopwatch	X		X			X	X	X	X	X		X		X	X	X
9007	Kerr-McGee Sec. 35 Mine Water	3	24-Hr. Comp.	Rectangular Weir	X		X			X	X	X	X	X		X		X	X	X
9009	Kerr-McGee Sec.[3/] 36 Mine Water	3	24-Hr. Comp.	Gage or Bucket & Stopwatch	X		X			X	X	X	X	X		X		X	X	X
9011	Kerr-McGee Seepage below tailings pond	1	8-Hr. Comp.	None	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9012	Kerr-McGee Mill Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9013	Kerr-McGee Sec. 35 Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X
9014	Ranchers Exploration Johnny M. Mine Water	1	8-Hr. Comp.	Gage	X		X			X	X	X	X	X		X		X	X	X
9015	Ranchers Exploration Johnny M. Mine Potable Water Supply	1	Grab	None						X		X	X		X				X	X

TABLE 3
STREAM STATIONS[1/]

Station Number	Station Description	Number Days Sampled	Type Sample	Analysis Required[2/] Cl	Mo	Na	NO_3 & NH_3	Se	V	Mn	U-Nat	Gross Alpha	Ra_{226}
9030	San Mateo Creek at Highway 53 Bridge West of San Mateo	3	Grab	X	X	X		X	X	X	X	X	X
9032	San Mateo Creek up-stream of Puertecito Creek	3	Grab	X	X	X		X	X	X	X	X	X
9034	Puertecito Creek upstream of Partner's IX Plant	3	Grab	X	X	X	X	X	X	X	X	X	X
9036	Puertecito Creek Downstream from Kerr-McGee Mill	3	Grab	X	X	X	X	X	X	X	X	X	X
9038	Puertecito Creek Near the Mouth of Rancho del Puerto	3	Grab	X	X	X	X	X	X	X	X	X	X
9040	San Mateo Creek at Highway 53 Bridge North of Grants	3	Grab	X	X	X		X	X	X	X	X	X
9050	Rio Puerco at Highway Bridge Downstream from United Nuclear and Kerr-McGee Mines	3	Grab	X	X	X		X	X	X	X	X	X
9052	Rio Puerco Upstream of Wingate Plant	3	Grab	X	X	X		X	X	X	X	X	X

TABLE 3, Page 2

Station Number	Station Description	Number Days Sampled	Type Sample	Analysis Required 2/ Cl	Mo	Na	NO_3 & NH_3	Se	V	Mn	U-Nat	Gross Alpha	Ra_{226}
9054	Rio Puerco at Highway 666 Bridge, Gallup, N. Mex.	3	Grab	X	X	X		X	X	X	X	X	X
9060	Rio Paguate at Paguate	3/	Grab	X	X	X		X	X	X	X	X	X
9062	Rio Moquino Upstream of Jackpile Mine	3/	Grab	X	X	X		X	X	X	X	X	X
9064	Rio Paguate at Jackpile Ford	3/	Grab	X	X	X		X	X	X	X	X	X
9066	Rio Paguate at Paguate Reservoir Discharge	3/	Grab	X	X	X		X	X	X	X	X	X
9068	Rio San Jose at I-40 Bridge East of Laguna	3/	Grab	X	X	X		X	X	X	X	X	X

1/ pH, conductivity and temperature will be measured periodically at all stations.
2/ Additional radiochemical (Th-230, Pb-210, Po 210, Th-228, Ra-228) will be required if gross alpha and radium 226 analysis indicate these compounds are present.
3/ This station will be sampled for 1 to 3 days if surface run-off occurs.

TABLE 4

PRESERVATIVES AND SAMPLE SIZE REQUIRED

Size of Sample	Preservative	Parameter
1 liter (unfiltered)	Iced	TDS, TSS, Sulfate, Chloride
1 liter (unfiltered)	5 ml HNO_3/l	Copper, iron, Moly, Sodium, Silenum, Vanadium, Arsenic, Manganese, Cobalt, Total Uranium
125 ml (unfiltered)	40 mg $HgCl_2$/l - Iced	Nitrate + Nitrite, Ammonia
2 l (filtered)	5 ml HNO_3/l	Gross alpha
8 l (filtered)*	5 ml Hcl/l	Dissolved Radium 226 Th-230, Pb-210, Po-210, Th-228, Ra-228

*4 liters each to NFIC and ORP.

Appendix B

CHAIN OF CUSTODY PROCEDURES

CHAIN OF CUSTODY PROCEDURES

General:

The evidence gathering portion of a survey should be characterized by the minimum number of samples required to give a fair representation of the effluent or water body from which taken. To the extent possible, the quantity of samples and sample locations will be determined prior to the survey.

Chain of Custody procedures must be followed to maintain the documentation necessary to trace sample possession from the time taken until the evidence is introduced into court. A sample is in your "custody" if:

1. It is in your actual physical possession, or

2. It is in your view, after being in your physical possession, or

3. It was in your physical possession and then you locked it up in a manner so that no one could tamper with it.

All survey participants will receive a copy of the survey study plan and will be knowledgeable of its contents prior to the survey. A pre-survey briefing will be held to re-appraise all participants of the survey objectives, sample locations and Chain of Custody procedures. After all Chain of Custody samples are collected, a de-briefing will be held in the field to determine adherence to Chain of Custody procedures and whether additional evidence type samples are required.

Sample Collection:

1. To the maximum extent achievable, as few people as possible should handle the sample.

2. Stream and effluent samples shall be obtained, using standard field sampling techniques.

3. Sample tags (Exhibit I) shall be securely attached to the sample container at the time the complete sample is collected and shall contain, at a minimum, the following information: station number, station location, date taken, time taken, type of sample, sequence number (first sample of the day - sequence No. 1, second sample - sequence No. 2, etc.), analyses required and samplers. The tags must be legibly filled out in ballpoint (waterproof ink).

Sample Collection (Continued)

4. Blank samples shall also be taken with preservatives which will be analyzed by the laboratory to exclude the possibility of container or preservative contamination.

5. A pre-printed, bound Field Data Record logbook shall be maintained to record field measurements and other pertinent information necessary to refresh the sampler's memory in the event he later takes the stand to testify regarding his action's during the evidence gathering activity. A separate set of field notebooks shall be maintained for each survey and stored in a safe place where they could be protected and accounted for at all times. Standard formats (Exhibits II and III) have been established to minimize field entries and include the date, time, survey, type of samples taken, volume of each sample, type of analysis, sample numbers, preservatives, sample location and field measurements such as temperature, conductivity, DO, pH, flow and any other pertinent information or observations. The entries shall be signed by the field sampler. The preparation and conservation of the field logbooks during the survey will be the responsibility of the survey coordinator. Once the survey is complete, field logs will be retained by the survey coordinator, or his designated representative, as a part of the permanent record.

6. The field sampler is responsible for the care and custody of the samples collected until properly dispatched to the receiving laboratory or turned over to an assigned custodian. He must assure that each container is in his physical possession or in his view at all times, or locked in such a place and manner that no one can tamper with it.

7. Colored slides or photographs should be taken which would visually show the outfall sample location and any water pollution to substantiate any conclusions of the investigation. Written documentation on the back of the photo should include the signature of the photographer, time, date and site location. Photographs of this nature, which may be used as evidence, shall also be handled recognizing Chain of Custody procedures to prevent alteration.

Transfer of Custody and Shipment:

1. Samples will be accompanied by a Chain of Custody Record which includes the name of the survey, samplers signatures, station number, station location, date, time, type of sample, sequence number, number of containers and analyses required (Fig. IV). When turning over the possession of samples, the transferor and transferee will sign, date and time the sheet. This record sheet

allows transfer of custody of a group of samples in the field, ~~to the mobile laboratory or when samples are dispatched to the~~ NFIC - Denver laboratory. When transferring a portion of the samples identified on the sheet to the field mobile laboratory, the individual samples must be noted in the column with the signature of the person relinquishing the samples. The field laboratory person receiving the samples will acknowledge receipt by signing in the appropriate column.

2. The field custodian or field sampler, if a custodian has not been assigned, will have the responsibility of properly packaging and dispatching samples to the proper laboratory for analysis. The "Dispatch" portion of the Chain of Custody Record shall be properly filled out, dated, and signed.

3. Samples will be properly packed in shipment containers such as ice chests, to avoid breakage. The shipping containers will be padlocked for shipment to the receiving laboratory.

4. All packages will be accompanied by the Chain of Custody Record showing identification of the contents. The original will accompany the shipment, and a copy will be retained by the survey coordinator.

5. If sent by mail, register the package with return receipt requested. If sent by common carrier, a Government Bill of Lading should be obtained. Receipts from post offices and bills of lading will be retained as part of the permanent Chain of Custody documentation.

6. If samples are delivered to the laboratory when appropriate personnel are not there to receive them, the samples must be locked in a designated area within the laboratory in a manner so that no one can tamper with them. The same person must then return to the laboratory and unlock the samples and deliver custody to the appropriate custodian.

Laboratory Custody Procedures:

1. The laboratory shall designate a "sample custodian." An alternate will be designated in his absence. In addition, the laboratory shall set aside a "sample storage security area." This should be a clean, dry, isolated room which can be securely locked from the outside.

2. All samples should be handled by the minimum possible number of persons.

3. All incoming samples shall be received only by the custodian, who will indicate receipt by signing the Chain of Custody Record Sheet

accompanying the samples and retaining the sheet as permanent records. Couriers picking up samples at the airport, post office, etc. shall sign jointly with the laboratory custodian.

4. Immediately upon receipt, the custodian will place the sample in the sample room, which will be locked at all times except when samples are removed or replaced by the custodian. To the maximum extent possible, only the custodian should be permitted in the sample room.

5. The custodian shall ensure that heat-sensitive or light-sensitive samples, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained.

6. Only the custodian will distribute samples to personnel who are to perform tests.

7. The analyst will record in his laboratory notebook or analytical worksheet, identifying information describing the sample, the procedures performed and the results of the testing. The notes shall be dated and indicate who performed the tests. The notes shall be retained as a permanent record in the laboratory and should note any abnormalities which occurred during the testing procedure. In the event that the person who performed the tests is not available as a witness at time of trial, the government may be able to introduce the notes in evidence under the Federal Business Records Act.

8. Standard methods of laboratory analyses shall be used as described in the "Guidelines Establishing Test Procedures for Analysis of Pollutants," 38 F.R. 28758, October 16, 1973. If laboratory personnel deviate from standard procedures, they should be prepared to justify their decision during cross-examination.

9. Laboratory personnel are responsible for the care and custody of the sample once it is handed over to them and should be prepared to testify that the sample was in their possession and view or secured in the laboratory at all times from the moment it was received from the custodian until the tests were run.

10. Once the sample testing is completed, the unused portion of the sample together with all identifying tags and laboratory records, should be returned to the custodian. The returned tagged sample will be retained in the sample room until it is required for trial. Strip charts and other documentation of work will also be turned over to the custodian.

Chain of Custody Procedures (Continued)

11. Samples, tags and laboratory records of tests may be destroyed only upon the order of the laboratory director, who will first confer with the Chief, Enforcement Specialist Office, to make certain that the information is no longer required or the samples have deteriorated.

EXHIBIT I

EPA, NATIONAL FIELD INVESTIGATIONS CENTER - DENVER

Station No.	Date	Time	Sequence No.

Station Location

________Grab
________Comp.

________BOD
________Solids
________COD
________Nutrients
________Metals
________Oil and Grease
________D.O.
________Other

Remarks/Preservative:

Samplers:

FRONT

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT
NATIONAL FIELD INVESTIGATIONS CENTER — DENVER
BUILDING 53, BOX 25227, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BACK

EXHIBIT II

FOR ______________________________ SURVEY, PHASE ______, DATE ______________

TYPE OF SAMPLE ______________________________

					ANALYSES REQUIRED																					
STATION NUMBER	STATION DESCRIPTION	TOTAL VOLUME	TYPE CONTAINER	PRESERVATIVE	NUTRIENTS	BOD	COD	TOC	TOTAL SOLIDS	SUSPENDED SOLIDS	ALKALINITY	DO	pH°	CONDUCTIVITY*	TEMPERATURE*	TOTAL COLIFORM	FECAL COLIFORM	TURBIDITY	OIL AND GREASE	METALS	BACTI	PESTICIDES	HERB	TRACE ORGANICS	PHENOL	CYANIDE

REMARKS

EXHIBIT III

Samplers: ______________________________

____

____

____

FIELD DATA RECORD

STATION	NUMBER	DATE	TIME	TEMPERATURE °C	CONDUCTIVITY μmhos/cm	pH S.U.	D.O. mg/l	Gage Ht. or Flow Ft. or CFS

EXHIBIT IV

ENVIRONMENTAL PROTECTION AGENCY
Office Of Enforcement
NATIONAL FIELD INVESTIGATIONS CENTER – DENVER
Building 53, Box 25227, Denver Federal Center
Denver, Colorado 80225

CHAIN OF CUSTODY RECORD

SURVEY	SAMPLERS: *(Signature)*

STATION NUMBER	STATION LOCATION	DATE	TIME	SAMPLE TYPE Water Comp.	SAMPLE TYPE Water Grab.	SAMPLE TYPE Air	SEQ. NO.	NO. OF CONTAINERS	ANALYSIS REQUIRED

Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by: *(Signature)*	Date/Time
Relinquished by: *(Signature)*	Received by Mobile Laboratory for field analysis: *(Signature)*	Date/Time

Dispatched by: *(Signature)*	Date/Time	Received for Laboratory by:	Date/Time
Method of Shipment:			

Distribution: Orig. – Accompany Shipment
1 Copy – Survey Coordinator Field Files

GPO 854-809

Appendix C

CHEMICAL ANALYSES DATA
NEW MEXICO SURVEY
Feb. 26-Mar. 14, 1975

CHEMICAL ANALYSES DATA
NEW MEXICO SURVEY
Feb. 26-Mar. 14, 1975

Sample No.†	Station Description	Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
		(pCi/l)				(mg/l)
9001-30-0227	KM I-X TAILINGS BY-PASS	600	60	149	1	4.2
9001-30-0228	KM I-X TAILINGS BY-PASS	490	60	148	1	2.0
9001-30-0301	KM I-X TAILINGS By-PASS	430	50	157	1	1.3
9003-30-0227	KM SEC 30W MINE WATER	1300	100	174	1	1.3
9003-30-0228	KM SEC 30W MINE WATER	1400	100	161	1	6.1
9003-30-0301	KM SEC 30W MINE WATER	1400	100	154	1	6.7
9005-30-0227	KM SEC 19 MINE WATER	72	19	9.3	0.1	0.23
9007-30-0227	KM SEC 35 MINE WATER	3000	100	32	1	17
9007-30-0828	KM SEC 35 MINE WATER	2400	100	52	1	14
9007-30-0301	KM SEC 35 MINE WATER	2800	100	69	1	26
9009-30-0227	KM SEC 36 MINE WATER	570	60	113	1	2.6
9009-30-0228	KM SEC 36 MINE WATER	630	60	178	1	3.4
9009-30-0301	KM SEC 36 MINE WATER	850	70	101	1	3.0
9010-30-0227	KM SEC 36 MINE WATER	580	70	59	1	2.5
9010-30-0228	KM SEC 36 MINE WATER	510	60	72	1	2.3
9010-30-0301	KM SEC 36 MINE WATER	580	60	65	1	2.3
9011-01-0227	KM SEEPAGE BELOW T POND	144000	3000	65	1	160
9012-01-0226	KM POTABLE WATER SUP	510	60	0.54	0.02	-
9013-01-0226	KM SEC 35 WATER SUP	3000	150	43	1	-
9014-30-0228	RE JOHNNY M MINE WATER	20	10	1.6	0.1	0.12
9016-30-0227	UNC I-X DISCHARGE	1600	100	14.3	0.4	6.6
9016-30-0228	UNC I-X DISCHARGE	2300	100	39	1	11
9016-30-0301	UNC I-X DISCHARGE	1400	100	39	1	5.9
9017-01-0226	UNC POTABLE WATER SUP	1500	100	23.5	0.5	-
9018-30-0227	UN-HP I-X DISCHARGE	760	70	111	2	2.3
9018-30-0228	UN-HP I-X DISCHARGE	770	70	101	2	3.0
9018-30-0301	UN-HP I-X DISCHARGE	970	70	111	1	5.8
9019-30-0228	UN-HP T PILE DECANT	29000	1000	52	1	150
9021-30-0228	ANAC INJ WELL FEED	62500	1300	53	1	130
9023-30-0304	UNC CHURCHROCK MINE D	730	60	19.8	0.5	7.6
9023-30-0305	UNC CHURCHROCK MINE D	840	70	22.9	0.5	6.5

† *Sample numbers are presented by station number-sequence-date.*

Sample No.	Station Description	Date	Analyses Performed: Dis. Grossα	±95%CL	Dis. Ra-226	±95%Cl	Total U
			(pCi/l)				(mg/l)
9023-30-0306	UNC CHURCHROCK MINE D		870	70	27.3	0.6	7.6
9023-01-0314	UNC CHURCHROCK MINE D		3100	90	53	1	20
9024-01-0303	UNC CHURCHROCK POTABLE WATER SUP		620	60	12.6	0.1	-
9025-30-0304	KM CHURCHROCK MINE DIS		240	40	8.1	0.3	0.97
9025-30-0305	KM CHURCHROCK MINE DIS		210	30	6.8	0.2	0.74
9025-30-0306	KM CHURCHROCK MINE DIS		230	40	8.7	0.2	0.72
9026-01-0303	KM CHURCHROCK H POTABLE WIS		120	30	6.5	0.1	-
9036-01-0226	PUERTECITO CK DS KM		1700	100	45	1	12
9036-01-0227	PUERTECITO CK DS KM		1400	100	47	1	6.2
9036-01-0228	PUERTECITO CK DS KM		1400	100	1	1	5.0
9038-01-0226	PUERTECITO CK @ RAN D PUERTO		1500	100	6.1	0.1	6.6
9038-01-0224	PUERTECITO CK @ RAN D PUERTO		1100	100	6.2	0.1	6.2
9038-01-0225	PUERTECITO CK @ RAN D PUERTO		750	60	7.2	0.1	4.7
9040-01-0226	SAN MATEO CK AT HWY 53		1000	80	1.09	0.03	4.7
9050-01-0303	RIO PUERCO DS UN & KM		500	50	0.97	0.05	5.0
9050-01-0304	RIO PUERCO DS UN & KM		470	50	2.54	0.05	3.8
9050-01-0305	RIO PUERCO DS UN & KM		490	60	2.60	0.05	3.8
9052-01-0303	RIO PUERCO US WINGATE		480	40	0.36	0.05	4.1
9052-01-0304	RIO PUERCO US WINGATE		510	60	0.43	0.02	4.8
9052-01-0305	RIO PUERCO US WINGATE		320	40	1.63	0.04	3.7
9054-01-0303	RIO PUERCO @ HWY 666		350	50	0.42	0.05	1.7
9054-01-0304	RIO PUERCO @ HWY 666		230	40	0.15	0.01	1.7
9054-01-0305	RIO PUERCO @ HWY 666		210	30	0.09	0.01	2.5
9060-01-0228	RIO PAGUATE @ PAGUATE		2.8	6.8	0.11	0.01	<.02
9062-01-0228	RIO MOQUINO		11.2	9.9	0.19	0.01	<.02
9064-01-0228	RIO PAGUATE @ JACKPILE FORD		270	40	4.8	0.1	1.2
9066-01-0228	RIO PAG @ PAG RES DIS		230	40	1.94	0.04	1.1
9068-01-0228	RIO SAN JOSE		38	18	0.37	0.02	0.10
9080-01-0304	KM SEC 36 3000 DRIFT		51	21	7.5	0.1	0.12
9081-01-0304	KM SEC 36 0900 DRIFT		47	20	8.7	0.1	0.05

Sample No.	Station Description	Date	Analyses Performed: Dis. Grossα (pCi/l)	±95%CL (pCi/l)	Dis. Ra-226 (pCi/l)	±95%Cl (pCi/l)	Total U (mg/l)
9082-01-0305	UNC CHURCHROCK POT WS @ SOWERS TR		1110	80	39.7	0.6	7.6
9101-01-0224			9	11	0.13	0.01	-
9102-01-0224			<3†	13	0.19	0.01	0.07
9103-01-0225			7	10	0.09	0.01	-
9104-01-0225			13	14	0.08	0.01	-
9105-01-0225			140	30	<0.05†	0.01	-
9106-01-0225			12	11	0.05	0.01	-
9107-01-0225			2500	200	0.72	0.02	14
9108-01-0225			47	23	0.34	0.02	-
9109-01-0225			39	17	0.13	0.01	-
9110-01-0225			<1†	6	<0.05†	0.01	-
9111-01-0225			7	9	0.24	0.01	-
9112-01-0225	GRANTS POTABLE		19	13	0.42	0.2	-
9113-01-0226			31	17	0.17	0.02	0.08
9114-01-0226			42	18	0.26	0.01	-
9115-01-0226			7	12	0.18	0.01	-
9116-01-0226			12	10	0.14	0.01	-
9117-01-0227	MONITOR, ANAC.		180	40	2.6	0.1	0.56
9118-01-0227			290	50	0.5	0.02	1.3
9119-01-0227			12	11	0.20	0.01	-
9120-01-0227			21	12	0.27	0.02	-
9121-01-0227			12	14	6.3	0.1	-
9123-01-0227			30	17	0.17	0.01	-
9123-01-0228			20	13	0.26	0.01	-
9124-01-0228			16	12	0.06	0.01	-
9125-01-0228			8	10	0.22	0.01	-
9126-01-0228			5	9	0.11	0.01	-
9127-01-0228			10	10	0.21	0.01	-
9128-01-0228			11	11	0.15	0.01	-
9129-01-0228			<1.6†	7	0.14	0.01	-
9130-01-0301			3	8	0.11	0.01	-
9131-01-0301			18	13	<0.05†	0.01	-
9132-01-0301			<1†	9	0.31	0.02	0.10
9133-01-0302			10	12	0.61	0.03	-

Sample No.	Station Description	Date	Analyses Performed: Dis. Grossα (pCi/l)	±95%CL (pCi/l)	Dis. Ra-226 (pCi/l)	±95%Cl (pCi/l)	Total U (mg/l)
9134-01-0303			8	11	0.24	0.01	0.04
9135-01-0303			400	70	1.92	0.04	2.6
9136-01-0303			22	16	0.27	0.02	-
9137-01-0303			10	9	0.68	0.03	-
9138-01-0303			6	8	0.64	0.02	-
9139-01-0305			14	11	0.22	0.01	-
9140-01-0305			6	10	0.10	0.01	-
9141-01-0305			3	7	0.12	0.01	0.02
9142-01-0305			9	9	0.16	0.01	-
9143-01-0305			14	9	0.83	0.04	-
9201-01-0226			110	40	3.6	0.1	1.0
9202-01-0226			86	31	0.30	0.02	-
9203-01-0226			33	15	0.07	0.01	-
9204-01-0226			8	13	0.14	0.01	-
9205-01-0226			170	40	0.18	0.01	-
9206-01-0226			56	25	0.60	0.02	-
9207-01-0227			410	120	1.15	0.03	-
9208-01-0227			49	35	4.0	0.1	-
9209-01-0227			<2†	10	1.95	0.04	-
9210-01-0227			45	29	0.26	0.02	-
9211-01-0227			<3†	15	0.20	0.01	-
9212-01-0303			112000	3000	4.9	0.1	-
9213-01-0303			8	32	6.6	0.1	-
9214-01-0303			14	34	1.18	0.03	-
9215-01-0303††			104	37	2.5	0.2	-
9216-01-0303			45	25	0.64	0.02	-
9217-01-0303			70	38	0.94	0.03	-
9218-01-0303			20	24	0.34	0.02	-
9219-01-0303			67	42	0.59	0.02	-
9220-01-0305			12	10	0.12	0.01	-
9221-01-0305			17	10	0.56	0.02	-

Sample No.	Station Description	Date	Dis. Gross α	±95%CL	Dis. Ra-226	±95%Cl	Total U
			Analyses Performed (pCi/l)				(mg/l)
9222-01-0305			2	9	0.57	0.02	-
9223-01-0305			4	9	0.37	0.02	-
9224-01-0305			24	12	0.13	0.01	-
9225-01-0305			12	15	0.29	0.01	-
9230-01-0228			<2†	6	0.31	0.02	-
9231-01-0228			10	10	1.7	0.05	-
9232-01-0228			18	13	3.7	0.08	0.02
9233-01-0228			2	4	0.18	0.02	0.04

† *Minimum detectable concentration*
†† *Gross alpha sample used for radium determination*

Sample No.	Station Description	Date	Analyses Performed			
			Cu	Fe	As	Co
			mg/l			
9011-30-0227			1.9	1,500	1.1	0.94
9012-01-0226			-	-	<0.05	-
9013-01-0226			-	-	<0.05	-
9017-01-0226			-	-	<0.05	-
9019-38-0228			0.1	0.22	3.0	0.10
9021-30-0228			0.5	200	0.15	0.62
9024-01-0303			-	-	<0.05	-
9026-01-0303			-	-	<0.05	-

Sample No.	Station Description	Date	Mo	Na	Se	V	Mn
			Analyses Performed				
			mg/l				
9001-30-0227	KM I-X TAILINGS BYPASS		2.5	180	0.06	0.7	0.03
9001-30-0228	KM I-X TAILINGS BYPASS		2.3	180	0.03	1.0	0.03
9001-30-0301	KM I-X TAILINGS BYPASS		2.4	180	0.07	1.0	0.03
9003-30-0227	KM Sec 30W MINE WATER		2.8	160	0.03	0.8	0.15
9003-30-0228	KM Sec 30W MINE WATER		2.6	160	0.04	0.7	0.18
9003-30-0301	KM Sec 30W MINE WATER		2.6	160	0.03	0.7	0.17
9005-30-0227	KM Sec 19 MINE WATER		0.6	120	<0.01	0.6	0.03
9007-30-0227	KM Sec 35 MINE WATER		5.2	190	0.08	0.6	0.09
9007-30-0228	KM Sec 35 MINE WATER		5.0	200	0.08	0.7	0.04
9007-30-0301	KM Sec 35 MINE WATER		4.7	210	0.04	1.0	0.06
9009-30-0227	KM Sec 36 MINE WATER		0.3	190	0.01	1.0	0.12
9009-30-0228	KM Sec 36 MINE WATER		0.3	190	<0.01	0.8	0.10
9009-30-0301	KM Sec 36 MINE WATER		0.3	180	0.01	0.8	0.12
9010-30-0227	KM Sec 36E MINE WATER		0.2	170	<0.01	0.8	0.10
9010-30-0228	KM Sec 36E MINE WATER		0.5	170	0.03	0.6	0.08
9010-30-0301	KM Sec 36E MINE WATER		0.3	170	0.01	0.4	0.08
9011-30-0227	KM SEEPAGE BELOW T POND		11	1,500	0.70	5.6	120
9012-01-0226	KM POTABLE WATER SUP		3.3	-	0.05	-	-
9013-01-0226	KM Sec 35 WATER SUP		8.2	-	0.02	-	-
9014-30-0228	RE JOHNNY M MINE WATER		0.3	60	<0.01	<0.3	0.01
9016-30-0227	UNC I-X DISCHARGE		4.4	310	0.11	<0.3	0.22
9016-30-0228	UNC I-X DISCHARGE		4.4	360	0.12	0.4	0.18
9016-30-0301	UNC I-X DISCHARGE		4.4	360	0.02	0.5	0.28
9017-01-0226	UNC POTABLE WATER SUP		6.0	-	0.11	-	-
9018-30-0227	UN-HP I-X DISCHARGE		1.3	140	0.33	0.4	0.05
9018-30-0228	UN-HP I-X DISCHARGE		1.5	140	0.33	<0.3	0.05
9018-30-0301	UN-HP I-X DISCHARGE		1.3	140	0.30	0.5	0.04
9019-30-0228	UN-HP T PILE DECANT		70	4,300	0.92	6.8	<0.01
9021-30-0228	ANAC INJ WELL FEED		0.2	1,200	0.03	6.3	340
9023-30-0304	UNC CHURCHROCK MINE D		0.2	100	0.06	0.5	0.05
9023-30-0305	UNC CHURCHROCK MINE D		0.2	100	0.06	0.4	0.06
9023-30-0306	UNC CHURCHROCK MINE D		0.1	90	<0.01	0.4	0.07
9023-01-0314	UNC CHURCHROCK MINE D		0.2	90	0.05	0.7	0.18
9024-01-0303	UNC CHURCHROCK POTABLE WATER SUP		1.9	-	0.06	-	-

Sample No.	Station Description	Date	Analysis Performed				
			Mo	Na	Se	V	Mn
			mg/l				
9025-30-0304	KM CHURCHROCK MINE DIS		0.2	90	0.01	0.7	0.07
9025-30-0305	KM CHURCHROCK MINE DIS		0.2	100	0.01	0.8	0.08
9025-30-0306	KM CHURCHROCK MINE DIS		0.2	100	0.01	0.9	0.10
9026-01-0303	KM CHURCHROCK MINE POTABLE WATER SUP		1.4	-	0.01	-	-
9036-01-0226	PUERTECITO CK DS KM		1.4	180	0.13	1.0	0.25
9036-01-0227	PUERTECITO CK DS KM		1.5	180	0.16	0.8	0.24
9036-01-0228	PUERTECITO CK DS KM		1.5	180	0.16	0.6	0.26
9038-01-0226	PUERTECITO CK @ RAN d PUERTO		2.1	160	0.07	0.5	0.08
9038-01-0227	PUERTECITO CK @ RAN d PUERTO		0.3	130	0.04	1.9	0.13
9038-01-0028	PUERTECITO CK @ RAN d PUERTO		1.5	130	0.01	0.8	0.11
9040-01-0226	SAN MATEO CK @ HWY 53		1.3	130	0.02	<0.3	1.8
9050-01-0303	RIO PUERCO DS UN & KM		0.5	110	0.07	0.5	1.9
9050-01-0304	RIO PUERCO DS UN & KM		0.3	100	0.03	0.6	0.19
9050-01-0305	RIO PUERCO DS UN & KM		0.3	100	0.03	0.6	0.19
9052-01-0303	RIO PUERCO US WINGATE		0.2	100	0.01	0.9	1.7
9052-01-0304	RIO PUERCO US WINGATE		0.2	90	0.01	0.5	0.61
9052-01-0305	RIO PUERCO US WINGATE		0.2	90	0.01	0.3	1.1
9054-01-0303	RIO PUERCO @ HWY 666		0.1	90	<0.01	0.3	0.12
9054-01-0304	RIO PUERCO @ HWY 666		0.2	90	<0.01	0.6	2.1
9054-01-0305	RIO PUERCO @ HWY 666		0.2	90	<0.01	0.6	2.0
9060-01-0228	RIO PAGUATE @ PAGUATE		<0.1	30	<0.01	0.6	0.11
9062-01-0228	RIO MOQUINO		0.2	70	<0.01	1.8	0.15
9064-01-0228	RIO PAGUATE @ JACKPILE FORD		0.2	120	0.05	0.5	0.28
9066-01-0228	RIO PAG @ PAG RES DIS		0.2	160	<0.01	0.6	0.14
9068-01-0228	RIO SAN JOSE		0.1	230	<0.01	<0.3	0.09
9080-01-0304	KM Sec 36 0000 DRIFT		0.1	220	0.01	<0.3	0.02
9081-01-0304	KM Sec 36 0900 DRIFT		0.4	260	<0.01	<0.3	0.06
9082-01-0305	UNC CHURCHROCK POT WS @ SOWERS TR		<0.1	100	0.06	0.6	0.03
9101-01-0224					-	-	
9102-01-0224	G WILCOX - MURRAY ACRES				1.06	<0.3	
9103-01-0225					-	-	
9104-01-0225					-	-	
9105-01-0225					-	-	
9106-01-0225					-	-	

Sample No.	Station Description	Date	Analysis Performed Mo	Na	Se	V	Mn
			mg/l				
9107-01-0225	C WORTHEN, BROADVIEW ACRES				1.06	0.3	
9108-01-0225					-	-	
9109-01-0225					-	-	
9110-01-0225					-	-	
9111-01-0225					-	-	
9112-01-0225					-	-	
9113-01-0226	C MEADOR - BROADVIEW ACRES				0.20	0.3	
9114-01-0226					-	-	
9115-01-0226					-	-	
9116-01-0226					-	-	
9117-01-0227					0.01	0.3	
9118-01-0227					0.01	0.8	
9119-01-0227					<0.01	0.9	
9120-01-0227					0.01	1.0	
9121-01-0227					0.01	0.8	
9122-01-0227					-	-	
9123-01-0228					0.01	1.1	
9124-01-0228					-	-	
9125-01-0228					-	-	
9126-01-0228					-	-	
9127-01-0228					-	-	
9128-01-0228					-	-	
9129-01-0228					0.02	1.3	
9130-01-0301					-	-	
9131-01-0301					-	-	
9132-01-0301	MARCUS WINDMILL				0.13	<0.3	
9133-01-0302					-	-	
9134-01-0303					<0.01	1.3	
9135-01-0303	UNHP WELL P				1.52	0.4	
9136-01-0303					-	-	
9137-01-0303					-	-	
9138-01-0303					<0.01	<0.3	
9139-01-0305					-	-	
9140-01-0305					<0.01	<0.3	

Sample No.	Station Description	Date	Mo	Na	Se	V	Mn
					mg/l		
9141-01-0305					<0.01	<0.3	
9142-01-0305					<0.01	<0.3	
9143-01-0305					-	-	
9201-01-0226					<0.01	<0.3	
9202-01-0226					-	-	
9203-01-0226					-	-	
9204-01-0226					-	-	
9205-01-0226					-	-	
9206-01-0226					-	-	
9207-01-0227					<0.01	0.4	
9208-01-0227	06 KM 43 14N, 9W Sec 32				0.29	0.8	
9209-01-0227					0.01	<0.3	
9210-01-0227					-	-	
9211-01-0227					<0.01	0.5	
9212-01-0303					-	-	
9213-01-0303					<0.01	0.6	
9214-01-0303					0.02	<0.3	
9215-01-0303					<0.01	<0.3	
9216-01-0303					-	-	
9217-01-0303					-	-	
9218-01-0303					-	-	
9219-01-0303					0.01	<0.3	
9220-01-0305					-	-	
9221-01-0305					0.01	<0.3	
9222-01-0305					-	-	
9223-01-0305					<0.01	<0.3	
9224-01-0305					-	-	
9225-01-0305					-	-	
9230-01-0228					<0.01	<0.3	
9231-01-0228					-	-	
9232-01-0228					<0.01	<0.3	
9233-01-0228					<0.01	0.3	

Sample No.	Station Description	Date	TSS	SO_4	Cl	NH_3 †	$NO_2 + NO_3$ †
			Analyses Performed				
			mg/l				
9001	KERR-MCGEE I-X TAILINGS BYPASS	Feb. 26	-	-	-	0.06	0.88
		Feb. 27	16	-	45	0.06	0.79
		Feb. 28	31	-	68	0.05	0.90
		Mar. 1	29	-	20	-	-
9003	KERR-MCGEE Sec 30W MINE WATER	Feb. 26	-	-	-	0.19	1.3
		Feb. 27	26	-	52	0.21	1.2
		Feb. 28	23	-	49	0.18	0.94
		Mar. 1	17	-	53	-	-
9005	KERR-MCGEE Sec 19 MINE WATER	Feb. 27	16	-	7.9	0.13	1.4
9007	KERR-MCGEE Sec 35 MINE WATER	Feb. 26	-	-	-	0.11	0.22
		Feb. 27	120	-	9.4	0.15	0.39
		Feb. 28	93	-	7.6	0.06	0.44
		Mar. 1	86	-	8.4	-	-
9009	KERR-MCGEE Sec 36 W MINE WATER	Feb. 26	-	-	-	0.07	0.30
		Feb. 27	36	13	-	0.04	0.21
		Feb. 28	44	13	-	0.04	0.26
		Mar. 1	33	13	-	-	-
9010	KERR-MCGEE Sec 36 E MINE WATER	Feb. 26	-	-	-	0.04	0.34
		Feb. 27	32	14	-	0.03	0.26
		Feb. 28	29	17	-	1.8	0.28
		Mar. 1	27	14	-	-	-
9011	KERR-MCGEE SEEPAGE BELOW	Feb. 27 COMP	38	2,200	15,000	-	-
	TAILINGS POND	Feb. 27 GRAB	48	2,200	16,000	460	16
9012	KERR-MCGEE POTABLE WATER SUPPLY	Feb. 26	-	-	-	0.13	1.0
9013	KERR-MCGEE Sec 35 WATER SUPPLY	Feb. 26	-	-	-	0.18	0.32
9014	RANCHERS EXPL JOHNNY M MINE WATER	Feb. 28	7	6.1	-	-	-
9016	UNITED NUCLEAR CORP I-X DISCHG	Feb. 26	-	-	-	0.07	0.28
		Feb. 27	5	-	190	0.04	0.07
		Feb. 28	7	-	200	0.01	0.06
		Mar. 1	3	-	190	-	-
9017	UNC POTABLE WATER SUPPLY	Feb. 26	-	-	-	0.08	0.06
9018	UNC-HP I-X DISCHARGE	Feb. 26	-	-	-	0.05	2.1
		Feb. 27	7	-	49	0.06	2.1
		Feb. 28	16	-	49	0.10	2.2
		Mar. 1	7	-	49	-	-

† *Grab Samples*

Sample No.	Station Description	Date	TSS	SO_4	Cl	NH_3†	$NO_2 + NO_3$†
			Analyses Performed (mg/l)				
9019	UNC-HP TAILINGS PILE DECANT	Feb. 28	5	4,300	1.5	4.4	4.4
9021	ANACONDA CO INJECTION WELL FEED	Feb. 27	-	4,900	-	69	7.4
		Feb. 28	3	-	65	-	-
9023	UN CHURCHROCK MINE DISCHARGE	Mar. 3	-		-	0.04	0.23
		Mar. 4	33		5.2	0.03	0.24
		Mar. 5	47		4.5	-	-
		Mar. 6	71		5.0	0.07	0.20
		Mar. 14	320		-	-	-
9024	UNC POTABLE WATER SUPPLY	Mar. 3	-		-	0.05	0.25
9025	KM CHURCHROCK MINE DISCHARGE	Mar. 3	-		-	0.03	0.34
		Mar. 4	38		0	0.06	0.45
		Mar. 5	45		0.5	-	-
		Mar. 6	58		3.2	0.07	0.79
9026	KM CHURCHROCK MINE POTABLE WS	Mar. 3	-		-	0.02	0.42
9036	PUERTECITO CREEK	Feb. 26			72	0.38	2.3
		Feb. 27			83	0.40	1.8
		Feb. 28			71	0.26	2.9
9038	PUERTECITO CREEK	Feb. 26			42	0.10	0.22
		Feb. 27			48	0.13	0.06
		Feb. 28			48	0.11	0.25
9040	SAN MATEO CREEK	Feb. 26			39	-	-
9050	RIO PUERCO @ HWY BRIDGE	Mar. 3			5.9		
		Mar. 4			3.8		
		Mar. 5			3.8		
9052	RIO PUERCO UPSTREAM OF WINGATE PLANK	Mar. 3			6.9		
		Mar. 4			6.8		
		Mar. 5			6.5		
9054	RIO PUERCO @ HWY 666	Mar. 3			23		
		Mar. 4			20		
		Mar. 5			17		
9068	RIO-PAGUATE	Feb. 28			0.6		
9062	RIO MOQUINO	Feb. 28			8.3		
9064	RIO PAGUATE	Feb. 28			2.0		
9066	RIO PAGUATE	Feb. 28			15		
9068	RIO SAN JOSE	Feb. 28			154		

† *Grab Samples*

Sample No.	Station Description	Date	TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			Analyses Performed				
			mg/l				
9101	MT TAYLOR MILL WORKS OLD RTE 66	Feb. 24	780		25	0.04	4.2
9102	G WILCOX - MURRAY ACRES	Feb. 24	2,300		180	0.01	5.5
9103	Q CONNERLY - ZUNI TRAILER PARK	Feb. 25	880		33	<0.01	6.2
9104	T SIMPSON - MURRAY ACRES	Feb. 25	1,400		37	<0.01	0.08
9105	SCHWAGERTY - MURRAY ACRES	Feb. 25	1,300		46	<0.01	1.00
9106	J PITMAN - BROADVIEW ACRES	Feb. 25	1,300		39	<0.01	0.33
9107	C WORTHEN - BROADVIEW ACRES	Feb. 25	3,800		260	0.01	14
9108	PITNEY - MURRAY ACRES	Feb. 25	2,200		110	0.01	3.3
9109	T A CHAPMAN - MURRAY ACRES	Feb. 25	1,300		9.5	0.01	2.5
9110	1-X WATER HOLIDAY INN - GRANTS	Feb. 25	430		55	0.01	0.11
9111	C&E CONCRETE - GRANTS	Feb. 26	560		30	0.05	3.4
9112	GRANTS CITY HALL-CITY WATER SUP	Feb. 26	730		32	0.02	0.47
9113	C MEADOR - BROADVIEW ACRES	Feb. 26	1,600		120	0.01	2.9
9114	BELL - TRAILER PARK	Feb. 26	970		34	<0.01	0.08
9115	COWELL - SE OF ANACONDA	Feb. 26	1,100		6.2	0.02	3.9
9116	MILAN WELL #1 CITY WATER	Feb. 26	500		14	0.02	1.6
9117	ANACONDA - MONITOR WELL	Feb. 27	2,300		11	0.03	1.5
9118	ANACONDA - WELL 2	Feb. 29	1,900		270	0.64	9.0
9119	ANACONDA - WELL 4	Feb. 27	880		42	0.13	5.7
9120	ANACONDA - MEXICAN CAMP	Feb. 27	490		10	0.04	0.73
9121	ANACONDA - GERRYHILL Sec 5	Feb. 27	2,000		4.2	0.14	0.05
9122	ANACONDA - NORTH WELL	Feb. 27	1,900		4.2	0.08	1.3
9123	ANACONDA - ENGINEERS' WELL	Feb. 28	960		61	0.09	3.20
9124	ANACONDA - BERRYHILL HOUSE	Feb. 28	940		65	0.05	0.80
9125	ANACONDA - LOS BLUEWATER	Feb. 28	1,000		12	0.05	0.95
9126	ANACONDA - ROUNDY	Feb. 28	1,100		110	0.04	6.5
9127	ANACONDA - FRED FREAS	Feb. 28	540		18	0.03	0.03
9128	ANACONDA - LEROY CHAPMAN	Feb. 28	490		18	0.03	1.4
9129	ANACONDA - JACK FREAS	Feb. 28	780		54	0.04	2.5
9130	N MARQUEZ - HOUSE WELL	Mar. 1	720		4.8	0.04	0.06
9131	C SANDOVAL - WINDMILL	Mar. 1	660		27	0.06	1.2
9132	N MARQUEZ - WINDMILL	Mar. 1	2,200		43	0.22	24
9133	G ENYART - GRANTS	Mar. 2	1,600		50	0.26	0.97

Sample No.	Station Description	Date	Analyses Performed				
			TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			mg/l				
9134	UN HP SUPPLY WELL 2	Mar. 3	1,600		0.2	0.03	0.42
9135	UN HP WELL D	Mar. 3	4,500		340	1.0	2.6
9136	UN HP SUPPLY WELL 1	Mar. 3	2,000		<0.2	0.07	0.28
9137	ERWIN WELL - GALLUP	Mar. 5	740		14	0.09	0.02
9138	BOARDMAN TRAILER PARK - GALLUP	Mar. 5	930		<0.2	0.50	1.2
9139	G HASSLER - GALLUP	Mar. 5	880		98	0.02	27
9140	DIXIE WELL - GALLUP	Mar. 5	1,500		<0.2	0.30	0.16
9141	CHURCHROCK VILLAGE	Mar. 5	720		0.5	0.50	0.18
9142	WHITE WELL - GALLUP	Mar. 5	620		630	0.01	0.02
9143	TOGAY WELL - GALLUP	Mar. 5	340		14	0.02	8.0
9201	PHIL HARRIS (WILCOXSON) KM 46	Feb. 26	1,900		23	0.14	0.09
9202	COUNTY LINE STOCK TANK KM 52	Feb. 26	2,100		56	0.06	14
9203	NAVAHO WIND MILL KM 45	Feb. 26	400		6.8	0.02	4.0
9204	INGERSOLL RAND KM 49	Feb. 26	2,200		36	0.05	18
9205	BINGHAM (RAGLAND) KM 47	Feb. 26	2,000		40	0.04	4.7
9206	MARQUEZ (RAGLAND) KM 63	Feb. 26	1,900		34	0.05	44
9207	KM-S-12	Feb. 27	14,000		3,100	0.50	0.04
9208	KM-43	Feb. 27	7,800		38	NS	NS
9209	KM-44	Feb. 27	2,700		17	0.66	11
9210	KM-51	Feb. 27	6,300		44	0.30	79
9211	KM-48	Feb. 27	4,100		31	0.80	1.3
9212	KM SEEPAGE RETURN	Mar. 3	36,000		3,100	590	12
9213	KM B-2	Mar. 3	8,900		3,400	0.12	0.25
9214	KM 36-2	Mar. 3	9,100		1,700	2.9	8.0
9215	KM 46	Mar. 3	3,200		100	10	2.0
9216	KM 47	Mar. 3	2,600		74	0.80	2.6
9217	KM 50	Mar. 3	4,700		470	9.1	16
9218	KM 51	Mar. 3	4,800		61	0.16	0.40
9219	KM 52	Mar. 3	6,700		1,300	0.08	1.3
9220	HARDGROUND FLATS WELL CRKM 2	Mar. 5	850		0.2	0.03	0.28
9221	E PUERCO R WELL CRKM 11	Mar. 5	340		14	0.04	14

Sample No.	Station Description	Date	Analyses Performed				
			TDS	SO_4	Cl	NH_3	$NO_2 + NO_3$
			mg/l				
9222	PUERCO WELL CRKM 16	Mar. 5	1,600		<0.2	34	0.01
9223	PIPELINE ROAD WELL CRK M 5	Mar. 5	880		<0.2	1.4	1.6
9224	NOSEROCK WELL CRKM 3	Mar. 5	980		<0.2	0.07	0.03
9225	NORTHEAST PIPELINE WELL CRK M10	Mar. 5	2,300		8.1	0.12	0.01
9230	ANACONDA JACKPILE WELL 4	Feb. 28	540		<0.2	0.05	0.05
9231	ANACONDA JACKPILE WELL P 10	Feb. 28	1,200		0.5	0.08	0.04
9232	ANACONDA JACKPILE WELL - NEW SHOP	Feb. 28	1,400		0.5	0.14	0.05
9233	PUGUATE MUNICIPAL WELL	Feb. 28	340		6.6	0.08	0.20

Appendix D

SELENIUM

EPA WATER QUALITY CRITERIA 1972

SELENIUM*

The toxicity of selenium resembles that of arsenic and can, if exposure is sufficient, cause death. Acute selenium toxicity is characterized by nervousness, vomiting, cough, dyspnea, convulsions, abdominal pain, diarrhea, hypotension, and respiratory failure. Chronic exposure leads to marked pallor, red staining of fingers, teeth and hair, debility, depression, epistaxis, gastrointestinal disturbances, dermatitis, and irritation of the nose and throat. Both acute and chronic exposure can cause odor on the breath similar to garlic (The Merck Index of Chemicals and Drugs 1968).[338] The only documented case of selenium toxicity from a water source, uncomplicated with selenium in the diet, concerned a three-month exposure to well water containing 9 mg/l (Beath 1962).[331]

Although previous evidence suggested that selenium was carcinogenic (Fitzhugh et al. 1944),[332] these observations have not been borne out by subsequent data (Volganev and Tschenkes 1967).[346] In recent years, selenium has become recognized as a dietary essential in a number of species (Schwarz 1960,[341] Nesheim and Scott 1961,[338] Oldfield et al. 1963[339]).

Elemental selenium is highly insoluble and requires oxidation to selenite or selenate before appreciable quantities appear in water (Lakin and Davidson 1967).[335] There is evidence that this reaction is catalyzed by certain soil bacteria (Olson 1967).[340]

No systematic investigation of the forms of selenium in excessive concentrations in drinking water sources has been carried out. However, from what is known of the solubilities of the various compounds of selenium, the principal inorganic compounds of selenium would be selenite and selenate. The ratio of their individual occurrences would depend primarily on pH. Organic forms of selenium occurred in seleniferous soils and had sufficient mobility in an aqueous environment to be preferentially absorbed over selenate in certain plants (Hamilton and Beath 1964).[334] However, the extent to which these compounds might occur in source waters is essentially unknown. Toxicologic examination of plant sources of selenium revealed that selenium present in seleniferous grains was more toxic than inorganic selenium added to the diet (Franke and Potter 1935).[333]

Intake of selenium from foods in seleniferous areas (Smith 1941),[342] may range from 600 to 6,340 µg/day, which approach estimated levels related to symptoms of selenium toxicity in man based on urine samples (Smith et al. 1936,[343] Smith and Westfall 1937[344]). If data on selenium in foods (Morris and Levander 1970)[337] are applied to the average consumption of foods (U.S. Department of Agriculture, Agriculture Research Service, Consumer and Food Economics Research Division 1967),[345] the normal dietary intake of selenium is about 200 µg/day.

If it is assumed that two liters of water are ingested per day, a 0.01 mg/l concentration of total selenium would increase the normal total dietary intake by 10 per cent (20 µg/day). Considering the range of selenium in food associated with symptoms of toxicity in man, this would provide a safety factor of from 2.7 to 29. A serious weakness in these calculations is that their validity depends on an assumption of equivalent toxicity of selenium in food and water, in spite of the fact that a considerable portion of selenium associated with plants is in an organic form. Adequate toxicological data that specifically examine the organic and the inorganic selenium compounds are not available.

Recommendation

Because the defined treatment process has little or no effect on removing selenium, and because there is a lack of data on its toxic effects on humans when ingested in water, it is recommended that public water supply sources contain no more than 0.01 mg/l selenium.

* *Water Quality Criteria, 1972, Environmental Protection Agency, Washington, D.C.*

Technical Note
ORP/LV-75-4

SUMMARY OF GROUND-WATER QUALITY IMPACTS OF URANIUM MINING AND MILLING IN THE GRANTS MINERAL BELT, NEW MEXICO

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August 1975

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Office of Radiation Programs
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PREFACE

The Office of Radiation Programs of the Environmental Protection Agency carries out a national program designed to evaluate population exposure to ionizing and non-ionizing radiation and to promote development of controls necessary to protect the public health and safety.

Within the Office of Radiation Programs, the Las Vegas Facility (ORP-LVF) conducts in-depth field studies of various radiation sources (e.g., nuclear facilities, uranium mill tailings, and phosphate mills) to provide technical data for environmental impact statement reviews as well as needed information on source characteristics, environmental transport, critical pathways for population exposure, and dose model validation.

This report summarizes the results of the ground-water study conducted by ORP-LVF during February and March 1975 in the Grants Mineral Belt area of New Mexico. The final technical report, "Ground-Water Quality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico", will be published at a later date as EPA-520/6-75-013.

Readers of this report are encouraged to inform the Office of Radiation Programs of any omissions or errors. Comments or requests for further information are also invited.

Donald W. Hendricks
Director, Office of
Radiation Programs, LVF

TABLE OF CONTENTS

FIGURES

Figures		Page

<u>TABLES</u>

Tables		Page

PURPOSE OF STUDY

In September 1974, the State of New Mexico Environmental Improvement Agency (NMEIA) made a request of Region VI of the U.S. Environmental Protection Agency (USEPA) to conduct a definitive survey of the Grants Mineral Belt area (Wright, 1974). At this time, a summary report evaluating the problem areas in the study area was also prepared by Region VI (Keefer, 1974). Briefly, the water-quality impacts associated with ongoing and projected uranium mining and milling in the Grants Mineral Belt of New Mexico were unknown. Whether a problem existed was questionable but worthy of investigation because of the toxic nature of the effluents and their persistence in the environment. The study areas of most concern were located near Churchrock, Ambrosia Lake-Grants, and Laguna-Paguate.

In late November 1974, the Office of Radiation Programs-Las Vegas Facility (ORP-LVF) and the National Enforcement Investigations Center (NEIC) were requested by Region VI to provide direct assistance to the NMEIA to conduct the study.

Representatives of ORP-LVF, NEIC, and NMEIA completed a field reconnaissance of the study area during the week of January 24, 1975. Industry representatives were contacted, arrangements were made for site access, and sampling locations and collection schedules were finalized after reviewing company monitoring programs. Study plans were prepared by both ORP-LVF and NEIC defining study participants, responsibilities, and specific analyses to be completed per location by each laboratory.

Subsequent meetings between the three participating agencies resulted in a final study plan which defined the following study objectives to the satisfaction of NMEIA (Bond, 1975):

1. Assess the impacts of waste discharges from uranium mining and milling on surface waters and ground waters of the Grants Mineral Belt.

2. Determine if discharges comply with all applicable regulations, standards, permits, and licenses.

3. Evaluate the adequacy of company water quality monitoring networks, self-monitoring data, analytical procedures, and reporting requirements.

4. Determine the composition of potable waters at uranium mines and mills.

5. Develop priorities for subsequent monitoring and other follow-up studies.

Ground-water aspects of objectives 1, 3, and 5 were the responsibility of ORP-LVF, whereas the remaining objectives were pursued by NEIC.

Actual sample collection began in late February 1975 in the Ambrosia Lake-Bluewater area. It proceeded to Paguate-Jackpile and was finally completed in the Gallup-Churchrock area in early March 1975. Laboratory analyses for the trace metals, gross alpha, and radium-226 were completed by NEIC. The other radiological analyses were completed by the Environmental Monitoring and Support Laboratory (EMSL), Las Vegas. Radiometric analyses were assigned the highest priority at each laboratory and were completed in July 1975.

SUMMARY AND CONCLUSIONS

TASK I: Assess the Impacts of Waste Discharges from Uranium Mining and Milling on Ground Waters of the Grants Mineral Belt.

1. Ground water is the principal source of water supply in the study area. Extensive development of ground water from the San Andres Limestone aquifer occurs in the Grants-Bluewater area where the water is used for agriculture, public water supply, and uranium mill feed water. Development of shallow, unconfined aquifers in the alluvium also occurs in this area. Principal ground-water development in the mining areas at Ambrosia Lake, Jackpile-Paguate, and Churchrock is from the Morrison Formation and, to a lesser extent, from the Dakota Sandstone or the Tres Hermanos Member of the Mancos Shale. The Gallup water supply is derived primarily from deep wells completed in the Gallup Sandstone using well fields located east and west of the urban area and 11 kilometers north of the city.

2. In proximity to the mines and mills and adjacent to the principal surface drainage courses, shallow ground-water contamination results from the infiltration of (1) effluents from mill tailings ponds, (2) mine drainage water that is first introduced to settling lagoons and thence to watercourses, and (3) discharge (tailings) from ion exchange plants. In the case of the Anaconda mill, seepage from the tailings ponds and migration of wastes injected into deep bedrock formations are observed in the San Andres Limestone and in the alluvium, both of which are potable aquifers. With the exception of seepage from the Kerr-McGee Section 36 mine in Ambrosia Lake, significant amounts of wastewater from the remaining mines and mills probably does not return to known bedrock aquifers. Deterioration of water quality results from conventional underground mining as a result of penetration or disruption of the ore body. The most dramatic changes are greatly increased dissolved radium and uranium. Induced movement of naturally saline ground water into potable aquifers is also likely but undocumented. Similarly, the ground-water quality impacts of solution (in situ) mining are unknown.

3. The Grants, Milan, Laguna, and Bluewater municipal water supplies have not been adversely affected by uranium mining and milling operations to date. For the Grants and Milan areas, chemical data from 1962 to the present indicate that near the Anaconda mill some observation wells have

increased slightly in total dissolved solids, sulfate, chloride and gross alpha but domestic wells have generally remained unchanged. Projections made in 1957 of gross nitrate deterioration of ground water have not been substantiated by subsequent data. Of the municipal supply wells in the study area, the Bluewater well bears additional monitoring because of its location relative to the Anaconda tailings ponds.

4. Contamination of the Gallup municipal ground-water supply by surface flows, consisting mostly of mine drainage, has not occurred and is extremely unlikely because of geologic conditions in the well field and the depth to productive aquifers. Another well field north of the City will, in no way, be affected by the drainage.

5. With the exception of the areas south and southwest of the United Nuclear-Homestake Partners mill, widespread ground-water contamination from mining and milling was not observed in the study area. Throughout the study area widespread contamination of ground water with radium was not observed despite concentrations of as much as 178 pCi/l in mine and mill effluents. Radium removal is pronounced, probably due to sorptive capacity of soils in the area. In the vicinity of the Anaconda mill, radium and nitrate concentrations in the alluvial aquifer decline with distance from the tailings ponds, but neither parameter exceeds drinking water standards.

6. Ground water in at least part of the shallow aquifer developed for domestic water supply downgradient from the United Nuclear-Homestake Partners mill is contaminated with selenium. Alternative water supplies can be developed using deep wells completed in the Chinle Formation or in the San Andres Limestone. Potential well sites are located in the developments affected and in the adjacent area. A third alternative includes connecting to the Milan municipal system. Further evaluations are necessary to determine the best course of action.

7. Mining practices, per se, have an adverse effect on natural water quality. Initial penetration and disruption of the ore body in the Churchrock mining area increased the concentration of dissolved radium in water pumped from the mines from 0.05 - 0.62 pCi/l to over 8 pCi/l. According to company data, the concentration rose to over 75 pCi/l, or at least 75 times the natural concentration, in the two-year period during which the mine was being developed. The pattern of increasing radium with time, seen in Ambrosia Lake, is being repeated. Ground-water inflow via long holes

in the Kerr-McGee Section 36 mine contains a relatively low concentration of dissolved radium-226. Therefore, much of the radium loading of mine effluent is apparently a result of leaching of ore solids remaining from mucking and transport within the mine. In some cases this could be reduced by improved mining practices, such as provision of drainage channels along haulage drifts.

8. Company data show that seepage from the Anaconda tailings pond at Bluewater averages 183 million liters/year (48.3 million gallons) for 1973 and 1974. The average volume injected for the same time period was 348 million liters/year (91.9 million gallons). Therefore, approximately one-third of the total effluent volume remaining after evaporation (531 million liters/year) enters the shallow aquifer which is a source of potable and irrigation water in Bluewater Valley. From 1960 through 1974, seepage alone introduced 0.41 curies of radium to the shallow potable aquifer. Adequate monitoring of the movement of the seepage and the injected wastes is not underway.

9. There are indications that waste injected into the Yeso Formation by the Anaconda Company are not confined to that unit as originally intended in 1960. Three nearby monitoring wells, completed in the overlying San Andres Limestone and/or the Glorieta Sandstone, show a trend of increasing chloride and uranium with time. Positive correlations of water quality fluctuations with the volumes of waste injected are a further indication of upward movement. The absence of monitoring wells in the injection zone is a major deficiency in the data collection program.

10. The maximum concentration of radium observed in shallow ground water adjacent to the Kerr-McGee mill at Ambrosia Lake was 6.6 pCi/l. According to company data, seepage from the tailings ponds occurs at the rate of 491 million liters/year (130 million gallons/year). This is 29 percent of the influent to the "evaporation ponds" and attests to their poor performance in this regard. Radium and gross alpha in the seepage are 56 pCi/l and 112,000-144,000 pCi/l, respectively. Total radium introduced to the ground water to date is estimated at 0.7 curies. Wells completed in bedrock and in alluvium, and located near watercourses containing mine drainage and seepage from tailings ponds, contain elevated levels of TDS, ammonia, and nitrate. One well, which contained 1.0 pCi/l in 1962, now is contaminated with 3.7 pCi/l of radium. Sorption or bio-uptake of radium is pronounced; hence, concentrations now in ground water are not representative of ultimate concentrations.

11. Water-quality data from 11 wells over a 200-square kilometer area in the Puerco River and South Fork Puerco River drainage basins reveal essentially no noticeable increase in concentrations of radionuclides or common inorganic and trace constituents in ground water as a result of mine drainage. Natural variations in the uranium content of sediments probably account for differences in radium content in shallow wells. Dissolved radium in shallow ground water underlying stream courses affected by waste water is essentially unchanged from that in areas unaffected by mine drainage. None of the samples contained more than recommended maximum concentrations for radium-226, natural uranium, thorium-230, thorium-232, or polonium-210 in drinking water. However, the paucity of sampling points and the absence of historical data make the foregoing conclusion a conditional one, particularly in the reaches of the Puerco River within approximately 10 kilometers downstream of the mines.

12. Four wells sampled in the vicinity of the Jackpile mine near Paguate contained 0.31 to 3.7 pCi/l radium-226. With the exception of the latter value from the new shop well in the mine area, remaining supplies contain 1.7 pCi/l or less radium. The Paguate municipal supply contains 0.18 pCi/l. None of the wells were above maximum permissible concentrations (MPC) for the other common isotopes of uranium, thorium, and polonium. Ground water from the Jackpile Sandstone may contain elevated levels of radium as a result of mining activities. Mine drainage water ponded within the pit contained 190 pCi/l radium and 170 pCi/l of uranium in 1970. The impacts of mining on ground-water quality downgradient from the mining area are unknown due to the lack of properly located monitoring wells. No adverse impacts from mining on the present water supply source for Paguate are expected.

13. Of the 71 ground-water samples collected for this study, a total of 6 had radium-226 in excess of the 3 pCi/l PHS Drinking Water Standard. Two of the 6 involved potable water supplies. One containing 3.6 pCi/l serves a single family and is located adjacent to Arroyo del Puerto and downgradient from the mines and mills in Ambrosia Lake. The second contains 3.7 pCi/l and is used as a potable supply for the labor force in the new shop at the Jackpile Mine.

14. The highest isotopic uranium and thorium, and polonium-210 contents for any potable ground-water supplies sampled in the study area are less than 1.72% of the total radionuclide population guide - MPC as established in NMEIA regulations.

15. The lowest observed concentration (background levels) in ground water are summarized as follows:

Radionuclides	Range (pCi/l)	Average (pCi/l)
Radium-226	0.06 - 0.31	0.16
Polonium-210	0.27 - 0.57	0.36
Thorium-230	0.013- 0.051	0.028
Thorium-232	0.010- 0.024	0.015
U-Natural	14 - 68	35

16. The uranium isotopes (uranium 234, 235 and 238) are the main contributors to the gross alpha result; however, in several determinations, gross alpha underestimated the activity present from natural uranium.

17. No correlation was found between gross alpha content of 15 pCi/l (including uranium isotopes) and a radium-226 content of 5 pCi/l.

18. It is doubtful that the gross alpha determination can even be used as an indicator of the presence of other alpha emitters (e.g., U-natural and polonium-210). Furthermore, since the gross alpha results have such large error terms, no meaningful determination of percentage of radionuclides to gross alpha can be implied.

19. Gross alpha determinations also failed to indicate the possible presence of lead-210 (primarily a beta emitter) which, because of the lower MPC of 33 pCi/l, may be a significant contributor to the radiological health hazard evaluation of any potable water supply.

20. Radium-226 in ground water is a good radiochemical indicator of wastewater contamination from mines and mills. Due to the low maximum permissible concentration, it also provides a good means for evaluating health effects. Selenium and nitrate also indicated the presence of mill effluents in ground water. Polonium-210, thorium-230 and thorium-232 concentrations in ground water fluctuate about background levels and are poor indicators of ground-water contamination from uranium mining and milling activities.

21. For routine radiological monitoring of potable ground-water supplies, isotopic uranium and thorium and polonium-210 analyses do not appear to be necessary due to their high maximum permissible concentrations (chemical toxicity of uranium may be a significant limiting factor, however).

TASK II: Evaluate the Adequacy of Company Water Quality Monitoring Networks, Self-Monitoring Data, Analytical Procedures, and Reporting Requirements.

1. Company sponsored ground-water monitoring programs range from inadequate to nonexistent. Actual monitoring networks are deficient in that sampling points are usually poorly located or of inadequate depth/location relative to the hydrogeologic system and the introduction of contaminants thereto. Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the ground-water sampling and monitoring programs represent minimal efforts in terms of network design, implementation, and level of investment.

2. Company radiochemical analytical methods are inadequate for measuring environmental levels of radionuclides and have high minimum detectable activities and large error terms. Incomplete analysis of radionuclide contents prevails. Few data are reported on other naturally occurring radionuclides such as isotopic thorium, polonium-210, and radium-228. In some cases, monitoring has been restricted to analysis of radium-226 and natural uranium, without consideration of these other radionuclides or toxic metals.

3. Monitoring of hydraulic and water-quality impacts associated with conventional mining and with solution (in situ) mining is not reported to regulatory agencies. It is likely that such monitoring is limited to meeting short-term economic and engineering needs of the companies rather than addressing long-term, general environmental concerns. As a result, overall impacts on ground water are not routinely determined and reported.

4. Off-site ground-water sampling networks do not utilize wells specifically located and constructed for monitoring purposes. Reliance on wells already in existence and utilized for domestic or livestock use falls short of the overall monitoring objectives (i.e., to determine impacts on ground water and to adjust company operations to acceptable levels). Deficiencies of this type can allow contamination to proceed unnoticed. On-site wells constructed specifically for monitoring are generally not completed to provide representative hydraulic and water quality data for the aquifer most likely to be affected.

5. Proven geophysical and geohydrologic techniques to formulate environmental monitoring networks are apparently not used. Such techniques can assist in specifying sampling

frequencies and provide the basis for adjustment of monitoring and operational practices to mitigate adverse impacts on ground water.

6. Monitoring the effects of the Jackpile and Paguate open pit mines on ground-water quality is nonexistent despite the magnitude of these operations. Drainage water within the pits has contained as much as 190 pCi/1 of radium. Two wells, used for potable supply and completed in the ore body, contain elevated levels of radium, further indicating a need for data to determine what the future impacts might be when mining ceases and before additional programs for heap leaching and <u>in situ</u> mining are implemented.

7. Careful analysis of material and water balances to determine seepage input to ground water for the various tailings disposal operations is not evident. For the Ananconda Company, the method utilized has not been altered in 14 years. For Kerr-McGee, overland flow presents a potential threat to the structural integrity of the retention dams. At the United Nuclear-Homestake Partners Mill, no quantitative estimates of seepage are available.

8. Records of U. S. Atomic Energy Commission (USAEC) inspection reports, mill license applications, seepage reports, etc., on file with the State appear to be incomplete and disorganized. No interpretive summary or review-type reports utilizing the monitoring data reported by industry are available from either the State or the U.S. Atomic Energy Commission files now held by the State. Liberal mill licensing conditions with respect to ground-water monitoring and water-quality impacts were initially established by the USAEC. Subsequently, there has been essentially no review, in any critical sense, of company operations with respect to ground-water contamination. The uranium mining and milling industry has not been pressed to monitor and protect ground-water resources. The limited efforts put forth by industry to date have largely not been reviewed by regulatory agencies at the State and Federal levels.

RECOMMENDATIONS

Action Required

1. Improved industry-sponsored monitoring programs should be implemented and the data made available to State and Federal regulatory agencies. Programs should be designed to detect likely hydraulic and water quality impacts from uranium milling and mining (open pit, underground, *in situ*). Revamped programs, specifically developed by joint concurrence of industry and regulatory agencies, should be incorporated in licenses, where possible. Licenses should specify minimal radiochemical analytical methods for detecting specific radionuclides as well as requirements for participation in quality assurance programs. Specific reporting procedures should include raw data, summary reports, and interpretations of data. Conclusions concerning impacts of operations on ground-water quality and remedial steps taken to abate or eliminate adverse impacts should be prepared. It is essential that the programs developed, as well as the data and interpretive reports prepared therefrom, be critically reviewed by the State to meet continuing regulatory responsibilities.

2. Because seepage from the Anaconda and Kerr-McGee tailings ponds constitutes a significant portion of the inflow to the ponds, it is recommended that seepage control measures be adopted. According to company records, such seepage presently totals some 674 million liters per year. Water budget analyses of the United Nuclear-Homestake Partners tailings pond should be made to determine how much seepage is occurring, and thereby contributing to contamination of the shallow aquifer locally developed for domestic water supplies in two adjacent privately owned housing developments.

3. Improved mining practices should be adopted to reduce the amount of radium leached from ore solids by ground water present in operating mines.

ADDITIONAL STUDIES REQUIRED

1. Studies should be immediately initiated to verify whether the source of ground-water contamination in the Broadview Acres and Murray Acres subdivision is from the nearby uranium mill. An improved monitoring program should be developed to predict contaminant migration and to provide the basis for subsequent enforcement action. Necessary action should be taken to provide potable water for the affected area. Studies should be undertaken to determine the means to prevent continuing contamination.

2. With regard to the Anaconda waste injection program, all available chemical and water level data for pre-injection and post-injection periods should be evaluated to ascertain if waste is migrating out of the Yeso Formation and into overlying aquifers containing potable water. Of particular concern are radium-226 and thorium-230 because of their abundance in the injected fluid. Limited chemical data indicating migration of waste beyond the injection interval necessitate that a thorough re-evaluation be made of the long term adequacy of this method of waste disposal. Construction of additional monitoring wells in the Yeso Formation and the Glorieta-San Andres is in order. Because of low MPC values, this is particularly true if increasing concentrations of radium-226 and possibly lead-210 are appearing in the aquifers above the injection zone. The Anaconda Company should also evaluate the current loss of uranium resources to the subsurface through their current disposal technique.

3. Available chemical data for ground-water samples collected by Kerr-McGee from wells located adjacent to Arroyo del Puerto and San Mateo Creek should be evaluated for long-term trends in water quality. Data for the Wilcoxson (P. Harris), Bingham, Marquez, and County Line Stock Tanks wells are of principal concern.

4. Water-quality data from the newly completed monitoring wells peripheral to the Kerr-McGee mill should be cross-checked using non-industry laboratories to determine the extent of contamination in the Dakota Sandstone.

5. The breadth of mining and milling activities in the Grants Mineral Belt clearly requires additional study if ground-water impacts are to be understood in any detailed or quantitative sense. The present study provides a preliminary assessment of but a small facet of the overall

activity in the district. Further study is recommended to determine impacts of past operations or expected impacts from mines and mills now in the planning or construction stages. Site specific investigations are necessary to determine the hydraulic and water quality responses to dewatering and solution mining.

6. Additional ground-water samples should be collected from wells adjacent to the Rio Puerco and east of Gallup to determine if radium concentrations are acceptably low and to establish baseline conditions for future reference. It is recommended that concentrations of trace metals should also be measured.

AREAL DESCRIPTION

Location and Description of Study Area

The Grants Mineral Belt, located in the southeastern part of McKinley County and the north-central portion of Valencia County, is a rectangular shaped area in northwestern New Mexico (John and West, 1963). It is 24 to 32 kilometers wide in the north-south direction and 137 to 177 kilometers long from east to west (see Figure 1) (Kelley, 1963; Kittel, Kelley, and Melancon, 1967).

At present, three mining districts dominate the Mineral Belt. These are Churchrock on the west, Grants-Ambrosia Lake in the center, and Paguate-Jackpile on the east. These contain the Gallup, Churchrock, Smith Lake, Ambrosia Lake, Grants, North Laguna, and South Laguna mining areas. The districts are physiographically separated, Laguna lying to the east and Grants and Gallup to the west (Kelley, 1963; Kittel, Kelley, and Melancon, 1967).

The Continental Divide, extending through approximately the middle of the area, separates the region into two areas of drainage. West of the Divide, streams and rivers drain into the Gulf of California via the Colorado River system, while to the east they eventually join the Rio Grande (Dutton, 1885). Nearly all the streams in the area are intermittent and flow only during periods of intense precipitation (Cooper and John, 1968; Gordon, 1961).

The Grants Mineral Belt of northwestern New Mexico is within the Navajo and Datil sections of the Colorado Plateau physiographic province (Fenneman, 1931). To the east are the Southern Rocky Mountains and to the west and south, the Basin and Range province. To the north lie the Central Rocky Mountains.

Characteristic landforms within the study area include rugged mountains, broad, flat valleys, mesas, cuestas, rock terraces, steep escarpments, canyons, lava flows, volcanic cones, buttes, and arroyos (Kittel, Kelley, and Melancon, 1967; Cooper and John, 1968). Lava flows and volcanic necks are the predominant landmarks of the Datil section (Fenneman, 1931).

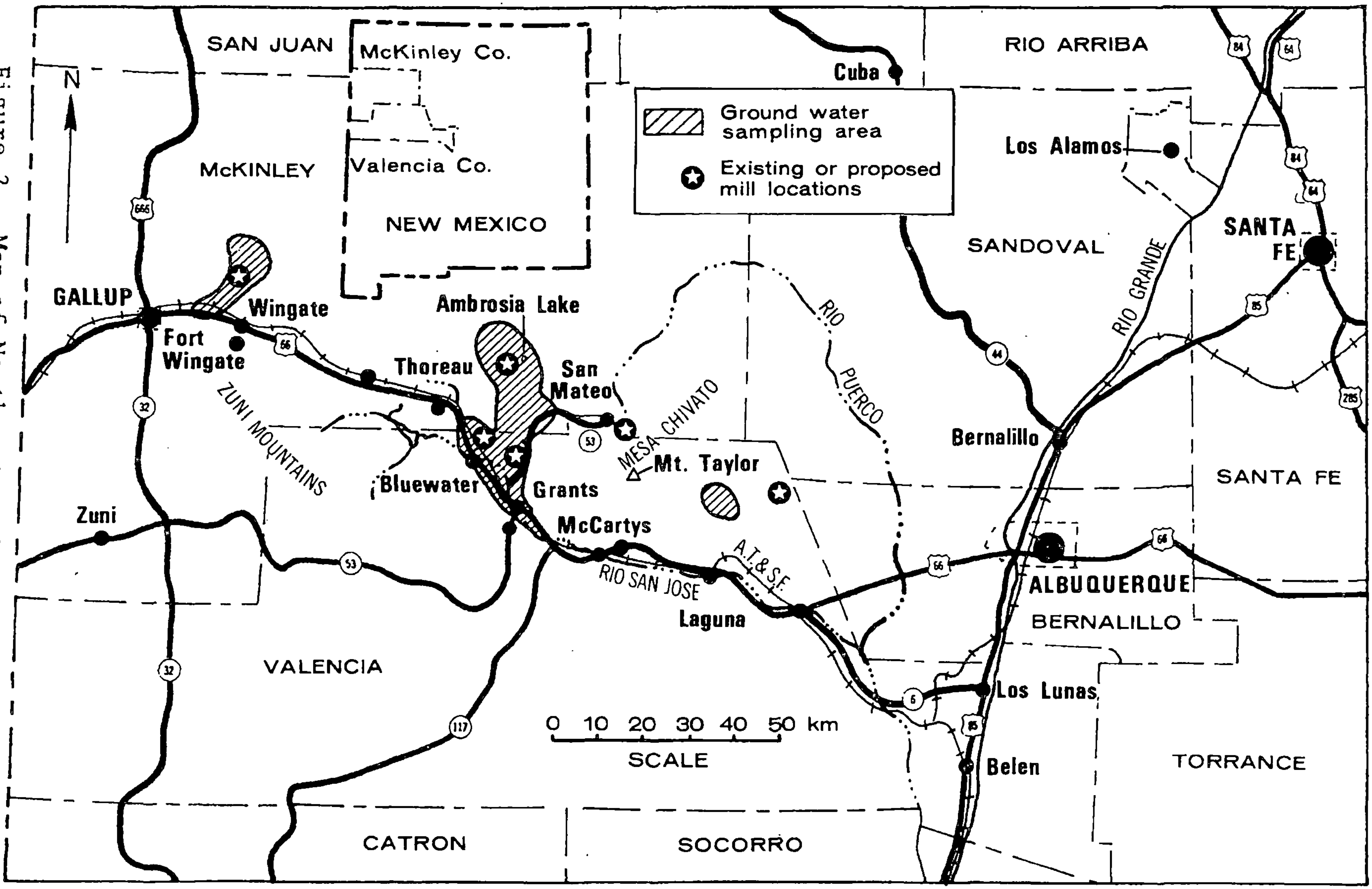


Figure 2. Map of Northwestern New Mexico Showing General Location of Sampling Areas in the Grants Mineral Belt

Prior to uranium mining and the discharge of mine and mill effluents, there were no perennial streams in southeastern McKinley County. In this period, the arroyos and wash channels and other natural depressions such as Ambrosia Lake, Casamero Lake and Smith Lake contained water only after heavy rains. There are intermittent ponds and lakes in the volcanic craters of the Cebolleta Mountains. The only perennial source of water is part of Bluewater Lake at the junction of Azul and Bluewater Creeks (Cooper and John, 1968).

Principal Industries

Until relatively recently, the principal industries in McKinley and Valencia Counties of northwestern New Mexico were farming and ranching. Tourism and small-scale logging were secondary. The land is mostly used for livestock grazing, while some irrigated farming is done in the valleys of Bluewater Creek and the Rio San Jose. The main crops are vegetables, and plants exist in the area for processing and packaging them.

Now that uranium ore has been found to be widespread throughout the Grants Mineral Belt, the uranium mining and milling industry predominates. What was a rural agricultural economy has partly become an industrial one. The figures on Table 1 indicate the importance of the uranium industry in the economy of New Mexico, especially the northwest part. The growth of the uranium industry has created a need for associated industries and services, especially the chemical industry. Caustic soda and soda ash are the main alkalies used in uranium milling. The construction and housing industries have flourished, and mining supply firms and concrete companies have been established (Gordon, 1961).

Gallup and Grants have grown rapidly, as have some of the smaller villages and communities. The population of McKinley County has grown from 27,451 in 1950 to 43,208 in 1970, and that of Valencia from 22,481 to 40,539 (University of New Mexico, Bureau of Business Research, 1972).

Table 1

Uranium Economy of New Mexico

Year	Production (tons or metric tons)	Value	Reserve	Percent of U. S. Total Reserve
1956	1,105,000 tons	$ 24,086,000	41 million tons	66 2/3%
1959	3,269,826 tons	$ 53,463,000	55 million tons	63%
Year ending June 30, 1962		McKinley Co. only $ 57,431,391		
1970	11,574,000 tons	$ 69,970,000		
1974	7,527 metric tons U_3O_8	$102,060,000		42%

1974 Production Capacity of Uranium Mills in New Mexico

Company	Plant Location	Nominal Capacity Tons Ore Per Day
The Anaconda Co.	Grants, New Mexico	3,000
Kerr-McGee Nuclear Corp.	Grants, New Mexico	7,000
United Nuclear-Homestake Partners	Grants, New Mexico	3,500
	Total	13,500
	Total U.S.	28,550
	Percentage in N.M.	47%

References: Midwest Research Institute (1975)
Health & Social Services, State of New Mexico (1975)
WASH 1174-74, The Nuclear Industry, USAEC (1974)

GEOLOGY AND HYDROLOGY

The principal bedrock and alluvial stratigraphic units in the Grants Mineral Belt range in age from Pennsylvanian to Recent (Hilpert, 1963). Figure 2, which is a generalized geologic cross section through the Grants and Ambrosia Lake areas, portrays these units and the dominant structural feature which is the Chaco slope developed on the north flank of the Zuni uplift. Conditions in the Churchrock area are essentially the same.

Pronounced topographic expression of the gently sloping bedrock units is abundantly evident in the Grants Mineral Belt. The sandstone strata on the mesas, actually gently dipping cuestas, form protective caps which resist weathering. The concave slopes and bottom lands form on less resistant units, typically shales and thin-bedded sandstones interbedded with shale. Although geographically less extensive, lava beds and limestone strata also function as caprocks.

Due to the scarcity of perennial surface water bodies, ground water is the principal source of water in the study area. Industrial, municipal, stock, and private domestic wells tap both bedrock and alluvial aquifers. In general, wells of low to moderate productivity are possible in the unconsolidated valley fill which constitutes an aquifer, primarily along the broad valleys of the Rio San Jose and the Rio Puerco. Numerous shallow domestic wells south and southwest of the United Nuclear-Homestake Partners mill also tap the shallow, unconfined aquifer. Part of the water supply for Gallup, and essentially all of that for Milan and Grants, is derived from shallow wells tapping valley fill and interbedded basalt layers (Dinwiddie et al., 1966).

Process water for the various uranium mills is derived from deep wells tapping bedrock aquifers. This is true for the Anaconda Company and United Nuclear-Homestake Partners mills, both of which tap the San Andres Limestone. Part of the feed water for the Kerr-McGee mill is from wells in the Morrison Formation and the more deeply buried Glorieta Sandstone and San Andres Limestone, with the balance coming from treated mine drainage water. Without exception, the operating mines continuously pump ground water as part of the mining operation. Where economical concentrations of uranium

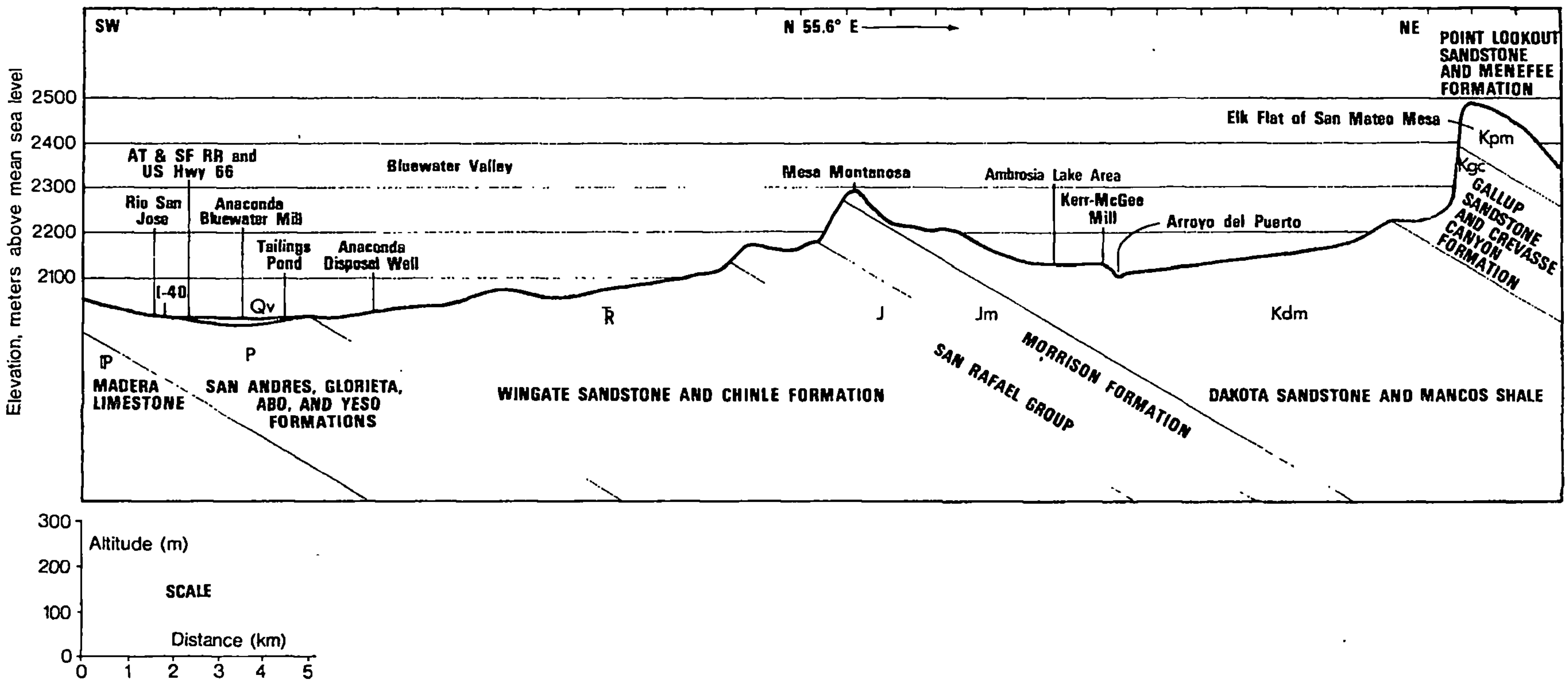


Figure 2. Generalized Structure Section from Bluewater to Ambrosia Lake

are present, ion exchange plants are operated to effect recovery from the waste streams, but radium removal is not practiced. In effect, the various mines are high capacity wells which locally dewater the ore-bearing formations, chief of which is the Westwater Canyon Member of the Morrison Formation. To a lesser extent, the overlying strata such as the Dakota Formation are also affected by dewatering.

The impacts of ground-water pumping and discharge to surface water courses are varied. Declining water levels in the aquifers tapped, and possibly in the adjacent formations, are immediately noticeable. For example, in the Churchrock area, the static water level in the old Churchrock mine is declining about 0.3 meter per month due to dewatering at the United Nuclear and Kerr-McGee mines. Discharge of the mine water has transformed nearby dry washes and ephemeral streams into perennial ones. Rio Puerco, Arroyo del Puerto, and San Mateo Creek are cases in point. Water introduced to these channels will persist until the losses due to bed infiltration, evapotranspiration, and diversion equal inflow. Infiltration of such waters to shallow alluvial aquifers may be adverse, depending on the quality of infiltrating water relative to ambient water quality in the aquifer and the use to which shallow ground water is or will be put. The combination of declining water levels in the deeper, bedrock aquifers and deteriorated water quality in the shallow aquifers may have particularly adverse impacts on stock wells also used by the local populace for potable supply.

Sorption of radionuclides, such as radium on the stream sediments, may result in a buildup of material that will later be dispersed by channel scouring associated with flash flooding. Both the gradual buildup of radium in the sediments and its subsequent redistribution will result in increased levels of radioactivity in the environment as compared to ambient, pre-mining conditions.

Uranium mining and milling in the study area are of particular importance to several aquifers in the study area. Wastes from the Anaconda Company mill in Bluewater have infiltrated via the tailings pile and affected the shallow, unconfined aquifer (Tsivoglou and O'Connell, 1962). Injection of wastes into the deeply buried Abo and Yeso Formations has increased radioactivity and salinity levels therein. Strictly speaking, these are considered aquifers despite the mineralized water naturally present. Should the contamination move upward into potable aquifers and extend too far laterally, injection would likely be terminated. Widespread contamination of the shallow aquifer adjacent to the tailings pond would similarly require abatement.

The Chinle Formation is a source of domestic water in the Murray Acres and Broadview Acres subdivisions downgradient from the United Nuclear-Homestake Partners mill. As will be shown below, the shallow alluvial aquifer in this area is already believed to be contaminated by the infiltration of effluents from the mill.

In the Ambrosia Lake area, contamination of shallow ground water is likely to be a result of infiltration of 1) effluents from the tailings ponds at the Kerr-McGee mill, 2) mine drainage water that is introduced to settling lagoons and natural water courses, and 3) discharges from ion exchange plants. Seepage from the now inactive United Nuclear, Inc., (formerly Phillips) mill tailings pile is also undoubtedly present in the shallow subsurface. The ultimate impact of these waste waters on ground-water quality is unknown. It is unlikely that seepage returns to the deep, bedrock aquifers will occur because of their relatively great depth and the presence of numerous impermeable layers between the shallow alluvial materials and the principal aquifer (Westwater Canyon Member). A possible exception to this occurs in the vicinity of the Kerr-McGee Section 36 mine where drainage enters a nearby holding pond and seeps out the bottom at a rate of about 400 liters/minute. Seepage may move along the underlying San Mateo fault and enter potable aquifers. Very limited volumes of water in the shallow alluvium render it an insignificant source of supply. What water is present near the mining and milling areas is now likely to be contaminated to varying degrees by industrial effluents. The long-term infiltration of radium-laden water along the stream channel of San Mateo Creek, both above and below the confluence with Arroyo del Puerto, may adversely affect the quality of shallow ground water now developed for stock watering.

The potential for future problems of water availability for ore processing in Ambrosia Lake has been cited by Cooper and John (1968). In essence, dewatering of the principal aquifer (Westwater Canyon Member of the Morrison Formation) to facilitate mining may necessitate use of the poorer quality water in the underlying Bluff Sandstone.

Hydrogeologic conditions in the vicinity of the Churchrock mines basically resemble those in Ambrosia Lake with respect to potential impacts of mining and milling on ground water. The potential for contamination of shallow ground-water resources is greatest along the channel of the Rio Puerco. Under natural conditions, shallow ground water was scarce or nonexistent; hence, deeper wells completed in bedrock are required for a reliable supply. With continued infiltration of mine drainage water, at least local saturation of the alluvium may occur and lead to ground water development using shallow wells. However, the radium content of the drainage water discharged to date is excessive for potable or stock use of such water, and long term recharge with mine drainage water is not recommended. The potential for contamination of municipal wells along the Rio Puerco, particularly on the east and west fringes of Gallup, is unlikely.

INDUSTRY-SPONSORED WATER QUALITY MONITORING PROGRAMS

Introduction

A principal goal of the project was to evaluate the nature and extent of water monitoring programs, and data therefrom, as implemented by industry. This presumed that descriptions of the sampling points, analytical procedures, and resulting data would be available for examination upon request to the companies. With the exception of the Anaconda Company, this was not the case.

The inadequacies of industry-supported testing and monitoring programs noted by Clark (1974) include lack of sufficient data, intermittent data, and unreliable data.... conclusions, which are at least not contradicted by the present study.

The most extensive monitoring and testing programs to detect ground-water contamination are conducted by Kerr-McGee and Anaconda. By comparison, United Nuclear and United Nuclear-Homestake Partners have minimal programs both at the mines and at the mills. Therefore, the Kerr-McGee and Anaconda programs, although in need of revision, are a marked improvement compared to inactivity.

Of greatest environmental concern is the discharge of waste water originating from mining and from ore processing. Included in the latter is the discharge stream or tailings from conventional acid and alkaline leach mills and from ion-exchange plants. A third problem area, concerning impacts on ground-water quality from solution mining in the Ambrosia Lake area, is essentially unknown outside the industries involved.

Identification of industrial ground-water monitoring programs, if any, to determine hydraulic and water quality responses to both shaft and solution mining was beyond the scope of the present project. It is expected that solution mining and the use of IX plants, with and without recycling, will gain in popularity, particularly if stricter discharge limits for uranium induce greater capital investment in IX equipment. For this reason, and also because of the heavy ground-water extraction associated with deep mining, deliberate monitoring programs should be implemented and the data made publicly available to detect likely hydraulic and water quality responses.

Adequacy of Water Quality Data and Monitoring Programs

Evaluating the adequacy of a ground-water monitoring program is rather subjective and rarely will there be unanimity of opinion. The diversity of mining activities and geologic or hydrologic settings necessitates great variety in program design. Outlooks and goals of diverse groups also play a large role.

On the basis of the information utilized, the principal deficiencies with ongoing programs can be classified under the following headings:

1. Ground-water monitoring
2. Analytical techniques and reporting procedures
3. Regulatory agency review

Existing ground-water sampling networks range from non-existent to defective. The non-existent networks involve entire operations, as in the case of the United Nuclear Corporation, or portions of operations, as in the case of the solution mining conducted by United Nuclear-Homestake Partners.

The latter's monitoring of a single well at the mill site to determine shallow ground-water contamination is considered grossly deficient. In essentially every instance of mining and milling, baseline ground-water conditions were not defined. Therefore, any changes due to disruption of natural conditions cannot be assessed. In the case of the Anaconda waste management program, for example, there is no information concerning pre-disposal concentrations of stable and radioactive chemical species in overlying potable reservoirs already affected by the wastewater.

Of the active ground-water monitoring programs that were reviewed, great reliance is placed on documenting the quality of water in active wells within the surrounding region. This is laudable with respect to current water use, but not especially productive in terms of defining water quality impacts. In many instances, sampling wells are located hydraulically upgradient or are so far removed from the likely effects of mining or milling as to show no change. Wells of excessive depth, i.e., below the aquifer likely to show change, are also of dubious value as monitoring points. With the exception of a portion of the Kerr-McGee on-site net, wells specifically constructed for monitoring are commonly too few in number and improperly situated with respect to depth and (or) location. Compared to the multi-million dollar uranium industry, producing multi-billion liters of toxic effluents, the ground-water sampling and monitoring programs represent minimal efforts in terms of network design, implementation, and level of investment. There are indications that deterioration in water quality is occurring through time and very possibly in response to the waste volumes disposed of in the last 15 years. With regard to this disposal scheme, there is real question as to whether the data that have been generated have been scrutinized. In other instances, expected adverse impacts of seepage on shallow ground water have not been found because they have either not been sought or have been sought in unlikely locations.

No response to the requests for information regarding analytical methods and reported results was received from three of the four companies contacted. A review of the available records by the authors at the New Mexico Environmental Improvement Agency indicates many deficiencies in the company programs. These deficiencies include lack of information concerning minimum detectable activities for analytical procedures utilized, overly large error terms, poor agreement with outside laboratories, absence of quality assurance programs, inability to detect radionuclides at truly environmental or background levels, and irregular or random sampling frequencies. Analysis for specific radionuclides such as isotopic thorium, lead-210, polonium-210, radium-228, all of which are associated with mining and milling effluents, is rarely done. With the exception of the Anaconda Company, results of monitoring programs to determine background levels of both radionuclides or chemical components are not discussed in any of the reports of the companies. From the data/reports reviewed, it is doubtful that the various company laboratories have the analytical capabilities to accurately analyze for environmental levels of the common radionuclides associated with uranium mining and milling.

During February 11 and 12, 1975, a brief review of available company records, USAEC inspection reports, and mill licenses in the possession of NMEIA was conducted. The following findings are preliminary, as not all of the company records were available at the time of the review:

1. The available records are disorganized and incomplete. A complete copy of each company's radioactive material license and supporting correspondence could not be found. Radiological monitoring data reports were often missing or incomplete. Attachments and maps referred to in correspondence in the records could not be found.

2. Except for the license condition requiring monitoring data related to the Anaconda waste injection program, USAEC licenses for the other uranium mills have never specifically required the establishment of ground-water monitoring networks or reporting of any data pertaining to such monitoring. (Some limited programs have, however, been described in company license applications.)

3. It appears that no effort has been made to review or to summarize the reported monitoring data. No interpretive or summary reports concerning environmental impact have been prepared.

4. Almost no information has been reported by the companies describing their radiochemical analytical procedures, quality assurance programs, or the accuracy and precision of reported results.

5. Review by State and Federal regulatory agencies of reports of company efforts to evaluate the fate of liquid tailings waste effluents (e.g., materials and water balances between input versus evaporation, spillage, or ground seepage and total pond capacity) are essentially non-existent.

Noted deficiencies at the Federal level stem largely from the rather liberal, initial licensing conditions (with respect to ground-water monitoring), perfunctory inspection of company monitoring programs and data, and, in general, the somewhat haphazard manner in which information was filed and cataloged for later reference. Simply put, the uranium mining and milling industry has not been overly pressed to monitor and protect ground-water resources, and what efforts they have put forth have largely not been reviewed.

GROUND-WATER QUALITY IMPACTS

Introduction

The breadth of mining and milling operations in the study area clearly requires additional study if ground-water impacts are to be understood in any detailed or quantitative sense. The following discussion must necessarily be regarded as a preliminary assessment of but a small facet of the overall mining and milling activity. Impacts of inactive operations, such as the Phillips mill, or future impacts from sources under development, such as the Gulf mine and mill in San Mateo or the nearby Johnny M mine, are not addressed herein. Very large voids in our knowledge of impacts on water sources include solution mining practices and dewatering of ore bodies. Essentially no data or interpretive reports are available outside industry circles that describe the hydraulic and water quality impacts of these operations, which may well have the greatest impact of all on ground water.

Contaminated and background concentrations of selected radionuclides, as well as gross and trace chemical constituents, were determined for 71 wells in the study area. These data are presented in Tables 2 through 5. In certain locations, these data relate to surface water phenomena such as natural streams or to manmade features, foremost of which are tailings disposal ponds or streams originating as mine discharge.

The data are discussed by study area and by uranium mining/milling activities therein.

Table 5 summarizes ground-water data from the present study and categorizes the data according to study area and aquifer. These reported values are the lowest concentrations reported for samples collected during the study and may not necessarily represent "true" background or ambient values that may have existed prior to uranium mining and milling activities in this area. For the most part, the values shown for bedrock aquifers are not from the principal ore-producing formations, namely the Westwater Canyon Member of the Morrison Formation. In the Grants-Bluewater area, "bedrock" refers primarily to the San Andres Limestone, whereas near the United Nuclear-Homestake Partners mill, the term includes the San Andres Limestone and the Chinle Formation. At Ambrosia Lake, the Westwater Canyon Member and the Bluff Wingate Sandstones were sampled, whereas

Table 2
Sampling Point Locations and Gross Chemical Data for Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	T	R	S	Q	LOCATION LAT.	LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	CONCENTRATION, mg/l TDS	CL	NH_3	NO_2+NO_3 as N
Paguate-Jackpile																				
9230	Well #4 (Anaconda Co.)	11	5	27	421	350909	1072054	210.	34.9	2/75	3	2/28	PI	17.4	8.8	1100	540.	<0.2	0.05	0.05
9231	Well P-10 (Anaconda Co.)	10	5	4	413	350716	1072214	--	61.6	2/75	8	2/28	PI	36.1	8.3	2500	1200.	0.5	0.08	0.04
9232	New Shop Well (Anac. Co.)	10	5	9	224	350653	1072152	184.	--	--	3	2/28	PI	13.6	8.1	2500	1400.	0.5	0.14	0.05
9233	Paguate Municipal Well	11	5	32	241	350828	1072302	22.9	Art.	2/75	3	2/28	M	15.2	7.5	675	340.	6.6	0.08	0.20
Grants-Bluewater																				
9021	Injection Well (Anac.Co.)	12	10	8	314	351649	1075519	547.4	72.2	4/59	9	2/28	W					65.	69.0	32.8
9101	Mt. Taylor Mill Works Old Rt. 66	11	10	5	442	351224	1075422	58.5	--	--	1	2/24	PI	12.	6.25	1050	780.	25.	0.04	4.2
9103	Q. Connerly	11	10	9	221	351212	1075331	37.2	24.4	2/75	3	2/25	P	12.	7.4	1200	880.	33.	<0.01	6.2
9111	C&E Concrete	11	10	22	341	350950	1075257	36.6	24.4	2/75	3	2/26	PI	14.	7.6	775	560.	30.	0.05	3.4
9112	Grants City Hall, Municipal water supply	11	10	26	244	350914	1075117	N/A	N/A	--	1	2/26	M	11.	7.3	1000	730.	32.	0.02	0.47
9115	Auro's Bar & Motel, Cowell House	12	11	24	334	351449	1075718	45.7	--	--	1	2/26	P	14.	7.1	1425	1100.	6.2	0.02	3.9
9116	Milan Well #1	11	10	21	221	351029	1075333	45.7	16.5	10/47	3	2/26	M	17.	7.5	700	500.	14.	0.02	1.6
9117	Monitor Well (Anac. Co.)	12	10	8	332	351650	1075518	191.4	58.3	3/60	1	2/27	O	20.	6.8	2900	2300.	11.	0.03	1.5
9118	Well #2 (Anac. Co.)	12	11	24	234	351527	1075648	138.	51.2	5/72	3	2/27	IP	18.5	7.1	2550	1900.	270.	0.64	39.9
9119	Well #4 (Anac. Co.)	12	11	25	214	351436	1075650	69.	42.1	5/72	3	2/27	IP	17.	7.2	1225	890.	42.	0.13	5.7
9120	Mexican Camp	12	10	30	112	351443	1075617	85.3	43.6	2/47	3	2/27	O	15.	7.5	720	490.	10.	0.04	0.73
9121	Berryhill, Sec. 5 (Anac. Co.)	12	10	5	341	351813	1075512	221.	74.9	1/58	4	2/27	S	20.	7.0	2900	2000.	4.2	0.14	0.05
9122	North Well (Anac. Co.)	12	10	7	143	351731	1075611	76.2	53.9	10/55	4	2/27	O	17.5	7.4	2200	1900.	4.2	0.08	1.3
9123	Engineer's Well	12	11	14	213	351643	1075801	35.1	26.8	2/75	2	2/28	O	11.5	7.3	1625	950.	61.	0.09	3.2
9124	Berryhill House	12	11	11	334	351659	1075823	45.7	37.1	6/56	1	2/28	P	11.	7.5	1800	940.	65.	0.05	0.8
9125	LDS Church-Bluewater	12	11	22	234	351521	1075859	70.2	27.9	12/46	1	2/28	M	5.	7.5	1300	1000.	12.	0.05	0.95
9126	Roundy House Well	12	11	23	231	351532	1075800	91.4	21.2	1/47	1	2/28	P	10.5	7.3	1975	1100.	110.	0.04	6.5
9127	Fred Freas	12	10	30	433	351347	1075552	41.1	--	--	3	2/28	P	13.	7.7	1025	540.	18.	0.03	0.03
9128	Leroy Chapman	12	10	32	211	351338	1075450	41.1	23.	1/47	1	2/28	P	11.	7.6	950	490.	13.	0.03	1.4
9129	Jack Freas	12	10	30	242	351424	1075530	48.8	32.5	2/55	1	2/28	P	11.5	7.5	1325	790.	54.	0.04	2.5

(Continued)

(continued)

Table 2

Sampling Point Locations and Gross Chemical Data for Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	T	R	S	Q	LOCATION LAT.	LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	TDS	CONCENTRATION, mg/l CL	NH_3	NO_2+NO_3 as N
United Nuclear-Homestake Partners																				
9102	G. Wilcox	12	10	27	442	351410	1075217	32.6	--	--	3	2/24	P	14.	6.5	2850	2300.	180.	0.01	5.5
9104	T. Simpson	12	10	27	444	351403	1075217	87.5	--		1	2/25	P	10.	8.4	2050	1400.	37.	<0.01	0.08
9105	Schwagerty	12	10	34	224	351351	1075218	77.7	--		1	2/25	P	11.	7.5	1950	1300.	46.	<0.01	1.00
9106	J. Pitman	12	10	35	332	351345	1075214	89.9	--		1	2/25	P	14.	8.8	1725	1300.	39.	<0.01	0.23
9107	C. Worthen	12	10	35	332	351341	1075208	26.2	5.5	2/75	3	2/25	P	14.	7.4	4000	3800.	260.	0.01	62
9108	Pitney	12	10	27	431	351406	1075246	54.9	--	--	6	2/25	P	14.	7.6	2775	2200.	110.	0.01	3.3
9109	T. A. Chapman	12	10	34	121	351352	1075255	38.1	13.1	2/75	6	2/25	P	14.5	7.5	1700	1300.	9.5	0.01	2.5
9113	C. Meador	12	10	35	144	351336	1075150	36.6	--		1	2/26	P	8.	7.8	2025	1600.	120.	0.01	2.9
9114	Bell	12	10	25	133	351427	1075108	152.4	--		1	2/26	P	17.	9.3	1475	970.	34.	<0.01	0.03
9133	G. Enyart	12	10	27	331	351408	1075312	64.0	15.2	3/75	1	3/02	P	18.	7.6	3000	1600.	50.	0.26	0.97
9134	Well #2 (UNHP)	12	10	26	311	351422	1075146	121.9	21.6	5/56	3	3/03	PI	15.	6.95	1600	1600.	0.2	0.03	0.42
9135	Well D (UNHP)	12	10	26	313	351417	1075208	26.8	16.4	3/75	3	3/03	O	12.	7.2	3500	4500.	340.	1.0	2.6
9136	Well #1 (UNHP)	12	10	26	242	351431	1075117	298.7	40.8	5/58	3	3/03	PI	18.	6.9	1850	2000.	<0.2	0.07	0.28
Ambrosia Lake																				
9130	N. Marquez house well	13	9	23	212	352048	1074527	85.3	15.4	3/75	3	3/01	N	16.	8.9	1300	720.	4.8	0.04	0.06
9131	C. Sandoval windmill	13	9	22	212	352043	1074526	39.6	11.3	3/75	3	3/01	S	14.	8.0	1300	660.	27.	0.06	1.2
9132	N. Marquez windmill	13	9	21	414	352022	1074803	44.2	19.5	3/75	5	3/01	N	14.	7.6	4250	2200.	43.	0.22	106.3
9201	KM-46, P. Harris (Wilcoxson)	13	9	16	411	352114	1074738	76.2	--	--	3	2/26	PS	13.	6.7	3250	1900.	23.	0.14	0.09
9202	KM-52, County Lne Stk Tnk	12	10	12	433	351636	1075037	30.5	14.2	11/55	3	2/26	SP	6.5	7.05	2200	2100.	56.	0.06	62
9203	KM-45, Navajo windmill	13	10	8	211	352238	1075508	108.8	--	--	7	2/26	SP	3.1	8.5	620	400.	6.8	0.02	4.0
9204	KM-49, Ingersoll Rand	13	9	22	121	352050	1074655	90.5	--	--	1	2/26	P	5.4	7.45	2150	2200.	36.	0.05	79.7
9205	KM-47, Bingham	13	9	22	121	352053	1074650	79.2	--	--	3	2/26	P	14.2	7.1	3100	2000.	40.	0.04	4.7
9206	KM-63, Marquez	13	9	15	343	352055	1074647	117.3	--	--	3	2/26	P.	13.	7.15	2050	1900.	34.	0.05	4.4
9207	KM-S-12	14	9	32	313	352346	1074911	12.5	0.91	2/75	5	2/27	O	11.9	6.5	>8000	14000.	3100.	0.50	0.04
9208	KM-43	14	9	32	321	352355	1074900	16.2	6.4	2/75	5	2/27	O	13.	7.5	7000	7800.	3.8	NS	NS
9209	KM-44	14	9	32	312	352355	1074902	42.1	32.9	2/75	5	2/27	O	14.1	7.1	3100	2700.	17.	0.66	48.7
9210	KM-51	14	9	32	322	352353	1074850	19.2	8.8	2/75	2	2/27	O	11.9	7.0	6000	6300.	44.	0.30	350
9211	KM-48	14	9	30	432	352430	1074939	16.2	11.3	2/75	5	2/27	O	13.	7.0	4200	4100.	31.	0.90	1.3
9212	KM, Seepage return	14	9	31	442	352342	1074919	N/A	N/A	N/A	3	3/03	-	9.	2.2	>>8000	36000.	3100.	590.	53
9213	KM-B-2	14	9	31	421	352354	1074926	8.2	1.04	3/75	5	3/03	O	8.6	5.5	>>8000	8900.	3400.	0.12	0.25

(Continued)

(continued)

Table 2
Sampling Point Locations and Gross Chemical Data for Ground-water Samples from the Grants Mineral Belt, New Mexico

NUMBER	DESCRIPTION	T	R	S	Q	LOCATION LAT.	LONG.	WELL DEPTH (m)	STATIC WATER LEVEL (m)	DATE MEAS.	SAMPLE POINT TYPE[1]	DATE SAMPLED[2]	WATER USE[3]	TEMP. °C	pH	SP. COND. umhos/cm	TDS	CONCENTRATION, mg/l CL	NH_3	NO_2 $+NO_3$ as N
Ambrosia Lake (Continued)																				
9214	KM-36-2	14	10	36	422	352352	1075026	17.4	10.1	3/75	5	3/03	0	12.5	6.85	>8000	9100.	1700.	2.9	8.0
9215	KM-46	14	9	30	331	352430	1075017	11.6	10.1	2/75	2	3/03	0	13.	6.7	3250	3200.	100.	10.	2.0
9216	KM-47	14	9	30	341	352430	1074959	18.9	7.3	2/75	5	3/03	0	14.2	7.1	3100	2600.	74.	0.80	2.6
9217	KM-50	14	9	32	114	352414	1074901	16.6	14.0	2/75	2	3/03	0	11.9	7.7	5750	4700.	470.	9.1	70.9
9218	KM-5-1	13	9	5	214	352316	1074835	10.4	7.3	3/75	5	3/03	0	13.5	6.95	5000	4800.	61.	0.16	0.40
9219	KM-5-2	13	9	5	141	352310	1074856	10.4	6.0	3/75	5	3/03	0	12.5	7.1	>8000	6700.	1300.	0.08	1.3
Gallup-Churchrock																				
9137	Erwin well	16	18	7	433	353730	1084524	610.	221.0	3/75	3	3/05	M	--	7.85	1225	740.	14.	0.09	0.02
9138	Boardman Trailer Park	15	18	14	243	353159	1084237	91.4	45.7	3/75	3	3/05	P	--	7.6	1450	930.	<0.2	0.50	1.2
9139	G. Hassler	15	17	8	133	353242	1084008	91.4	4.6	3/75	1	3/05	P	--	7.75	1400	880.	98.	0.02	119.6
9140	Dixie well	15	17	9	413	353227	1083835	--	1.2	3/75	3	3/05	N	--	7.7	2400	1500.	<0.2	0.30	0.16
9141	Churchrock Village	15	17	12	333	353222	1083553	65.6	--	--	6	3/05	P	--	7.8	1375	720.	0.5	0.50	0.18
9142	White well	16	16	16	422	353701	1083147	--	2.1	3/75	2	3/05	N	--	8.00	1000	620.	630.	0.01	0.02
9220	CRKM-2, Hardground Flats well	Navajo Reservation				353958	1083404	189.6	--	--	4	3/05	SP	--	9.15	1350	850.	0.	0.03	0.28
9221	CRKM-11, E. Puerco River well (=Togay well, 9143)	16	16	15	431	353638	1083059	96.9	--	--	7	3/05	SP	--	7.65	550	340.	14.	0.04	62
9222	CRKM-16, Puerco well	16	17	25	113	353533	1083551	42.7	7.04	3/75	7	3/05	SP	--	7.25	2200	1600.	0.	34.	0.01
9223	CRKM-5, Pipeline Rd well	16	15	33	422	353420	1083810	37.2	10.7	3/75	7	3/05	S	--	7.65	1350	880.	0.	1.4	1.6
9224	CRKM-3, Nose Rock well	16	17	15	131	353709	1083720	207.3	31.4	--	4	3/05	SP	--	8.9	1550	980.	0.	0.07	0.03
9225	CRKM-10, N.E. Pipeline well	Navajo Reservation				354015	1082841	284.1	>91.4	3/75	7	3/05	SP	--	8.05	2650	2300.	8.1	0.12	0.01

Explanation

1 - Sampling Point
- 1-outside faucet
- 2-hand bailed
- 3-pumped (well head)
- 4-windmill
- 5-mobile pump
- 6-kitchen faucet
- 7-holding tank
- 8-wash room
- 9-pre-injection filter discharge

2 - Date Sampled
- 1975

3 - Well Type
- N-not in use
- P-potable
- S-stock
- M-municipal supply
- I-industrial
- O-observation/monitor
- W-waste discharge

Table 3
Selenium and Vanadium Concentrations in Selected Ground-water Samples[1]

NUMBER	DESCRIPTION	Se (mg/l)	V (mg/l)
United Nuclear-Homestake Partners			
9102	G. Wilcox	1.06	<0.3
9107	C. Worthen	1.06	0.3
9113	C. Meador	0.20	0.3
9134	Well #2 (UNHP)	<0.01	1.3
9135	Well D (UHNP)	1.52	0.4
Grants Bluewater			
9117	Monitor well (Anaconda)	0.01	0.3
9118	Well #2	0.01	0.8
9119	Well #4	<0.01	0.9
9120	Mexican Camp	<0.01	1.0
9121	Berryhill, Section 5	<0.01	0.8
9123	Engineer's well	0.01	1.1
9129	Jack Freas	0.02	1.3
Ambrosia Lake			
9132	N. Marquez windmill	.13	< .3
9201	KM-46, P. Harris (Wilcoxson)	<0.01	< .3
9207	KM-S-12	<0.01	0.4
9208	KM-43	.29	0.8
9209	KM-44	.01	<0.3
9211	KM-48	<0.1	0.5
9213	KM-B-2	<0.1	0.6
9214	KM-36-2	.02	<0.3
9215	KM-46	<0.01	<0.3
9219	KM-5-2	0.01	<0.3
Gallup-Churchrock			
9138	Boardman Trailer Park	<0.01	<0.3
9140	Dixie well	<0.01	<0.3
9141	Churchrock Village	<0.01	<0.3
9142	White well	<0.01	<0.3
9221	CRKM-11, E. Puerco	0.01	<0.3
9222	CRKM-16, Puerco well	<0.01	<0.3
Paguate-Jackpile			
9230	Well #4	<0.01	<0.3
9232	New Shop well	<0.01	<0.3
9233	Paguate Municipal well	0.01	<0.3

[1] Analyzed by National Enforcement Investigations Center, Denver, Colorado.

Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Number	Location Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.		Th-230	Th-232	Po-210
	Paguate-Jackpile											
9230	Well #4	< 2.0 ± 5	0.31 ± .02	0.23 ±.095						< 0.029	0.012	0.31 ± .11
9231	Well P-10	10 ± 10	1.7 ± .05							< 0.016	< 0.016	0.29 ± .11
9232	New Shop Well	18 ± 13	3.7 ± .08					0.02	14	< 0.016	< 0.011	0.69 ± .20
9233	Paguate Municipal Well	2 ± 4	0.18 ± .02	0.10 ±.072				0.04	27	< 0.018	< 0.010	0.39 ± .18
	Grants--Bluewater Area											
9024	Injection Well Anaconda Company	62,500±1,300	53 ±1	27 ±0.95	10,000±750	420 ±67	11,000±770	130	86,000	82000±1200	51 ± 30	3,100±250
9101	Mt. Taylor Mill Works Old Mt. 66	9± 11	0.13± .01									
9103	Q. Connerly	7± 10	0.09± .01									
9111	C&E Concrete	7± 9	0.24± .01							<0.028	<0.012	0.55± .15
9112	Grants City Hall	19± 13	0.42± .02	0.10± .098						0.046±.038	0.0094±.021	0.26± .13
9115	Cowell House	7± 12	0.18± .01									
9116	Milan Well No. 1	12± 10	0.14± .01							<0.0072	<0.013	0.30± .12
9117	Monitor Well Anaconda Company	190± 40	2.6 ± .1	2.6 ± .30	100± 7.7	3.0± .58	74± 5.7	0.56	379	<0.016	<0.0097	2.3 ± .90
9118	Well No. 2 Anaconda Company	290± 50	0.50± .02	0.21± .09				1.3	860	0.52±.093	0.54±.094	1.1 ± .37
9119	Well No. 4 Anaconda Company	12± 11	0.20± .01	0.18± .089						<0.030	<0.019	0.26± .19
9120	Mexican Camp	21± 12	0.27± .02							<0.017	<0.0053	0.66± .25
9121	Berryhill Section 5	12± 14	6.3 ± .1							<0.0081	<0.0051	0.28± .17
9122	North Well	30± 17	0.17± .01							0.034±.024	<0.0084	0.51± .17
9123	Engineer's Well	20± 13	0.26± .01	0.36± .11						0.033±.026	<0.016	0.48± .26
9124	Berryhill House	16± 12	0.06± .01									
9125	LDS Church--Bluewater	3± 10	0.22± .01							<0.034	<0.012	<0.070
9126	Roundy House	5± 9	0.11± .01							0.040±.031	<0.015	<0.10
9127	Fred Freas	10± 10	0.21± .01	0.28± .11						<0.034	<0.029	0.39± .14
9128	L. Chapman	11± 11	0.15± .01									
9129	Jack Freas	<1.6± 7	0.14± .01	0.87± .29						<0.018	<0.012	0.31± .16

(continued)
Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Location Number	Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.		Th-230	Th-232	Po-210
United Nuclear - Homestake Partners												
9102-G.	Wilcox	< 3 ± 13	0.19 ± .01	0.22±.091	10 ± .73	0.22± .048	7.7 ± .57	0.07	47	<0.021	<0.012	1.0 ± .95
9104-T.	Simpson	13 ± 14	0.08 ± .01							0.048±.029	<0.021	0.31± .14
9105-	Schwagerty	140 ± 30	0.05 ± .01									
9106-J.	Pitman	12 ± 11	0.05 ± .01	0.19±.087						<0.017	<0.010	0.40± .26
9107-C.	Worthen	2500 ±200	0.72 ± .02	0.78±.17				14	9478	0.99 ±.13	0.034±0.031	1.2 ± .52
9108	Pitney	47 ± 23	0.34 ± .02							0.026±.023	<0.013	0.31± .14
9109-T.	A. Chapman	39 ± 17	0.13 ± .01									
9113-C.	Meador	31 ± 17	0.17 ± .02	<0.072				0.08	54	<0.037	<0.042	2.3 ± .69
9114	Bell	42 ± 18	0.26 ± .01									
9133-G.	Enyart	10 ± 12	0.61 ± .03	0.65±.15	5.1±.47	0.15± .04	3.8 ± .31			0.36 ±.078	<0.016	0.95± .24
9134-	Well #2 UNHP	8 ± 11	0.24 ± .01					0.04	27	0.045±.039	<0.026	0.76± .41
9135-	Well D UNHP	400 ± 70	1.92 ± .04	2.8 ±.31	240±16	9.3 ±1.1	240 ±16	2.6	1760	<0.013	<0.018	2.3 ±2.1
9136-	Well #1 UNHP	22 ± 16	0.27 ± .02									
Ambrosia Lake												
9130	N. Marquez House	3± 6	0.11 ± .01									
9131	C. Sandoval Windmill	18± 13	0.05 ± .01	0.22 ± .10						0.036±.025	< 0.021	< 0.55
9132	N. Marquez Windmill	< 1.0± 9	0.31 ± .02	0.47 ± .14	81 ± 5.1	2.8 ± .22	74 ±4.7	0.10	68	<0.018	< 0.012	0.79 ±0.43
9201	P. Harris	110± 40	3.6 ± .1					1.0	677	0.03 ±.027	< 0.014	0.52 ±0.16
9202	County Line Stock Tank	86± 31	0.30 ± .02							<0.026	< 0.011	0.22 ±0.10
9203	Navajo Windmill	33± 15	0.07 ± .01									
9204	Ingersoll Ranch	8± 13	0.14 ± .01	0.30 ± .11						<0.015	< 0.012	0.61 ±0.21
9205	Bingham; KM-47	170± 40	0.18 ± .01									
9206	Marquez; KM-63	56± 25	0.60 ± .02									
9207	KM-S-12	410± 120	1.15 ± .03							0.27 ±.066	0.24±.062	< 0.13
9208	KM-43	49± 35	4.0 ± .1	4.7 ± .40						0.021±.019	< 0.014	< [illegible]
9209	KM-44	< 2.0± 10	1.95 ± .04							<0.026	< [illegible]	[illegible] ±0.53
9210	KM-51	45± 29	0.26 ± .02	0.35 ± .12						<0.023	< 0.0098	0.24 ±0.10
9211	KM-48	< 2.0± 15	0.20 ± .01							<0.013	< 0.0040	2.7 ±0.4[illegible]
9212	KM-Seepage Return	112,000±3,000	4.9 ± .1	10.[illegible] ± .6[illegible]								
9213	KM-S-2	8± 32	6.6 ± .1	6.4 ± .47						<0.016	< 0.011	< 0.94
9214	KM-36-2	14± 34	1.18 ± .03	1.5 ± .23	11 ± .78	0.31±.056	6.8 ± .5[illegible]			<0.015	< 0.014	0.70 ±0.[illegible]

(continued)

(continued)
Table 4

Radiological Data for Selected Ground-water Samples[1]

Grants Mineral Belt, New Mexico

Location Number Description	Gross Alpha	Ra-226 NEIC	Ra-226 EMSL	U-234	U-235	U-238	U-nat.		Th-230	Th-232	Po-210
Ambrosia Lake (Continued)											
9215 KM-46	104± 37	2.5 ± .2	2.7 ± .30						0.17 ±.057	< 0.016	< [illegible]
9216 KM-47	45± 25	0.64 ± .02							0.079±.038	< 0.017	0.29 ±0.20
9217 KM-50	70± 38	0.94 ± .03	0.72 ± .16						0.055±.035	< 0.015	1.2 ±0.84
9218 KM-5-1	20± 24	0.34 ± .02	0.34 ± .11						<0.021	< 0.016	3.5 ±2.6
9219 KM-5-2	67± 42	0.59 ± .02	0.76 ± .17	12 ± .63	0.27± .039	6.7 ± .37			<0.039	< 0.031	0.96 ±0.64
Gallup-Churchrock											
9137-Edwin Well	10 ± 9	0.63 ± .03									
9138-Boardman Trailer Park	6 ± 8	0.64 ± .02							0.088±.038	< 0.019	0.27± .20
9139-T. Hassler	14 ± 11	0.22 ± .01									
9140-Dixie Well	6 ± 10	0.10 ± .01	0.15 ± .082	1.8 ± .16	0.053±.022	1.4 ± .14			<0.030	< 0.016	0.50± .20
9141-Churchrock Village	3 ± 7	0.12 ± .01	0.26 ± .10				0.02	14	<0.028	< 0.016	0.23± .11
9142-White Well	9 ± 9	0.16 ± .01	0.42 ± .13						0.073±.035	< 0.011	<0.080
9143-Togav Well(same as 9221)	14 ± 9	0.83 ± .04	0.38 ± .12						<0.044	< 0.034	0.42± .17
9220-Hardground Flats Well-CRKM-2	12 ± 10	0.12 ± .01									
9221-E.Puerco River Well-CRKM-11	17 ± 10	0.56 ± .02	0.21 ± .093						<0.029	< 0.016	0.19± .18
9222-Puerco Well CRKM-16	2 ± 9	0.57 ± .02									
9223-Pipeline Road Well-CRKM-5	4 ± 9	0.37 ± .02							0.037±.020	< 0.012	0.52± .15
9224-Rose Rock Well CRKM-3	24 ± 12	0.13 ± .01							0.053±.049	< 0.036	0.23± .15
9225-N.E. Pipeline Well CRKM-10	12 ± 15	0.29 ± .01							<0.015	< 0.011	0.56± .33

1. Concentrations ± two sigma counting error in pCi/l . U-natural reported as mg/l and in pCi/l, respectively.

Sources of analyses:
Environmental Monitoring and Support Laboratory, USEPA: Ra-226, U-234, U-235, U-238, Th-230, Th-232, Po-210, Pb-210
National Enforcement Investigations Center, USEPA: Gross alpha, Ra-226, U-nat.

All analyses except U-nat. are on the filtered sample and therefore represent the concentrations actually in solution.
U-nat. is analyzed using unfiltered water and represents both the dissolved and suspended fractions.

Table 5

Typical Background Ground Water Radionuclide Concentrations (pCi/l) by Geographic Area & Aquifer [1]

Radionuclide/Aquifer		Paguate-Jackpile	Grants-Bluewater	[illegible]HP	Ambrosia Lake	Gallup-Churchrock
^{226}Ra	Bedrock	0.31 ± .02	0.14 ± .01	0.06 ± .01	0.16 ± .01	0.12 ± .01
	Alluvium	<0.13 [3]	0.13 ± .01	0.15 ± .02	0.23 ± .02	0.11 ± .01
^{210}Po	Bedrock	0.43 ± .14	0.33 ± .15	0.35 ± .20 [2]	0.57 ± .19	0.35 ± .19
	Alluvium	<0.39 [3]	0.30 ± .14	<0.31 [3]	0.27 ± .18	0.27 ± .17
^{230}Th	Bedrock	<0.020	<0.032	<0.033	<0.023	<0.030
	Alluvium	<0.018 [3]	<0.013	<0.014	<0.028	<0.011
^{232}Th	Bedrock	<0.013	<0.015	<0.015	<0.013	<0.014
	Alluvium	<0.010 [3]	<0.013	<0.013	<0.018	<0.015
^{234}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<10 [2]	<12	<1.3 [3]
^{235}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<0.23 [2]	<0.29	<0.033 [3]
^{238}U	Bedrock	---	---	---	---	---
	Alluvium	---	---	<7.7 [3]	<6.3	<1.4 [3]
U-Natural						
	Bedrock	14 [3]	---	---	---	---
	Alluvium	27 [3]	---	54	68 [3]	14 [3]

(1) Average of lowest reported concentrations of this study. ^{226}Ra and U-natural analyses by [illegible], all other radionuclide analyses by [illegible].

2 Based on Chinle Formation.

3 Results of only one sample reported: therefore, two sigma error of 100% assumed for these values.

bedrock aquifers in the Churchrock mining area mostly include the Dakota Sandstone. In the Paguate-Jackpile area, three of the four wells examined are in the Morrison Formation (Jackpile Sandstone Member).

Table 6 is a compilation of uranium, radium, and gross
Table 6 is a compilation of uranium, radium, and gross
beta concentrations in ground water for various localities in the Grants Mineral Belt. These are largely from the ore bodies or from strata adjacent thereto, and are intended to show natural concentrations of these radionuclides. Despite the wide variations, radium rarely exceeds 10 pCi/l and is commonly less than 5 pCi/l, except in mines or in ponds formed from mine drainage. Dissolved uranium is also enriched in waters associated with active mines and can readily reach concentrations of several hundred pCi/l. Natural background uranium levels are difficult to estimate from the limited data but would appear to be on the order of 20 pCi/l or less. Concentrations markedly greater than the foregoing, particularly if associated with mining and milling activity, may be evidence of degradation.

<u>Bluewater-Milan-Grants</u>

The relationship of the Anaconda Company mill and tailings pile to local geologic and cultural features is shown in Figure 3. Cultivated areas in the photograph are situated in Bluewater Valley which contains the town of Bluewater on the western edge. The irregularly shaped landforms northeast and east of the mill are basalt lava flows which are also the substrate for a portion of the tailings ponds. Also shown is the proximity of the San Andres Limestone to the tailings ponds. The light colored areas in the tailings pond are composed of sand, whereas the darker gray and black patterns indicate wet slimes and free water surface, respectively.

The expected impacts of uranium mining and milling on groundwater in the developed area between Bluewater and Grants can be traced to the Anaconda Company mill. It is unlikely that the United Nuclear-Homestake Partners mill could adversely affect ground water in this area.

Significant introduction of wastes into ground water in the Bluewater area occurs as a result of seepage from the tailings ponds. Past investigators noted the migration of nitrate from the ponds (New Mexico Department of Public Health, 1957). Changes in the milling process greatly

Table 6

Summary of Reported Concentrations
for Radium, Gross Beta and Natural Uranium in Ground Water in the Grants Mineral Belt[1]

Location T	R	S	Q	Source	Depth (meters)	Aquifer[2]	Radium pCi/l	gross β pCi/l	U natural dissolved pCi/l
9	12	11	222	Paxton Spring	Spring	Qb	4.3		1.82
12	11	24	4	Industrial Well	109		0.4		4.27
12	11	24	4	Anaconda Well (Injection)	109	Ps	0.36		
12	12	4	343	Bluewater Lake	Surface		<0.1		0.84
12	10	8	3	Well	442	Pym	0.2±0.1		1.96
13	6	30	100	El Paso Natural Gas Co.		Jmw	8.5±1.7	36 ± 5	
13	8	30	200	El Paso Natural Gas Co.		Kd	2.9±0.6	12 ± 2	
13	9	29	144	Westvaco Mineral Development Co.		Jt	5.1	150	
13	9	29	41	Mine Drift	137	Jt	5.1		139
14	9	28	441	Well		Jmw	1.1		<.07
14	9	32	413	Well	174	Jmw	10 ±2		8.4
14	9	32	221	Mine Drift		Jmw	42		16.1
14	9	17	400	Kermac Nuclear Fuels Corp.		Kd	2.7±0.5	18 ± 3	
14	9	18	400	Kermac Nuclear Fuels Corp.		Jmw	5.6±1.1	37 ± 6	
14	9	26	143	Kermac Nuclear Fuels Corp.	216	Jmw	1.1	69	
14	9	29	312	Phillips Petroleum Co.	224	Jmw	10 ±2	39 ± 7	
14	9	30	200	Kermac Nuclear Fuels Corp.		Jmw	2.0±0.4	12 ± 2	
14	9	32	122	Homestake-New Mexico Partners	190	Jmw	42	49	
14	9	32	314	Homestake-New Mexico Partners	168	Jmw	1.1±0.2	18 ± 4	
14	9	34	422	United Nuclear Company	306	Jmw	1.4±0.3	9.0± 1.5	
14	9	36	313	United Nuclear Company		Kd	27 ±5	75 ±11	
14	9	36	313	United Nuclear Company	457	Jmw	1.2±0.2	6.5± 0.9	
14	10	24	100	Kermac Nuclear Fuels Corp.		Jmw	2.3±0.5	56 ± 8	
15	12	17	123	Homestake-Sapin Partner	372	Jmw	0.2±0.1	9.8± 1.4	
17	12	20	11	Crownpoint Well 1	714	Jmw	0.05		<0.28
17	16	35	14	UNC-NE Churchrock Mine	457	Jmw	0.62		185
17	16	35	14	UNC-NE Churchrock Mine	518	Jmw	0.09		22
17	16	35	14	UNC-NE Churchrock Mine	549	Jmw	8.10		847
17	16	35	12	KM-Section 35, Churchrock Mine	549	Jmw			
23	14	3	13	Gas Company Burnham Well 1	1585	Jmw	0.24		0.05
				Pond in South Paguate pit	Pond		190		170

1. Data sources are as follows:
   - Ambrosia Lake area: Cooper and John, 1968
   - Laguna-Paguate: Lyford, 1975
   - Churchrock: Hiss and Kelley, 1975
   - Grants-Bluewater-Prewitt: Stow, 1961

   Grants-Bluewater-Prewitt:

2. Aquifers:
   - Qb basalt flow
   - Kd Dakota Fm.
   - Jmw Morrison Fm., Westwater Canyon Mbr.
   - Jt Todilto Fm.
   - Ps San Andres Ls.
   - Pym Yeso Fm, Meseta Blancha Mbr.

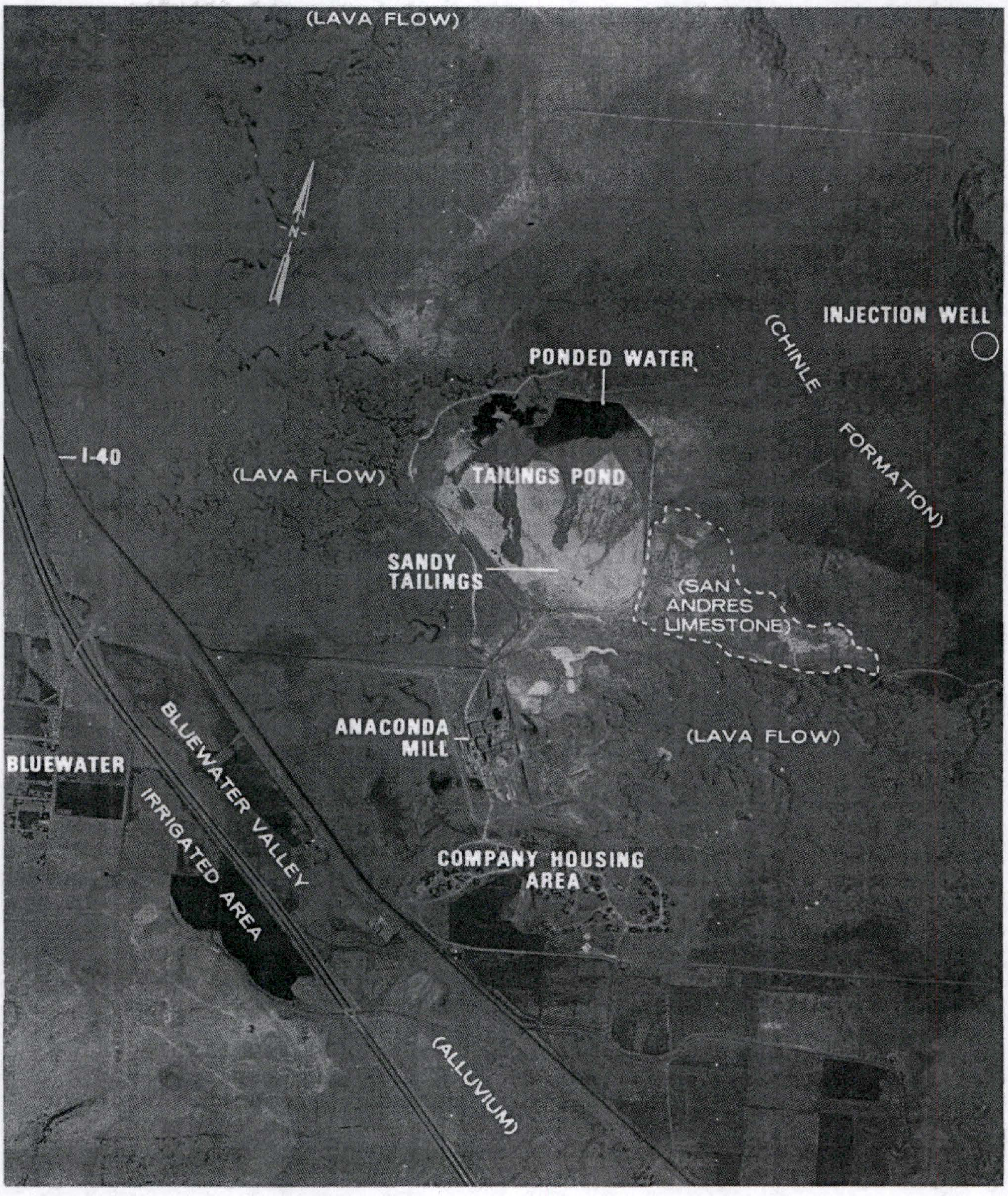


Figure 3. The Anaconda Company Uranium Mill and Tailings Pond-Bluewater

reduced the nitrate content in the effluent, but seepage has continued at a rather high rate, averaging 182.9 x 10^6 liters per year for 1973-1974 (Gray, 1975). The average volume injected in the same period was 348 x 10^6 liters. Therefore, the seepage:injection ratio is 0.53. In essence, one third of the waste stream portion not evaporated enters the shallow aquifer. Assuming that this ratio applies to the period 1953-1960, seepage is estimated at 3200 x 10^6 liters or 845 million gallons. From 1953 to mid-1960, the seepage fraction was probably larger, but is unknown. Discounting this seven-year period and assuming an average radium concentration of 125 pCi/l, seepage has introduced 0.41 curies of radium to the shallow aquifer, which is very definitely potable.

The New Mexico Department of Public Health (1957) compared pre-1955 and 1956-1957 nitrate data for nearby wells completed in alluvium and in the San Andres Limestone. It was concluded that nitrate contamination occurred between 1955 and 1957 after only two years of milling. At the time of the field study (June-Nov., 1956), it was estimated that 87 percent of the effluent leaked from the 28.4 hectare pond at a rate of about 10,000 liters/minute. The plant manager at the time expected that slimes in the waste would seal the bottom of the lagoon in about a year. However, the present loss rate of 347 liters/minute from a ponded area of about 14.4 hectares shows that leakage continues.

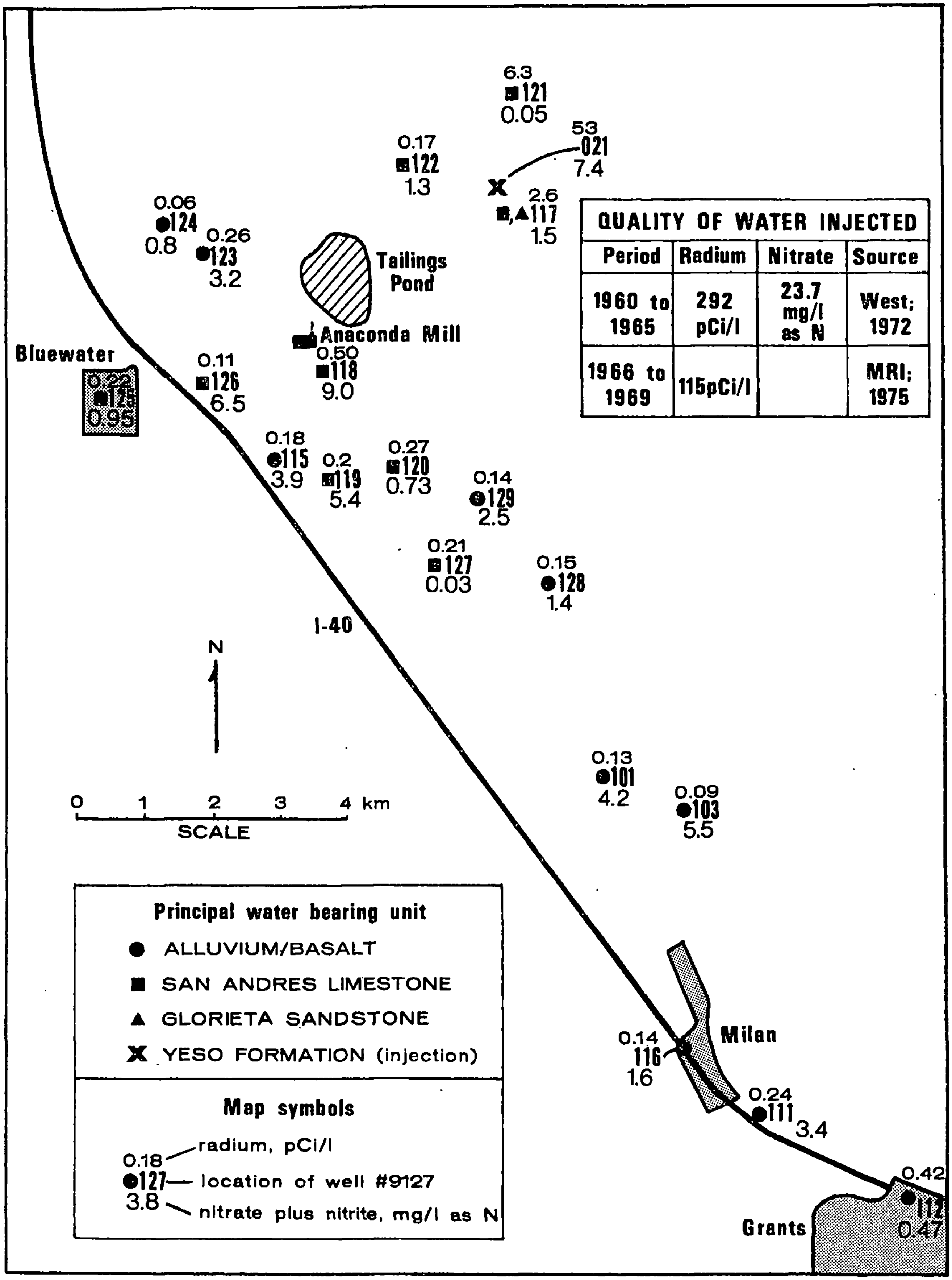
As of May 1957, two wells in the shallow aquifer and three in the deep (San Andres Limestone) aquifer had nitrate concentrations of 66 to 84 mg/l (15-19 mg/l NO_3-N), and elevated nitrate levels were present as far as 10 kilometers downgradient from the lagoon or 4.5 kilometers from the Grants supply wells. At the present time, the maximum nitrate concentrations in the bedrock and alluvial aquifers within 4 kilometers of the ponds are 39 and 17.3 mg/l. Concentrations in two wells midway between the ponds and Grants average 21.5 mg/l. In the 1956 study it was also concluded that high nitrate within 4.5 kilometers of Grants was a result of waste disposal. This would imply movement of 10 kilometers in 2 to 3 years, which is extremely unlikely.

To evaluate ground-water quality trends, available nitrate (expressed as nitrate), TDS, chloride, sulfate and gross alpha data (from the foregoing study, from the Anaconda Company (Gray, 1975), and from the present investigation), were plotted to determine changes in ground-water quality with respect to distance from the tailings ponds and with time.

These data show that there is a general lack of marked deterioration in ground-water quality with time; and, with the exception of gross alpha, there is close agreement between the company data and those from the present study. For example, the Fred Freas well (#9127), completed in alluvium, and the Mexican Camp well (#9120), which taps the San Andres Limestone, show essentially no change in TDS, sulfate, chloride, or nitrate for the period 1956 to 1975. The slight decline in TDS in the Fred Freas well is contrary to what would be expected if gross contamination was present. However, the similarity between gross alpha and sulfate fluctuations for the Mexican Camp well suggest that wastes are within the well's area of influence.

The selenium, vanadium, and total dissolved solids (TDS) data for the Bluewater-Grants area generally substantiate the foregoing interpretation and hint at the possibility of contamination of the alluvial aquifer. Selenium ranges from less than 0.01 mg/l to 0.02 mg/l, with most values being 0.01 or less. Vanadium ranges from 0.3 to 1.3 mg/l and is lowest in the Anaconda monitor well (#9117). Concentrations for seven wells adjacent to the Anaconda mill and tailings ponds average 0.89 mg/l, which is two to three times higher than the average for the remainder of the study area (see Table 3). It is suspected that these elevated levels are indicative of contamination, but they may simply reflect the normal concentration of vanadium in the alluvial and San Andres Limestone aquifers. Water supply well #2 at the United Nuclear-Homestake Partners mill is also completed in this formation and contains 1.3 mg/l. Additional sampling is recommended to characterize background and contaminated levels before definite conclusions are drawn. With the exception of the Jack Freas well (#9129), which is used for domestic supply, the selenium and vanadium concentrations are within recommended drinking water standards.

Radium and nitrate concentrations in ground water are depicted in Figure 4. With the exception of the Berryhill Section 5 well (station #9121) and the Anaconda injection well (#9021), radium-226 in both the alluvial/basalt aquifer and in the underlying San Andres Limestone ranges from 0.06 to 0.42 pCi/l. If well #9124 is considered as a background, radium in the alluvial aquifer decreases as a function of distance from the tailings ponds. The elevated radium level in well #9123 is postulated on the basis of a radial flow pattern centered on the tailings ponds and superimposed on the natural ground-water flow which is southeastward. In



Period	Radium	Nitrate	Source
1960 to 1965	292 pCi/l	23.7 mg/l as N	West; 1972
1966 to 1969	115pCi/l		MRI; 1975

Figure 4. Radium and Nitrate Concentrations in Ground Water in the Grants-Bluewater Area

this direction, wells #9115, #9129, #9128, #9101, and #9103 could also be affected. The gradually reduced concentrations along the flow path may reflect dilution and sorption effects or they may simply be coincidental. For unknown reasons, the trend reverses in the Milan-Grants area, and concentrations begin to increase along the flow path. With the exception of wells #9101 and #9103, essentially the same pattern is true for nitrate. Variations in chloride, which is also a likely indicator of mill effluent, do not fit the pattern for radium and nitrate and, to some extent, weaken the conclusion that contaminants are recognizable in the alluvium.

In the San Andres Limestone and Glorieta Sandstone, radium concentrations range from 0.11 to 2.6 pCi/l (0.11 to 0.50 if well #9117 is excluded) and show no pronounced lateral trends. The highest concentrations (2.6 pCi/l) are in the Anaconda monitor well (#9117) and may indicate contamination (or this may simply be a naturally elevated level in the Glorieta Sandstone). Very few wells tap this formation and water quality is poorly known. Anaconda well #2 (#9118) is also relatively high in radium, nitrate, and polonium-210. It is quite possible that the well is contaminated by downward seepage of wastes from the tailings pond.

The Berryhill Section 5 well (#9121) is listed in the Anaconda Company records as being completed in the alluvium. It is equipped with a windmill and is used for stock watering. However, Gordon (1961) indicates that as of January 1958 there were two wells in the area. The active well, 221 meters deep and completed in the San Andres Limestone, replaced an older well, 107 meters deep and completed in the Chinle Formation. Therefore, contamination of either the Chinle Formation or the San Andres Limestone by injected wastes is occurring insofar as the radium-226 concentration of 6.3 pCi/l in the Berryhill Section 5 well greatly exceeds normal concentrations in either formation (see also Table 4).

Because of excessive seepage from the tailings ponds, the Anaconda Company developed an injection well to dispose of decanted effluent. According to company and U. S. Geological Survey reports (Fitch, 1959; West, 1972), favorable geologic, hydraulic and water quality conditions exist to allow this disposal method. However, subsequent evaluation of the monitoring data and inadequacies in the number and location of monitoring wells make this conclusion questionable.

From 1960 to date, injection has been into the Yeso and Abo Formations at depths of 289.6 to 433.7 meters. Between the injection zone and the lowermost potable aquifer, there is reportedly a relatively impervious sequence of sedimentary rocks, including numerous anhydrite and gypsum beds (Fitch, 1959; West, 1972). When the injection program was conceived in 1960, this sequence was considered sufficient protection for the overlying potable aquifers. Also, it was reasoned that when the waste fluid contacted the gypsum or anhydrite, as well as other disposal zone rocks, an ion exchange occurred between radium (in the fluid) and calcium (in the reservoir rocks), thereby reducing somewhat the radium concentration in the injection fluid.

Based on laboratory tests of the drill cores from the disposal zones, neutralization of the waste effluent was expected to occur. The pH of the formation waters ranges from 7.4 to 8, while the effluent has a pH of about 2.2. It was thought that the acid effluent becomes neutral or slightly basic due to the preponderance of disposal zone waters. Radium solubility would, therefore, decline. The disposal zone waters have been shown to be non-potable due to their brackish quality. Chemical analyses indicate a very high concentration of total dissolved solids, and it was reasoned that contamination of the deeper formations would not deny foreseeable use for the contained water.

Evidence of leakage from the injection zone is shown in Figure 5, which summarizes Anaconda Company data on the volumes of wastes injected from 1960 through 1973. Also shown are trends in natural uranium and chloride from the monitor well #9117, Roundy windmill, and North well (#9122) for the period 1969 through 1973. It is readily apparent that both chloride and uranium concentrations in all three monitoring wells are increasing with time and vary directly with the volumes of waste injected. The concentration of polonium-210 in the Monitor well exceeds that in all other wells in the Bluewater-Grants area and is well above the average of 0.33 pCi/1 for six wells in bedrock. Concentrations of chloride and natural uranium in the waste water average 2010 ppm and 7340 pCi/1, respectively, for the period 1960 to 1965 (West, 1972). Radium from 1960 through 1969 averages 221 pCi/1 (Clark, 1974). According to the partial chemical data for these three monitoring wells and contrary to original projections, contamination apparently extends into the San Andres Limestone.

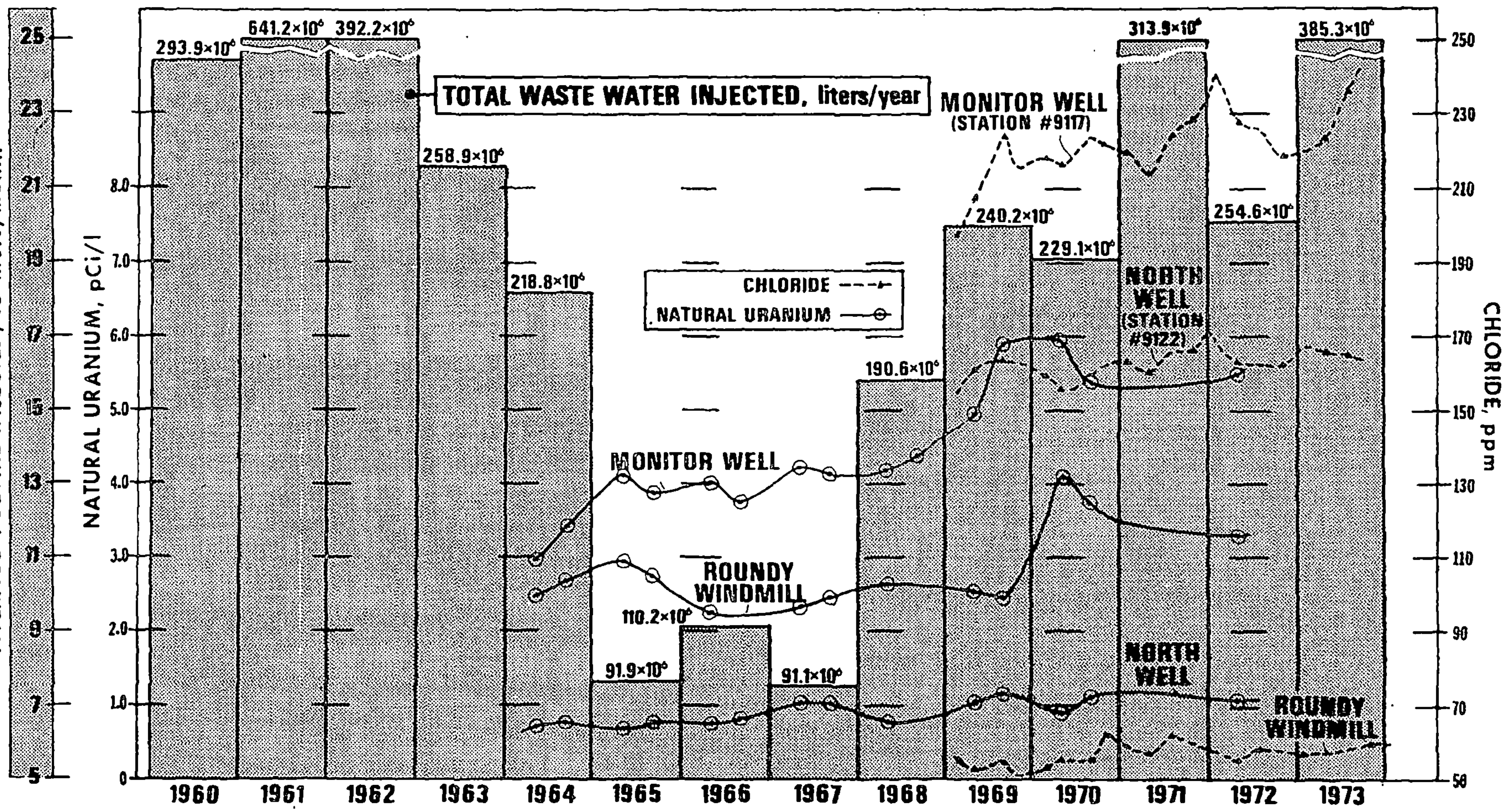


Figure 5. Summary of Waste Volumes Injected via the Anaconda Disposal Well and Water Quality in Selected Monitoring Wells

Sulfate, TDS, and gross alpha in North well (#9122) and in the Monitor well (#9117) are increasing slightly with time. For North well, TDS increased at a rate of about 13 mg/l per year and has gone from 1680 mg/l in June 1956 to 1900 mg/l in February 1975. Gross alpha is apparently increasing about 0.1 pCi/liter per year, but the company analytical results of about 2 pCi/l are markedly below the 30 pCi/l reported herein.

At the present time, ground water developed for potable use does not appear to be adversely affected by the Anaconda disposal practices. This conclusion is based on analyses for seven wells (9118, 9119, 9124, 9125, 9126, 9127 and 9129) completed in bedrock and in alluvium and generally located peripheral to and within 4 kilometers of the tailings ponds. Anaconda supply wells #2 and #4, which show slightly increasing trends for TDS, chloride, or sulfate, are closest to the ponds and are used for potable and mill feed purposes. For the remaining wells, increasing and decreasing trends for TDS and sulfate are present whereas chloride, nitrate and gross alpha results are rather stable. Because of its proximity to the Anaconda tailings ponds and because of its use as a public water supply, the LDS well in Bluewater should be more routinely monitored for nitrate and radium.

In summary, the interpretation of ground-water quality offered by the New Mexico Health Department (1957) is not supported by subsequent data. Concentrations of nitrates and chloride, in particular, are not markedly different today than in the base period from 1953 to 1956. Data for the period 1956 to 1969 may bear out the earlier predictions of gross contamination; but, if so, water quality since 1969 is only slightly changed. For widespread ground-water contamination to quickly occur from 1955 to 1956 and then rapidly attenuate is very unlikely considering the dynamics of ground-water flow and the continuing history of waste disposal. It is a matter of conjecture whether the earlier data were faulty or were misinterpreted. Ground-water flow patterns in the vesicular basalt and interbedded alluvium underlying the northwest pond and portions of the main pond are not described in the available references. Complex permeability distributions and waste density considerations add further complications. However, seepage is occurring and it is possible that the Company estimates stated above are conservative.

The foregoing comments do not imply that ground-water contamination is absent. Gross contamination of nearby wells, or a continuation of the earlier, perhaps erroneous predictions of contamination, is not apparent. The major qualification of these conclusions is that wells properly located and completed for sampling purposes are not available; hence, the extent of contamination is not well understood. Contamination is evident in the North and Monitor wells but is not yet a problem. Available chemical data for pre- and post-injection periods should be evaluated, together with monthly or quarterly injection volumes, to further confirm or deny the trends shown in Figure 5. If the trends shown are valid, thorough reevaluation of the injection method of waste disposal and construction of additional monitoring wells in the Yeso Formation and the Glorieta-San Andres is in order. Such measures are particularly important if increasing concentrations of radium-226 (and possibly lead-210) are appearing in the aquifers above the injection zone.

United Nuclear-Homestake Partners Mill and Surrounding Area

The mill is partially surrounded on the southwest or downgradient side by housing developments and irrigated farm lands, both of which depend on local ground-water supplies. Also obvious in Figure 6 is a darker seepage area around the base of the tailings pile. The seepage is collected and pumped back to the pond above the sandy tailings, but seepage from the pile proper and from the encircling moat can enter the ground-water reservoir. The five-sided polygon adjacent to the mill buildings is an inactive tailings pile that was formerly part of the Homestake-New Mexico Partners mill. In the upper left-hand portion of the photograph is shown the terminus of the San Mateo Creek drainage from the San Mateo and Ambrosia Lake areas.

Three distinct aquifers are present in the area of the mill and surrounding developments. In ascending order, these include the San Andres Limestone, the Chinle Formation, and the alluvium. Water table conditions and a southwestward lateral flow gradient prevail in the latter, with static water levels about 15 meters below land surface. The San Andres Limestone originally was under artesian head, but heavy pumping for irrigation and for industry has removed much of the head once present. Data presented by Gordon (1961) indicate a downwind flow gradient, but the permeability of the Chinle Formation is low, and actual vertical

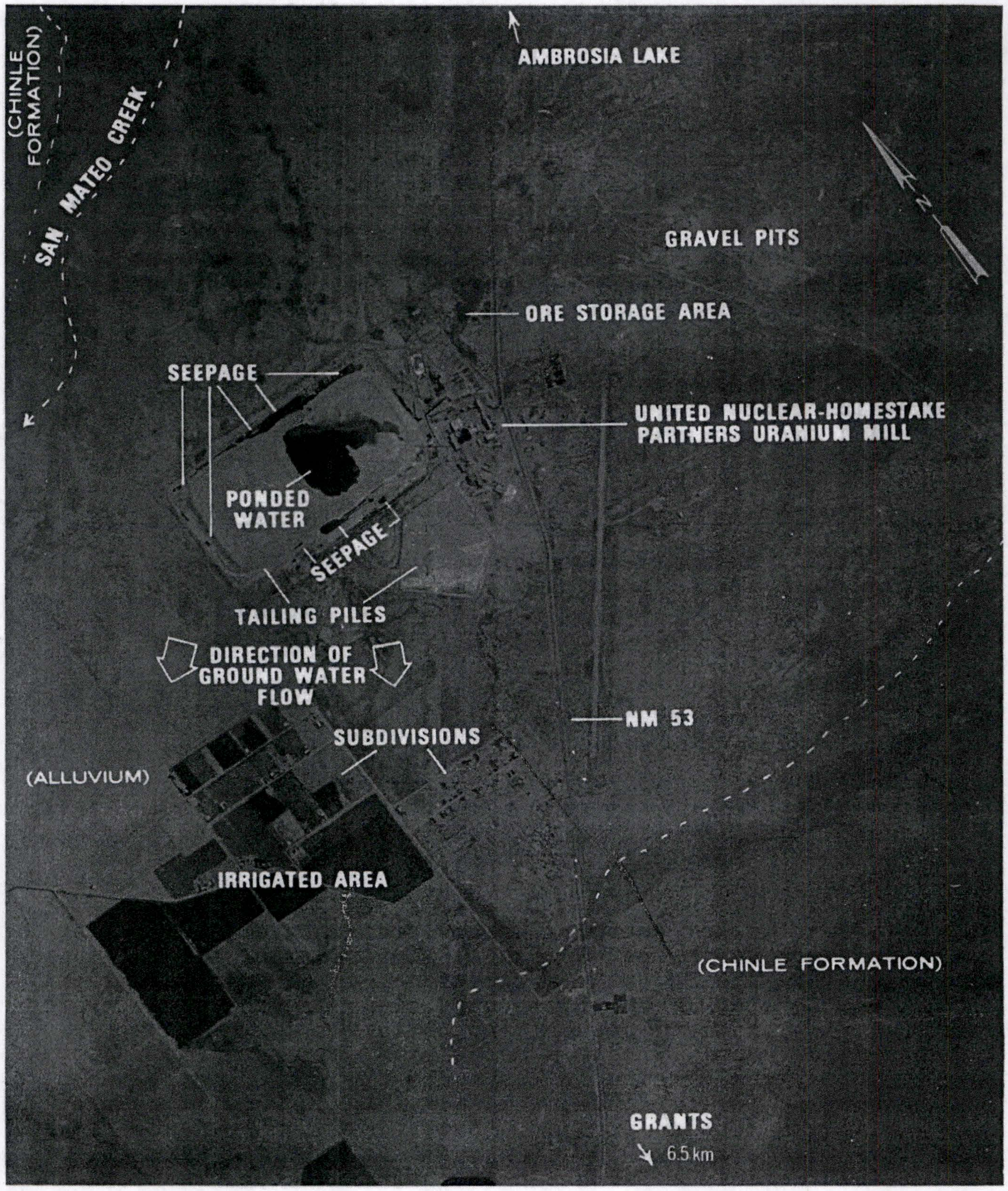


Figure 6. The United Nuclear-Homestake Partners Uranium Mill and Tailings Ponds-Milan

water transfer is probably minimal. The chief significance of these hydrogeologic conditions is that liquid effluents produced by the uranium milling operation are likely to infiltrate at the mill site and travel in a south-southeast direction toward the nearby subdivisions. Water quality in the Chinle Formation and the still deeper San Andres Limestone is likely to be unaffected.

Radium concentrations in groundwater (Figure 7) from the San Andres and Chinle range from 0.05 to 0.27 pCi/l, with a mean of 0.16 pCi/l for six determinations. Realistically, assuming that minimum detectable amount is 0.1 pCi/l versus 0.05, the average increases to 0.18 pCi/l. The peak value from shallow wells tapping the water table aquifer in the alluvium is 1.92 pCi/l in well D, the single active monitoring well (#9135). Although below the PHS drinking water standard of 3 pCi/l, this value does indicate movement of contaminants away from the tailings pond. Attenuation due to sorption may mask a very sharp concentration gradient between this well and the pond. At a distance of approximately 0.6 kilometers from the ponds, radium in the shallow aquifer reverts to levels of 0.13 to 0.72 pCi/l and averages 0.36 pCi/l, or about twice that present in the bedrock reservoirs at depth. Relatively high concentrations (0.72, 0.61 pCi/l) in the Worthen and Enyart wells may reflect plumes or fronts of contaminants that have advanced ahead of the main body. The water table map (Figure 8), prepared by Chavez (1961), portrays an elongated, northeast-trending lobe or mound centered on the smaller tailings pile from the now inactive Homestake-New Mexico Partners mill.

The possibility of ground-water pollution from the United Nuclear-Homestake Partners tailings pond was noted in the early 1960's (Chavez, 1961). Samples from on-site monitoring wells completed in the alluvium contained from 0.8 to 9.5 pCi/l radium despite the fact that ore had been processed for less than two years. These concentrations are markedly above the normal range of 0.1 to 0.4 pCi/l in wells several miles west of the mill and from wells in the alluvium between San Rafael and Grants.

Chloride and TDS data for well #9107 (Figure 7) support the idea of a tongue of contaminated ground water in the area between this well and the tailings pile. Nitrate in this well was 62 mg/l and, therefore, does not meet the PHS Drinking Water Standard of 45 mg/l. Infants and fetuses are particularly susceptible to nitrate poisoning at concentrations above 45 mg/l, and alternate sources of potable water should be utilized. Heterogeneities in sediment permeabilities, coupled with irregular induced flow gradients resulting

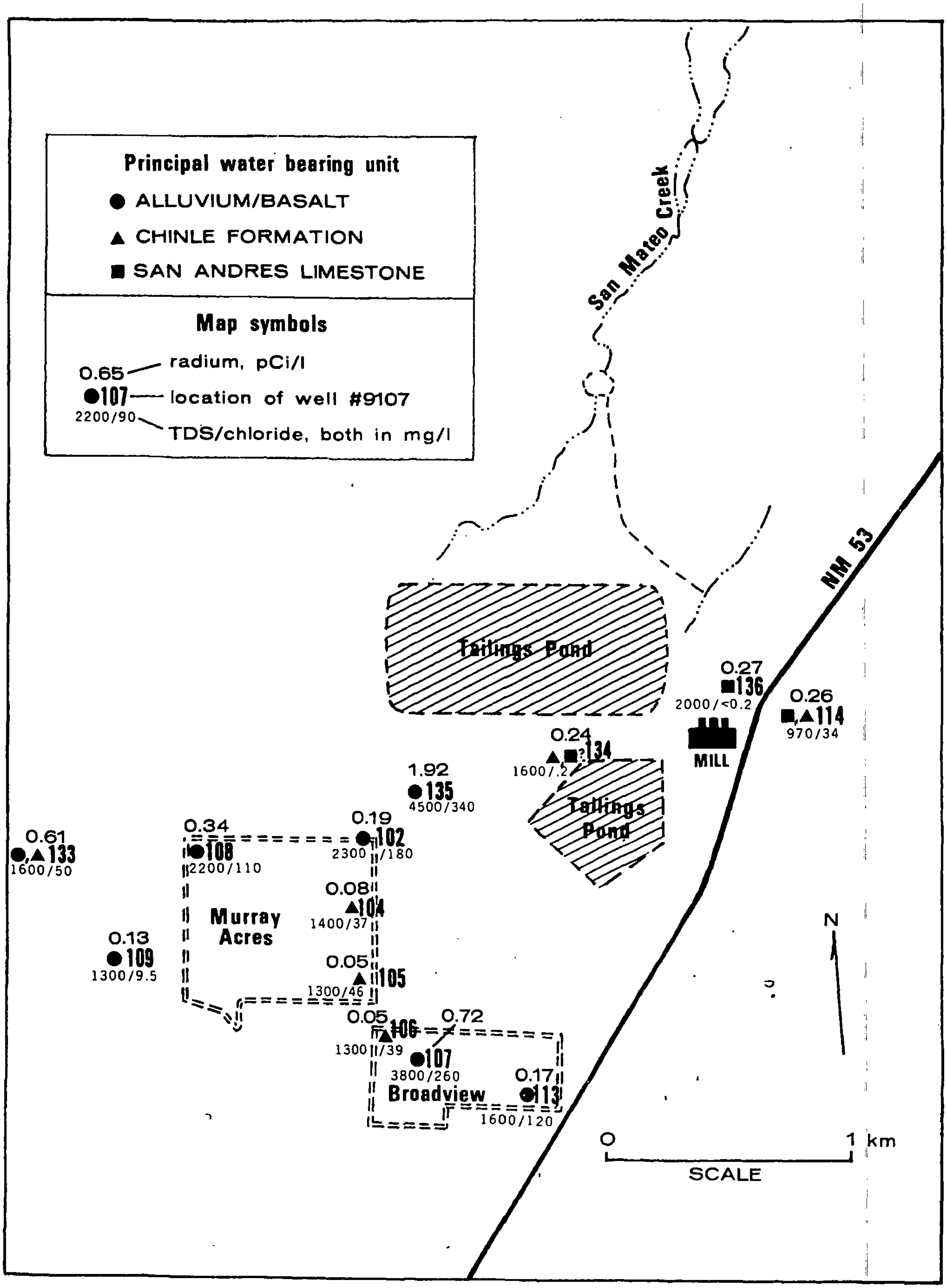


Figure 7. Radium, TDS and Chloride in Ground Water Near the United Nuclear-Homestake Partners Mill

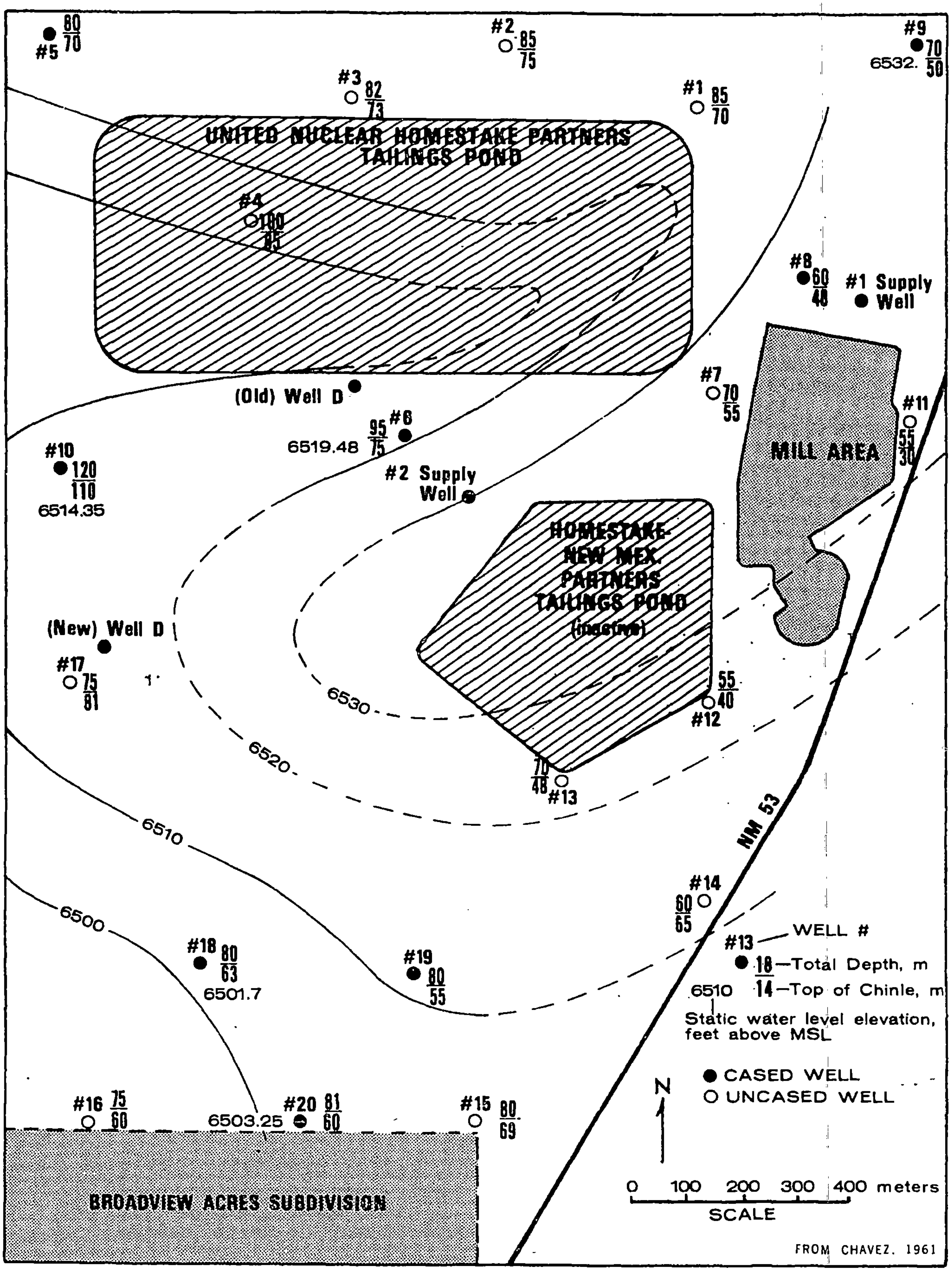


Figure 8. Water Table Contours and Well Locations at the United Nuclear-Homestake Partners Mill Site

from seepage return flows, make definition of the polluted front rather difficult. It is clear that one well (well D, #9135) is inadequate for the task.

Selenium concentrations (see Table 3) in several of the domestic wells located downgradient from the mill are anomalously high and are, perhaps, the best indicator of ground-water contimination. Nearby wells (#9102, #9107, and #9113) contain from 20 to 106 times the recommended maximum selenium concentration of 0.01 mg/l (National Academy of Sciences-National Academy of Engineering, 1972). Two of the wells contain approximately two-thirds of the concentration in the monitor well (1.52 mg/l). The water supply for the mill contains <0.01 mg/l, whereas the seepage collection ponds adjacent to the presently active pile contain 0.92 mg/l. Because of analytical difficulties and differences between laboratories, the selenium data are most useful to show elevated trends rather than necessarily an absolute concentration in the ground-water system. Additional sampling is necessary to more accurately define the extent of contamination.

Elevated levels of polonium-210 are present in well D (#9135) and in other wells (#9102, #9106, #9107, and #9113) downgradient from a suspected contamination front in the shallow aquifer. Background for polonium-210 is approximately 0.34 pCi/l (Table 5) in wells tapping either the Chinle Formation or the alluvium, whereas concentrations range from 1.0 to 2.3 pCi/l in wells suspected to be contaminated. The highest value for polonium-210 was from well D (#9135). The elevated level of polonium-210 in supply well #2 (#9134) cannot be explained.

Provision of an alternative water supply is strongly recommended to avoid consumption of shallow ground water exceeding 0.01 mg/l selenium. Deeper wells completed only in the Chinle Formation and preferably fully cemented in the interval from land surface to 15 meters into the Chinle should be considered minimum. Other alternatives include the construction of high capacity wells nearby, but away from the developments, or placing the developments on the Milan municipal water system.

Ambrosia Lake Area

The Kerr-McGee mill is located on the dip slope of a southeast-facing cuesta in an area underlain by a thin veneer of silt and clay alluvium over the Mancos Shale. Shown in Figure 9 is the large network of tailings ponds and water storage reservoirs built by excavation and by selectively sorting the coarse tailings for retention dams. Discharge from numerous mines and from ion exchange plants gives rise to perennial flow in Arroyo del Puerto which trends north-south. Seepage from the tailings ponds and from the aforementioned sources is evident from the vegetation present in the formerly dry washes. Shown in the upper right corner of the photograph, taken in September 1973, is the inactive tailings pile at the United Nuclear Corporation mill. The ponded water shown on the pile has since evaporated or seeped into the tailings.

Ground-water sampling in the Ambrosia Lake area focused on the Kerr-McGee tailings disposal operation and the combined impact of various ion exchange plant and mine water discharges into San Mateo Creek and Arroyo del Puerto. Because of influent stream conditions, these surface water bodies represent line sources of recharge to the shallow ground-water reservoir. Of the 22 wells sampled in the area (see Figure 10), all but 3 were part of the Kerr-McGee Nuclear Corporation environmental monitoring network. The absence of sampling points near the United Nuclear mill and tailings pile or near the active mines and ion exchange plants precluded study in these areas. Poorly understood are the effects of seepage from settling ponds and from open channels leading to the two principal streams in the area. The disposition of solutions involved _in situ_ leaching is also unknown.

Nevertheless, the conservative parameters clearly indicate the infiltration of wastewater. Whereas shallow ground water beneath San Mateo Creek contains about 700 mg/l TDS in the reach above Arroyo del Puerto, the reach below has about 2000 mg/l. Ammonia increases four fold from 0.05 to 0.22 mg/l, and nitrite plus nitrate (as N) go from an average of less than 1 mg/l to 24 mg/l. The recommended maximum in drinking water is 10 mg/l. Selenium and vanadium concentrations in ground water do not markedly increase near the tailings ponds. One exception is well KM-43 (#9208) which contains 0.29 mg/l selenium as well as high radium and TDS. The Marquez windmill (#9132) is also enriched in selenium which further substantiates the TDS, chloride, ammonia, and nitrate data results which show contamination of the shallow aquifer. Nitrate, derived from

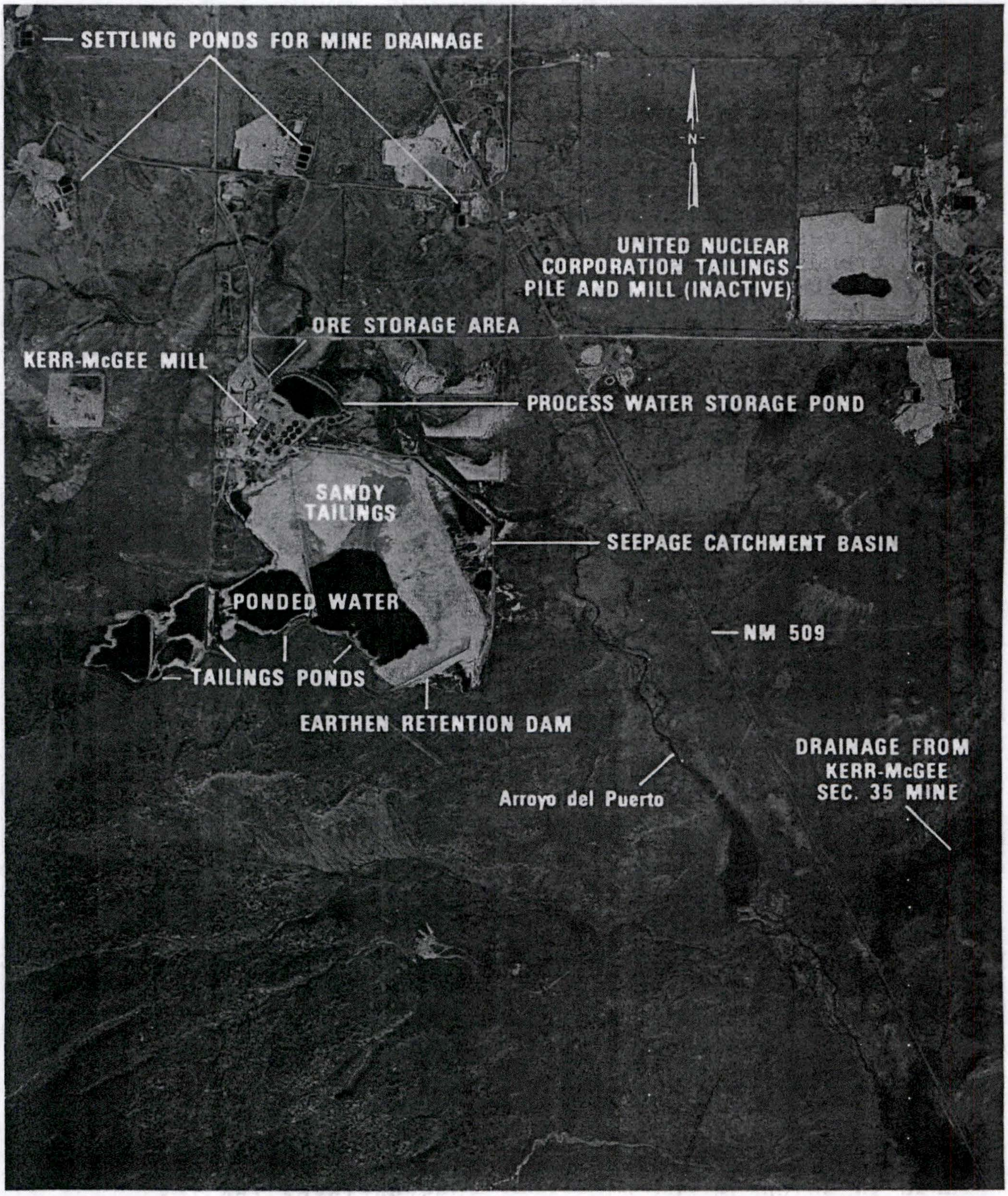


Figure 9. Kerr-McGee Nuclear Corporation Uranium Mill, Tailings Ponds, and Mines-Ambrosia Lake

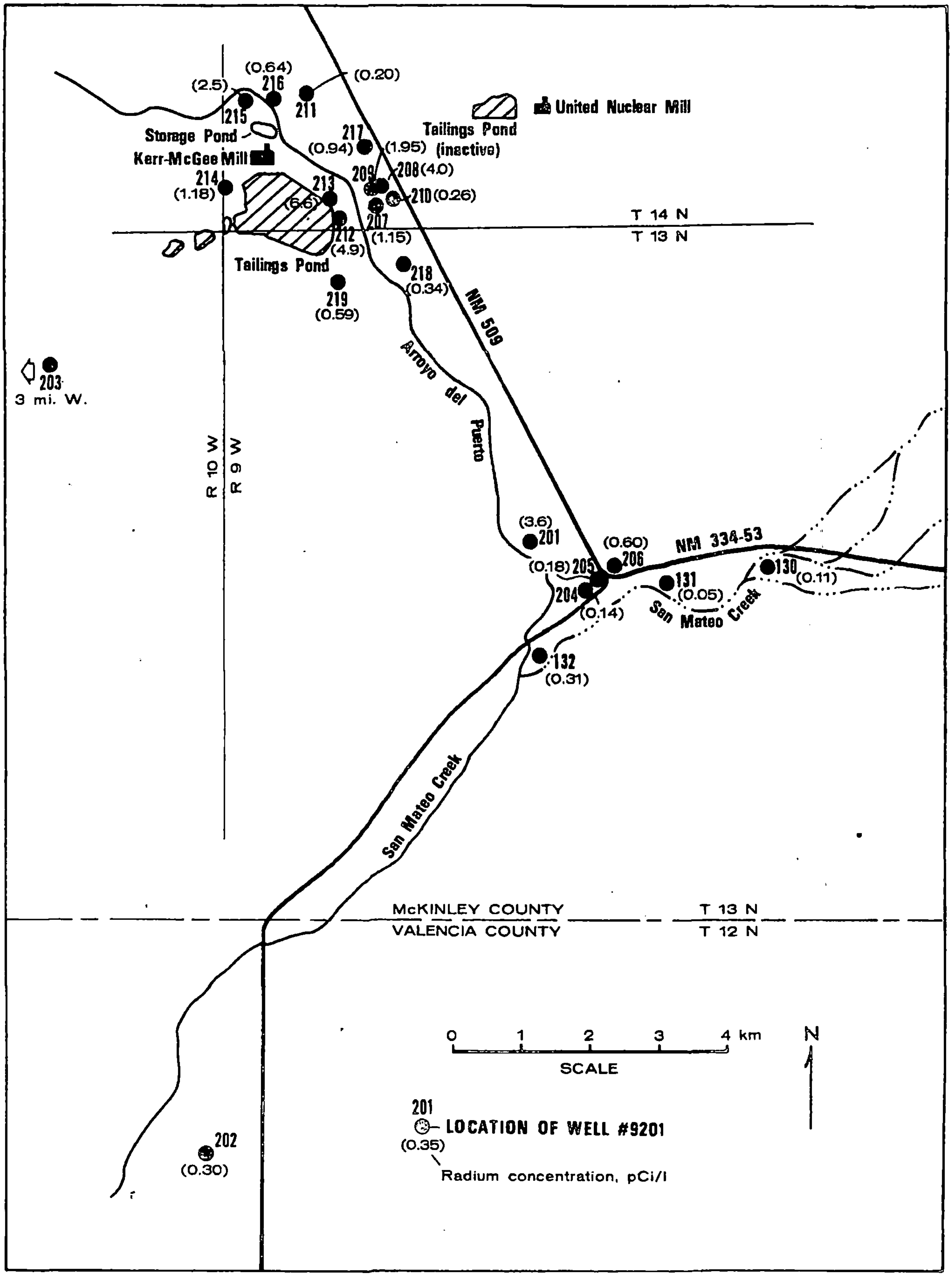


Figure 10. Radium Concentrations in Ground Water in the Ambrosia Lake Area

very high concentrations of ammonia in the mill effluents, persists in shallow ground water. This is particularly true for shallow wells located east of the ponds and along San Mateo Creek, both above and below the county line. The range of concentration exceeding the PHS Standard is 48.7 to 350 mg/l. One of these wells (#9204-Ingersoll Rand) is used for a potable supply, whereas well #9202 is for stock watering.

The concentration of radium in ground water in the vicinity of the tailings piles at the Kerr-McGee mill averages 1.7 pCi/l for the 12 wells sampled. The highest concentration, 6.6 pCi/l, occurs at station #9213 near the base of the seepage catchment basin and probably characterizes the quality of ground-water seeping beneath and through the retention dam. Water in the basin, per se, contains 65 pCi/l radium. Note that high TDS, chloride, ammonia, and nitrate plus nitrite appear in the seepage. Within 1 to 2 kilometers of the tailings pile periphery, radium concentrations in shallow ground water to depths of 17 meters are 4 pCi/l or less.

The foregoing general pattern is in agreement with the migration described by the Kerr-McGee staff at the time of the field study. Despite a concentration of 65 pCi/l in seepage from the ponds, concentrations in the immediately adjacent ground water do not exceed 6.6 pCi/l, and quickly reduce to 4 pCi/l or less. Seepage leaving the property and moving southeastward parallel to Arroyo del Puerto averages 0.47 pCi/l radium.

Despite the relatively localized contamination of ground water adjacent to the Kerr-McGee tailings ponds, serious question remains concerning their adequacy as a means of waste disposal. Company data for 1973 and 1974 reveal that seepage from the ponds averaged 935 liters/minute. Influent averaged 3181 liters/minute; therefore, 29 percent of the wastes entered the ground water and the balance evaporated. Assuming 60 pCi/l in the seepage and a 20-year operating period, 0.6 curies of radium would be introduced to ground water. The company data indicate that the seepage rate was fairly constant at 946 and 924 liters/minute for 1973 and 1974, respectively. Also shown in the water balance are additions to storage in the third quarter of each of three years (1972, 1973, 1974). The writers interpret this as overland flow related to thunderstorm activity prevalent at this time of year. The rapid influx of overland flow into the ponds prompts questions concerning their stability and overall company management practices. The ponds are operated with very little freeboard and the berms or dikes are composed of sandy tailings that are readily eroded, particularly if overflow conditions develop. Catastrophic failure of the tailings ponds could occur.

Churchrock Area

The Puerco River at Gallup was ephemeral until upstream mining operations reached a scale such that wastewater discharge was sufficient to cause perennial flow. At present the combined discharge from the United Nuclear and Kerr-McGee mines, located as shown in Figure 11, is about 16×10^6 liters/day and characterized by 8 to 23 pCi/l radium, 700 to 4900 pCi/l uranium, 0.01 to 0.04 mg/l selenium, and 0.4 to 0.8 mg/l vanadium. In terms of radium, selenium, and vanadium, the water is unfit for stock or potable uses and not recommended for irrigation. Infiltration of the mine wastewater represents a remote threat to potable ground water in the vicinity of the Puerco River and possibly part of the Gallup municipal supply. In part, the present study examines whether noticeable ground-water quality deterioration has occurred to date.

Ground-water sampling in the Churchrock area involved 13 wells located along the Puerco River and South Fork Puerco River. For control purposes, an adjacent watershed tributary to the Rio Puerco was also sampled. A single sample from a newly developed well serving the Gallup area was also tested. The sampling points included water used for stock, domestic use, and for public drinking water supplies. Alluvial and bedrock aquifers were sampled in an area of 200 km^2 located generally east and northeast of Gallup.

None of the ground-water samples contain sufficient quantities of naturally occurring radionuclides to constitute a health problem. The radiochemical, trace element, and gross chemical data do not indicate that contamination of ground water is occurring as a result of the mining operations underway. However, two of the wells (#9139, #9221) contain 119.6 and 62 mg/l nitrate, respectively, and, therefore, do not meet the PHS Drinking Water Standard of 45 mg/l. The mine drainage waters contain less than 4 mg/l, hence this is not the source. Consumption of water this high in nitrates is particularly dangerous to infants and the unborn and alternate supplies should be utilized. More suitably located

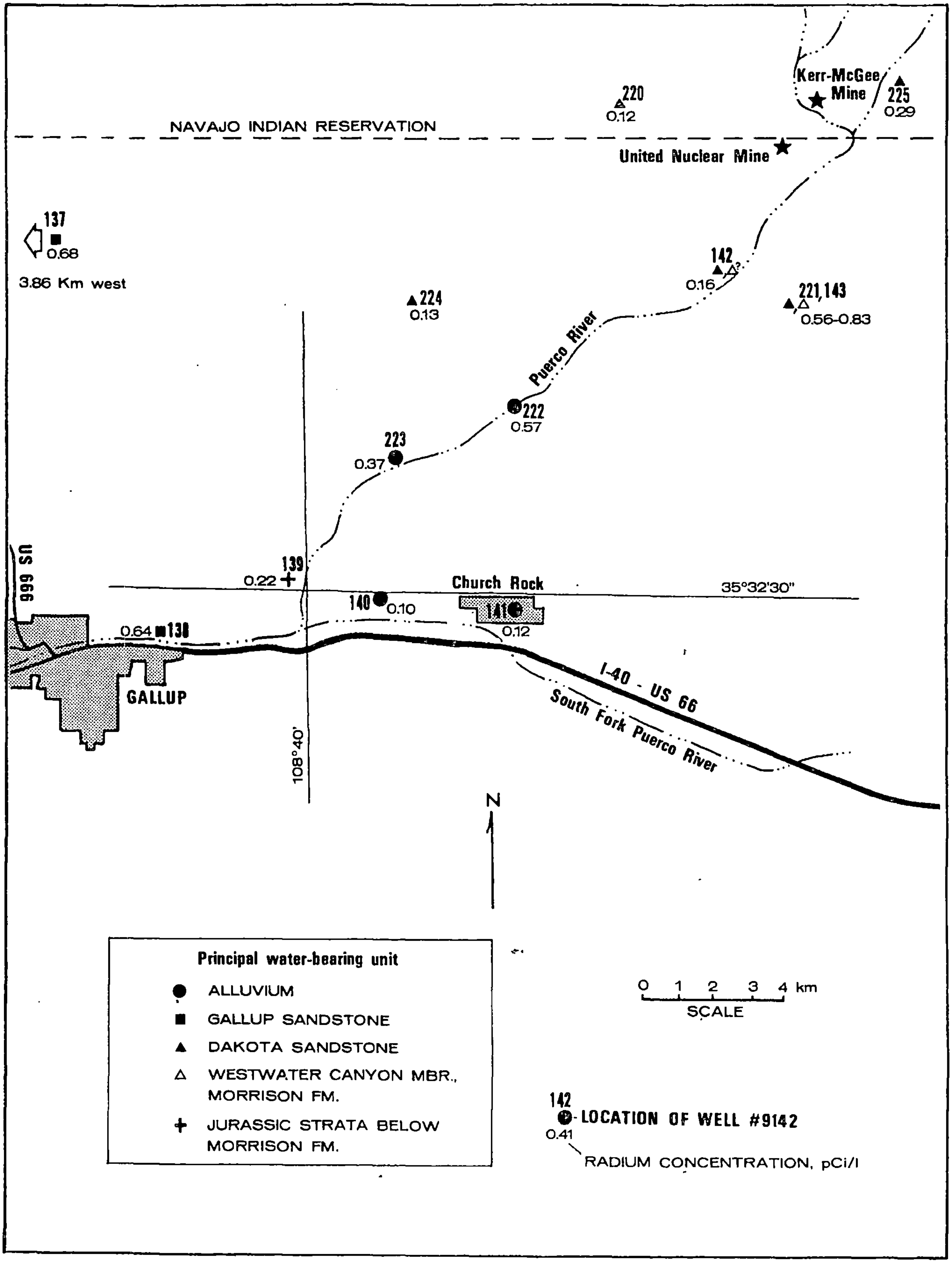


Figure 11. Radium Concentrations in Ground Water in the Churchrock-Gallup Area

sampling points, together with revised analytical programs are strongly recommended improvements to the existing industrial efforts.

By comparison, the effects of mining on the concentration or radium in ground water are pronounced. Present discharge from the Kerr-McGee mine, which is in the development versus mining stage, averages 7.9 pCi/l as compared to 23.3 pCi/l for the United Nuclear mine. The latter is producing ore. In both cases, elevated radium concentrations are present. In large part, these are attributable to mining operations and practices and do not represent natural water quality, evident from samples of ground water collected from 4 wells and 3 long holes, all in the Westwater Canyon Member (Hiss and Kelley, 1975). Radium varied from 0.05 to 0.62 pCi/l compared to 0.28 to 184.8 pCi/l uranium. An additional sample collected in November 1973 from the settling pond discharge at the United Nuclear mine contained 8.1 pCi/l radium and 847 pCi/l natural uranium. Thus, initial penetration of the ore body increased radium at least 10-fold and subsequent mine development work over a two-year period resulted in another three-fold increase. Compared to natural concentrations, radium increased some 23 times. Similar trends also seen in the Ambrosia Lake area prevail, indicating that ultimate radium concentrations on the order of 50 to 150 pCi/l are likely. This has been tentatively confirmed by company, self-monitoring data.

Jackpile-Paguate Area

Sampling in the vicinity of the Jackpile-Paguate open pit uranium mine included four wells located as shown in Figure 12. One of these (#9233) is the Paguate municipal supply which is a flowing artesian well completed in alluvium at a depth of 22.9 meters. The remaining three wells are property of the Anaconda Company and are used for potable supply and for equipment washing, etc. It is believed that all three were former exploration holes that have been reamed out, cased, and equipped with a submersible pump. The water quality is probably representative of the Jackpile Sandstone Member of the Morrison Formation, which also is the principal ore body in the Laguna mining district.

Dissolved radium in water from the Jackpile Sandstone aquifer ranges from 0.31 to 3.7 pCi/l. The latter value is from the new shop well which is a source of potable and nonpotable water for the facility. Continued consumptive use of this water is not recommended because the radium exceeds the PHS Drinking Water Standard of 3 pCi/l.

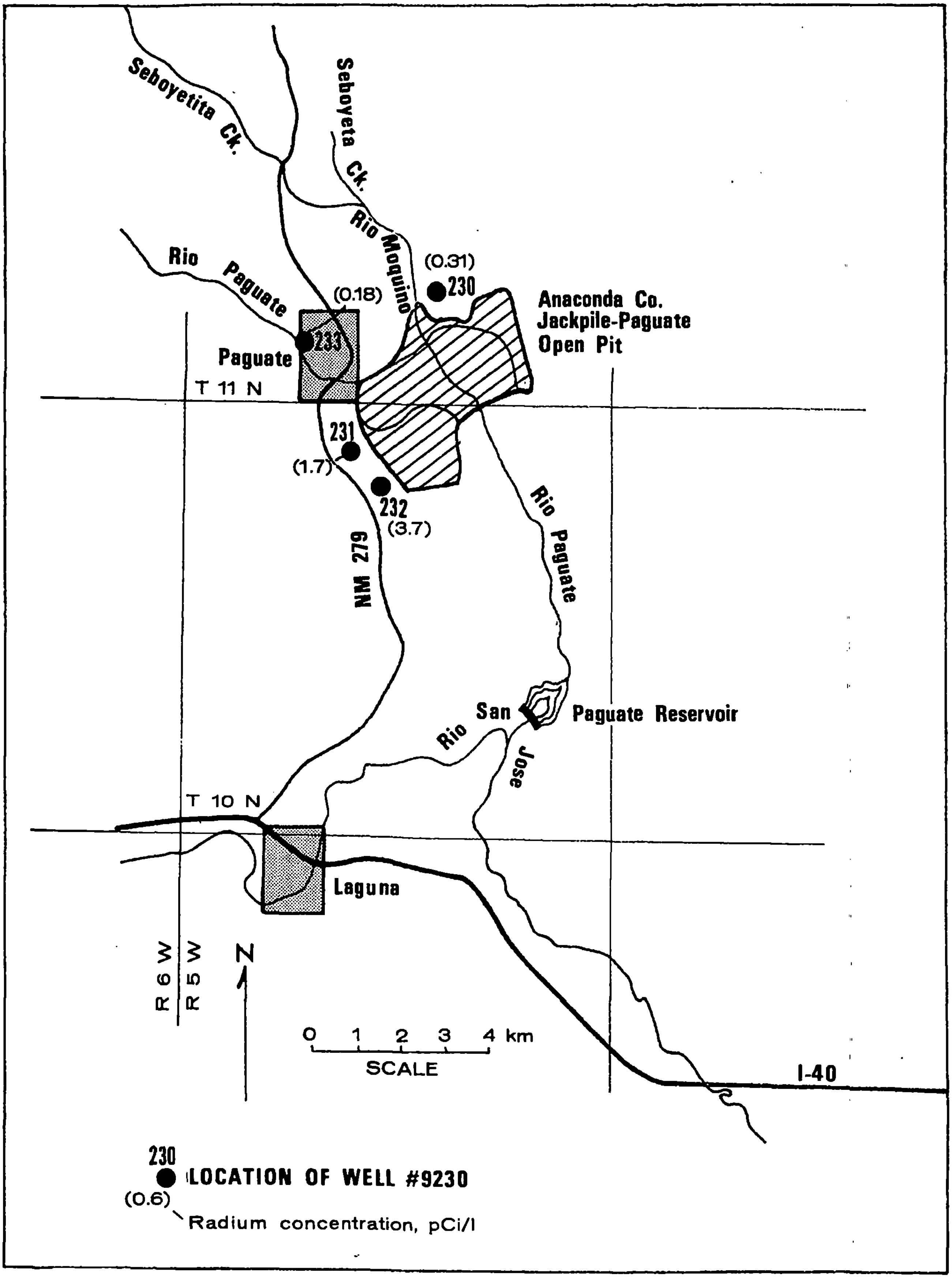


Figure 12. Radium Concentrations in Ground Water in the Paguate-Jackpile Area

The village of Paguate water supply is well below the recommended maximum level for not only radium but also the other isotopes considered in the present study. Selenium, however, is at the maximum recommended level of 0.01 mg/l. It is extremely unlikely that the present shallow-well supply will be affected by mining unless the open pit would be extended close to the well field. Recharge to the shallow aquifer is derived from runoff which infiltrates to the west and north. After percolating southward, it then reappears in a marshy area west of the village. Springs and artesian conditions are likely the result of decreasing transmissivity due to the near surface occurrence of shales and poorly permeable sandstones in the lower reaches of Pueblo Arroyo.

The downstream impacts of the Jackpile-Paguate mine on ground water were not determined because of the absence of suitable sampling points. It is recommended that shallow monitor wells be installed at several points along the Rio Paguate to ascertain the chemical, radiochemical, and trace element species present. Limited coring in the sediment-filled Paguate reservoir would provide data on variations in the radium and uranium content before and during mining. Such data would also provide information on radioactivity associated with sediment transport during periods of peak runoff and erosion.

Significance of Radiological Data

Regulations and Guidelines

On August 14, 1975, the U.S. EPA published in the Federal Register (40 FR158, p. 34323-34328) a "Notice of Proposed Maximum Contaminant Levels for Radioactivity" to be included in 10 CFR Part 141 - Interim Primary Drinking Water Regulations. The following are the proposed maximum contaminant levels for radium-226, radium-228, and gross alpha particle radioactivity:

1. Combined radium-226 and radium-228 not to exceed 5 pCi/l.

2. Gross alpha particle activity (including radium-226 but exclusive of radon and uranium contents) not to exceed 15 pCi/l.

The proposed regulations also discuss maximum contaminant levels of beta particle and photon radioactivity from man-made radionuclides.

Therefore, with respect to these proposed radioactive contaminant levels, the following conclusions were reached:

1. Additional analysis for radium-228 and lead-210 will proceed and be reported in a separate report at a later date.

2. Since radium-228 is a daughter product of thorium-232 and thorium analyses of these waters fluctuated around background concentrations, it appears that the radium-228 content should also be at background levels (i.e., less than 0.02 pCi/l. Hence, the radium-228 content, under assumed equilibrium conditions, should be less than 0.042 pCi/l, the highest reported thorium-232 content.

3. Only two locations out of the 71 ground-water locations sampled have radium-226 concentrations in excess of 5 pCi/l. Therefore, the proposed new standard of 5 pCi/l for combined radium-226 and radium-228 contents is therefore exceeded at these two locations.

4. Sixty of the 71 ground-water locations had gross alpha results in excess of the proposed 15 pCi/l limit; however, the gross alpha results reported here include uranium isotopes. Included in the list of sixty locations are several locations where the gross alpha results are less than 15 pCi/l, but consideration of the 2 sigma confidence level would then indicate a gross alpha possibly in excess of the 15 pCi/l limit.

5. The proposed maximum gross beta limit excludes naturally occurring radionuclides (e.g., lead-210); therefore, there is no presently proposed maximum contaminant level for lead-210. The NMEIA population guide MPC of 33 pCi/l appears to be the only current applicable guideline for lead-210 content.

Since the above radioactivity contaminant levels are proposed and not final interim primary drinking water regulations, the following discussions of the radiological analyses of water samples obtained during this study will be based on the U.S.P.H.S. Drinking Water Standards (1962) and current NRC/NMEIA maximum permissible concentration levels.

Radium-226

Of the 71 ground-water sampling locations of this study, only 6 locations showed radium-226 concentrations in excess of the 3.0 pCi/l drinking water standard (U.S.P.H.S. Drinking Water Standards, PHS Publication

No. 956; 1962). The population guide--maximum permissible concentration (10CFR, Part 20, Table II, column 2, unrestricted areas) is 10 pCi/l for radium-226. Table 7 lists the 6 locations and presents the gross alpha and radium-226 results.

The Jackpile-New Shop well, Paguate (#9232), is a potable water supply having a radium concentration in excess of the drinking water standard. This water need not be used for human consumption since other nearby wells have much lower radium concentrations (e.g., the Paguate municipal supply (#9233) or the Jackpile well (#9230)).

The Phil Harris well, Grants (#9201), is the only other potable water supply with a radium concentration in excess of 3.0 pCi/l. The Berryhill Section 5 windmill, Bluewater (#9121), is used as a stock water supply; and since there are no nearby human consumers, the radium concentration of 6.3 0.1 pCi/l is of no immediate health hazard.

Samples from two Kerr-McGee monitoring wells (#9208 and #9213), located within 800 meters of the main tailings retention dam, contain radium in excess of 3.0 pCi/l. These wells are not fitted with pumps, are in a restricted area, and contain water otherwise unfit for comsumption. For example, TDS varies from 7500 to 8900 mg/l. Therefore, these wells do not constitute a health hazard in terms of dissolved radium. Similarly, station #9212 consists of seepage return water collected at the base of the retention dam. Aside from the radium content of 4.9 pCi/l, the water is in a restricted area, is not used for any purpose, and contains 36,000 mg/l TDS. Therefore, consumptive use and creation of a health hazard is extremely unlikely.

For comparison purposes, Table 8 shows the radium concentrations for municipal water supplies surveyed during this study.

A radium concentration of 0.68 pCi/l from the Erwin well north of Gallup (#9233) was the highest radium concentration for the municipal supplies. It appears that, on the whole, municipal water supplies in the Grants Mineral Belt area do not exceed 23% percent of the drinking water standard of 3.0 pCi/l.

Ten privately owned, potable water supplies were surveyed in the Murray Acres-Broadview Acres and other areas surrounding the United Nuclear-Homestate Partners mill. The highest radium concentration was 0.72 pCi/l

Table 7

Locations with Radium-226 in Excess of the PHS Drinking Water Standard[1]

Location Description	Radium-226[2] Dissolved pCi/l	Radium-226[2] Two Sigma pCi/l	Gross Alpha[2] Dissolved pCi/l	Gross Alpha[2] Two Sigma pCi/l	Remarks
#9121-Berryhill Section 5 Bluewater	6.3	0.1	12	14	Windmill Stock Feed Water
#9201-P. Harris Grants KM-46	3.6	0.1	110	40	Potable Water Supply
#9208-KM-43 Grants	4.0	0.1	49	35	Monitor Well
#9212-KM Seepage Return-Grants	4.9	0.1	112,000	3,000	Surface Water Sample
#9213-KM-B-2 Grants	6.6	0.1	8	32	Monitor Well
#9232-Jackpile-New Shop Well Paguate	3.7	0.08	18	13	Potable Water Supply

1 PHS Drinking Water Standard, 1962, is 3.0 pCi/l for Radium-226.

2 Radium and gross alpha analysis by NEIC-Denver.

Table 8

Radium and Gross Alpha Concentrations for Municipal Water Supplies[1]

Location Description	Radium-226 Dissolved pCi/l	Radium-226 Two Sigma pCi/l	Gross Alpha Dissolved pCi/l	Gross Alpha Two Sigma pCi/l
#9112-Grants City Hall	0.42	0.02	19	13
#9116-Milan City Well #1	0.14	0.01	12	10
#9125-LDS Bluewater	0.22	0.01	8	10
#9137-Erwin Well Gallup	0.68	0.03	10	9
#9233-Municipal Well Paguate	0.18	0.02	2	4
#9141-Churchrock Village	0.12	0.01	3	7

1 Radium and gross alpha results by NEIC-Denver.

at the Worthen well (#9107), and the lowest concentration was less than 0.05 pCi/l at the Schwagerty well (#9105). The average radium concentration for these 10 private wells was 0.26 pCi/l.

Six privately owned, potable water supplies in the Ambrosia Lake area contain 0.07 to 3.6 pCi/l. Of nine privately owned potable water supplies surveyed in the Grants-Bluewater area, the maximum radium concentration was 0.24 pCi/l. Only two privately owned wells were used solely as potable water supplies in the Gallup area. These were the Hassler (#9139) and Boardman (#9138) residences. The radium concentrations at these two locations were 0.22 and 0.64 pCi/l, respectively. The other 8 wells in the Gallup-Churchrock area were used mainly as stock water supplies and had an average radium concentration of 0.35 pCi/l.

Other Radionuclides

Table 9 entitled "Maximum Permissible Concentrations in Water" presents the unrestricted area - MPC and the population guide - MPC for selected radionuclides. The PHS Drinking Water Standard of 3 pCi/l for radium-226 is more restrictive than the population guide - MPC; therefore, the radium content evaluations were based on the 3 pCi/l drinking water standard. The other radionuclide content evaluations are based on the soluble MPC value since filtered ground-water samples were analyzed. The MPC values listed are from the NRC regulations which are also consistent with the NMEIA regulations (June 16, 1973).

Only 3 potable water supplies had complete isotopic uranium analysis - Wilcox (#9102), Enyart (#9133), and Dixie well (#9140). The highest reported results (for the Wilcox well) indicate less than 0.1%, 0.002%, and 0.06% of the population guide - MPC for uranium-234, uranium-235, and uranium-238, respectively.

Of all the potable water supplies analyzed for thorium-230, the Worthen well (#9107) had the highest concentration of 0.99 pCi/l. However, this is less than 0.15% of the population guide - MPC. The Meador well (#9113) had the highest thorium-232 content of 0.042 pCi/l and polonium-210 content of 2.3 pCi/l. These are 0.006% and 0.98% of the population guide - MPC, respectively.

Table 9

Maximum Permissible Concentrations in Water[1]
(Above Natural Background)

Radionuclide		Appendix B Table II, Column 2 (Unrestricted Areas) pCi/l	Population Guide[2] pCi/l
^{226}Ra	Soluble	30	10[+]
	Insoluble	30,000	10,000
^{228}Ra	Soluble	30	10
	Insoluble	30,000	10,000
^{210}Po	Soluble	700	233
	Insoluble	30,000	10,000
^{210}Pb	Soluble	100	33
	Insoluble	200,000	66,667
^{230}Th	Soluble	2,000	667
	Insoluble	30,000	10,000
^{232}Th	Soluble	2,000	667
	Insoluble	40,000	13,333
^{234}U	Soluble	30,000	10,000
	Insoluble	30,000	10,000
^{235}U	Soluble	30,000	10,000
	Insoluble	30,000	10,000
^{238}U	Soluble	40,000	13,333
	Insoluble	40,000	13,333
U-Natural			
	Soluble	30,000	10,000
	Insoluble	30,000	10,000

1 10CFR-Part 20--Standards for Protection Against Radiation--U.S.N.R.C. (April 30, 1975).

2 Population Guide = 1/3 times Unrestricted Area MPC--Table II Values.

\+ A maximum permissible concentration of 3.33 pCi/l for ^{226}Ra is the Handbook 69 population guide (i.e., 1/30th of the HB69 continuous occupational exposure limits).

All 6 municipal water supplies were analyzed for thorium-230, thorium-232, and polonium-210. The highest thorium-230 content was for Grants (#9112), with 0.046 pCi/l (0.007% population guide - MPC). The highest thorium-232 content was for the Churchrock Village, with 0.016 pCi/l (0.002% of the population guide - MPC). The highest polonium-210 content was for the Municipal well at Paguate (#9233) with 0.39 pCi/l (0.17% of the population guide - MPC). In summary, exclusive of the radium-226 content, the highest isotopic uranium, thorium, and polonium-210 contents for any potable water supply in the Grants Mineral Belt area is less than 1.72% of the total radionuclide population guide - MPC. Exclusive of the Kerr-McGee seepage return sample (#9212) and the Anaconda injection well sample (#9107), the Worthen private well (#9107) had the highest gross alpha result of 2500 pCi/l. This gross alpha result underestimates the U-natural content reported as 9800 pCi/l (i.e., 98% of the allowable MPC). There are other examples of inconsistencies between gross alpha and natural uranium data. For example, samples #9102 and #9113 have gross alpha results of 3 pCi/l and 31 pCi/l, respectively. Comparable U-natural contents are 49 and 56 pCi/l (less than 0.56% of the U-natural MPC). In general, it appears that the uranium isotopes represent the greatest contributor of alpha activity. Considering the total radionuclide values to be the summation of uranium isotopes, thorium-230, thorium-232, and polonium-210 concentrations, the percentage of total radionuclides compared to gross alpha ranged from 31% (#9219) to 639% (#9102), exclusive of #9132 which has an extremely large discrepancy of results. Therefore, it appears that the gross alpha determinations have underestimated the natural uranium contents. It is doubtful that the gross alpha determination can even be used as an indicator of the presence of other alpha emitters (e.g., U-natural and polonium-210). Since the gross alpha results have such large error terms, no meaningful determinations of percentage of other radionuclides to gross alpha result can be implied.

With respect to the use of 15 pCi/l gross alpha (including uranium isotopes) as a "scan level" to indicate radium contents in excess of 5 pCi/l, only 2 locations fall in this category. Location #9121 had a gross alpha of 12 ± 14 pCi/l and a radium-226 content of 6.3 ± 0.1 pCi/l. Because of the large error term in the gross alpha determination (8 ± 32 pCi/l) for location #9213, this sample would be included in the group of locations having a gross alpha result greater than 15 pCi/1. This location had the highest radium-226 content of all the ground-water locations sampled (6.6 pCi/1). Of the 58 remaining ground-water locations with gross alpha results greater than 15 pCi/1 (range: <3 ± 13 to 2500 ± 200 pCi/1), the radium-226 contents ranged from 0.19 to 0.72 pCi/1, respectively. For ground-water samples with gross alpha greater than 15 pCi/1, the radium-226 concentration ranged from 0.06 to 6.6 pCi/1. Therefore, there appears to be no correlation between a gross alpha level of 15 pCi/1 (including uranium isotopes) and a radium-226 content of 5 pCi/1.

It is appropriate to conclude that for routine radiological monitoring of potable water supplies, isotopic uranium and thorium, polonium-210, and radium-228 analyses are not necessary. Accurate radium-226 and lead-210 analyses for each sample yield the most information for radiological evaluations of drinking water conditions.

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. ORP/LV-75-4	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Technical Note: Summary-Ground Water Quality Impacts of Uranium Mining and Milling in the Grants Mineral Belt, New Mexico		5. REPORT DATE August 1975
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Robert F. Kaufmann, Gregory G. Eadie, Charles R. Russell		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Environmental Protection Agency, Office of Radiation Programs, Las Vegas Facility, P. O. Box 15027, Las Vegas, Nevada 89114		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Same as above		13. TYPE OF REPORT AND PERIOD COVERED Final
		14. SPONSORING AGENCY CODE
15. SUPPLEMENTARY NOTES		

16. ABSTRACT

Ground-water contamination from uranium mining and milling results from the infiltration of radium-bearing mine, mill, and ion-exchange plant effluents. Radium, selenium, and nitrate were of most value as indicators of contamination. In recent years, mining has increased radium in mine effluents from several picocuries/liter (pCi/l) or less, to 100-150 pCi/l. The shallow aquifer in use in the vicinity of one mill was grossly contaminated with selenium, attributable to the mill tailings. Seepage from two other mill tailings ponds averaged 674×10^6 liters/year and, to date, has contributed an estimated 1.1 curies of radium to ground water. At one of these, an injection well was used to dispose of over 3400×10^6 liters of waste from 1960-1973. The wastes have not been properly monitored and have apparently migrated to more shallow, potable aquifers. No adverse impacts on municipal water quality in Paguate, Bluewater, Grants, Milan, and Gallup were observed. No correlation was found between gross alpha greater than 15pCi/l and radium-226 in excess of 5 pCi/l. Company-sponsored monitoring and reporting programs do not describe the full impact of mining and milling operations on ground-water quality. Review by State and Federal agencies has generally been superficial. Improvements in these areas and additional ground-water sampling are recommended.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Ground water, hydrogeology, uranium, water pollution, waste disposal, injection wells, wastes, natural radio-activity, radium, radiation hazards, radioactive wastes, mining, milling, tailings ponds.	Grants Mineral Belt New Mexico -Uranium mining and milling.	Radioactive contaminants, Radioactive waste processing, waste disposal.

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES 71
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 906/9-75-002	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Water Quality Impacts of Uranium Mining and Milling Activities		5. REPORT DATE September 1975
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) EPA, Region VI; ORP-Las Vegas; NEIC-Denver		8. PERFORMING ORGANIZATION REPORT NO. EPA 906/9-75-002
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Protection Agency Region VI 1600 Patterson Street, Suite 1100 Dallas, Texas 75201		10. PROGRAM ELEMENT NO. 2FH192
		11. CONTRACT/GRANT NO. N/A
12. SPONSORING AGENCY NAME AND ADDRESS N/A		13. TYPE OF REPORT AND PERIOD COVERED Final
		14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

Ground water in the study area is affected by mining and waste disposal associated with mining and milling. Contamination appears in close proximity to the mining and milling centers with the exception of more widespread selenium contamination of shallow ground water adjacent to the United Nuclear-Homestake Partners Mill. Contamination of municipally operated water supplies in the study area is not evident. Potable supplies derived from mine water at four industrial sites exceed applicable limits for selenium in drinking water. Three such systems exceed limits for Radium 226.

Recommendations developed are designed to assist the State in future regulation of uranium mining and milling for the purpose of safeguarding public health and insuring future environmental quality.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Uranium Radioisotopes Ground Water Water Quality Surface Water Potable Water	BT Radioisotopes RT Aquifers; water wells; water table RT Water Pollution NT Lagoons UF Drinking Water RT Public Health	

18. DISTRIBUTION STATEMENT Release unlimited	19. SECURITY CLASS *(This Report)* N/A	21. NO. OF PAGES 188
	20. SECURITY CLASS *(This page)* N/A	22. PRICE

EPA Form 2220-1 (9-73)

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Insert the EPA report number as it appears on the cover of the publication.

2. **LEAVE BLANK**

3. **RECIPIENTS ACCESSION NUMBER**
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Title should indicate clearly and briefly the subject coverage of the report, and be displayed prominently. Set subtitle, if used, in smaller type or otherwise subordinate it to main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific title.

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Each report shall carry a date indicating at least month and year. Indicate the basis on which it was selected *(e.g., date of issue, date of approvcl, date of preparation, etc.)*.

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Give name(s) in conventional order *(John R. Doe, J. Robert Doe, etc.)*. List author's affiliation if it differs from the performing organization.

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Insert if performing organization wishes to assign this number.

9. **PERFORMING ORGANIZATION NAME AND ADDRESS**
Give name, street, city, state, and ZIP code. List no more than two levels of an organizational hirearchy.

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Use the program element number under which the report was prepared. Subordinate numbers may be included in parentheses.

11. **CONTRACT/GRANT NUMBER**
Insert contract or grant number under which report was prepared.

12. **SPONSORING AGENCY NAME AND ADDRESS**
Include ZIP code.

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Indicate interim final, etc., and if applicable, dates covered.

14. **SPONSORING AGENCY CODE**
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15. **SUPPLEMENTARY NOTES**
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16. **ABSTRACT**
Include a brief *(200 words or less)* factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey, mention it here.

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    (b) IDENTIFIERS AND OPEN-ENDED TERMS - Use identifiers for project names, code names, equipment designators, etc. Use open-ended terms written in descriptor form for those subjects for which no descriptor exists.

    (c) COSATI FIELD GROUP - Field and group assignments are to be taken from the 1965 COSATI Subject Category List. Since the majority of documents are multidisciplinary in nature, the Primary Field/Group assignment(s) will be specific discipline, area of human endeavor, or type of physical object. The application(s) will be cross-referenced with secondary Field/Group assignments that will follow the primary posting(s).

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January 31, 2023 Report Reference, (EPA 1976), (EPA. April 1 1976. Application to Discharge to Waters of the United States, Permit No NM0028118. US Environmental Protection Agency.), Rio Algom Mining LLC, Ambrosia Lake West site, License SUA-1473.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1600 PATTERSON
DALLAS, TEXAS 75201

APR 1 1976

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (771817)

Mr. J. M. Swales, Vice President
Kerr-McGee Nuclear Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Section 35 & 36 Environ Rahn

Re: Application ~~to Discharge~~ to Waters of the United States
Permit No. NM0028118

Dear Mr. Swales:

Enclosed is a copy of the permit which this agency proposes to issue under the authority of the Federal Water Pollution Control Act Amendments of 1972.

This National Pollutant Discharge Elimination System (NPDES) permit regulating the discharge of pollutants from your facility will be issued and effective as indicated on the permit and the enclosed public notice pursuant to 40 CFR 125, as amended. A copy of the Regional Administrator's determination regarding this permit will be mailed to you no less than 30 days after the date of the enclosed public notice.

Should you have any questions concerning any part of the permit, please feel free to contact the Permits and Support Branch in Region VI.

Sincerely yours,

for John C. White
Regional Administrator

Enclosures

cc w/permit copy:
New Mexico Environmental
Improvement Agency

RECEIVED
SEP 2 1976
TLH
Safety & Env. Dept.

U. S. ENVIRONMENTAL PROTECTION AGENCY/STATE OF NEW MEXICO

PUBLIC NOTICE

APRIL 3, 1976

The purpose of this notice is to state EPA's intention to issue wastewater discharge permits under the authority of the Federal Water Pollution Control Act Amendments of 1972 (FWPCAA), P. L. 92-500, to the four applicants identified in the attached list, and the intention of the State of New Mexico to certify compliance of the applicants with applicable provisions of the aforesaid act. This proposed issuance has been made on the basis of preliminary staff review by the Environmental Protection Agency, Region VI, after consultation with the State of New Mexico.

It is the tentative determination of the Region VI staff to issue these permits and they shall become effective on July 3, 1976, unless:

a. The State of New Mexico denies certification prior to that date.

b. Comments received prior to May 3, 1976, warrant a substantial change from or denial of the proposed permit.

c. A public hearing is held requiring delay of the effective date.

Persons wishing to comment upon or object to the proposed determinations are invited to submit same in writing to:

Ms. Carol Young
U. S. Environmental Protection Agency
Region VI, Permits and Support Branch (6AEP)
1600 Patterson, Suite 1100
Dallas, Texas 75201

within thirty (30) days of publication date of the Public Notice of these applications. The application number should appear next to the above address on the first page of any submitted comments. All comments or objections received within this 30-day period will be considered in the formulation of final determination regarding the applications and a public hearing shall be held where the Regional Administrator finds a significant degree of public interest.

Any person may submit a request for an adjudicatory hearing within 10 days from receipt of Regional Administrator's determination to reconsider the permit. The contested provisions of the proposed permit shall then be stayed pending final action of the Agency pursuant to 40 CFR 125.36.

Requirements which must be satisfied prior to the granting of a request for an adjudicatory hearing or for requests to be party at an adjudicatory hearing may be obtained from 40 CFR 125.36(b), or from available fact sheets. Further information may be obtained at the above address, Room 1142, or telephone (214) 749-1983, between 8:00 a.m. and 4:30 p.m. Monday through Friday.

Notice is also given that the New Mexico Environmental Improvement Agency has tentatively determined to certify to the U. S. Environmental Protection Agency that the discharge, as proposed, will comply with the applicable provisions of Sections 301, 302, 306 and 307 of the Federal Water Pollution Control Act Amendments of 1972. Interested persons may offer, in writing, their views concerning this tentative determination of the New Mexico Environmental Improvement Agency or may request a public hearing thereon. These views or any request for public hearing must be received by the New Mexico Environmental Improvement Agency office within the 30-day period mentioned above. Mail should be addressed to Ms. Helen Gram, Program Manager, New Mexico Environmental Improvement Agency, P.O. Box 2348, Santa Fe, New Mexico 87501.

1. Permit No. NM0020389 for NPDES Authorization to discharge to waters of the United States.

The applicant's mailing address is: United Nuclear-Homestake Partners
P.O. Box 98
Grants, New Mexico 87020

The discharge is made into Arroyo del Puerto into San Mateo Creek, a water of the United States which is classified for recreation and support of desirable aquatic life presently common in New Mexico waters, and is located on that water on Section 25, T14N, R10W NMPM in the Ambrosia Lake mining area approximately 25 miles north of Grants, New Mexico. A fact sheet is attached. The applicant's activities, under the standard industrial classification (SIC) code 1094 which result in the exsiting discharge are the recovery by ion exchange of uranium from mine water.

2. Permit No. NM0026573 for NPDES authorization to Discharge to waters of the United States.

The applicant's mailing address is: Ranchers Exploration and Development Corporation
P. O. Box 6217
Albuquerque, New Mexico 87107

The discharge is made into San Mateo Creek, a water of the United States which is classified for recreation and support of desirable aquatic life presently common in New Mexico waters, and is located on that water in McKinley County, New Mexico, approximately four miles west of San Mateo, New Mexico.

A fact sheet is not available.

The applicant's activities, under the standard industrial classification (SIC) code 1094 which result in the existing discharge are underground mining of uranium ore.

3. Permit No. NM0028100 for NPDES Authorization to Discharge to waters of the United States.

The applicant's mailing address is: Gulf Oil Corporation
1720 South Bellaire Street
Denver, Colorado 80222

The discharge is made into an unnamed arroyo into San Mateo Creek, a water of the United States which is classified for recreation and support of desirable aquatic life presently common in New Mexico waters, and is located on that water on Section 14, T13N, R8W NMPM in McKinley County, New Mexico, approximately one and one-half miles north of San Mateo, New Mexico. A fact sheet is attached. The applicant's activities, under the standard industrial classification (SIC) code 1094 which result in the existing discharge are underground mining of uranium ore.

4. Permit No. NM0028118 for NPDES Authorization to Discharge to waters of the United States.

The applicant's mailing address is: Kerr-McGee Nuclear Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

The discharge is made into Arroyo del Puerto into San Mateo Creek, a water of the United States which is classified for recreation and support of desirable aquatic life presently common in New Mexico waters, and is located on that water in the Ambrosia Lake mining area approximately 25 miles north of Grants, New Mexico. A fact sheet is not available. The applicant's activities under the standard industrial classification (SIC) code 1094 which result in the existing discharge are underground mining of uranium ore.

Permit No. NM0028118
Application No. NM0028118

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Kerr-McGee Nuclear Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

is authorized to discharge from a facility located at

Sections 35 & 36, T13N, R9W, NMPM
Uranium Mines

to receiving waters named

Arroyo del Puerto to San Mateo creek

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on July 3, 1976.

This permit and the authorization to discharge shall expire at midnight, July 2, 1981.

Signed this 1st day of April 1976.

for [signature]
John E. White
Regional Administrator

A-1 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning effective date and lasting through 6-30-77 the permittee is authorized to discharge from outfall(s) serial number(s) 001.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations				Monitoring Requirements	
	kg/day (lbs/day)		Other Units (Specify)			
	Daily Avg	Daily Max	Daily Avg	Daily Max	Measurement Frequency	Sample Type
Flow—m^3/Day (MGD)	N/A	N/A	N/A	N/A	3/week	Instantaneous
Temperature	N/A	N/A	N/A	N/A	1/week	Grab
Total Suspended Solids	N/A	N/A	20 mg/l	30 mg/l	1/week	24-hr. composite
Chemical Oxygen Demand	N/A	N/A	100 mg/l	200 mg/l	1/week	24-hr. composite
Soluble Radium 226	N/A	N/A	N/A	30 pCi/l	1/week	24-hr. composite
Total Arsenic	N/A	N/A	0.5 mg/l	1.0 mg/l	1/week	24-hr. composite
Total Cadmium	N/A	N/A	0.05mg/l	0.10mg/l	1/week	24-hr. composite
Total Uranium	N/A	N/A	2.0 mg/l	4.0 mg/l	1/week	24-hr. composite
Total Zinc	N/A	N/A	0.5 mg/l	1.0 mg/l	1/week	24-hr. composite
Total Molybdenum	N/A	N/A	N/A	N/A	1/month	24-hr. composite
Total Selenium	N/A	N/A	N/A	N/A	1/month	24-hr. composite
Total Vandium	N/A	N/A	N/A	N/A	1/month	24-hr. composite
Total Radium 226	N/A	N/A	N/A	N/A	1/month	24-hr. composite

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 1/week by grab sample.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At outlet of treatment system.

35-36

A-2 EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning 7-1-77 and lasting through expiration date, the permittee is authorized to discharge from outfall(s) serial number(s) 001.

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations kg/day (lbs/day) Daily Avg	Daily Max	Other Units (Specify) Daily Avg	Daily Max	Monitoring Requirements Measurement Frequency	Sample Type
Flow—m^3/Day (MGD)	N/A	N/A	N/A	N/A	Continuous	Record
Temperature	N/A	N/A	N/A	N/A	1/week	Grab
Total Suspended Solids	N/A	N/A	20 mg/l	30 mg/l	1/week	24-hr. composite
Chemical Oxygen Demand	N/A	N/A	100 mg/l	200 mg/l	1/week	24-hr. composite
Total Radium 226	N/A	N/A	10 ~~3 pCi/l~~	30 ~~10 pCi/l~~	1/week	24-hr. composite
~~Total Arsenic~~	~~N/A~~	~~N/A~~	~~0.5 mg/l~~	~~1.0 mg/l~~	~~1/week~~	~~24-hr. composite~~
~~Total Cadmium~~	~~N/A~~	~~N/A~~	~~0.05mg/l~~	~~0.10mg/l~~	~~1/week~~	~~24-hr. composite~~
Total Uranium	N/A	N/A	2.0 mg/l	4.0 mg/l	1/week	24-hr. composite
Total Zinc	N/A	N/A	0.5 mg/l	1.0 mg/l	1/week	24-hr. composite
Total Molybdenum	N/A	N/A	N/A	N/A	1/month	24-hr. composite
Total Selenium	N/A	N/A	N/A	N/A	1/month	24-hr. composite
Total Vanadium	N/A	N/A	N/A	N/A	1/month	24-hr. composite
added Radium, dissolved			3 pCi/l	10 pCi/l	1/week	

* Per stipulation

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored 1/week by grab sample.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): At outlet of treatment system.

* Checked against Stipulation & agreement secured May 18, 1978

TRK

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

Completion of final plans by	7-31-76
Report of Progress	12-31-76
Attainment of Operational Level by	6-30-77

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

C. MONITORING AND REPORTING

1. *Representative Sampling*

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. *Reporting*

Monitoring results obtained during the previous 3 months shall be summarized for each month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed reporting period. The first report is due on October 28, 1976. . Duplicate signed copies of these, and all other reports required herein, shall be submitted to the Regional Administrator and the State at the following addresses:

Mr. John C. White
Regional Administrator
Region VI
1600 Patterson, Suite 1100
Environmental Protection Agency
Dallas, Texas 75201

Ms. Helen Gram, Program Manager
New Mexico Environmental
Improvement Agency
P.O. Box 2348
Santa Fe, New Mexico 87501

3. *Definitions*

a. ~~The "daily average" discharge means the total discharge by weight during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made.~~

b. The "daily maximum" discharge means the total discharge by weight during any calendar day.

4. *Test Procedures*

Test procedures for the analysis of pollutants shall conform to regulations published pursuant to Section 304(g) of the Act, under which such procedures may be required.

5. *Recording of Results*

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The exact place, date, and time of sampling;

b. The dates the analyses were performed;

c. The person(s) who performed the analyses;

d. The analytical techniques or methods used; and

e. The results of all required analyses.

6. *Additional Monitoring by Permittee*

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (EPA No. 3320-1). Such increased frequency shall also be indicated.

7. *Records Retention*

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the State water pollution control agency.

A. MANAGEMENT REQUIREMENTS

1. *Change in Discharge*

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

2. *Noncompliance Notification*

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum effluent limitation specified in this permit, the permittee shall provide the Regional Administrator and the State with the following information, in writing, within five (5) days of becoming aware of such condition:

a. A description of the discharge and cause of noncompliance; and

b. The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

3. *Facilities Operation*

The permittee shall at all times maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit.

4. *Adverse Impact*

The permittee shall take all reasonable steps to minimize any adverse impact to navigable waters resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. *Bypassing*

Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited, except (i) where unavoidable to prevent loss of life or severe property damage, or (ii) where excessive storm drainage or runoff would damage any facilities necessary for compliance with the effluent limitations and prohibitions of this permit. The permittee shall promptly notify the Regional Administrator and the State in writing of each such diversion or bypass.

6. *Removed Substances*

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.

7. *Power Failures*

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or, if such alternative power source is not in existence, and no date for its implementation appears in Part I,

b. Halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

B. RESPONSIBILITIES

1. *Right of Entry*

The permittee shall allow the head of the State water pollution control agency, the Regional Administrator, and/or their authorized representatives, upon the presentation of credentials:

a. To enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any discharge of pollutants.

2. *Transfer of Ownership or Control*

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Regional Administrator and the State water pollution control agency.

3. *Availability of Reports*

Except for data determined to be confidential under Section 308 of the Act, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act.

4. *Permit Modification*

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

5. *Toxic Pollutants*

Notwithstanding Part II, B-4 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified.

6. *Civil and Criminal Liability*

Except as provided in permit conditions on "Bypassing" (Part II, A-5) and "Power Failures" (Part II, A-7), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. *Oil and Hazardous Substance Liability*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. *State Laws*

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. *Property Rights*

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. *Severability*

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

PART III

OTHER REQUIREMENTS

deleted per stipulation agreement 5/18/78

1. Provisions shall be made to assure the elimination of all seepage, overflow or other sources which may result in any direct or indirect surface discharge other than authorized by this permit.

2. Definitions

a. The "daily average" concentration means the arithmetic average (weighted by flow value) of all the daily determinations of concentration made during a calendar month. Daily determinations of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the daily determination of concentration shall be arithmetic average (weighted by flow value) of all the samples collected during that calendar day.

b. The "daily maximum" concentration means the daily determination of concentration for any calendar day.

c. "Composite sample" means a sample consisting of a minimum of three (3) grab samples of effluent collected at regular intervals over a normal operating day and combined proportional to flow, or a sample continuously collected proportional to flow over a normal operating day.

Part III (cont'd)

OTHER REQUIREMENTS

3. Test Procedures

a. The effluent characteristics "soluble radium 226" and "total radium 226" shall be measured by Method 305 "Radium 226 in Water" in accordance with the procedures discussed for soluble radium 226 and total radium 226 in Standard Methods for the Examination of Water and Wastewater, 13th Edition, 1971, pg. 617, or an equivalent method.

b. The effluent characteristic "Total Uranium" shall be measured by the procedure discussed in the HASL Procedural Manual, edited by John H. Harley, HASL 300 Health and Safety Laboratory, U.S. Atomic Energy Commission, 1973, pg. EU-03, or an equivalent method.

T. L. Hurst

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1600 PATTERSON
DALLAS, TEXAS 75201

NPDES DETERMINATION

The Regional Administrator, after considering the facts and the requirements and policies expressed in Public Law 92-500 and implementing regulations, has determined that Permit No. NM0028118, Kerr-McGee Nuclear Corp., be issued and effective as proposed in Public Notice dated April 3, 1976, subject to timely certification (or waiver thereof) by the state certifying agency, provided, however, that any condition(s) contested in a request for an Adjudicatory Hearing submitted within 10 days from receipt of this determination shall be stayed if the Regional Administrator grants the request for Hearing.

Dated: May 25, 1976

for Regional Administrator
Region VI

January 31, 2023 Report Reference, (EPA 1978), (EPA. November 21 1978. Letter Voiding NPDES No NM0028118.), Rio Algom Mining LLC, Ambrosia Lake West site, License SUA-1473.

United States Environmental Protection Agency
Region 6
1201 Elm Street
Dallas TX 75270
Arkansas, Louisiana, Oklahoma, Texas, New Mexico

EPA

Copy to WJS
Bob Tryenda
L. Garfield
D. Cody
11/29/78

November 21, 1978

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (168505)

Mr. F. A. McPherson
Corporate Vice President
Kerr-McGee Nuclear Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73102

Re: NPDES No. NM0028118
Kerr-McGee Nuclear Corporation
Oklahoma City, Oklahoma

Dear Mr. McPherson:

In accordance with Judge Marvin Jones' letter of August 22, 1978, a copy of which is attached, you are hereby notified that the referenced permit is discontinued and void.

Should you again propose to discharge any pollutant from this facility to waters of the United States, it will be necessary for you to make a new application at least 180 days in advance of the date on which it is proposed to commence the discharge. Any permit issued as a result of such reapplication will contain conditions and limitations consistent with the situation, and the law and regulations in effect at the time of reissuance, irrespective of any previously issued permit.

If you have any questions, please feel free to contact Ms. LaRee Eschberger at the above address or telephone (214) 767-2765.

Sincerely,

Jim Collins
for Howard G. Bergman
Director
Enforcement Division (6AE)

Attachment

cc: New Mexico Environmental
Improvement Division

January 31, 2023 Report Reference, (EPA 2013), (EPA. September 2013. Documented Release Sampling for Section 30 Uranium Mine. (CERCLIS No. NMN000607480).), Rio Algom Mining LLC, Ambrosia Lake West site, License SUA-1473.

DOCUMENTED RELEASE SAMPLING REPORT

FOR

SECTION 30 URANIUM MINE
GRANTS LEGACY URANIUM SITES
GRANTS, MCKINLEY COUNTY, NEW MEXICO

Prepared for

U.S. Environmental Protection Agency Region 6
Linda Carter, Project Officer
1445 Ross Avenue
Dallas, Texas 75202

Contract No. EP-W-06-042
Technical Direction Document TO-0035-12-11-04
WESTON Work Order No. 20406.012.035.0785.01
NRC No. N/A
CERCLIS No. NMN000607480
FPN N/A
EPA SAM: Mark Purcell
START-3 PTL: Patrick Buster

Prepared by

Weston Solutions, Inc.
Robert Beck, VP, P.E., Program Manager
70 NE Loop 410, Suite 600
San Antonio, Texas 78216
(210) 308-4300

September 2013

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) tasked Weston Solutions, Inc. (WESTON®), the EPA Region 6 Superfund Technical Assessment and Response Team (START-3) contractor, to conduct Documented Release Sampling (DRS) at the Section 30 Uranium Mine site (hereinafter the "Site") located near Ambrosia Lake, McKinley County, New Mexico.

The Site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) under CERCLIS No. NMN000607480. On 23 August 2011, the EPA conducted an Airborne Spectral Photometric Environmental Collection Technology (ASPECT) overflight of the San Mateo area and collected measurements for exposure rate, total count rate, and elemental uranium. Results from the ASPECT overflight indicated elevated radiation exposure rates and gamma radiation activity (total count rate).

START-3 (the EPA team) conducted DRS at the Site on 27 and 28 February 2013 that included collecting surface gamma radiation measurements in addition to conducting sampling and performing chemical/radiological analyses of surface soil. The specific sampling objectives for the DRS were to collect data that could be used to document a potential release of hazardous substances to the environment and to potentially warrant further site investigation and/or reclamation. Based on the results of the DRS sampling event, soil contamination attributable to the Site was documented via these contributing factors:

- Ninety-two of the 100 stationary 1-minute gamma measurement locations had readings higher than two times the mean background average reading of 15,026 (counts per minute (cpm), indicating a documented release at the Site.
- Radium 226 (Ra-226) soil sampling results from the Section 30 Uranium Mine ranged from 12.1 to 451 picoCuries per gram (pCi/g). All 11 sample results exceeded three times the background Ra-226 result average of 1.33 pCi/g for the mine. This indicates a documented release at the Site.
- Arsenic, lead, molybdenum, potassium, selenium, uranium, and vanadium were detected in soil samples that exceeded three times background concentrations, indicating a documented release at the Site.

This Documented Release Sampling Report has been prepared to describe the technical scope of work that was completed as part of the Technical Direction Document (TDD) No. TO-0035-12-11-04 under Contract No. EP-W-06-042 for EPA Region 6. The EPA Site Assessment Manager (SAM) was Mark Purcell, and the START-3 Project Team Leader (PTL) was Patrick Buster.

☐ The EPA Task Monitor did not provide final approval of this report prior to the completion date of the work assignment. Therefore, Weston Solutions, Inc. has submitted this report absent the Task Monitor's approval.

☒ The EPA Task Monitor has provided final approval of this report. Therefore, Weston Solutions, Inc. has submitted this report with the Task Monitor's approval.

TABLE OF CONTENTS

Section **Page**

LIST OF APPENDICES

LIST OF FIGURES*

***All figures are provided as separate portable document format (PDF) files.**

LIST OF TABLES*

***All tables are provided as separate portable document format (PDF) files.**

1. INTRODUCTION

WESTON, the EPA Region 6 START-3 Contractor, was tasked by EPA under Contract Number EP-W-06-042, TDD No. TO-0035-12-11-04 (Appendix G) to conduct Documented Release Sampling (DRS) at the Section 30 Uranium Mine site (Site) located in McKinley County, New Mexico. Site coordinates are Latitude 35.436418° North and Longitude -107.878394° West. A Site Location Map is provided as Figure 1-1. All figures and tables are provided as separate portable document format (PDF) files. START-3 has prepared this DRS Report to provide the EPA with the field radiation scanning results and present the analytical data obtained during the field investigation performed at the Site.

1.1 SITE BACKGROUND

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), WESTON was tasked to perform DRS at the Site located near San Mateo, McKinley County, New Mexico.

The Site was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) under CERCLIS No. NMN000607480. On 23 August 2011, EPA conducted an Airborne Spectral Photometric Environmental Collection Technology (ASPECT) overflight of the San Mateo area and collected measurements for exposure rate, total count rate, and elemental uranium. Results from the ASPECT overflight indicated elevated radiation exposure rates and gamma radiation activity (total count rate). Figure 1-2 presents the ASPECT overflight exposure rate results. The gamma radiation readings at the Site were statistically greater than background readings in the area. Additionally, according to the New Mexico Environment Department (NMED) Ground Water Quality Bureau Pre-CERLCIS Screening Assessment of the Site, issued October 31, 2011, there has been no documented Site reconnaissance by a New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD) contractor (Reference 1).

This report has been prepared to provide available background information collected for the Site, discuss the DRS activities, and present the analytical data obtained as part of the investigation.

1.2 OBJECTIVES OF THE INVESTIGATION

After reviewing the NMED memorandum and reviewing the results obtained from the ASPECT overflight, EPA concluded that an investigation was needed to determine if hazardous substances have been released to the environment from past historical mining activities and despite reclamation histories of the mine. This investigation is designed to provide a high-confidence determination by direct observation, field measurement, and laboratory analysis that a hazardous substance has been released at the Site, termed a "documented release." The definition of a release under CERCLA (Section 101(22) is *"[A]ny spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant or contaminant)..."* For the purpose of this investigation, a documented release can be established by chemical analysis that requires attributing the hazardous substance to the Site, determining background concentrations, demonstrating that the concentration of the hazardous substance in a release sample is significantly increased above Site background concentrations, and attributing some portion of the significant increase to the Site. EPA will use this information obtained during the DRS to determine if additional investigation and/or remediation is warranted under CERCLA.

1.3 SCOPE OF WORK

The DRS Scope of Work is intended to describe the tasks requiring completion in order to evaluate the Site. As part of this DRS, the EPA team performed the following major tasks:

- Prepared a site-specific Quality Assurance Sampling Plan (QASP), approved by the EPA, and Health and Safety Plan (HASP) prior to sampling activities.
- Evaluated available information from the on-site observations, historical aerial photographs, area environmental information, and historical documents provided by EPA.
- Conducted DRS field sampling/scanning activities on 27 and 28 February 2013. Samples were collected at various locations with the highest 1-minute stationary gamma measurements. The samples were collected in general accordance with the site-specific QASP and HASP to document the presence and migration of hazardous substances attributable to the Site.

- Submitted the DRS samples to National Environmental Laboratory Accreditation Program (NELAP) certified laboratories for analysis and reviewed and tabulated the resulting data.
- Compared the laboratory results to three times the background concentrations to establish a documented release.
- Prepared this report to present the findings of the DRS.

1.4 REPORT FORMAT

The DRS report contains the following sections:

- Section 1 – Introduction
- Section 2 – Site Characteristics
- Section 3 – Documented Release Sampling
- Section 4 – Summary
- Section 5 – References

Additional information is provided in the following appendices:

- Appendix A Digital Photographs
- Appendix B Site Logbook
- Appendix C Quality Assurance Sampling Plan
- Appendix D Laboratory Data Packages
- Appendix E Laboratory Data Validation Packages
- Appendix F Reference Documentation
- Appendix G TDD No. 0035-12-11-04

Tables and figures cited in this report are provided as separate PDF files. Photographs taken during the DRS activities are provided as Appendix A. Field logbook notes are provided as Appendix B. The site-specific QASP is provided as Appendix C.

2. SITE CHARACTERISTICS

Information regarding the site location, description, and site history is included in the following subsections.

2.1 SITE LOCATION AND DESCRIPTION

The Site is within the Ambrosia Lake Mining Subdistrict, located 19 miles north of Grants in McKinley County, New Mexico. The Site has approximately 44 acres of disturbed surface and was mined from 1957 until 1984. Between 1984 and 2000, areas of the mine were used for old stope leaching activities. Old stope leaching activities were discontinued in January 2000, and the mine operations were permanently suspended in December 2002.

2.2 SITE HISTORY

The Site was an underground mine during operation, when an estimated 3.6 million tons of uranium ore was produced. There are no surface water features on the Site, and water runoff drains into Arroyo Del Puerto, a tributary of San Mateo Creek located approximately 1 mile south of the Site. Site reclamation began in 1994. Between 2003 and 2005 the Site structures were removed and the main shaft, ventilation holes, and injection holes were plugged. This was followed by contouring and revegetation. Site features and conditions are most recently documented in reports from a Pre-CERCLIS screening assessment (PCS) from NMED and from an ASPECT survey conducted on 23 August 2011. According to the ASPECT survey, the gamma radiation readings at the Site were statistically greater than background readings in the area.

3. DOCUMENTED RELEASE SAMPLING

The specific information regarding field observations, sampling activities, background determination, gamma scanning and measurements, soil sampling, and deviations from the QASP are included in the following subsections (Reference 2).

3.1 OVERVIEW

The EPA team was tasked to conduct DRS at the Site, including collecting environmental samples, gamma scanning approximately 10% of the Site, and collecting 100 stationary 1-minute gamma measurements. The specific sampling objectives were to collect data that could be used to document a release of hazardous substances to the environment as a result of historical mining operations. The Contaminants of Concern (CoCs) included all identifiable gamma emitting radioisotopes, specifically, the daughters of uranium-238 (U-238) and radium-226 (Ra-226). Additional CoCs included arsenic, molybdenum, selenium, and total uranium.

The EPA team implemented the QASP at the Site on 27 and 28 February 2013 and collected gamma measurements sufficient to provide approximately 10% coverage of the surface area of the Site. Figure 3-1 illustrates the assessment area. Mine area gamma radiation distribution results are presented in Table 3-1. In addition, 1-minute stationary gamma measurements were collected at 100 evenly spaced grid locations throughout the mine area. The stationary gamma measurements are listed in Table 3-2 and the locations are presented on Figure 3-2. In addition, 10 soil samples and 1 duplicate soil sample were collected at the 1-minute stationary locations that had elevated gamma activity. Sample locations are illustrated on Figure 3-2. Three background soil samples (Figure 3-1) were collected to the north, east, and west beyond the perimeter of the mine area, and 1-minute stationary readings were collected at each location. No background location could be sampled to the south, as the EPA team had no access to the property south of the Section 30 assessment area. The locations of the background samples are presented on Figure 3-1, and the 1-minute gamma measurements are listed in Table 3-2.

Surface soil samples were collected and submitted to the NELAP-certified laboratory for the following analyses: total metals including arsenic, molybdenum, selenium, and total uranium by Methods SW846 6010/6020 and 7470/7471, and all identifiable gamma emitting radioisotopes by

Method LANL ER-0130 gamma spectrometry. The analytical data were validated by START-3. Laboratory analytical results for radioisotopes and metals are presented in Tables 3-3 and 3-4, respectively. The laboratory data packages are included in Appendix D. The validated laboratory data packages are included in Appendix E.

3.2 FIELD OBSERVATIONS

The Site reconnaissance took place on 27 and 28 February 2013. The weather was generally sunny, with high temperatures around 50 degrees Fahrenheit and light winds. The mine area was generally flat on the north side of the road with uniform grass vegetation. The mine area on the south side of the road, however, was very rugged. There were many holes, trenches, berms, and an old stock tank noted. This area was fairly uniformly covered in desert grass vegetation and shrubs of heavy density, including tumbleweeds and scattered trees. During the Site reconnaissance, it was noted that the surface of the mine area mostly consisted of a tan to light orange soil on the north side of the road and tan to gray soil on the south side of the road. In general, readings were significantly elevated around the gray soil more so than the other soil types on the Site. Pictures of these areas can be seen in Appendix A. At the time of the Site reconnaissance, conditions were extremely dry, and no surface water was noted near or on the Site. There is a possibility that soil could be transported off-site with high winds or flash flooding. However, at the time of the Site reconnaissance, there were no evident signs that this has occurred.

3.3 BACKGROUND DETERMINATION

The QASP (Reference 2) protocol determined the background for the individual Site as the mean of the field measurements and laboratory results of samples collected from four locations at the perimeter of the property. These four sample locations corresponded to the four cardinal directions of the compass (north, east, south, and west). The protocol indicates that a Site background location should have similar physical, chemical, geological, radiological, and biological characteristics. One background soil sample was collected to the north of the Site, where a 1-minute stationary gamma measurement was also collected. There were no other background samples collected due to either elevated readings, as this is a historically highly disturbed mining area, or no property access.

3.4 GAMMA SCANNING

Due to the size of the Site, it was determined that approximately 10% of the surface area would be scanned using a 2-inch X 2-inch NaI detector held approximately 1 meter above the ground surface in conjunction with a Global Positioning System (GPS) unit. The disturbed area of the Site is approximately 44 acres in size (Reference 1). The assessment area is approximately 59 acres in size and was selected by reviewing historical imagery and assessing the most disturbed areas of the Site. Evenly placed transects were walked across the Site from one end of the disturbed claim boundary to another. Each transect was approximately 10 meters apart. One-second measurements of gamma activity were recorded and electronically attached to the appropriate GPS designation for subsequent plotting and depiction of the ambient gamma activity. A total of 25,495 gamma radiation measurements were collected from the Site, ranging from 18,519 counts per minute (cpm) to 999,960 cpm. Site gamma radiation results and statistics are provided in Table 3-1 and on Figure 3-1.

3.5 STATIONARY GAMMA MEASUREMENTS

Stationary 1-minute gamma measurements were collected at 100 (175-foot) evenly spaced grid locations across the Site using the same type of instrumentation and at the same height above the ground surface as the gamma scanning measurements. Because the stationary measurements are integrated over 1-minute intervals versus 1-second intervals, the measurements provide a more accurate measurement of the ambient gamma activity at that point. The QASP protocol states that a single-point measurement greater than two times the background average concentration indicates a documented release at the mine (Reference 2). At the 100 total stationary locations, gamma measurements ranged from 25,091 cpm to 391,816 cpm, with 92 measurements exceeding two times the background average measurement of 15,026 cpm. The stationary measurement locations and measurements are illustrated in Figure 3-2 and presented in Table 3-2.

3.6 SOIL SAMPLING

Ten soil samples (including 1 background and 1 duplicate sample) were collected at 0 to 6-inch depths at locations identified by the stationary measurements as being suspect. Figure 3-2 depicts the sampling locations, and Table 3-2 presents the 1-minute stationary gamma measurements at each sample location. Surface soil samples were collected and submitted for total metals including total uranium, molybdenum, tin, and mercury by Methods SW846 6010/6020 and 7470/7471, and all identifiable gamma emitting radioisotopes by Method LANL ER-0130 Gamma Spectrometry. The QASP states that if any sample contains U-238 as determined by alpha spectrometry or Ra-226 as determined by gamma spectrometry at a concentration equal to or greater than three times the mean background average concentration, the Site will be identified as having a documented release (Reference 2). All 11 soil samples from the Site exceeded three times the background average concentration for Ra-226. The analytical data were validated by START-3. The metals and radioisotopes laboratory results are included in Tables 3-3 and 3-4. Laboratory data are presented in Appendix D, and the validated laboratory data packages are included in Appendix E.

3.7 DEVIATIONS FROM THE QASP

The following deviations from the QASP occurred during the field work:

- Background samples were only collected to the north of the Site. No background samples could be located to the east, south, or west because either the EPA team did not have access to the property, or gamma radiation readings were consistently elevated in the area.

4. SUMMARY

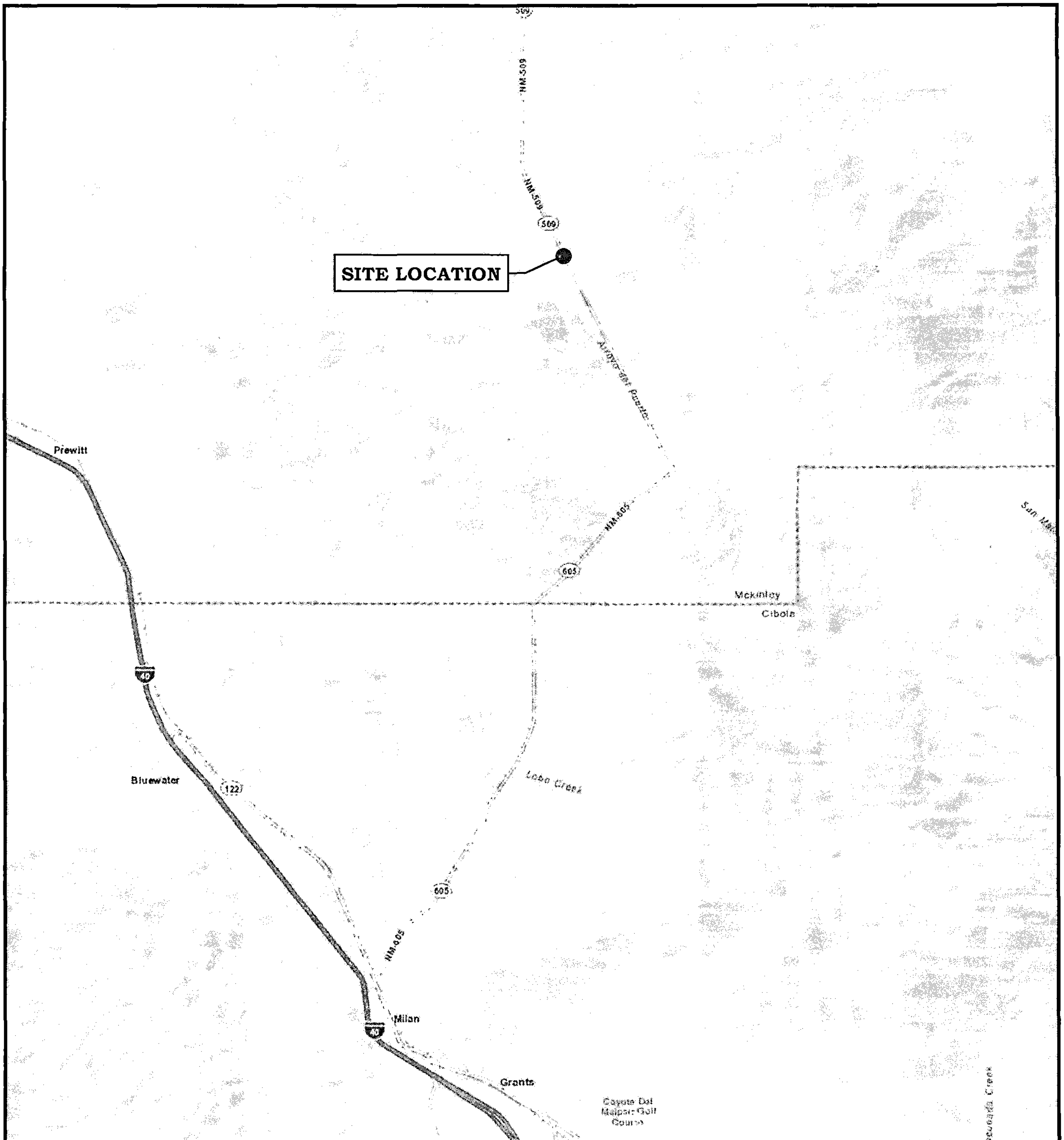
The EPA team conducted DRS at the Section 30 Uranium Mine Site on 27 and 28 February 2013 that included collecting surface gamma radiation measurements in addition to conducting sampling and performing chemical/radiological analyses of surface soil. The specific sampling objectives for the DRS were to collect data that could be used to document a potential release of hazardous substances to the environment and to potentially warrant further site investigation and/or remediation. Based on the results of the DRS sampling event, soil contamination attributable to the Site was documented via these contributing factors:

- Ninety-two of the 100 stationary 1-minute gamma measurement locations had readings higher than two times the mean background average reading of 15,026 (counts per minute (cpm), indicating a documented release at the Site.
- Radium 226 (Ra-226) soil sampling results from the Section 30 Uranium Mine ranged from 12.1 to 451 pCi/g. All 11 sample results exceeded three times the background Ra-226 result average of 1.33 pCi/g for the mine. This indicates a documented release at the Site.
- Arsenic, lead, molybdenum, potassium, selenium, uranium, and vanadium were detected in soil samples that exceeded three times background concentrations, indicating a documented release at the Site.

5. REFERENCES

1. NMED (New Mexico Environment Department). *Pre-CERCLIS Screening Assessment of the Section 30 Mine*. 31 October 2011.

2. Weston Solutions, Inc. *Quality Assurance Sampling Plan for the Section 30 Uranium Mine, Grants, McKinley County, New Mexico.* January 2013.

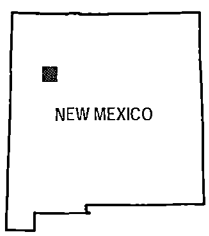


0 3 6

SCALE IN MILES

LEGEND

● SECTION 30 URANIUM MINE LOCATION



N

TDD NO: TO-0035-12-11-04
CERCLIS NO.: NMN000607480

SOURCE: ESRI STREETMAPS

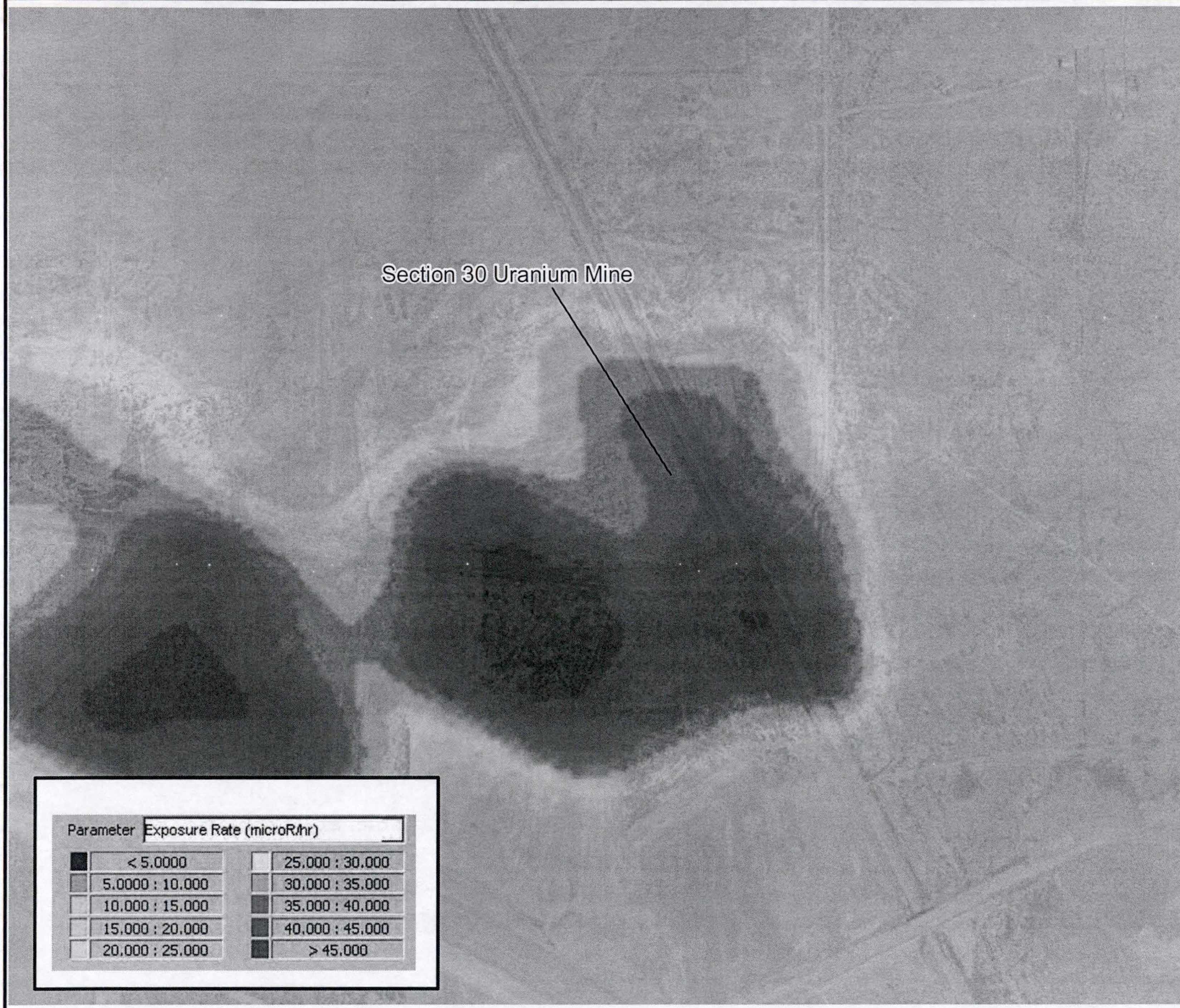
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

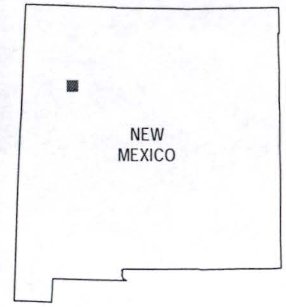
US EPA REGION 6

FIGURE 1-1
SITE LOCATION MAP
SECTION 30 URANIUM MINE
MCKINLEY COUNTY, NEW MEXICO

DATE	PROJECT NO	SCALE
DEC. 2012	20406.012.035.0785.01	AS SHOWN

File: L:\20406_START3_R6\Section_30_Uranium_Mine\GIS\FIGURE_1-1_SITE_LOCATION_MAP.mxd 1/9/2013 12:26:16 PM bondp





*Units are in microroentgen per hour (uR/hr)

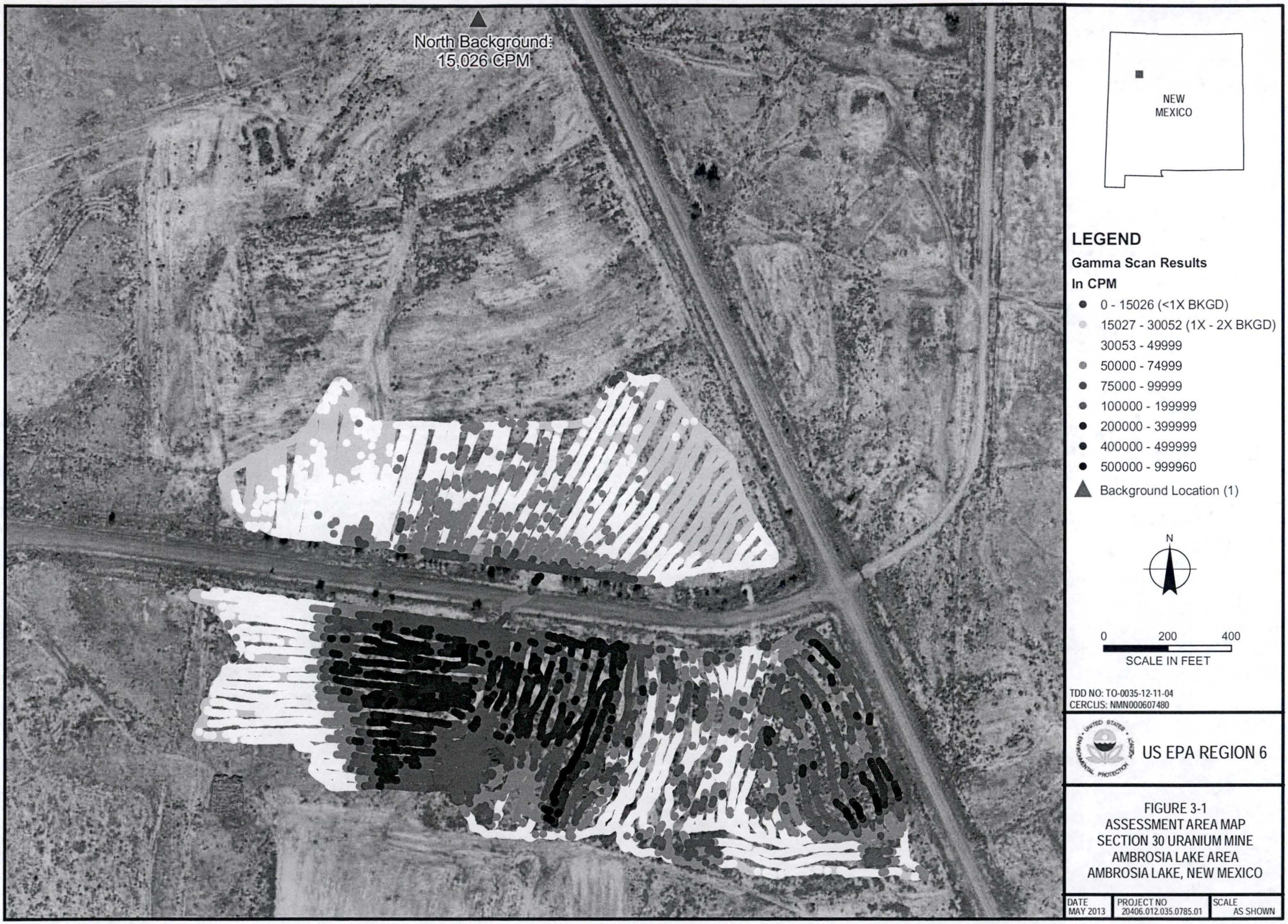
N

TDD NO: TO-0035-12-11-04
CERCLIS: NMN000607480
SOURCE: GOOGLE EARTH

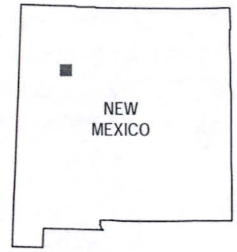
US EPA REGION 6

FIGURE 1-2
SECTION 30 URANIUM MINE
EXPOSURE RATE MAP
EPA ASPECT OVERFLIGHT
DATE: 08/23/2011
AMBROSIA LAKE, McKINLEY COUNTY
NEW MEXICO

DATE	PROJECT NO	SCALE
JAN 2013	20406.012.035.0785.01	N/A



File: \\fsnm01\data\Temp\Section 30\Figure 3-1 Assessment Area Map.mxd, 28-May-13 13:41, STARTGIS



LEGEND

- Soil Sample Locations (10)
- Remaining Locations (90)
- Background Location (1)

N

0 200 400
SCALE IN FEET

TDD NO: TO-0035-12-11-04
CERCLIS: NMN000607480

US EPA REGION 6

FIGURE 3-2
STATIONARY READINGS MAP
SECTION 30 URANIUM MINE
AMBROSIA LAKE AREA
AMBROSIA LAKE, NEW MEXICO

DATE	PROJECT NO	SCALE
MAY 2013	20406.012.035.0785.01	AS SHOWN

File: \\fsnm01\data\Temp\Section 30\Figure 3-2 Stationary Readings Map.mxd, 28-May-13 15:59, STARTGIS

Table 3-1
Site Gamma Radiation Distribution
Section 30 Uranium Mine
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico

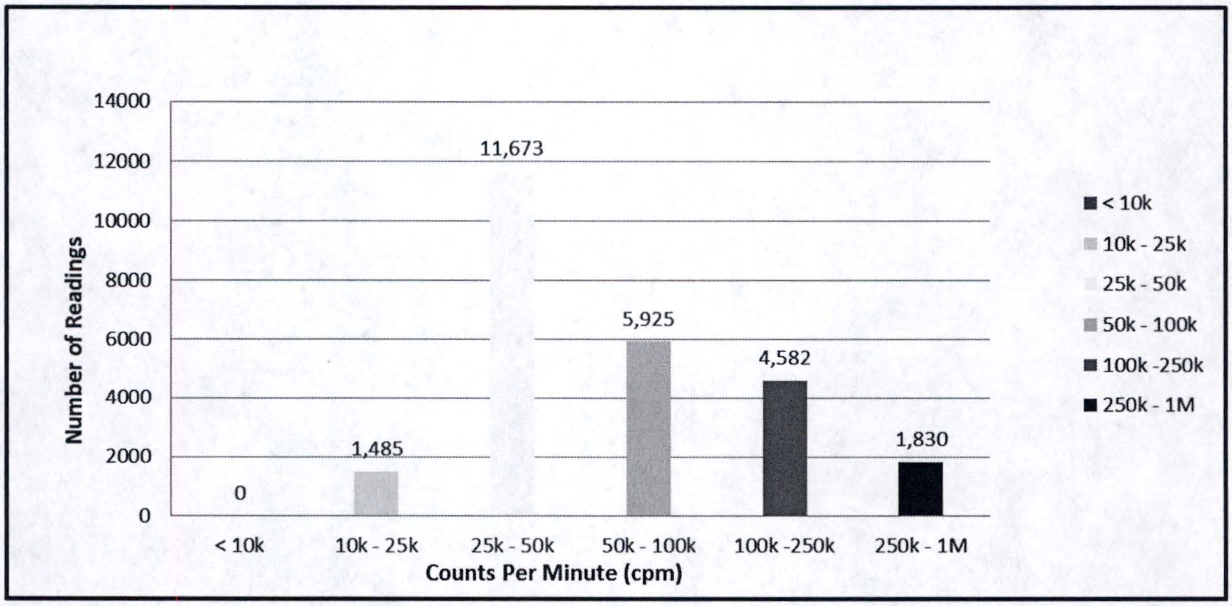


Table 3-2
Stationary Gamma Measurements Summary
Section 30 Uranium Mine
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico

Stationary Location ID	Gamma Activity (Counts Per Minute)	Remark
S30-01-130227	**90,948**	>2X Background
S30-02-130227	**116,5232**	>2X Background
S30-03-130227	**99,391**	>2X Background
S30-04-130227	**141,119**	>2X Background; sample collected
S30-05-130227	**100,751**	>2X Background
S30-06-130227	**40,533**	>2X Background
S30-07-130227	**33,810**	>2X Background
S30-08-130227	**41,067**	>2X Background
S30-09-130227	27,995	
S30-10-130227	**41,452**	>2X Background
S30-11-130227	**45,563**	>2X Background
S30-12-130227	**76,555**	>2X Background
S30-13-130227	**54,667**	>2X Background
S30-14-130227	**51,924**	>2X Background
S30-15-130227	**43,826**	>2X Background
S30-16-130227	**46,896**	>2X Background
S30-17-130227	28,382	
S30-18-130227	**30,549**	>2X Background
S30-19-130227	25,332	
S30-20-130227	**34,369**	>2X Background
S30-21-130227	28,606	
S30-22-130227	**34,383**	>2X Background
S30-23-130227	**41,087**	>2X Background
S30-24-130227	**44,479**	>2X Background
S30-25-130227	**48,072**	>2X Background
S30-26-130227	**37,999**	>2X Background
S30-27-130227	29,804	
S30-28-130227	26,005	
S30-29-130227	25,091	
S30-30-130227	**33,063**	>2X Background
S30-31-130227	**41,446**	>2X Background
S30-32-130227	**67,720**	>2X Background
S30-33-130227	**45,147**	>2X Background
S30-34-130227	**35,011**	>2X Background
S30-35-130227	26,047	
S30-36-130227	**30,918**	>2X Background
S30-37-130227	**30,270**	>2X Background
S30-38-130227	**72,872**	>2X Background
S30-39-130227	**34,371**	>2X Background
S30-40-130227	**33,453**	>2X Background

Table 3-2
Stationary Gamma Measurements Summary
Section 30 Uranium Mine
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico
(Continued)

Stationary Location ID	Gamma Activity (Counts Per Minute)	Remark
S30-41-130227	**40,273**	>2X Background
S30-42-130227	**57,109**	>2X Background
S30-43-130227	**66,077**	>2X Background
S30-44-130227	**38,329**	>2X Background
S30-45-130227	**58,244**	>2X Background
S30-46-130227	**40,788**	>2X Background
S30-47-130227	**38,768**	>2X Background
S30-48-130227	**38,956**	>2X Background
S30-49-130227	**51,947**	>2X Background
S30-50-130227	**133,430**	>2X Background
S30-51-130227	**60,247**	>2X Background
S30-52-130227	**42,752**	>2X Background
S30-53-130227	**295,687**	>2X Background; sample collected
S30-54-130227	**92,658**	>2X Background
S30-55-130227	**67,260**	>2X Background
S30-56-130227	**83,151**	>2X Background
S30-57-130227	**111,514**	>2X Background
S30-58-130227	**37,953**	>2X Background
S30-59-130227	**49,174**	>2X Background
S30-60-130227	**49,822**	>2X Background
S30-61-130227	**235,886**	>2X Background; sample collected
S30-62-130227	**178,400**	>2X Background
S30-63-130227	**30,697**	>2X Background
S30-64-130227	**34,014**	>2X Background
S30-65-130227	**40,703**	>2X Background
S30-66-130227	**138,513**	>2X Background
S30-67-130227	**260,391**	>2X Background
S30-68-130227	**139,828**	>2X Background
S30-69-130227	**245,958**	>2X Background; sample collected
S30-70-130227	**360,259**	>2X Background; sample collected
S30-71-130227	**94,008**	>2X Background
S30-72-130227	**46,441**	>2X Background
S30-73-130227	**60,367**	>2X Background
S30-74-130227	**77,686**	>2X Background
S30-75-130227	**108,705**	>2X Background

Table 3-2
Stationary Gamma Measurements Summary
Section 30 Uranium Mine
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico
(Continued)

Stationary Location ID	Gamma Activity (Counts Per Minute)	Remark
S30-76-130227	**35,034**	>2X Background
S30-77-130227	**36,829**	>2X Background
S30-78-130227	**63,213**	>2X Background
S30-79-130227	**250,415**	>2X Background
S30-80-130227	**246,106**	>2X Background
S30-81-130227	**138,309**	>2X Background
S30-82-130227	**176,163**	>2X Background
S30-83-130227	**261,077**	>2X Background; sample collected
S30-84-130227	**57,563**	>2X Background
S30-85-130227	**42,212**	>2X Background
S30-86-130227	**67,425**	>2X Background
S30-87-130227	**182,051**	>2X Background
S30-88-130227	**35,869**	>2X Background
S30-89-130227	**36,595**	>2X Background
S30-90-130227	**391,816**	>2X Background; sample collected
S30-91-130227	**321,783**	>2X Background; sample collected
S30-92-130227	**220,529**	>2X Background
S30-93-130227	**123,718**	>2X Background
S30-94-130227	**298,647**	>2X Background; sample collected
S30-95-130227	**284,513**	>2X Background; sample collected
S30-96-130227	**47,819**	>2X Background
S30-97-130227	**62,570**	>2X Background
S30-98-130227	**66,357**	>2X Background
S30-99-130227	**35,044**	>2X Background
S30-100-130227	**36,611**	>2X Background
S30-BKGD-N-130227	15,026	Background location; sample collected

Table 3-3
Laboratory Results for Radioisotopes
Section 30 Uranium Mine DRS
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico

Analyte	Units	3X Background	SampleID Date Type	S30-04-130228 2/28/2013 Field Sample	S30-53-130228 2/28/2013 Field Sample	S30-61-130228 2/28/2013 Field Sample	S30-69-130228 2/28/2013 Field Sample	S30-70-130228 2/28/2013 Field Sample	S30-83-130228 2/28/2013 Field Sample	S30-90-130228 2/28/2013 Field Sample	S30-90-2-130228 2/28/2013 Field Duplicate	S30-91-130228 2/28/2013 Field Sample	S30-94-130228 2/28/2013 Field Sample	S30-95-130228 2/28/2013 Field Sample	S30-BKGD-N-130228 2/28/2013 Field Sample
Radiation															
Actinium-228	pCi/g	3.48	--	1.91	0.652	1.19	0.581	0.0638	2.26	1.02	1.65	2.05	1.05	2.32	1.16
Bismuth-214	pCi/g	3.99	--	12.1	451	191	328	372	205	316	356	210	308	104	1.33
Lead-210	pCi/g	3.06	--	9.27	143	116	118	193	98.5	123	198	132	107	71.9	1.02
Lead-212	pCi/g	3.42	--	2.47	15.9	1.23	11.4	2.28	2.74	11.6	9.67	1.06	10.7	2.41	1.14
Lead-214	pCi/g	4.23	--	12.4	457	196	330	376	208	325	360	209	315	108	1.41
Potassium-40	pCi/g	69.6	--	29.3	23.6	28.8	22.8	24.7	27.5	29	23.8	26.3	19.4	32.7	23.2
Protactinium-234m	pCi/g	13.41	--	5.04	230	47.7	140	196	45	118	105	79.6	51.3	82.5	4.47
Radium-226	pCi/g	3.99	--	12.1	451	191	328	372	205	316	356	210	308	104	1.33
Thallium-208	pCi/g	2.769	--	1.7	2.53	0.967	0.619	1.21	1.43	2.24	1.29	0.69	1.29	1.7	0.923
Thorium-234	pCi/g	2.829	--	9.03	197	30.5	88.9	84.4	32.8	139	102	66.4	33.4	59.6	0.943
Uranium-235	pCi/g	0.2271	--	1.33	16.7	4.61	12.7	11.5	8.8	11.3	13.5	7.41	8.48	4.27	-0.0757

pCi/g: picoCuries per gram

highlighted values are greater than or equal to 3x the background average concentration

Table 3-4
Laboratory Results for Metals
Section 30 Uranium Mine DRS
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico

Analyte	Units	3X Background	SampleID Date Type	S30-04-130228 2/28/2013 Field Sample	S30-53-130228 2/28/2013 Field Sample	S30-61-130228 2/28/2013 Field Sample	S30-69-130228 2/28/2013 Field Sample	S30-70-130228 2/28/2013 Field Sample	S30-83-130228 2/28/2013 Field Sample	S30-90-130228 2/28/2013 Field Sample	S30-90-2-130228 2/28/2013 Field Duplicate	S30-91-130228 2/28/2013 Field Sample	S30-94-130228 2/28/2013 Field Sample
Metals													
ALUMINUM	mg/kg	9600	--	6800	4800	5000	3800	5300	7900	4600	4800	3900	5100
ANTIMONY	mg/kg	6.3	--	2.1 UJL	2 UJL	2 UJL	2 UJL	2 UJL	2.1 UJL	2.1 UJL	2 UJL	2 UJL	2.1 UJL
ARSENIC	mg/kg	10.2	--	5.9	23	9.2	18	22	13	16	17	4.2	15
BARIUM	mg/kg	237	--	82	99	77	68	110	120	80	78	210	93
BERYLLIUM	mg/kg	1.53	--	0.69	1.2	0.68	0.74	1.1	0.89	0.81	0.9	0.51 U	0.83
CADMIUM	mg/kg	1.53	--	0.53 U	0.51 U	0.5 U	0.5 U	0.51 U	0.53 U	0.51 U	0.5 U	0.51 U	0.52 U
CALCIUM	mg/kg	57000	--	15000	12000	7200	28000	11000	15000	18000	15000	5300	17000
CHROMIUM	mg/kg	9.9	--	6.6	3.1	4.3	3.2	3.8	7.5	4.4	4.3	3.3	4.8
COBALT	mg/kg	9.9	--	5.6	3.7	3.5	3.5	4	5.8	3.8	3.9	2.7	3.4
COPPER	mg/kg	13.2	--	10	6.1	7.2	5.5	7	13	9.2	8	4.6	12
IRON	mg/kg	27600	--	16000	12000	11000	10000	13000	17000	12000	12000	11000	13000
LEAD	mg/kg	17.7	--	11	29	23	17	27	18	21	23	11	21
MAGNESIUM	mg/kg	11700	--	4300	2300	2400	2600	2600	3500	2500	2500	1800	2800
MANGANESE	mg/kg	360	--	210	190	160	350	190	240	200	200	170	220
MERCURY	mg/kg	0.102	--	0.038	0.078	0.063	0.09	0.076	0.048	0.067	0.068	0.034 U	0.051
MOLYBDENUM	mg/kg	3	--	1.3	38	4	49	25	7.9	14	13	2.7	13
NICKEL	mg/kg	16.8	--	9.5	4.4	5.4	4.9	5.2	9.2	6.2	5.7	2.9	4.9
POTASSIUM	mg/kg	2610	--	2100 JK	1600 JK	1400 JK	1500 JK	1800 JK	2800 JK	1900 JK	1800 JK	780 JK	2100 JK
SELENIUM	mg/kg	1.53	--	2.6	87	32	43	84	16	49	47	53	37
SILVER	mg/kg	3	--	1.1 U	1 U	0.99 U	0.99 U	1 U	1.1 U	1 U	1 U	1 U	1 U
SODIUM	mg/kg	300	--	110 U	100 U	99 U	99 U	100 U	110 U	100 U	100 U	100 U	100 U
THALLIUM	mg/kg	15.3	--	5.3 U	1 U	0.99 U	5 U	1 U	1.1 U	1 U	1 U	5.1 U	5.2 U
TIN	mg/kg	15.3	--	5.3 U	5.1 U	5 U	5 U	5.1 U	5.3 U	5.1 U	5 U	5.1 U	5.2 U
URANIUM	mg/kg	7.5	--	12	560	51	130	310	92	190	260	110	120
VANADIUM	mg/kg	27	--	19	310	120	150	280	88	160	190	88	170
ZINC	mg/kg	63	--	41	24	28	25	30	42	29	36	28	45

mg/kg: milligrams per kilogram

highlighted values are greater than or equal to 3x the background average concentration

U - Sample was analyzed for but not detected

J - The analyte was analyzed for, but the associated numerical value
may not be consistent with the amount actually present in the sample or may not be
consistent with the sample detection or quantitation limit

L - low bias

H - high bias

K - unknown bias

Table 3-4
Laboratory Results for Metals
Section 30 Uranium Mine DRS
Grants Legacy Mine Sites
Ambrosia Lake, McKinley County, New Mexico

Analyte	Units	3X Background	SampleID Date Type	S30-95-130228 2/28/2013 Field Sample	S30-BKGD-N-130228 2/28/2013 Field Sample
Metals					
ALUMINUM	mg/kg	9600	--	8900	3200
ANTIMONY	mg/kg	6.3	--	2.1 UJL	2.1 UJL
ARSENIC	mg/kg	10.2	--	13	3.4
BARIUM	mg/kg	237	--	110	79
BERYLLIUM	mg/kg	1.53	--	0.9	0.51 U
CADMIUM	mg/kg	1.53	--	0.53 U	0.51 U
CALCIUM	mg/kg	57000	--	12000	19000
CHROMIUM	mg/kg	9.9	--	8.1	3.3
COBALT	mg/kg	9.9	--	5.7	3.3
COPPER	mg/kg	13.2	--	12	4.4
IRON	mg/kg	27600	--	18000	9200
LEAD	mg/kg	17.7	--	18	5.9
MAGNESIUM	mg/kg	11700	--	3800	3900
MANGANESE	mg/kg	360	--	220	120
MERCURY	mg/kg	0.102	--	0.041	0.034 U
MOLYBDENUM	mg/kg	3	--	15	1 U
NICKEL	mg/kg	16.8	--	9.8	5.6
POTASSIUM	mg/kg	2610	--	2900 JK	870 JK
SELENIUM	mg/kg	1.53	--	26	0.51 U
SILVER	mg/kg	3	--	1.1 U	1 U
SODIUM	mg/kg	300	--	340	100 U
THALLIUM	mg/kg	15.3	--	5.3 U	5.1 U
TIN	mg/kg	15.3	--	5.3 U	5.1 U
URANIUM	mg/kg	7.5	--	120	2.5
VANADIUM	mg/kg	27	--	70	9
ZINC	mg/kg	63	--	48	21

mg/kg: milligrams per kilogram

highlighted values are greater than or equal to 3x the background average concentration

U - Sample was analyzed for but not detected

J - The analyte was analyzed for, but the associated numerical value
may not be consistent with the amount actually present in the sample or may not be
consistent with the sample detection or quantitation limit

L - low bias

H - high bias

K - unknown bias

APPENDIX B

SITE LOGBOOK

SECTION 30

URANIUM MINE DRS

Rite in the Rain®

ALL-WEATHER

JOURNAL

№ 391

TDD-TD-0035-12-11-04

20406.012.035.0785.01

0650 Arrive at Grants EPA command post. EPA Team: Patrick Buster (Project/Field Team Lead), Derrick Cobb and Thomas Evans (field scientists) and EPA SAM LaDonna Turner. EPA Team will meet with Rio Algom at their facility for site specific safety orientation around 0815 - contact: Billy Ray. Weather: low 7°F, high 44°F, winds NW @ 5-10 mph. Equipment: Gamma Scan unit: Trimble Geo XT Explorer RFW21453 paired with Ludlum 2221 #149457/44-10 #PR053098. Calibration due 12/19/13. Single point (1-min scaler) unit: Ludlum 2221 #163950/44-10 #PR129169. Will source check both (background as well) to compare variance for QC - will be logged on a separate form using both background and CO-60. PB Section 30 mine assessment area is 59 acres - will take 2 days minimum. ——— PB

0824 Arrive at Rio Algom HQ for safety orientation ——— PB

0830 Sign in at front office - prepare for briefing. ——— PB (Douglas Murray) ——— PB

0845 Over 65 wells on large-scale site - One brand new one onsite (maybe) - dry. May be able to obtain water sample from mine shaft. ——— PB

0925 Complete orientation ——— PB

0930 South portion of Section 30 is NRC. Call

Mark Purcell to ask if we should do that portion - need clarification before proceeding with DRS - as grid system would potentially change. Mark says he will make a phone call and get back within a few minutes. Harold (escort) awaiting EPA Team for escorting. ——— PB

1015 Receive clarification from SAM. Says he called NRC and its OK to go south of road. Get scan form for PPE from Rio Algom - log information <20 mR and return to office tomorrow, as EPA team will be onsite past 4:00 PM. EPA Team will "sign out" tomorrow when signing in - all things above discussed with Doug Murray. ——— PB

1040 Complete site escort with Harold. Begin preparing for field activities ——— PB

1050 Begin laying pin flags ——— PB

1315 Finish laying out pin flags, very rugged terrain on south side of road - thick brush + channels filled with tumbleweeds. Rio Algom requests that we split samples with them. Gamma scanning will be affected by terrain south of road. Break for quick lunch. ——— PB

1642 Finish collecting 100 - 1 minute single points. Will collect samples tomorrow from locations 4, 53, 61, 69, 70, 83, 90, 91, 94, 95 - where highest readings were - EXCEPT - #4 was added to have 1 sample from North side of road 400K CPM. #61 was added to get sample from

4

TO-0035-12-11-04
20406.012.035.0785.01
Section 30 Uranium Mine DRS 2/27/13

— continued — from SE side of site ~~*~~ 235K cpm. —— PB

~~1502~~ 1707 PB Depart site for day. Scan boots: 14 cpm — Rio Algom wants less than 20 cpm. EPA Team will collect samples (split with Rio Algom) and complete gamma scan remainder of site. Finish "rough" terrain with thick vegetation on SE side of site. —— PB

~~1840~~ Arrive at Grants Command Post. —— PB

1900 Finish downloading data / preparing for tomorrow. —— PB

END OF LOG DAY

5

TO-0035-12-11-04
20406.012.035.0785.01
Section 30 Uranium Mine DRS 2/28/13

0645 Arrive at Grants EPA command post. Preparing for final field work at Section 30. Equipment: same as 2/27/13 — no changes. Weather: High 48°F, Low 12°F, winds NW 10-20 mph. Activities: Collect split samples for Rio Algom & samples for EPA — finish gamma scanning. —— PB

0750 Depart command post. —— PB

0823 Arrive at Rio Algom HQ to sign in. —— PB

0838 Sign in - arrive at Section 30 Assessment area. —— PB

0840 H&S meeting. —— PB

1030 Complete gamma scanning south parcel. Begin scanning North parcel. Collecting soil samples. Duplicate at #70. PB

1200 Finish ~~pickup~~ PB picking up pin flags. Still gamma scanning North parcel — need to locate a background. —— PB

1230 Begin looking for background north of site. There is no site access east of site, and south / west are not good background areas due to high gamma readings. —— PB

1250 Locate background north of site 15,026 cpm. —— PB

1403 Complete Section 30 Activities. Head to HQ to check out. —— PB

1425 Check out. Turn in exposure form. Rio Algom will try and escort to Section 15. —— PB

1800 Arrive at command post - download data / plot / SCRIBE upload. See following pages for single point scaler readings —— PB

Rite in the Rain.

TD-0035-12-11-04
20406.012.035.0785.01

Section 30 Uranium Mine DRS 2/28/13

Location	Time	Reading (CPM)	Comment
1	1055	90,448	
2	1057	116,523	
3	1059	94,391	
4	1101	141,119	Sampled
5	1103	100,751	
6	1106	40,537	
7	1108	33,810	
8	1110 ~~1112~~	~~30,545~~ PB 41,067	
9	1132	27,995	
10	1130	41,482 PB	
11	1127	45,567	
12	1125	76,555	
13	1123	54,667	
14	1121	51,924	
15	1118	43,826	
16	1116	46,896	
17	1114	28,382	
18	1112	30,549	
19	1135	25,332	
20	1137	34,369	
21	1139	28,606	
22	1141	34,383	
23	1144	41,087	
24	1146	44,479	

TD-0035-12-11-04
20406.012.035.0785.01

Section 30 Uranium Mine DRS 2/28/13

Location	Time	Reading (CPM)	Comment
25	1148	48,072	
26	1150	37,999	
27	1153	27,804	
28	1155	26,005	
29	1213	25,091	
30	1211	33,063	
31	1209	41,446	
32	1207	67,720	
33	1204	45,147	
34	1202	35,011	
35	1200	26,047	
36	1158	30,918	
37	1223	30,270	
38	1230	72,872	
39	1232	34,371	
40	1343	33,453	
41	1350	40,273	
42	1348	57,109	
43	PB ~~1402~~ 1346	PB ~~56,244~~ 66,077	
44	PB ~~1405~~ 1400	PB ~~40,788~~ 38,329	
45	PB ~~1407~~ 1402	PB ~~38,768~~ 58,244	
46	PB ~~1410~~ 1405	PB ~~38,956~~ 40,788	
47	PB ~~1413~~ 1407	38,768	
48	PB ~~1415~~ 1410	38,956	

TO-0035-12-11-04
20406.012.035.0785.01

Section 30 Uranium Mine DRS 2/28/13

Location	Time	Reading (CPM)	Comment
49	1413	51,447	
50	1415	133,430	
51	1417	60,247	
52	1444	42,752	
53	1442	295,627	Sampled
54	1440	92,658	
55	1437	67,260	
56	1435	83,151	
57	1432	111,514	
58	1430	37,953	
59	1427	49,174	
60	1425	43,822	
61	1423	235,886	Sampled
62	1419	178,400	
63	1446	30,697	
64	1450	34,014	
65	1452	40,703	
66	1454	138,513	
67	1456	260,391	
68	1458	139,828	
69	1505	245,958	Sampled
70	1507	360,259	Sampled
71	1517	94,008	
72	1519	46,441	

TO-0035-12-11-04
20406.012.035.0785.01

Section 30 Uranium Mine DRS 2/28/13

Location	Time	Reading (CPM)	Comment
73	1522	66,367	
74	1527	77,686	
75	1529	108,705	
76	1547	35,034	
77	1546	36,829	
78	1544	63,213	
79	1542	250,415	
80	1540	246,106	
81	1539	138,309	
82	1537	PD ~~261,077~~ 176,163	
83	1535	PD ~~57,563~~ 261,077	Sampled
84	1533	PD ~~42,212~~ 57,563	
85	1532	PD ~~67,425~~ 42,212	
86	1524	67,425	
87	1531	182,051	
88	1554	35,869	
89	1558	36,595	
90	1600	391,816	Sampled/dup
91	1603	321,783	Sampled
92	1606	220,539	
93	1607	123,719	
94	1609	298,647	Sampled
95	1611	284,573	Sampled
96	1615	49,819	

TO-0035-12-11-04
20406.012.036.0785.01

Section 30 Uranium Mine DRS 2/28/13

Location	Time	Reading (cpm)	Comment
97	1336	62,570	
98	1338	66,357	
99	1549	35,074	
100	1552	36,611	

APPENDIX C

QUALITY ASSURANCE SAMPLING PLAN

DOCUMENTED RELEASE SAMPLING

QUALITY ASSURANCE SAMPLING PLAN

FOR

SECTION 30 URANIUM MINE
GRANTS LEGACY URANIUM SITES
GRANTS, MCKINLEY COUNTY, NEW MEXICO

Prepared for

U.S. Environmental Protection Agency Region 6
Linda Carter, Project Officer
1445 Ross Avenue
Dallas, Texas 75202

Contract No. EP-W-06-042
Technical Direction Document TO-0035-12-11-04
WESTON Work Order No. 20406.012.035.0785.01
NRC No. N/A
CERCLIS No. NMN000607480
FPN N/A
EPA SAM: Mark Purcell
START-3 PTL: Patrick Buster

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

All figures are provided as separate portable document format (PDF) files.

1. INTRODUCTION

Weston Solutions, Inc. (WESTON®), the Superfund Technical Assessment and Response Team (START-3) Contractor, has been tasked by the U.S. Environmental Protection Agency (EPA) Region 6 under Contract Number EP-W-06-042, Technical Direction Document (TDD) No. TO-0035-12-11-04 (Appendix C) to conduct Documented Release Sampling (DRS) at the Section 30 Uranium Mine located in McKinley County, New Mexico. Site coordinates are Latitude 35.414825° North and Longitude -107.824225° West. A Site Location Map is provided as Figure 1-1. All figures are provided as separate portable document format (PDF) files. This Quality Assurance Sampling Plan (QASP) describes the technical scope of work to be completed as part of the TDD.

1.1 PROJECT OBJECTIVES

The objective of the DRS is to determine if past mining activities resulted in releases of hazardous substances to the environment at legacy uranium mine sites that have a wide range of reclamation histories. The existence and migration of hazardous substances and identification of the receptors, or targets, potentially exposed to the hazardous substances will be assessed. This Quality Assurance Sampling Plan (QASP) provides the generic guidance for conducting DRS and specific field sampling plans for the Section 30 Mine.

The DRS objective will be achieved by evaluating data obtained during the site assessment using a 2 inches by 2 inches NaI detector in conjunction with a Global Positioning System (GPS) unit. The detector will be mounted on a cart or hand-held approximately 15 inches above the soil surface. The instrument will be set with an "open" window to allow detection of the broad spectrum of gamma energies associated with the naturally occurring radionuclides. Samples will be collected from surface soil and potential surface water on-site, downgradient, and at background locations. Sediment samples in the surface water pathway may also be collected during this DRS. Additional samples may be collected to determine specific conditions in anomalous features on-site, if warranted. Section 4.1 describes the laboratory analyses that will be used as part of this investigation.

1.2 PROJECT TEAM

The EPA Project Team will consist of Mark Purcell as the Site Assessment Manager (SAM), Patrick Buster as the Project Team Leader (PTL), a Data Manager (DM), and a Field Team Leader (FTL) who will also act as the Field Safety Officer (FSO). The FTL will oversee collection of the samples as necessary, record the activities at each sample location in the field logbook, and verify sample documentation. Sample documentation and preparation will also be the responsibility of the FTL. The PTL will be responsible for documenting the work performed and will serve as liaison to the EPA SAM.

1.3 QASP FORMAT

This QASP has been organized in a format that is intended to facilitate and effectively meet the objective of the removal assessment. The QASP is organized as follows:

- Section 1 – Introduction
- Section 2 – Site Background
- Section 3 – Sampling Approach and Procedures
- Section 4 – Laboratory Analyses
- Section 5 – Data Validation
- Section 6 – Water Sampling
- Section 7 – Quality Assurance

2. SITE BACKGROUND

Information regarding the site location, description, and site history is included in the following subsections.

2.1 SITE LOCATION AND DESCRIPTION

The Section 30 Uranium Mine Site is within the Ambrosia Lake Mining Subdistrict, located 19 miles north of Grants in McKinley County, New Mexico. The Section 30 Mine Site has approximately 44 acres of disturbed surface and was mined from 1957 until 1984. Between 1984 and 2000, areas of the mine were used for old stope leaching activities. Old stope leaching activities were discontinued in January 2000, and the Section 30 mine permanently suspended operations in December 2002.

2.2 SITE HISTORY

The Grants Mining District provided significant uranium extraction and production in New Mexico from the 1950s until late in the 20th century. Ninety-seven former legacy uranium mines and five mill sites have been identified in the Ambrosia Lake, Laguna, and Marquez subdistricts.

The Section 30 Mine Site was an underground mine during operation, when an estimated 3.6 million tons of uranium ore was produced. There are no surface water features on the site, and water runoff drains into Arroyo Del Puerto, a tributary of San Mateo Creek approximately 1 mile to the south. Site reclamation began in 1994. Between 2003 and 2005 the site structures were removed and the main shaft, ventilation holes, and injection holes were plugged. This was followed by contouring and revegetation. Site features and conditions are most recently documented in reports from a Pre-CERCLIS screening assessment (PCS) from the New Mexico Environment Department and from an EPA Airborne Spectral Photometric Environmental Collection Technology (ASPECT) survey conducted on 23 August 2011. The gamma radiation readings at the Section 30 Mine Site were statistically greater than background readings in the area.

3. SAMPLING APPROACH AND PROCEDURES

3.1 OBJECTIVE

The objective of this QASP is to develop a standardized assessment process for legacy uranium mines that includes site reconnaissance and limited sampling that can be accomplished by a small work crew of three to five staff members in one work day or less. The QASP includes direct observation, field measurements, soil and water sampling, and laboratory analyses to determine with high confidence if a release of hazardous substances has occurred at the mine site. EPA and Weston Standard Operating Procedures (SOPs) are provided as Appendix A.

3.2 CRITERIA FOR OBSERVED RELEASE AND DATA QUALITY OBJECTIVES

The criteria against which each site will be evaluated are taken from the New Mexico Environmental Department (NMED) draft document *"Generic Field Investigation and Soil/Sediment Sampling Work Plan Guidance to Assess a Legacy Uranium Mine Site for An Observed Release"* dated July, 2011. That document describes the following three numerical criteria that define whether a hazardous substance is present and represents an observed release.

1. The on-site gamma count rate will be compared to the mean background gamma count rate to determine if the count rate is equal to or greater than two times the background mean.
2. Laboratory analyses of soil/sediment samples will be compared to the background isotopic concentrations to determine if the concentration is equal to or greater than three times the background mean.
3. Laboratory analyses of soil/sediment samples will be compared to the background isotopic concentrations to determine if the concentration is equal to or greater than two standard deviations above the background mean.

An observed release is part of the Site Investigation strategy for computing a Hazardous Ranking System (HRS) under CERCLA, which is the program administered primarily by the EPA for evaluation of sites for the Superfund NPL ("Guidance for Performing Site Inspections Under CERCLA, EPA/540-R-92-021"). For the purposes of this QASP, the only radioisotopes of concern related to Criteria 2 and 3 above are U-238 and Ra-226. The laboratory analyses will generate data for other radioisotopes (such as K-40) as a bi-product of the analyses, but these other isotopic data are not relevant to the project objectives and will not be evaluated or compared to any criteria because they are unrelated to uranium mine operations.

More detailed instructions as to how to apply these criteria are discussed in the sections below. However, these criteria are applied to individual measurements or laboratory analyses for each sampling/measurement point. If measurements or laboratory analyses exceed any of these criteria, the site is determined to demonstrate conditions of an "observed release" and is to be considered for further evaluation and possible follow-on action. The criteria are not based on risk or dose, nor are they based on the area size of the impacted soil.

The objective of soil sampling is to determine if a hazardous substance is present and represents an observed release. To accomplish this, data quality objectives (DQOs) have been established and are included in Appendix B. The DQOs presented were developed using the seven-step process set out in the *EPA Guidance for Quality Assurance Project Plans: EPA QA/G-5*.

3.3 DETERMINATION OF BACKGROUND

As stated above, the numerical criteria are relative to either the count rate or soil concentration at some level above the background mean. Therefore, it is critical to accurately identify the background mean for each property or mining claim site. Background radiation has many sources including cosmic, terrestrial, and man-made sources, all of which can contribute to the natural variability of the ambient gamma background count rate level. When considering the natural background concentration of various radioisotopes, uranium 238 (U-238) and its daughter products (particularly Ra-226), in equilibrium, are commonly found in U.S. soils at concentrations ranging from about 0.5 to 1.5 picocuries per gram (pCi/g). However, since uranium mines are normally located in areas geologically enhanced in uranium, the background levels of U-238 and daughters near legacy uranium mines may be above these concentrations. Other radionuclides found in natural background soils include K-40 at typical concentrations ranging from 10 to 25 pCi/g; Th-232 and daughters ranging from 0.5 to 1.5 pCi/g; and Cs-137, a man-made radioisotope from nuclear weapons testing, at about 0.5 pCi/g. Establishing background concentrations that describe a distribution of measurement data is necessary to identify and evaluate contributions attributable to legacy mines.

A site background location should have similar physical, chemical, geological, radiological, and biological characteristics as the legacy mine site if there were no impacts from uranium mining or milling at the site. For purposes of this QASP, the background for each legacy mine site is determined following guidance provided by the Hazard Ranking System (HRS) protocol. The HRS protocol determines the background for the individual site as the mean of field measurements and laboratory analyses of samples collected from four locations at the perimeter of the property corresponding to the four directions of a compass (N, S, E, and W). After locating the four background locations at the perimeter of the mining claim (or at the boundary of the property), each location should be gamma scanned (the technique of gamma scanning is described in a following section) to verify that the area appears to have a homogenous gamma ambient level and a visual confirmation that the other four characteristics listed above appear satisfied. The gamma-scan data (count rate and location) should be saved for data validation and quality control purposes.

Due to the nature of the extended uranium mining in the area, a pre-designated background location may exhibit radiological characteristics that do not appear to meet the HRS requirement for a site background to have similar chemical, physical, radiological, geological, and biological characteristics as the legacy mine site if there were no impacts from uranium mining/milling. If the FTL determines that significantly elevated readings are encountered or physical conditions indicate possible impacts from past mining or milling activities, a background location may be moved to another area reasonably close by. If a more suitable background location cannot be located, a sample will still be collected and data will be recorded from the most suitable location in that immediate area. That background location may be used or omitted from consideration based on final data evaluation when the site report is developed.

At each background location, a 1-minute stationary gamma count rate measurement will be collected with the detector held approximately 15 inches above the ground surface. The count rate and location, as recorded by GPS, will be saved and the mean calculated from these four measurements. At each background location, a soil sample will be collected for radiochemical and stable chemical analyses. A sample of approximately 6-inch depth and 1 kilogram (kg) mass will be collected in a ziplock plastic bag. Rocks of greater than approximately 0.25-inch-diameter should be discarded, as should any biological material such as grass or twigs. Samples should be analyzed by gamma spectrometry for all detectable radioisotopes by this method and by alpha spectrometry for isotopes of the U-238 and Th-232 decay chains. The suite of metal analytes to be analyzed in each soil sample include the 23 Target Analyte List (TAL) metals: aluminum, tin, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, thallium, vanadium, zinc, and mercury, plus two additional metals, total uranium and molybdenum. Additional information and specific analytical techniques are discussed in a subsequent section.

3.4 DIRECT OBSERVATION

An observed release means that hazardous substances have been documented on the mine site or in surrounding area soil or water, and that the substances are attributable, at least in part, to the site that is being evaluated. An observed release can be established by direct observation if hazardous substances such as mine ore and/or waste rock that are geologically foreign and mineralogically distinct from the native surface soil and rock composition on the surface of the mine property are present. An observed release can also be established by observation of ore or waste rock transported off-site by wind or water erosion, particularly into nearby drainage channels. Determination of mine surface or off-site hazardous substances by direct observation should be documented by photographs and logbook entries that clearly demonstrate that the site remains impacted by prior mining activities. Determination by direct observation does not quantitatively demonstrate that the numerical criteria have been exceeded, but it is highly likely that subsequent stationary gamma measurements and soil sampling in the areas noted by direct observation will conclusively demonstrate conditions of "observed release."

3.5 GAMMA SCANNING

Like direct observation, scanning does not provide a quantitative assessment of site conditions but is an excellent tool to assess the relative gamma activity of the area. Scanning is useful in quickly determining the general radiological condition of the site and determining where background radiological conditions exist. It literally paints a picture that depicts where areas of elevated gamma activity are present and identifies where additional measurements and sampling efforts should be placed.

Gamma scanning will be conducted using a 2 inches by 2 inches NaI detector in conjunction with a GPS unit. The detector will be mounted on a cart or hand-held approximately 15 inches above the soil surface. The instrument will be set with an "open window" to allow detection of the broad spectrum of gamma energies associated with the naturally occurring radionuclides. The technician will walk transects at approximately 0.5 meter-per-second from one end of the mine claim boundary to another. One-second measurements of gamma activity are recorded and electronically attached to the appropriate GPS designation for subsequent plotting and depiction of ambient gamma activity. The field-of-view for this detector system is approximately 1 meter wide perpendicular to the direction of the travel. The disturbed area of the Section 30 Mine Site is approximately 44 acres in size; however, the assessment area will be approximately 59 acres. Five to ten percent coverage will be the objective due to the large size of the site, and transects will be walked at a distance of approximately 10 - 20 meters apart, depending on site conditions. It is expected that these transects can be completed within eight to twelve hours with one monitoring team. The FTL may modify the transect spacing as necessary to ensure maximum site coverage and compliance with project scheduling and time constraints based on actual site conditions encountered in the field.

In addition to walking the transects, the technician will visually search for suspect areas such as waste rock or ore piles, mine portals (adits, shafts, vents, bore holes), machinery, building foundations, haul roads, arroyos, stream beds, or surface impoundments to gamma scan. "Suspect" areas can also be defined as any area where elevated gamma readings are detected. The technician should use the audible signal from the instrument system for guidance to areas of elevated gamma activity. If there are many suspect areas needing to be gamma scanned, a second gamma-scanning system should be employed to help with the survey load.

Data are recorded and plotted in units of gamma counts per minute (cpm). However, the data are collected in counts per second (cps) and then multiplied by 60 seconds/minute to arrive at cpm. Therefore, any slight variation in the collected count rate is magnified by this multiplication. For this reason, it is not unusual for isolated measurements to be significantly elevated above background. These isolated measurements are usually statistical outliers and are not indicative of actual elevated gamma activity. However, any significantly elevated gamma measurements (greater than 2 times background) should be re-investigated, particularly if there is a locus of elevated measurements around a common point.

Data from these gamma scans provide a useful representation of site conditions and will be presented in the site report with a color-coded display to clearly show the various levels of elevated readings. Because of the statistical variation in the readings, the gamma-scanning data are not used for comparison to the observed release criteria for gamma measurements. These data are useful to identify areas where soil samples should be collected and stationary gamma measurements made.

3.6 STATIONARY GAMMA MEASUREMENTS

Stationary 1-minute gamma measurements will be collected at grid points across the property, and at additional suspect locations identified by the gamma-scanning data. Because these stationary measurements are integrated over 1-minute intervals versus 1-second intervals for the scanning measurements, the stationary measurements will be a more accurate measurement of the ambient gamma activity at that point. Stationary measurements will be made with the same type of instrumentation and at the same height above ground surface as the gamma-scanning measurements. The instrument set will again be a 2 inches by 2 inches NaI detector coupled to a GPS system, operated in the "open window" mode, and held at about 15 inches above the ground surface.

The approximate size of the assessment area is 59 acres. To collect thorough and sufficient data, grid spacing will be placed at approximately 175-foot-square spacing. This 175-foot grid spacing will generate 100 evenly spaced locations across the property. Assuming 1 minute to collect the data plus 5 minutes of additional time to walk to the next grid point, 100 measurements would require one person approximately 10 hours to collect, allowing the task to be completed in one work day if performed in parallel with the other site activities. Visual Sample Plan (VSP) software will be used to precisely generate sample locations using the designated grid spacing once the perimeter of the site is established. Each measurement location will be assigned its applicable GPS coordinates and located in the field using an appropriate electronic device. If the size of the mine site is altered or other site conditions change during the site reconnaissance, VSP software will be used to re-establish the number of grids and grid spacing most suitable for the mine site as determined by the FTL.

In addition to the grid locations, stationary 1-minute measurements will be collected at suspect areas as identified by direct observation of the site or by gamma scanning. These measurements will again be collected using the same instrument and GPS system. It is presumed that a second instrument set will be required for these measurements at suspect areas.

Interpretation of these data compares each count rate measurement, collected either from grid points or suspect areas that exhibit elevated gamma readings, with the mean gamma background count rate measurement. If any count rate measurement is equal to or greater than two times (2X) the mean background count rate, the property is identified as having an observed release. It is important to note that a property identified as having an observed release may require no further action eventually if, for instance, the majority of the property has levels equal to background. Clean-up levels for these sites are not established in the document, and the observed release criteria are not the clean-up criteria.

3.7 SOIL SAMPLING

Soil samples of 0 to 6-inch depths and approximately 1 kilogram (kg) mass will be collected at locations identified by the stationary measurements as being suspect. It is recommended that the locations with the highest 1-minute stationary readings be the primary locations considered for sampling. It is expected that about 10 samples will be collected from a typical mine site. When a suspect location is selected for sampling based on the stationary measurement, the potential location will first be carefully examined both visually and by radiological scanning to confirm that the site is free of nuggets of ore or waste rock, or other hot particles that can significantly impact analytical results. It is the intent of soil sample analyses to quantify the residual uranium concentration averaged over the entire 1 kg mass, and therefore a reasonably homogeneous sample is desired.

If the suspect area has a few obvious nuggets or hot spots of contamination that are not typical of a broad area being sampled and can be excised, remove the hot spots and re-survey the potential location. Document in the field log what the conditions were and the number of nuggets or hot spots removed. If the ambient gamma activity is still significantly elevated and the location is therefore a good candidate for sampling, continue collecting the soil sample at this location, and re-collect the 1-minute stationary measurement at the location. If removing the hot spots has also removed the elevated gamma activity, then another sampling spot should be selected. If the potential sample location is obviously composed of multiple nuggets or hot spots that will likely be excluded when the sample is collected, the sample should not be collected, and another location should be selected for that sample. Again, any non-radioactive rocks of greater than 0.25-inch diameter and any biological material should be removed from the sample, possibly using a sieve. Alternately, if nuggets of elevated radioactivity appear to be widespread and typical for the site, they may be included in the sample if the laboratory has a procedure for crushing and grinding the sample prior to homogenizing, and the laboratory is directed to do so.

4. LABORATORY ANALYSES

4.1 ANALYTICAL METHODS

Samples collected from the background locations and the suspect locations will be submitted to a qualified radiological laboratory for gamma spectrometry analyses. Sample preparation should include drying and homogenization of the entire 1 kg sample. The minimum gamma spectrometry aliquot size should be 0.5 kg. The laboratory will be requested to report all identifiable gamma emitting radioisotopes, specifically, the daughters of U-238, Ra-226, Th-232, and K-40. The requested sensitivity should be 0.1 picocuries per gram (pCi/g). The requested analytical procedure for Ra-226 should be by quantification of Bi-214 after an ingrowth period of at least 21 days. The suite of metal analytes to be analyzed in each soil sample includes the 23 Target Analyte List (TAL) metals: aluminum, tin, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, thallium, vanadium, zinc, and mercury, plus two additional metals, total uranium and molybdenum. Information regarding laboratory, analytical methods, container size, preservation techniques, and hold times is included in Table 4-1.

Since these samples are from legacy mine sites, it is assumed that the U-238 and Th-232 radioisotope decay chains will be in equilibrium. However, due to different solubilities of the chemical species found naturally in the environment, it is possible that the daughters may not be in equilibrium with the parents. Also, it is possible that mill tailings may have been returned to the mine site for storage and/or disposal. If this is the case, then the concentrations of the residual radioisotopes will not be in equilibrium. If it is suspected that any sample may not be in equilibrium, or if verification of equilibrium is desired, then additional analyses for isotopic uranium and isotopic thorium by alpha spectrometry will be requested of the laboratory. Analytical sensitivity of 0.1 pCi/g and a minimum aliquot size of 10 grams will be required. It is recommended that one laboratory be selected for both types of analyses.

4.2 DATA INTERPRETATION

Interpretation of these data compares analytical results of each sample with the background mean concentration. If any sample contains U-238 as determined by alpha spectrometry or Ra-226 as determined by gamma spectrometry at a concentration equal to or greater than three times (3x) the mean background concentration or at a concentration equal to or greater than two times (2x) the standard deviation above the mean concentration, the property will be identified as having an observed release. No other isotopic results will be compared to background concentrations. However, the project Certified Health Physicist (CHP) will review any analytical data for isotopes other than U-238 and Ra-226 for which the results appear to exceed the two previously described criteria.

Table 4 - 1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times
Section 30 Uranium Mine
Grants, McKinley County, New Mexico

Name	Analytical Methods	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time
TAL Metals plus total uranium, molybdenum, tin and mercury	SW846 6010/6020 SW846 7470/7471	Polyethylene (water), Glass (solid)	HNO_3 to pH<2 (water), 4°C	500 mL, 8 oz	28 days for mercury 180 days all other metals
U-238, Ra-226	Gamma Spectrometry	Polyethylene (water), Glass (solid)	NA (soil/water)	1 gallon, 1 kg (32 oz)	6 months
Uranium/Thorium if determined in field	Alpha Spec ASTM 3972-90M	Polyethylene (water), Glass (solid)	HNO_3 to pH< 2 (water), NA (soil)	1 liter, 8 oz	6 months

Radiological methods to be conducted by Eberline Analytical, Oakridge, Tennessee.

TAL Metals analyzed by ALS Laboratories, Fort Collins, Colorado.

5. DATA VALIDATION

5.1 FIELD INSTRUMENTS

Each field instrument will be calibrated on an annual basis by a qualified and registered calibration vendor. Validation of field measurements will be accomplished by maintenance and review of daily background and source checks of the instrument sets. Prior to initiation of field activities, 20 one-minute background counts and 20 one-minute source check counts will be collected and a mean calculated. During field operations, a one-minute background count and one-minute source check count will be made at the start and end of each work day. If the individual one-minute count falls outside of the mean +/- 20%, the instrument will not be used until evaluated by the project CHP. Individual control charts will be maintained for the background and source check on each instrument to monitor instrument performance for trends.

5.2 LABORATORY ANALYSES

Analytical laboratory reports will be reviewed by a CHP to confirm compliance with the technical specifications and reasonableness of the analytical results. Technical specifications reviewed will be that the requested isotopes are reported, that the minimum sensitivity was attained, and the required 21-day in-growth time for Ra-226 was observed. The reasonableness of the data will be evaluated by review of the various gamma spectrometry results to determine if they are in equilibrium, if appropriate, and if the results are within the expected range of results.

6. WATER SAMPLING

6.1 WATER SAMPLING PROCEDURES

WESTON Standard Operating Procedures (SOPs) 1002-01 for Surface Water Sample Collection and 1002-02 for Groundwater Monitoring Well Sample Collection (Appendix A) will be utilized if either groundwater or surface water is observed on or in the vicinity of the mine site. The specific sampling procedures are described below.

6.2 GROUNDWATER PATHWAY SAMPLING

An attempt will be made to collect groundwater samples from any groundwater monitoring wells or home/stock water supply wells that exist either on-site or within 1,000 meters of the nearest property boundary. No on-site wells are known to be on-site. If a well is discovered, survey personnel will measure depth to groundwater in each of the wells and then follow the EPA Guidance for Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures (Appendix A) for sampling the wells, if appropriate. Readings for temperature, pH, and conductivity will be collected every 5 minutes. Once three consecutive readings stabilize for pH (+ 0.5 units), conductivity (+ 10% μmhos/cm), and temperature (+ 1°C), or the water has purged for a maximum of 30 minutes, the samples will be collected. The groundwater samples will be analyzed for the same list of radionuclides and TAL metals as were identified for soil samples.

6.3 SURFACE WATER PATHWAY SAMPLING

An attempt will be made to collect a surface water sample and a sediment sample from any surface water impoundments, streams, or stock ponds that exist either on-site or within 1,000 meters of the nearest property boundary to document a release to the surface water pathway from the site. Samples will be analyzed for the same list of radionuclides and TAL metals as were identified for soil samples. No surface water impoundments or drainage channels are known to exist at Section 30 Mine Site. Samples will be collected from water as directed by the EPA if water is present on or around the mine site at the time of the site reconnaissance. If gamma scanning data collected from a drainage pathway are suspect, soil/sediment sample(s) may be collected and analyzed for the same list of radionuclides and TAL metals as identified for soil samples.

7. QUALITY ASSURANCE

Quality assurance will be conducted in accordance with the WESTON Corporate Quality Management Manual, dated September 2012; the WESTON START-3 Quality Management Plan, dated June 2010; and EPA Quality Assurance/Quality Control Guidance for Removal Activities, dated April 1990. Following receipt of the TDD from EPA, a Quality Control (QC) officer will be assigned and will monitor work conducted throughout the entire project including reviewing interim report deliverables and field audits. The START-3 PTL will be responsible for QA/QC of the field investigation activities. The designated laboratory utilized during the investigation will be responsible for QA/QC related to the analytical work. START-3 will also collect samples to verify that laboratory QA/QC is consistent with the required standards and to validate the laboratory data received.

7.1 SAMPLE CUSTODY PROCEDURES

Because of the evidentiary nature of sample collection, the possession of samples must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. After sample collection and identification, samples will be maintained under chain-of-custody (COC) procedures. If the sample collected is to be split (laboratory QC), the sample will be allocated into similar sample containers. Sample labels completed with the same information as that on the original sample container will be attached to each of the split samples. Personnel required to package and ship coolers containing potentially hazardous material will be trained accordingly.

Sampling personnel will prepare and complete chain-of-custody forms using the Scribe Environmental Sampling Data Management System (SCRIBE) for all samples sent to a designated off-site laboratory. The chain-of-custody procedures are documented and will be made available to personnel involved with the sampling. A typical chain-of-custody record will be completed each time a sample or group of samples is prepared for shipment to the laboratory. The record will repeat the information on each sample label and will serve as documentation of handling during shipment. A copy of this record will remain with the shipped samples at all times, and another copy will be retained by the member of the sampling team who originally relinquished the samples. At the completion of the project, the data manager will export the SCRIBE chain-of-custody documentation to the Analytical Service Tracking System (ANSETS) database.

Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

- Samples will be accompanied by the COC record. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. These custody records document transfer of sample custody from the sampler to another person or to the laboratory.
- Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be custody-sealed for shipment to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to seal to ensure that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape.
- If sent by common carrier, a bill of lading or airbill will be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer.

SOPs 1101.01 and 1102.01 describe these procedures in more detail.

7.2 PROJECT DOCUMENTATION

Documents will be completed legibly and in ink and by entry into field logbooks, Response Manager, or SCRIBE. Response Manager is the Enterprise Data Collection System designed to provide near real-time access to non-analytical data normally collected in logbooks. Response Manager provides a standard data collection interface for modules of data normally collected by field personnel while on-site. These modules fall into two basic categories for Response and Removal. The modules include Emergency Response, Reconnaissance, Facility Assessment, Shipping, Containers, Materials, Calls, HHW, and General/Site-Specific data. The system provides users with a standard template for laptop/desktop/tablet PCs that will synchronize to the secure web interface using merge replication technology to provide access to field collected data on the RRC-EDMS EPA Web Hub. Response Manager also includes a PDA application that provides some of the standard data entry templates from Response Manager to users for field data entry. Response Manager also includes an integrated GPS unit with the secure PDA application, and the coordinates collected in Response Manager are automatically mapped on the RRC-EDMS interactive mapping site. GIS personnel can then access this data to provide comprehensive site maps for decision-making support.

Response Manager also includes an Analytical Module that is designed to give SCRIBE users the ability to synchronize the SCRIBE field data to the RRC-EDMS Web Hub. This allows analytical data managers and data validators access to data to perform reviews from anywhere with an Internet connection. The Analytical Module is designed to take the analytical data entered into EPA SCRIBE software and make it available for multiple users to access on one site. START-3 personnel will utilize SCRIBE for data entry on-site and will upload to the Response Manager Analytical module.

7.2.1 Field Documentation

The following field documentation will be maintained as described below.

Field Logbook

The field logbook is a descriptive notebook detailing site activities and observations so that an accurate, factual account of field procedures may be reconstructed. Entries will be signed by the individuals making them. Entries should include, at a minimum, the following:

- Site name and project number.
- Names of personnel on-site.
- Dates and times of all entries.
- Description of all site activities, including site entry and exit times.
- Noteworthy events and discussions.
- Weather conditions.
- Site observations.
- Identification and description of samples and locations.
- Subcontractor information and names of on-site personnel.
- Dates and times of sample collections and chain-of-custody information.
- Records of photographs.
- Site sketches.
- Calibration results.

Sample Labels

Sample labels will be securely affixed to the sample container. The labels will clearly identify the particular sample and include the following information:

- Site name and project number.
- Date and time the sample was collected.
- Sample preservation method.
- Analysis requested.
- Sampling location.

Chain-of-Custody Record

A chain-of-custody will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed for and a copy of the record will be kept by each individual who has signed it. The chain-of-custody is discussed in Subsection 7.1 Sample Custody Procedures.

Custody Seal

Custody seals demonstrate that a sample container has not been tampered with or opened. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

Photographic Documentation

START-3 will take photographs to document site conditions and activities as site work progresses. Initial conditions should be well documented by photographing features that define the site-related contamination or special working conditions. Representative photographs should be taken of each type of site activity. The photographs should show typical operations and operating conditions as well as special situations and conditions that may arise during site activities. Site final conditions should also be documented as a record of how the site appeared at completion of the work.

Photographs should be taken with either a film camera or digital camera capable of recording the date on the image. Each photograph will be recorded in the logbook and within Response Manager with the location of the photographer, direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Where appropriate, the photograph location, direction, and subject will also be shown on a site sketch and recorded within Response Manager.

7.2.2 Report Preparation

At the completion of the project, START-3 will review and validate all laboratory data and prepare a draft report of field activities and analytical results for EPA review. Draft deliverable documents will be uploaded to the EPA TeamLink website for EPA review and comment.

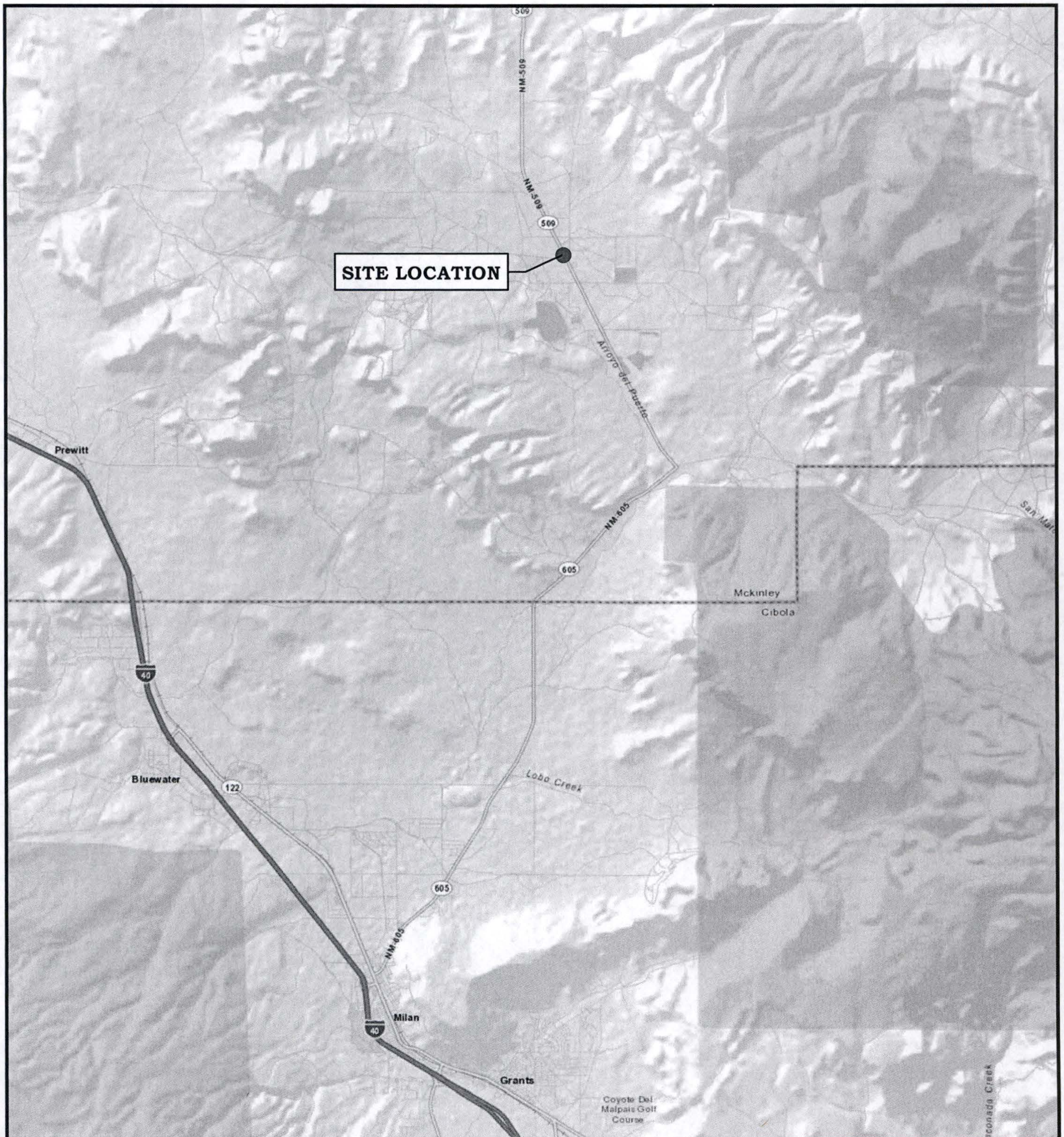
7.2.3 Response Manager

The Response Manager module located on the EPA Web Hub, https://solutions.westonproject.net/epawebhub/, will be used to collect and organize the data gathered from project activities. The information to be included will encompass some or all of the following depending on the specific project needs:

- General Module – site-specific data including location and type of site. It also includes an area for all key site locations including geo-spatial data associated with the key site locations.
- Emergency Response Module – includes the following sub-modules: Basic Info, HAZMAT, Release, Time Line Log, Incident Zones, Photos, Sensitive Receptors, Evacuations, Source, Cause, and Weather.
- Reconnaissance Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for targeted reconnaissance efforts. Typically the data in this module is associated with ESF-10 deployments and the clean-up of orphaned containers and hazardous debris, but the module can be utilized for any and all reconnaissance activities.
- Facility Assessment Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for assessments of structures. Typically utilized for EPA-regulated program facilities during an ESF-10 deployment of resources. This module can be utilized to track the assessment of any facilities including multiple assessments of the fixed facilities.
- Shipping Module – provides standard templates for creating a cradle-to-grave record of all waste shipments from the site until they are recycled or destroyed. This includes the ability to capture manifest and manifest line items and upload photos/original documents to support the records.
- Container Module – provides standard templates for cataloguing containers including HAZCAT and Layer information in each container. The module also allows for tracking which containers are bulked.

- Properties Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for collection of property data including access agreements and assessments of the property and current status of property with regard to the site removal action.
- Materials Module – provides standard templates for tracking materials that are brought on-site or that are removed from the site.
- Daily Reports – provides standard templates for tracking daily site activities, daily site personnel, and daily site notes for reporting back to the EPA OSC in a POLREP or SITREP.
- HHW Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for tracking the amount of HHW collected at individual collection stations by HHW type.
- Data Files – data files can be uploaded in the photo module section and be associated with individual records or with the site in general. The meta data associated with that data file can be filled in using the photo log fields.

The data stored in the Response Manager database can be viewed and edited by any individual with access rights to those functions. At any time deemed necessary, POLREPs and/or SITREPs can be generated by exporting the data out of Response Manager into Microsoft Excel/Word. The database is stored on a secure server and backed up regularly.



0 3 6

SCALE IN MILES

LEGEND

● SECTION 30 URANIUM MINE LOCATION

NEW MEXICO

N

US EPA REGION 6

FIGURE 1-1
SITE LOCATION MAP
SECTION 30 URANIUM MINE
MCKINLEY COUNTY, NEW MEXICO

TDD NO: TO-0035-12-11-04
CERCLIS NO.: NMN000607480

SOURCE: ESRI STREETMAPS

DATE	PROJECT NO	SCALE
DEC. 2012	20406.012.035.0785.01	AS SHOWN

File: L:\20406_START3_R6\Section_30_Uranium_Mine\GIS\FIGURE_1-1_SITE_LOCATION_MAP.mxd 1/9/2013 12:26:16 PM bondp

APPENDIX A

EPA GUIDANCE DOCUMENTS AND WESTON STANDARD OPERATING PROCEDURES

United States Environmental Protection Agency | Office of Research and Development | Office of Solid Waste and Emergency Response | EPA/540/S-95/504
April 1996

EPA Ground Water Issue

LOW-FLOW (MINIMAL DRAWDOWN) GROUND-WATER SAMPLING PROCEDURES

by Robert W. Puls[1] and Michael J. Barcelona[2]

Background

The Regional Superfund Ground Water Forum is a group of ground-water scientists, representing EPA's Regional Superfund Offices, organized to exchange information related to ground-water remediation at Superfund sites. One of the major concerns of the Forum is the sampling of ground water to support site assessment and remedial performance monitoring objectives. This paper is intended to provide background information on the development of low-flow sampling procedures and its application under a variety of hydrogeologic settings. It is hoped that the paper will support the production of standard operating procedures for use by EPA Regional personnel and other environmental professionals engaged in ground-water sampling.

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I. Introduction

The methods and objectives of ground-water sampling to assess water quality have evolved over time. Initially the emphasis was on the assessment of water quality of aquifers as sources of drinking water. Large water-bearing units were identified and sampled in keeping with that objective. These were highly productive aquifers that supplied drinking water via private wells or through public water supply systems. Gradually, with the increasing awareness of subsurface pollution of these water resources, the understanding of complex hydrogeochemical processes which govern the fate and transport of contaminants in the subsurface increased. This increase in understanding was also due to advances in a number of scientific disciplines and improvements in tools used for site characterization and ground-water sampling. Ground-water quality investigations where pollution was detected initially borrowed ideas, methods, and materials for site characterization from the water supply field and water analysis from public health practices. This included the materials and manner in which monitoring wells were installed and the way in which water was brought to the surface, treated, preserved and analyzed. The prevailing conceptual ideas included convenient generalizations of ground-water resources in terms of large and relatively homogeneous hydrologic *units*. With time it became apparent that conventional water supply generalizations of *homogeneity* did not adequately represent field data regarding pollution of these subsurface resources. The important role of *heterogeneity* became increasingly clear not only in geologic terms, but also in terms of complex physical,

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chemical and biological subsurface processes. With greater appreciation of the role of heterogeneity, it became evident that subsurface pollution was ubiquitous and encompassed the unsaturated zone to the deep subsurface and included unconsolidated sediments, fractured rock, and *aquitards* or low-yielding or impermeable formations. Small-scale processes and heterogeneities were shown to be important in identifying contaminant distributions and in controlling water and contaminant flow paths.

It is beyond the scope of this paper to summarize all the advances in the field of ground-water quality investigations and remediation, but two particular issues have bearing on ground-water sampling today: aquifer heterogeneity and colloidal transport. Aquifer heterogeneities affect contaminant flow paths and include variations in geology, geochemistry, hydrology and microbiology. As methods and the tools available for subsurface investigations have become increasingly sophisticated and understanding of the subsurface environment has advanced, there is an awareness that in most cases a primary concern for site investigations is characterization of contaminant flow paths rather than entire aquifers. In fact, in many cases, plume thickness can be less than well screen lengths (e.g., 3-6 m) typically installed at hazardous waste sites to detect and monitor plume movement over time. Small-scale differences have increasingly been shown to be important and there is a general trend toward smaller diameter wells and shorter screens.

The hydrogeochemical significance of colloidal-size particles in subsurface systems has been realized during the past several years (Gschwend and Reynolds, 1987; McCarthy and Zachara, 1989; Puls, 1990; Ryan and Gschwend, 1990). This realization resulted from both field and laboratory studies that showed faster contaminant migration over greater distances and at higher concentrations than flow and transport model predictions would suggest (Buddemeier and Hunt, 1988; Enfield and Bengtsson, 1988; Penrose et al., 1990). Such models typically account for interaction between the mobile aqueous and immobile solid phases, but do not allow for a mobile, reactive solid phase. It is recognition of this third *phase* as a possible means of contaminant transport that has brought increasing attention to the manner in which samples are collected and processed for analysis (Puls et al., 1990; McCarthy and Degueldre, 1993; Backhus et al., 1993; U. S. EPA, 1995). If such a phase is present in sufficient mass, possesses high sorption reactivity, large surface area, and remains stable in suspension, it can serve as an important mechanism to facilitate contaminant transport in many types of subsurface systems.

Colloids are particles that are sufficiently small so that the surface free energy of the particle dominates the bulk free energy. Typically, in ground water, this includes particles with diameters between 1 and 1000 nm. The most commonly observed mobile particles include: secondary clay minerals; hydrous iron, aluminum, and manganese oxides; dissolved and particulate organic materials, and viruses and bacteria. These reactive particles have been shown to be mobile under a variety of conditions in both field studies and laboratory column experiments, and as such need to be included in monitoring programs where identification of the *total* mobile contaminant loading (dissolved + naturally suspended particles) at a site is an objective. To that end, sampling methodologies must be used which do not artificially bias *naturally* suspended particle concentrations.

Currently the most common ground-water purging and sampling methodology is to purge a well using bailers or high speed pumps to remove 3 to 5 casing volumes followed by sample collection. This method can cause adverse impacts on sample quality through collection of samples with high levels of turbidity. This results in the inclusion of otherwise immobile artifactual particles which produce an overestimation of certain analytes of interest (e.g., metals or hydrophobic organic compounds). Numerous documented problems associated with filtration (Danielsson, 1982; Laxen and Chandler, 1982; Horowitz et al., 1992) make this an undesirable method of rectifying the turbidity problem, and include the removal of potentially mobile (contaminant-associated) particles during filtration, thus artificially biasing contaminant concentrations low. Sampling-induced turbidity problems can often be mitigated by using low-flow purging and sampling techniques.

Current subsurface conceptual models have undergone considerable refinement due to the recent development and increased use of field screening tools. So-called hydraulic *push* technologies (e.g., cone penetrometer, Geoprobe®, QED HydroPunch®) enable relatively fast screening site characterization which can then be used to design and install a monitoring well network. Indeed, alternatives to conventional monitoring wells are now being considered for some hydrogeologic settings. The ultimate design of any monitoring system should however be based upon adequate site characterization and be consistent with established monitoring objectives.

If the sampling program objectives include accurate assessment of the magnitude and extent of subsurface contamination over time and/or accurate assessment of subsequent remedial performance, then some information regarding plume delineation in three-dimensional space is necessary prior to monitoring well network design and installation. This can be accomplished with a variety of different tools and equipment ranging from hand-operated augers to screening tools mentioned above and large drilling rigs. Detailed information on ground-water flow velocity, direction, and horizontal and vertical variability are essential baseline data requirements. Detailed soil and geologic data are required prior to and during the installation of sampling points. This includes historical as well as detailed soil and geologic logs which accumulate during the site investigation. The use of borehole geophysical techniques is also recommended. With this information (together with other site characterization data) and a clear understanding of sampling objectives, then appropriate location, screen length, well diameter, slot size, etc. for the monitoring well network can be decided. This is especially critical for new in situ remedial approaches or natural attenuation assessments at hazardous waste sites.

In general, the overall goal of any ground-water sampling program is to collect water samples with no alteration in water chemistry; analytical data thus obtained may be used for a variety of specific monitoring programs depending on the regulatory requirements. The sampling methodology described in this paper assumes that the monitoring goal is to sample monitoring wells for the presence of contaminants and it is applicable whether mobile colloids are a concern or not and whether the analytes of concern are metals (and metalloids) or organic compounds.

II. Monitoring Objectives and Design Considerations

The following issues are important to consider prior to the design and implementation of any ground-water monitoring program, including those which anticipate using low-flow purging and sampling procedures.

A. Data Quality Objectives (DQOs)

Monitoring objectives include four main types: detection, assessment, corrective-action evaluation and resource evaluation, along with *hybrid* variations such as site-assessments for property transfers and water availability investigations. Monitoring objectives may change as contamination or water quality problems are discovered. However, there are a number of common components of monitoring programs which should be recognized as important regardless of initial objectives. These components include:

1) Development of a conceptual model that incorporates elements of the regional geology to the local geologic framework. The conceptual model development also includes initial site characterization efforts to identify hydrostratigraphic units and likely flow-paths using a minimum number of borings and well completions;

2) Cost-effective and well documented collection of high quality data utilizing simple, accurate, and reproducible techniques; and

3) Refinement of the conceptual model based on supplementary data collection and analysis.

These fundamental components serve many types of monitoring programs and provide a basis for future efforts that evolve in complexity and level of spatial detail as purposes and objectives expand. High quality, reproducible data collection is a common goal regardless of program objectives.

High quality data collection implies data of sufficient accuracy, precision, and completeness (i.e., ratio of valid analytical results to the minimum sample number called for by the program design) to meet the program objectives. Accuracy depends on the correct choice of monitoring tools and procedures to minimize sample and subsurface disturbance from collection to analysis. Precision depends on the repeatability of sampling and analytical protocols. It can be assured or improved by replication of sample analyses including blanks, field/lab standards and reference standards.

B. Sample Representativeness

An important goal of any monitoring program is collection of data that is truly representative of conditions at the site. The term *representativeness* applies to chemical and hydrogeologic data collected via wells, borings, piezometers, geophysical and soil gas measurements, lysimeters, and temporary sampling points. It involves a recognition of the statistical variability of individual subsurface physical properties, and contaminant or major ion concentration levels, while explaining extreme values. Subsurface temporal and spatial variability are facts. Good professional practice seeks to maximize representativeness by using proven accurate and reproducible techniques to define limits on the distribution of measurements collected at a site. However, measures of representativeness are dynamic and are controlled by evolving site characterization and monitoring objectives. An evolutionary site characterization model, as shown in Figure 1, provides a systematic approach to the goal of consistent data collection.

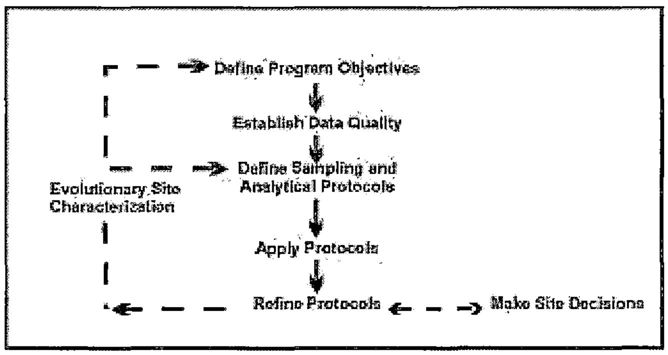

Figure 1. Evolutionary Site Characterization Model

The model emphasizes a recognition of the causes of the variability (e.g., use of inappropriate technology such as using bailers to purge wells; imprecise or operator-dependent methods) and the need to control avoidable errors.

1) Questions of Scale

A sampling plan designed to collect representative samples must take into account the potential scale of changes in site conditions through space and time as well as the chemical associations and behavior of the parameters that are targeted for investigation. In subsurface systems, physical (i.e., aquifer) and chemical properties over time or space are not statistically independent. In fact, samples taken in close proximity (i.e., within distances of a few meters) or within short time periods (i.e., more frequently than monthly) are highly auto-correlated. This means that designs employing high-sampling frequency (e.g., monthly) or dense spatial monitoring designs run the risk of redundant data collection and misleading inferences regarding trends in values that aren't statistically valid. In practice, contaminant detection and assessment monitoring programs rarely suffer these *over-sampling* concerns. In corrective-action evaluation programs, it is also possible that too little data may be collected over space or time. In these cases, false interpretation of the spatial extent of contamination or underestimation of temporal concentration variability may result.

2) Target Parameters

Parameter selection in monitoring program design is most often dictated by the regulatory status of the site. However, background water quality constituents, purging indicator parameters, and contaminants, all represent targets for data collection programs. The tools and procedures used in these programs should be equally rigorous and applicable to all categories of data, since all may be needed to determine or support regulatory action.

C. Sampling Point Design and Construction

Detailed site characterization is central to all decision-making purposes and the basis for this characterization resides in identification of the geologic framework and major hydro-stratigraphic units. Fundamental data for sample point location include: subsurface lithology, head-differences and background geochemical conditions. Each sampling point has a proper use or uses which should be documented at a level which is appropriate for the program's data quality objectives. Individual sampling points may not always be able to fulfill multiple monitoring objectives (e.g., detection, assessment, corrective action).

1) Compatibility with Monitoring Program and Data Quality Objectives

Specifics of sampling point location and design will be dictated by the complexity of subsurface lithology and variability in contaminant and/or geochemical conditions. It should be noted that, regardless of the ground-water sampling approach, few sampling points (e.g., wells, drive-points, screened augers) have zones of influence in excess of a few feet. Therefore, the spatial frequency of sampling points should be carefully selected and designed.

2) Flexibility of Sampling Point Design

In most cases *well-point* diameters in excess of 1 7/8 inches will permit the use of most types of submersible pumping devices for low-flow (minimal drawdown) sampling. It is suggested that *short* (e.g., less than 1.6 m) screens be incorporated into the monitoring design where possible so that comparable results from one device to another might be expected. *Short*, of course, is relative to the degree of vertical water quality variability expected at a site.

3) Equilibration of Sampling Point

Time should be allowed for equilibration of the well or sampling point with the formation after installation. Placement of well or sampling points in the subsurface produces some disturbance of ambient conditions. Drilling techniques (e.g., auger, rotary, etc.) are generally considered to cause more disturbance than *direct-push* technologies. In either case, there may be a period (i.e., days to months) during which water quality near the point may be distinctly different from that in the formation. Proper development of the sampling point and adjacent formation to remove fines created during emplacement will shorten this water quality *recovery* period.

III. Definition of Low-Flow Purging and Sampling

It is generally accepted that water in the well casing is non-representative of the formation water and needs to be purged prior to collection of ground-water samples. However, the water in the screened interval may indeed be representative of the formation, depending upon well construction and site hydrogeology. Wells are purged to some extent for the following reasons: the presence of the air interface at the top of the water column resulting in an oxygen concentration gradient with depth, loss of volatiles up the water column, leaching from or sorption to the casing or filter pack, chemical changes due to clay seals or backfill, and surface infiltration.

Low-flow purging, whether using portable or dedicated systems, should be done using pump-intake located in the middle or slightly above the middle of the screened interval. Placement of the pump too close to the bottom of the well will cause increased entrainment of solids which have collected in the well over time. These particles are present as a result of well development, prior purging and sampling events, and natural colloidal transport and deposition. Therefore, placement of the pump in the middle or toward the top of the screened interval is suggested. Placement of the pump at the top of the water column for sampling is only recommended in unconfined aquifers, screened across the water table, where this is the desired sampling point. Low-flow purging has the advantage of minimizing mixing between the overlying stagnant casing water and water within the screened interval.

A. Low-Flow Purging and Sampling

Low-flow refers to the velocity with which water enters the pump intake and that is imparted to the formation pore water in the immediate vicinity of the well screen. It does not necessarily refer to the flow rate of water discharged at the surface which can be affected by flow regulators or restrictions. Water level drawdown provides the best indication of the stress imparted by a given flow-rate for a given hydrological situation. The objective is to pump in a manner that minimizes stress (drawdown) to the system to the extent practical taking into account established site sampling objectives. Typically, flow rates on the order of 0.1 - 0.5 L/min are used, however this is dependent on site-specific hydrogeology. Some extremely coarse-textured formations have been successfully sampled in this manner at flow rates to 1 L/min. The effectiveness of using low-flow purging is intimately linked with proper screen location, screen length, and well construction and development techniques. The reestablishment of natural flow paths in both the vertical and horizontal directions is important for correct interpretation of the data. For high resolution sampling needs, screens less than 1 m should be used. Most of the need for purging has been found to be due to passing the sampling device through the overlying casing water which causes mixing of these stagnant waters and the dynamic waters within the screened interval. Additionally, there is disturbance to suspended sediment collected in the bottom of the casing and the displacement of water out into the formation immediately adjacent to the well screen. These disturbances and impacts can be avoided using dedicated sampling equipment, which precludes the need to insert the sampling device prior to purging and sampling.

Isolation of the screened interval water from the overlying stagnant casing water may be accomplished using low-flow minimal drawdown techniques. If the pump intake is located within the screened interval, most of the water pumped will be drawn in directly from the formation with little mixing of casing water or disturbance to the sampling zone. However, if the wells are not constructed and developed properly, zones other than those intended may be sampled. At some sites where geologic heterogeneities are sufficiently different within the screened interval, higher conductivity zones may be preferentially sampled. This is another reason to use shorter screened intervals, especially where high spatial resolution is a sampling objective.

B. Water Quality Indicator Parameters

It is recommended that water quality indicator parameters be used to determine purging needs prior to sample collection in each well. Stabilization of parameters such as pH, specific conductance, dissolved oxygen, oxidation-reduction potential, temperature and turbidity should be used to determine when formation water is accessed during purging. In general, the order of stabilization is pH, temperature, and specific conductance, followed by oxidation-reduction potential, dissolved oxygen and turbidity. Temperature and pH, while commonly used as purging indicators, are actually quite insensitive in distinguishing between formation water and stagnant casing water; nevertheless, these are important parameters for data interpretation purposes and should also be measured. Performance criteria for determination of stabilization should be based on water-level drawdown, pumping rate and equipment specifications for measuring indicator parameters. Instruments are available which utilize in-line flow cells to continuously measure the above parameters.

It is important to establish specific well stabilization criteria and then consistently follow the same methods thereafter, particularly with respect to drawdown, flow rate and sampling device. Generally, the time or purge volume required for parameter stabilization is independent of well depth or well volumes. Dependent variables are well diameter, sampling device, hydrogeochemistry, pump flow rate, and whether the devices are used in a portable or dedicated manner. If the sampling device is already in place (i.e., dedicated sampling systems), then the time and purge volume needed for stabilization is much shorter. Other advantages of dedicated equipment include less purge water for waste disposal, much less decontamination of equipment, less time spent in preparation of sampling as well as time in the field, and more consistency in the sampling approach which probably will translate into less variability in sampling results. The use of dedicated equipment is strongly recommended at wells which will undergo routine sampling over time.

If parameter stabilization criteria are too stringent, then minor oscillations in indicator parameters may cause purging operations to become unnecessarily protracted. It should also be noted that turbidity is a very conservative parameter in terms of stabilization. Turbidity is always the last parameter to stabilize. Excessive purge times are invariably related to the establishment of too stringent turbidity stabilization criteria. It should be noted that natural turbidity levels in ground water may exceed 10 nephelometric turbidity units (NTU).

C. Advantages and Disadvantages of Low-Flow (Minimum Drawdown) Purging

In general, the advantages of low-flow purging include:

- samples which are representative of the *mobile* load of contaminants present (dissolved and colloid-associated);
- minimal disturbance of the sampling point thereby minimizing sampling artifacts;
- less operator variability, greater operator control;

- reduced stress on the formation (minimal drawdown);
- less mixing of stagnant casing water with formation water;
- reduced need for filtration and, therefore, less time required for sampling;
- smaller purging volume which decreases waste disposal costs and sampling time;
- better sample consistency; reduced artificial sample variability.

Some disadvantages of low-flow purging are:

- higher initial capital costs,
- greater set-up time in the field,
- need to transport additional equipment to and from the site,
- increased training needs,
- resistance to change on the part of sampling practitioners,
- concern that new data will indicate a *change in conditions* and trigger an *action.*

IV. Low-Flow (Minimal Drawdown) Sampling Protocols

The following ground-water sampling procedure has evolved over many years of experience in ground-water sampling for organic and inorganic compound determinations and as such summarizes the authors' (and others) experiences to date (Barcelona et al., 1984, 1994; Barcelona and Helfrich, 1986; Puls and Barcelona, 1989; Puls et. al. 1990, 1992; Puls and Powell, 1992; Puls and Paul, 1995). High-quality chemical data collection is essential in ground-water monitoring and site characterization. The primary limitations to the collection of *representative* ground-water samples include: mixing of the stagnant casing and *fresh* screen waters during insertion of the sampling device or ground-water level measurement device; disturbance and resuspension of settled solids at the bottom of the well when using high pumping rates or raising and lowering a pump or bailer; introduction of atmospheric gases or degassing from the water during sample handling and transfer, or inappropriate use of vacuum sampling device, etc.

A. Sampling Recommendations

Water samples should not be taken immediately following well development. Sufficient time should be allowed for the ground-water flow regime in the vicinity of the monitoring well to stabilize and to approach chemical equilibrium with the well construction materials. This lag time will depend on site conditions and methods of installation but often exceeds one week.

Well purging is nearly always necessary to obtain samples of water flowing through the geologic formations in the screened interval. Rather than using a general but arbitrary guideline of purging three casing volumes prior to sampling, it is recommended that an in-line water quality measurement device (e.g., flow-through cell) be used to establish the stabilization time for several parameters (e.g. , pH, specific conductance, redox, dissolved oxygen, turbidity) on a well-specific basis. Data on pumping rate, drawdown, and volume required for parameter stabilization can be used as a guide for conducting subsequent sampling activities.

The following are recommendations to be considered before, during and after sampling:

- use low-flow rates (<0.5 L/min), during both purging and sampling to maintain minimal drawdown in the well;
- maximize tubing wall thickness, minimize tubing length;
- place the sampling device intake at the desired sampling point;
- minimize disturbances of the stagnant water column above the screened interval during water level measurement and sampling device insertion;
- make proper adjustments to stabilize the flow rate as soon as possible;
- monitor water quality indicators during purging;
- collect unfiltered samples to estimate contaminant loading and transport potential in the subsurface system.

B. Equipment Calibration

Prior to sampling, all sampling device and monitoring equipment should be calibrated according to manufacturer's recommendations and the site Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP). Calibration of pH should be performed with at least two buffers which bracket the expected range. Dissolved oxygen calibration must be corrected for local barometric pressure readings and elevation.

C. Water Level Measurement and Monitoring

It is recommended that a device be used which will least disturb the water surface in the casing. Well depth should be obtained from the well logs. Measuring to the bottom of the well casing will only cause resuspension of settled solids from the formation and require longer purging times for turbidity equilibration. Measure well depth after sampling is completed. The water level measurement should be taken from a permanent reference point which is surveyed relative to ground elevation.

D. Pump Type

The use of low-flow (e.g., 0.1-0.5 L/min) pumps is suggested for purging and sampling all types of analytes. All pumps have some limitation and these should be investigated with respect to application at a particular site. Bailers are inappropriate devices for low-flow sampling.

1) General Considerations

There are no unusual requirements for ground-water sampling devices when using low-flow, minimal drawdown techniques. The major concern is that the device give consistent results and minimal disturbance of the sample across a range of *low* flow rates (i.e., < 0.5 L/min). Clearly, pumping rates that cause minimal to no drawdown in one well could easily cause *significant* drawdown in another well finished in a less transmissive formation. In this sense, the pump should not cause undue pressure or temperature changes or physical disturbance on the water sample over a reasonable sampling range. Consistency in operation is critical to meet accuracy and precision goals.

2) Advantages and Disadvantages of Sampling Devices

A variety of sampling devices are available for low-flow (minimal drawdown) purging and sampling and include peristaltic pumps, bladder pumps, electrical submersible pumps, and gas-driven pumps. Devices which lend themselves to both dedication and consistent operation at definable low-flow rates are preferred. It is desirable that the pump be easily adjustable and operate reliably at these lower flow rates. The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and some volatiles loss. Gas-driven pumps should be of a type that does not allow the gas to be in direct contact with the sampled fluid.

Clearly, bailers and other *grab* type samplers are ill-suited for low-flow sampling since they will cause repeated disturbance and mixing of *stagnant* water in the casing and the *dynamic* water in the screened interval. Similarly, the use of inertial lift foot-valve type samplers may cause too much disturbance at the point of sampling. Use of these devices also tends to introduce uncontrolled and unacceptable operator variability.

Summaries of advantages and disadvantages of various sampling devices are listed in Herzog et al. (1991), U. S. EPA (1992), Parker (1994) and Thurnblad (1994).

E. Pump Installation

Dedicated sampling devices (left in the well) capable of pumping and sampling are preferred over <u>any</u> other type of device. Any portable sampling device should be slowly and carefully lowered to the middle of the screened interval or slightly above the middle (e.g., 1-1.5 m below the top of a 3 m screen). This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize resuspension of solids which will have collected at the bottom of the well. These two disturbance effects have been shown to directly affect the time required for purging. There also appears to be a direct correlation between size of portable sampling devices relative to the well bore and resulting purge volumes and times. The key is to minimize disturbance of water and solids in the well casing.

F. Filtration

Decisions to filter samples should be dictated by sampling objectives rather than as a *fix* for poor sampling practices, and field-filtering of certain constituents should not be the default. Consideration should be given as to what the application of field-filtration is trying to accomplish. For assessment of truly dissolved (as opposed to operationally *dissolved* [i.e., samples filtered with 0.45 µm filters]) concentrations of major ions and trace metals, 0.1 µm filters are recommended although 0.45 µm filters are normally used for most regulatory programs. Alkalinity samples must also be filtered if significant particulate calcium carbonate is suspected, since this material is likely to impact alkalinity titration results (although filtration itself may alter the CO_2 composition of the sample and, therefore, affect the results).

Although filtration may be appropriate, filtration of a sample may cause a number of unintended changes to occur (e.g. oxidation, aeration) possibly leading to filtration-induced artifacts during sample analysis and uncertainty in the results. Some of these unintended changes may be unavoidable but the factors leading to them must be recognized. Deleterious effects can be minimized by consistent application of certain filtration guidelines. Guidelines should address selection of filter type, media, pore size, etc. in order to identify and minimize potential sources of uncertainty when filtering samples.

In-line filtration is recommended because it provides better consistency through less sample handling, and minimizes sample exposure to the atmosphere. In-line filters are available in both disposable (barrel filters) and non-disposable (in-line filter holder, flat membrane filters) formats and various filter pore sizes (0.1-5.0 µm). Disposable filter cartridges have the advantage of greater sediment handling capacity when compared to traditional membrane filters. Filters must be pre-rinsed following manufacturer's recommendations. If there are no recommendations for rinsing, pass through a minimum of 1 L of ground water following purging and prior to sampling. Once filtration has begun, a filter cake may develop as particles larger than the pore size accumulate on the filter membrane. The result is that the effective pore diameter of the membrane is reduced and particles smaller than the stated pore size are excluded from the filtrate. Possible corrective measures include prefiltering (with larger pore size filters), minimizing particle loads to begin with, and reducing sample volume.

G. Monitoring of Water Level and Water Quality Indicator Parameters

Check water level periodically to monitor drawdown in the well as a guide to flow rate adjustment. The goal is minimal drawdown (<0.1 m) during purging. This goal may be difficult to achieve under some circumstances due to geologic heterogeneities within the screened interval, and may require adjustment based on site-specific conditions and personal experience. In-line water quality indicator parameters should be continuously monitored during purging. The water quality indicator parameters monitored can include pH, redox potential, conductivity, dissolved oxygen (DO) and turbidity. The last three parameters are often most sensitive. Pumping rate, drawdown, and the time or volume required to obtain stabilization of parameter readings can be used as a future guide to purge the well. Measurements should be taken every three to five minutes if the above suggested rates are used. Stabilization is achieved after all parameters have stabilized for three successive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity, and turbidity or DO. Three successive readings should be within ± 0.1 for pH, ± 3% for conductivity, ± 10 mv for redox potential, and ± 10% for turbidity and DO. Stabilized purge indicator parameter trends are generally obvious and follow either an exponential or asymptotic change to stable values during purging. Dissolved oxygen and turbidity usually require the longest time for stabilization. The above stabilization guidelines are provided for rough estimates based on experience.

H. Sampling, Sample Containers, Preservation and Decontamination

Upon parameter stabilization, sampling can be initiated. If an in-line device is used to monitor water quality parameters, it should be disconnected or bypassed during sample collection. Sampling flow rate may remain at established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles, or loss of volatiles due to extended residence time in tubing. Typically, flow rates less than 0.5 L/min are appropriate. The same device should be used for sampling as was used for purging. Sampling should occur in a progression from least to most contaminated well, if this is known. Generally, volatile (e.g., solvents and fuel constituents) and gas sensitive (e.g., Fe^{2+}, CH_4, H_2S/HS^-, alkalinity) parameters should be sampled first. The sequence in which samples for most inorganic parameters are collected is immaterial unless filtered (dissolved) samples are desired. Filtering should be done last and in-line filters should be used as discussed above. During both well purging and sampling, proper protective clothing and equipment must be used based upon the type and level of contaminants present.

The appropriate sample container will be prepared in advance of actual sample collection for the analytes of interest and include sample preservative where necessary. Water samples should be collected directly into this container from the pump tubing.

Immediately after a sample bottle has been filled, it must be preserved as specified in the site (QAPP). Sample preservation requirements are based on the analyses being performed (use site QAPP, FSP, RCRA guidance document [U. S. EPA, 1992] or EPA SW-846 [U. S. EPA, 1982]). It may be advisable to add preservatives to sample bottles in a controlled setting prior to entering the field in order to reduce the chances of improperly preserving sample bottles or introducing field contaminants into a sample bottle while adding the preservatives.

The preservatives should be transferred from the chemical bottle to the sample container using a disposable polyethylene pipet and the disposable pipet should be used only once and then discarded.

After a sample container has been filled with ground water, a Teflon™ (or tin)-lined cap is screwed on tightly to prevent the container from leaking. A sample label is filled out as specified in the FSP. The samples should be stored inverted at 4°C.

Specific decontamination protocols for sampling devices are dependent to some extent on the type of device used and the type of contaminants encountered. Refer to the site QAPP and FSP for specific requirements.

I. Blanks

The following blanks should be collected:

(1) field blank: one field blank should be collected from each source water (distilled/deionized water) used for sampling equipment decontamination or for assisting well development procedures.

(2) equipment blank: one equipment blank should be taken prior to the commencement of field work, from each set of sampling equipment to be used for that day. Refer to site QAPP or FSP for specific requirements.

(3) trip blank: a trip blank is required to accompany each volatile sample shipment. These blanks are prepared in the laboratory by filling a 40-mL volatile organic analysis (VOA) bottle with distilled/deionized water.

V. Low-Permeability Formations and Fractured Rock

The overall sampling program goals or sampling objectives will drive how the sampling points are located, installed, and choice of sampling device. Likewise, site-specific hydrogeologic factors will affect these decisions. Sites with very low permeability formations or fractures causing discrete flow channels may require a unique monitoring approach. Unlike water supply wells, wells installed for ground-water quality assessment and restoration programs are often installed in low water-yielding settings (e.g., clays, silts). Alternative types of sampling points and sampling methods are often needed in these types of environments, because low-permeability settings may require extremely low-flow purging (<0.1 L/min) and may be technology-limited. Where devices are not readily available to pump at such low flow rates, the primary consideration is to avoid dewatering of the well screen. This may require repeated recovery of the water during purging while leaving the pump in place within the well screen.

Use of low-flow techniques may be impractical in these settings, depending upon the water recharge rates. The sampler and the end-user of data collected from such wells need to understand the limitations of the data collected; i.e., a strong potential for underestimation of actual contaminant concentrations for volatile organics, potential false negatives for filtered metals and potential false positives for unfiltered metals. It is suggested that comparisons be made between samples recovered using low-flow purging techniques and samples recovered using passive sampling techniques (i.e., two sets of samples). Passive sample collection would essentially entail acquisition of the sample with no or very little purging using a dedicated sampling system installed within the screened interval or a passive sample collection device.

A. Low-Permeability Formations (<0.1 L/min recharge)

1. Low-Flow Purging and Sampling with Pumps

   a. "portable or non-dedicated mode" - Lower the pump (one capable of pumping at <0.1 L/min) to mid-screen or slightly above and set in place for minimum of 48 hours (to lessen purge volume requirements). After 48 hours, use procedures listed in Part IV above regarding monitoring water quality parameters for stabilization, etc., but do not dewater the screen. If excessive drawdown and slow recovery is a problem, then alternate approaches such as those listed below may be better.

   b. "dedicated mode" - Set the pump as above at least a week prior to sampling; that is, operate in a dedicated pump mode. With this approach significant reductions in purge volume should be realized. Water quality parameters should stabilize quite rapidly due to less disturbance of the sampling zone.

2. Passive Sample Collection

Passive sampling collection requires insertion of the device into the screened interval for a sufficient time period to allow flow and sample equilibration before extraction for analysis. Conceptually, the extraction of water from low yielding formations seems more akin to the collection of water from the unsaturated zone and passive sampling techniques may be more appropriate in terms of obtaining "representative" samples. Satisfying usual sample volume requirements is typically a problem with this approach and some latitude will be needed on the part of regulatory entities to achieve sampling objectives.

B. Fractured Rock

In fractured rock formations, a low-flow to zero purging approach using pumps in conjunction with packers to isolate the sampling zone in the borehole is suggested. Passive multi-layer sampling devices may also provide the most "representative" samples. It is imperative in these settings to identify flow paths or water-producing fractures prior to sampling using tools such as borehole flowmeters and/or other geophysical tools.

After identification of water-bearing fractures, install packer(s) and pump assembly for sample collection using low-flow sampling in "dedicated mode" or use a passive sampling device which can isolate the identified water-bearing fractures.

VI. Documentation

The usual practices for documenting the sampling event should be used for low-flow purging and sampling techniques. This should include, at a minimum: information on the conduct of purging operations (flow-rate, drawdown, water-quality parameter values, volumes extracted and times for measurements), field instrument calibration data, water sampling forms and chain of custody forms. See Figures 2 and 3 and "Ground Water Sampling Workshop -- A Workshop Summary" (U. S. EPA, 1995) for example forms and other documentation suggestions and information. This information coupled with laboratory analytical data and validation data are needed to judge the "useability" of the sampling data.

VII. Notice

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VIII. References

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Figure 2. **Ground Water Sampling Log**

Project ________ **Site** ________ **Well No.** ________ **Date** ________

Well Depth ________ **Screen Length** ________ **Well Diameter** ________ **Casing Type** ________

Sampling Device ________ **Tubing type** ________ **Water Level** ________

Measuring Point ________ **Other Infor** ________

____

Sampling Personnel ________

Time	pH	Temp	Cond.	Dis.O_2	Turb.	[ ]Conc			Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi\ r^3$

Figure 3. **Ground Water Sampling Log** (with automatic data logging for most water quality parameters)

Project ______________ **Site** ______________ **Well No.** ____________ **Date** ____________________

Well Depth ___________ **Screen Length** __________ **Well Diameter** _________ **Casing Type** ___________

Sampling Device ______________ **Tubing type** ___________________ **Water Level** ______________

Measuring Point __________________ **Other Infor** ____

____

Sampling Personnel ____

Time	Pump Rate	Turbidity	Alkalinity	[ ] Conc	Notes

Type of Samples Collected

____

Information: 2 in = 617 ml/ft, 4 in = 2470 ml/ft: $Vol_{cyl} = \pi r^2 h$, $Vol_{sphere} = 4/3\pi r^3$

SOP	1001.01				
GROUP	Sampling Procedures				
SUB-GROUP	Soil Sampling Procedures				
TITLE	Surface Soil Sampling				
DATE	11/19/2001	FILE	1001-01.DOC	PAGE	1 of 3

INTRODUCTION

The following Standard Operating Procedure (SOP) is to describe the procedures for collecting representative soil samples. Analysis of soil samples may determine whether concentrations of specific soil pollutants exceed established action levels, or if the concentrations of soil pollutants present a risk to public health, welfare, or the environment. This SOP is similar to SOP Number 1001.03 for collecting near surface soil samples with a hand auger.

PROCEDURE

Surface soil samples may be collected using a variety of methods and equipment. The methods and equipment used are dependent on the depth of the desired sample, the type of sample required (disturbed versus undisturbed), and the type of soil. Near-surface soils may be easily sampled using a spade, trowel, or hand scoop.

Sample Preservation

Cooling to 4°C ± 2°C, supplemented by a minimal holding time, is suggested.

Interferences and Potential Problems

There are two primary interferences or potential problems associated with soil sampling: cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the use of dedicated (disposable) sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in compaction of the sample, or inadequate homogenization of the samples where required, resulting in variable, non-representative results. Homogenization may also affect sample representativeness where the analytical requirements include volatile organic compounds.

Equipment or Apparatus

The equipment used for sampling may be selected from the following list, as appropriate:

- Tape measure
- Survey stakes or flags
- Stainless steel, plastic, or other appropriate homogenization bucket or bowl
- Ziploc plastic bags
- Logbook
- Labels
- Chain-of-custody forms and seals
- Coolers
- Ice
- Decontamination supplies and equipment
- Canvas or plastic sheet
- Spatulas/spades/shovels
- Scoops

- Plastic or stainless steel spoons
- Trowel

Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and what equipment and supplies are required.
2. Obtain necessary sampling and monitoring equipment from the list above.
3. Prepare schedules, and coordinate with staff, client, and regulatory agencies, if appropriate.
4. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
5. Decontaminate or preclean equipment, and ensure that it is in working order.
6. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations will be utility-cleared by the property owner or other responsible party prior to soil sampling.
7. Evaluate safety concerns associated with sampling that may require use of personal protective equipment and/or air monitoring.

Surface Soil Sample Collection

Collect samples from the near-surface soil with tools such as spades, shovels, and scoops. Surface material can be removed to the required depth with this equipment, then a stainless steel or plastic scoop can be used to collect the sample. The use of a flat, pointed mason trowel to cut a block of the desired soil can be helpful when undisturbed profiles are required. A stainless steel scoop, lab spoon, or plastic spoon will suffice in most other applications. Avoid the use of devices plated with chrome or other target analyte materials.

The following procedures should be followed when collecting surface soil samples:

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.
2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.
3. If volatile organic analysis is to be performed, transfer a portion of the sample directly into an appropriate, labeled sample container(s) with a stainless steel lab spoon, plastic lab spoon, or equivalent and secure the cap(s) tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into an appropriate, labeled container(s) and secure the cap(s) tightly; or if composite samples are to be collected, place a sample from another sampling interval into the

homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled container(s) and secure the cap(s) tightly.

4. Fill hole created through sampling with unused material or other appropriate backfill material (sand).
5. Record applicable information into field log book or appropriate forms as documentation of sampling.

INTRODUCTION

The following Standard Operating Procedure (SOP) is to describe the procedures for collecting representative surface water samples. Analysis of surface samples may determine whether concentrations of specific soil pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

PROCEDURE

Surface water samples may be collected using a variety of methods and equipment. The methods and equipment used are usually dependent on the location of the body of water being sampled. Sampling can be performed by merely submerging the sample container, a weighted-bottle sampler with stopper, a bailer, or by pump assisted methods. Several types of pumps can be used for sampling depending on the objectives of sampling and the site conditions.

Sample Preservation

Samples are to be preserved in conformance with the site-specific Quality Assurance Project Plan, Sampling and Analysis Plan or work plan. In general these requirements include refrigeration to 4°C, addition of appropriate additives (HCl, H_2SO_4, NaOH) to adjust and fix pH, and a defined maximum holding time. If a site-specific plan is not available, the analytical laboratory should be consulted for the appropriate preservation procedures.

Interferences and Potential Problems

There are two primary interferences or potential problems associated with surface water sampling: cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, undue disturbance of the sample matrix, or improper sample location.

Equipment or Apparatus

- Ziploc plastic bags
- Logbook
- Labels
- Chain-of-custody forms and seals
- Coolers
- Ice
- Decontamination supplies and equipment
- Discharge tubing
- Sample containers
- Sampling devices

Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.
2. Obtain necessary sampling and monitoring equipment.
3. Decontaminate or preclean equipment, and ensure that it is in working order.
4. Prepare schedules, and coordinate with staff, client, and regulatory agencies, if appropriate.
5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

Surface Water Sampling

Samples from shallow depths can be readily collected by merely submerging the sample container. In flowing surface water bodies, the container's mouth should be positioned so that it faces upstream, while the sampling personnel stand downstream so as not to stir up sediment that could potentially contaminate the sample.

Collecting a representative sample from a larger body of surface water requires that samples be collected near the shore unless boats are feasible and permitted. If boats are used, the body of water should be cross sectioned, and samples should be collected at various depths across the body of water in accordance with the specified sampling plan. For this type of sampling, a weighted-bottle sampler is used to collect samples at a predetermined depth. The sampler consists of a glass bottle, a weighted sinker, a bottle stopper, and a line that is used to open the bottle and to lower and raise the sampler during sampling. The procedure for use is as follows:

- Assemble the weighted bottle sampler.
- Gently lower the sampler to the desired depth so as not to remove the stopper prematurely.
- Pull out the stopper with a sharp jerk of the sampler line.
- Allow the bottle to fill completely, as evidenced by the cessation of air bubbles.
- Raise the sampler and cap the bottle.
- Wipe the bottle clean. The sampling bottle can be also be used as the sample container for shipping.

Teflon bailers have also been used where feasible for collecting samples in deep bodies of water.

Another method of extending the reach of sampling efforts is the use of a small peristaltic pump. In this method the sample is drawn through heavy-wall Teflon tubing and pumped directly into the sample container. This system allows the operator to reach into the liquid body, sample from depth, or sweep the width of narrow streams.

The general sampling procedures are listed below:

1. Collect the sample using whichever technique, submerged bottle, bottle sampler with stopper, pump & tubing, or bailer.

2. The collected sample may be collected in the sample containers or may be transferred to the appropriate sample containers in order of the volatile organics first and inorganics last.

3. Label sample containers, place on ice in a cooler, remove, and decontaminate equipment as necessary.

REFERENCES

SOP 0110.01 Sample Nomenclature
SOP 1005.01 Field Duplicate Collection
SOP 1005.02 Rinse Blank Preparation
SOP 1005.03 Field Blank Preparation
SOP 1101.01 Sample Custody - Field
SOP 1102.01 Sample Shipping
SOP 1201.01 Sampling Equipment Decontamination
SOP 1501.01 Field Logbook

INTRODUCTION

The following Standard Operating Procedure (SOP) is to describe the procedures for collecting representative sediment samples using a trowel, piston corer, WILDCO KB Core Sampler, a Ponar Grab Sampler, or other similar equipment. Analysis of sediment samples may be performed to determine whether concentrations of specific sediment pollutants exceed established action levels, or if the concentrations of sediment pollutants present a risk to public health, welfare, or the environment.

PROCEDURE

Overview

Sediment samples may be collected using trowels, core and Ponar sampler, or a variety of similar methods and equipment. The methods and equipment used are dependent on the depth of the desired sample, the type of sample required (disturbed versus undisturbed), and the type of sediment (fines versus coarse). Sampling in shallow areas or streams near the surface may only require a hand trowel, while sampling at depth may be performed using a core or Ponar sampler.

Sample Preservation

Refrigeration to 4° C $\pm$ 2° C, supplemented by a minimal holding time, is suggested.

Interferences and Potential Problems

There are two primary interferences or potential problems associated with sediment sampling: cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the use of dedicated (disposable) sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in mixing of the sample, or inadequate homogenization of the samples where required, resulting in variable, non-representative results. Homogenization may also affect sample representativeness when the analytical requirements include volatile organic compounds.

Equipment or Apparatus

The equipment selected for the sampling effort may include the following as appropriate:

- Tape measure
- Survey stakes or flags
- Stainless steel, plastic, or other appropriate homogenization bucket or bowl
- Ziploc plastic bags
- Logbook
- Labels
- Chain-of-custody forms and seals
- Coolers
- Ice

- Decontamination supplies and equipment (i.e. brushes and buckets)
- Canvas or plastic sheeting
- Spatulas
- Scoops
- Plastic or stainless steel spoons
- Trowel
- Auger bucket
- Extension rods
- T-handle
- KB Core Sampler
- Ponar Grab Sampler
- Air monitor

Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.
2. Obtain necessary sampling and monitoring equipment from the list above. Additional equipment may be added to this list as appropriate to perform other sampling.
3. Decontaminate or preclean equipment, and ensure that it is in working order.
4. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.
5. Use stakes, buoys, or flagging to identify and mark all sampling locations. Consider specific site factors, including extent and nature of contaminant, when selecting sample locations. If required, the proposed locations may be adjusted based on site access, property boundaries, and obstructions.

Sediment Sampling in Shallow Waters

The following procedures should be used when collecting sediment samples in shallow waters:

1. Collect sediments as specified in the work plan or as determined during office preparation activities, using a stainless steel trowel, piston corer or similar device and a stainless steel, tempered glass or aluminum container.
2. Standing downstream of the sample stations, collect discrete sediment samples from each station and, if required in the work plan, composite in stainless steel, tempered glass or aluminum container.
3. Collect sediment samples of deposited material from the depth specified in the work plan or as determined during the office preparation activities. Record the depth in the logbook. Selective removal of the top sediment layers may be required and should be accomplished by carefully removing the sediments with a stainless steel trowel or scoop. In streams where water velocity is insufficient to disturb sediment fines during sediment sampling, a stainless

steel trowel or scoop may be used for sampling. Where water velocities are high, a stainless steel corer will be utilized.

4. When applicable, composite discrete sediment samples by placing equal volumes of sediment material collected from the sample points into the container and mixing thoroughly to obtain a homogeneous mixture. Samples may be sieved or hand picked, if necessary, to remove larger materials, such as leaves, sticks, gravel, or rocks. Record in the logbook the nature of any materials removed from the sediment samples.
5. Place each sediment sample into the proper clean, unused sample container, as required by the work plan or laboratory. Sampling personnel must avoid placing sediment into the sample container and decanting off the excess liquid in analyzing for volatile organics and water soluble compounds in the sediment and reduces accurate representation of sediment analysis.
6. Fill out labels with waterproof ink and attach to the sample container.
7. Decontaminate sampling equipment between samples.

Sediment Sampling in Deep Waters

Procedures for sampling in deep waters are the same as for shallow waters except the sampling equipment is different. Soft, fine-grained sediments collected in deep waters will be sampled with a WILDCO KB Core Sampler or similar equipment . Coarse-grained sediments will be collected utilizing a Ponar Grab Sampler or similar equipment. Both samplers will be operated from a boat following appropriate safety procedures. Documentation, containerization, labeling and decontamination procedures are the same as for sediment samples collected in shallow waters.

Sediment Sampling in Drainage Ditches and Intermittent Streams

Procedures for sediment sampling in drainage ditches and the dry portions of intermittent streams are as specified for shallow water sediments.

INTRODUCTION

The following Standard Operating Procedure (SOP) describes the procedure for collecting field duplicate soil and water samples. When samples are collected for analysis, it is typically desired that independent data allowing evaluation of laboratory precision (i.e., the degree to which a laboratory result can be repeated) on site-specific samples be collected.

A field duplicate sample is a second sample collected at the same location as the original sample. Duplicate samples are collected simultaneously or in immediate succession, using identical recovery techniques, and treated in an identical manner during storage, transportation, and analysis. The sample containers are assigned an identification number in the field such that they cannot be identified (blind duplicate) as duplicated samples by laboratory personnel performing the analysis. Specific locations are designated for collection of field duplicate samples prior to the beginning of sample collection.

The duplicate soil sampling procedure is closely related to SOP Nos. 1001.01, 1001.03, and 1001.10 regarding soil sampling procedures. This procedure serves as an alternative method or extension of sample preparation prior to placing the samples in containers, as described in the 1001 series of the SOPs (e.g. 1001.01 and 1001.03).

DUPLICATE SOIL SAMPLING PROCEDURE

The procedure to be used to physically collect soil samples are described in SOP Nos. 1001.01 and 1001.03. Reference should be made to these SOPs for specific sampling equipment, procedures, and other general guidelines. As soil is collected, the following procedure will be used to prepare a field duplicate sample:

- The soil will be collected in general accordance with SOP 1001.01 or 1001.03, with the exception that samples will generally not be immediately placed into sample containers and an additional preparation step (i.e., sample splitting) will be performed.

- As they are collected, soil samples to be submitted as field duplicates will be staged in a clean mixing bowl or mixing bucket.

- For samples that will be analyzed for volatile organic compounds, the soil sample will be split in half and an equal portion of soil will be placed directly into two or more different sample containers, each container representing a different sample for laboratory analysis. The soil will not be homogenized to minimize the potential for volatilization of the organic compounds potentially in the sample.

- For analyses of chemicals other than volatile organic compounds, the soil removed from the discrete sample location will be homogenized in a clean mixing bowl using a clean scoop or spatula (as described in SOPs 1001.01 and 1001.03). Homogenization will generally continue until the discrete samples being combined are reasonably indistinguishable as individual samples in the soil mixture. However, it is recognized that homogenization can be difficult for highly plastic clays. In this case, equal amounts of the soil core of each clay sample will be cut into small, roughly cubical pieces using a stainless steel knife and placed into a bowl and homogenized to extent practical.

- The field duplicate sample (except for volatiles as note above) will be collected from the mixing bowl containing the homogenized samples after homogenization is performed. The composited sample will be collected using a stainless steel or disposable plastic scoop or similar tool. The sample will be placed in a clean sample container and then handled in accordance with soil sampling SOPs 1001.01 and 1001.03.

Another difference from the referenced SOPs is that additional soil volume may need to be collected from a discrete sample location during the sampling process to provide sufficient sample volume for two or more sets of laboratory analyses. If the collection of additional sample volume will result in the sample interval expanding to greater depths or laterally outward, the sampling tools identified in 1001 series of the SOPs can be used at two immediately vertically or laterally adjacent locations, as appropriate. If sampling from two adjacent but distinct locations is necessary to obtain adequate sample volume, the soil from the two locations should be composited in accordance with SOP 1001.10. Field duplicates of composited samples may also be performed using this SOP for field duplicate samples.

Variations on this procedure are allowable to accommodate different soil conditions and any site requirements specifically identified in the site-specific Sampling and Analysis Plan. Equipment that may be used as part of the soil compositing procedure is identified under SOP Nos. 1001.01 and 1001.03 where soil sampling methods are described.

DUPLICATE WATER SAMPLING PROCEDURES

The procedure to be used to physically collect water samples are described in 1002 series of the SOPs (e.g. 1002.01 and 1002.02). Reference should be made to these SOPs for specific sampling equipment, procedures, and other general guidelines. A duplicate water sample will be collected from the same location as the parent sample and within 15 minutes of the collection of the parent sample.

The number of samples that may be submitted as blind field duplicates for the project in question will be specified in the site-specific sampling plan. Blind field duplicates are typically collected at a frequency of 1 per 10 samples of a given environmental media at sites, especially where laboratory analytical data will be used for evaluating regulatory compliance and other engineering judgments. Sampling in support of a routine monitoring program may not require field duplicates. Reference should be made to the site-specific contract and work plans.

REFERENCES

SOP No. 1001.01 - Standard Operating Procedure, Surface Soil Sampling
SOP No. 1001.03 - Standard Operating Procedure, Soil Sampling - Hand Auger Method
SOP No. 1001.10 - Standard Operating Procedure, Soil Compositing

SOP	**1005.02**				
GROUP	Sampling Procedures				
SUB-GROUP	Field QA/QC Sampling				
TITLE	Rinse Blank Preparation				
DATE	2/6/2009	**FILE**	1005-02.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents a method to prepare a type of quality control sample specific to the field decontamination process, the equipment rinse blank. The rinse blank provides information on the effectiveness of the decontamination process employed in the field. When used in conjunction with field blanks and trip blanks, the rinse blank can be used to assist in evaluating possible compromise of samples from field related activities.

PROCEDURE

The equipment rinse blank is prepared by passing target analyte-free (i.e., deionized) water over and through a field decontaminated sampling device, then collecting the rinse water in appropriate clean sample containers. Rinse blanks will typically be collected from equipment that comes in contact with samples, such as auger buckets, split spoons, bailers, shelby tubes, and stainless steel spoons/trowels. The collected sample will be coded appropriately prior to logging and shipping. Equipment blanks are not required if dedicated sampling equipment is used. Equipment blanks will be collected periodically during the day immediately after decontamination of the sampling equipment being used.

The frequency for collecting equipment blanks will be determined prior to engaging in field activities, and communicated in site-specific quality assurance project plans, sampling and analyses plans, or a type of work plan. Equipment blanks will be collected at a rate relative to each type of sample collection procedure (i.e., surface sample, sample at depth using a hand auger). Equipment blanks will generally be collected at a frequency of 1 per 20 (normal) samples of a given matrix.

SOP	**1101.01**				
GROUP	Sampling Handling				
SUB-GROUP	Sample Custody				
TITLE	Sample Custody in the Field				
DATE	**11/19/2001**	**FILE**	1101-01.DOC	**PAGE**	1 of 4

INTRODUCTION

The following Standard Operating Procedure (SOP) presents procedures for maintaining sample chain of custody (COC) during activities where samples are collected.

PROCEDURE

Sample custody is defined as being under a person's custody if any of the following conditions exist:

- it is in their possession,
- it is in their view, after being in their possession,
- it was in their possession and they locked it up, or
- it is in a designated secure area.

A designated field sampler will be personally responsible for the care and custody of collected samples until they are transferred to another person or properly dispatched to the laboratory. To the extent practicable, as few people as possible will handle the samples.

Sample tags or labels will be completed and applied to the container of each sample. When the tags or labels are being completed, waterproof ink will be used. If waterproof ink is not used, the tags or labels will be covered by transparent waterproof tape. Sample containers may also be placed in Ziploc-type storage bags to help keep them clean in the cooler. Information typically included on the sample tags or labels will include the following:

- Project Code
- Station Number and Location
- Sample Identification Number
- Date and Time of Sample Collection
- Type of Laboratory Analysis Required
- Preservation Required, if applicable
- Collector's Signature
- Priority (optional)
- Other Remarks

Additonal information may include:

- Anticipated Range of Results (Low, Medium, or High)
- Sample Analysis Priority

A COC form will be completed each time a sample or group of samples is prepared for transfer to the laboratory. The form will repeat the information on each of the sample labels and will serve as documentation of handling during shipment. The minimum information requirements of the COC form are listed in Table 1101.01-A. An example COC form is shown in Figure 1101.01-A. The completed COC must be reviewed by the Field Team Leader or Site Manager prior to sample shipment. The COC form will remain each sample shipping container at all times, and another copy will be retained by the member of the sampling team who originally relinquished the samples or in a project file.

TABLE 1101.01-A CHAIN OF CUSTODY FORM

INFORMATION	COMPLETED BY	DESCRIPTION
COC	Laboratory	enter a unique number for each chain of custody form
SHIP TO	Field Team	enter the laboratory name and address
CARRIER	Field Team	enter the name of the transporter (e.g., FedEx) or handcarried
AIRBILL	Field Team	enter the airbill number or transporter tracking number (if applicable)
PROJECT NAME	Field Team	enter the project name
SAMPLER NAME	Field Team	enter the name of the person collecting the samples
SAMPLER SIGNATURE	Field Team	signature of the person collecting the samples
SEND RESULTS TO	Field Team	enter the name and address of the prime contractor
FIELD SAMPLE ID	Field Team	enter the unique identifying number given to the field sample (includes MS, MSD, field duplicate and field blanks)
DATE	Field Team	enter the year and date the sample was collected in the format M/D (e.g., 6/3)
TIME	Field Team	enter the time the sample was collected in 24 hour format (e.g., 0900)
MATRIX	Field Team	enter the sample matrix (e.g., water, soil)
PRESERVATIVE	Field Team	enter the preservative used (e.g., HNO3) or "none"
FILTERED/ UNFILTERED	Field Team	enter "F" if the sample was filtered or "U" if the sample was not filtered
CONTAINERS	Field Team	enter the number of containers associated with the sample
MS/MSD	Field Team or Laboratory	enter "X" if the sample is designated for the MS/MSD
ANALYSES REQUESTED	Field Team	enter the method name of the analysis requested (e.g., SW6010A)
COMMENTS	Field Team	enter comments
SAMPLE CONDITION UPON RECEIPT AT LABORATORY	Laboratory	enter any problems with the condition of any sample(s)
COOLER TEMPERATURE	Laboratory	enter the internal temperature of the cooler, in degrees C, upon opening
SPECIAL INSTRUCTIONS/COMMENTS	Laboratory	enter any special instructions or comments
RELEASED BY (SIG)	Field Team and Laboratory	enter the signature of the person releasing custody of the samples
COMPANY NAME	Field Team and Laboratory	enter the company name employing the person releasing/receiving custody
RECEIVED BY (SIG)	Field Team and Laboratory	enter the signature of the person receiving custody of the samples
DATE	Field Team and Laboratory	enter the date in the format M/D/YY (e.g., 6/3/96) when the samples were released/received
TIME	Field Team and Laboratory	enter the date in 24 hour format (e.g., 0900) when the samples were released/received

FIGURE 1101.01-A CHAIN OF CUSTODY FORM

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the methods used for minimizing the potential for cross-contamination, and provides general guidelines for sampling equipment decontamination procedures.

PROCEDURE

As part of the Health and Safety Plan (HASP), develop and set up a decontamination plan before any personnel or equipment enter the areas of potential exposure. The decontamination plan should include the following:

- The number, location, and layout of decontamination stations
- Which decontamination apparatus is needed
- The appropriate decontamination methods
- Methods for disposal of contaminated clothing, apparatus, and solutions

<u>Decontamination Methods</u>

Personnel, samples, and equipment leaving the contaminated area of a site will be decontaminated. Various decontamination methods will be used to either physically remove contaminants, inactivate contaminants by disinfection or sterilization, or both. The physical decontamination techniques appropriate for equipment decontamination can be grouped into two categories: abrasive methods and non-abrasive methods.

Abrasive Cleaning Methods

Abrasive cleaning methods work by rubbing/scrubbing the surface containing the contaminant. This method includes mechanical and wet blasting methods.

Mechanical cleaning methods use brushes of metal or nylon. The amount and type of contaminants removed will vary with the hardness of bristles, length of brushing time, and degree of brush contact.

Cleaning can also be accomplished by water blasting which is also referred to as steam cleaning and pressure washing. Pressure washing utilizes high-pressure that is sprayed from a nozzle onto sampling equipment to physically remove soil or (potentially) contaminated material. Steam cleaning is a modification of pressure washing where the water is heated to temperatures approaching 100 °C to assist in removing organic constituents from equipment.

Disinfection/Rinse Methods

Disinfectants are a practical means of inactivating chemicals or contaminants of concern. Standard sterilization methods involve heating the equipment which is impractical for large equipment. Rinsing removes contaminants through dilution, physical attraction, and solubilization.

The use of distilled/deionized water commonly available from commercial vendors may be acceptable for decontamination of sampling equipment provided that it has been verified by laboratory analysis to be target analyte free. Tap water may be used from any municipal water treatment system for mixing of decontamination solutions. An untreated potable water supply is not an acceptable substitute for tap water. Acids and solvents are occasionally utilized in decontamination of equipment to remove metals and organics, respectively, from sampling equipment. Other than ethanol, these are avoided when possible due to the safety, disposal, and transportation concerns associated with them.

Equipment or apparatuses that may be selected for use include the following:

- Personal protective clothing
- Non-phosphate detergent
- Selected solvents for removal of polar and nonpolar organics (ethanol, methanol, hexane)
- Acid washes for removal of metals (nitric acid)
- Long-handled brushes
- Drop cloths or plastic sheeting
- Paper towels
- Galvanized tubs or buckets
- Distilled, deionized, or tap water (as required by the project)
- Storage containers for spent wash solutions
- Sprayers (pressurized and non-pressurized)
- Trash bags
- Safety glasses or splash shield

<u>Field Sampling Equipment Cleaning Procedures</u>

The following procedures should be followed:

1. Where applicable, follow physical removal procedures previously described (pressure wash, scrub wash)
2. Wash equipment with a non-phosphate detergent solution
3. Rinse with tap water
4. Rinse with distilled or deionized water
5. Rinse with 10% nitric acid if the sample will be analyzed for metals/organics
6. Rinse with distilled or deionized water
7. Use a solvent rinse (pesticide grade) if the sample will be analyzed for organics
8. Air dry the equipment completely
9. Rinse again with distilled or deionized water

10. Place in clean bag or container for storage/transport to subsequent sampling locations.

Selection of the solvent for use in the decontamination process is based on the contaminants present at the site. Solvent rinses are not necessarily required when organics are not a contaminant of concern and may be eliminated from the sequence specified below. Similarly, an acid rinse is not required if the analyses do not include inorganics. Use of a solvent is required when organic contamination is present on-site. Typical solvents used for removal of organic contaminants include acetone, ethanol, hexane, methanol, or water. An acid rinse step is required if metals are present on-site. If a particular contaminant fraction is not present at the site, the ten-step decontamination procedure listed above may be modified for site specificity.

Sampling equipment that requires the use of plastic tubing should be disassembled and the tubing replaced with clean tubing before commencement of sampling and between sampling locations. Plastic tubing should not be reused.

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the procedures for documenting activities observed or completed in the field in a field logbook. The documentation should represent all activities of WESTON personnel and entities under WESTON's supervision.

TERMS

FSP - Field Sampling Plan

SAP - Sampling and Analysis Plan

QAPP - Quality Assurance Project Plan

HASP - Health and Safety Plan

PROCEDURE

Field logbooks will be used and maintained during field activities to document pertinent information observed or completed by WESTON personnel or entities that WESTON is responsible for providing oversight. Field logbooks are legal documents that form the basis for later written reports and may serve as evidence in legal proceedings. The Site Manager or Field Team Leader will review field log entries daily and initial each page of entries. Field logbooks will be maintained by the Site Manager or Field Team Leader during field activities and transferred to the project files for a record of activities at the conclusion of the project. General logbook entry procedures are listed below.

- Logbooks must be permanently bound with all pages numbered to the end of the book. Entries should begin on page 1.
- Only use blue or black ink (waterproof) for logbook entries.
- Sign entries at the end of the day, or before someone else writes in the logbook.
- If a complete page is not used, draw a line diagonally across the blank portion of the page and initial and date the bottom line.
- If a line on the page is not completely filled, draw a horizontal line through the blank portion.
- Ensure that the logbook clearly shows the sequence of the day's events.
- Do not write in the margins or between written lines, and do not leave blank pages to fill in later.
- If an error is made, make corrections by drawing a single line through the error and initialing it.
- Maintain control of the logbook and keep in a secure location.

Field logbooks will contain, at a minimum, the following information, if applicable:

General Information

- Name, location of site, and work order number
- Name of the Site Manager or Field Team Leader
- Names and responsibilities of all field team members using the logbook (or involved with activities for which entries are being made)
- Weather conditions
- Field observations
- Names of any site visitors including entities that they represent

Sample Collection Activities

- Date(s) and times of the sample collection or event.
- Number and types of collected samples.
- Sample location with an emphasis on any changes to documentation in governing documents (i.e., SAP, FSP). This may include measurements from reference points or sketches of sample locations with respect to local features.
- Sample identification numbers, including any applicable cross-references to split samples or samples collected by another entity.
- A description of sampling methodology, or reference to any governing document (i.e., FSP, SAP, QAPP).
- Summary of equipment preparation and decontamination procedures.
- Sample description including depth, color, texture, moisture content, and evidence of waste material or staining.
- Air monitoring (field screening) results.
- Types of laboratory analyses requested.

Site Health and Safety Activities

- All safety, accident, and/or incident reports.

- Real-time personnel air monitoring results, if applicable, or if not documented in the HASP.
- Heat/cold stress monitoring data, if applicable.
- Reasons for upgrades or downgrades in personal protective equipment.
- Health and safety inspections, checklists (drilling safety guide), meetings/briefings.
- Calibration records for field instruments.

Oversight Activities

- Progress and activities performed by contractors including operating times.
- Deviations of contractor activities with respect to project governing documents (i.e., specifications).
- Contractor sampling results and disposition of contingent soil materials/stockpiles.
- Excavation specifications and locations of contractor confirmation samples.
- General site housekeeping and safety issues by site contractors.

SOP	**1502.01**				
GROUP	Field Documentation				
SUB-GROUP					
TITLE	Photograph Logs				
DATE	11/19/2001	FILE	1502-01.DOC	PAGE	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the requirements for collecting information related to photodocumentation of site activities.

PROCEDURE

- Uniquely number each roll of film obtained for use.
- Record the following information for each negative exposed:
  1. Date and Time
  2. Photographer Name
  3. Witness Name
  4. Orientation (Landscape, Portrait, or Panaoramic)
  5. Description (including activity being performed, specific equipment of interest, sample location(s), compass direction photographer is facing)
- Record "NA" for the negatives not used if the roll is not completely used prior to development.
- Record unique roll number on receipt when film is submitted for development.
- Verify descriptions on log with negative numbers when photographs are received from processing.

FORMS

Blank Photograph Logs can be printed from WESTON On-Line from the *Records Management Application.* Selecting the *Reports/Project Planning/Blank Photo Logs* menu option will generate a project specific log with 36 entries.

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the sample nomenclature for analytical samples that will generate unique sample names compatible with most data management systems. The sample nomenclature is based upon specific requirements for the reporting of these results. A site specific data management plan should be prepared prior to sample collection.

PROCEDURE

SAMPLE NOMENCLATURE – SOIL AND SEDIMENT

Area of Concern – ID – Depth - Collection Type + QC Type

Where:

Area of Concern: A four-digit identifier used to designate the particular Area of Concern (AOC) that the location where the sample was collected.

ID: A three-digit identifier used to designate the particular location in the AOC from which the sample was collected or the center of the composite sample.

Depth: A two-digit code used to designate what depth of sample was collected:

03	0 to 3 inches
06	3 to 6 inches
12	6 to 12 inches

Collection Type: A one-digit code used to designate what type of sample was collected:

1	Surface Water
2	Ground Water
3	Leachate
4	Field QC/water sample
5	Soil/Sediment

6	Oil
7	Waste
8	Other
9	Drinking Water

QC Type: A one-digit code used to designate the QC type of the sample:

1	Normal
2	Duplicate
3	Rinsate Blank
4	Trip Blank
5	Field Blank
6	Confirmation

Examples:

- ***2054-055-06-51:*** Represents the normal soil sample collected from AOC 2054 at location 055 from 3 to 6 inches of depth.
- ***2054-055-06-52***: Represents the duplicate soil sample collected from AOC 2054 at location 055 from 3 to 6 inches of depth.
- ***2054-055-06-43***: Represents the rinsate water sample collected after the last sample of the day if last sample was collected from AOC 2054 at location 055 from 3 to 6 inches of depth.

SAMPLE NOMENCLATURE – WATER (from fixed station or location to be sampled more than once)

WELL OR STATION – YYYYMMDD - Collection Type + QC Type

Where:

Well or Station: For Wells and boreholes always assume there will be 10 or more so Monitoring Well 1 becomes designated MW01 or MW-01. If it is anticipated that there will be over 100 wells designate Monitoring Well 1 as MW001 or MW-001.

YYYYMMDD: A four-digit year + two-digit month + two-digit day

Collection Type: A one-digit code used to designate what type of sample was collected and are shown on page 1.

QC Type: A one-digit code used to designate the QC type of the sample and are shown on page 1.

Examples:

- ***MW01-20090226-21:*** Represents the normal groundwater sample collected from Monitoring Well 1 on 26 February 2009.
- ***MW01-20090226-44:*** Represents the trip blank in the same ice chest as the groundwater sample in the previous collected from Monitor Well 1 on 02/26/2009. All trip blanks must have a sample ID and they must be unique and on the Chain-of -Custody.
- ***2054-000-00-43:*** Represents the rinsate sample from AOC 2054

APPENDIX B

SITE-SPECIFIC DATA QUALITY OBJECTIVES

SITE-SPECIFIC DATA QUALITY OBJECTIVES
SECTION 30 URANIUM MINE
GRANTS, McKINLEY COUNTY, NEW MEXICO

STEP 1. STATE THE PROBLEM	
Legacy uranium mine sites in the Grants Mining District of northwest New Mexico may contain soil/sediment and mine waste rock that are elevated in trace metals and radionuclides above background concentrations which may pose a hazard to human health and the environment.	
STEP 2. IDENTIFY THE DECISION	
Does the soil environment at the generic 59-acre uranium mine site contain hazardous and radiological materials at concentrations that: 1) equal or exceed a value of two standard deviations above the mean site-specific background concentration for a specific radionuclide; or 2) exceed three times the natural background concentrations for the specific radionuclide, whichever is lower. If these concentrations satisfy the criteria in 1) and 2), the conditions constitute and establish an *"observed release"* per the HRS Guidance Manual, Section 5.1 page 55; and the CERCLA SI Guidance in Section 4.9.4 page 89-90, (EPA/540-R-92-021).	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	• If the concentrations of hazardous and radiological materials in soil at the uranium mine site constitute an *observed* release, then further remedial action under CERCLA will be recommended.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	• Elevated metal and radionuclide concentrations in soil at the uranium mine site are equal to or exceed two standard deviations above the mean site-specific background concentrations. • Elevated metal and radionuclide concentrations in soil at the uranium mine site are equal to or exceed by three times the mean background concentrations for radiological measurement and soil sampling.
SOURCES FOR EACH INFORMATIONAL INPUT AND INPUTS THAT ARE OBATINED THROUGH ENVIRONMENTAL MEASUREMENTS.	• Radiological gamma survey measurements with hand-held NaI detector instrument conducted at 175 feet grid spacing across site area and at unique site features. • Background radiological measurements collected at up to four off-site locations will provide an average background radioactivity concentration for comparison. • Field measurements of gamma activity are collected and the field variance is calculated to determine the number of soil/sediments to be collected. • Background surface soil samples analyzed by a laboratory for 23 metals and isotopes of three or four radionuclides. • Suspected hot spot soil locations within the mine site property analyzed by a laboratory for 23 metals and isotopes of three or four radionuclides.

SITE-SPECIFIC DATA QUALITY OBJECTIVES
SECTION 30 URANIUM MINE
(CONTINUED)

STEP 3. IDENTIFY INPUTS TO THE DECISION (Continued)	
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	• Concentrations of hazardous materials and radionuclides more than three times the background concentrations constitute an "observed release" per the HRS Guidance Manual, Section 5.1 page 55. • Concentrations of metal and radionuclide concentrations in soil/sediment that are equal to or exceed two standard deviations above the mean site-specific background concentrations constitute an observed release per Section 4.9.4 (page 89) of the guidance document for performing site inspections under CERCLA.
POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	• Gamma radioactivity concentrations in cpm and/or uR/hr (dose) will be determined using field instruments to measure radioactivity on the soil surface and at 3 feet high for a 60-second count rate. • Gamma measurements will be used to calculate the average background concentration, the average site concentration, and the range. • Laboratory analyte concentrations for specific metals and radionuclides will be used to calculate: the background mean concentrations, the site mean concentrations, the range, and the variance.
STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DOMAIN OF GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	Property boundary surrounding uranium mine site and/or all areas suspected of impact by mine activities and/or natural erosion processes that may have dispersed on-site materials beyond property boundaries.
CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Gamma radiation and radionuclide concentration measured in soil/sediments impacted by mine waste rock.
DETERMINATION OF WHEN TO COLLECT DATA.	• Data will be collected after target uranium mine sites are identified and access is acquired from landowners. • Field measurements of background gamma activity and site-specific activity will be collected using a grid system. • Determination of the field variance from the field measurements will be used in a formula to calculate the number of soil/sediments to be collected for laboratory analysis.

SITE-SPECIFIC DATA QUALITY OBJECTIVES
SECTION 30 URANIUM MINE
(CONTINUED)

STEP 4. DEFINE THE BOUNDARIES OF THE STUDY (Continued)	
PRACTICAL CONSTRAINTS ON DATA COLLECTION.	• Access to the site and/or appropriate background area is not attainable due to landowner and/or physical constraints. • Field radiological measurements may be unreliable due to excessive soil moisture, inclement weather, equipment malfunction, or operator error. • Erroneous determination of field gamma activity measurements and subsequent erroneous calculation of the field variance may result in an inadequate number of soil/sediments collected for laboratory analysis.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	• Field measurements of gamma radioactivity will be used to calculate: the mean background gamma concentration; the on-site mean gamma concentration; the on-site range of gamma concentrations; and the field variance of the on-site gamma concentration. • The on-site gamma concentrations will be compared to the mean background gamma concentration of the mine site to determine if the concentration is equal to or two times the mean. • Laboratory analyte concentrations for specific metals and radionuclides will be used to calculate the specific mean background soil/sediment mean concentrations; the specific on-site mean soil/sediment concentrations; the range of on-site specific concentrations; and the statistical variability of on-site concentrations, e.g., the sample variance and standard deviation. • Laboratory analyte concentrations that are equal to or exceed three times the mean background concentrations will be characterized as an observed release. • Laboratory analyte concentrations that are equal to or exceed two standard deviations above the mean background concentration will be characterized as an observed release.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	• Field measurements of gamma radioactivity that are equal to or exceed twice the mean background gamma activity concentration. • Laboratory analyte concentrations that are equal to or exceed three times the mean background concentrations will be characterized as an observed release. • Laboratory analyte concentrations that are equal to or exceed two standard deviations above the mean background concentration will be characterized as an observed release.
DECISION RULES.	• If on-site field gamma activity measurements exceed the mean background gamma activity concentration by more than two times, the likelihood of an observed release is high.

SITE-SPECIFIC DATA QUALITY OBJECTIVES
SECTION 30 URANIUM MINE
(CONTINUED)

STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	• Limit for uncertainty in measurement is 20% (0.20) at a 95% confidence level for the data set. • Mean background gamma radioactivity concentrations typically range from 12-20 200 microroentgens per hour (uR/hr) or less than 3,000 to 5,000 counts per minute. • On-site uranium mine waste rock gamma radioactivity concentrations may range over uR/hr and higher, or several tens or hundreds of thousands cpm (>> 10,000-100,000 cpm). • Background concentration of radium-226 in soil is generally 1.0-1.5 picocuries per gram (pCi/g). • Uranium mass concentrations in soil typically measure 3 ug/g or 2 pCi/g. • Uranium mine site waste rock concentrations of radium-226 may exceed 100 pCi/g.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	Type I Error: Deciding that the uranium mine site is represented by field measurements and/or sample results does not exceed three times the mean background concentration or two standard deviations above the mean background concentration when, in truth, it does. The consequence of this decision error is that the soil/sediment/waste rock material will remain in place, un-remediated, possibly presenting a hazard to human health and the environment. This decision error is the most severe. Type II Error: Deciding that the uranium mine site area represented by field measurements and/or sample results does exceed the mean background concentration by three times or two standard deviations when, in truth, it does not. The consequences of this decision error can potentially cause remedial action to continue under CERCLA and potentially divert resources from higher priority sites.
TRUE STATE OF NATURE FOR EACH DECISION RULE.	Type I: The field and laboratory measurements of hazardous materials and radionuclide concentrations in soil are greater than three times or two standard deviations above the mean background concentrations. Type II: The field and laboratory measurements of hazardous materials and radionuclide concentrations in soil are less than three times or two standard deviations above the mean background concentrations.
DEFINITION OF THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTEHESIS (H_o) AND FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTEHSIS (H_a).TRUE STATE OF NATURE FOR EACH DECISION RULE.	Type I: Ambient radioactivity levels impact human health. Type II: Ambient radioactivity levels do not impact human health.

STEP 7. OPTIMIZE THE DESIGN	
REVIEW THE DQOs.	Determine what else can be done to improve the methodology. Get some internal and external review by other staff and agencies. Test implementation of proposed design/methodology at one or two sites, then review lessons learned. Make adjustments in design and improve methodology with more sites over time.
DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN. A total of up to 12 soil samples and 1 water sample will be collected from the uranium mine pits and waste areas within the Section 30 Uranium Mine and analyzed to determine the presence of metals and radionuclides above background concentrations.	

APPENDIX C

TDD No. TO-0035-12-11-04

EPA U.S. EPA Washington, DC 20460	START3 Technical Direction Document Assessment/Inspection Activities - Enforcement Funds (0035) Weston Solutions, Inc.	TDD #: TO-0035-12-11-04 Contract: EP-W-06-042

! = required field ☐ Moved To EAS

Note: Remaining Amount includes $0.00 in Reserve.

TDD Name:	Section 30 Mine	! Period:	Base Period
! Purpose:	Work Assignment Initiation		
! Priority:	High	! Start Date:	11/14/2012
Overtime:	Yes	! Completion Date:	10/31/2013
! Funding Category:	Enforcement Funds	Invoice Unit:	
! Project/Site Name:	Section 30 Mine	WorkArea:	ASSESSMENT/INSPECTIONS ACTIVITIES
Project Address:	Section 30,T14N,R10W; 5.2 miles on State Highway 509, north of the junction of State Hwys 509 and 605 in Ambrosia Lake Mining Sub-District	Activity:	Integrated Assessment (IA)
County:	McKinley	Work Area Code:	
City, State:	, NM	Activity Code:	IA
Zip:		EMERGENCY CODE:	☐ KAT ☐ RIT
! SSID:	A6FJ	FPN:	
CERCLIS:	NMN000607480	Performance Based:	No
Operable Unit:			

Authorized TDD Ceiling:	Cost/Fee	LOE (Hours)
Previous Action(s):	$0.00	0.0
This Action:	$30,000.00	0.0
New Total:	$30,000.00	0.0

Specific Elements Assess the potential for short or long term clean-up actions., Perform field screening and analysis of samples.

Description of Work:

All activities performed in support of this TDD shall be in accordance with the contract and TO PWS.

The Grants Mining District provided significant uranium extraction and production in New Mexico from the 1950s until late into the 20th century. There are three mining sub-districts within the Grants Mining District: Ambrosia Lake, Laguna, and Marquez. Land ownership within these sub-districts consists of public, tribal, tribal trust and private property. These mining sub-districts contain 97 former legacy uranium mines and five mill sites. EPA is currently assessing the mine sites for releases of hazardous substances that may have impacted soil, surface water, sediment and ground water. The Section 30 Mine, located in the Ambrosia Lake mining sub-districts has been previously reclaimed by Rio Algom under the direction of the New Mexico Energy, Minerals and Natural Resources Department's Mining and Minerals Division. Under this TDD, the contractor shall investigate mine water discharge locations, sample potentially-impacted soil for elevated concentrations and radioactivity of elemental uranium and radionuclides, sample any surface water and sediment present for metals and radionuclides, and sample any accessible groundwater wells in the immediate area of the Section 30 Mine site in the Ambrosia Lake sub-district. The contractor shall document mine site features (e.g., open and plugged mine portals, waste rock piles, protore stockpiles, mining-related structures, etc.), surface drainage features, ground water wells and all sample locations with photographs, descriptions, and geospatially. The contractor shall prepare and submit to EPA for review and approval a draft and final report for the site. Coordinate with SAM, Mark Purcell at purcell.mark@epa.gov or 214-665-6707 upon receipt of the TDD.

Accounting and Appropriation Information

SFO: 22

Line	DCN	IFMS	Budget / FY	Approp. Code	Budget Org Code	Program Element	Object Class	Site Project	Cost Org Code	Amount
1	ENC016	XXX	11	TD	06S	501EC7	2505	A6FJIA00	C001	$30,000.00

Funding Summary	Funding
Previous:	$0.00
This Action:	$30,000.00
Total:	$30,000.00

Funding Category

Enforcement Funds

Section
- Signed by Mark Purcell/R6/USEPA/US on 11/07/2012 09:53:32 AM, according to Jeff Criner/start6/rfw-
: Mark Purcell Date: 11/07/2012
Phone #:
Project Officer Section - Signed by Cora Stanley/R6/USEPA/US on 11/08/2012 02:27:22 PM, according to Jeff Cri
Project Officer: Linda Carter Date: 11/07/2012
Contracting Officer Section - Signed by Cora Stanley/R6/USEPA/US on 11/08/2012 02:27:22 PM, according to Jef
Contracting Officer: Cora Stanley Date: 11/08/2012
Contractor Section
Contractor Contact: Date:

APPENDIX D

LABORATORY DATA PACKAGES

WESTON SOLUTIONS, INC.

Section 30 Mine DRS

STANDARD LEVEL IV
REPORT OF ANALYSIS

WORK ORDER #13-03012-OR

April 4, 2013

EBERLINE ANALYTICAL/OAK RIDGE LABORATORY
OAK RIDGE, TN

TABLE OF CONTENTS

Eberline Services – Oak Ridge Laboratory

LABORATORY DATA SUPPORT CHECKLIST

MP-001-3

Eberline Services Work Order # 13-030 12

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

Date for Partial	Initials	Date	Initials	Checklist Items
		3/5/13	KC	Sample Log-In
		4/1/13	KBS	Data Compilation
		4-1-13	mLT	First Technical Data Review
		4/2/13	MSA	Second Technical Data Review
		4/3/13	[illegible]	Data Entry/Electronic Deliverable
		4/3/13	[illegible]	Case Narrative
		04/03/13	EWT	Electronic Deliverable Proof
		4/3/13	MSA	Samples Analyzed within Holding Time Yes? X No?
		4/3/13	MSA	QA/QC Review
				Client in Possession of Data Electronic or Hard Copy
				Invoiced by Laboratory

Technical/Clerical Corrections, Signatures Needed, Problems, Etc	Date/Initials

Date package approved by: [signature] 4/4/13

Laboratory Manager Date

Copy No. ______

SECTION I

CHAIN OF CUSTODY

13-030 12

USEPA
DateShipped: 3/4/2013
CarrierName: FedEx
AirbillNo: 794879663628

REC'D MAR 0 5 2013

CHAIN OF CUSTODY RECORD
Section 30 Mine DRS
Contact Name: Kristie Warr
Contact Phone: 713-985-6600

No: 1-0035121104-130304-0001
Cooler #: 1
Lab: Eberline Services
Lab Phone: 865-481-0683

Lab #	Sample #	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
4	S30-04-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	141,119 CPM	N
5	S30-53-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	295,687 CPM	N
6	S30-61-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	235,886 CPM	N
7	S30-69-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	245,958 CPM	N
8	S30-70-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	360,259 CPM	N
9	S30-83-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	261,077 CPM	N
10	S30-90-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	391,816 CPM	N
11	S30-90-2-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	391,816 CPM	N
12	S30-91-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	321,783 CPM	N
13	S30-94-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	298,647 CPM	N
14	S30-95-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	284,513 CPM	N
15	S30-BKGD-N-130228	Gamma Spectroscopy	Soil	2/28/2013	1	16 oz jar	None	15,026 CPM	N

Special Instructions: Level IV Deliverable, Standard TAT

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
12/samples	[signature]	3/4/13	Fedex								
	FedEx		Kristie Carlotta	3/5/13	845						

2805

EBERLINE SERVICES
Oak Ridge Laboratory

Internal Chain of Custody

Work Order #	13-03012
Lab Deadline	3/28/2013
Analysis	Gamma - Level 4
Sample Matrix	Soil/Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
21 day ingrowth: Report Ac228, Bi214, K40, Pa234m, Pb212/214, Th234, Tl208, Ra226 from Bi214 & all positives	04	47	I1.5
	05	49	I1.5
	06	60	I1.5
	07	58	I1.5
	08	50	I1.5
	09	48	I1.5
	10	52	I1.5
	11	49	I1.5
	12	54	I1.5
	13	62	I1.5
	14	46	I1.5
	15	63	I1.5

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room 1230	[illegible]	3-~~25~~-13 KS 5
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room 0955	[illegible]	3-6-13
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room 0555	[illegible]	[illegible]
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	4/11/13 1408
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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SECTION II

SAMPLE ACKNOWLEDGEMENT

Client Name	Contract/PO	Project Type	Date Received	Required Turnaround Days	Eberline Services Work Order
Weston Solutions, Inc.	**0082148**	**Environmental**	**03/05/2013**	**28**	**13-03012**
Project Name	Client WO	Sample Disp	Lab Deadline	Internal Deadline	Client Deadline
82148	**Section 30 Mine DRS**	**H**	**03/28/2013**	**04/01/2013**	**04/02/2013**

Internal ID	Client ID	Sample Date	Matrix	Storage	Gamma																								Ttl
01	LCS	03/05/13	SO	I1.5	X																								1
02	BLANK	03/05/13	SO	I1.5	X																								1
03	DUP	03/05/13	SO	I1.5	X																								1
04	S30-04-130228	02/28/13 00:00	SO	I1.5	X																								1
05	S30-53-130228	02/28/13 00:00	SO	I1.5	X																								1
06	S30-61-130228	02/28/13 00:00	SO	I1.5	X																								1
07	S30-69-130228	02/28/13 00:00	SO	I1.5	X																								1
08	S30-70-130228	02/28/13 00:00	SO	I1.5	X																								1
09	S30-83-130228	02/28/13 00:00	SO	I1.5	X																								1
10	S30-90-130228	02/28/13 00:00	SO	I1.5	X																								1
11	S30-90-2-130228	02/28/13 00:00	SO	I1.5	X																								1
12	S30-91-130228	02/28/13 00:00	SO	I1.5	X																								1
13	S30-94-130228	02/28/13 00:00	SO	I1.5	X																								1
14	S30-95-130228	02/28/13 00:00	SO	I1.5	X																								1
15	S30-BKGD-N-130228	02/28/13 00:00	SO	I1.5	X																								1
																													0
																													0
																													0
																													0
																													0
	Totals Per Analysis (non QA samples)				12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

EBERLINE SERVICES

Sample Log In Report

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830

Voice: (865) 481-0683
Fax: (865) 483-4621

Invoice	ACCOUNTS PAYABLE Weston Solutions, Inc. 5599 San Felipe Suite 700 Houston, TX 77056	**Report Data**	Kristie Warr Weston Solutions, Inc. 5599 San Felipe Suite 700 Houston, TX 77056
Voice	713-985-6686	Voice	713-985-6636
Fax	713-985-6703	Fax	713-985-6703
Contact	Kristie Warr		
Voice	713-985-6636		
Fax	713-985-6703		

Printed: 3/5/2013 12:16 PM

Eberline Services – Oak Ridge Laboratory

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER # 13-030 12

SAMPLE MATRIX/MATRICES: (CIRCLE ONE OR BOTH)

AQUEOUS NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

Received in good condition?	Y	N	
If aqueous, properly preserved	Y	N	N/A

WERE CHAIN OF CUSTODY SEALS:

Present on outside of package?	Y	N
Unbroken on outside of package?	Y	N
Present on samples?	Y	N
Unbroken on samples?	Y	N
Was chain of custody present upon sample receipt?	Y	N

IF THE RESPONSE TO ANY OF THE ABOVE IS **NO**, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: ____________________

SIGNATURE: Krister Carlston DATE: 3/5/13

SECTION III

CASE NARRATIVE

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-35393

April 4, 2013

Kristie Warr
Weston Solutions, Inc.
5599 San Felipe Suite 700
Houston, TX 77056

CASE NARRATIVE

Work Order # 13-03012-OR

SAMPLE RECEIPT

This work order contains twelve soil samples received 03/05/2013. These samples were analyzed by Gamma Spectroscopy.

CLIENT ID	LAB ID	CLIENT ID	LAB ID
S30-04-130228	13-03012-04	S30-90-130228	13-03012-10
S30-53-130228	13-03012-05	S30-90-2-130228	13-03012-11
S30-61-130228	13-03012-06	S30-91-130228	13-03012-12
S30-69-130228	13-03012-07	S30-94-130228	13-03012-13
S30-70-130228	13-03012-08	S30-95-130228	13-03012-14
S30-83-130228	13-03012-09	S30-BKGD-N-130228	13-03012-15

ANALYTICAL METHODS

Gamma Spectroscopy was performed using Method LANL ER-130 Modified.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 2-sigma value.

GAMMA SPECTROSCOPY

Samples were dried, homogenized and placed into appropriate gamma spectroscopy geometry containers. Samples were then sealed for 21 days to allow for ingrowth of Radon-222 and progeny. Samples were counted on High Purity Germanium (HPGe) gamma ray detectors. Energy lines from Lead-214 and Bismuth-214 were analyzed for determinations of Radium-226 activity.

Samples demonstrated acceptable results for all gamma-emitting radionuclides as reported. The method blank demonstrated acceptable results for all radionuclides as reported. Results for the Bismuth-214, Potassium-40 and Lead-214 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 4/4/2013

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://www.eberlineservices.com/client.htm to provide us with feedback on our services.

SECTION IV

ANALYTICAL RESULTS SUMMARY

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Kristie Warr	SDG:	13-03012
Weston Solutions, Inc.	Project:	Section 30 Mine DRS
5599 San Felipe Suite 700	Analysis Category:	ENVIRONMENTAL
Houston, TX 77056	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
13-03012-01	LCS	KNOWN	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Cobalt-60	LANL ER-130 Modified	1.32E+02	5.29E+00			pCi/g
13-03012-01	LCS	KNOWN	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Cesium-137	LANL ER-130 Modified	8.04E+01	3.22E+00			pCi/g
13-03012-01	LCS	SPIKE	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Cobalt-60	LANL ER-130 Modified	1.32E+02	9.43E+00	1.16E+01	6.48E-01	pCi/g
13-03012-01	LCS	SPIKE	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Cesium-137	LANL ER-130 Modified	7.94E+01	7.98E+00	8.96E+00	5.01E-01	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	2.84E-02	5.10E-02	5.11E-02	1.17E-01	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	7.51E-03	3.70E-02	3.70E-02	7.00E-02	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	3.80E-02	1.43E-01	1.43E-01	3.48E-01	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	1.71E+00	1.92E+00	1.92E+00	3.03E+00	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	-6.43E-03	2.61E-02	2.61E-02	4.74E-02	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	1.96E-02	3.23E-02	3.23E-02	6.67E-02	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	7.51E-03	3.70E-02	3.70E-02	7.00E-02	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	1.08E-02	3.55E-01	3.55E-01	6.25E-01	pCi/g
13-03012-02	MBL	BLANK	03/05/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	6.03E-02	6.22E-02	6.23E-02	1.02E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Actinium-228	LANL ER-130 Modified	2.20E+00	4.11E-01	4.26E-01	5.33E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Bismuth-214	LANL ER-130 Modified	1.14E+01	8.36E-01	1.02E+00	2.44E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.85E+01	3.84E+00	4.11E+00	1.21E+00	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	9.68E+00	9.75E+00	9.76E+00	1.81E+01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-210	LANL ER-130 Modified	7.84E+00	2.63E+00	2.66E+00	2.70E+00	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-212	LANL ER-130 Modified	2.44E+00	5.68E-01	5.81E-01	2.38E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-214	LANL ER-130 Modified	1.26E+01	2.10E+00	2.19E+00	2.76E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Radium-226	LANL ER-130 Modified	1.14E+01	8.36E-01	1.02E+00	2.44E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thorium-234	LANL ER-130 Modified	9.07E+00	2.89E+00	2.93E+00	3.59E+00	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.44E+00	2.60E-01	2.70E-01	3.77E-01	pCi/g
13-03012-03	DUP	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Uranium-235	LANL ER-130 Modified	7.24E-01	6.74E-01	6.75E-01	1.10E+00	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION

601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Kristie Warr		SDG:	13-03012
Weston Solutions, Inc.		Project:	Section 30 Mine DRS
5599 San Felipe Suite 700		Analysis Category:	ENVIRONMENTAL
Houston, TX 77056		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.91E+00	3.49E-01	3.63E-01	4.72E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Bismuth-214	LANL ER-130 Modified	1.21E+01	8.83E-01	1.08E+00	2.65E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.93E+01	3.97E+00	4.24E+00	1.38E+00	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	5.04E+00	9.13E+00	9.13E+00	1.67E+01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-210	LANL ER-130 Modified	9.27E+00	2.36E+00	2.41E+00	2.94E+00	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-212	LANL ER-130 Modified	2.47E+00	5.69E-01	5.83E-01	2.37E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-214	LANL ER-130 Modified	1.24E+01	2.07E+00	2.16E+00	2.83E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Radium-226	LANL ER-130 Modified	1.21E+01	8.83E-01	1.08E+00	2.65E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thorium-234	LANL ER-130 Modified	9.03E+00	3.29E+00	3.33E+00	3.45E+00	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.70E+00	3.05E-01	3.17E-01	3.75E-01	pCi/g
13-03012-04	DO	S30-04-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.33E+00	9.30E-01	9.32E-01	1.11E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Actinium-228	LANL ER-130 Modified	6.52E-01	1.31E+00	1.31E+00	2.18E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Bismuth-214	LANL ER-130 Modified	4.51E+02	2.72E+01	3.57E+01	1.04E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.36E+01	5.45E+00	5.58E+00	5.80E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	2.30E+02	6.87E+01	6.97E+01	6.21E+01	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-210	LANL ER-130 Modified	1.43E+02	1.65E+01	1.81E+01	1.39E+01	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-212	LANL ER-130 Modified	1.59E+01	2.54E+00	2.66E+00	1.33E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Lead-214	LANL ER-130 Modified	4.57E+02	5.20E+01	5.70E+01	1.29E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Radium-226	LANL ER-130 Modified	4.51E+02	2.72E+01	3.57E+01	1.04E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thorium-234	LANL ER-130 Modified	1.97E+02	2.12E+01	2.35E+01	1.67E+01	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Thallium-208	LANL ER-130 Modified	2.53E+00	1.08E+00	1.08E+00	1.64E+00	pCi/g
13-03012-05	TRG	S30-53-130228	02/28/13 00:00	3/5/2013	3/29/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.67E+01	4.09E+00	4.18E+00	4.91E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.19E+00	1.09E+00	1.09E+00	1.47E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	1.91E+02	1.01E+01	1.40E+01	6.92E-01	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.88E+01	5.33E+00	5.53E+00	3.74E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	4.77E+01	3.14E+01	3.15E+01	4.05E+01	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.16E+02	1.18E+01	1.32E+01	8.31E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.23E+00	5.80E-01	5.83E-01	7.28E-01	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	1.96E+02	3.20E+01	3.35E+01	8.56E-01	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	1.91E+02	1.01E+01	1.40E+01	6.92E-01	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	3.05E+01	7.55E+00	7.71E+00	9.78E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	9.67E-01	2.58E-01	2.63E-01	1.03E+00	pCi/g
13-03012-06	TRG	S30-61-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	4.61E+00	2.64E+00	2.65E+00	3.30E+00	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

Eberline Analytical
Final Report of Analysis

Report To:		Work Order Details:	
Kristie Warr		SDG:	13-03012
Weston Solutions, Inc.		Project:	Section 30 Mine DRS
5599 San Felipe Suite 700		Analysis Category:	ENVIRONMENTAL
Houston, TX 77056		Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	5.81E-01	1.11E+00	1.11E+00	1.85E+00	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	3.28E+02	1.98E+01	2.60E+01	8.75E-01	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.28E+01	4.38E+00	4.53E+00	4.96E+00	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	1.40E+02	4.32E+01	4.38E+01	5.23E+01	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.18E+02	1.38E+01	1.51E+01	1.16E+01	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.14E+01	1.86E+00	1.95E+00	1.13E+00	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	3.30E+02	3.75E+01	4.12E+01	1.09E+00	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	3.28E+02	1.98E+01	2.60E+01	8.75E-01	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	8.89E+01	1.44E+01	1.51E+01	1.41E+01	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	6.19E-01	8.90E-01	8.90E-01	1.37E+00	pCi/g
13-03012-07	TRG	S30-69-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.27E+01	3.30E+00	3.37E+00	4.16E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	6.38E-02	1.52E+00	1.52E+00	2.54E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	3.72E+02	2.10E+01	2.83E+01	1.14E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.47E+01	6.93E+00	7.04E+00	7.06E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	1.96E+02	7.77E+01	7.84E+01	7.25E+01	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.93E+02	1.92E+01	2.16E+01	1.19E+01	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	2.28E+00	1.02E+00	1.02E+00	1.16E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	3.76E+02	4.18E+01	4.61E+01	1.40E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	3.72E+02	2.10E+01	2.83E+01	1.14E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	8.44E+01	1.31E+01	1.38E+01	1.51E+01	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.21E+00	1.22E+00	1.22E+00	1.87E+00	pCi/g
13-03012-08	TRG	S30-70-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.15E+01	3.62E+00	3.66E+00	4.97E+00	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	2.26E+00	9.09E-01	9.16E-01	1.46E+00	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	2.05E+02	1.08E+01	1.51E+01	7.13E-01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.75E+01	5.14E+00	5.33E+00	3.94E+00	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	4.50E+01	3.69E+01	3.69E+01	4.27E+01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	9.85E+01	1.13E+01	1.24E+01	8.29E+00	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	2.74E+00	8.78E-01	8.89E-01	7.76E-01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	2.08E+02	3.41E+01	3.57E+01	9.01E-01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	2.05E+02	1.08E+01	1.51E+01	7.13E-01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	3.28E+01	9.16E+00	9.31E+00	1.05E+01	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.43E+00	3.27E-01	3.35E-01	1.11E+00	pCi/g
13-03012-09	TRG	S30-83-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	8.80E+00	3.39E+00	3.42E+00	3.50E+00	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Kristie Warr	SDG:	13-03012
Weston Solutions, Inc.	Project:	Section 30 Mine DRS
5599 San Felipe Suite 700	Analysis Category:	ENVIRONMENTAL
Houston, TX 77056	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.02E+00	1.16E+00	1.16E+00	2.02E+00	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	3.16E+02	1.92E+01	2.51E+01	9.29E-01	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.90E+01	6.39E+00	6.56E+00	5.18E+00	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	1.18E+02	4.92E+01	4.96E+01	5.63E+01	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.23E+02	1.53E+01	1.66E+01	1.33E+01	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.16E+01	1.89E+00	1.98E+00	1.22E+00	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	3.25E+02	3.69E+01	4.05E+01	1.15E+00	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	3.16E+02	1.92E+01	2.51E+01	9.29E-01	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	1.39E+02	1.66E+01	1.80E+01	1.53E+01	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	2.24E+00	9.64E-01	9.70E-01	1.49E+00	pCi/g
13-03012-10	TRG	S30-90-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.13E+01	3.29E+00	3.34E+00	4.39E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.65E+00	1.55E+00	1.56E+00	2.61E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	3.56E+02	2.00E+01	2.71E+01	1.17E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.38E+01	7.02E+00	7.12E+00	6.94E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	1.05E+02	6.52E+01	6.54E+01	7.57E+01	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.98E+02	2.01E+01	2.25E+01	1.26E+01	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	9.67E+00	1.70E+00	1.77E+00	1.37E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	3.60E+02	4.01E+01	4.42E+01	1.43E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	3.56E+02	2.00E+01	2.71E+01	1.17E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	1.02E+02	1.43E+01	1.52E+01	1.56E+01	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.29E+00	1.24E+00	1.24E+00	1.91E+00	pCi/g
13-03012-11	TRG	S30-90-2-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	1.35E+01	3.86E+00	3.92E+00	5.04E+00	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	2.05E+00	1.23E+00	1.24E+00	1.51E+00	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	2.10E+02	1.10E+01	1.54E+01	7.01E-01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.63E+01	4.99E+00	5.17E+00	3.90E+00	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	7.96E+01	2.95E+01	2.98E+01	4.11E+01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.32E+02	1.32E+01	1.48E+01	8.67E+00	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.06E+00	5.78E-01	5.81E-01	7.61E-01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	2.09E+02	3.41E+01	3.58E+01	8.71E-01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	2.10E+02	1.10E+01	1.54E+01	7.01E-01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	6.64E+01	9.44E+00	1.00E+01	1.05E+01	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	6.90E-01	7.26E-01	7.27E-01	1.13E+00	pCi/g
13-03012-12	TRG	S30-91-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	7.41E+00	2.46E+00	2.49E+00	3.33E+00	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

Eberline Analytical
Final Report of Analysis

Report To:	Work Order Details:	
Kristie Warr	SDG:	13-03012
Weston Solutions, Inc.	Project:	Section 30 Mine DRS
5599 San Felipe Suite 700	Analysis Category:	ENVIRONMENTAL
Houston, TX 77056	Sample Matrix:	SO

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	CSU	MDA	Report Units
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.05E+00	1.24E+00	1.25E+00	1.87E+00	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	3.08E+02	2.24E+01	2.74E+01	8.99E-01	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	1.94E+01	5.00E+00	5.10E+00	4.95E+00	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	5.13E+01	4.04E+01	4.05E+01	5.23E+01	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.07E+02	1.35E+01	1.45E+01	1.18E+01	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.07E+01	1.75E+00	1.83E+00	1.12E+00	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	3.15E+02	3.58E+01	3.93E+01	1.06E+00	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	3.08E+02	2.24E+01	2.74E+01	8.99E-01	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	3.34E+01	9.01E+00	9.17E+00	1.33E+01	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.29E+00	8.85E-01	8.88E-01	1.37E+00	pCi/g
13-03012-13	TRG	S30-94-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	8.48E+00	2.95E+00	2.98E+00	4.05E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	2.32E+00	1.14E+00	1.15E+00	1.60E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	1.04E+02	6.21E+00	8.20E+00	6.83E-01	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	3.27E+01	5.88E+00	6.11E+00	3.73E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	8.25E+01	4.04E+01	4.06E+01	4.19E+01	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	7.19E+01	8.40E+00	9.17E+00	7.26E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	2.41E+00	6.05E-01	6.17E-01	6.53E-01	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	1.08E+02	1.21E+01	1.33E+01	8.11E-01	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	1.04E+02	6.21E+00	8.20E+00	6.83E-01	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	5.96E+01	8.27E+00	8.82E+00	9.16E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	1.70E+00	3.87E-01	3.96E-01	1.02E+00	pCi/g
13-03012-14	TRG	S30-95-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	4.27E+00	2.37E+00	2.38E+00	2.94E+00	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Actinium-228	LANL ER-130 Modified	1.16E+00	2.24E-01	2.31E-01	2.46E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Bismuth-214	LANL ER-130 Modified	1.33E+00	1.90E-01	2.01E-01	1.45E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Potassium-40	LANL ER-130 Modified	2.32E+01	2.99E+00	3.22E+00	5.84E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Protactinium-234m	LANL ER-130 Modified	4.47E+00	4.95E+00	4.96E+00	9.11E+00	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-210	LANL ER-130 Modified	1.02E+00	8.24E-01	8.25E-01	1.47E+00	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-212	LANL ER-130 Modified	1.14E+00	2.74E-01	2.80E-01	1.08E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Lead-214	LANL ER-130 Modified	1.41E+00	2.76E-01	2.85E-01	1.44E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Radium-226	LANL ER-130 Modified	1.33E+00	1.90E-01	2.01E-01	1.45E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thorium-234	LANL ER-130 Modified	9.43E-01	1.02E+00	1.02E+00	1.81E+00	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Thallium-208	LANL ER-130 Modified	9.23E-01	1.82E-01	1.88E-01	1.96E-01	pCi/g
13-03012-15	TRG	S30-BKGD-N-130228	02/28/13 00:00	3/5/2013	4/1/2013	13-03012	Uranium-235	LANL ER-130 Modified	-7.57E-02	2.94E-01	2.94E-01	4.82E-01	pCi/g

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

SECTION V

ANALYTICAL STANDARD

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90070

1366 Sand in 16 Ounce PP Taral Jar Filled to Top GAS-1202

Customer: Eberline / Oak Ridge, TN
P.O. No.: 7393, Item 8
Reference Date: 01-Jan-2012 12:00 PM EST **Grams of Master Source:** 0.017043

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, % Type u_A	u_B	U	Calibration Method*
Am-241	59.5	1.580E+05	———	1.974E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.677E+05	2.858E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.795E+04	1.499E+03	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.245E+05	2.122E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.707E+05	4.614E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.755E+05	2.991E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.128E+05	1.923E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.228E+05	7.206E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.084E+05	3.552E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	3.552E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.476E+05	7.629E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

SECTION VI

QUALITY CONTROL SAMPLE RESULTS SUMMARY

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
13-03012	Gamma	1	pCi	g	Weston Solutions, Inc.

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	CSU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	CSU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
CO-60	0.01	99.96%	8.79%	100.00%	4.00%	1.32E+02	5.29E+00	1.32E+02	1.16E+01	GAS-1102	1.32E+02	5.29E+00	7.36E+02
CS-137	0.21	98.77%	11.28%	100.00%	4.00%	8.04E+01	3.22E+00	7.94E+01	8.96E+00	GAS-1102	8.04E+01	3.22E+00	7.36E+02

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS CSU	Sample Result	Sample CSU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original CSU	Replicate Result	Replicate CSU
BI-214	0.86	5.52	1.21E+01	1.08E+00	1.14E+01	1.02E+00
K-40	0.26	2.73	2.93E+01	4.24E+00	2.85E+01	4.11E+00
PB-214	0.12	1.52	1.24E+01	2.16E+00	1.26E+01	2.19E+00

QC Summary

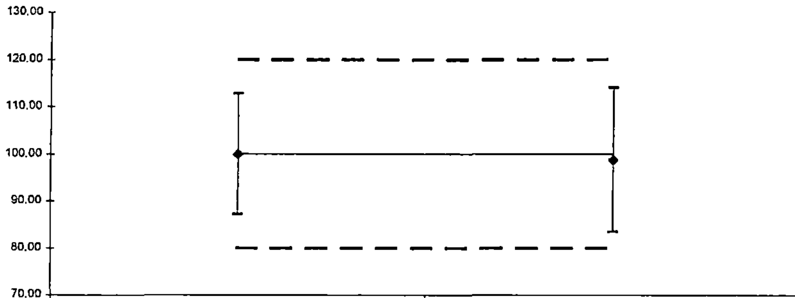
LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.00	OK	OK	<CS-137	BI-214>	NA	
0.99	OK	OK	<CO-60	K-40>	NA	OK
				PB-214>	NA	OK

Eberline Services
Analysis Control Chart

Printed: 4/3/2013 12:25 PM

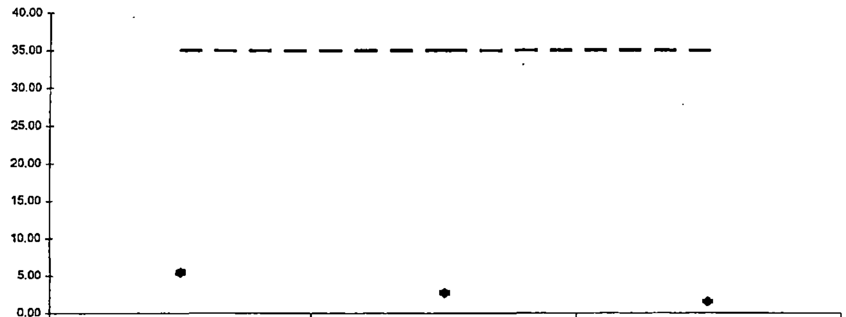
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
13-03012	Gamma	1	pCi	g	Weston Solutions, Inc.

LCS % Recovery



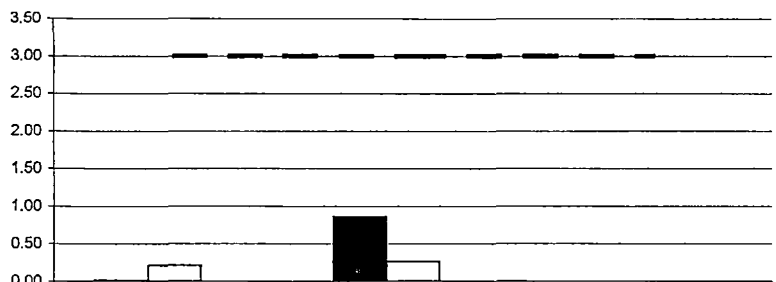
	CO-60	CS-137
Lower Error	87.18	83.48
Upper Error	112.75	114.06
%R	99.96	98.77
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	BI-214	K-40	PB-214
Lower Error	5.77	2.93	1.65
Upper Error	5.28	2.54	1.39
RPD	5.52	2.73	1.52
CL	35	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
CO-60	0.01	0.86	0.00
CS-137	0.21	0.26	0.00
	0.00	0.00	0.00
UCL	3	3	3

No Matrix Spike

Version

0023

SECTION VII

LABORATORY TECHNICIAN'S NOTES
&
RUN LOGS

GE 1

DATE	Sample #	Client	Load Time	CT Time	Analysis	Tech
3/27/13	1303095-05	Accadia	0914	1 hr	γ	KB
3/27/13	Chipper Test	Lab	1016	15 mins	γ	KB
3/27/13	1303104-06	USA	1037	1 hr	γ	KB
3/27/13	1303104-01	USA	1140	30 min	γ	KB
3/27/13	1303078-03	UCOR	1212	2 hrs	γ	KB
3/27/13	1303078-04	UCOR	1419	2 hrs	γ	KB
3/27/13	1303078-02	UCOR	1619	2 hrs	γ	KB
3/28/13	Daily Bkgd	Lab	0716	15 min	γ	AG
3/28/13	GAW-12	Lab	0744	15 min	γ	AG
3/28/13	GAS-1202	Lab	0804	15 m	γ	AG
3/28/13	GAS-1201	Lab	0826	15 m	γ	AG
3/28/13	1303010-03	Weston	0850	1 hr	γ	KB
3/28/13	1303010-04	Weston	0950	1 hr	γ	KB
3/28/13	1303010-11	Weston	1254	1 hr	γ	KB
3/28/13	1303111-03	Hudson Ranch	1051	1 hr	γ	KB
3/28/13	1303111-04	Hudson Ranch	1153	1 hr	γ	KB
3/28/13	1303010-14	Weston	1357	1 hr	γ	KB
3/29/13	1303010-17	Weston	1457	1 hr	γ	KB
3/28/13	1303011-01	Weston	1558	30 mins	γ	KB
3/28/13	1303011-05	Weston	1630	1 hr	γ	KB
3/29/13	Daily Pulser	Lab	0715	15 min	γ	AG
3/29/13	GAW-12	Lab	0745	15 min	γ	AG
3/29/13	GAS-1202	Lab	0814	15 m	γ	AG
3/29/13	GAS. 1201	Lab	0834	15 m	γ	AG
3/29/13	1303011-07	Weston	0902	1 hr	γ	KB
3/29/13	1303011-10	Weston	1003	1 hr	γ	KB
3/29/13	1303011-13	Weston	1106	1 hr	γ	KB
3/29/13	1303117-03	TGE	~~1207~~	1 hr	γ	KB
3/29/13	1303117-04	TGE	1308	1 hr	γ	KB
3/29/13	1303117-05	TGE	1409	1 hr	γ	KB
3/29/13	1303011-17	Weston	1510	1 hr	γ	KB
3/29/13	1303012-03	Weston	1611	1 hr	γ	KB
3/29/13	1303012-04	Weston	1711	1 hr	γ	KB
3/30/13	Chamber Bkgd	Lab	1711	24 hrs	γ	KB

GEI

DATE	Sample #	Client	Loadtime	CT Time	Analysis	Tech
4/11/17	Cal-1201	LAS	0527	15m	✓	—
4/11/17	Daily Plan	LAS	0552	15m	✓	—
4/11/17	GA win	LAS	0647	15m	✓	—
4/11/17	GA 2 Iron	LAS	0672	15m	✓	—
4/11/17	1707012-06	Westonsol	0652	2h	✓	—
4/11/17	1707012-09	Westonsol	0755	2h	✓	—
4/11/17	1707012-12	Westonsol	0859	2h	✓	—
4/11/17	1707012-15	Westonsol	1002	2h	✓	—

GE 2

DATE	SAmple #	Client	LoadTime	Time	Analysis	Tech
3/28/13	1303010-07	Weston	1025	1 hr	✓	ICB
3/28/13	1303010-08	Weston	1127	1 hr	✓	ICB
3/28/13	1303010-10	Weston	1228	1 hr	✓	ICB
3/28/13	1303010-13	Weston	1329	1 hr	✓	ICB
3/28/13	1303010-14	Weston	1435	1 hr	✓	ICB
3/28/13	1303011-02	Weston	1536	1 hr	✓	ICB
3/28/13	1303011-06	Weston	1638	1 hr	✓	ICB
3/29/13	Daily Bkgd	Lab	0716	15 min	✓	AG
3/29/13	GAS-1201	Lab	0746	15 min	✓	AG
3/29/13	GAW-12	Lab	0815	15 min	✓	AG
3/29/13	GAS-1202	Lab	0835	15 min	✓	AG
3/29/13	1303011-08	Weston	0903	1 hr	✓	ICB
3/29/13	1303011-11	Weston	1004	1 hr	✓	ICB
3/29/13	1303011-14	Weston	1107	1 hr	✓	ICB
3/29/13	1303117-02	TGE	1208	1 hr	✓	ICB
3/29/13	1303119-02	Hudson Ranch	1309	30 mins	✓	ICB
3/29/13	1303119-01	Hudson Ranch	1343	30 min	✓	ICB
3/29/13	1303011-16	Weston	1413	1 hr	✓	ICB
3/29/13	1303011-18	Weston	1514	1 hr	✓	ICB
3/29/13	1303012-05	Weston	1615	1 hr	✓	ICB
3/29/13	1303110-02	UCOR	1718	2 hrs	✓	ICB
3/30/13	Chamber Bkgd	Lab	1712	24 hrs	✓	KB
4/1/17	GAS-1202	Lab	0527	15 min	✓	—
4/1/17	GAS-1202	Lab	0552	15 min	✓	—
4/1/17	Daily Bkgd	Lab	0617	15 min	✓	—
4/1/17	GAW-12	Lab	0632	15 min	✓	—
4/1/17	1707012-04	Weston Sol.	0655	1 hr	✓	—
4/1/17	1707012-10	Weston Sol.	0756	1 hr	✓	—
4/1/17	1707012-12	Weston Sol.	0900	1 hr	✓	—
4/1/17	1707012-01	Weston Sol.	1007	30 min	✓	—

0027

DATe	SAmple #	Client	LoadTime	CTTime	Analysis	Tech
3/29/13	Daily Bkgd	Lab	0716	15min	γ	AG
3/29/13	GAS-1202	Lab	0747	15min	γ	AG
3/29/13	GAS-1201	Lab	0816	15 min	γ	AG
3/29/13	GAW-12	Lab	0836	15 min	γ	AG
3/29/13	1303011-09	Weston	0904	1hr	γ	KB
3/29/13	1303011-12	Weston	1009	1hr	γ	KB
3/29/13	1303011-15	Weston	1111	1hr	γ	KB
3/29/13	1303117-01	TGE	1212	30 mins.	γ	KB
3/29/13	1303119-03	Hudson Ranch	1243	30 mins.	γ	KB
3/29/13	1303119-04	Hudson Ranch	1316	30 mins.	γ	KB
3/29/13	1303110-03	UCOR	1349	2hrs	γ	KB
3/29/13	1303110-01	UCOR	1551	30mins	γ	KB
3/29/13	1303110-04	UCOR	1628	2hrs	γ	KB
3/30/13	Chamber Bkgd	Lab	1713	24 hrs	γ	KB
4/11/17	GAW-12	Lab	0528	1hr	✓	—
4/11/17	GAS-1202	Lab	0577	1hr	✓	—
4/11/17	GAS-1201	Lab	0644	1hr	✓	—
4/11/17	Daily Bkgd	Lab	0672	1hr	✓	—
4/11/17	1707012-08	Weston Sol.	0657	2hr	✓	—
4/11/17	1707012-11	Weston Sol.	0758	2hr	✓	—
4/11/17	1707012-14	Weston Sol.	0902	2hr	✓	—
4/11/17	1707012-02	Weston Sol.	1004	2hr	✓	—

SECTION VIII

ANALYTICAL DATA (GAMMA SPECTROSCOPY)

13-03012
Gamma
Run 1

Work Order	13-03012
Analysis Code	Gamma
Run	1
Date Received	3/5/2013
Lab Deadline	3/28/2013
Client	Weston Solutions, Inc.
Project	82148
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	SO
Method	LANL ER-130 Modified
Instrument Type	Gamma Spectroscopy
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		03/05/13 00:00	1.0000E+00
02	MBL	BLANK		03/05/13 00:00	1.0000E+00
03	DUP	S30-04-130228	47	02/28/13 00:00	3.4957E+02
04	DO	S30-04-130228	47	02/28/13 00:00	3.4957E+02
05	TRG	S30-53-130228	49	02/28/13 00:00	5.1791E+02
06	TRG	S30-61-130228	60	02/28/13 00:00	4.4545E+02
07	TRG	S30-69-130228	58	02/28/13 00:00	5.2702E+02
08	TRG	S30-70-130228	50	02/28/13 00:00	4.7532E+02
09	TRG	S30-83-130228	48	02/28/13 00:00	4.2895E+02
10	TRG	S30-90-130228	52	02/28/13 00:00	4.3130E+02
11	TRG	S30-90-2-130228	49	02/28/13 00:00	4.3631E+02
12	TRG	S30-91-130228	54	02/28/13 00:00	4.7526E+02
13	TRG	S30-94-130228	62	02/28/13 00:00	4.9365E+02
14	TRG	S30-95-130228	46	02/28/13 00:00	4.2819E+02
15	TRG	S30-BKGD-N-130228	63	02/28/13 00:00	4.6226E+02

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

13-03012
Gamma
Run 1

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS				0.00								
02	MBL				0.00								
03	DUP				0.00								
04	DO				0.00								
05	TRG				0.00								
06	TRG				0.00								
07	TRG				0.00								
08	TRG				0.00								
09	TRG				0.00								
10	TRG				0.00								
11	TRG				0.00								
12	TRG				0.00								
13	TRG				0.00								
14	TRG				0.00								
15	TRG				0.00								

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Eberline Services
Oak Ridge Laboratory
Analysis Sheet

13-03012
Gamma
Run 1

Internal Fraction	*Sample Desc*	*Rough Prep Date*	*Rough Prep By*	*Prep Date*	*Prep By*	*Sep t0 Date/Time*	*Sep t0 By*	*Sep t1 Date/Time*	*Sep t1 By*
01	LCS								
02	MBL								
03	DUP								
04	DO	03/06/13 08:20	KSALLINGS						
05	TRG	03/06/13 08:20	KSALLINGS						
06	TRG	03/06/13 08:20	KSALLINGS						
07	TRG	03/06/13 08:20	KSALLINGS						
08	TRG	03/06/13 08:20	KSALLINGS						
09	TRG	03/06/13 08:20	KSALLINGS						
10	TRG	03/06/13 08:20	KSALLINGS						
11	TRG	03/06/13 08:20	KSALLINGS						
12	TRG	03/06/13 08:20	KSALLINGS						
13	TRG	03/06/13 08:20	KSALLINGS						
14	TRG	03/06/13 08:20	KSALLINGS						
15	TRG	03/06/13 08:20	KSALLINGS						

0032

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Preliminary Data Report & Analytical Calculations

Work Order: 13-03012-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
01	CO-60	LCS	LCS	pCi/g	1.32E+02	9.43E+00	6.48E-01	1.32E+02	99.96	OK		03/05/13 00:00	1.00E+00	04/01/13 10:03	YES
01	CS-137	LCS	LCS	pCi/g	7.94E+01	7.98E+00	5.01E-01	8.04E+01	98.77	OK		03/05/13 00:00	1.00E+00	04/01/13 10:03	YES
02	AC-228	MBL	BLANK	pCi/g	2.84E-02	5.10E-02	1.17E-01					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	BI-214	MBL	BLANK	pCi/g	7.51E-03	3.70E-02	7.00E-02					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	K-40	MBL	BLANK	pCi/g	3.80E-02	1.43E-01	3.48E-01					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	PA-234M	MBL	BLANK	pCi/g	1.71E+00	1.92E+00	3.03E+00					03/05/13 00:00	1.00E+00	04/01/13 10:04	YES
02	PB-212	MBL	BLANK	pCi/g	-6.43E-03	2.61E-02	4.74E-02					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	PB-214	MBL	BLANK	pCi/g	1.96E-02	3.23E-02	6.67E-02					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	RA-226	MBL	BLANK	pCi/g	7.51E-03	3.70E-02	7.00E-02					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	TH-234	MBL	BLANK	pCi/g	1.08E-02	3.55E-01	6.25E-01					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
02	TL-208	MBL	BLANK	pCi/g	6.03E-02	6.22E-02	1.02E-01					03/05/13 00:00	1.00E+00	04/01/13 10:04	NO
03	AC-228	DUP	S30-04-130228	pCi/g	2.20E+00	4.11E-01	5.33E-01					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	BI-214	DUP	S30-04-130228	pCi/g	1.14E+01	8.36E-01	2.44E-01				NA	02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	K-40	DUP	S30-04-130228	pCi/g	2.85E+01	3.84E+00	1.21E+00				NA	02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	PA-234M	DUP	S30-04-130228	pCi/g	9.68E+00	9.75E+00	1.81E+01					02/28/13 00:00	3.50E+02	03/29/13 16:11	NO
03	PB-210	DUP	S30-04-130228	pCi/g	7.84E+00	2.63E+00	2.70E+00					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	PB-212	DUP	S30-04-130228	pCi/g	2.44E+00	5.68E-01	2.38E-01					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	PB-214	DUP	S30-04-130228	pCi/g	1.26E+01	2.10E+00	2.76E-01				NA	02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	RA-226	DUP	S30-04-130228	pCi/g	1.14E+01	8.36E-01	2.44E-01					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	TH-234	DUP	S30-04-130228	pCi/g	9.07E+00	2.89E+00	3.59E+00					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	TL-208	DUP	S30-04-130228	pCi/g	1.44E+00	2.60E-01	3.77E-01					02/28/13 00:00	3.50E+02	03/29/13 16:11	YES
03	U-235	DUP	S30-04-130228	pCi/g	7.24E-01	6.74E-01	1.10E+00					02/28/13 00:00	3.50E+02	03/29/13 16:11	NO
04	AC-228	DO	S30-04-130228	pCi/g	1.91E+00	3.49E-01	4.72E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	BI-214	DO	S30-04-130228	pCi/g	1.21E+01	8.83E-01	2.65E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	K-40	DO	S30-04-130228	pCi/g	2.93E+01	3.97E+00	1.38E+00					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	PA-234M	DO	S30-04-130228	pCi/g	5.04E+00	9.13E+00	1.67E+01					02/28/13 00:00	3.50E+02	03/29/13 17:11	NO
04	PB-210	DO	S30-04-130228	pCi/g	9.27E+00	2.36E+00	2.94E+00					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	PB-212	DO	S30-04-130228	pCi/g	2.47E+00	5.69E-01	2.37E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	PB-214	DO	S30-04-130228	pCi/g	1.24E+01	2.07E+00	2.83E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	RA-226	DO	S30-04-130228	pCi/g	1.21E+01	8.83E-01	2.65E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	TH-234	DO	S30-04-130228	pCi/g	9.03E+00	3.29E+00	3.45E+00					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	TL-208	DO	S30-04-130228	pCi/g	1.70E+00	3.05E-01	3.75E-01					02/28/13 00:00	3.50E+02	03/29/13 17:11	YES
04	U-235	DO	S30-04-130228	pCi/g	1.33E+00	9.30E-01	1.11E+00					02/28/13 00:00	3.50E+02	03/29/13 17:11	NO
05	AC-228	TRG	S30-53-130228	pCi/g	6.52E-01	1.31E+00	2.18E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	NO
05	BI-214	TRG	S30-53-130228	pCi/g	4.51E+02	2.72E+01	1.04E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	K-40	TRG	S30-53-130228	pCi/g	2.36E+01	5.45E+00	5.80E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	PA-234M	TRG	S30-53-130228	pCi/g	2.30E+02	6.87E+01	6.21E+01					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	PB-210	TRG	S30-53-130228	pCi/g	1.43E+02	1.65E+01	1.39E+01					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES

Work Order: 13-03012-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
05	PB-212	TRG	S30-53-130228	pCi/g	1.69E+01	2.54E+00	1.33E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	NO
05	PB-214	TRG	S30-53-130228	pCi/g	4.57E+02	5.20E+01	1.29E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	RA-226	TRG	S30-53-130228	pCi/g	4.61E+02	2.72E+01	1.04E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	TH-234	TRG	S30-53-130228	pCi/g	1.97E+02	2.12E+01	1.67E+01					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
05	TL-208	TRG	S30-53-130228	pCi/g	2.53E+00	1.08E+00	1.64E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	NO
05	U-235	TRG	S30-53-130228	pCi/g	1.67E+01	4.09E+00	4.91E+00					02/28/13 00:00	5.18E+02	03/29/13 16:15	YES
06	AC-228	TRG	S30-61-130228	pCi/g	1.19E+00	1.09E+00	1.47E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	NO
06	BI-214	TRG	S30-61-130228	pCi/g	1.91E+02	1.01E+01	6.92E-01					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	K-40	TRG	S30-61-130228	pCi/g	2.88E+01	5.33E+00	3.74E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	PA-234M	TRG	S30-61-130228	pCi/g	4.77E+01	3.14E+01	4.05E+01					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	PB-210	TRG	S30-61-130228	pCi/g	1.16E+02	1.18E+01	8.31E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	PB-212	TRG	S30-61-130228	pCi/g	1.23E+00	5.80E-01	7.28E-01					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	PB-214	TRG	S30-61-130228	pCi/g	1.96E+02	3.20E+01	8.56E-01					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	RA-226	TRG	S30-61-130228	pCi/g	1.91E+02	1.01E+01	6.92E-01					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	TH-234	TRG	S30-61-130228	pCi/g	3.05E+01	7.55E+00	9.78E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	TL-208	TRG	S30-61-130228	pCi/g	9.67E-01	2.58E-01	1.03E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	YES
06	U-235	TRG	S30-61-130228	pCi/g	4.61E+00	2.64E+00	3.30E+00					02/28/13 00:00	4.45E+02	04/01/13 06:52	NO
07	AC-228	TRG	S30-69-130228	pCi/g	5.81E-01	1.11E+00	1.85E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	NO
07	BI-214	TRG	S30-69-130228	pCi/g	3.28E+02	1.98E+01	8.75E-01					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	K-40	TRG	S30-69-130228	pCi/g	2.28E+01	4.38E+00	4.96E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	PA-234M	TRG	S30-69-130228	pCi/g	1.40E+02	4.32E+01	5.23E+01					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	PB-210	TRG	S30-69-130228	pCi/g	1.18E+02	1.38E+01	1.16E+01					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	PB-212	TRG	S30-69-130228	pCi/g	1.14E+01	1.86E+00	1.13E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	NO
07	PB-214	TRG	S30-69-130228	pCi/g	3.30E+02	3.75E+01	1.09E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	RA-226	TRG	S30-69-130228	pCi/g	3.28E+02	1.98E+01	8.75E-01					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	TH-234	TRG	S30-69-130228	pCi/g	8.89E+01	1.44E+01	1.41E+01					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
07	TL-208	TRG	S30-69-130228	pCi/g	6.19E-01	8.90E-01	1.37E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	NO
07	U-235	TRG	S30-69-130228	pCi/g	1.27E+01	3.30E+00	4.16E+00					02/28/13 00:00	5.27E+02	04/01/13 06:53	YES
08	AC-228	TRG	S30-70-130228	pCi/g	6.38E-02	1.52E+00	2.54E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	NO
08	BI-214	TRG	S30-70-130228	pCi/g	3.72E+02	2.10E+01	1.14E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	K-40	TRG	S30-70-130228	pCi/g	2.47E+01	6.93E+00	7.06E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	PA-234M	TRG	S30-70-130228	pCi/g	1.96E+02	7.77E+01	7.26E+01					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	PB-210	TRG	S30-70-130228	pCi/g	1.93E+02	1.92E+01	1.19E+01					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	PB-212	TRG	S30-70-130228	pCi/g	2.28E+00	1.02E+00	1.16E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	PB-214	TRG	S30-70-130228	pCi/g	3.76E+02	4.18E+01	1.40E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	RA-226	TRG	S30-70-130228	pCi/g	3.72E+02	2.10E+01	1.14E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	TH-234	TRG	S30-70-130228	pCi/g	8.44E+01	1.31E+01	1.51E+01					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
08	TL-208	TRG	S30-70-130228	pCi/g	1.21E+00	1.22E+00	1.87E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	NO

Work Order: 13-03012-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
08	U-235	TRG	S30-70-130228	pCi/g	1.15E+01	3.62E+00	4.97E+00					02/28/13 00:00	4.75E+02	04/01/13 06:54	YES
09	AC-228	TRG	S30-83-130228	pCi/g	2.26E+00	9.09E-01	1.46E+00					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	BI-214	TRG	S30-83-130228	pCi/g	2.05E+02	1.08E+01	7.13E-01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	K-40	TRG	S30-83-130228	pCi/g	2.75E+01	5.14E+00	3.94E+00					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	PA-234M	TRG	S30-83-130228	pCi/g	4.50E+01	3.69E+01	4.27E+01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	PB-210	TRG	S30-83-130228	pCi/g	9.85E+01	1.13E+01	8.29E+00					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	PB-212	TRG	S30-83-130228	pCi/g	2.74E+00	8.78E-01	7.76E-01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	PB-214	TRG	S30-83-130228	pCi/g	2.08E+02	3.41E+01	9.01E-01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	RA-226	TRG	S30-83-130228	pCi/g	2.05E+02	1.08E+01	7.13E-01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	TH-234	TRG	S30-83-130228	pCi/g	3.28E+01	9.16E+00	1.05E+01					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	TL-208	TRG	S30-83-130228	pCi/g	1.43E+00	3.27E-01	1.11E+00					02/28/13 00:00	4.29E+02	04/01/13 07:55	YES
09	U-235	TRG	S30-83-130228	pCi/g	8.80E+00	3.39E+00	3.50E+00					02/28/13 00:00	4.29E+02	04/01/13 07:55	NO
10	AC-228	TRG	S30-90-130228	pCi/g	1.02E+00	1.16E+00	2.02E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	NO
10	BI-214	TRG	S30-90-130228	pCi/g	3.16E+02	1.92E+01	9.29E-01					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	K-40	TRG	S30-90-130228	pCi/g	2.90E+01	6.39E+00	5.18E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	PA-234M	TRG	S30-90-130228	pCi/g	1.18E+02	4.92E+01	5.63E+01					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	PB-210	TRG	S30-90-130228	pCi/g	1.23E+02	1.53E+01	1.33E+01					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	PB-212	TRG	S30-90-130228	pCi/g	1.16E+01	1.89E+00	1.22E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	NO
10	PB-214	TRG	S30-90-130228	pCi/g	3.25E+02	3.69E+01	1.15E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	RA-226	TRG	S30-90-130228	pCi/g	3.16E+02	1.92E+01	9.29E-01					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	TH-234	TRG	S30-90-130228	pCi/g	1.39E+02	1.66E+01	1.53E+01					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
10	TL-208	TRG	S30-90-130228	pCi/g	2.24E+00	9.64E-01	1.49E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	NO
10	U-235	TRG	S30-90-130228	pCi/g	1.13E+01	3.29E+00	4.39E+00					02/28/13 00:00	4.31E+02	04/01/13 07:56	YES
11	AC-228	TRG	S30-90-2-130228	pCi/g	1.65E+00	1.55E+00	2.61E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	NO
11	BI-214	TRG	S30-90-2-130228	pCi/g	3.56E+02	2.00E+01	1.17E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	K-40	TRG	S30-90-2-130228	pCi/g	2.38E+01	7.02E+00	6.94E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	PA-234M	TRG	S30-90-2-130228	pCi/g	1.05E+02	6.52E+01	7.57E+01					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	PB-210	TRG	S30-90-2-130228	pCi/g	1.98E+02	2.01E+01	1.26E+01					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	PB-212	TRG	S30-90-2-130228	pCi/g	9.67E+00	1.70E+00	1.37E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	NO
11	PB-214	TRG	S30-90-2-130228	pCi/g	3.60E+02	4.01E+01	1.43E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	RA-226	TRG	S30-90-2-130228	pCi/g	3.56E+02	2.00E+01	1.17E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	TH-234	TRG	S30-90-2-130228	pCi/g	1.02E+02	1.43E+01	1.56E+01					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
11	TL-208	TRG	S30-90-2-130228	pCi/g	1.29E+00	1.24E+00	1.91E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	NO
11	U-235	TRG	S30-90-2-130228	pCi/g	1.35E+01	3.86E+00	5.04E+00					02/28/13 00:00	4.36E+02	04/01/13 07:58	YES
12	AC-228	TRG	S30-91-130228	pCi/g	2.05E+00	1.23E+00	1.51E+00					02/28/13 00:00	4.75E+02	04/01/13 08:59	NO
12	BI-214	TRG	S30-91-130228	pCi/g	2.10E+02	1.10E+01	7.01E-01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	K-40	TRG	S30-91-130228	pCi/g	2.63E+01	4.99E+00	3.90E+00					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	PA-234M	TRG	S30-91-130228	pCi/g	7.96E+01	2.96E+01	4.11E+01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
12	PB-210	TRG	S30-91-130228	pCi/g	1.32E+02	1.32E+01	8.67E+00					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	PB-212	TRG	S30-91-130228	pCi/g	1.06E+00	5.78E-01	7.61E-01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	PB-214	TRG	S30-91-130228	pCi/g	2.09E+02	3.41E+01	8.71E-01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	RA-226	TRG	S30-91-130228	pCi/g	2.10E+02	1.10E+01	7.01E-01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	TH-234	TRG	S30-91-130228	pCi/g	6.64E+01	9.44E+00	1.05E+01					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
12	TL-208	TRG	S30-91-130228	pCi/g	6.90E-01	7.26E-01	1.13E+00					02/28/13 00:00	4.75E+02	04/01/13 08:59	NO
12	U-235	TRG	S30-91-130228	pCi/g	7.41E+00	2.46E+00	3.33E+00					02/28/13 00:00	4.75E+02	04/01/13 08:59	YES
13	AC-228	TRG	S30-94-130228	pCi/g	1.05E+00	1.24E+00	1.87E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	NO
13	BI-214	TRG	S30-94-130228	pCi/g	3.08E+02	2.24E+01	8.99E-01					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	K-40	TRG	S30-94-130228	pCi/g	1.94E+01	5.00E+00	4.95E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	PA-234M	TRG	S30-94-130228	pCi/g	5.13E+01	4.04E+01	5.23E+01					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	PB-210	TRG	S30-94-130228	pCi/g	1.07E+02	1.35E+01	1.18E+01					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	PB-212	TRG	S30-94-130228	pCi/g	1.07E+01	1.75E+00	1.12E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	NO
13	PB-214	TRG	S30-94-130228	pCi/g	3.15E+02	3.58E+01	1.06E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	RA-226	TRG	S30-94-130228	pCi/g	3.08E+02	2.24E+01	8.99E-01					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	TH-234	TRG	S30-94-130228	pCi/g	3.34E+01	9.01E+00	1.33E+01					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
13	TL-208	TRG	S30-94-130228	pCi/g	1.29E+00	8.85E-01	1.37E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	NO
13	U-235	TRG	S30-94-130228	pCi/g	8.48E+00	2.95E+00	4.05E+00					02/28/13 00:00	4.94E+02	04/01/13 09:00	YES
14	AC-228	TRG	S30-95-130228	pCi/g	2.32E+00	1.14E+00	1.60E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	NO
14	BI-214	TRG	S30-95-130228	pCi/g	1.04E+02	6.21E+00	6.83E-01					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	K-40	TRG	S30-95-130228	pCi/g	3.27E+01	5.88E+00	3.73E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	PA-234M	TRG	S30-95-130228	pCi/g	8.25E+01	4.04E+01	4.19E+01					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	PB-210	TRG	S30-95-130228	pCi/g	7.19E+01	8.40E+00	7.26E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	PB-212	TRG	S30-95-130228	pCi/g	2.41E+00	6.05E-01	6.53E-01					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	PB-214	TRG	S30-95-130228	pCi/g	1.08E+02	1.21E+01	8.11E-01					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	RA-226	TRG	S30-95-130228	pCi/g	1.04E+02	6.21E+00	6.83E-01					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	TH-234	TRG	S30-95-130228	pCi/g	5.96E+01	8.27E+00	9.16E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	TL-208	TRG	S30-95-130228	pCi/g	1.70E+00	3.87E-01	1.02E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	YES
14	U-235	TRG	S30-95-130228	pCi/g	4.27E+00	2.37E+00	2.94E+00					02/28/13 00:00	4.28E+02	04/01/13 09:02	NO
15	AC-228	TRG	S30-BKGD-N-130228	pCi/g	1.16E+00	2.24E-01	2.46E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	BI-214	TRG	S30-BKGD-N-130228	pCi/g	1.33E+00	1.90E-01	1.45E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	K-40	TRG	S30-BKGD-N-130228	pCi/g	2.32E+01	2.99E+00	5.84E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	PA-234M	TRG	S30-BKGD-N-130228	pCi/g	4.47E+00	4.95E+00	9.11E+00					02/28/13 00:00	4.62E+02	04/01/13 10:02	NO
15	PB-210	TRG	S30-BKGD-N-130228	pCi/g	1.02E+00	8.24E-01	1.47E+00					02/28/13 00:00	4.62E+02	04/01/13 10:02	NO
15	PB-212	TRG	S30-BKGD-N-130228	pCi/g	1.14E+00	2.74E-01	1.08E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	PB-214	TRG	S30-BKGD-N-130228	pCi/g	1.41E+00	2.76E-01	1.44E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	RA-226	TRG	S30-BKGD-N-130228	pCi/g	1.33E+00	1.90E-01	1.45E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	TH-234	TRG	S30-BKGD-N-130228	pCi/g	9.43E-01	1.02E+00	1.81E+00					02/28/13 00:00	4.62E+02	04/01/13 10:02	NO

Eberline Services
Oak Ridge Laboratory

Preliminary Data Report & Analytical Calculations

Work Order: 13-03012-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time	Identified
15	TL-208	TRG	S30-BKGD-N-130228	pCi/g	9.23E-01	1.82E-01	1.96E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	YES
15	U-235	TRG	S30-BKGD-N-130228	pCi/g	-7.67E-02	2.94E-01	4.82E-01					02/28/13 00:00	4.62E+02	04/01/13 10:02	NO

0037

Count Room Report
Client: Weston Solutions, Inc.

13-03012-Gamma-1 (pCi/g) in SO
Tracer ID:

Thru
solid

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	03/05/13 00:00	1.0000				0.00		
02	MBL	BLANK	03/05/13 00:00	1.0000				0.00		
03	DUP	S30-04-130228	02/28/13 00:00	349.5700				0.00		
04	DO	S30-04-130228	02/28/13 00:00	349.5700				0.00		
05	TRG	S30-53-130228	02/28/13 00:00	517.9100				0.00		
06	TRG	S30-61-130228	02/28/13 00:00	445.4500				0.00		
07	TRG	S30-69-130228	02/28/13 00:00	527.0200				0.00		
08	TRG	S30-70-130228	02/28/13 00:00	475.3200				0.00		
09	TRG	S30-83-130228	02/28/13 00:00	428.9500				0.00		
10	TRG	S30-90-130228	02/28/13 00:00	431.3000				0.00		
11	TRG	S30-90-2-130228	02/28/13 00:00	436.3100				0.00		
12	TRG	S30-91-130228	02/28/13 00:00	475.2600				0.00		
13	TRG	S30-94-130228	02/28/13 00:00	493.6500				0.00		
14	TRG	S30-95-130228	02/28/13 00:00	428.1900				0.00		
15	TRG	S30-BKGD-N-130228	02/28/13 00:00	462.2600				0.00		

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404•352•8677
Fax 404•352•2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

GAS - 1102

83913-416

Sand in 16 oz. PP Taral Jar Filled to Top

Customer: Eberline Services / Eberline Analytical Corp.'
P.O. No.: 6705, Item 8
Reference Date: 01-Jan-2011 12:00 PM EST **Grams of Master Source:** 0.016810

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty, % Type u_A	u_B	U	Calibration Method
Am-241	59.5	1.580E+05	———	2.075E+03	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.697E+05	2.853E+03	0.8	2.3	4.9	HPGe
Co-57	122.1	2.718E+02	8.711E+04	1.464E+03	0.5	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	2.096E+03	0.5	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.753E+05	4.628E+03	0.4	1.9	3.9	HPGe
Sn-113	391.7	1.151E+02	1.769E+05	2.974E+03	0.5	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.109E+05	1.864E+03	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.224E+05	7.101E+03	0.5	1.9	3.9	HPGe
Co-60	1173.2	1.925E+03	2.142E+05	3.601E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.143E+05	3.602E+03	0.6	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.472E+05	7.517E+03	0.5	1.9	3.9	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1956

Corporate Office
24937 Avenue Tibbitts Valencia, California 91355

Laboratory
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Eberline Analytical
Oak Ridge Laboratory

Aliquot Worksheet

Work Order	Run	Analysis Code	Rpt Units	Lab Deadline	Technician
13-03012	1	Gamma	grams	3/28/2013	KSALLINGS

Lab Fraction	Weston Solutions, Inc. Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data No of Dils	Dil Factor	Ratio	Aliquot Data Aliquot	Net Equiv	MS Aliquot Data Aliquot	Net Equiv	H-3 Solids Only Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	S30-04-130228	DUP					3.4957E+02	3.4957E+02				
04	S30-04-130228	DO					3.4957E+02	3.4957E+02				
05	S30-53-130228	TRG					5.1791E+02	5.1791E+02				
06	S30-61-130228	TRG					4.4545E+02	4.4545E+02				
07	S30-69-130228	TRG					5.2702E+02	5.2702E+02				
08	S30-70-130228	TRG					4.7532E+02	4.7532E+02				
09	S30-83-130228	TRG					4.2895E+02	4.2895E+02				
10	S30-90-130228	TRG					4.3130E+02	4.3130E+02				
11	S30-90-2-130228	TRG					4.3631E+02	4.3631E+02				
12	S30-91-130228	TRG					4.7526E+02	4.7526E+02				
13	S30-94-130228	TRG					4.9365E+02	4.9365E+02				
14	S30-95-130228	TRG					4.2819E+02	4.2819E+02				
15	S30-BKGD-N-130228	TRG					4.6226E+02	4.6226E+02				

Comments	

Technician: Kerry Sally Date: 3/6/13

00340

Eberline Services - Oak Ridge
Prep Logbook
Version 2.0 8/1999

Rough Sample Preparation Log Book

Work Order	Lab Deadline	Date Received in Prep	Date Sealed	Date Returned	Technician
13-03012	3/28/2013	3/5/2013	3/6/2013	3/7/2013	KSALLINGS

Eberline	Weston Solutions, Inc.	Tare (g)	Gross (g)		Net (g)		Percent		Gamma		Special
Fraction	Client ID	Pan Wt	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Liquid	Solid	Dry Wt.	LEPS Wt.	Info
04	S30-04-130228	13.8000	458.7400	423.3000	444.9400	409.5000	7.97%	92.03%	0.0000	0.0000	
05	S30-53-130228	13.8400	566.9500	551.0100	553.1100	537.1700	2.88%	97.12%	0.0000	0.0000	
06	S30-61-130228	13.8300	491.8500	475.9600	478.0200	462.1300	3.32%	96.68%	0.0000	0.0000	
07	S30-69-130228	13.6400	574.9100	558.0500	561.2700	544.4100	3.00%	97.00%	0.0000	0.0000	
08	S30-70-130228	13.5700	527.6000	508.7600	514.0300	495.1900	3.67%	96.33%	0.0000	0.0000	
09	S30-83-130228	13.5700	483.1800	461.9700	469.6100	448.4000	4.52%	95.48%	0.0000	0.0000	
10	S30-90-130228	13.5400	479.5500	463.7400	466.0100	450.2000	3.39%	96.61%	0.0000	0.0000	
11	S30-90-2-130228	13.5000	482.0100	463.0700	468.5100	449.5700	4.04%	95.96%	0.0000	0.0000	
12	S30-91-130228	13.4000	522.7500	508.8300	509.3500	495.4300	2.73%	97.27%	0.0000	0.0000	
13	S30-94-130228	13.3900	539.5800	520.2600	526.1900	506.8700	3.67%	96.33%	0.0000	0.0000	
14	S30-95-130228	13.4500	503.8400	471.0800	490.3900	457.6300	6.68%	93.32%	0.0000	0.0000	
15	S30-BKGD-N-130228	13.5200	507.3300	490.4700	493.8100	476.9500	3.41%	96.59%	0.0000	0.0000	

Comments	
Special Codes	H: Hot, O: Organic Hazard, P: PCB Hazard, R: Rush, T: Other (see comments)

Technician: Kenny Sall

Date: **Analysis: Rough Prep Logbook**

Analysis: Gamma Page No. 8429

Sample ID : 1303012-01 Acquisition date : 1-APR-2013 10:03:38

C
4/1/13

VAX/VMS Peak Search Report Generated 1-APR-2013 10:34:18.43

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301201_GE2_GAS1202_190111.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : GAS-1102
Deposition Date :
Sample Date : 1-JAN-2011 00:00:00.
Acquisition date : 1-APR-2013 10:03:38.
Sample ID : 1303012-01
Sample Quantity : 7.36000E+02 GRAM
Sample type : SOLID
Sample Geometry : 0
Detector name : GE2
Detector Geometry: GAS-1202
Elapsed live time: 0 00:30:00.00
Elapsed real time: 0 00:30:20.67 1.1%
Start channel : 5
End channel : 4096
Sensitivity : 2.50000
Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	12.42	9283	12057	1.80	12.54	11	6	4.3		
2	21.99	110319	6305	1.31	22.10	19	10	0.6	1.94E+02	
2	24.90*	36287	3776	1.47	25.01	19	10	1.4		
0	31.90	1850	5302	1.43	32.02	30	6	13.2		
2	50.16	5578	8500	1.57	50.27	44	20	6.4	1.57E+03	
2	59.16*	78258	7510	1.60	59.28	44	20	0.9		AM-241
0	67.78	2292	18126	4.95	67.89	64	11	23.0		
0	87.86*	40006	11553	1.22	87.98	84	8	1.4		NP-237
										SN-126
										CD-109
0	121.84	8148	7007	1.22	121.96	118	8	4.2		CO-57
0	136.21	1031	5335	1.82	136.32	133	7	24.3		CO-57
0	165.57	1530	4774	1.51	165.68	162	7	15.8		CE-139
0	309.51	177	2876	2.74	309.62	307	6	96.9		
0	391.33	442	2945	1.89	391.43	389	7	41.8		SN-113
0	582.16*	132	1474	2.41	582.26	580	6	93.7		
0	602.40	99	1182	3.09	602.50	601	5	106.9		
0	633.71	127	1378	1.34	633.81	632	6	93.7		
0	661.06*	27218	2314	1.69	661.16	656	10	1.4		CS-137
0	848.70	115	1378	3.10	848.79	847	6	103.3		
0	897.55	379	2302	1.60	897.64	894	8	45.0		Y-88
0	1110.48	136	1627	2.68	1110.57	1107	8	104.3		
0	1145.55	65	596	2.78	1145.64	1144	5	115.0		
0	1172.36*	26524	1155	2.22	1172.45	1167	11	1.3		CO-60
0	1184.22	108	638	7.06	1184.30	1180	8	83.6		
0	1235.55	41	175	3.37	1235.64	1234	6	107.4		
0	1265.04	49	207	5.22	1265.12	1261	9	109.7		
0	1273.30	41	153	3.13	1273.38	1270	7	105.2		NA-22
0	1331.52*	24094	296	2.31	1331.60	1325	14	1.3		CO-60
6	1367.24	39	56	3.95	1367.32	1364	17	66.9	2.49E+00	
6	1375.64	40	101	3.95	1375.72	1364	17	97.6		
0	1405.47*	31	62	1.49	1405.55	1403	7	92.6		
0	1450.85	22	38	1.45	1450.93	1449	5	97.1		
0	1458.98*	50	94	3.21	1459.06	1454	12	82.6		
0	1514.70	24	44	2.68	1514.78	1512	6	95.3		
0	1581.78	30	57	3.26	1581.85	1578	8	93.8		

AG
4/1/13

Sample ID : 1303012-01   Acquisition date : 1-APR-2013 10:03:38

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1612.95	36	100	8.10	1613.03	1607	13	117.3		
0	1835.09	248	62	2.86	1835.16	1829	13	18.4		Y-88
3	2067.76	13	5	3.10	2067.82	2066	14	59.5	1.40E+00	
3	2073.40	17	23	3.32	2073.46	2066	14	126.5		
0	2109.30	13	21	2.57	2109.36	2107	7	130.7		
0	2284.83	14	18	1.01	2284.89	2282	5	107.7		
0	2394.78	9	7	1.41	2394.83	2389	10	135.2		
0	2503.82	311	7	2.79	2503.87	2499	10	11.8		
0	2612.95*	21	0	2.84	2613.00	2608	9	47.7		

Summary of Nuclide Activity
Sample ID : 1303012-01
Acquisition date : 1-APR-2013 10:03:38

Total number of lines in spectrum	43	
Number of unidentified lines	23	
Number of lines tentatively identified by NID	20	46.51%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	2.60Y	1.82	1.617E-01	2.944E-01	3.111E-01	105.67	
CO-57	270.90D	8.18	7.889E+00	6.454E+01	0.784E+01	12.15	
Y-88	106.60D	209.	1.244E+00	2.597E+02	0.495E+02	19.06	
CD-109	464.00D	3.41	8.634E+02	2.945E+03	0.359E+03	12.19	
SN-113	115.10D	141.	1.049E+00	1.477E+02	0.638E+02	43.20	
SN-126	1.00E+05Y	1.00	8.685E+01	8.685E+01	0.921E+01	10.61	
CS-137	30.17Y	1.05	7.542E+01	7.942E+01	0.798E+01	10.05	
CE-139	137.66D	62.6	1.719E+00	1.075E+02	0.198E+02	18.37	
NP-237	2.14E+06Y	1.00	2.553E+02	2.553E+02	0.268E+02	10.51	
			---------	---------			
	Total Activity :		1.293E+03	3.947E+03			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.34	9.834E+01	1.322E+02	0.094E+02	7.13	
			---------	---------			
	Total Activity :		9.834E+01	1.322E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-241	432.20Y	1.00	1.943E+02	1.950E+02	0.166E+02	8.52	
			---------	---------			
	Total Activity :		1.943E+02	1.950E+02			

Grand Total Activity : 1.586E+03 4.274E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-01 Acquisition date : 1-APR-2013 10:03:38

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NA-22	1274.54	99.94*	5.167E-01	1.617E-01	2.944E-01	105.67	OK

Final Mean for 1 Valid Peaks = 2.944E-01+/- 3.111E-01 (105.67%)

CO-57	122.06	85.51*	2.486E+00	7.819E+00	6.396E+01	13.57	OK
	136.48	10.60	2.420E+00	8.200E+00	6.708E+01	27.23	OK

Final Mean for 2 Valid Peaks = 6.454E+01+/- 7.839E+00 (12.15%)

Y-88	898.02	93.40	6.741E-01	1.229E+00	2.565E+02	45.98	OK
	1836.01	99.38*	4.090E-01	1.247E+00	2.604E+02	20.94	OK

Final Mean for 2 Valid Peaks = 2.597E+02+/- 4.949E+01 (19.06%)

CD-109	88.03	3.72*	2.541E+00	8.634E+02	2.945E+03	12.19	OK

Final Mean for 1 Valid Peaks = 2.945E+03+/- 3.591E+02 (12.19%)

SN-113	255.12	1.93	1.798E+00	-----	Line Not Found	-----	Absent
	391.69	64.90*	1.324E+00	1.049E+00	1.477E+02	43.20	OK

Final Mean for 1 Valid Peaks = 1.477E+02+/- 6.380E+01 (43.20%)

SN-126	87.57	37.00*	2.540E+00	8.685E+01	8.685E+01	10.61	OK

Final Mean for 1 Valid Peaks = 8.685E+01+/- 9.213E+00 (10.61%)

CS-137	661.65	85.12*	8.649E-01	7.542E+01	7.942E+01	10.05	OK

Final Mean for 1 Valid Peaks = 7.942E+01+/- 7.982E+00 (10.05%)

CE-139	165.85	80.35*	2.261E+00	1.719E+00	1.075E+02	18.37	OK

Final Mean for 1 Valid Peaks = 1.075E+02+/- 1.975E+01 (18.37%)

NP-237	86.50	12.60*	2.537E+00	2.553E+02	2.553E+02	10.51	OK

Final Mean for 1 Valid Peaks = 2.553E+02+/- 2.684E+01 (10.51%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-60	1173.22	100.00*	5.487E-01	9.863E+01	1.326E+02	11.17	OK
	1332.49	100.00	5.008E-01	9.815E+01	1.319E+02	9.27	OK

Final Mean for 2 Valid Peaks = 1.322E+02+/- 9.428E+00 (7.13%)

Sample ID : 1303012-01 Acquisition date : 1-APR-2013 10:03:38

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-241	59.54	35.90*	2.289E+00	1.943E+02	1.950E+02	8.52	OK

Final Mean for 1 Valid Peaks = 1.950E+02+/- 1.661E+01 (8.52%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
NA-22	2.944E-01	3.111E-01	4.606E-01	4.185E-02	0.639
CO-57	6.454E+01	7.839E+00	2.272E+00	2.787E-01	28.403
CO-60	1.322E+02	9.428E+00	6.478E-01	6.699E-02	204.070
Y-88	2.597E+02	4.949E+01	3.625E+01	3.339E+00	7.165
CD-109	2.945E+03	3.591E+02	2.678E+01	3.063E+00	109.987
SN-113	1.477E+02	6.380E+01	7.421E+01	7.650E+00	1.990
SN-126	8.685E+01	9.213E+00	7.894E-01	7.680E-02	110.017
CS-137	7.942E+01	7.982E+00	5.009E-01	4.566E-02	158.565
CE-139	1.075E+02	1.975E+01	1.839E+01	1.549E+00	5.848
NP-237	2.553E+02	2.684E+01	2.319E+00	2.232E-01	110.088
AM-241	1.950E+02	1.661E+01	9.197E-01	6.874E-02	211.988

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AL-26	-9.039E-03		9.073E-02	1.650E-01	1.513E-02	-0.055
K-40	1.232E+00		1.148E+00	1.960E+00	1.731E-01	0.629
TI-44	2.105E+00	+	5.205E-01	3.808E-01	3.058E-02	5.527
MN-54	1.484E+00		1.873E+00	3.173E+00	2.784E-01	0.468
ZN-65	1.488E+01		7.935E+00	1.205E+01	1.202E+00	1.235
SE-75	1.587E+01		3.453E+01	5.508E+01	9.634E+00	0.288
KR-85	2.548E+01		5.863E+01	1.010E+02	1.007E+01	0.252
NB-93M	1.042E+02		4.413E+01	2.336E+01	9.223E+00	4.460
NB-94	-1.300E-01		3.350E-01	5.549E-01	4.764E-02	-0.234
RU-106	-1.520E+00		1.094E+01	1.856E+01	2.589E+00	-0.082
AG-108M	-9.032E-02		2.825E-01	4.741E-01	4.307E-02	-0.191
AG-110M	1.633E+02		1.703E+01	1.036E+01	9.470E-01	15.763
TE123M	-4.304E+00		2.150E+01	3.200E+01	2.899E+00	-0.134
SB-125	-1.259E+00		1.289E+00	2.183E+00	2.221E-01	-0.577
I-129	1.740E+00		6.039E-01	8.069E-01	1.116E-01	2.156
BA-133	-2.669E-02		3.925E-01	6.152E-01	1.028E-01	-0.043
CS-134	-1.539E-01		5.458E-01	8.290E-01	7.969E-02	-0.186
CS-135	-1.297E+00		1.138E+00	1.736E+00	3.100E-01	-0.747
LA-138	3.264E-02		1.587E-01	2.752E-01	2.347E-02	0.119
CE-144	8.270E+00		1.067E+01	1.617E+01	1.819E+00	0.511
PM-144	-6.315E-01		1.179E+00	1.968E+00	2.980E-01	-0.321
PM-145	-2.959E+00		2.315E+00	1.901E+00	1.246E+00	-1.556
PM-146	-2.550E-01		7.677E-01	1.314E+00	1.311E-01	-0.194
EU-152	-3.320E-01		9.808E-01	1.425E+00	1.537E-01	-0.233
GD-153	-9.065E-01		6.709E+00	1.099E+01	1.180E+00	-0.083
EU-154	5.434E-01	+	5.742E-01	8.736E-01	7.938E-02	0.622
EU-155	1.425E+02	+	1.499E+01	3.408E+00	3.280E-01	41.827
HO-166M	1.204E-01		4.536E-01	7.705E-01	7.009E-02	0.156
HF-172	-6.756E-01		3.102E+00	4.655E+00	5.543E-01	-0.145
LU-173	1.244E+00		2.632E+00	4.193E+00	7.669E-01	0.297
LU-176	-2.025E-02		2.168E-01	3.142E-01	5.460E-02	-0.064
TA-182	1.552E+01		1.372E+02	2.270E+02	2.270E+01	0.068

Sample ID : 1303012-01 Acquisition date : 1-APR-2013 10:03:38

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-207	1.705E-01		2.348E-01	4.049E-01	3.966E-02	0.421
TL-208	9.297E-01	+	8.764E-01	1.279E+00	1.243E-01	0.727
BI-210M	-1.010E-02		3.991E-01	6.341E-01	1.088E-01	-0.016
PB-210	1.021E+02		1.202E+01	1.224E+01	1.064E+00	8.345
PB-211	-2.041E+00		7.051E+00	1.214E+01	1.191E+00	-0.168
BI-212	1.202E+00		2.168E+00	3.692E+00	3.352E-01	0.326
PB-212	9.595E-02		4.086E-01	6.539E-01	9.618E-02	0.147
BI-214	3.131E-01		5.361E-01	8.312E-01	7.941E-02	0.377
PB-214	-4.703E-01		5.421E-01	8.330E-01	1.147E-01	-0.565
RN-219	3.047E-01		3.109E+00	5.385E+00	5.274E-01	0.057
RA-223	-4.123E+00		5.013E+00	7.716E+00	1.245E+00	-0.534
RA-224	1.376E+00		4.611E+00	7.373E+00	1.102E+00	0.187
RA-226	3.814E+00		8.542E+00	8.013E+00	1.468E+01	0.476
TH-227	9.073E-02		1.582E+00	2.525E+00	3.648E-01	0.036
AC-228	1.261E+00		1.338E+00	2.251E+00	1.919E-01	0.560
TH-230	5.245E+02	+	1.297E+02	9.484E+01	7.602E+00	5.530
PA-231	1.176E+00		8.760E+00	1.276E+01	2.253E+00	0.092
TH-231	5.061E+02	+	8.964E+01	1.251E+01	2.151E+00	40.466
PA-234	-7.109E-01		7.500E-01	1.104E+00	1.264E-01	-0.644
PA-234M	-1.699E+00		3.987E+01	6.598E+01	6.054E+00	-0.026
TH-234	6.101E+00		5.946E+00	8.160E+00	6.292E-01	0.748
U-235	-1.957E-01		1.360E+00	2.207E+00	4.069E-01	-0.089
AM-243	-1.335E-01		3.345E-01	5.088E-01	4.356E-02	-0.262
CM-243	1.107E+00		1.375E+00	2.182E+00	4.127E-01	0.508

Sample ID : 1303012-01 Acquisition date : 1-APR-2013 10:03:38

Total number of lines in spectrum	43	
Number of unidentified lines	23	
Number of lines tentatively identified by NID	20	46.51%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NA-22	2.60Y	1.82	1.617E-01	2.944E-01	3.111E-01	105.67	
CO-57	270.90D	8.18	7.889E+00	6.454E+01	0.784E+01	12.15	
Y-88	106.60D	209.	1.244E+00	2.597E+02	0.495E+02	19.06	
CD-109	464.00D	3.41	8.634E+02	2.945E+03	0.359E+03	12.19	
SN-113	115.10D	141.	1.049E+00	1.477E+02	0.638E+02	43.20	
SN-126	1.00E+05Y	1.00	8.685E+01	8.685E+01	0.921E+01	10.61	
CS-137	30.17Y	1.05	7.542E+01	7.942E+01	0.798E+01	10.05	
CE-139	137.66D	62.6	1.719E+00	1.075E+02	0.198E+02	18.37	
NP-237	2.14E+06Y	1.00	2.553E+02	2.553E+02	0.268E+02	10.51	
			---------	---------			
	Total Activity :		1.293E+03	3.947E+03			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.34	9.834E+01	1.322E+02	0.094E+02	7.13	
			---------	---------			
	Total Activity :		9.834E+01	1.322E+02			

Nuclide Type : NATURAL

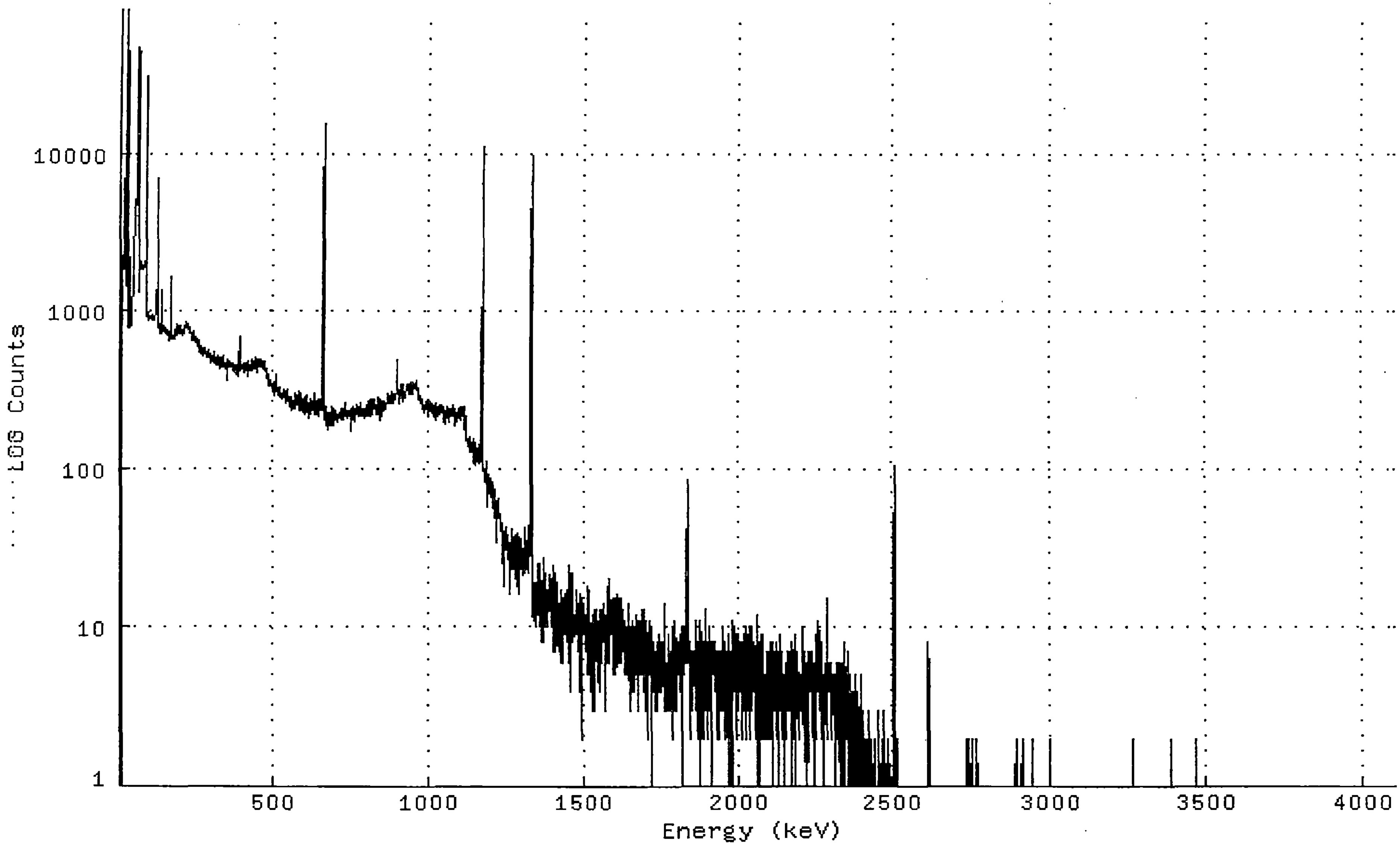
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-241	432.20Y	1.00	1.943E+02	1.950E+02	0.166E+02	8.52	
			---------	---------			
	Total Activity :		1.943E+02	1.950E+02			

Grand Total Activity : 1.586E+03 4.274E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301201_GE2_GAS1202_190111.CNF;1
Title :
Sample Title: GAS-1102

Start Time: 1-APR-2013 10:03: Sample Time: 1-JAN-2011 00:00: Energy Offset: -1.16012E-01
Real Time : 0 00:30:20.67 Sample ID : 1303012-01 Energy Slope : 1.00003E+00
Live Time : 0 00:30:00.00 Sample Type: SOLID Energy Quad : 0.00000E+00



0508

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301201_GE2_GAS1202_1901

Channel

1:	0	0	0	0	0	522	1458	1811
9:	1658	1894	2569	6858	5380	2115	2606	1812
17:	1979	2662	1432	2590	12173	80650	22588	6609
25:	24996	6631	1276	771	780	817	978	2150
33:	1451	951	805	1079	1110	1052	1009	1128
41:	1280	1536	1691	1810	2005	2215	2595	3303
49:	4555	5036	4628	4475	4478	4618	4887	5216
57:	5508	6395	45459	41737	2003	1354	1296	1477
65:	1692	1866	1978	2021	1953	1896	1909	1839
73:	1940	1847	1904	1815	1911	1911	1873	1877
81:	1897	1997	1997	2118	2179	2120	6758	30051
89:	6492	926	921	906	958	876	900	923
97:	877	912	904	898	881	915	930	892
105:	858	933	882	898	916	896	864	906
113:	905	914	951	942	948	927	983	961
121:	1900	6858	1965	791	770	876	795	817
129:	812	771	721	810	750	800	805	1343
137:	1198	759	711	786	757	725	747	789
145:	767	781	765	749	714	735	725	763
153:	692	719	698	715	719	643	703	742
161:	685	702	712	693	1127	1618	799	653
169:	692	675	690	664	673	683	648	692
177:	715	676	659	702	749	692	688	744
185:	731	818	776	754	750	803	726	716
193:	755	725	723	716	726	794	755	790
201:	715	725	734	700	761	719	706	742
209:	789	758	751	751	772	776	776	811
217:	810	845	815	800	779	814	770	786
225:	748	744	764	781	720	704	716	694
233:	706	690	712	715	647	733	732	658
241:	708	690	639	671	641	644	667	627
249:	633	589	617	627	604	651	602	634
257:	616	565	633	541	623	573	581	582
265:	582	551	528	531	517	542	539	573
273:	541	547	531	532	554	538	573	547
281:	499	502	543	549	518	538	513	537
289:	553	517	514	519	464	500	500	517
297:	503	520	475	497	498	506	498	495
305:	464	474	480	502	536	537	509	489
313:	473	454	489	461	446	494	471	506
321:	457	470	450	497	422	466	479	499
329:	480	496	460	490	479	443	440	432
337:	474	512	445	458	460	462	425	442
345:	440	462	464	466	460	363	453	479
353:	434	415	464	448	430	463	474	444
361:	432	461	448	433	433	432	429	425
369:	421	438	454	408	432	404	438	451
377:	426	416	427	440	390	444	423	433
385:	442	442	452	429	383	434	666	617
393:	446	428	413	450	430	424	439	429
401:	448	435	432	446	455	455	399	439
409:	433	462	457	465	453	409	439	382
417:	448	475	418	438	429	433	449	440
425:	425	439	409	426	408	444	447	482

433:	438	459	425	467	453	459	435	421
441:	434	501	425	447	456	494	457	480
449:	424	473	433	403	456	448	479	473
457:	471	460	464	461	454	430	449	492
465:	457	463	425	418	460	456	442	476
473:	424	412	430	434	413	411	419	364
481:	364	366	383	346	392	336	358	334
489:	369	357	345	349	363	330	341	340
497:	341	305	322	318	322	337	330	289
505:	316	329	350	305	331	387	382	363
513:	340	310	317	324	289	285	294	319
521:	301	281	280	290	318	283	271	283
529:	296	285	294	288	282	289	314	303
537:	299	293	280	284	304	270	260	268
545:	292	309	280	263	286	276	241	258
553:	258	273	279	251	262	265	282	267
561:	230	258	238	251	266	240	256	257
569:	261	277	263	297	237	257	244	273
577:	257	265	259	250	277	296	305	255
585:	230	249	247	249	230	293	249	241
593:	240	222	246	244	232	269	229	241
601:	259	279	259	264	220	236	225	233
609:	291	250	222	258	256	206	234	242
617:	247	246	246	219	251	232	273	222
625:	264	249	242	234	247	258	218	223
633:	292	256	252	249	233	239	244	221
641:	236	266	246	211	241	275	240	237
649:	234	255	242	273	242	248	272	234
657:	258	246	422	4320	15125	7712	779	228
665:	214	204	221	218	186	228	237	243
673:	213	194	213	220	177	225	210	187
681:	211	194	218	208	217	239	226	237
689:	218	186	244	218	220	186	217	205
697:	238	224	218	222	226	221	203	197
705:	217	221	199	212	210	212	217	224
713:	207	223	214	222	213	201	227	202
721:	236	217	204	216	211	235	216	220
729:	260	221	216	219	214	220	222	229
737:	228	232	220	206	222	227	218	212
745:	212	228	220	230	216	169	214	235
753:	229	202	245	223	214	231	202	213
761:	214	205	197	238	221	218	218	225
769:	246	217	253	217	234	242	226	215
777:	235	241	233	224	247	213	255	219
785:	220	213	223	238	216	227	240	232
793:	211	239	209	228	236	228	215	249
801:	244	213	238	213	242	263	253	254
809:	211	247	214	233	271	227	230	220
817:	243	251	270	253	273	252	236	246
825:	251	261	242	232	216	245	249	232
833:	278	237	232	253	232	243	217	253
841:	204	270	238	227	253	215	233	265
849:	263	268	236	228	239	244	268	243
857:	248	253	255	242	255	246	238	276
865:	256	278	262	292	264	257	257	263
873:	260	285	273	277	286	260	274	304
881:	293	281	255	257	292	281	279	284
889:	294	287	270	290	284	292	292	300
897:	482	394	300	326	295	280	304	300
905:	257	286	280	302	339	296	287	302

913:	306	331	268	309	337	308	303	289
921:	281	295	303	288	317	329	337	309
929:	343	332	321	335	295	336	326	297
937:	305	310	347	341	329	318	297	332
945:	337	328	351	294	337	322	320	323
953:	323	322	338	329	330	340	310	359
961:	330	315	318	277	300	287	273	280
969:	272	281	285	262	261	263	273	267
977:	249	256	255	235	241	224	250	236
985:	243	246	265	265	247	236	241	256
993:	250	230	219	263	272	228	261	234
1001:	231	255	263	238	248	243	234	237
1009:	258	223	245	251	217	219	212	249
1017:	248	230	241	203	240	232	255	227
1025:	239	242	240	224	215	222	252	225
1033:	254	221	237	224	234	236	237	228
1041:	253	201	227	217	198	247	210	207
1049:	215	230	192	208	226	233	245	215
1057:	239	232	239	208	196	208	225	233
1065:	232	235	212	218	233	231	221	238
1073:	246	214	212	235	211	248	227	214
1081:	223	218	187	221	203	198	211	220
1089:	223	214	236	225	216	222	206	232
1097:	209	216	241	216	210	199	239	243
1105:	227	210	227	215	226	241	235	212
1113:	199	208	176	196	175	214	188	170
1121:	148	155	150	148	155	145	140	130
1129:	157	149	127	129	139	127	141	138
1137:	146	141	136	129	126	107	129	124
1145:	154	134	144	105	124	135	122	120
1153:	119	124	121	123	135	110	121	129
1161:	106	135	122	142	124	129	109	122
1169:	144	354	3128	10721	10147	2481	289	102
1177:	86	97	87	82	99	82	96	110
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1193:	73	72	85	73	86	73	74	75
1201:	65	66	56	63	81	60	75	71
1209:	65	52	48	53	56	52	47	42
1217:	46	34	61	55	64	64	53	51
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1233:	33	36	43	45	40	34	18	34
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1249:	37	34	26	28	38	38	34	34
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1265:	23	25	35	29	23	23	24	33
1273:	28	37	27	22	20	35	25	23
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1289:	37	23	16	34	28	36	24	29
1297:	26	24	24	21	27	25	24	28
1305:	29	35	25	22	42	23	27	24
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1345:	19	15	17	11	13	12	25	12
1353:	14	18	18	10	23	25	14	17
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1369:	8	12	8	11	13	22	10	15
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1393:	10	10	20	11	10	12	14	24
1401:	7	8	14	14	16	22	9	12
1409:	7	8	12	14	14	19	15	15
1417:	13	7	9	13	10	9	11	10
1425:	9	11	17	6	8	11	10	15
1433:	6	13	16	9	11	10	10	11
1441:	9	11	8	13	14	17	10	12
1449:	6	24	16	10	4	10	13	11
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1465:	8	9	12	10	10	12	11	9
1473:	12	17	9	12	12	14	8	10
1481:	10	12	12	4	11	10	15	16
1489:	7	15	11	2	12	15	7	14
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1505:	7	9	11	8	11	11	9	5
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1705:	2	5	9	7	3	8	11	6
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1729:	4	7	3	6	7	5	6	6
1737:	7	3	5	8	6	9	7	5
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1753:	4	8	7	7	8	6	6	3
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1769:	6	6	6	4	3	6	4	7
1777:	6	9	3	6	7	7	7	7
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1793:	5	5	3	9	8	4	3	7
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1809:	5	9	4	4	9	4	5	6
1817:	1	9	3	7	10	5	10	5
1825:	7	10	7	9	6	8	9	8
1833:	23	72	84	55	20	11	6	6
1841:	2	3	4	4	8	5	3	5
1849:	7	7	7	5	5	6	6	7
1857:	6	6	3	6	11	4	7	4
1865:	3	5	2	8	5	7	4	4

1873:	2	1	5	11	8	5	6	2
1881:	6	7	4	2	6	5	8	5
1889:	9	3	6	4	6	6	13	5
1897:	6	6	2	4	6	6	5	10
1905:	3	3	10	3	3	5	1	8
1913:	8	6	6	5	8	6	7	6
1921:	8	4	6	6	6	6	5	7
1929:	2	6	6	7	4	2	6	5
1937:	6	3	4	4	7	7	3	5
1945:	6	8	3	10	6	5	8	5
1953:	6	6	5	2	5	5	4	7
1961:	7	4	1	3	8	1	5	9
1969:	5	6	6	1	5	7	1	4
1977:	11	2	3	8	4	9	8	6
1985:	8	6	10	3	6	4	6	9
1993:	2	7	3	3	9	6	5	4
2001:	8	6	7	6	8	5	7	8
2009:	2	8	4	5	5	4	3	3
2017:	9	3	10	6	5	2	9	3
2025:	9	4	4	6	4	4	8	4
2033:	10	2	7	4	7	10	4	3
2041:	7	5	8	4	5	5	7	7
2049:	4	6	2	6	4	5	12	4
2057:	3	2	4	1	2	8	7	1
2065:	3	0	7	3	9	2	5	6
2073:	5	9	4	8	3	4	2	4
2081:	2	3	3	5	5	2	2	2
2089:	6	4	7	7	2	6	3	3
2097:	5	4	5	2	8	5	4	3
2105:	5	1	1	8	7	7	3	5
2113:	3	6	3	5	3	6	3	3
2121:	8	2	7	7	1	7	2	3
2129:	8	9	3	4	5	7	3	4
2137:	2	2	4	7	2	5	3	4
2145:	1	3	4	2	3	6	4	3
2153:	3	3	4	5	3	7	4	5
2161:	3	3	5	5	7	7	8	1
2169:	1	6	4	2	3	4	3	7
2177:	6	9	2	4	4	5	1	7
2185:	4	4	7	3	7	4	2	4
2193:	5	4	3	5	4	4	3	3
2201:	4	3	3	10	9	6	6	3
2209:	2	4	5	6	7	2	0	6
2217:	2	6	6	1	2	4	3	7
2225:	3	4	6	6	4	7	4	5
2233:	6	7	3	4	4	4	1	5
2241:	4	6	5	4	3	5	9	4
2249:	5	2	8	4	5	11	5	6
2257:	10	9	6	9	7	6	3	5
2265:	5	5	8	6	2	4	5	4
2273:	5	5	1	6	4	5	6	3
2281:	3	4	5	5	15	2	5	6
2289:	5	5	5	4	5	5	4	6
2297:	5	4	3	2	4	4	3	4
2305:	3	5	5	2	3	1	5	3
2313:	2	2	4	3	4	6	5	2
2321:	3	6	2	2	0	5	2	2
2329:	6	2	2	3	4	0	4	6
2337:	2	4	1	7	4	3	8	4
2345:	3	2	2	4	3	3	2	7

2353:	2	0	0	2	2	5	0	1
2361:	5	0	2	2	2	2	4	0
2369:	3	2	4	1	4	1	2	5
2377:	0	2	2	1	0	4	0	4
2385:	0	0	1	1	1	0	1	2
2393:	5	2	2	1	2	0	1	1
2401:	2	0	1	3	1	1	1	2
2409:	0	1	1	1	2	1	2	1
2417:	1	0	1	1	0	1	3	1
2425:	0	0	2	1	0	1	0	1
2433:	1	1	0	2	0	1	0	0
2441:	1	0	0	0	1	1	0	1
2449:	1	3	0	1	0	0	0	0
2457:	0	1	0	2	0	2	1	0
2465:	0	1	0	0	3	0	0	1
2473:	0	1	1	1	0	1	2	0
2481:	1	0	0	2	0	0	0	0
2489:	1	1	0	0	1	1	1	0
2497:	1	3	0	2	6	33	86	105
2505:	61	19	6	0	0	1	2	0
2513:	0	0	1	0	0	0	0	0
2521:	0	0	0	0	0	0	0	0
2529:	0	0	0	0	0	1	0	0
2537:	0	0	0	0	0	0	0	0
2545:	0	0	1	0	0	1	0	0
2553:	0	0	0	0	0	0	1	1
2561:	1	0	0	0	0	0	0	0
2569:	0	0	0	0	0	0	1	0
2577:	0	0	0	1	0	0	0	0
2585:	0	1	0	1	0	0	1	0
2593:	0	0	0	0	0	0	0	0
2601:	1	1	0	0	0	0	0	0
2609:	1	1	3	2	8	5	5	0
2617:	0	0	0	0	0	1	0	0
2625:	0	0	0	0	0	0	0	0
2633:	0	1	0	0	0	0	0	0
2641:	0	0	0	0	0	0	0	0
2649:	0	0	0	0	0	0	0	0
2657:	0	0	0	0	0	0	1	0
2665:	0	1	0	0	0	1	0	0
2673:	1	0	0	0	0	0	1	0
2681:	0	0	1	0	1	0	1	0
2689:	0	0	1	1	0	0	0	1
2697:	0	0	0	1	0	0	0	0
2705:	0	0	0	0	0	0	0	1
2713:	0	0	0	0	0	0	1	0
2721:	0	0	0	0	0	0	0	0
2729:	0	1	2	0	1	0	1	0
2737:	0	0	1	0	0	2	0	0
2745:	0	0	0	0	0	2	0	1
2753:	0	0	0	0	0	0	0	1
2761:	0	0	0	0	0	2	0	0
2769:	0	0	0	0	0	0	0	0
2777:	0	0	0	0	0	0	0	0
2785:	0	0	0	0	0	0	0	0
2793:	0	0	0	0	0	0	1	0
2801:	0	0	0	0	0	0	0	0
2809:	0	0	0	0	0	0	0	0
2817:	1	0	0	0	0	0	0	1
2825:	0	0	0	0	0	0	0	0

2833:	0	0	0	0	0	1	0	0
2841:	0	0	1	0	0	0	0	0
2849:	0	0	0	0	1	0	0	0
2857:	0	0	0	0	0	0	1	0
2865:	0	0	1	0	0	0	0	0
2873:	0	0	0	0	0	0	0	1
2881:	0	0	1	0	0	0	0	1
2889:	0	2	0	1	0	0	0	0
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	1	2	0	0	0
2913:	0	0	0	0	0	0	0	0
2921:	0	0	0	0	0	0	1	0
2929:	0	1	1	0	0	0	1	0
2937:	0	0	0	2	0	0	0	0
2945:	1	0	0	0	0	1	0	0
2953:	0	0	0	0	0	0	0	0
2961:	0	0	0	1	0	1	0	1
2969:	1	0	1	1	0	0	0	0
2977:	0	0	0	0	0	0	1	0
2985:	0	0	0	0	0	0	0	0
2993:	0	0	2	0	0	0	0	0
3001:	0	0	0	0	0	0	0	0
3009:	0	0	0	0	0	0	0	0
3017:	0	0	0	0	0	0	1	0
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	0	0	0	0	0
3041:	0	0	0	0	0	1	0	0
3049:	0	1	0	0	0	0	0	0
3057:	0	0	0	0	0	0	0	0
3065:	0	1	0	1	0	0	0	0
3073:	0	0	0	0	0	0	1	0
3081:	0	0	0	0	0	0	0	0
3089:	0	0	0	0	0	1	0	1
3097:	0	0	0	0	0	0	0	0
3105:	0	0	0	0	0	0	0	0
3113:	0	0	0	0	0	0	0	0
3121:	1	0	0	0	0	0	0	0
3129:	0	1	0	0	0	0	0	0
3137:	0	0	0	0	0	0	0	0
3145:	0	0	0	0	0	0	0	0
3153:	0	0	0	0	0	0	0	0
3161:	0	0	1	0	0	0	0	0
3169:	0	0	0	0	0	0	0	0
3177:	0	0	1	0	0	1	0	0
3185:	0	0	0	0	1	0	0	1
3193:	0	0	0	0	0	0	0	0
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	0	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	0	1	0	0	0	0	0	1
3241:	0	1	0	0	1	0	0	0
3249:	0	0	0	0	0	0	0	0
3257:	0	0	0	0	0	2	1	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	1	0
3305:	0	0	0	0	0	0	1	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	0	0	1	0	0
3329:	0	0	0	0	0	0	1	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	0	0	0	0	0
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	0	0	0	0	0
3369:	0	1	1	0	0	0	0	0
3377:	0	1	0	0	0	0	0	2
3385:	0	1	0	0	0	0	0	0
3393:	0	0	0	0	1	0	0	0
3401:	0	0	0	0	0	0	0	0
3409:	0	0	1	0	0	0	0	0
3417:	1	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	1	0	0	1	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	1	0	0	0	0	0	0	0
3457:	0	0	0	1	0	2	0	0
3465:	0	0	0	0	0	0	1	0
3473:	0	0	0	0	0	0	0	1
3481:	0	0	0	0	0	0	0	0
3489:	0	1	0	0	1	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	1	1	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	1	0	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	1	0	0	0	1	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	0	0	1	0	0
3609:	0	0	0	0	1	1	0	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	0	1	0	0	0
3633:	0	0	0	0	1	0	0	0
3641:	0	0	0	0	0	0	1	0
3649:	0	0	0	0	0	1	0	0
3657:	0	0	0	0	0	0	1	0
3665:	0	0	0	0	0	0	0	0
3673:	1	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	1	0	0	0	0	0	1	0
3697:	0	1	0	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	1	0	0	0	0
3761:	0	0	1	0	0	0	0	0
3769:	0	0	0	1	0	0	0	0
3777:	0	1	1	0	0	0	0	0
3785:	0	1	0	0	0	0	0	0

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	1	1	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	1	0	0	0	0	0	0	0
3849:	1	0	0	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	0	0	0	0	0	1	0	0
3873:	0	0	0	0	1	0	0	0
3881:	0	0	0	0	0	0	0	1
3889:	0	0	0	0	0	0	0	0
3897:	1	0	0	0	0	0	0	0
3905:	0	0	0	0	0	0	0	0
3913:	0	0	0	1	0	0	0	1
3921:	0	0	0	0	0	0	1	0
3929:	0	0	1	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	1
3953:	0	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	1
3969:	0	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	0	0	0	1
3993:	0	0	1	0	1	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	1
4017:	0	0	0	0	1	0	0	0
4025:	0	0	0	0	0	0	0	1
4033:	0	0	0	1	0	0	0	0
4041:	0	1	0	0	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	0	0	0	0	1	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	1	0	0	0	0	0

Sample ID : 1303012-02 Acquisition date : 1-APR-2013 10:04:45

4/1/13

VAX/VMS Peak Search Report Generated 1-APR-2013 11:05:30.32

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301202_GE3_GAS1202_190112.		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: BLANK		
Deposition Date	:		
Sample Date	: 1-APR-2013 00:00:00.	Acquisition date	: 1-APR-2013 10:04:45.
Sample ID	: 1303012-02	Sample Quantity	: 7.83400E+02 GRAM
Sample type	: SOLID	Sample Geometry	: 0
Detector name	: GE3	Detector Geometry	: GAS-1202
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:14.01 0.4%
Start channel	: 5	End channel	: 4096
Sensitivity	: 2.50000	Gaussian	: 15.00000
Critical level	: Yes		

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	157.66	32	47	1.44	157.98	155	6	77.3		TE123M
3	327.24	9	6	2.21	327.55	326	10	89.5	4.53E+00	
3	332.25	14	14	2.21	332.56	326	10	118.4		
0	375.28	25	29	4.12	375.59	371	10	91.7		
0	440.60	19	27	6.60	440.90	433	13	127.7		
0	496.35	17	8	4.69	496.65	493	8	75.3		RU-103
0	533.22	14	7	3.64	533.51	531	6	81.7		
0	569.20	9	5	2.75	569.50	567	6	107.4		
0	582.08*	15	12	2.44	582.38	578	8	102.4		
0	611.98	20	30	5.04	612.27	605	14	128.5		
0	622.35	10	3	0.95	622.64	620	5	85.1		RU-106
0	785.36	13	2	3.57	785.64	782	7	63.9		
0	1000.05	8	4	5.66	1000.32	996	8	111.8		PA-234M
0	1034.28	12	5	1.14	1034.55	1029	9	83.9		
0	1051.13	5	3	2.38	1051.40	1048	6	141.4		
0	1084.07	7	1	1.39	1084.34	1081	6	97.6		
0	1240.07	6	0	1.00	1240.33	1237	6	81.6		
0	1407.98	6	2	1.84	1408.23	1405	6	110.6		
0	1709.51	8	0	3.00	1709.75	1705	9	70.7		
0	1907.77	5	0	2.98	1908.00	1904	7	89.4		

AG
3 4/1/13

Summary of Nuclide Activity
Sample ID : 1303012-02
Acquisition date : 1-APR-2013 10:04:45

Total number of lines in spectrum	20	
Number of unidentified lines	13	
Number of lines tentatively identified by NID	7	35.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RU-103	39.35D	1.01	1.997E-02	2.012E-02	1.549E-02	77.00	
RU-106	368.20D	1.00	1.293E-01	1.294E-01	1.121E-01	86.64	
TE123M	119.70D	1.00	1.672E-02	1.676E-02	1.308E-02	78.01	
	Total Activity :		1.659E-01	1.663E-01			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PA-234M	4.47E+09Y	1.00	1.708E+00	1.708E+00	1.920E+00	112.41	
	Total Activity :		1.708E+00	1.708E+00			

Grand Total Activity : 1.874E+00 1.874E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RU-103	497.08	89.00*	9.168E-01	1.997E-02	2.012E-02	77.00	OK

Final Mean for 1 Valid Peaks = 2.012E-02+/- 1.549E-02 (77.00%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RU-106	621.84	9.80*	7.478E-01	1.293E-01	1.294E-01	86.64	OK

Final Mean for 1 Valid Peaks = 1.294E-01+/- 1.121E-01 (86.64%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TE123M	159.00	84.10*	2.166E+00	1.672E-02	1.676E-02	78.01	OK

Final Mean for 1 Valid Peaks = 1.676E-02+/- 1.308E-02 (78.01%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	4.879E-01	1.708E+00	1.708E+00	112.41	OK

Final Mean for 1 Valid Peaks = 1.708E+00+/- 1.920E+00 (112.41%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
RU-103	2.012E-02	1.549E-02	2.459E-02	3.796E-03	0.818
RU-106	1.294E-01	1.121E-01	1.958E-01	3.094E-02	0.661
TE123M	1.676E-02	1.308E-02	1.706E-02	1.634E-03	0.983
PA-234M	1.708E+00	1.920E+00	3.034E+00	3.314E-01	0.563

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	-3.399E-02		9.354E-02	1.738E-01	1.793E-02	-0.196
NA-22	1.489E-03		1.652E-02	3.391E-02	3.133E-03	0.044
NA-24	7.819E-04		2.536E-02	5.242E-02	4.993E-03	0.015
AL-26	7.069E-03		1.678E-02	4.057E-02	3.782E-03	0.174
K-40	3.796E-02		1.434E-01	3.477E-01	3.411E-02	0.109
AR-41	4.483E-01		7.562E-01	1.836E+00	1.711E-01	0.244
TI-44	-1.294E-02		1.306E-02	2.089E-02	1.688E-03	-0.620
SC-46	-3.506E-03		1.227E-02	2.327E-02	2.740E-03	-0.151
V-48	-6.110E-03		1.439E-02	2.590E-02	2.871E-03	-0.236
CR-51	2.783E-02		1.104E-01	1.983E-01	3.252E-02	0.140
MN-54	7.638E-03		1.432E-02	3.088E-02	3.752E-03	0.247
CO-56	-4.286E-03		1.405E-02	2.603E-02	3.144E-03	-0.165
CO-57	-2.343E-03		1.364E-02	2.288E-02	2.582E-03	-0.102
CO-58	2.530E-03		1.636E-02	3.233E-02	3.974E-03	0.078
FE-59	1.210E-02		1.753E-02	4.654E-02	4.860E-03	0.260
CO-60	-5.207E-03		1.865E-02	3.409E-02	2.992E-03	-0.153
ZN-65	2.348E-03		3.778E-02	7.384E-02	7.102E-03	0.032
GA-67	1.967E-02		4.833E-02	7.915E-02	8.917E-02	0.249
SE-75	1.080E-02		1.721E-02	3.191E-02	5.551E-03	0.338
RB-82	-1.719E-02		1.269E-01	2.143E-01	2.659E-02	-0.080
RB-83	-3.907E-03		2.321E-02	4.439E-02	7.541E-03	-0.088
KR-85	1.999E+00		4.278E+00	8.233E+00	8.895E-01	0.243
SR-85	8.778E-03		1.879E-02	3.616E-02	3.907E-03	0.243
Y-88	9.887E-03		1.390E-02	3.809E-02	3.530E-03	0.260
NB-93M	-8.051E-01		5.736E-01	8.418E-01	2.347E-01	-0.956
NB-94	-8.601E-03		1.425E-02	2.441E-02	2.908E-03	-0.352
NB-95	-4.468E-03		1.640E-02	3.004E-02	3.737E-03	-0.149
NB-95M	-7.830E-02		5.301E-02	7.257E-02	1.063E-02	-1.079
ZR-95	-4.173E-03		2.191E-02	4.217E-02	5.516E-03	-0.099
MO-99	1.885E-03		1.438E-01	2.750E-01	3.436E-02	0.007
AG-108M	-3.715E-03		1.760E-02	3.257E-02	4.075E-03	-0.114
CD-109	-4.371E-01		3.450E-01	5.331E-01	6.298E-02	-0.820
AG-110M	6.831E-04		1.366E-02	2.699E-02	3.355E-03	0.025
SN-113	-5.244E-03		1.487E-02	2.755E-02	2.568E-03	-0.190
SB-124	1.761E-03		1.566E-02	2.766E-02	3.283E-03	0.064
I-125	-6.040E-02		2.479E-01	4.204E-01	4.126E-02	-0.144
SB-125	7.274E-03		3.851E-02	6.981E-02	6.814E-03	0.104
SB-126	-2.258E-03		2.698E-02	5.172E-02	6.472E-03	-0.044
SN-126	-4.065E-02		3.467E-02	5.420E-02	5.514E-03	-0.750

Sample ID : 1303012-02 Acquisition date : 1-APR-2013 10:04:45

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
SB-127	-4.393E-02		3.914E-02	5.855E-02	7.322E-03	-0.750
I-129	2.426E-02		3.278E-02	5.945E-02	6.916E-03	0.408
I-131	1.754E-03		1.345E-02	2.617E-02	3.173E-03	0.067
TE-132	2.020E-04		1.232E-02	2.130E-02	2.977E-03	0.009
BA-133	-1.923E-02		1.782E-02	2.913E-02	4.773E-03	-0.660
I-133	8.582E-03		2.387E-02	4.373E-02	4.814E-03	0.196
CS-134	-6.075E-03		1.647E-02	2.621E-02	3.120E-03	-0.232
CS-135	-2.557E-02		6.778E-02	1.106E-01	1.961E-02	-0.231
I-135	-6.820E-03		1.664E-01	3.335E-01	3.060E-02	-0.020
CS-136	8.345E-04		2.348E-02	4.176E-02	4.439E-03	0.020
CS-137	-8.006E-04		1.469E-02	2.859E-02	3.569E-03	-0.028
LA-138	1.420E-02		2.296E-02	5.546E-02	5.313E-03	0.256
CE-139	-8.195E-03		1.219E-02	1.946E-02	1.793E-03	-0.421
BA-140	6.453E-03		5.037E-02	9.114E-02	3.087E-02	0.071
LA-140	2.229E-03		1.446E-02	3.294E-02	3.157E-03	0.068
CE-141	7.214E-03		2.252E-02	3.931E-02	7.646E-03	0.183
CE-143	1.790E-02		2.886E-02	5.454E-02	9.829E-03	0.328
CE-144	-1.296E-02		9.908E-02	1.672E-01	1.803E-02	-0.078
PM-144	4.750E-03		1.551E-02	3.130E-02	3.917E-03	0.152
PM-145	3.923E-02		7.259E-02	1.223E-01	7.973E-02	0.321
PM-146	1.864E-02		3.014E-02	6.188E-02	6.179E-03	0.301
ND-147	1.803E-02		1.186E-01	2.089E-01	2.303E-02	0.086
PM-149	1.239E-01		3.459E-01	6.361E-01	1.174E-01	0.195
EU-152	9.567E-02	+	1.065E-01	2.759E-01	3.220E-02	0.347
GD-153	8.597E-04		5.501E-02	9.346E-02	9.910E-03	0.009
EU-154	4.193E-03		4.649E-02	9.545E-02	8.818E-03	0.044
EU-155	1.518E-02		3.764E-02	6.578E-02	6.608E-03	0.231
EU-156	2.156E-02		1.521E-01	3.022E-01	7.389E-02	0.071
HO-166M	2.165E-03		2.956E-02	5.709E-02	7.146E-03	0.038
HF-172	-3.214E-02		9.730E-02	1.614E-01	1.795E-02	-0.199
LU-172	-1.419E-02		2.100E-02	3.428E-02	3.392E-03	-0.414
LU-173	2.441E-02		4.870E-02	8.930E-02	1.617E-02	0.273
HF-175	1.405E-03		1.267E-02	2.448E-02	3.472E-03	0.057
LU-176	-1.082E-02		1.172E-02	1.713E-02	2.934E-03	-0.631
TA-182	3.986E-02		5.787E-02	1.257E-01	1.199E-02	0.317
IR-192	2.185E-02		2.635E-02	5.498E-02	5.600E-03	0.397
HG-203	5.237E-03		1.352E-02	2.451E-02	4.645E-03	0.214
BI-207	1.081E-02	+	1.169E-02	2.393E-02	2.750E-03	0.452
TL-208	6.033E-02	+	6.219E-02	1.021E-01	1.190E-02	0.591
BI-210M	-1.663E-03		2.437E-02	4.150E-02	7.098E-03	-0.040
PB-210	3.248E-01		3.615E-01	6.629E-01	5.391E-02	0.490
PB-211	-3.090E-01		3.990E-01	6.878E-01	6.374E-02	-0.449
BI-212	6.142E-02		1.310E-01	2.694E-01	3.370E-02	0.228
PB-212	-6.427E-03		2.605E-02	4.739E-02	7.063E-03	-0.136
BI-214	7.512E-03		3.696E-02	7.001E-02	8.358E-03	0.107
PB-214	1.964E-02		3.229E-02	6.670E-02	8.927E-03	0.295
RN-219	6.027E-02		1.772E-01	3.513E-01	3.239E-02	0.172
RA-223	-1.362E-01		2.955E-01	4.281E-01	6.786E-02	-0.318

Sample ID : 1303012-02 Acquisition date : 1-APR-2013 10:04:45

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
RA-224	2.730E-01		2.808E-01	5.284E-01	7.989E-02	0.517
RA-225	-1.070E-02		4.652E-02	7.950E-02	7.104E-03	-0.135
RA-226	1.517E-01		4.342E-01	6.503E-01	1.192E+00	0.233
TH-227	-4.794E-02		9.412E-02	1.512E-01	2.218E-02	-0.317
AC-228	2.844E-02		5.103E-02	1.170E-01	1.360E-02	0.243
TH-230	-3.493E+00		3.323E+00	5.292E+00	4.264E-01	-0.660
PA-231	3.465E-01		4.567E-01	8.671E-01	1.510E-01	0.400
TH-231	-4.043E-01		1.705E-01	2.570E-01	3.568E-02	-1.573
PA-233	7.057E-03		2.753E-02	4.945E-02	1.318E-02	0.143
PA-234	4.502E-03		5.246E-02	9.007E-02	9.806E-03	0.050
TH-234	1.080E-02		3.550E-01	6.254E-01	4.795E-02	0.017
U-235	9.494E-02		1.050E-01	1.884E-01	3.467E-02	0.504
NP-237	3.724E-02		9.228E-02	1.613E-01	1.620E-02	0.231
NP-239	-7.409E-04		6.186E-02	1.048E-01	1.121E-02	-0.007
AM-241	-3.757E-02		3.678E-02	5.899E-02	4.340E-03	-0.637
AM-243	4.944E-03		1.989E-02	3.351E-02	2.929E-03	0.148
CM-243	3.190E-02		7.571E-02	1.373E-01	2.565E-02	0.232

Summary of Nuclide Activity
Sample ID : 1303012-02

Acquisition date : 1-APR-2013 10:04:45

Total number of lines in spectrum	20	
Number of unidentified lines	13	
Number of lines tentatively identified by NID	7	35.00%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RU-103	39.35D	1.01	1.997E-02	2.012E-02	1.549E-02	77.00	
RU-106	368.20D	1.00	1.293E-01	1.294E-01	1.121E-01	86.64	
TE123M	119.70D	1.00	1.672E-02	1.676E-02	1.308E-02	78.01	
			---------	---------			
	Total Activity :		1.659E-01	1.663E-01			

Nuclide Type : NATURAL

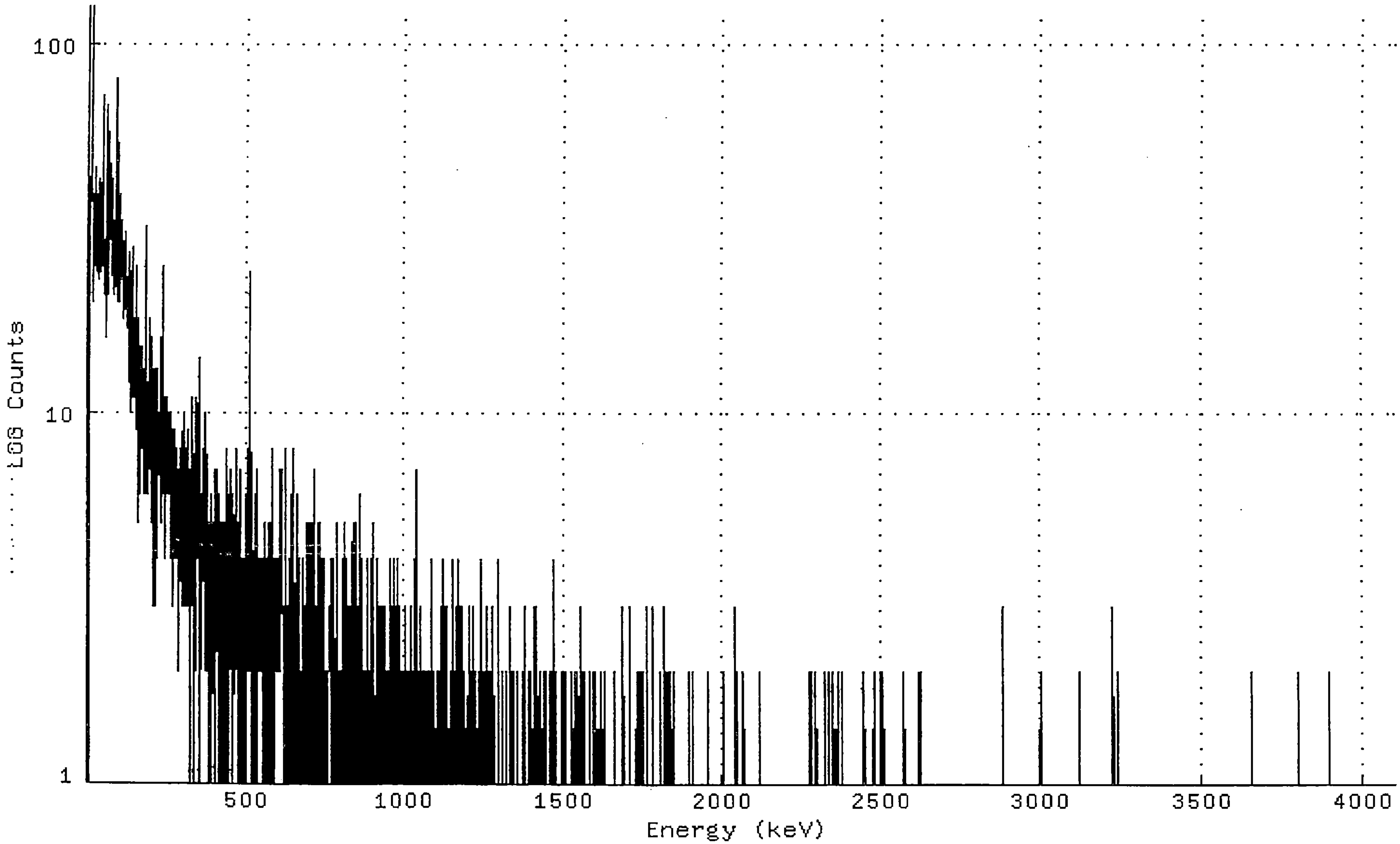
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PA-234M	4.47E+09Y	1.00	1.708E+00	1.708E+00	1.920E+00	112.41	
			---------	---------			
	Total Activity :		1.708E+00	1.708E+00			

Grand Total Activity : 1.874E+00 1.874E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301202_GE3_GAS1202_190112.CNF;1
Title :
Sample Title: BLANK

Start Time: 1-APR-2013 10:04:	Sample Time: 1-APR-2013 00:00:	Energy Offset: -3.21163E-01
Real Time : 0 01:00:14.01	Sample ID : 1303012-02	Energy Slope : 1.00005E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301202_GE3_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	0
9:	15	127	110	83	92	46	44	31
17:	39	26	29	20	31	28	46	34
25:	32	25	28	35	31	39	30	37
33:	25	23	26	28	43	24	28	29
41:	28	30	26	24	27	65	72	27
49:	25	30	29	28	27	29	24	23
57:	21	42	33	32	29	16	68	49
65:	33	30	34	21	22	39	30	34
73:	32	33	47	34	35	43	29	32
81:	26	21	23	33	33	29	27	31
89:	34	22	31	59	80	36	24	28
97:	20	30	35	20	20	39	29	23
105:	28	29	33	29	32	23	27	29
113:	28	24	27	18	22	31	26	19
121:	24	23	25	22	18	21	19	18
129:	17	21	19	22	16	12	27	10
137:	24	11	19	19	11	14	20	28
145:	22	14	11	13	13	18	11	12
153:	14	9	9	10	14	25	12	9
161:	5	18	10	12	12	9	11	8
169:	15	11	6	14	15	8	12	13
177:	10	13	12	10	8	10	6	9
185:	18	32	17	8	6	7	6	12
193:	7	6	10	11	7	15	18	9
201:	8	16	8	8	5	8	13	3
209:	9	13	10	8	8	10	5	3
217:	7	13	4	6	7	6	13	4
225:	6	10	9	7	7	7	9	5
233:	16	7	7	7	8	6	25	9
241:	9	8	10	11	4	7	9	4
249:	11	10	6	9	6	7	11	8
257:	7	10	6	8	9	4	7	10
265:	6	10	5	6	3	9	9	8
273:	7	5	4	6	7	9	7	7
281:	4	7	4	8	4	5	4	6
289:	7	2	4	4	6	7	6	8
297:	4	3	3	6	5	5	8	10
305:	5	3	5	4	3	7	4	6
313:	8	3	6	3	9	7	3	7
321:	6	5	6	4	3	1	7	3
329:	11	4	5	4	10	6	1	3
337:	4	5	6	5	2	4	2	7
345:	11	4	4	6	5	8	8	14
353:	4	7	3	4	1	4	3	6
361:	3	4	3	4	6	4	8	7
369:	4	4	3	8	2	8	10	6
377:	5	5	5	2	3	2	4	1
385:	2	5	1	6	6	4	5	2
393:	1	3	4	3	3	5	3	7
401:	5	6	3	5	1	5	4	5
409:	3	7	6	6	6	4	5	5
417:	0	2	2	1	2	5	2	2
425:	4	4	5	1	3	5	1	4

433:	3	5	3	2	1	7	8	3
441:	3	2	2	6	1	1	1	4
449:	5	3	4	4	7	3	6	4
457:	2	3	1	3	3	4	2	4
465:	4	7	3	3	5	8	4	1
473:	5	2	2	1	2	3	3	1
481:	3	0	7	1	2	3	4	4
489:	2	2	2	2	0	4	4	3
497:	5	6	2	1	1	8	2	4
505:	3	4	3	2	6	7	19	24
513:	12	5	2	2	1	0	5	2
521:	1	2	2	1	3	6	2	4
529:	5	2	1	7	5	3	5	0
537:	2	4	3	2	3	2	2	2
545:	4	3	2	3	3	2	2	4
553:	1	3	4	4	1	4	2	5
561:	3	2	1	4	4	2	1	4
569:	3	5	1	0	1	4	5	0
577:	1	3	2	4	3	5	8	7
585:	1	1	3	4	3	1	2	2
593:	3	4	2	2	2	2	4	4
601:	3	4	2	3	3	2	3	2
609:	7	7	4	3	5	4	4	2
617:	2	2	1	2	3	0	8	0
625:	0	2	0	1	1	2	3	2
633:	2	2	3	0	1	4	1	0
641:	6	2	1	3	2	4	8	1
649:	3	0	4	3	3	1	0	1
657:	0	6	2	2	2	2	1	2
665:	4	2	2	1	2	1	2	2
673:	2	0	1	1	3	0	0	4
681:	0	3	2	2	1	1	0	0
689:	3	5	2	1	3	3	2	3
697:	5	1	4	3	5	0	1	3
705:	5	2	3	5	0	4	1	1
713:	7	3	0	1	3	2	3	1
721:	1	2	3	3	3	3	3	5
729:	1	2	1	2	1	3	5	2
737:	1	2	4	2	4	2	4	4
745:	1	1	2	0	1	1	0	0
753:	2	1	1	0	2	1	2	2
761:	2	3	2	2	2	3	4	0
769:	2	2	3	4	0	2	2	2
777:	2	1	2	0	1	0	2	3
785:	2	3	5	0	0	1	2	2
793:	2	0	2	1	1	1	1	0
801:	2	1	2	4	1	2	2	2
809:	3	5	2	0	2	1	2	3
817:	2	0	4	2	3	1	0	1
825:	0	3	1	3	0	1	1	2
833:	1	1	2	0	4	5	2	0
841:	3	2	0	2	0	0	5	1
849:	0	1	1	3	1	1	0	6
857:	2	4	4	2	0	4	2	1
865:	1	4	3	1	1	0	1	1
873:	2	1	1	0	2	1	1	3
881:	0	4	1	0	0	2	1	0
889:	1	1	1	1	3	0	1	4
897:	3	5	1	1	0	0	1	0
905:	0	0	1	1	1	3	0	4

913:	0	3	2	0	0	1	2	3
921:	1	1	2	1	1	3	0	3
929:	1	2	0	0	0	0	3	0
937:	0	1	2	0	1	2	0	1
945:	0	0	2	1	1	2	1	0
953:	2	0	4	1	2	1	1	1
961:	1	1	3	1	1	2	4	0
969:	3	2	1	1	3	1	0	3
977:	4	0	0	4	0	2	0	1
985:	0	1	3	1	2	1	2	0
993:	1	2	0	0	2	1	1	2
1001:	3	3	0	2	0	1	1	2
1009:	1	1	0	1	2	1	1	0
1017:	2	2	0	2	3	1	1	2
1025:	1	2	0	1	1	1	4	1
1033:	0	1	2	7	0	0	0	1
1041:	1	1	2	1	1	1	1	0
1049:	1	2	3	2	0	1	0	1
1057:	2	0	2	2	0	0	2	2
1065:	1	2	0	0	1	2	0	0
1073:	2	1	1	2	1	2	0	0
1081:	0	1	1	2	4	0	1	2
1089:	1	2	1	1	0	0	0	0
1097:	1	0	0	1	0	2	2	1
1105:	0	0	0	0	1	2	1	0
1113:	2	1	0	3	0	3	3	3
1121:	1	2	1	4	0	3	0	0
1129:	0	0	0	1	0	2	2	3
1137:	0	1	1	0	1	0	0	2
1145:	1	1	2	1	2	0	1	1
1153:	4	0	1	2	2	1	1	0
1161:	1	3	0	1	2	1	1	1
1169:	1	1	0	4	0	1	1	1
1177:	0	2	3	1	1	1	3	1
1185:	0	1	1	0	2	0	2	1
1193:	1	1	0	1	0	1	1	0
1201:	0	0	0	3	0	0	1	1
1209:	2	2	0	0	2	1	1	1
1217:	1	0	3	1	0	1	1	1
1225:	2	0	0	0	0	1	1	0
1233:	1	2	0	0	0	0	2	0
1241:	4	0	0	0	1	0	0	2
1249:	0	0	0	0	2	0	0	2
1257:	2	1	1	3	0	0	0	0
1265:	1	1	1	0	2	0	0	0
1273:	1	2	1	0	2	0	0	0
1281:	3	0	1	0	1	0	1	0
1289:	0	1	1	0	0	0	4	0
1297:	1	0	0	1	0	0	0	0
1305:	0	0	2	1	2	1	1	1
1313:	1	1	1	0	0	1	0	1
1321:	2	2	0	1	1	1	0	1
1329:	0	0	1	0	0	3	1	0
1337:	2	1	0	1	1	1	0	0
1345:	2	0	0	0	0	0	0	1
1353:	0	0	2	0	1	0	0	0
1361:	0	0	0	0	0	1	0	1
1369:	1	0	1	1	1	1	2	0
1377:	0	3	1	0	1	0	0	1
1385:	1	1	0	0	0	0	0	0

1393:	0	2	0	1	0	1	2	2
1401:	1	0	1	0	0	1	1	2
1409:	3	0	1	0	1	1	1	1
1417:	1	3	0	0	0	0	0	0
1425:	0	0	0	2	1	1	1	0
1433:	1	1	0	1	2	1	0	0
1441:	0	0	1	2	0	1	0	1
1449:	1	0	0	0	0	0	0	0
1457:	0	1	0	2	0	1	2	0
1465:	1	0	0	4	0	0	1	1
1473:	2	0	2	0	1	1	1	0
1481:	0	0	0	0	1	0	0	0
1489:	0	1	0	0	1	1	0	2
1497:	0	0	0	2	1	0	0	0
1505:	2	0	0	1	1	0	1	0
1513:	0	0	1	0	0	0	0	0
1521:	1	0	0	2	2	0	0	1
1529:	1	1	0	0	2	0	1	0
1537:	0	0	0	2	0	1	1	0
1545:	1	1	1	1	0	0	3	0
1553:	1	1	1	0	1	0	0	2
1561:	1	1	1	2	1	0	1	0
1569:	1	0	0	0	1	0	0	0
1577:	0	0	1	1	0	0	0	2
1585:	1	1	0	0	0	0	1	1
1593:	0	2	0	1	0	0	0	0
1601:	0	0	0	2	0	0	0	1
1609:	0	0	1	1	0	0	0	0
1617:	2	2	0	1	0	2	0	0
1625:	0	0	0	0	0	0	0	2
1633:	1	0	0	1	0	0	0	0
1641:	0	1	1	0	0	1	0	0
1649:	0	1	0	0	0	0	1	0
1657:	0	0	1	0	0	1	2	0
1665:	0	0	0	1	1	1	0	0
1673:	0	0	1	0	1	0	0	1
1681:	0	1	0	1	1	0	1	3
1689:	1	0	0	1	0	0	0	1
1697:	0	0	0	0	1	0	0	0
1705:	0	0	0	2	1	3	1	1
1713:	0	0	1	1	0	0	1	0
1721:	0	0	0	0	0	0	0	0
1729:	0	1	2	0	0	0	1	1
1737:	1	0	2	1	0	0	0	1
1745:	0	0	1	2	2	0	0	2
1753:	1	0	0	0	0	0	0	0
1761:	0	0	0	1	3	0	1	1
1769:	0	0	0	0	0	1	0	0
1777:	0	0	0	0	0	3	0	0
1785:	0	0	0	0	0	0	1	0
1793:	0	1	1	0	0	0	0	1
1801:	0	0	0	0	0	1	2	0
1809:	0	1	0	1	0	0	0	3
1817:	0	2	1	0	0	0	0	2
1825:	1	1	1	2	0	1	0	0
1833:	0	0	0	0	2	2	0	0
1841:	0	0	0	0	0	2	0	2
1849:	0	0	0	0	0	0	1	0
1857:	0	0	0	0	0	0	0	0
1865:	0	0	0	0	0	0	1	0

1873:	0	1	0	0	1	0	1	0
1881:	0	0	1	1	0	0	1	0
1889:	1	0	0	1	0	2	0	0
1897:	0	0	0	0	0	0	0	0
1905:	0	0	2	1	2	0	0	0
1913:	1	0	0	0	0	0	0	1
1921:	0	0	0	0	0	0	0	0
1929:	1	0	0	1	0	0	0	0
1937:	0	0	0	0	0	0	0	1
1945:	1	1	0	0	1	0	0	0
1953:	0	0	1	0	2	0	1	0
1961:	0	0	1	0	0	0	0	1
1969:	0	0	0	0	0	1	0	1
1977:	0	1	1	0	0	0	0	0
1985:	0	0	0	0	0	0	0	0
1993:	0	0	0	0	0	0	0	0
2001:	0	1	0	0	2	0	0	1
2009:	1	1	0	0	0	0	0	0
2017:	0	0	0	0	1	0	0	0
2025:	0	0	0	0	1	0	1	1
2033:	0	0	0	0	0	0	0	0
2041:	3	0	0	1	0	2	0	0
2049:	0	0	0	0	0	0	0	0
2057:	1	0	0	0	1	0	0	0
2065:	0	2	0	0	1	1	1	0
2073:	0	0	0	1	0	0	0	0
2081:	1	0	0	0	0	0	0	1
2089:	1	0	0	0	0	0	1	1
2097:	1	0	0	1	0	0	1	0
2105:	0	1	1	1	1	1	0	0
2113:	1	0	0	1	2	0	2	0
2121:	0	1	0	0	0	0	0	0
2129:	0	0	0	1	0	0	0	0
2137:	1	0	0	1	0	0	0	0
2145:	0	0	1	1	0	0	0	0
2153:	0	0	1	0	0	0	0	1
2161:	0	1	0	0	0	0	1	0
2169:	0	0	0	1	0	0	0	0
2177:	0	0	0	0	0	0	0	0
2185:	0	0	1	0	1	0	1	0
2193:	1	0	0	1	1	0	0	0
2201:	0	0	0	1	0	0	0	0
2209:	1	0	0	0	0	1	0	0
2217:	0	0	0	0	0	0	1	0
2225:	0	1	0	0	0	1	1	0
2233:	0	1	0	0	0	1	0	0
2241:	1	0	1	0	0	1	1	0
2249:	0	0	1	0	0	0	1	0
2257:	0	0	0	0	1	0	0	0
2265:	0	0	1	0	0	0	1	0
2273:	2	0	0	0	2	0	0	0
2281:	1	0	0	0	0	0	0	0
2289:	1	0	0	0	0	2	0	0
2297:	0	0	1	0	0	0	0	0
2305:	1	1	1	0	0	0	1	0
2313:	0	0	1	0	0	0	0	0
2321:	0	2	0	0	1	0	1	0
2329:	1	1	0	0	2	0	0	0
2337:	0	0	0	0	0	0	0	0
2345:	0	0	0	2	1	0	0	0

2353:	0	1	0	0	0	0	0	1
2361:	2	0	0	0	0	1	0	0
2369:	0	0	0	0	0	2	0	2
2377:	1	0	0	1	0	0	0	1
2385:	0	0	0	1	0	0	0	0
2393:	0	0	0	0	0	0	0	0
2401:	0	0	1	0	1	0	0	0
2409:	0	0	0	0	0	1	0	0
2417:	0	0	0	0	0	0	1	1
2425:	0	0	1	0	0	0	0	0
2433:	0	0	0	1	0	0	0	0
2441:	0	0	0	2	0	0	0	0
2449:	1	1	0	0	0	0	0	0
2457:	0	1	0	0	0	1	0	0
2465:	1	0	0	0	0	0	0	1
2473:	0	0	2	0	0	0	0	0
2481:	1	1	0	1	1	0	0	0
2489:	0	0	0	1	1	0	0	0
2497:	0	2	0	0	0	0	0	2
2505:	0	1	0	1	0	0	0	0
2513:	0	0	0	0	1	0	0	1
2521:	0	1	1	1	0	0	0	0
2529:	0	0	0	0	0	1	0	0
2537:	0	0	0	0	1	0	0	0
2545:	0	0	0	0	0	0	0	0
2553:	0	0	0	0	1	1	1	0
2561:	0	0	0	0	0	0	1	0
2569:	0	2	0	0	0	0	0	0
2577:	0	1	0	0	0	0	0	0
2585:	0	0	0	0	0	0	0	1
2593:	0	0	0	0	1	1	0	0
2601:	0	0	0	0	0	1	0	0
2609:	0	0	0	0	0	0	0	2
2617:	1	1	0	1	1	2	0	0
2625:	0	0	0	0	1	0	0	0
2633:	0	0	0	1	0	0	0	0
2641:	0	1	0	0	0	0	0	0
2649:	0	0	0	0	0	0	0	0
2657:	0	0	0	0	0	0	0	0
2665:	1	0	0	0	0	0	0	0
2673:	0	0	0	1	0	0	0	0
2681:	0	0	0	1	0	1	0	0
2689:	0	1	0	0	0	0	1	0
2697:	0	1	0	1	0	0	0	0
2705:	0	0	1	0	0	0	0	0
2713:	0	0	0	0	0	0	0	0
2721:	0	0	0	0	0	0	0	0
2729:	1	0	0	0	1	0	0	0
2737:	0	0	1	0	0	0	0	1
2745:	0	0	0	0	0	0	0	0
2753:	0	0	0	1	0	0	0	0
2761:	0	0	1	0	1	0	0	0
2769:	0	0	0	0	0	0	0	0
2777:	0	0	0	0	0	0	0	0
2785:	0	0	0	0	0	0	0	0
2793:	1	0	0	0	0	0	0	0
2801:	0	0	0	0	1	0	0	0
2809:	0	0	0	0	0	0	0	1
2817:	0	0	0	0	0	0	0	0
2825:	0	0	1	1	0	0	1	0

2833:	0	0	0	0	0	0	0	0
2841:	0	0	0	1	0	0	0	0
2849:	0	0	1	0	0	1	0	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	0	0	0	0	0	0
2873:	0	0	0	0	3	0	0	0
2881:	1	1	1	0	0	0	0	0
2889:	0	0	0	0	0	0	0	0
2897:	0	0	0	0	1	0	0	0
2905:	0	0	0	1	0	0	0	0
2913:	0	0	0	1	0	1	0	0
2921:	0	0	0	1	0	0	0	0
2929:	0	0	0	0	0	0	0	0
2937:	0	1	0	0	1	0	0	0
2945:	0	0	1	0	0	1	0	0
2953:	0	0	0	1	0	0	0	0
2961:	0	0	0	0	0	0	1	0
2969:	0	0	0	0	0	0	0	0
2977:	0	1	0	0	0	0	0	0
2985:	0	0	0	0	0	0	0	0
2993:	0	0	0	2	0	1	0	1
3001:	1	0	0	0	0	0	0	0
3009:	1	0	0	0	0	0	0	0
3017:	1	0	0	0	0	0	0	1
3025:	0	0	0	0	0	0	0	1
3033:	0	0	0	0	0	0	0	0
3041:	0	0	0	0	0	0	0	0
3049:	0	0	0	0	0	0	0	0
3057:	0	0	0	0	1	0	1	0
3065:	0	1	1	0	0	0	0	0
3073:	0	0	0	0	0	0	0	0
3081:	0	0	0	0	0	1	0	0
3089:	0	0	0	0	0	0	0	0
3097:	0	0	0	0	0	0	1	0
3105:	0	0	0	0	0	0	0	0
3113:	0	0	0	0	0	2	0	1
3121:	0	0	0	0	0	0	0	0
3129:	0	0	0	1	0	0	0	0
3137:	0	1	0	0	0	0	0	0
3145:	0	0	0	1	0	1	0	0
3153:	0	0	0	1	0	0	0	1
3161:	0	0	0	0	1	1	0	0
3169:	1	0	1	0	0	0	0	0
3177:	0	0	0	0	0	0	0	0
3185:	0	0	0	0	0	0	0	0
3193:	0	0	1	0	0	0	0	0
3201:	0	0	0	1	0	1	0	0
3209:	0	0	0	0	0	1	0	0
3217:	0	0	0	0	1	0	3	0
3225:	0	0	1	0	0	0	0	1
3233:	0	0	0	0	0	0	2	0
3241:	0	0	1	0	0	0	0	0
3249:	0	0	0	1	1	0	0	0
3257:	0	0	1	0	0	0	0	0
3265:	0	1	1	0	0	0	0	0
3273:	0	0	0	1	0	0	0	0
3281:	0	0	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	0	0	0	0	0
3329:	0	0	0	0	0	1	0	0
3337:	0	0	0	0	0	0	0	1
3345:	0	0	0	0	0	0	0	0
3353:	1	0	0	0	0	0	0	0
3361:	0	0	0	0	0	0	1	0
3369:	0	0	0	0	1	0	0	0
3377:	1	0	0	0	0	0	0	0
3385:	0	0	0	0	0	0	0	0
3393:	0	0	0	0	0	0	0	0
3401:	0	0	0	0	0	0	0	0
3409:	0	0	0	0	0	1	0	1
3417:	0	1	0	0	0	0	0	0
3425:	0	0	0	0	0	1	0	0
3433:	0	0	0	0	0	0	1	0
3441:	0	0	0	0	0	1	0	0
3449:	0	0	0	0	0	0	0	0
3457:	1	0	0	0	0	0	0	0
3465:	0	0	0	0	0	1	0	0
3473:	0	0	0	0	0	0	0	0
3481:	0	0	1	0	0	1	0	1
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	1	0	1	0	0	0	0
3513:	0	0	0	1	0	0	0	0
3521:	0	0	0	1	0	1	0	0
3529:	1	0	0	1	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	1	0	0	0	0	0
3553:	0	1	0	0	0	0	0	1
3561:	0	0	1	1	0	0	0	0
3569:	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	0	0	1
3585:	0	0	1	0	0	0	0	0
3593:	0	0	0	1	0	0	0	0
3601:	0	0	0	0	0	0	0	1
3609:	1	0	0	0	0	1	0	1
3617:	0	0	1	0	0	0	0	0
3625:	0	0	0	0	1	0	0	0
3633:	0	0	0	0	0	0	0	0
3641:	0	0	0	1	1	0	0	0
3649:	0	0	0	0	2	0	0	0
3657:	0	0	0	0	0	0	0	1
3665:	1	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	1	0
3689:	0	0	0	1	0	0	0	0
3697:	0	1	0	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	0	0	1	1	0	0	1
3729:	0	0	0	0	0	0	0	0
3737:	1	0	1	0	0	0	0	0
3745:	0	0	0	0	0	1	1	0
3753:	0	1	0	1	0	0	0	0
3761:	0	0	0	0	0	0	0	0
3769:	1	0	0	1	0	0	1	0
3777:	0	0	0	0	0	0	0	0
3785:	0	0	0	0	1	0	0	0

3793:	0	0	0	0	0	2	0	0
3801:	1	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	1	0	0	1	0	0	0	0
3825:	0	0	0	0	0	0	0	1
3833:	0	0	0	0	0	0	0	0
3841:	0	0	1	0	0	0	0	0
3849:	0	0	1	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	1	0	0	0	0	1	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	1	0	0	0	0	1	0
3889:	0	0	0	0	0	2	0	0
3897:	0	0	0	0	0	0	0	0
3905:	0	0	0	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	1	0	0	0	1	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	1	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	1	0	1	0	0	0	0
3969:	0	0	0	0	1	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	1	1	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	1
4017:	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	1	1	0	1	0	0	0	0
4041:	1	0	0	0	0	0	0	0
4049:	0	0	1	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	0
4073:	1	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

Sample ID : 1303012-03 Acquisition date : 29-MAR-2013 16:11:16

VAX/VMS Peak Search Report Generated 29-MAR-2013 17:11:48.51

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301203_GE1_GAS1202_190089.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-04-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 29-MAR-2013 16:11:16
Sample ID : 1303012-03 Sample Quantity : 3.49570E+02 gram
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:02.72 0.1%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	46.09*	399	1351	1.74	46.32	43	7	32.3		PB-210
0	63.11*	463	1789	1.90	63.34	60	6	30.8		TH-234
0	76.15*	3598	3576	3.56	76.38	71	11	7.3		AM-243
0	87.02	363	1303	1.68	87.25	86	4	29.9		NP-237 SN-126 CD-109
0	92.65*	869	1740	1.29	92.88	90	7	17.9		
0	185.84*	1018	1346	1.55	186.06	181	10	15.0		RA-226
0	209.17	108	550	1.83	209.39	208	5	67.7		
1	235.94	94	313	1.77	236.16	235	13	52.5	8.78E+01	
1	238.94*	1031	488	1.77	239.16	235	13	8.8		PB-212
1	241.90	1082	442	1.64	242.12	235	13	8.6		RA-224
0	257.68*	144	780	3.67	257.90	252	10	75.0		
0	269.91	93	695	1.68	270.13	267	8	100.2		
0	276.15	74	561	4.17	276.37	274	7	109.6		
3	295.24*	2116	259	1.45	295.46	291	16	4.8	2.61E+00	PB-214
3	300.33	86	452	2.20	300.55	291	16	85.7		PB-212
0	328.02	56	337	1.91	328.23	326	6	107.5		
0	338.24*	232	565	2.06	338.45	333	11	41.9		AC-228
0	351.90*	3361	426	1.36	352.11	348	8	4.1		PB-214
0	463.25	92	244	1.94	463.46	460	8	62.0		
0	510.54*	88	285	2.08	510.74	506	10	78.6		
1	582.99*	242	139	1.99	583.18	577	18	20.3	3.05E+00	TL-208
1	586.99	26	122	1.99	587.18	577	18	159.7		
0	609.34*	2398	232	1.98	609.53	605	11	4.8		BI-214
0	701.11	40	135	3.57	701.30	698	8	105.7		
0	728.66	61	216	1.77	728.85	724	10	93.1		BI-212
0	768.29	236	134	1.94	768.47	765	8	21.4		
4	781.99	29	46	2.15	782.17	780	13	77.3	2.81E+00	
4	785.89	82	82	2.45	786.07	780	13	43.6		
0	805.48	59	190	2.22	805.66	800	11	94.6		
0	839.67	47	126	1.78	839.84	836	8	89.0		
0	863.50	62	185	7.00	863.67	857	14	97.2		
0	911.64*	218	113	2.01	911.81	909	9	22.6		AC-228
0	934.13	129	119	1.96	934.30	930	9	35.2		
1	964.64	49	67	2.17	964.80	959	16	65.4	1.58E+00	

AG
4/1/13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	969.03*	102	67	2.17	969.20	959	16	33.7		AC-228
0	1013.86	30	89	3.39	1014.02	1011	9	119.5		
0	1048.57	76	152	9.65	1048.73	1040	17	78.5		
6	1116.98	42	55	3.40	1117.13	1114	11	71.5	1.33E+00	ZN-65
6	1120.29*	479	52	1.78	1120.45	1114	11	10.4		BI-214
0	1155.55	56	119	1.95	1155.70	1151	9	75.7		
0	1212.19	29	51	1.41	1212.34	1210	6	87.2		
0	1237.96*	214	126	2.35	1238.11	1234	11	24.3		
0	1283.66	97	94	3.12	1283.80	1278	15	48.2		
0	1363.30	22	39	2.45	1363.44	1359	9	110.9		
0	1377.77*	135	54	1.95	1377.91	1372	10	26.6		
0	1385.27	33	28	3.00	1385.41	1383	6	60.3		
4	1402.30	41	44	3.10	1402.44	1397	17	63.0	3.15E+00	
4	1408.24	92	23	2.16	1408.38	1397	17	27.2		
0	1426.88	19	27	1.55	1427.01	1424	7	100.1		
0	1460.88*	714	51	1.86	1461.02	1456	11	8.5		K-40
0	1508.88	83	60	2.05	1509.01	1503	10	41.4		
1	1588.09	22	23	2.39	1588.22	1586	19	75.3	2.00E+00	
1	1599.89	23	21	2.40	1600.01	1586	19	80.8		
0	1663.40	29	17	2.24	1663.52	1658	12	72.9		
0	1684.57	13	15	3.65	1684.69	1682	8	117.4		
0	1715.88	10	7	1.77	1716.00	1713	7	108.2		
0	1729.59	124	12	2.40	1729.71	1726	8	20.4		
0	1764.51*	434	26	2.35	1764.62	1758	13	10.8		BI-214
0	1847.58	52	11	1.99	1847.68	1844	9	36.0		
0	2053.30	8	8	1.89	2053.39	2049	8	140.3		
0	2079.51	8	4	2.94	2079.60	2077	7	110.4		
6	2086.61	6	1	3.10	2086.70	2085	9	71.8	1.35E+00	
6	2090.43	10	2	2.80	2090.52	2085	9	88.5		
0	2096.91	7	0	2.50	2097.00	2095	5	75.6		
0	2118.72	46	10	1.53	2118.80	2114	10	39.1		
0	2203.95*	101	3	1.96	2204.03	2198	11	21.1		BI-214
0	2214.50	12	0	2.87	2214.58	2210	9	57.7		
0	2293.82	19	5	3.65	2293.89	2290	9	62.2		
0	2357.80	8	0	1.66	2357.88	2355	6	70.7		
0	2391.06	8	0	1.66	2391.13	2388	7	70.7		
0	2447.43	31	2	2.05	2447.49	2443	9	40.1		
2	2608.95	6	1	2.44	2609.00	2608	14	7.7	9.15E-01	
2	2614.04*	74	2	2.68	2614.10	2608	14	25.7		TL-208
0	2788.56	5	0	1.24	2788.60	2785	7	89.4		

Sample ID : 1303012-03   Acquisition date : 29-MAR-2013 16:11:16

Total number of lines in spectrum	74	
Number of unidentified lines	40	
Number of lines tentatively identified by NID	34	45.95%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.849E+01	2.849E+01	0.384E+01	13.47	
TL-208	1.41E+10Y	1.00	1.442E+00	1.442E+00	0.260E+00	18.00	
PB-210	22.26Y	1.00	7.823E+00	7.843E+00	2.630E+00	33.54	
BI-212	1.41E+10Y	1.00	1.270E+00	1.270E+00	1.190E+00	93.68	
PB-212	1.41E+10Y	1.00	2.440E+00	2.440E+00	0.568E+00	23.27	
BI-214	1602.00Y	1.00	1.144E+01	1.144E+01	0.084E+01	7.31	
PB-214	1602.00Y	1.00	1.259E+01	1.259E+01	0.210E+01	16.65	
RA-224	1.41E+10Y	1.00	2.878E+01	2.878E+01	0.703E+01	24.41	
RA-226	1602.00Y	1.00	2.812E+01	2.813E+01	5.175E+01	183.99	
AC-228	1.41E+10Y	1.00	2.204E+00	2.204E+00	0.411E+00	18.64	
TH-234	4.47E+09Y	1.00	9.071E+00	9.071E+00	2.894E+00	31.90	
			---------	---------			
	Total Activity :		1.337E+02	1.337E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
ZN-65	244.40D	1.09	2.899E-01	3.154E-01	2.274E-01	72.11	
AM-243	7380.00Y	1.00	3.962E+00	3.962E+00	0.466E+00	11.76	
			---------	---------			
	Total Activity :		4.252E+00	4.278E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.066E+00	7.387E+00	2.380E+00	32.22	
SN-126	1.00E+05Y	1.00	7.103E-01	7.103E-01	2.249E-01	31.66	
NP-237	2.14E+06Y	1.00	2.085E+00	2.085E+00	0.659E+00	31.63	
			---------	---------			
	Total Activity :		9.861E+00	1.018E+01			

Grand Total Activity : 1.478E+02 1.482E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-03 Acquisition date : 29-MAR-2013 16:11:16

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.849E+01	2.849E+01	13.47	OK
	Final Mean for 1 Valid Peaks = 2.849E+01+/- 3.836E+00 (13.47%)						
TL-208	583.14	30.22*	1.055E+00	1.627E+00	1.627E+00	23.05	OK
	860.37	4.48	7.641E-01	----- Line	Not Found	-----	Absent
	2614.66	35.85	3.498E-01	1.271E+00	1.271E+00	28.27	OK
	Final Mean for 2 Valid Peaks = 1.442E+00+/- 2.596E-01 (18.00%)						
PB-210	46.50	4.25*	2.577E+00	7.823E+00	7.843E+00	33.54	OK
	Final Mean for 1 Valid Peaks = 7.843E+00+/- 2.630E+00 (33.54%)						
BI-212	727.17	11.80*	8.782E-01	1.270E+00	1.270E+00	93.68	OK
	1620.62	2.75	4.685E-01	----- Line	Not Found	-----	Absent
	Final Mean for 1 Valid Peaks = 1.270E+00+/- 1.190E+00 (93.68%)						
PB-212	238.63	44.60*	2.057E+00	2.413E+00	2.413E+00	24.04	OK
	300.09	3.41	1.767E+00	3.058E+00	3.058E+00	90.36	OK
	Final Mean for 2 Valid Peaks = 2.440E+00+/- 5.678E-01 (23.27%)						
BI-214	609.31	46.30*	1.017E+00	1.094E+01	1.094E+01	11.71	OK
	1120.29	15.10	6.174E-01	1.103E+01	1.103E+01	13.93	OK
	1764.49	15.80	4.419E-01	1.336E+01	1.336E+01	14.73	OK
	2204.22	4.98	3.841E-01	1.132E+01	1.132E+01	23.75	OK
	Final Mean for 4 Valid Peaks = 1.144E+01+/- 8.362E-01 (7.31%)						
PB-214	295.21	19.19	1.787E+00	1.325E+01	1.325E+01	29.63	OK
	351.92	37.19*	1.574E+00	1.233E+01	1.233E+01	20.12	OK
	Final Mean for 2 Valid Peaks = 1.259E+01+/- 2.097E+00 (16.65%)						
RA-224	240.98	3.95*	2.045E+00	2.878E+01	2.878E+01	24.41	OK
	Final Mean for 1 Valid Peaks = 2.878E+01+/- 7.027E+00 (24.41%)						
RA-226	186.21	3.28*	2.369E+00	2.812E+01	2.813E+01	183.99	OK
	Final Mean for 1 Valid Peaks = 2.813E+01+/- 5.175E+01 (183.99%)						
AC-228	338.32	11.40	1.621E+00	2.698E+00	2.698E+00	47.42	OK
	911.07	27.70*	7.291E-01	2.319E+00	2.319E+00	24.56	OK
	969.11	16.60	6.934E-01	1.910E+00	1.910E+00	35.05	OK
	Final Mean for 3 Valid Peaks = 2.204E+00+/- 4.108E-01 (18.64%)						

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.882E+00	9.071E+00	9.071E+00	31.90	OK

Final Mean for 1 Valid Peaks = 9.071E+00+/- 2.894E+00 (31.90%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
ZN-65	1115.52	50.75*	6.195E-01	2.899E-01	3.154E-01	72.11	OK

Final Mean for 1 Valid Peaks = 3.154E-01+/- 2.274E-01 (72.11%)

AM-243	74.67	66.00*	2.955E+00	3.962E+00	3.962E+00	11.76	OK

Final Mean for 1 Valid Peaks = 3.962E+00+/- 4.659E-01 (11.76%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.962E+00	7.066E+00	7.387E+00	32.22	OK

Final Mean for 1 Valid Peaks = 7.387E+00+/- 2.380E+00 (32.22%)

SN-126	87.57	37.00*	2.963E+00	7.103E-01	7.103E-01	31.66	OK

Final Mean for 1 Valid Peaks = 7.103E-01+/- 2.249E-01 (31.66%)

NP-237	86.50	12.60*	2.964E+00	2.085E+00	2.085E+00	31.63	OK

Final Mean for 1 Valid Peaks = 2.085E+00+/- 6.594E-01 (31.63%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K-40	2.849E+01	3.836E+00	1.210E+00	1.169E-01	23.551
ZN-65	3.154E-01	2.274E-01	3.182E-01	2.676E-02	0.991
CD-109	7.387E+00	2.380E+00	3.783E+00	4.265E-01	1.952
SN-126	7.103E-01	2.249E-01	3.637E-01	3.474E-02	1.953
TL-208	1.442E+00	2.596E-01	3.772E-01	3.832E-02	3.822
PB-210	7.843E+00	2.630E+00	2.703E+00	2.132E-01	2.901
BI-212	1.270E+00	1.190E+00	1.087E+00	1.007E-01	1.168
PB-212	2.440E+00	5.678E-01	2.382E-01	5.245E-02	10.246
BI-214	1.144E+01	8.362E-01	2.441E-01	2.418E-02	46.861
PB-214	1.259E+01	2.097E+00	2.757E-01	5.319E-02	45.672
RA-224	2.878E+01	7.027E+00	2.707E+00	6.094E-01	10.633
RA-226	2.813E+01	5.175E+01	3.360E+00	6.160E+00	8.371
AC-228	2.204E+00	4.108E-01	5.327E-01	4.639E-02	4.137
TH-234	9.071E+00	2.894E+00	3.585E+00	2.662E-01	2.530
NP-237	2.085E+00	6.594E-01	1.125E+00	1.063E-01	1.853
AM-243	3.962E+00	4.659E-01	1.892E-01	1.577E-02	20.944

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
BE-7	-5.784E-01		8.862E-01	1.517E+00	1.624E-01	-0.381
NA-22	1.006E-01		9.130E-02	1.610E-01	1.439E-02	0.624
AL-26	4.688E-03		4.916E-02	9.362E-02	8.554E-03	0.050
TI-44	7.551E-02		1.043E-01	1.414E-01	1.099E-02	0.534
SC-46	-6.437E-02		9.969E-02	1.669E-01	1.461E-02	-0.386
V-48	-1.017E-01		2.718E-01	4.645E-01	4.029E-02	-0.219
CR-51	-9.846E-01		1.436E+00	2.190E+00	5.535E-01	-0.450
MN-54	-3.341E-04		9.186E-02	1.446E-01	1.303E-02	-0.002
CO-56	3.712E-02		1.066E-01	1.735E-01	1.555E-02	0.214
CO-57	-3.445E-02		7.756E-02	1.245E-01	1.383E-02	-0.277
CO-58	-3.810E-02		1.149E-01	1.758E-01	1.602E-02	-0.217
FE-59	-2.052E-01		2.293E-01	3.709E-01	3.398E-02	-0.553
CO-60	-9.314E-03		9.065E-02	1.568E-01	1.285E-02	-0.059
SE-75	7.656E-02		1.603E-01	2.116E-01	5.865E-02	0.362
RB-82	-4.509E-01		1.613E+00	1.947E+00	1.789E-01	-0.232
RB-83	-3.094E-02		1.764E-01	2.958E-01	4.966E-02	-0.105
KR-85	2.539E+01		1.702E+01	2.918E+01	3.094E+00	0.870
SR-85	1.517E-01		1.017E-01	1.743E-01	1.848E-02	0.870
Y-88	1.354E-02		8.600E-02	1.571E-01	1.427E-02	0.086
NB-93M	-7.816E+00		2.183E+00	8.685E-01	2.101E-01	-8.999
NB-94	-4.727E-02		7.978E-02	1.185E-01	1.048E-02	-0.399
NB-95	6.234E-01		2.025E-01	3.579E-01	3.299E-02	1.742
ZR-95	4.696E-03		1.867E-01	3.288E-01	3.305E-02	0.014
RU-103	9.035E-04		1.113E-01	1.978E-01	3.064E-02	0.005
RU-106	2.928E-01		6.681E-01	1.214E+00	1.715E-01	0.241
AG-108M	-5.972E-02		9.110E-02	1.359E-01	1.260E-02	-0.439
AG-110M	-1.983E-02		7.486E-02	1.304E-01	1.215E-02	-0.152

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
SN-113	8.218E-03		1.232E-01	2.182E-01	2.359E-02	0.038
TE123M	-1.219E-01		9.865E-02	1.526E-01	1.444E-02	-0.799
SB-124	1.501E-02		1.063E-01	1.714E-01	1.709E-02	0.088
I-125	-3.457E-01		1.488E+00	2.463E+00	2.314E-01	-0.140
SB-125	-7.919E-03		2.273E-01	4.013E-01	4.348E-02	-0.020
SB-126	1.451E-01		8.078E-01	1.293E+00	1.199E-01	0.112
SB-127	-1.030E+01		3.942E+01	6.856E+01	6.361E+00	-0.150
I-129	-2.843E-02		1.397E-01	2.320E-01	2.547E-02	-0.123
I-131	3.436E-01		9.167E-01	1.650E+00	2.759E-01	0.208
BA-133	4.440E-02		1.074E-01	1.752E-01	3.681E-02	0.253
CS-134	2.211E-02		8.261E-02	1.332E-01	1.329E-02	0.166
CS-135	6.022E-01		4.956E-01	7.260E-01	2.071E-01	0.830
CS-136	1.496E+00	+	1.183E+00	8.797E-01	7.772E-02	1.701
CS-137	-1.920E-02		8.772E-02	1.528E-01	1.418E-02	-0.126
LA-138	5.968E-02		1.272E-01	2.245E-01	2.118E-02	0.266
CE-139	-4.460E-02		9.821E-02	1.564E-01	1.428E-02	-0.285
BA-140	-4.762E-01		1.274E+00	2.194E+00	7.389E-01	-0.217
LA-140	1.451E-01		4.457E-01	8.077E-01	7.600E-02	0.180
CE-141	2.110E-01		2.763E-01	4.475E-01	1.113E-01	0.471
CE-144	-4.197E-02		6.330E-01	1.026E+00	1.089E-01	-0.041
PM-144	-9.711E-03		7.999E-02	1.256E-01	1.167E-02	-0.077
PM-145	-1.325E-01		3.247E-01	5.147E-01	3.354E-01	-0.257
PM-146	5.563E-02		1.688E-01	2.902E-01	3.112E-02	0.192
ND-147	1.569E+00		3.202E+00	5.795E+00	6.097E-01	0.271
EU-152	2.560E+00	+	7.633E-01	1.476E+00	1.706E-01	1.734
GD-153	-7.754E-02		3.012E-01	4.878E-01	4.966E-02	-0.159
EU-154	2.650E-01		2.555E-01	4.473E-01	3.997E-02	0.592
EU-155	8.598E-01	+	2.720E-01	4.784E-01	4.518E-02	1.797
EU-156	-2.826E-01		3.148E+00	4.923E+00	1.134E+00	-0.057
HO-166M	-4.840E-02		1.309E-01	2.255E-01	2.092E-02	-0.215
HF-172	-1.521E-01		5.686E-01	9.171E-01	1.004E-01	-0.166
LU-172	2.139E+00		2.691E+00	5.023E+00	4.251E-01	0.426
LU-173	3.666E-01		4.603E-01	6.025E-01	1.773E-01	0.608
HF-175	1.317E-02		1.329E-01	1.718E-01	3.599E-02	0.077
LU-176	-1.972E-02		7.821E-02	1.133E-01	3.086E-02	-0.174
TA-182	5.714E+00	+	7.958E-01	1.333E+00	1.117E-01	4.287
IR-192	4.316E-02		1.984E-01	3.198E-01	3.427E-02	0.135
HG-203	6.853E-02		1.504E-01	2.243E-01	6.997E-02	0.305
BI-207	-7.446E-02		6.546E-02	1.077E-01	1.106E-02	-0.691
BI-210M	1.389E-01		1.763E-01	2.344E-01	6.350E-02	0.593
PB-211	-6.628E-01		2.355E+00	4.114E+00	4.379E-01	-0.161
RN-219	4.177E-01		1.010E+00	1.812E+00	1.926E-01	0.231
RA-223	1.298E+00		1.742E+00	2.838E+00	6.946E-01	0.457
RA-225	1.253E-01		9.310E-01	1.437E+00	1.238E-01	0.087
TH-227	8.448E-01	+	4.802E-01	1.229E+00	2.640E-01	0.687
TH-230	1.825E+01		2.658E+01	3.600E+01	2.792E+00	0.507
PA-231	2.676E+00		3.096E+00	4.988E+00	1.390E+00	0.537
TH-231	-3.746E-02		6.481E-01	1.082E+00	1.396E-01	-0.035

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
PA-233	1.988E-01		3.766E-01	6.080E-01	2.042E-01	0.327
PA-234	2.389E-01		3.121E-01	5.154E-01	5.524E-02	0.464
PA-234M	9.682E+00		9.749E+00	1.813E+01	1.569E+00	0.534
U-235	7.244E-01		6.744E-01	1.103E+00	2.020E-01	0.657
AM-241	2.851E-01		2.231E-01	3.480E-01	2.492E-02	0.819
CM-243	6.074E-01	+	6.918E-01	8.299E-01	2.551E-01	0.732

Summary of Nuclide Activity
Sample ID : 1303012-03
Acquisition date : 29-MAR-2013 16:11:16

Total number of lines in spectrum	74	
Number of unidentified lines	40	
Number of lines tentatively identified by NID	34	45.95%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.849E+01	2.849E+01	0.384E+01	13.47	
TL-208	1.41E+10Y	1.00	1.442E+00	1.442E+00	0.260E+00	18.00	
PB-210	22.26Y	1.00	7.823E+00	7.843E+00	2.630E+00	33.54	
BI-212	1.41E+10Y	1.00	1.270E+00	1.270E+00	1.190E+00	93.68	
PB-212	1.41E+10Y	1.00	2.440E+00	2.440E+00	0.568E+00	23.27	
BI-214	1602.00Y	1.00	1.144E+01	1.144E+01	0.084E+01	7.31	
PB-214	1602.00Y	1.00	1.259E+01	1.259E+01	0.210E+01	16.65	
RA-224	1.41E+10Y	1.00	2.878E+01	2.878E+01	0.703E+01	24.41	
RA-226	1602.00Y	1.00	2.812E+01	2.813E+01	5.175E+01	183.99	
AC-228	1.41E+10Y	1.00	2.204E+00	2.204E+00	0.411E+00	18.64	
TH-234	4.47E+09Y	1.00	9.071E+00	9.071E+00	2.894E+00	31.90	
			---------	---------			
	Total Activity :		1.337E+02	1.337E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
ZN-65	244.40D	1.09	2.899E-01	3.154E-01	2.274E-01	72.11	
AM-243	7380.00Y	1.00	3.962E+00	3.962E+00	0.466E+00	11.76	
			---------	---------			
	Total Activity :		4.252E+00	4.278E+00			

Nuclide Type : FISSION

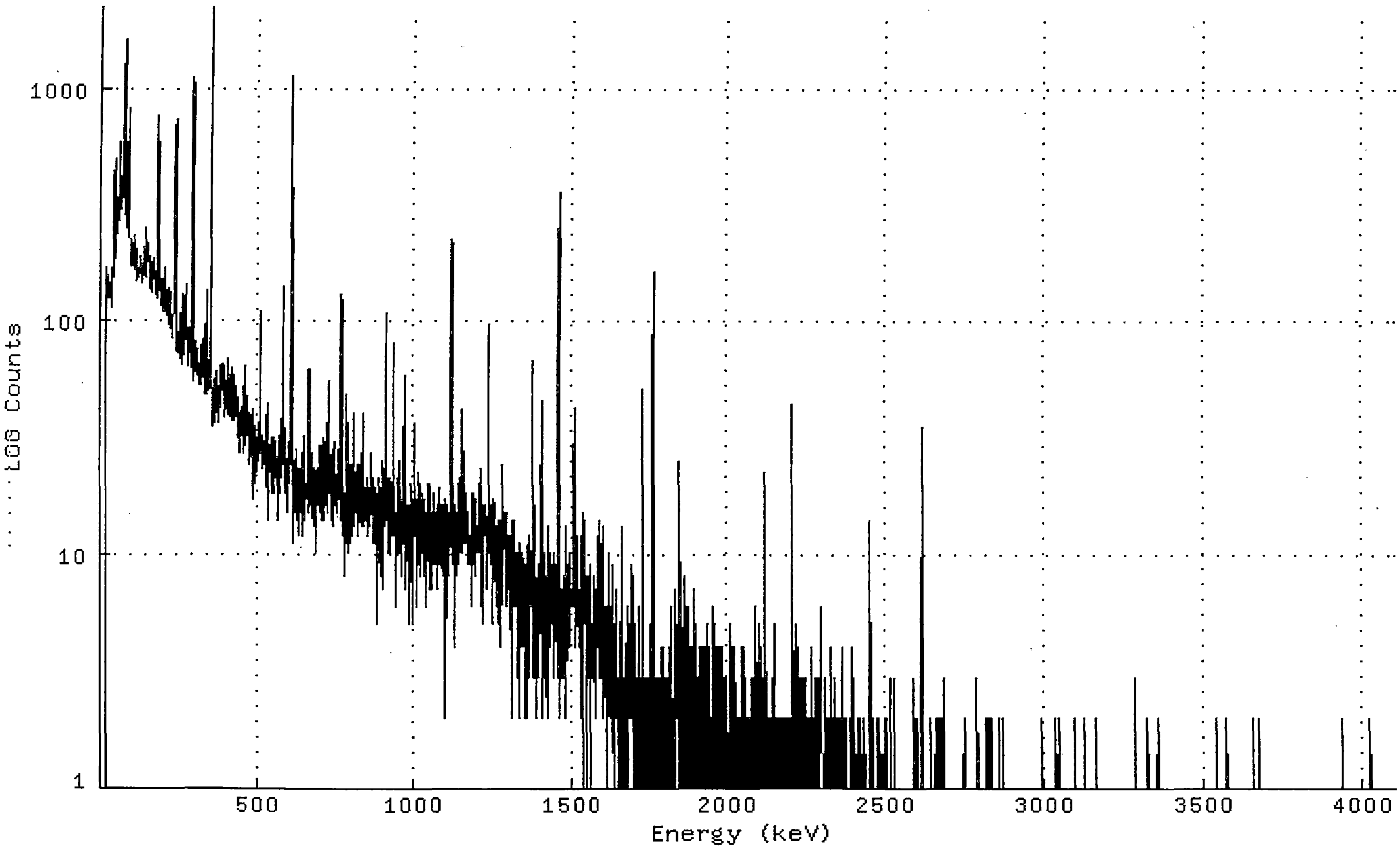
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.066E+00	7.387E+00	2.380E+00	32.22	
SN-126	1.00E+05Y	1.00	7.103E-01	7.103E-01	2.249E-01	31.66	
NP-237	2.14E+06Y	1.00	2.085E+00	2.085E+00	0.659E+00	31.63	
			---------	---------			
	Total Activity :		9.861E+00	1.018E+01			

Grand Total Activity : 1.478E+02 1.482E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301203_GE1_GAS1202_190089.CNF;1
Title :
Sample Title: S30-04-130228

Start Time: 29-MAR-2013 16:11	Sample Time: 28-FEB-2013 00:00	Energy Offset: -2.35223E-01
Real Time : 0 01:00:02.72	Sample ID : 1303012-03	Energy Slope : 1.00007E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301203_GE1_GAS1202_1900

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25:	157	145	156	139	146	138	132	138
33:	133	134	113	139	168	135	133	165
41:	160	180	155	192	199	403	489	187
49:	184	245	211	208	340	262	250	236
57:	245	255	278	287	301	317	585	572
65:	303	320	355	371	308	344	335	355
73:	382	550	1257	648	1604	1103	324	324
81:	314	311	252	483	320	264	571	579
89:	252	440	285	384	823	375	259	192
97:	182	216	189	190	172	173	171	192
105:	187	216	179	186	190	174	167	165
113:	233	182	176	156	174	196	149	153
121:	167	168	154	167	164	173	165	160
129:	171	190	179	165	176	165	166	160
137:	146	166	177	181	183	184	174	249
145:	205	178	154	186	162	192	202	190
153:	177	215	201	181	167	172	164	137
161:	154	158	160	179	131	134	160	164
169:	169	152	185	159	151	149	162	156
177:	136	129	142	125	140	160	163	132
185:	201	754	450	141	147	138	135	154
193:	151	116	132	125	139	146	133	110
201:	150	124	136	146	150	137	109	109
209:	170	160	113	106	115	127	126	130
217:	114	122	103	138	96	127	114	132
225:	120	107	93	104	105	84	104	102
233:	101	105	108	160	125	272	686	173
241:	197	736	342	108	93	74	81	82
249:	88	72	86	89	85	68	104	107
257:	102	83	129	85	75	65	94	89
265:	71	74	81	73	107	113	142	98
273:	83	91	98	97	107	80	93	69
281:	82	64	71	77	84	93	80	82
289:	74	68	62	82	68	131	1100	1012
297:	100	55	67	98	78	81	81	74
305:	70	60	69	58	68	70	65	75
313:	64	62	65	61	58	53	55	54
321:	59	53	74	78	56	57	68	82
329:	69	58	59	53	54	67	48	64
337:	70	134	126	59	63	67	48	51
345:	55	50	57	55	67	62	431	2254
353:	806	72	51	50	35	41	51	36
361:	51	44	56	41	50	46	36	40
369:	40	41	56	47	51	60	45	42
377:	49	38	36	47	44	57	45	63
385:	42	60	58	65	54	50	50	51
393:	55	64	38	44	55	40	41	52
401:	54	55	53	41	59	58	49	39
409:	59	69	50	49	58	43	45	38
417:	40	45	47	37	62	39	58	37
425:	38	47	49	40	39	43	47	40

433:	38	52	40	31	32	32	46	36
441:	27	29	40	37	37	34	42	32
449:	41	38	37	32	38	36	52	36
457:	42	44	27	30	36	42	64	50
465:	36	46	32	32	47	33	41	34
473:	40	39	29	32	24	33	32	35
481:	39	35	26	40	28	36	41	40
489:	17	30	35	20	26	27	26	22
497:	31	27	30	25	31	30	28	31
505:	31	25	36	27	45	64	109	77
513:	34	25	26	32	25	23	24	27
521:	24	29	30	25	27	28	30	19
529:	25	39	33	14	34	44	23	30
537:	32	22	22	26	25	29	24	23
545:	26	18	31	27	30	30	22	18
553:	20	31	28	24	21	22	30	26
561:	30	21	26	26	26	24	23	14
569:	25	27	18	21	32	29	26	33
577:	21	26	33	36	40	47	140	109
585:	24	24	34	22	29	18	29	26
593:	25	15	21	16	20	22	23	30
601:	24	20	25	28	26	24	28	127
609:	1106	1124	124	27	15	17	23	11
617:	22	25	25	22	15	22	18	28
625:	14	16	20	17	18	18	19	12
633:	23	18	15	20	21	22	21	23
641:	19	21	19	20	27	12	21	32
649:	25	25	23	14	18	18	20	17
657:	17	18	18	18	37	23	15	31
665:	61	61	25	16	22	16	18	16
673:	27	22	20	17	15	13	22	23
681:	20	15	18	19	22	18	22	10
689:	22	23	17	22	23	23	16	26
697:	15	16	17	23	29	28	29	19
705:	14	22	23	17	31	23	18	16
713:	14	19	20	16	30	18	20	36
721:	17	17	23	18	15	21	41	55
729:	29	23	22	28	25	20	23	22
737:	19	14	23	13	17	19	28	23
745:	16	17	19	19	30	19	20	21
753:	18	16	15	20	24	21	22	18
761:	17	28	15	24	14	29	23	129
769:	117	29	17	12	18	18	18	14
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785:	27	48	28	15	13	19	17	10
793:	14	13	23	24	16	11	20	12
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817:	17	18	13	13	24	17	12	15
825:	19	18	18	24	18	13	23	27
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857:	13	17	17	16	27	25	18	26
865:	16	13	21	15	12	11	11	12
873:	11	17	17	13	19	12	18	14
881:	16	11	5	16	21	19	14	20
889:	15	17	11	8	18	19	11	18
897:	25	14	18	7	15	13	22	23
905:	16	15	23	17	14	31	108	88

913:	28	21	19	18	10	12	21	21
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929:	15	12	13	13	31	79	60	15
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953:	11	12	25	10	15	8	11	12
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977:	14	10	13	10	13	10	5	10
985:	16	13	20	14	17	13	14	11
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1073:	12	7	13	12	14	14	19	9
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1257:	11	12	8	7	11	7	13	10
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1337:	2	8	8	9	4	6	4	10
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1457:	5	4	30	178	356	156	22	6
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1481:	4	9	7	2	6	9	8	6
1489:	7	4	4	7	5	10	9	7
1497:	7	7	6	7	7	7	7	8
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1705:	2	3	5	3	3	3	3	1
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1745:	2	1	1	2	0	1	3	3
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1761:	1	7	47	163	160	61	9	3
1769:	1	0	2	1	3	0	1	2
1777:	3	2	0	2	3	1	1	2
1785:	3	3	1	1	4	2	1	1
1793:	1	2	3	3	4	2	1	2
1801:	3	1	2	3	3	2	3	1
1809:	2	2	0	3	0	2	2	2
1817:	4	3	6	0	5	2	3	1
1825:	1	1	2	1	0	2	3	4
1833:	1	7	2	1	4	5	5	5
1841:	2	4	2	1	2	5	25	21
1849:	4	3	2	0	2	1	4	2
1857:	3	0	0	3	8	2	4	1
1865:	2	2	3	1	6	3	2	2

1873:	6	0	2	4	2	3	4	3
1881:	2	0	4	3	4	3	3	1
1889:	2	2	4	1	4	6	1	7
1897:	2	5	3	1	2	0	1	2
1905:	3	1	1	1	2	3	4	1
1913:	0	3	2	4	0	3	2	1
1921:	2	4	1	3	2	0	1	2
1929:	0	3	4	0	2	5	5	0
1937:	5	1	1	2	1	3	4	2
1945:	0	2	1	2	0	2	0	3
1953:	1	0	6	0	1	3	2	3
1961:	0	3	5	2	2	0	2	3
1969:	4	0	0	4	1	2	4	4
1977:	3	1	1	3	3	1	1	4
1985:	3	4	0	2	3	1	0	1
1993:	3	3	1	2	2	3	3	0
2001:	0	1	0	1	1	1	2	1
2009:	0	5	3	3	0	3	0	4
2017:	2	2	4	1	2	1	3	4
2025:	2	1	2	2	1	1	1	2
2033:	2	2	1	0	1	0	0	0
2041:	0	1	4	0	3	2	1	1
2049:	0	2	0	4	4	2	3	1
2057:	2	1	2	1	0	1	1	2
2065:	0	1	0	1	0	2	0	1
2073:	0	1	1	1	0	3	3	3
2081:	1	1	0	1	0	1	3	1
2089:	0	6	2	1	0	0	0	2
2097:	3	2	0	0	4	5	1	2
2105:	3	4	3	1	0	3	3	1
2113:	0	2	3	0	5	10	22	6
2121:	5	2	1	1	0	1	0	1
2129:	0	2	0	2	2	0	1	2
2137:	0	2	1	1	1	0	0	2
2145:	3	1	0	5	1	0	0	2
2153:	2	2	2	0	2	1	0	1
2161:	2	2	0	1	1	1	1	0
2169:	2	1	1	0	0	2	2	1
2177:	2	0	2	1	0	0	1	1
2185:	1	1	1	2	0	1	0	2
2193:	2	1	0	1	1	0	2	1
2201:	1	6	20	44	23	5	3	0
2209:	0	0	1	1	1	3	0	5
2217:	1	0	0	0	4	3	1	1
2225:	1	3	1	2	2	1	2	3
2233:	1	1	1	1	1	1	0	0
2241:	2	3	1	1	2	3	1	1
2249:	2	0	1	1	0	0	0	1
2257:	0	2	2	2	2	3	2	4
2265:	1	0	1	2	2	1	2	0
2273:	1	3	2	0	3	0	1	3
2281:	1	0	0	0	2	3	2	2
2289:	0	1	2	3	6	2	4	3
2297:	2	0	1	1	1	0	0	1
2305:	1	1	0	1	3	1	1	0
2313:	0	2	0	0	1	0	0	0
2321:	1	4	1	2	2	3	0	0
2329:	2	1	0	0	1	1	1	1
2337:	3	0	1	1	2	0	0	2
2345:	1	0	1	2	1	2	0	1

2353:	1	0	0	1	1	4	2	0
2361:	0	0	0	1	2	0	1	0
2369:	1	1	2	1	0	2	0	1
2377:	0	0	1	0	0	1	1	2
2385:	0	1	0	0	0	2	4	1
2393:	1	0	0	1	3	0	1	1
2401:	0	0	0	0	1	0	2	0
2409:	1	0	0	0	2	1	1	0
2417:	2	2	1	1	0	0	0	1
2425:	2	1	0	0	0	2	0	0
2433:	0	1	1	1	0	1	1	0
2441:	0	0	0	0	0	5	14	9
2449:	3	2	0	1	1	1	2	1
2457:	1	0	1	1	0	1	0	0
2465:	1	0	0	0	1	0	2	1
2473:	0	1	0	1	0	0	2	0
2481:	0	0	1	0	0	1	0	1
2489:	1	1	1	2	0	1	1	0
2497:	0	2	0	1	0	0	0	0
2505:	1	0	1	1	0	0	1	1
2513:	1	3	0	0	1	0	0	0
2521:	0	1	3	1	0	2	0	1
2529:	0	0	1	1	0	0	1	0
2537:	0	0	1	1	1	1	1	1
2545:	1	0	1	0	0	0	0	0
2553:	0	0	0	0	1	0	0	0
2561:	0	0	1	0	1	1	0	1
2569:	0	0	1	1	0	1	0	0
2577:	0	0	0	0	1	0	0	0
2585:	3	0	1	1	0	0	0	2
2593:	0	1	2	1	0	0	0	0
2601:	0	0	0	0	0	0	1	0
2609:	3	1	1	5	19	35	18	5
2617:	2	1	1	1	0	0	0	1
2625:	1	1	0	1	0	1	0	0
2633:	0	0	0	0	1	2	0	0
2641:	0	1	1	0	0	1	1	0
2649:	0	0	0	0	0	0	0	2
2657:	1	0	0	0	0	1	2	0
2665:	0	0	0	0	0	2	1	1
2673:	0	0	2	1	0	0	0	0
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2689:	1	0	1	0	0	1	1	0
2697:	0	0	1	0	1	1	0	0
2705:	0	0	1	0	0	0	0	0
2713:	0	0	0	1	0	0	0	0
2721:	0	0	0	0	0	1	1	1
2729:	0	0	1	0	1	1	0	1
2737:	0	0	1	0	1	1	1	1
2745:	0	0	2	0	0	0	0	0
2753:	0	0	0	1	0	0	0	0
2761:	0	1	1	0	0	0	0	0
2769:	0	0	0	0	0	0	1	1
2777:	0	1	0	0	0	0	0	0
2785:	0	0	0	3	1	1	0	0
2793:	0	0	0	0	0	0	0	1
2801:	0	0	0	1	0	1	0	1
2809:	0	0	0	0	0	0	0	0
2817:	2	0	0	0	2	0	0	0
2825:	1	2	0	1	0	1	0	0

2833:	2	1	0	0	0	0	1	0
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2849:	0	0	1	0	0	0	0	0
2857:	1	0	1	2	0	0	1	0
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2889:	0	0	0	1	0	0	1	0
2897:	0	0	0	0	0	0	1	1
2905:	1	0	1	0	0	1	0	1
2913:	0	0	0	0	0	0	0	1
2921:	0	1	0	0	0	0	1	0
2929:	0	0	0	0	1	0	1	0
2937:	0	0	1	0	1	0	0	0
2945:	0	1	0	0	1	0	1	1
2953:	0	0	1	1	0	0	0	0
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2969:	0	0	0	1	0	0	0	0
2977:	0	0	0	0	1	0	0	0
2985:	0	1	1	1	1	0	1	0
2993:	2	0	0	0	0	0	0	0
3001:	0	0	1	0	1	0	1	0
3009:	0	0	0	0	0	0	0	0
3017:	0	1	0	0	0	0	0	0
3025:	0	0	0	1	0	0	0	0
3033:	1	0	0	1	2	0	1	0
3041:	0	1	0	0	0	2	0	0
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3057:	1	0	0	0	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	0	0	0	0	0	0	0	0
3081:	0	0	0	0	1	0	0	0
3089:	0	0	0	0	0	0	0	0
3097:	2	0	0	0	0	0	0	0
3105:	0	0	0	1	0	0	0	0
3113:	0	0	0	1	0	1	0	0
3121:	0	0	1	0	0	2	0	0
3129:	0	0	0	0	0	1	0	0
3137:	0	0	0	0	0	0	0	0
3145:	0	1	0	0	0	0	0	0
3153:	1	1	0	0	0	0	0	0
3161:	0	2	0	0	0	0	0	0
3169:	0	0	1	0	0	0	0	0
3177:	0	0	0	1	0	0	0	0
3185:	0	0	0	0	1	0	0	0
3193:	0	1	0	0	0	0	1	0
3201:	0	0	0	0	1	0	0	0
3209:	1	0	1	0	0	0	1	1
3217:	0	0	0	0	0	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	0	1	0	0	0	1
3249:	0	0	0	1	0	0	0	0
3257:	0	0	0	0	1	0	1	0
3265:	0	0	0	1	0	1	1	0
3273:	1	1	0	0	0	0	0	0
3281:	0	0	0	3	0	0	0	0
3289:	0	0	0	0	0	1	0	0
3297:	0	0	0	0	1	1	0	0
3305:	0	0	0	1	0	0	1	0

3313:	0	0	0	0	0	0	0	0
3321:	0	2	0	0	0	0	0	0
3329:	0	1	0	0	1	0	0	0
3337:	0	0	0	1	1	0	0	0
3345:	0	0	0	0	0	0	0	0
3353:	2	0	0	1	1	0	0	0
3361:	0	0	0	0	0	0	1	0
3369:	1	0	0	0	0	0	0	0
3377:	0	0	0	0	0	0	0	0
3385:	1	0	0	0	0	0	0	0
3393:	1	0	0	0	0	0	1	0
3401:	1	0	0	0	0	0	0	0
3409:	0	0	0	0	0	0	0	0
3417:	1	0	1	0	0	0	0	0
3425:	0	0	0	0	1	0	0	0
3433:	0	0	0	0	0	0	0	0
3441:	0	0	0	1	0	0	0	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	0	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	1	0	0	0	0	0	0	0
3481:	0	0	1	0	0	0	0	0
3489:	0	0	0	0	0	0	0	1
3497:	0	0	0	0	0	0	0	0
3505:	0	1	0	0	0	0	0	0
3513:	0	0	0	1	0	1	0	0
3521:	0	0	0	1	1	0	1	0
3529:	0	0	1	0	0	0	0	2
3537:	0	1	1	0	0	0	0	0
3545:	1	0	0	0	1	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	1	0	0	0	0	0	0	0
3569:	0	1	2	0	0	0	0	0
3577:	0	0	0	0	0	0	0	1
3585:	0	0	0	1	0	0	0	0
3593:	0	1	0	0	0	0	0	1
3601:	0	0	1	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	1	0	0	0
3625:	0	0	0	0	0	0	0	0
3633:	0	0	0	0	0	0	1	0
3641:	0	0	0	1	1	0	0	1
3649:	0	1	0	0	1	2	0	1
3657:	0	0	0	0	0	0	0	0
3665:	0	0	0	1	0	2	1	0
3673:	0	1	0	0	1	0	1	0
3681:	0	0	0	1	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	1	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	0	0	0	0	1	0	0
3729:	0	0	0	0	0	0	1	0
3737:	0	1	0	0	0	0	1	0
3745:	1	1	0	1	0	1	0	1
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	1	0
3769:	0	1	0	1	1	0	0	0
3777:	0	0	0	0	0	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	1	0	0	0	0
3825:	0	0	0	0	0	1	0	0
3833:	0	1	1	1	1	0	0	1
3841:	0	0	0	0	0	0	0	0
3849:	0	0	0	0	0	0	1	0
3857:	0	0	1	0	0	0	0	0
3865:	0	0	0	0	0	0	0	1
3873:	0	0	0	0	1	0	0	0
3881:	0	0	0	1	1	0	0	0
3889:	0	0	0	0	0	0	1	0
3897:	0	1	0	0	0	0	0	0
3905:	0	0	0	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	1	0	2	0	0	0	0
3937:	0	0	1	0	0	0	1	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	1	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	1	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	1	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	1	0	0	0	0	1	0	0
4009:	0	0	0	0	0	0	0	0
4017:	0	0	0	2	0	0	0	0
4025:	1	0	0	0	0	0	1	0
4033:	0	0	0	0	0	0	0	1
4041:	0	1	0	1	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	1
4065:	0	0	0	0	0	0	0	0
4073:	1	0	1	0	0	1	0	1
4081:	0	0	0	1	0	0	1	0
4089:	1	0	0	0	0	0	0	0

NB 3/30/13

Sample ID : 1303012-04 Acquisition date : 29-MAR-2013 17:11:45

VAX/VMS Peak Search Report Generated 29-MAR-2013 18:12:16.88

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301204_GE1_GAS1202_190092.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-04-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 29-MAR-2013 17:11:45
Sample ID : 1303012-04 Sample Quantity : 3.49570E+02 gram
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:02.70 0.1%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	46.10*	472	1049	1.76	46.33	43	6	23.9		PB-210
0	63.28*	461	2220	1.91	63.51	60	7	35.5		TH-234
0	76.01*	2283	4220	3.37	76.24	71	9	10.1		AM-243
0	87.12	371	1325	1.64	87.35	86	4	29.5		NP-237 SN-126 CD-109
0	92.83*	772	1740	1.27	93.06	90	7	20.1		
0	127.98	148	1104	1.30	128.21	125	7	75.9		
0	144.15*	173	1160	1.38	144.37	141	7	67.5		CE-141
0	155.01	123	957	1.89	155.24	153	6	81.4		
0	186.19*	819	1118	1.63	186.41	183	8	15.9		RA-226
0	208.82	96	820	1.89	209.04	207	7	101.5		
1	235.94	92	301	1.76	236.16	235	12	52.1	9.42E+01	
1	238.88*	1023	466	1.66	239.10	235	12	8.8		PB-212
1	241.86	968	420	1.62	242.07	235	12	9.2		RA-224
0	257.96*	103	542	1.39	258.18	255	7	78.1		
0	270.32	129	610	1.86	270.54	267	7	65.9		
4	295.21*	2092	303	1.50	295.43	292	12	5.0	5.85E+00	PB-214
4	299.91	158	387	2.42	300.13	292	12	59.2		PB-212
0	338.45*	188	466	1.69	338.66	335	8	42.3		AC-228
0	351.91*	3306	400	1.36	352.12	348	8	4.1		PB-214
0	387.24	57	327	3.22	387.45	384	7	109.0		
0	461.76	56	245	1.58	461.96	459	7	96.0		
0	511.05*	117	238	1.85	511.25	506	10	55.7		
0	582.64*	300	219	1.94	582.84	577	10	21.9		TL-208
0	609.29*	2489	168	1.97	609.48	606	8	4.4		BI-214
0	646.83	49	159	3.62	647.02	642	10	101.5		
0	665.61	43	149	1.83	665.80	662	7	98.8		
0	678.72	36	106	2.64	678.90	676	7	100.4		
0	727.41	55	141	1.96	727.60	724	8	80.0		BI-212
0	768.48	268	182	1.96	768.66	763	12	23.6		
0	776.43	30	96	3.24	776.61	775	7	113.7		RB-82
4	786.30	94	87	2.22	786.48	781	19	39.2	1.40E+00	
4	794.62	47	111	2.79	794.80	781	19	83.5		
0	806.26	57	139	2.05	806.44	803	9	78.4		
0	840.62	47	109	1.60	840.80	838	8	82.3		

AG 4/1/13

Sample ID : 1303012-04 Acquisition date : 29-MAR-2013 17:11:45

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	859.39	54	129	1.94	859.57	855	10	82.3		TL-208
0	911.23*	176	81	2.06	911.40	909	7	22.9		AC-228
0	934.02	127	110	1.93	934.19	930	9	34.8		
0	951.04	39	119	6.06	951.21	947	10	110.8		
3	965.14	56	85	2.23	965.30	962	10	61.2	1.89E+00	
3	968.92*	101	55	1.76	969.09	962	10	31.1		AC-228
0	1110.21	30	61	4.37	1110.37	1106	8	99.3		
0	1120.36*	528	123	2.09	1120.52	1115	12	12.1		BI-214
3	1155.24	64	78	2.71	1155.40	1149	14	53.1	3.11E+00	
3	1159.47	26	50	2.12	1159.63	1149	14	104.1		
0	1207.18	40	72	2.42	1207.33	1203	8	80.7		
1	1238.06*	212	62	2.27	1238.21	1233	14	18.3	3.13E+00	
1	1243.64	25	54	2.28	1243.79	1233	14	113.2		
0	1252.66	35	98	3.18	1252.81	1247	11	113.6		
0	1281.48	55	76	1.48	1281.62	1277	8	62.0		
0	1299.21	17	38	2.68	1299.35	1297	6	126.0		
0	1377.64*	137	38	1.86	1377.78	1374	7	22.8		
0	1386.05	26	50	3.70	1386.19	1383	9	106.9		
0	1406.89	63	98	1.73	1407.03	1401	10	64.0		
0	1460.94*	734	65	2.26	1461.07	1456	11	8.6		K-40
0	1509.56	67	78	2.01	1509.69	1504	12	58.4		
0	1544.33	38	42	4.60	1544.45	1540	10	78.4		
1	1587.60	15	34	2.89	1587.72	1577	25	154.8	2.48E+00	
1	1592.44	15	41	3.96	1592.56	1577	25	196.5		
0	1661.06	38	20	1.78	1661.18	1656	10	54.5		
0	1729.64	107	18	2.02	1729.75	1724	12	25.0		
0	1745.05	15	5	3.63	1745.16	1741	8	76.7		
0	1764.47*	423	10	2.24	1764.59	1759	10	10.1		BI-214
0	1800.04	10	4	3.55	1800.15	1797	6	94.1		
0	1847.96	45	16	2.15	1848.07	1844	8	42.5		
0	1901.14	20	7	10.62	1901.24	1896	13	76.8		
0	2075.55	11	7	1.19	2075.64	2072	9	106.9		
0	2104.50	13	8	1.33	2104.59	2100	8	90.9		
0	2118.57	31	5	2.41	2118.66	2114	9	44.0		
0	2203.94*	118	0	3.07	2204.02	2200	9	18.6		BI-214
0	2293.13	13	2	3.61	2293.21	2290	7	66.1		
0	2447.85	17	8	2.85	2447.91	2444	8	77.5		
0	2614.06*	86	4	3.65	2614.12	2610	8	23.9		TL-208
0	3016.02	5	2	2.69	3016.04	3012	7	118.4		

Sample ID : 1303012-04 Acquisition date : 29-MAR-2013 17:11:45

Total number of lines in spectrum	73	
Number of unidentified lines	39	
Number of lines tentatively identified by NID	34	46.58%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.928E+01	2.928E+01	0.397E+01	13.54	
TL-208	1.41E+10Y	1.00	1.699E+00	1.699E+00	0.305E+00	17.96	
PB-210	22.26Y	1.00	9.247E+00	9.270E+00	2.359E+00	25.45	
BI-212	1.41E+10Y	1.00	1.135E+00	1.135E+00	0.915E+00	80.62	
PB-212	1.41E+10Y	1.00	2.471E+00	2.471E+00	0.569E+00	23.03	
BI-214	1602.00Y	1.00	1.209E+01	1.209E+01	0.088E+01	7.30	
PB-214	1602.00Y	1.00	1.240E+01	1.240E+01	0.207E+01	16.66	
RA-224	1.41E+10Y	1.00	2.574E+01	2.574E+01	0.635E+01	24.65	
RA-226	1602.00Y	1.00	2.263E+01	2.263E+01	4.166E+01	184.07	
AC-228	1.41E+10Y	1.00	1.910E+00	1.910E+00	0.349E+00	18.29	
TH-234	4.47E+09Y	1.00	9.031E+00	9.031E+00	3.293E+00	36.46	
			---------	---------			
	Total Activity :		1.276E+02	1.277E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RB-82	25.55D	2.24	5.994E-01	1.343E+00	1.533E+00	114.17	
AM-243	7380.00Y	1.00	2.514E+00	2.514E+00	0.345E+00	13.73	
			---------	---------			
	Total Activity :		3.114E+00	3.857E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.222E+00	7.550E+00	2.400E+00	31.79	
SN-126	1.00E+05Y	1.00	7.259E-01	7.259E-01	2.266E-01	31.22	
CE-141	32.50D	1.89	2.893E-01	5.455E-01	3.930E-01	72.04	
NP-237	2.14E+06Y	1.00	2.131E+00	2.131E+00	0.665E+00	31.19	
			---------	---------			
	Total Activity :		1.037E+01	1.095E+01			

Grand Total Activity : 1.411E+02 1.425E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Line Activity Report
Sample ID : 1303012-04 Acquisition date : 29-MAR-2013 17:11:45

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.928E+01	2.928E+01	13.54	OK
Final Mean for 1 Valid Peaks = 2.928E+01+/- 3.965E+00 (13.54%)							
TL-208	583.14	30.22*	1.055E+00	2.022E+00	2.022E+00	24.48	OK
	860.37	4.48	7.641E-01	3.414E+00	3.414E+00	82.90	OK
	2614.66	35.85	3.498E-01	1.464E+00	1.464E+00	26.72	OK
Final Mean for 3 Valid Peaks = 1.699E+00+/- 3.051E-01 (17.96%)							
PB-210	46.50	4.25*	2.577E+00	9.247E+00	9.270E+00	25.45	OK
Final Mean for 1 Valid Peaks = 9.270E+00+/- 2.359E+00 (25.45%)							
BI-212	727.17	11.80*	8.782E-01	1.135E+00	1.135E+00	80.62	OK
	1620.62	2.75	4.685E-01	-----	Line Not Found	-----	Absent
Final Mean for 1 Valid Peaks = 1.135E+00+/- 9.153E-01 (80.62%)							
PB-212	238.63	44.60*	2.057E+00	2.395E+00	2.395E+00	24.05	OK
	300.09	3.41	1.767E+00	5.616E+00	5.616E+00	65.71	OK
Final Mean for 2 Valid Peaks = 2.471E+00+/- 5.691E-01 (23.03%)							
BI-214	609.31	46.30*	1.017E+00	1.135E+01	1.135E+01	11.56	OK
	1120.29	15.10	6.174E-01	1.217E+01	1.217E+01	15.28	OK
	1764.49	15.80	4.419E-01	1.302E+01	1.302E+01	14.27	OK
	2204.22	4.98	3.841E-01	1.322E+01	1.322E+01	21.54	OK
Final Mean for 4 Valid Peaks = 1.209E+01+/- 8.829E-01 (7.30%)							
PB-214	295.21	19.19	1.787E+00	1.310E+01	1.310E+01	29.66	OK
	351.92	37.19*	1.574E+00	1.213E+01	1.213E+01	20.12	OK
Final Mean for 2 Valid Peaks = 1.240E+01+/- 2.066E+00 (16.66%)							
RA-224	240.98	3.95*	2.045E+00	2.574E+01	2.574E+01	24.65	OK
Final Mean for 1 Valid Peaks = 2.574E+01+/- 6.346E+00 (24.65%)							
RA-226	186.21	3.28*	2.369E+00	2.263E+01	2.263E+01	184.07	OK
Final Mean for 1 Valid Peaks = 2.263E+01+/- 4.166E+01 (184.07%)							
AC-228	338.32	11.40	1.621E+00	2.188E+00	2.188E+00	47.84	OK
	911.07	27.70*	7.291E-01	1.867E+00	1.867E+00	24.85	OK
	969.11	16.60	6.934E-01	1.889E+00	1.889E+00	32.57	OK
Final Mean for 3 Valid Peaks = 1.910E+00+/- 3.492E-01 (18.29%)							

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.882E+00	9.031E+00	9.031E+00	36.46	OK

Final Mean for 1 Valid Peaks = 9.031E+00+/- 3.293E+00 (36.46%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
RB-82	776.52	13.00*	8.317E-01	5.994E-01	1.343E+00	114.17	OK

Final Mean for 1 Valid Peaks = 1.343E+00+/- 1.533E+00 (114.17%)

AM-243	74.67	66.00*	2.955E+00	2.514E+00	2.514E+00	13.73	OK

Final Mean for 1 Valid Peaks = 2.514E+00+/- 3.451E-01 (13.73%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.962E+00	7.222E+00	7.550E+00	31.79	OK

Final Mean for 1 Valid Peaks = 7.550E+00+/- 2.400E+00 (31.79%)

SN-126	87.57	37.00*	2.963E+00	7.259E-01	7.259E-01	31.22	OK

Final Mean for 1 Valid Peaks = 7.259E-01+/- 2.266E-01 (31.22%)

CE-141	145.44	48.40*	2.648E+00	2.893E-01	5.455E-01	72.04	OK

Final Mean for 1 Valid Peaks = 5.455E-01+/- 3.930E-01 (72.04%)

NP-237	86.50	12.60*	2.964E+00	2.131E+00	2.131E+00	31.19	OK

Final Mean for 1 Valid Peaks = 2.131E+00+/- 6.645E-01 (31.19%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K-40	2.928E+01	3.965E+00	1.380E+00	1.334E-01	21.214
RB-82	1.343E+00	1.533E+00	2.244E+00	2.062E-01	0.599
CD-109	7.550E+00	2.400E+00	3.822E+00	4.309E-01	1.975
SN-126	7.259E-01	2.266E-01	3.674E-01	3.509E-02	1.976
CE-141	5.455E-01	3.930E-01	4.198E-01	1.044E-01	1.299
TL-208	1.699E+00	3.051E-01	3.748E-01	3.807E-02	4.533
PB-210	9.270E+00	2.359E+00	2.939E+00	2.318E-01	3.154
BI-212	1.135E+00	9.153E-01	1.035E+00	9.592E-02	1.097
PB-212	2.471E+00	5.691E-01	2.372E-01	5.224E-02	10.418
BI-214	1.209E+01	8.829E-01	2.652E-01	2.627E-02	45.593
PB-214	1.240E+01	2.066E+00	2.825E-01	5.451E-02	43.897
RA-224	2.574E+01	6.346E+00	2.696E+00	6.070E-01	9.547
RA-226	2.263E+01	4.166E+01	3.421E+00	6.272E+00	6.615
AC-228	1.910E+00	3.492E-01	4.723E-01	4.113E-02	4.043
TH-234	9.031E+00	3.293E+00	3.453E+00	2.563E-01	2.616
NP-237	2.131E+00	6.645E-01	1.137E+00	1.074E-01	1.873
AM-243	2.514E+00	3.451E-01	1.976E-01	1.648E-02	12.721

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
BE-7	-1.873E-01		8.681E-01	1.523E+00	1.630E-01	-0.123
NA-22	-4.686E-02		1.007E-01	1.483E-01	1.325E-02	-0.316
AL-26	6.864E-03		5.674E-02	1.020E-01	9.322E-03	0.067
TI-44	-3.531E-02		1.090E-01	1.431E-01	1.112E-02	-0.247
SC-46	-1.173E-01		9.887E-02	1.578E-01	1.382E-02	-0.743
V-48	4.517E-02		2.713E-01	4.843E-01	4.201E-02	0.093
CR-51	-3.512E-01		1.448E+00	2.288E+00	5.783E-01	-0.153
MN-54	4.078E-02		9.129E-02	1.492E-01	1.344E-02	0.273
CO-56	1.286E-02		1.032E-01	1.651E-01	1.479E-02	0.078
CO-57	-3.888E-03		8.309E-02	1.244E-01	1.383E-02	-0.031
CO-58	-3.030E-02		1.065E-01	1.639E-01	1.495E-02	-0.185
FE-59	1.637E-01		2.402E-01	4.403E-01	4.034E-02	0.372
CO-60	2.872E-02		9.071E-02	1.619E-01	1.327E-02	0.177
ZN-65	1.247E-01		2.294E-01	3.123E-01	2.626E-02	0.399
SE-75	5.172E-02		1.625E-01	2.132E-01	5.908E-02	0.243
RB-83	1.106E-01		1.757E-01	3.073E-01	5.160E-02	0.360
KR-85	1.222E+01		1.657E+01	2.753E+01	2.919E+00	0.444
SR-85	7.305E-02		9.901E-02	1.645E-01	1.744E-02	0.444
Y-88	6.203E-02		7.609E-02	1.543E-01	1.401E-02	0.402
NB-93M	-7.686E+00		2.150E+00	8.554E-01	2.070E-01	-8.985
NB-94	6.657E-02		7.795E-02	1.440E-01	1.274E-02	0.462
NB-95	7.531E-01		1.941E-01	3.523E-01	3.248E-02	2.138
ZR-95	-4.168E-02		1.884E-01	3.119E-01	3.135E-02	-0.134
RU-103	-2.035E-03		1.126E-01	1.997E-01	3.093E-02	-0.010
RU-106	-5.685E-01		6.960E-01	1.164E+00	1.644E-01	-0.489
AG-108M	-4.929E-02		9.058E-02	1.365E-01	1.266E-02	-0.361

Sample ID : 1303012-04 Acquisition date : 29-MAR-2013 17:11:45

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
AG-110M	4.906E-02		8.731E-02	1.444E-01	1.345E-02	0.340
SN-113	7.359E-02		1.326E-01	2.169E-01	2.346E-02	0.339
TE123M	6.679E-03		1.050E-01	1.566E-01	1.482E-02	0.043
SB-124	3.899E-02		1.110E-01	1.809E-01	1.804E-02	0.216
I-125	-9.265E-01		1.542E+00	2.518E+00	2.366E-01	-0.368
SB-125	3.622E-02		2.242E-01	3.993E-01	4.326E-02	0.091
SB-126	2.312E-01		7.766E-01	1.258E+00	1.166E-01	0.184
SB-127	-2.655E+01		4.516E+01	6.801E+01	6.310E+00	-0.390
I-129	-1.301E-01		1.408E-01	2.273E-01	2.496E-02	-0.572
I-131	2.945E-01		9.440E-01	1.694E+00	2.832E-01	0.174
BA-133	5.994E-02		1.087E-01	1.779E-01	3.738E-02	0.337
CS-134	5.758E-03		8.547E-02	1.358E-01	1.354E-02	0.042
CS-135	8.755E-01		5.497E-01	7.759E-01	2.213E-01	1.128
CS-136	-3.392E-01		4.922E-01	8.146E-01	7.197E-02	-0.416
CS-137	-4.174E-02		9.430E-02	1.447E-01	1.343E-02	-0.288
LA-138	-3.082E-02		1.207E-01	2.067E-01	1.950E-02	-0.149
CE-139	-2.968E-02		1.005E-01	1.609E-01	1.468E-02	-0.185
BA-140	2.793E-01		1.296E+00	2.312E+00	7.784E-01	0.121
LA-140	1.489E-01		3.918E-01	7.254E-01	6.826E-02	0.205
CE-144	-5.364E-02		6.891E-01	1.028E+00	1.092E-01	-0.052
PM-144	-9.134E-02		7.606E-02	1.233E-01	1.145E-02	-0.741
PM-145	-1.167E-01		3.332E-01	5.342E-01	3.480E-01	-0.218
PM-146	1.658E-01		1.739E-01	2.915E-01	3.126E-02	0.569
ND-147	6.812E-01		3.125E+00	5.597E+00	5.889E-01	0.122
EU-152	1.765E+00	+	1.150E+00	1.379E+00	1.594E-01	1.280
GD-153	-1.495E-01		2.954E-01	4.749E-01	4.834E-02	-0.315
EU-154	-3.919E-02		2.687E-01	4.128E-01	3.689E-02	-0.095
EU-155	8.787E-01	+	2.741E-01	4.802E-01	4.534E-02	1.830
EU-156	-5.937E-01		2.905E+00	4.508E+00	1.038E+00	-0.132
HO-166M	-2.641E-02		1.307E-01	2.276E-01	2.112E-02	-0.116
HF-172	1.261E-01		5.990E-01	9.043E-01	9.898E-02	0.139
LU-172	-8.206E-01		2.950E+00	5.049E+00	4.273E-01	-0.163
LU-173	5.478E-01		4.215E-01	6.080E-01	1.790E-01	0.901
HF-175	-2.934E-03		1.372E-01	1.756E-01	3.679E-02	-0.017
LU-176	4.020E-02		7.534E-02	1.132E-01	3.083E-02	0.355
TA-182	6.309E+00	+	9.638E-01	1.376E+00	1.153E-01	4.585
IR-192	2.335E-01		1.909E-01	3.240E-01	3.472E-02	0.721
HG-203	-2.636E-02		1.410E-01	2.238E-01	6.982E-02	-0.118
BI-207	1.263E-02		6.266E-02	1.125E-01	1.155E-02	0.112
BI-210M	-1.421E-01		1.916E-01	2.303E-01	6.239E-02	-0.617
PB-211	1.633E+00		2.345E+00	4.234E+00	4.507E-01	0.386
RN-219	-1.125E-01		1.010E+00	1.778E+00	1.891E-01	-0.063
RA-223	-2.448E-01		1.623E+00	2.860E+00	6.999E-01	-0.086
RA-225	2.409E-01		9.499E-01	1.471E+00	1.267E-01	0.164
TH-227	8.308E-01	+	4.693E-01	1.205E+00	2.587E-01	0.690
TH-230	-9.253E+00		2.779E+01	3.649E+01	2.830E+00	-0.254
PA-231	2.200E+00		3.151E+00	4.729E+00	1.318E+00	0.465
TH-231	1.482E-01		6.320E-01	1.064E+00	1.373E-01	0.139

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
PA-233	1.773E-01		3.669E-01	5.936E-01	1.994E-01	0.299
PA-234	2.894E-01		3.397E-01	5.204E-01	5.577E-02	0.556
PA-234M	5.035E+00		9.125E+00	1.668E+01	1.444E+00	0.302
U-235	1.328E+00	+	9.300E-01	1.110E+00	2.034E-01	1.196
AM-241	3.113E-01		2.219E-01	3.470E-01	2.485E-02	0.897
CM-243	1.811E-01		5.413E-01	8.061E-01	2.478E-01	0.225

Summary of Nuclide Activity
Sample ID : 1303012-04
Acquisition date : 29-MAR-2013 17:11:45

Total number of lines in spectrum	73	
Number of unidentified lines	39	
Number of lines tentatively identified by NID	34	46.58%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.928E+01	2.928E+01	0.397E+01	13.54	
TL-208	1.41E+10Y	1.00	1.699E+00	1.699E+00	0.305E+00	17.96	
PB-210	22.26Y	1.00	9.247E+00	9.270E+00	2.359E+00	25.45	
BI-212	1.41E+10Y	1.00	1.135E+00	1.135E+00	0.915E+00	80.62	
PB-212	1.41E+10Y	1.00	2.471E+00	2.471E+00	0.569E+00	23.03	
BI-214	1602.00Y	1.00	1.209E+01	1.209E+01	0.088E+01	7.30	
PB-214	1602.00Y	1.00	1.240E+01	1.240E+01	0.207E+01	16.66	
RA-224	1.41E+10Y	1.00	2.574E+01	2.574E+01	0.635E+01	24.65	
RA-226	1602.00Y	1.00	2.263E+01	2.263E+01	4.166E+01	184.07	
AC-228	1.41E+10Y	1.00	1.910E+00	1.910E+00	0.349E+00	18.29	
TH-234	4.47E+09Y	1.00	9.031E+00	9.031E+00	3.293E+00	36.46	
			---------	---------			
	Total Activity :		1.276E+02	1.277E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RB-82	25.55D	2.24	5.994E-01	1.343E+00	1.533E+00	114.17	
AM-243	7380.00Y	1.00	2.514E+00	2.514E+00	0.345E+00	13.73	
			---------	---------			
	Total Activity :		3.114E+00	3.857E+00			

Nuclide Type : FISSION

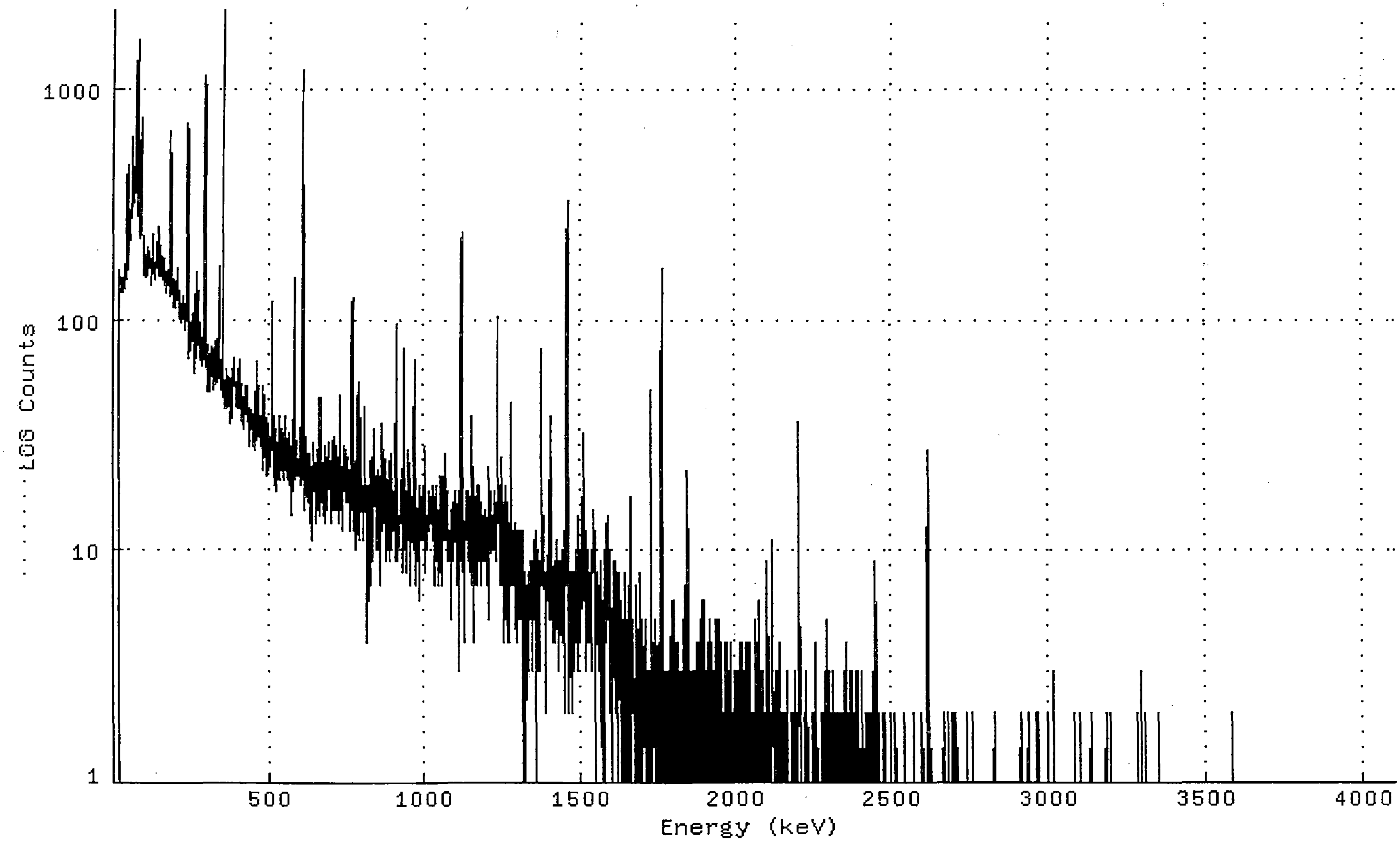
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.222E+00	7.550E+00	2.400E+00	31.79	
SN-126	1.00E+05Y	1.00	7.259E-01	7.259E-01	2.266E-01	31.22	
CE-141	32.50D	1.89	2.893E-01	5.455E-01	3.930E-01	72.04	
NP-237	2.14E+06Y	1.00	2.131E+00	2.131E+00	0.665E+00	31.19	
			---------	---------			
	Total Activity :		1.037E+01	1.095E+01			

Grand Total Activity : 1.411E+02 1.425E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301204_GE1_GAS1202_190092.CNF;1
Title :
Sample Title: S30-04-130228

Start Time: 29-MAR-2013 17:11	Sample Time: 28-FEB-2013 00:00	Energy Offset: -2.35223E-01
Real Time : 0 01:00:02.70	Sample ID : 1303012-04	Energy Slope : 1.00007E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



5010

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301204_GE1_GAS1202_1900

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	119	164	154	130	153	140
25:	139	153	139	130	137	131	131	136
33:	153	149	138	150	137	162	173	158
41:	173	148	189	166	206	385	470	164
49:	197	268	243	200	301	270	219	241
57:	226	274	278	286	277	319	613	618
65:	345	336	358	382	324	342	363	358
73:	387	433	1303	606	1625	1144	306	344
81:	318	289	268	476	320	224	593	598
89:	281	457	281	338	749	364	283	190
97:	155	223	189	205	200	179	160	184
105:	153	177	175	154	187	205	193	171
113:	189	177	197	173	173	167	184	159
121:	182	183	149	140	140	174	184	163
129:	232	191	168	176	168	173	164	150
137:	163	169	167	172	177	177	189	250
145:	189	202	162	156	186	170	197	155
153:	161	196	209	167	175	172	149	171
161:	169	172	175	172	158	183	142	151
169:	157	160	142	150	131	157	141	165
177:	143	160	143	142	138	167	125	148
185:	204	660	420	158	142	142	128	144
193:	113	140	131	148	148	140	146	139
201:	113	139	123	140	145	124	121	129
209:	167	166	108	124	101	126	100	113
217:	103	105	97	105	106	111	126	108
225:	102	122	101	123	112	105	116	97
233:	90	106	99	151	123	255	709	159
241:	208	674	290	95	97	68	88	89
249:	96	91	80	73	99	96	80	99
257:	104	88	129	91	58	82	79	86
265:	68	98	83	68	130	161	113	107
273:	77	92	115	78	89	97	81	74
281:	76	74	66	79	63	74	67	79
289:	83	76	66	66	77	130	1129	932
297:	100	69	62	120	102	55	60	48
305:	78	77	58	58	53	57	71	48
313:	66	76	57	59	64	64	56	62
321:	49	74	67	71	61	52	65	76
329:	74	81	61	56	73	53	59	58
337:	53	126	170	69	67	55	65	54
345:	58	50	51	49	66	65	382	2217
353:	824	68	46	54	46	44	44	44
361:	41	43	47	41	61	52	41	54
369:	47	45	56	46	42	46	49	55
377:	40	41	41	35	47	52	37	43
385:	42	54	68	59	67	51	54	56
393:	50	53	49	47	42	45	53	41
401:	46	61	52	44	62	60	57	49
409:	66	41	46	44	47	52	41	36
417:	46	44	42	46	33	33	45	51
425:	40	39	42	40	50	45	45	51

433:	36	36	41	39	39	34	28	34
441:	33	36	38	40	35	36	36	33
449:	28	39	36	37	35	34	48	43
457:	37	27	39	38	37	48	65	44
465:	30	43	31	37	34	51	38	28
473:	30	30	38	29	34	34	22	35
481:	51	32	25	25	32	40	38	47
489:	28	27	37	27	23	29	21	23
497:	28	28	35	32	31	31	25	23
505:	30	24	26	27	32	71	119	64
513:	34	30	23	19	27	38	24	31
521:	33	27	20	33	18	25	20	29
529:	27	23	29	28	31	31	27	38
537:	20	27	33	27	27	22	26	27
545:	20	22	29	32	28	22	23	23
553:	24	36	22	38	24	20	23	30
561:	22	28	22	19	26	21	21	32
569:	21	28	22	14	27	25	20	18
577:	24	26	31	36	37	37	151	132
585:	33	20	26	29	25	21	22	30
593:	21	21	24	23	21	24	24	29
601:	32	25	19	34	30	20	29	156
609:	1197	1087	136	28	15	21	32	20
617:	29	31	24	18	20	17	18	20
625:	23	26	17	18	14	21	13	16
633:	26	25	18	19	11	19	23	17
641:	20	18	18	19	25	29	25	23
649:	18	20	13	14	18	15	24	23
657:	25	27	15	24	23	31	14	20
665:	46	46	19	16	18	29	23	20
673:	19	19	18	14	20	28	26	21
681:	20	13	16	20	20	15	15	24
689:	25	21	27	29	22	26	19	17
697:	19	13	16	21	24	23	30	26
705:	24	23	15	21	19	31	21	15
713:	16	15	16	19	28	17	20	25
721:	17	20	24	13	19	21	47	46
729:	19	16	15	19	18	12	23	15
737:	15	21	19	24	20	18	28	19
745:	27	24	24	18	16	18	25	18
753:	19	19	16	19	14	22	19	12
761:	15	18	15	20	20	24	30	114
769:	124	23	16	27	25	12	16	24
777:	24	22	17	10	13	14	20	12
785:	27	41	53	14	15	11	14	16
793:	22	20	37	26	20	15	14	15
801:	19	17	11	17	19	39	42	20
809:	19	15	14	19	4	17	19	9
817:	18	16	12	14	19	18	6	8
825:	24	14	18	19	14	20	15	9
833:	17	20	25	20	16	16	33	24
841:	18	13	21	17	14	10	17	10
849:	22	16	15	17	15	13	7	16
857:	20	15	16	27	35	19	16	12
865:	19	14	13	22	14	13	27	23
873:	16	16	9	18	13	10	18	13
881:	14	17	20	9	23	24	13	10
889:	13	14	10	17	13	26	14	18
897:	14	17	12	15	18	9	11	35
905:	15	11	15	14	9	33	95	84

913:	16	12	13	10	14	10	14	13
921:	13	17	16	14	20	18	15	16
929:	11	13	8	18	28	75	53	21
937:	11	10	15	8	17	18	13	14
945:	16	14	11	12	18	27	21	14
953:	14	11	23	7	16	15	17	12
961:	14	12	10	25	34	26	18	26
969:	66	39	7	13	9	16	10	10
977:	9	14	9	13	18	7	10	19
985:	6	15	14	11	12	11	13	16
993:	18	13	15	19	12	13	9	10
1001:	28	20	20	8	10	11	10	13
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1033:	16	7	11	19	14	9	9	19
1041:	17	11	13	13	7	13	15	12
1049:	8	10	11	21	14	13	10	14
1057:	21	17	7	17	14	11	13	15
1065:	18	24	13	12	15	26	11	18
1073:	12	9	15	12	13	11	12	10
1081:	9	10	12	12	13	5	11	14
1089:	14	16	14	10	12	14	9	13
1097:	17	11	14	11	18	14	8	12
1105:	13	7	12	14	18	14	9	14
1113:	3	9	11	12	9	18	46	215
1121:	239	60	10	14	13	8	13	7
1129:	4	13	10	12	15	11	17	18
1137:	12	14	11	11	18	10	9	13
1145:	17	10	10	11	12	9	7	10
1153:	13	21	38	29	18	4	17	17
1161:	16	6	9	17	12	7	12	7
1169:	11	16	7	13	15	19	13	11
1177:	9	13	19	10	10	12	11	16
1185:	12	12	7	11	12	14	9	13
1193:	11	11	12	15	9	12	10	11
1201:	7	11	12	10	12	16	23	18
1209:	12	9	5	18	11	12	10	12
1217:	12	11	13	13	14	10	12	13
1225:	18	10	11	17	10	16	14	9
1233:	11	12	11	15	33	103	78	14
1241:	15	13	9	19	10	8	7	11
1249:	12	17	7	25	19	8	11	12
1257:	4	16	10	8	11	5	9	19
1265:	9	10	4	11	6	9	16	8
1273:	7	5	11	13	12	4	13	19
1281:	43	21	12	7	7	10	10	8
1289:	10	12	8	7	8	13	9	5
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1305:	5	7	8	10	5	9	7	7
1313:	12	5	7	7	12	12	1	6
1321:	7	8	8	5	6	1	5	6
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1353:	5	11	6	6	8	10	12	1
1361:	9	10	10	7	5	7	6	3
1369:	10	8	5	4	3	4	7	9
1377:	41	75	33	7	8	7	8	13
1385:	14	12	11	4	8	4	2	7

1393:	6	6	6	9	6	6	9	10
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1409:	24	7	5	6	5	8	4	6
1417:	8	9	5	7	7	5	4	5
1425:	11	10	7	10	5	6	9	6
1433:	5	9	3	6	7	9	5	9
1441:	9	4	10	4	5	5	7	6
1449:	2	4	5	5	12	7	12	7
1457:	7	12	37	185	328	191	17	8
1465:	12	2	4	5	4	5	8	6
1473:	8	2	6	3	8	4	5	8
1481:	4	5	6	3	10	8	4	7
1489:	5	8	5	7	3	6	10	14
1497:	7	7	4	9	8	5	6	6
1505:	6	9	9	9	32	30	11	10
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1521:	6	10	8	10	4	4	8	4
1529:	6	5	8	8	6	3	6	6
1537:	8	10	9	10	8	9	14	15
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1553:	6	6	8	5	5	3	5	7
1561:	3	6	5	9	3	3	3	4
1569:	2	1	5	6	3	4	5	7
1577:	2	4	1	4	10	6	13	7
1585:	6	4	11	8	7	6	6	5
1593:	14	6	2	10	3	3	8	4
1601:	1	5	4	2	2	4	5	9
1609:	6	5	5	3	9	2	5	2
1617:	5	4	6	4	8	6	1	5
1625:	3	8	3	3	4	4	6	3
1633:	3	2	1	5	0	2	3	3
1641:	5	3	1	8	6	4	2	4
1649:	4	4	3	2	5	0	0	3
1657:	2	3	5	5	10	17	6	3
1665:	4	1	5	3	3	2	5	2
1673:	2	0	0	1	2	2	4	0
1681:	4	4	5	7	3	1	2	4
1689:	1	3	3	1	8	3	3	5
1697:	5	3	4	1	3	1	2	2
1705:	2	3	3	3	5	2	3	3
1713:	1	3	3	3	3	2	2	0
1721:	3	1	1	1	1	3	1	10
1729:	30	49	19	2	4	3	2	2
1737:	4	2	2	1	2	1	2	4
1745:	5	3	3	0	0	1	1	3
1753:	4	0	1	3	3	0	2	1
1761:	2	5	33	164	166	54	8	0
1769:	2	1	1	0	0	3	1	3
1777:	3	1	1	2	3	1	3	1
1785:	0	2	1	4	1	2	2	3
1793:	3	6	3	2	0	4	3	1
1801:	6	0	1	0	2	1	1	3
1809:	3	4	2	1	4	1	4	1
1817:	3	1	0	1	0	2	2	3
1825:	2	3	3	3	3	0	5	1
1833:	1	2	2	3	3	7	6	3
1841:	2	1	4	1	1	6	20	22
1849:	7	4	0	3	3	1	1	1
1857:	0	2	2	3	3	1	0	3
1865:	1	1	1	1	3	1	1	0

1873:	4	3	1	3	1	3	1	1
1881:	3	2	2	4	1	3	5	4
1889:	1	4	2	4	6	3	2	1
1897:	6	3	4	1	1	2	2	2
1905:	1	1	3	0	0	1	1	2
1913:	2	4	0	5	4	1	1	0
1921:	2	0	0	0	2	2	4	2
1929:	0	1	3	0	1	5	4	3
1937:	4	2	1	5	1	2	2	1
1945:	1	2	5	1	5	3	2	4
1953:	1	1	1	1	2	2	2	1
1961:	0	1	0	1	4	2	2	3
1969:	3	1	2	3	4	1	2	2
1977:	3	1	2	1	2	3	1	2
1985:	2	4	1	1	1	1	2	0
1993:	2	1	0	2	0	1	3	1
2001:	3	0	3	0	1	1	1	2
2009:	1	3	3	2	0	2	1	1
2017:	4	1	4	0	4	3	1	1
2025:	0	3	2	1	1	3	0	4
2033:	4	3	1	3	4	1	2	1
2041:	3	2	2	4	1	3	0	1
2049:	0	1	1	2	0	2	0	1
2057:	1	2	0	1	1	1	5	0
2065:	0	2	1	0	4	1	0	1
2073:	2	2	6	1	2	2	2	0
2081:	2	1	1	3	2	2	0	3
2089:	2	0	0	2	1	0	0	2
2097:	0	2	3	0	0	4	9	2
2105:	3	3	0	1	4	0	0	1
2113:	1	0	1	2	5	11	8	4
2121:	4	0	1	1	0	2	2	3
2129:	0	1	0	0	0	3	1	3
2137:	1	2	1	1	0	4	3	1
2145:	1	1	1	0	2	0	1	2
2153:	1	1	1	1	0	0	2	0
2161:	0	1	1	2	1	1	3	2
2169:	1	1	1	0	0	0	1	1
2177:	1	0	1	2	1	1	0	1
2185:	0	1	0	2	1	3	0	0
2193:	3	1	2	0	1	2	0	0
2201:	3	4	36	36	27	11	2	0
2209:	0	0	0	1	1	0	0	1
2217:	1	1	0	1	2	0	0	0
2225:	2	2	0	0	0	3	0	1
2233:	0	0	1	1	1	0	0	0
2241:	1	0	0	0	2	1	2	2
2249:	2	0	2	0	0	1	0	0
2257:	4	1	0	2	0	1	1	1
2265:	0	0	0	1	0	1	1	0
2273:	0	1	0	1	2	0	1	2
2281:	2	0	2	2	0	0	1	1
2289:	1	0	3	1	4	5	1	0
2297:	0	2	1	0	3	1	2	0
2305:	2	2	1	1	1	2	2	1
2313:	3	2	1	2	1	0	2	0
2321:	1	1	0	0	2	0	1	0
2329:	1	2	1	1	1	0	0	1
2337:	1	2	0	1	0	2	1	1
2345:	2	1	1	2	3	2	1	1

2353:	0	0	0	4	3	1	2	0
2361:	0	1	1	1	0	3	2	3
2369:	2	1	0	3	1	2	3	0
2377:	2	2	1	1	1	0	1	3
2385:	1	1	0	0	0	3	1	0
2393:	2	1	1	0	1	0	1	1
2401:	2	1	1	3	0	2	0	0
2409:	1	0	0	1	1	1	0	2
2417:	0	1	1	1	1	0	2	0
2425:	2	1	0	1	1	2	2	0
2433:	2	2	2	0	0	1	1	1
2441:	1	3	1	0	1	5	5	9
2449:	4	1	0	3	2	1	1	1
2457:	1	0	2	1	1	0	0	0
2465:	1	0	0	0	2	0	0	1
2473:	1	0	2	1	1	1	0	0
2481:	0	1	0	0	1	1	1	0
2489:	0	0	0	1	2	1	0	0
2497:	0	1	0	1	0	0	1	0
2505:	1	1	1	1	2	0	0	0
2513:	0	1	0	0	0	0	0	0
2521:	1	0	1	0	0	0	0	0
2529:	0	0	0	0	0	0	2	1
2537:	0	0	0	0	1	0	0	1
2545:	0	1	0	0	1	1	0	0
2553:	0	0	0	0	1	1	0	0
2561:	0	1	0	0	1	0	0	0
2569:	2	0	0	0	1	0	1	0
2577:	1	0	0	1	0	0	0	0
2585:	0	1	1	1	0	0	0	0
2593:	0	2	0	1	0	0	0	0
2601:	1	0	0	0	0	0	1	1
2609:	0	0	2	7	23	27	22	15
2617:	0	2	0	0	0	0	0	0
2625:	0	0	0	1	0	0	1	1
2633:	0	0	0	0	0	1	0	0
2641:	0	0	0	0	0	0	0	0
2649:	0	0	0	0	0	0	0	0
2657:	1	0	0	0	0	2	0	0
2665:	1	1	0	0	0	0	1	0
2673:	1	1	0	2	0	1	0	0
2681:	1	0	0	0	0	1	0	0
2689:	0	0	2	0	0	0	0	2
2697:	0	0	1	0	0	1	2	0
2705:	0	0	0	0	0	1	0	0
2713:	1	0	0	0	0	0	0	1
2721:	0	1	0	0	1	0	1	0
2729:	0	0	0	0	0	0	0	2
2737:	0	0	0	0	0	0	0	0
2745:	0	0	1	0	0	0	1	1
2753:	0	1	2	0	0	0	0	0
2761:	0	0	0	0	0	0	0	1
2769:	1	0	0	0	0	1	1	1
2777:	0	0	0	0	0	0	1	1
2785:	0	1	0	0	0	0	0	0
2793:	0	0	0	0	0	0	0	1
2801:	0	0	0	0	0	0	0	0
2809:	1	0	0	0	0	0	0	0
2817:	1	0	0	0	1	0	0	0
2825:	1	2	0	0	0	0	0	0

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2841:	0	1	0	1	0	0	1	0
2849:	0	0	1	1	0	0	0	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	1	0	0	0	0	0
2873:	0	0	0	0	1	0	0	0
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2889:	0	0	1	0	1	1	0	0
2897:	0	0	0	0	0	0	0	0
2905:	1	0	0	0	0	2	0	0
2913:	1	0	0	0	0	0	0	0
2921:	1	0	1	0	0	0	1	0
2929:	0	0	0	1	1	1	2	2
2937:	0	0	1	1	0	0	0	0
2945:	0	0	0	1	0	0	0	0
2953:	0	1	1	0	0	0	0	0
2961:	0	0	2	0	0	0	2	0
2969:	1	0	1	1	0	0	0	1
2977:	0	0	0	0	0	0	1	0
2985:	0	0	0	0	0	1	0	0
2993:	0	1	0	0	0	0	2	1
3001:	1	0	1	0	0	0	1	0
3009:	0	0	0	0	1	0	2	1
3017:	3	0	1	0	0	0	1	0
3025:	0	0	0	0	0	1	0	0
3033:	0	0	0	0	0	0	0	0
3041:	0	0	0	0	0	0	0	0
3049:	1	0	0	0	0	0	0	1
3057:	0	0	0	0	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	0	1	0	0	1	0	0	0
3081:	0	2	0	0	0	0	1	0
3089:	1	0	0	0	0	0	0	0
3097:	0	0	0	0	0	2	0	0
3105:	0	0	1	0	0	0	0	0
3113:	0	0	0	0	0	1	0	0
3121:	0	0	0	1	0	0	0	0
3129:	0	0	0	0	0	0	2	0
3137:	0	0	0	0	1	0	0	0
3145:	0	0	1	0	0	0	1	0
3153:	1	0	0	0	0	0	1	0
3161:	1	1	0	0	0	0	0	0
3169:	0	1	0	0	0	0	0	0
3177:	0	0	0	0	0	0	2	0
3185:	1	1	0	0	0	0	0	0
3193:	0	0	1	0	2	0	1	1
3201:	1	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	1	0	0	0	0	0	0
3225:	0	0	0	1	0	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	1	1	0	0	0	0	0	0
3249:	0	0	0	0	0	1	0	0
3257:	0	0	0	1	0	0	0	1
3265:	0	1	1	0	0	0	0	0
3273:	0	1	1	0	0	0	0	0
3281:	1	2	0	1	0	0	0	0
3289:	0	0	1	0	0	3	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	2	0	0	0	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	1	0	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	1	0	0	0	0	1	0	0
3345:	0	0	0	2	0	0	0	0
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	0	0	1	0	0
3369:	0	1	0	0	0	0	0	1
3377:	0	1	0	0	1	0	0	0
3385:	0	1	0	0	0	1	0	0
3393:	0	0	0	1	0	1	0	0
3401:	0	0	0	0	1	0	0	0
3409:	0	1	0	0	0	0	1	0
3417:	0	1	0	1	0	1	1	0
3425:	0	0	1	0	1	0	0	0
3433:	1	0	0	0	0	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	0	0	0	1	0
3457:	0	0	0	0	0	1	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	1	1	0	0	0	0	0
3481:	0	1	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	1	0	0	0
3537:	0	0	0	1	0	0	0	0
3545:	1	0	0	0	0	0	0	0
3553:	1	0	1	0	1	0	0	0
3561:	0	0	0	0	1	0	0	0
3569:	1	0	0	0	0	1	0	0
3577:	0	0	2	0	0	0	0	1
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	1	1	1	0	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	1	0	0	0	1
3617:	0	1	0	0	0	0	0	0
3625:	0	0	0	0	0	0	0	0
3633:	0	0	1	0	0	0	0	1
3641:	0	0	1	0	0	0	0	0
3649:	0	0	1	0	0	1	0	0
3657:	0	1	0	0	0	0	0	0
3665:	0	0	0	0	0	1	1	0
3673:	0	0	0	0	0	0	0	0
3681:	1	0	0	0	0	1	0	0
3689:	0	0	0	0	0	0	0	1
3697:	0	0	0	0	0	0	0	0
3705:	0	1	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	1	1	0	0
3737:	0	1	0	0	0	1	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	1	1	0	0	0	0	0
3761:	0	0	0	0	0	0	0	1
3769:	0	0	0	0	0	0	1	0
3777:	0	0	0	1	0	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	0	0	0	0	0	0
3801:	1	0	0	0	0	1	0	1
3809:	0	1	1	0	0	0	0	0
3817:	0	0	0	0	0	0	1	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	1
3841:	0	0	0	0	0	1	0	0
3849:	0	0	0	0	0	0	0	0
3857:	0	1	0	0	0	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	0	0	0	1	0
3881:	0	1	0	0	0	0	0	0
3889:	1	0	0	1	0	0	0	0
3897:	1	0	0	0	0	0	0	0
3905:	0	0	1	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	1	1	0	0
3929:	0	0	0	1	0	0	0	0
3937:	0	0	0	0	1	0	0	1
3945:	0	0	0	0	0	0	0	0
3953:	0	1	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	0	0	0
3977:	0	0	0	0	1	0	0	1
3985:	0	0	0	0	1	0	0	0
3993:	0	1	0	0	0	0	0	0
4001:	0	0	0	1	0	1	0	0
4009:	0	0	1	0	0	0	0	0
4017:	0	0	0	0	0	0	0	0
4025:	0	1	0	0	0	0	1	0
4033:	0	0	0	1	1	0	0	0
4041:	0	0	0	0	1	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	1	0	0	1	0	0	0
4065:	0	0	0	0	0	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

CB 3/29/13

Sample ID : 1303012-05 Acquisition date : 29-MAR-2013 16:15:30

VAX/VMS Peak Search Report Generated 29-MAR-2013 17:17:19.63

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301205_GE2_GAS1202_190090.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-53-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 29-MAR-2013 16:15:30
Sample ID : 1303012-05 Sample Quantity : 5.17910E+02 gram
Sample type : SOLID Sample Geometry : 0
Detector name : GE2 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:19.40 2.2%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	31.77	958	24615	1.24	31.89	30	5	49.5		
0	45.94*	8246	33992	1.69	46.06	45	4	6.4		PB-210
0	63.05*	12118	60787	1.33	63.16	61	5	6.4		TH-234
0	76.01*	131067	133404	2.75	76.12	71	10	1.2		AM-243
0	88.12	5245	71309	1.01	88.23	85	5	15.4		SN-126
										CD-109
0	93.36*	13774	55429	1.73	93.48	91	6	5.8		
0	98.12	2098	35451	1.38	98.24	97	5	27.3		
0	112.67*	1635	36189	1.58	112.78	111	5	35.3		
0	122.24	650	35393	1.37	122.36	121	5	87.2		CO-57
0	143.59*	3761	52360	1.36	143.71	141	7	20.4		U-235
0	153.86	2439	45110	1.32	153.97	152	6	27.9		
0	163.26*	708	33648	1.59	163.38	162	5	78.1		U-235
0	185.81*	37987	49703	1.35	185.92	182	8	2.3		RA-226
0	196.78*	737	28099	2.59	196.89	195	5	68.7		
0	204.98*	1033	24936	1.21	205.09	203	5	46.4		U-235
2	235.99	4835	24266	1.88	236.10	232	15	10.4	3.36E+01	
2	241.67	44752	14998	1.37	241.78	232	15	1.2		RA-224
0	258.81	1561	17629	1.38	258.92	257	5	26.2		
6	269.71	7221	24814	2.82	269.82	266	12	7.9	5.13E+01	CS-135
6	274.32	2202	15291	1.64	274.43	266	12	17.6		
0	294.85*	97935	22757	1.35	294.96	291	8	0.8		PB-214
0	303.79	490	10071	2.03	303.90	303	4	58.9		
0	313.90	441	14433	1.63	314.01	312	6	86.8		
0	323.65	1044	11385	1.88	323.75	322	5	31.3		RA-223
0	329.13	789	11709	1.76	329.24	328	5	41.7		
0	338.03*	411	11599	1.00	338.14	337	5	79.2		
0	351.49*	169435	24359	1.85	351.59	346	12	0.6		PB-214
0	387.37	2467	18695	3.72	387.48	383	10	21.1		
3	401.42	1257	5569	1.51	401.52	400	9	16.6	2.50E+00	RN-219
3	404.77	1384	11258	1.89	404.88	400	9	25.1		PB-211
0	426.81	765	12030	3.97	426.92	424	7	48.3		
0	444.91	341	7897	1.59	445.02	443	6	83.2		
0	454.00	1123	10035	1.96	454.10	451	8	31.5		
0	461.58	945	8459	2.21	461.68	459	7	32.9		
0	479.90	1142	7800	1.57	480.01	477	7	26.4		

AG 4/1/13

Sample ID : 1303012-05 Acquisition date : 29-MAR-2013 16:15:30

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	486.52	1567	8435	2.04	486.63	484	8	21.0		
0	509.96*	2199	10234	3.50	510.06	505	11	18.4		
0	532.97	523	5686	1.60	533.07	530	6	46.4		
0	542.96	453	5401	1.53	543.06	541	6	52.2		
0	572.59	437	5628	1.94	572.69	570	7	57.8		
1	579.72	1183	4057	1.75	579.82	576	10	17.2	7.35E-01	
0	598.51	170	3908	2.77	598.61	597	5	111.6		
0	608.73*	125618	7480	1.68	608.83	604	10	0.6		BI-214
0	615.81	325	4536	2.91	615.91	614	7	69.6		
0	664.84	3456	4949	1.56	664.94	661	8	7.8		
0	702.74	1008	4985	1.99	702.84	699	8	25.1		
0	719.50	998	4384	2.09	719.60	716	8	23.8		
0	733.87	252	3859	2.70	733.96	731	7	82.7		
0	742.07	877	4941	2.09	742.17	738	9	29.7		
0	752.74	356	4292	1.43	752.83	749	8	64.7		
0	767.58*	12094	5810	1.90	767.67	762	11	3.0		
0	785.22	2819	5448	2.07	785.31	781	10	10.5		
0	805.43	2797	4115	2.09	805.53	802	8	8.8		
0	825.73	353	2677	2.26	825.83	824	5	45.3		
0	831.27	510	3738	2.16	831.36	829	7	40.7		PB-211
0	838.50	1637	4766	2.13	838.60	835	9	16.0		
0	933.32	6236	4459	2.13	933.41	929	9	4.6		
0	963.33	607	3800	1.86	963.42	960	8	36.1		
0	999.92*	904	4350	2.12	1000.01	995	10	28.1		PA-234M
0	1031.93	184	2340	1.87	1032.02	1030	6	84.5		
0	1051.71	418	3888	1.81	1051.80	1046	10	56.7		
0	1069.04	561	3297	2.14	1069.13	1065	9	37.9		
0	1102.49	403	3214	2.07	1102.58	1099	9	51.7		
0	1119.43*	27100	4345	2.22	1119.51	1113	13	1.6		BI-214
0	1132.54	433	2440	1.84	1132.63	1129	7	39.1		
0	1154.24	2849	3427	2.18	1154.33	1150	10	8.6		
0	1181.26	286	2584	2.03	1181.34	1177	8	62.7		
0	1206.78	789	2872	1.89	1206.87	1202	10	26.4		
0	1237.19*	9939	2841	2.24	1237.27	1232	10	2.8		
0	1252.34	570	2837	3.20	1252.42	1248	10	35.9		
2	1272.34	100	543	2.03	1272.42	1271	14	58.3	1.91E+00	
2	1280.01	2228	1648	2.14	1280.09	1271	14	7.2		
0	1302.50	186	1535	1.56	1302.59	1300	6	68.5		
0	1315.62	126	1209	2.73	1315.71	1314	5	84.4		
3	1376.67	6932	1711	2.19	1376.75	1371	18	3.1	1.68E+00	
3	1384.28	1229	1686	2.30	1384.36	1371	18	12.5		
2	1400.51	1955	1521	2.07	1400.59	1396	17	7.8	7.32E-01	
2	1406.97	3545	1837	2.21	1407.05	1396	17	5.2		
0	1425.50	117	1796	1.85	1425.58	1423	7	122.3		
0	1459.85*	818	2165	2.41	1459.93	1456	8	20.9		K-40
0	1508.12*	2985	2572	2.32	1508.19	1504	9	7.1		
2	1537.52	774	1846	2.67	1537.60	1530	17	20.8	2.51E+00	
2	1542.25	652	1548	2.43	1542.33	1530	17	22.2		
0	1582.22	1038	2228	2.35	1582.30	1577	12	19.2		
5	1593.97	511	1223	3.13	1594.05	1590	13	24.1	8.21E-01	
5	1598.40	450	1165	2.43	1598.48	1590	13	27.6		

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1645.69	80	752	3.42	1645.77	1643	7	116.6		
1	1655.16	128	214	2.11	1655.23	1654	12	29.6	3.52E+00	
1	1660.10*	1482	720	2.38	1660.17	1654	12	8.0		
0	1682.58	297	800	2.51	1682.65	1679	8	34.9		
0	1691.98	382	976	2.94	1692.05	1688	11	33.4		
0	1728.37	4633	1028	2.56	1728.44	1722	13	4.1		
0	1763.28*	21704	1022	2.56	1763.35	1756	14	1.5		BI-214
0	1776.55	62	319	3.28	1776.62	1774	6	95.9		
0	1781.84	54	325	1.68	1781.92	1780	6	108.0		
2	1836.98	414	511	2.53	1837.05	1831	24	21.1	1.72E+00	
2	1846.17	2912	495	2.53	1846.24	1831	24	4.6		
0	1871.76	314	817	2.37	1871.83	1866	12	38.2		
4	1888.69	146	554	2.78	1888.76	1885	15	58.5	1.40E+00	
4	1895.30	194	587	2.81	1895.37	1885	15	44.8		
3	1934.30	219	631	3.25	1934.37	1929	15	45.4	1.65E+00	
3	1937.71	112	617	3.26	1937.78	1929	15	88.9		
0	1968.43	72	382	3.06	1968.50	1965	7	93.5		
0	1993.94	100	424	5.53	1994.01	1989	10	79.5		
0	2013.70	389	688	9.21	2013.76	2004	20	34.6		
0	2052.65	116	350	2.20	2052.72	2047	11	65.7		
0	2088.47	49	187	3.13	2088.53	2085	7	98.2		
0	2107.50	85	229	2.22	2107.56	2103	10	70.6		
0	2116.99	1460	206	2.60	2117.06	2112	11	6.5		
0	2191.18	82	139	2.43	2191.24	2188	8	54.8		
0	2202.54	5877	268	2.83	2202.60	2196	15	2.9		
0	2292.03	317	139	3.01	2292.08	2287	13	19.1		
0	2333.28*	41	44	6.58	2333.33	2328	14	80.7		
0	2368.20	17	22	2.82	2368.26	2364	8	105.0		
0	2445.98	1608	41	2.79	2446.04	2439	15	5.3		
0	2481.57	21	18	4.26	2481.62	2476	9	84.1		
0	2535.46	9	2	2.89	2535.51	2533	6	78.9		
0	2569.11	10	5	3.36	2569.16	2565	7	100.7		
0	2612.56*	67	5	3.84	2612.61	2607	10	28.6		
0	2693.15	42	11	2.62	2693.20	2687	14	45.0		
0	2734.18	8	3	1.94	2734.23	2731	7	99.0		
0	2767.04	30	6	6.02	2767.08	2761	11	48.0		
0	2877.24	11	2	4.52	2877.28	2873	8	74.4		
0	2919.55	24	2	2.43	2919.59	2914	10	47.8		
0	2976.90	17	0	3.67	2976.94	2972	9	48.5		
0	2996.65	16	0	1.92	2996.69	2992	9	50.0		
0	3050.97	14	2	3.96	3051.01	3046	9	66.9		

Summary of Nuclide Activity
Sample ID : 1303012-05
Acquisition date : 29-MAR-2013 16:15:30

Total number of lines in spectrum	127	
Number of unidentified lines	80	
Number of lines tentatively identified by NID	47	37.01%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.363E+01	2.363E+01	0.545E+01	23.06	
PB-210	22.26Y	1.00	1.429E+02	1.432E+02	0.165E+02	11.52	
PB-211	3.28E+04Y	1.00	4.479E+01	4.479E+01	1.042E+01	23.27	
BI-214	1602.00Y	1.00	4.512E+02	4.512E+02	0.272E+02	6.03	
PB-214	1602.00Y	1.00	4.574E+02	4.574E+02	0.520E+02	11.36	
RN-219	3.28E+04Y	1.00	2.161E+01	2.161E+01	0.426E+01	19.71	
RA-223	3.28E+04Y	1.00	2.554E+01	2.554E+01	0.905E+01	35.42	
RA-224	1.41E+10Y	1.00	8.816E+02	8.816E+02	1.368E+02	15.52	
RA-226	1602.00Y	1.00	7.821E+02	7.821E+02	14.33E+02	183.26	
PA-234M	4.47E+09Y	1.00	2.302E+02	2.302E+02	0.687E+02	29.84	
TH-234	4.47E+09Y	1.00	1.966E+02	1.966E+02	0.212E+02	10.77	
U-235	7.04E+08Y	1.00	1.674E+01	1.674E+01	0.409E+01	24.43	
			---------	---------			
	Total Activity :		3.274E+03	3.275E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.08	4.433E-01	4.783E-01	4.214E-01	88.11	
CD-109	464.00D	1.05	8.043E+01	8.408E+01	1.646E+01	19.57	
SN-126	1.00E+05Y	1.00	8.090E+00	8.090E+00	1.507E+00	18.63	
			---------	---------			
	Total Activity :		8.897E+01	9.265E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-135	2.30E+06Y	1.00	3.759E+01	3.759E+01	0.749E+01	19.93	
AM-243	7380.00Y	1.00	1.162E+02	1.162E+02	0.111E+02	9.52	
			---------	---------			
	Total Activity :		1.538E+02	1.538E+02			

Grand Total Activity : 3.517E+03 3.521E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-05 Acquisition date : 29-MAR-2013 16:15:30

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
K-40	1460.81	10.67*	4.705E-01	2.363E+01	2.363E+01	23.06	OK

Final Mean for 1 Valid Peaks = 2.363E+01+/- 5.447E+00 (23.06%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
PB-210	46.50	4.25*	1.969E+00	1.429E+02	1.432E+02	11.52	OK

Final Mean for 1 Valid Peaks = 1.432E+02+/- 1.650E+01 (11.52%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
PB-211	404.84	2.90*	1.290E+00	5.363E+01	5.363E+01	27.22	OK
	831.96	2.90	7.168E-01	3.559E+01	3.559E+01	41.81	OK

Final Mean for 2 Valid Peaks = 4.479E+01+/- 1.042E+01 (23.27%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
BI-214	609.31	46.30*	9.260E-01	4.247E+02	4.247E+02	10.38	OK
	1120.29	15.10	5.678E-01	4.582E+02	4.582E+02	10.88	OK
	1764.49	15.80	4.183E-01	4.760E+02	4.760E+02	10.07	OK
	2204.22	4.98	3.725E-01	-----	Line Not Found	-----	Absent

Final Mean for 3 Valid Peaks = 4.512E+02+/- 2.719E+01 (6.03%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
PB-214	295.21	19.19	1.631E+00	4.536E+02	4.536E+02	18.60	OK
	351.92	37.19*	1.436E+00	4.598E+02	4.598E+02	14.35	OK

Final Mean for 2 Valid Peaks = 4.574E+02+/- 5.197E+01 (11.36%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
RN-219	401.80	6.50*	1.298E+00	2.161E+01	2.161E+01	19.71	OK

Final Mean for 1 Valid Peaks = 2.161E+01+/- 4.259E+00 (19.71%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
RA-223	323.87	3.88*	1.527E+00	2.554E+01	2.554E+01	35.42	OK

Final Mean for 1 Valid Peaks = 2.554E+01+/- 9.049E+00 (35.42%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
RA-224	240.98	3.95*	1.863E+00	8.816E+02	8.816E+02	15.52	OK

Final Mean for 1 Valid Peaks = 8.816E+02+/- 1.368E+02 (15.52%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
RA-226	186.21	3.28*	2.147E+00	7.821E+02	7.821E+02	183.26	OK

Final Mean for 1 Valid Peaks = 7.821E+02+/- 1.433E+03 (183.26%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	6.188E-01	2.302E+02	2.302E+02	29.84	OK

Final Mean for 1 Valid Peaks = 2.302E+02+/- 6.868E+01 (29.84%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.351E+00	1.966E+02	1.966E+02	10.77	OK

Final Mean for 1 Valid Peaks = 1.966E+02+/- 2.117E+01 (10.77%)

Sample ID : 1303012-05 Acquisition date : 29-MAR-2013 16:15:30

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
U-235	143.76	10.50*	2.382E+00	2.180E+01	2.180E+01	27.81	OK
	163.35	4.70	2.275E+00	9.601E+00	9.601E+00	80.54	OK
	205.31	4.70	2.043E+00	1.560E+01	1.560E+01	50.94	OK

Final Mean for 3 Valid Peaks = 1.674E+01+/- 4.091E+00 (24.43%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.486E+00	4.433E-01	4.783E-01	88.11	OK
	136.48	10.60	2.420E+00	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 4.783E-01+/- 4.214E-01 (88.11%)

CD-109	88.03	3.72*	2.541E+00	8.043E+01	8.408E+01	19.57	OK

Final Mean for 1 Valid Peaks = 8.408E+01+/- 1.646E+01 (19.57%)

SN-126	87.57	37.00*	2.540E+00	8.090E+00	8.090E+00	18.63	OK

Final Mean for 1 Valid Peaks = 8.090E+00+/- 1.507E+00 (18.63%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
CS-135	268.24	16.00*	1.740E+00	3.759E+01	3.759E+01	19.93	OK

Final Mean for 1 Valid Peaks = 3.759E+01+/- 7.491E+00 (19.93%)

AM-243	74.67	66.00*	2.478E+00	1.162E+02	1.162E+02	9.52	OK

Final Mean for 1 Valid Peaks = 1.162E+02+/- 1.106E+01 (9.52%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
K-40	2.363E+01	5.447E+00	5.800E+00	5.122E-01	4.073
CO-57	4.783E-01	4.214E-01	5.923E-01	7.244E-02	0.808
CD-109	8.408E+01	1.646E+01	1.681E+01	1.921E+00	5.002
SN-126	8.090E+00	1.507E+00	1.617E+00	1.573E-01	5.003
CS-135	3.759E+01	7.491E+00	2.950E+00	5.267E-01	12.743
PB-210	1.432E+02	1.650E+01	1.386E+01	1.205E+00	10.331
PB-211	4.479E+01	1.042E+01	1.772E+01	1.738E+00	2.527
BI-214	4.512E+02	2.719E+01	1.038E+00	9.913E-02	434.822
PB-214	4.574E+02	5.197E+01	1.293E+00	1.780E-01	353.771
RN-219	2.161E+01	4.259E+00	7.886E+00	7.724E-01	2.740
RA-223	2.554E+01	9.049E+00	1.213E+01	1.956E+00	2.107
RA-224	8.816E+02	1.368E+02	1.231E+01	1.840E+00	71.622
RA-226	7.821E+02	1.433E+03	1.597E+01	2.926E+01	48.963
PA-234M	2.302E+02	6.868E+01	6.213E+01	5.701E+00	3.705
TH-234	1.966E+02	2.117E+01	1.672E+01	1.289E+00	11.760
U-235	1.674E+01	4.091E+00	4.914E+00	9.060E-01	3.407
AM-243	1.162E+02	1.106E+01	9.356E-01	8.010E-02	124.177

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
BE-7	3.366E+00		4.514E+00	6.973E+00	6.967E-01	0.483
NA-22	2.968E-01		3.625E-01	5.964E-01	5.419E-02	0.498
AL-26	2.390E-01		2.128E-01	3.781E-01	3.469E-02	0.632
TI-44	2.131E+00		5.403E-01	6.938E-01	5.572E-02	3.071
SC-46	1.751E-01		4.607E-01	7.671E-01	6.506E-02	0.228
V-48	-2.053E+00		1.274E+00	2.030E+00	1.837E-01	-1.012
CR-51	1.627E+00		7.988E+00	1.007E+01	1.678E+00	0.162
MN-54	1.686E+00		5.134E-01	6.242E-01	5.472E-02	2.700
CO-56	-2.082E-02		4.893E-01	7.280E-01	6.342E-02	-0.029
CO-58	-2.150E-01		4.807E-01	7.120E-01	6.328E-02	-0.302
FE-59	1.009E+00		1.092E+00	1.621E+00	1.697E-01	0.623
CO-60	-1.492E-01		4.009E-01	5.798E-01	5.996E-02	-0.257
ZN-65	3.100E+01		3.530E+00	2.273E+00	2.266E-01	13.638
SE-75	1.098E-01		7.365E-01	9.372E-01	1.639E-01	0.117
RB-82	-9.016E-01		7.333E+00	8.673E+00	7.787E-01	-0.104
RB-83	2.551E-01		7.760E-01	1.266E+00	2.077E-01	0.202
KR-85	1.157E+02		7.067E+01	1.087E+02	1.084E+01	1.064
SR-85	6.914E-01		4.222E-01	6.496E-01	6.477E-02	1.064
Y-88	1.789E+00	+	4.179E-01	6.005E-01	5.525E-02	2.980
NB-93M	4.701E+01		2.370E+01	2.506E+01	9.897E+00	1.876
NB-94	1.727E-01		3.476E-01	5.801E-01	4.980E-02	0.298
NB-95	3.627E+01		3.684E+00	1.874E+00	1.689E-01	19.354
ZR-95	2.735E-01		1.031E+00	1.234E+00	1.217E-01	0.222
RU-103	-2.503E-01		5.076E-01	8.599E-01	1.293E-01	-0.291
RU-106	1.843E+00		3.158E+00	4.820E+00	6.707E-01	0.382
AG-108M	5.631E-01		3.599E-01	5.483E-01	4.981E-02	1.027

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
AG-110M	-3.601E-03		3.536E-01	5.351E-01	4.891E-02	-0.007
SN-113	7.959E-02		6.000E-01	9.321E-01	9.303E-02	0.085
TE123M	5.102E-02		5.658E-01	7.373E-01	6.654E-02	0.069
SB-124	9.423E-02		5.837E-01	7.079E-01	6.796E-02	0.133
I-125	-1.528E+01		8.927E+00	1.342E+01	1.498E+00	-1.139
SB-125	3.122E+00	+	1.547E+00	1.844E+00	1.852E-01	1.693
SB-126	1.755E+01	+	4.528E+00	5.288E+00	4.805E-01	3.318
SB-127	3.949E+02		1.695E+02	2.851E+02	2.596E+01	1.385
I-129	-3.748E-01		8.443E-01	1.309E+00	1.811E-01	-0.286
I-131	-3.903E+00		4.298E+00	7.321E+00	9.214E-01	-0.533
BA-133	3.027E-01		5.387E-01	7.726E-01	1.291E-01	0.392
CS-134	7.814E+00		9.444E-01	7.356E-01	7.066E-02	10.622
CS-136	3.531E+00		2.363E+00	3.526E+00	3.435E-01	1.001
CS-137	2.058E+00		4.331E-01	6.206E-01	5.658E-02	3.317
LA-138	-4.235E-01		5.821E-01	8.787E-01	7.494E-02	-0.482
CE-139	6.649E-01		5.017E-01	7.429E-01	6.232E-02	0.895
BA-140	-2.895E+00		7.886E+00	9.466E+00	3.171E+00	-0.306
LA-140	1.143E+01		2.470E+00	3.550E+00	3.148E-01	3.221
CE-141	4.514E+00		1.793E+00	2.094E+00	5.218E-01	2.156
CE-144	-1.449E+00		3.016E+00	4.861E+00	5.470E-01	-0.298
PM-144	2.753E-01		3.369E-01	5.128E-01	4.675E-02	0.537
PM-145	-4.975E+00		3.730E+00	2.763E+00	1.807E+00	-1.800
PM-146	3.494E+00	+	1.163E+00	1.274E+00	1.269E-01	2.743
ND-147	4.462E+01		1.601E+01	2.419E+01	2.403E+00	1.845
EU-152	7.162E+01	+	9.047E+00	6.887E+00	7.429E-01	10.399
GD-153	-5.235E-02		1.478E+00	2.227E+00	2.392E-01	-0.024
EU-154	7.618E-01		1.003E+00	1.650E+00	1.500E-01	0.462
EU-155	5.441E+00		1.569E+00	2.243E+00	2.159E-01	2.425
EU-156	2.476E+00		1.330E+01	1.990E+01	4.564E+00	0.124
HO-166M	6.388E-02		6.471E-01	8.927E-01	8.120E-02	0.072
HF-172	9.196E-01		2.909E+00	4.359E+00	5.190E-01	0.211
LU-172	7.972E+00		1.325E+01	1.962E+01	1.926E+00	0.406
LU-173	2.031E+01		4.123E+00	2.706E+00	4.948E-01	7.505
HF-175	2.390E-01		6.331E-01	7.953E-01	1.155E-01	0.301
LU-176	7.769E-02		3.447E-01	4.979E-01	8.653E-02	0.156
TA-182	2.178E+02		2.365E+01	6.730E+00	6.730E-01	32.368
IR-192	4.617E-01		8.623E-01	1.333E+00	1.331E-01	0.346
HG-203	-4.840E-01		6.878E-01	9.814E-01	1.885E-01	-0.493
BI-207	1.659E-02		3.218E-01	4.908E-01	4.806E-02	0.034
TL-208	2.528E+00		1.076E+00	1.637E+00	1.591E-01	1.544
BI-210M	3.363E-01		8.249E-01	1.051E+00	1.803E-01	0.320
BI-212	-5.817E-01		3.454E+00	4.103E+00	3.725E-01	-0.142
PB-212	1.587E+01		2.535E+00	1.331E+00	1.958E-01	11.920
RA-225	-1.084E+01		4.651E+00	7.432E+00	7.343E-01	-1.458
TH-227	3.231E+01	+	5.891E+00	4.721E+00	6.820E-01	6.843
AC-228	6.516E-01		1.312E+00	2.184E+00	1.862E-01	0.298
TH-230	5.145E+02		1.368E+02	1.767E+02	1.416E+01	2.911
PA-231	1.928E+01	+	1.188E+01	2.116E+01	3.737E+00	0.911

Sample ID : 1303012-05 Acquisition date : 29-MAR-2013 16:15:30

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
TH-231	6.823E+00		4.166E+00	6.294E+00	1.082E+00	1.084
PA-233	1.261E+00		1.864E+00	2.658E+00	7.128E-01	0.474
PA-234	-1.536E+00		1.478E+00	2.363E+00	2.705E-01	-0.650
NP-237	1.322E+01		3.806E+00	5.440E+00	5.236E-01	2.429
AM-241	9.927E+00		1.382E+00	1.741E+00	1.302E-01	5.701
CM-243	-9.995E-01		2.414E+00	3.476E+00	6.575E-01	-0.288

Summary of Nuclide Activity
Sample ID : 1303012-05

Acquisition date : 29-MAR-2013 16:15:30

Total number of lines in spectrum	127	
Number of unidentified lines	80	
Number of lines tentatively identified by NID	47	37.01%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.363E+01	2.363E+01	0.545E+01	23.06	
PB-210	22.26Y	1.00	1.429E+02	1.432E+02	0.165E+02	11.52	
PB-211	3.28E+04Y	1.00	4.479E+01	4.479E+01	1.042E+01	23.27	
BI-214	1602.00Y	1.00	4.512E+02	4.512E+02	0.272E+02	6.03	
PB-214	1602.00Y	1.00	4.574E+02	4.574E+02	0.520E+02	11.36	
RN-219	3.28E+04Y	1.00	2.161E+01	2.161E+01	0.426E+01	19.71	
RA-223	3.28E+04Y	1.00	2.554E+01	2.554E+01	0.905E+01	35.42	
RA-224	1.41E+10Y	1.00	8.816E+02	8.816E+02	1.368E+02	15.52	
RA-226	1602.00Y	1.00	7.821E+02	7.821E+02	14.33E+02	183.26	
PA-234M	4.47E+09Y	1.00	2.302E+02	2.302E+02	0.687E+02	29.84	
TH-234	4.47E+09Y	1.00	1.966E+02	1.966E+02	0.212E+02	10.77	
U-235	7.04E+08Y	1.00	1.674E+01	1.674E+01	0.409E+01	24.43	
			---------	---------			
	Total Activity :		3.274E+03	3.275E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.08	4.433E-01	4.783E-01	4.214E-01	88.11	
CD-109	464.00D	1.05	8.043E+01	8.408E+01	1.646E+01	19.57	
SN-126	1.00E+05Y	1.00	8.090E+00	8.090E+00	1.507E+00	18.63	
			---------	---------			
	Total Activity :		8.897E+01	9.265E+01			

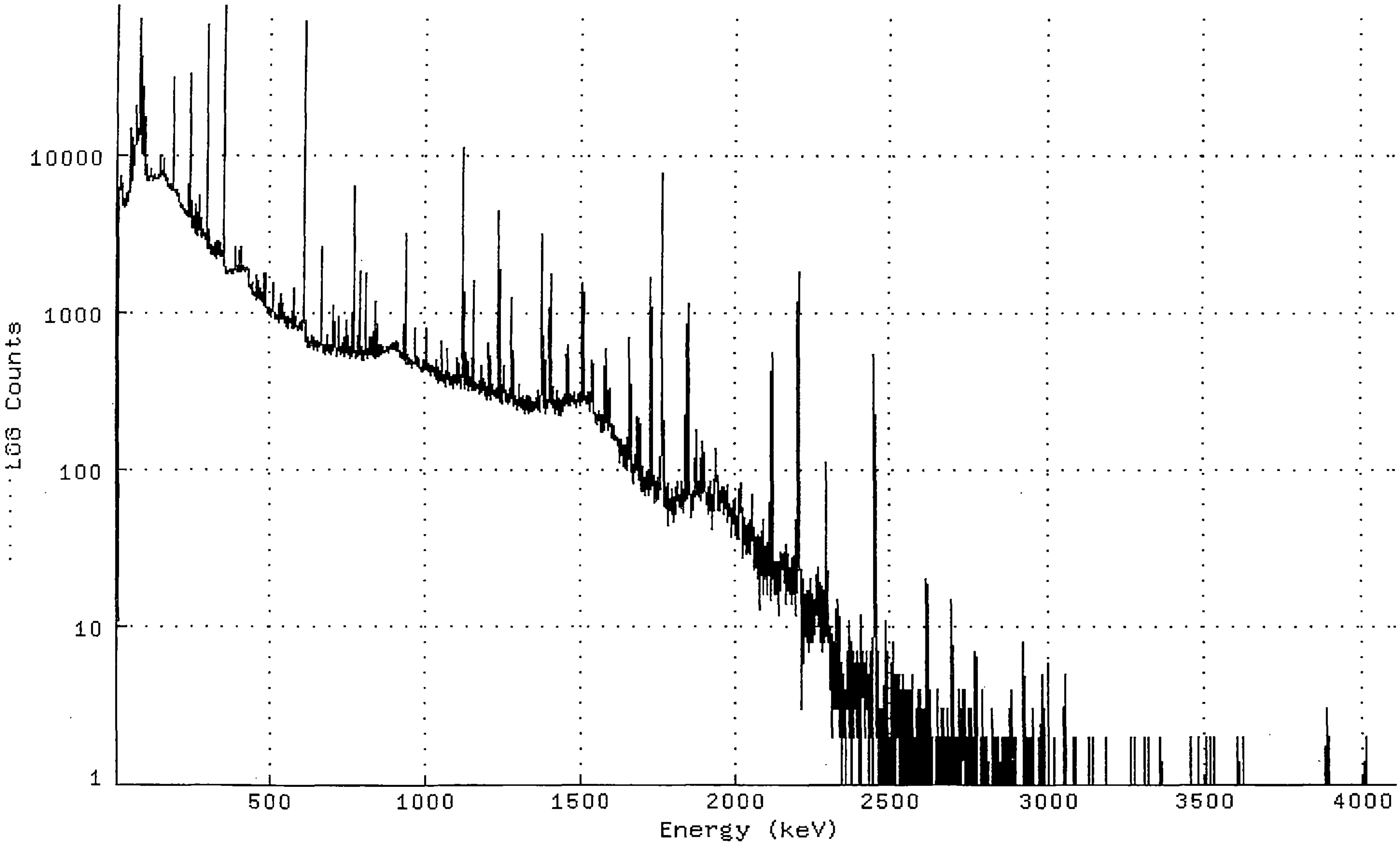
Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-135	2.30E+06Y	1.00	3.759E+01	3.759E+01	0.749E+01	19.93	
AM-243	7380.00Y	1.00	1.162E+02	1.162E+02	0.111E+02	9.52	
			---------	---------			
	Total Activity :		1.538E+02	1.538E+02			

Grand Total Activity : 3.517E+03 3.521E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301205_GE2_GAS1202_190090.CNF;1
Title :
Sample Title: S30-53-130228
Start Time: 29-MAR-2013 16:15 Sample Time: 28-FEB-2013 00:00 Energy Offset: -1.16012E-01
Real Time : 0 01:01:19.40 Sample ID : 1303012-05 Energy Slope : 1.00003E+00
Live Time : 0 01:00:00.00 Sample Type: SOLID Energy Quad : 0.00000E+00



5125

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301205_GE2_GAS1202_1900

Channel

1:	0	0	0	4	28	2957	5539	5995
9:	6020	6201	6054	7243	7229	6022	6301	7188
17:	6046	5583	5279	5082	4743	4893	4687	4803
25:	4860	4939	5233	5151	4748	4741	5088	5691
33:	5029	5024	5064	5237	5300	5175	5230	5785
41:	5774	6013	6324	6666	6825	13981	14642	6842
49:	7193	9329	7871	8247	12784	9702	8508	8697
57:	9159	10179	10701	11834	12147	12881	20401	15245
65:	12252	12292	14232	14426	13075	13150	13300	13575
73:	14268	27603	45507	25956	72833	24243	14630	12583
81:	14312	10127	12709	17940	9884	11982	26752	16272
89:	11664	15611	8974	15486	17147	10092	10179	7412
97:	7326	8622	7705	7030	6866	6963	6856	6897
105:	7148	6919	6993	7179	7347	7255	7544	7666
113:	8015	7340	7262	7002	7183	7091	6883	6939
121:	7238	7416	7064	7210	7115	7029	7114	7103
129:	7115	7063	6986	7141	6987	7163	7312	7239
137:	7339	7337	7564	7356	7518	7510	8324	9978
145:	7915	7474	7413	7611	7797	7782	7922	7722
153:	8040	9229	7901	7411	7246	7374	7255	6953
161:	6833	6868	7184	6942	6667	6703	6598	6283
169:	6385	6475	6267	6308	6437	6146	6184	6214
177:	6097	6048	6380	6257	6357	6556	6523	6517
185:	13563	30983	11638	5988	6026	5991	5896	5945
193:	5813	5776	5746	5962	5817	5730	5588	5466
201:	5497	5434	5254	5216	5686	4999	4821	4694
209:	4968	4840	4808	4635	4778	4679	4486	4632
217:	4591	4502	4559	4532	4334	4489	4447	4339
225:	4288	4278	4354	4317	4321	4185	4121	4207
233:	4145	4029	5212	6444	4251	4311	4292	4103
241:	16294	32361	7100	3629	3548	3543	3533	3435
249:	3497	3553	3424	3518	3461	3521	3628	4481
257:	3611	4292	4793	3322	3172	3240	3182	3137
265:	3093	3193	3100	3401	5473	4677	5073	3626
273:	3299	4096	3963	3152	3026	3042	3070	3041
281:	3317	3051	3273	3168	3112	3320	2966	2902
289:	2956	2942	2984	2990	3127	21232	67381	17558
297:	2876	2556	2913	3344	2548	2742	2773	2823
305:	2632	2333	2436	2451	2470	2452	2466	2502
313:	2505	2630	2490	2390	2357	2345	2332	2353
321:	2273	2313	2654	2797	2361	2304	2229	2288
329:	2724	2838	2318	2330	2462	2548	2471	2316
337:	2250	2748	2362	2304	2353	2335	2345	2361
345:	2254	2307	2430	2511	2676	6315	68565	91143
353:	10347	2045	1828	1899	1748	1882	1827	1816
361:	1822	1810	1814	1788	1774	1754	1817	1874
369:	1844	1833	1867	1888	1768	1814	1860	1859
377:	1786	1845	1804	1855	1779	1845	1849	1840
385:	1922	2379	2451	2537	2591	1874	1906	1813
393:	1963	1860	1912	1948	1820	1896	1874	1817
401:	2448	2458	1997	2202	2586	2128	1908	1953
409:	1837	1910	1879	1934	1898	1947	1863	1849
417:	1806	1933	1878	1888	1921	1901	1886	1893
425:	1878	1934	1921	1796	1778	1595	1600	1436

433:	1510	1455	1488	1394	1440	1399	1450	1398
441:	1381	1342	1308	1425	1519	1340	1326	1320
449:	1300	1263	1327	1348	1350	1733	1708	1217
457:	1270	1205	1243	1278	1551	1559	1313	1267
465:	1193	1201	1202	1243	1405	1391	1218	1274
473:	1246	1326	1190	1154	1154	1134	1328	1782
481:	1379	1100	1065	1105	1132	1629	1774	1243
489:	1058	1050	1011	1054	1073	1039	978	1016
497:	1040	1012	991	959	1048	973	952	928
505:	953	1009	1006	1074	1382	1528	1471	1232
513:	1037	930	904	940	940	937	962	936
521:	911	965	950	936	942	897	865	940
529:	908	989	896	986	1301	1139	898	996
537:	970	992	902	897	937	1000	1135	964
545:	901	917	860	880	977	872	875	816
553:	930	868	871	870	907	901	779	879
561:	857	929	845	870	910	853	866	851
569:	840	794	861	1007	924	854	845	780
577:	809	858	1169	1429	971	873	943	890
585:	807	812	810	772	787	787	788	784
593:	778	861	799	784	792	863	824	838
601:	761	794	846	840	891	848	3030	36427
609:	70254	18340	1158	687	644	677	744	761
617:	729	663	686	601	677	620	645	651
625:	641	612	611	590	656	603	626	680
633:	711	664	617	608	684	629	659	605
641:	578	630	605	608	597	618	621	642
649:	651	624	586	640	563	603	591	619
657:	591	598	608	635	655	621	640	1424
665:	2627	1245	618	575	618	544	584	577
673:	598	568	533	559	571	552	617	564
681:	561	663	700	641	608	619	592	617
689:	544	544	542	573	571	541	591	603
697:	616	629	635	564	661	1101	1028	718
705:	668	618	614	606	597	596	586	577
713:	571	579	559	518	593	629	943	903
721:	618	599	579	532	559	596	542	568
729:	550	563	559	600	621	625	565	568
737:	573	515	557	646	722	887	721	646
745:	554	570	536	528	549	547	537	697
753:	613	585	561	559	511	543	519	587
761:	559	513	584	575	825	1193	4040	6280
769:	2145	672	570	510	531	552	560	546
777:	533	528	516	552	556	567	566	902
785:	1819	1536	703	545	528	545	530	561
793:	494	511	593	533	564	530	562	565
801:	492	496	548	697	1539	1761	831	541
809:	499	562	536	586	562	566	582	561
817:	546	537	613	685	688	592	540	551
825:	652	694	607	526	532	580	751	734
833:	588	559	504	571	692	1171	1170	618
841:	572	584	521	535	600	558	578	611
849:	517	566	584	617	557	533	543	560
857:	556	570	570	542	562	594	566	559
865:	543	569	547	550	551	588	585	602
873:	568	588	588	563	578	544	590	592
881:	601	601	586	602	574	613	582	585
889:	639	599	579	588	579	582	589	592
897:	609	631	595	586	595	568	655	621
905:	611	574	594	608	577	634	602	594

913:	525	517	568	518	524	517	528	516
921:	518	506	511	555	516	518	496	520
929:	529	499	573	1205	3159	2824	922	515
937:	469	471	510	467	484	487	528	494
945:	486	483	483	463	470	494	466	443
953:	481	458	480	461	468	467	473	482
961:	468	499	797	725	496	464	476	470
969:	518	457	476	450	460	450	457	463
977:	434	511	434	456	414	440	437	433
985:	430	427	415	470	485	461	437	453
993:	435	430	447	462	476	461	522	794
1001:	733	509	429	424	440	426	427	413
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1017:	392	430	438	449	444	440	425	437
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1041:	392	358	375	411	394	403	368	369
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1129:	380	382	345	458	555	421	332	338
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1145:	365	344	318	388	349	360	355	376
1153:	695	1559	1379	594	321	317	320	347
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1225:	314	307	302	284	304	327	301	282
1233:	294	328	479	1873	4418	3548	984	312
1241:	267	286	289	290	259	284	269	262
1249:	261	311	380	455	458	382	310	302
1257:	286	312	278	318	265	270	273	294
1265:	275	279	260	266	295	272	270	310
1273:	282	328	282	279	279	355	745	1243
1281:	890	374	269	251	303	281	268	279
1289:	265	292	261	288	277	259	252	240
1297:	274	273	269	261	297	292	342	280
1305:	249	250	278	247	272	272	263	252
1313:	238	243	288	288	291	225	260	272
1321:	268	253	245	251	249	251	263	238
1329:	287	244	224	245	245	245	285	290
1337:	275	264	276	258	257	232	229	253
1345:	240	239	263	229	255	270	241	252
1353:	259	266	244	247	254	260	247	275
1361:	293	266	241	319	244	236	249	250
1369:	262	248	246	231	257	321	716	2398
1377:	3170	1401	440	260	247	289	395	709
1385:	663	367	241	235	245	260	228	272

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1409:	452	248	262	250	285	277	286	254
1417:	244	250	223	248	259	276	267	274
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1497:	308	301	289	282	250	297	302	263
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1513:	303	279	290	290	267	286	259	286
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1537:	474	486	355	311	332	467	420	281
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1553:	213	204	189	209	212	235	200	207
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1569:	203	181	177	213	222	170	181	187
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1593:	294	314	297	213	241	321	327	201
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1609:	167	152	155	172	157	156	161	154
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1673:	88	99	122	101	106	95	95	121
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1689:	112	142	159	210	178	127	101	88
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1705:	76	73	84	78	68	75	95	88
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1721:	76	69	76	74	117	176	725	1658
1729:	1637	708	172	78	87	84	87	76
1737:	75	75	78	61	90	77	65	84
1745:	63	84	63	70	71	65	65	88
1753:	76	88	82	75	79	89	91	161
1761:	763	3705	7748	6875	2459	451	91	75
1769:	70	64	58	69	64	58	76	60
1777:	75	60	52	44	81	72	63	61
1785:	58	59	65	64	65	55	58	62
1793:	52	70	74	58	58	51	49	67
1801:	62	46	64	51	69	61	72	57
1809:	75	81	65	84	65	62	77	60
1817:	57	64	69	57	59	73	67	83
1825:	56	60	63	72	56	65	64	75
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1849:	109	80	69	75	65	60	60	57
1857:	68	49	60	60	57	63	57	70
1865:	74	66	70	75	84	99	142	177

1873:	119	89	75	69	66	67	73	84
1881:	78	71	65	67	66	63	71	115
1889:	117	105	75	70	78	104	148	109
1897:	87	84	76	77	80	63	67	67
1905:	59	64	60	66	61	77	52	68
1913:	73	82	75	63	54	76	54	64
1921:	41	62	67	68	43	69	62	64
1929:	66	59	79	92	84	134	122	94
1937:	103	80	89	70	63	61	65	55
1945:	73	70	66	62	68	55	64	77
1953:	77	77	62	69	66	76	68	65
1961:	51	69	72	56	60	60	70	63
1969:	79	64	58	46	67	61	51	57
1977:	59	53	50	58	56	48	37	52
1985:	52	52	47	48	45	48	49	59
1993:	63	65	52	50	55	38	40	50
2001:	44	48	36	37	45	36	50	52
2009:	74	74	64	53	54	56	56	81
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2089:	46	33	16	32	25	21	20	23
2097:	26	16	34	31	21	23	24	21
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2113:	30	31	117	315	543	387	143	44
2121:	21	20	22	16	24	26	20	20
2129:	24	25	26	19	20	16	22	22
2137:	26	21	12	18	23	19	17	21
2145:	24	30	27	23	29	27	23	25
2153:	30	25	22	19	26	25	19	25
2161:	15	33	14	21	16	19	17	22
2169:	21	17	29	17	16	22	20	21
2177:	24	14	20	22	20	14	27	19
2185:	21	28	20	16	24	32	44	47
2193:	22	24	12	22	22	22	48	233
2201:	760	1758	1827	989	303	71	31	24
2209:	21	14	23	23	20	3	11	17
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2225:	9	9	8	15	11	10	17	13
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2241:	11	15	20	12	15	11	8	16
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2289:	16	45	104	110	73	35	15	14
2297:	9	8	10	9	8	8	10	7
2305:	10	4	6	4	4	2	5	9
2313:	7	6	8	5	4	3	3	6
2321:	13	5	6	8	6	8	3	9
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2377:	5	2	3	5	3	4	6	4
2385:	5	3	5	2	7	3	3	5
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2401:	3	7	4	3	4	5	5	7
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2417:	4	4	7	3	4	4	5	2
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2521:	2	5	0	0	1	0	3	4
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2537:	3	0	1	2	4	2	3	1
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2553:	4	2	2	2	3	1	2	1
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2577:	1	1	3	0	0	2	1	1
2585:	1	1	4	1	2	0	2	0
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2601:	3	0	3	0	0	1	0	2
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2649:	1	1	0	1	2	1	0	0
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2713:	0	1	2	4	0	2	1	3
2721:	1	2	0	2	4	4	3	2
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2737:	0	0	2	1	1	1	3	0
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2793:	2	0	1	0	1	1	0	2
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2825:	2	1	0	0	0	2	0	2

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2953:	0	1	0	1	0	1	0	0
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2969:	0	0	0	0	0	1	2	3
2977:	5	3	3	0	0	2	0	1
2985:	0	3	1	1	0	0	0	0
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3001:	0	0	0	0	0	0	0	1
3009:	0	0	0	0	0	2	0	0
3017:	0	0	0	1	1	0	1	0
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3041:	0	0	0	0	1	0	0	2
3049:	2	5	2	2	3	0	0	0
3057:	0	0	0	0	0	0	0	1
3065:	1	0	0	0	1	0	0	0
3073:	0	0	0	0	2	0	2	1
3081:	2	1	1	0	0	1	0	1
3089:	1	0	0	0	1	0	0	0
3097:	0	0	0	0	0	0	1	1
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4081:	0	0	0	0	1	0	0	0
4089:	0	0	0	1	0	0	0	0

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

4/11/13

VAX/VMS Peak Search Report Generated 1-APR-2013 07:53:20.13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301206_GE1_GAS1202_190099.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-61-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 06:52:27.
Sample ID : 1303012-06 Sample Quantity : 4.45450E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:37.71 1.0%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	26.63*	376	9066	1.90	26.86	26	5	76.7		
0	46.32*	7484	13215	1.66	46.56	44	5	5.2		PB-210
0	53.42*	1897	15927	1.42	53.65	51	5	20.5		
0	62.99*	1983	22792	1.94	63.22	61	5	23.3		TH-234
0	67.09*	930	24093	1.15	67.32	66	5	50.4		
0	76.16*	54915	40758	3.24	76.39	72	8	1.5		AM-243
0	86.41	4126	21096	1.51	86.64	86	4	10.0		NP-237 SN-126
0	93.09*	1431	16375	2.62	93.32	92	5	27.1		
0	122.80	425	15177	1.61	123.03	121	6	92.2		CO-57
0	143.83*	764	16781	1.52	144.05	142	6	54.2		
0	154.44	1130	19763	1.77	154.67	152	7	41.8		
0	186.08*	13052	18370	1.79	186.31	182	8	4.0		RA-226
0	200.81	341	10078	2.86	201.03	200	5	89.1		
4	235.97	1607	6320	1.30	236.18	233	14	14.6	1.97E+00	
4	238.78*	668	7682	1.61	239.00	233	14	41.6		PB-212
4	241.99*	17794	5848	1.33	242.20	233	14	1.9		RA-224
1	255.94	792	6557	1.78	256.16	253	10	31.4	1.70E+01	
1	258.62	1343	6359	1.79	258.84	253	10	19.0		
6	270.16	3330	10594	2.89	270.38	266	12	11.7	6.77E+00	
6	274.69	864	4659	1.41	274.91	266	12	23.6		
0	285.57	254	5819	4.45	285.78	284	5	91.4		
0	295.19*	39697	8533	1.85	295.40	291	8	1.3		PB-214
0	314.08	368	5333	2.68	314.29	312	6	63.6		
0	323.78	479	4440	1.17	323.99	322	5	42.8		RA-223
0	329.49	426	5376	1.64	329.70	327	6	55.3		LA-140
0	338.64*	260	5335	1.62	338.86	337	6	89.7		
0	351.87*	68048	6472	1.37	352.08	348	8	0.9		PB-214
0	387.63	1104	6179	3.64	387.84	384	9	26.4		
3	401.63	692	3539	1.65	401.84	399	10	26.8	1.85E+00	RN-219
3	405.26	564	3597	1.78	405.46	399	10	33.1		PB-211
0	427.81	439	4452	4.58	428.01	425	7	51.6		
0	454.92	383	2845	1.38	455.12	453	6	45.3		
0	461.92	396	3257	2.11	462.13	459	7	48.9		
0	480.64	601	2871	2.08	480.84	478	7	30.8		
0	487.23	544	2728	1.81	487.43	485	7	33.0		LA-140

AG
4/1/13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	510.87*	948	3850	3.47	511.07	506	11	26.3		
0	534.76	326	2744	4.23	534.96	531	8	56.7		
0	543.51	150	2476	2.87	543.70	541	7	111.4		
4	573.64	174	2469	2.64	573.84	569	18	100.7	2.76E+00	
4	580.15	464	1861	1.89	580.34	569	18	31.2		
4	583.13*	316	2176	2.41	583.33	569	18	51.5		TL-208
0	609.30*	49957	3308	1.98	609.49	603	12	1.0		BI-214
0	616.78	222	1574	3.27	616.97	614	7	60.9		
0	665.42	1302	2253	1.84	665.61	662	9	14.4		
0	702.98	453	1926	1.93	703.17	700	8	34.8		
0	720.02	304	1561	1.51	720.21	717	7	44.7		
0	743.17	190	1744	3.09	743.36	739	8	77.6		
0	768.24	4749	2437	2.03	768.42	762	12	5.1		
0	785.89	1077	1863	1.58	786.07	782	9	15.7		
0	806.12	1079	1837	1.84	806.30	802	9	15.6		
0	821.44	129	1026	1.68	821.62	819	5	76.9		
0	832.04	223	1500	2.14	832.21	829	7	59.1		PB-211
0	839.11	604	1655	1.93	839.29	836	8	24.7		
0	912.02*	142	1457	1.80	912.19	909	7	91.2		
0	934.01*	2685	2143	1.87	934.18	928	12	7.9		
0	964.03	318	1225	1.98	964.20	961	7	38.2		
0	972.45	219	1971	1.43	972.62	968	12	82.2		
1	995.03	64	312	2.00	995.20	994	11	69.5	5.13E+00	
1	998.03	102	1105	2.18	998.20	994	11	112.8		
1	1000.96*	176	1117	2.18	1001.12	994	11	65.1		PA-234M
0	1032.92	110	1060	3.49	1033.09	1030	7	100.5		
0	1052.31	202	1229	1.42	1052.47	1049	8	61.7		
0	1069.60	201	1219	1.81	1069.76	1066	8	61.7		
0	1103.85	130	979	1.87	1104.01	1101	7	81.2		
0	1120.37*	10291	1560	2.10	1120.53	1115	11	2.5		BI-214
0	1133.50	166	1060	1.71	1133.65	1130	8	69.9		
0	1155.28	1158	1420	2.07	1155.44	1150	11	13.9		
0	1181.72	278	1291	3.93	1181.87	1176	12	53.2		
0	1207.72	426	1442	2.29	1207.87	1202	13	38.1		
0	1230.55	66	643	1.75	1230.70	1229	6	123.3		
0	1238.16	3832	1201	2.06	1238.30	1234	10	4.7		
0	1253.37	295	1043	2.88	1253.52	1249	10	42.7		
0	1281.03	959	876	2.04	1281.17	1277	8	12.5		
0	1304.30	133	747	1.68	1304.44	1300	8	73.3		
0	1311.21	83	555	3.91	1311.36	1309	6	92.2		
3	1377.74*	2764	590	1.91	1377.88	1373	18	4.7	6.22E-01	
3	1385.36	442	575	2.07	1385.50	1373	18	19.7		
3	1401.61	851	592	2.04	1401.75	1396	16	11.4	1.20E+00	
3	1408.07	1458	604	1.98	1408.21	1396	16	7.5		
0	1416.56	114	750	1.48	1416.69	1413	8	85.5		
0	1460.78*	918	1081	1.83	1460.92	1456	11	15.3		K-40
0	1509.26	1164	1156	2.03	1509.39	1505	10	12.4		
4	1538.49	316	649	2.18	1538.62	1533	16	28.7	1.62E+00	
4	1543.41	296	528	2.08	1543.54	1533	16	27.7		
0	1557.72	79	500	2.05	1557.85	1555	7	96.8		
0	1583.31	384	736	2.17	1583.43	1579	10	28.4		

Post-NID Peak Search Report (continued)
Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
2	1594.99	168	524	2.24	1595.12	1591	13	47.4	1.20E+00	LA-140
2	1599.05	147	502	2.27	1599.17	1591	13	54.1		
0	1661.24	714	513	2.36	1661.36	1655	13	15.1		
0	1683.93	134	335	2.46	1684.04	1679	10	54.1		
0	1694.28	214	491	4.14	1694.40	1689	16	48.4		
8	1726.05	71	195	3.62	1726.16	1723	11	97.1	1.94E+00	
8	1729.70	1770	152	2.12	1729.82	1723	11	5.3		
0	1764.57*	8456	326	2.29	1764.68	1758	13	2.3		BI-214
0	1838.58	213	229	2.76	1838.69	1833	10	30.0		
0	1847.52	1275	206	2.29	1847.63	1843	10	7.0		
0	1872.56	130	284	2.02	1872.66	1867	12	54.4		
0	1936.18	101	296	3.70	1936.28	1930	12	71.4		
0	2018.72	107	103	2.68	2018.82	2015	10	40.6		
0	2052.44	60	150	3.31	2052.53	2047	13	88.6		
0	2089.77	77	138	10.56	2089.86	2078	18	74.9		
0	2118.75*	481	171	2.32	2118.84	2112	13	14.5		
3	2191.72	41	56	3.11	2191.80	2188	24	67.0	1.58E+00	
3	2204.07*	2270	50	2.45	2204.15	2188	24	4.3		BI-214
0	2293.39	139	24	2.24	2293.47	2288	11	21.9		
0	2447.63	689	16	2.32	2447.69	2441	12	7.9		
0	2483.09	9	5	3.95	2483.15	2479	9	107.4		
0	2497.94	10	0	1.33	2498.00	2494	8	63.2		
0	2505.60	17	2	4.54	2505.66	2502	8	57.0		
0	2577.52	7	0	2.88	2577.57	2574	7	75.6		
0	2614.09*	67	2	2.74	2614.14	2607	12	27.5		TL-208
0	2632.24	9	2	3.65	2632.29	2628	9	92.8		
0	2769.93	9	6	4.09	2769.97	2766	8	118.5		
0	2977.70	11	0	2.96	2977.73	2974	7	60.3		
0	3054.35	5	2	2.70	3054.37	3050	7	133.8		

Summary of Nuclide Activity
Sample ID : 1303012-06

Acquisition date : 1-APR-2013 06:52:27

Total number of lines in spectrum	115	
Number of unidentified lines	64	
Number of lines tentatively identified by NID	51	44.35%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.875E+01	2.875E+01	0.533E+01	18.55	
TL-208	1.41E+10Y	1.00	9.670E-01	9.670E-01	2.578E-01	26.66	
PB-210	22.26Y	1.00	1.151E+02	1.155E+02	0.118E+02	10.24	
PB-211	3.28E+04Y	1.00	2.050E+01	2.050E+01	0.628E+01	30.62	
PB-212	1.41E+10Y	1.00	1.227E+00	1.227E+00	0.580E+00	47.25	
BI-214	1602.00Y	1.00	1.907E+02	1.907E+02	0.100E+02	5.27	
PB-214	1602.00Y	1.00	1.956E+02	1.956E+02	0.320E+02	16.36	
RN-219	3.28E+04Y	1.00	1.260E+01	1.260E+01	0.367E+01	29.14	
RA-223	3.28E+04Y	1.00	1.242E+01	1.242E+01	0.614E+01	49.43	
RA-224	1.41E+10Y	1.00	3.713E+02	3.713E+02	0.852E+02	22.95	
RA-226	1602.00Y	1.00	2.831E+02	2.831E+02	5.193E+02	183.43	
PA-234M	4.47E+09Y	1.00	4.769E+01	4.769E+01	3.136E+01	65.77	
TH-234	4.47E+09Y	1.00	3.051E+01	3.051E+01	0.755E+01	24.76	
			---------	---------			
	Total Activity :		1.311E+03	1.311E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	2.983E-01	3.240E-01	3.012E-01	92.98	
SN-126	1.00E+05Y	1.00	6.343E+00	6.343E+00	0.915E+00	14.43	
NP-237	2.14E+06Y	1.00	1.862E+01	1.862E+01	0.267E+01	14.36	
			---------	---------			
	Total Activity :		2.526E+01	2.528E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
LA-140	12.79D	5.76	9.028E-01	5.200E+00	1.514E+00	29.12	
AM-243	7380.00Y	1.00	4.746E+01	4.746E+01	0.445E+01	9.37	
			---------	---------			
	Total Activity :		4.836E+01	5.266E+01			

Grand Total Activity : 1.384E+03 1.389E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.875E+01	2.875E+01	18.55	OK
	Final Mean for 1 Valid Peaks = 2.875E+01+/- 5.334E+00 (18.55%)						
TL-208	583.14	30.22*	1.055E+00	1.672E+00	1.672E+00	52.61	OK
	860.37	4.48	7.641E-01	----- Line Not Found		-----	Absent
	2614.66	35.85	3.498E-01	9.008E-01	9.008E-01	29.93	OK
	Final Mean for 2 Valid Peaks = 9.670E-01+/- 2.578E-01 (26.66%)						
PB-210	46.50	4.25*	2.577E+00	1.151E+02	1.155E+02	10.24	OK
	Final Mean for 1 Valid Peaks = 1.155E+02+/- 1.182E+01 (10.24%)						
PB-211	404.84	2.90*	1.415E+00	2.316E+01	2.316E+01	35.03	OK
	831.96	2.90	7.856E-01	1.653E+01	1.653E+01	59.89	OK
	Final Mean for 2 Valid Peaks = 2.050E+01+/- 6.275E+00 (30.62%)						
PB-212	238.63	44.60*	2.057E+00	1.227E+00	1.227E+00	47.25	OK
	300.09	3.41	1.767E+00	----- Line Not Found		-----	Absent
	Final Mean for 1 Valid Peaks = 1.227E+00+/- 5.799E-01 (47.25%)						
BI-214	609.31	46.30*	1.017E+00	1.788E+02	1.788E+02	10.73	OK
	1120.29	15.10	6.174E-01	1.860E+02	1.860E+02	9.61	OK
	1764.49	15.80	4.419E-01	2.041E+02	2.041E+02	10.32	OK
	2204.22	4.98	3.841E-01	1.999E+02	2.000E+02	11.76	OK
	Final Mean for 4 Valid Peaks = 1.907E+02+/- 1.005E+01 (5.27%)						
PB-214	295.21	19.19	1.787E+00	1.950E+02	1.951E+02	29.26	OK
	351.92	37.19*	1.574E+00	1.959E+02	1.959E+02	19.73	OK
	Final Mean for 2 Valid Peaks = 1.956E+02+/- 3.200E+01 (16.36%)						
RN-219	401.80	6.50*	1.423E+00	1.260E+01	1.260E+01	29.14	OK
	Final Mean for 1 Valid Peaks = 1.260E+01+/- 3.673E+00 (29.14%)						
RA-223	323.87	3.88*	1.674E+00	1.242E+01	1.242E+01	49.43	OK
	Final Mean for 1 Valid Peaks = 1.242E+01+/- 6.139E+00 (49.43%)						
RA-224	240.98	3.95*	2.045E+00	3.713E+02	3.713E+02	22.95	OK
	Final Mean for 1 Valid Peaks = 3.713E+02+/- 8.520E+01 (22.95%)						
RA-226	186.21	3.28*	2.369E+00	2.831E+02	2.831E+02	183.43	OK
	Final Mean for 1 Valid Peaks = 2.831E+02+/- 5.193E+02 (183.43%)						

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	6.754E-01	4.769E+01	4.769E+01	65.77	OK

Final Mean for 1 Valid Peaks = 4.769E+01+/- 3.136E+01 (65.77%)

TH-234	63.29	3.80*	2.882E+00	3.051E+01	3.051E+01	24.76	OK

Final Mean for 1 Valid Peaks = 3.051E+01+/- 7.554E+00 (24.76%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.806E+00	2.983E-01	3.240E-01	92.98	OK
	136.48	10.60	2.710E+00	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 3.240E-01+/- 3.012E-01 (92.98%)

SN-126	87.57	37.00*	2.963E+00	6.343E+00	6.343E+00	14.43	OK

Final Mean for 1 Valid Peaks = 6.343E+00+/- 9.151E-01 (14.43%)

NP-237	86.50	12.60*	2.964E+00	1.862E+01	1.862E+01	14.36	OK

Final Mean for 1 Valid Peaks = 1.862E+01+/- 2.673E+00 (14.36%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
LA-140	328.77	20.50	1.655E+00	2.115E+00	1.218E+01	60.26	OK
	487.03	45.50	1.222E+00	1.650E+00	9.505E+00	34.90	OK
	815.85	23.50	7.984E-01	-----	Line Not Found	-----	Absent
	1596.49	95.49*	4.734E-01	6.261E-01	3.606E+00	48.51	OK

Final Mean for 3 Valid Peaks = 5.200E+00+/- 1.514E+00 (29.12%)

AM-243	74.67	66.00*	2.955E+00	4.746E+01	4.746E+01	9.37	OK

Final Mean for 1 Valid Peaks = 4.746E+01+/- 4.448E+00 (9.37%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.875E+01	5.334E+00	3.743E+00	3.617E-01	7.680
CO-57	3.240E-01	3.012E-01	3.784E-01	4.204E-02	0.856
SN-126	6.343E+00	9.151E-01	1.071E+00	1.023E-01	5.922
LA-140	5.200E+00	1.514E+00	2.193E+00	2.064E-01	2.371
TL-208	9.670E-01	2.578E-01	1.029E+00	1.045E-01	0.940
PB-210	1.155E+02	1.182E+01	8.306E+00	6.552E-01	13.900
PB-211	2.050E+01	6.275E+00	1.168E+01	1.243E+00	1.755
PB-212	1.227E+00	5.799E-01	7.275E-01	1.602E-01	1.687
BI-214	1.907E+02	1.005E+01	6.919E-01	6.854E-02	275.631
PB-214	1.956E+02	3.200E+01	8.561E-01	1.652E-01	228.493
RN-219	1.260E+01	3.673E+00	5.179E+00	5.507E-01	2.434
RA-223	1.242E+01	6.139E+00	8.132E+00	1.990E+00	1.527
RA-224	3.713E+02	8.520E+01	8.269E+00	1.861E+00	44.905
RA-226	2.831E+02	5.193E+02	1.059E+01	1.942E+01	26.720
PA-234M	4.769E+01	3.136E+01	4.052E+01	3.506E+00	1.177
TH-234	3.051E+01	7.554E+00	9.779E+00	7.260E-01	3.120
NP-237	1.862E+01	2.673E+00	3.202E+00	3.024E-01	5.814
AM-243	4.746E+01	4.448E+00	6.092E-01	5.079E-02	77.907

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	5.067E-01		3.030E+00	4.693E+00	5.023E-01	0.108
NA-22	-2.518E-01		2.672E-01	3.817E-01	3.411E-02	-0.660
AL-26	-1.248E-01		1.511E-01	2.393E-01	2.186E-02	-0.522
TI-44	5.689E-01	+	2.912E-01	4.220E-01	3.279E-02	1.348
SC-46	-1.635E-01		3.030E-01	5.041E-01	4.412E-02	-0.324
V-48	-7.321E-01		1.024E+00	1.502E+00	1.303E-01	-0.487
CR-51	1.741E+00		5.688E+00	7.155E+00	1.808E+00	0.243
MN-54	3.514E-01		3.234E-01	4.025E-01	3.627E-02	0.873
CO-56	2.269E-01		3.193E-01	4.903E-01	4.393E-02	0.463
CO-58	-2.120E-01		3.182E-01	4.727E-01	4.309E-02	-0.448
FE-59	6.405E-01		7.127E-01	1.093E+00	1.002E-01	0.586
CO-60	-9.830E-02		2.545E-01	3.748E-01	3.072E-02	-0.262
ZN-65	1.201E+00		5.967E-01	9.265E-01	7.791E-02	1.297
SE-75	-1.069E-01		5.033E-01	6.322E-01	1.752E-01	-0.169
RB-82	3.977E-01		4.991E+00	6.040E+00	5.551E-01	0.066
RB-83	-4.805E-01		5.542E-01	8.302E-01	1.394E-01	-0.579
KR-85	1.182E+02		4.796E+01	7.442E+01	7.889E+00	1.589
SR-85	7.260E-01		2.945E-01	4.569E-01	4.844E-02	1.589
Y-88	6.848E-01		2.547E-01	4.213E-01	3.827E-02	1.625
NB-93M	-7.147E+01		1.774E+01	2.118E+00	5.124E-01	-33.744
NB-94	5.755E-02		2.224E-01	3.764E-01	3.330E-02	0.153
NB-95	1.153E+01		1.283E+00	1.150E+00	1.060E-01	10.029
ZR-95	-2.025E-01		5.466E-01	8.226E-01	8.268E-02	-0.246
RU-103	2.324E-02		3.461E-01	5.943E-01	9.205E-02	0.039
RU-106	-1.890E+00		2.067E+00	3.071E+00	4.338E-01	-0.616

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-108M	7.760E-02		2.375E-01	3.645E-01	3.379E-02	0.213
CD-109	1.068E+02		1.506E+01	1.274E+01	1.436E+00	8.384
AG-110M	-1.194E-01		2.343E-01	3.536E-01	3.295E-02	-0.338
SN-113	3.793E-01		4.012E-01	6.279E-01	6.790E-02	0.604
TE123M	4.123E-01		3.358E-01	4.935E-01	4.671E-02	0.835
SB-124	3.310E-01		3.138E-01	4.886E-01	4.874E-02	0.678
I-125	-4.580E+00		4.634E+00	7.491E+00	7.038E-01	-0.611
SB-125	1.902E+00	+	1.006E+00	1.239E+00	1.343E-01	1.535
SB-126	6.547E+00	+	2.997E+00	4.024E+00	3.732E-01	1.627
I-129	-1.485E-01		4.346E-01	6.570E-01	7.215E-02	-0.226
I-131	2.011E+00		3.528E+00	6.102E+00	1.020E+00	0.330
BA-133	5.843E-01		3.517E-01	5.252E-01	1.103E-01	1.113
CS-134	7.089E-01		2.472E-01	3.813E-01	3.802E-02	1.859
CS-135	1.125E+01		3.511E+00	2.290E+00	6.533E-01	4.912
CS-136	1.752E-01		1.720E+00	2.585E+00	2.285E-01	0.068
CS-137	4.386E-01		2.473E-01	3.876E-01	3.596E-02	1.132
LA-138	5.537E-02		3.479E-01	5.792E-01	5.464E-02	0.096
CE-139	-8.561E-02		3.098E-01	4.913E-01	4.485E-02	-0.174
BA-140	4.949E+00		5.936E+00	7.184E+00	2.419E+00	0.689
CE-141	1.344E+00		1.025E+00	1.432E+00	3.686E-01	0.939
CE-144	-2.611E+00		2.011E+00	3.149E+00	3.343E-01	-0.829
PM-144	7.175E-02		2.186E-01	3.362E-01	3.125E-02	0.213
PM-145	-1.563E-01		9.384E-01	1.525E+00	9.935E-01	-0.103
PM-146	1.263E+00	+	5.902E-01	8.406E-01	9.014E-02	1.502
ND-147	7.525E+00		1.168E+01	1.817E+01	1.912E+00	0.414
EU-152	3.188E+01	+	4.568E+00	4.712E+00	5.446E-01	6.766
GD-153	-4.586E-01		8.899E-01	1.423E+00	1.449E-01	-0.322
EU-154	-3.703E-01		7.261E-01	1.057E+00	9.448E-02	-0.350
EU-155	7.686E+00	+	1.103E+00	1.427E+00	1.348E-01	5.384
EU-156	-4.324E+00		9.628E+00	1.434E+01	3.302E+00	-0.302
HO-166M	-5.540E-01		5.033E-01	5.794E-01	5.376E-02	-0.956
HF-172	-1.157E+00		1.915E+00	2.803E+00	3.068E-01	-0.413
LU-172	5.554E-01		9.918E+00	1.662E+01	1.407E+00	0.033
LU-173	1.067E+01		3.353E+00	1.870E+00	5.505E-01	5.707
HF-175	9.644E-02		4.315E-01	5.412E-01	1.134E-01	0.178
LU-176	-2.557E-01		2.268E-01	3.327E-01	9.066E-02	-0.769
TA-182	9.796E+01	+	9.414E+00	4.693E+00	3.933E-01	20.875
IR-192	-1.558E-01		5.754E-01	8.852E-01	9.486E-02	-0.176
HG-203	-1.058E-01		5.385E-01	6.749E-01	2.105E-01	-0.157
BI-207	-6.920E-02		2.053E-01	3.132E-01	3.216E-02	-0.221
BI-210M	8.169E-01		5.932E-01	7.114E-01	1.928E-01	1.148
BI-212	-2.939E-01		1.785E+00	2.708E+00	2.510E-01	-0.109
RA-225	-4.220E-01		3.140E+00	4.738E+00	4.082E-01	-0.089
TH-227	1.137E+01	+	2.990E+00	3.185E+00	6.842E-01	3.570
AC-228	1.187E+00	+	1.088E+00	1.467E+00	1.278E-01	0.809
TH-230	1.451E+02	+	7.426E+01	1.076E+02	8.341E+00	1.349
PA-231	2.451E+01		1.181E+01	1.429E+01	3.984E+00	1.715
TH-231	2.738E+00	+	2.131E+00	2.995E+00	3.863E-01	0.914

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-233	5.290E-01		1.308E+00	1.873E+00	6.294E-01	0.282
PA-234	1.996E-01		9.572E-01	1.532E+00	1.642E-01	0.130
U-235	4.608E+00	+	2.641E+00	3.298E+00	6.043E-01	1.397
AM-241	4.246E+00		7.485E-01	1.037E+00	7.426E-02	4.095
CM-243	-4.788E-01		1.623E+00	2.322E+00	7.138E-01	-0.206

Sample ID : 1303012-06 Acquisition date : 1-APR-2013 06:52:27

Total number of lines in spectrum	115	
Number of unidentified lines	64	
Number of lines tentatively identified by NID	51	44.35%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.875E+01	2.875E+01	0.533E+01	18.55	
TL-208	1.41E+10Y	1.00	9.670E-01	9.670E-01	2.578E-01	26.66	
PB-210	22.26Y	1.00	1.151E+02	1.155E+02	0.118E+02	10.24	
PB-211	3.28E+04Y	1.00	2.050E+01	2.050E+01	0.628E+01	30.62	
PB-212	1.41E+10Y	1.00	1.227E+00	1.227E+00	0.580E+00	47.25	
BI-214	1602.00Y	1.00	1.907E+02	1.907E+02	0.100E+02	5.27	
PB-214	1602.00Y	1.00	1.956E+02	1.956E+02	0.320E+02	16.36	
RN-219	3.28E+04Y	1.00	1.260E+01	1.260E+01	0.367E+01	29.14	
RA-223	3.28E+04Y	1.00	1.242E+01	1.242E+01	0.614E+01	49.43	
RA-224	1.41E+10Y	1.00	3.713E+02	3.713E+02	0.852E+02	22.95	
RA-226	1602.00Y	1.00	2.831E+02	2.831E+02	5.193E+02	183.43	
PA-234M	4.47E+09Y	1.00	4.769E+01	4.769E+01	3.136E+01	65.77	
TH-234	4.47E+09Y	1.00	3.051E+01	3.051E+01	0.755E+01	24.76	
			---------	---------			
	Total Activity :		1.311E+03	1.311E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	2.983E-01	3.240E-01	3.012E-01	92.98	
SN-126	1.00E+05Y	1.00	6.343E+00	6.343E+00	0.915E+00	14.43	
NP-237	2.14E+06Y	1.00	1.862E+01	1.862E+01	0.267E+01	14.36	
			---------	---------			
	Total Activity :		2.526E+01	2.528E+01			

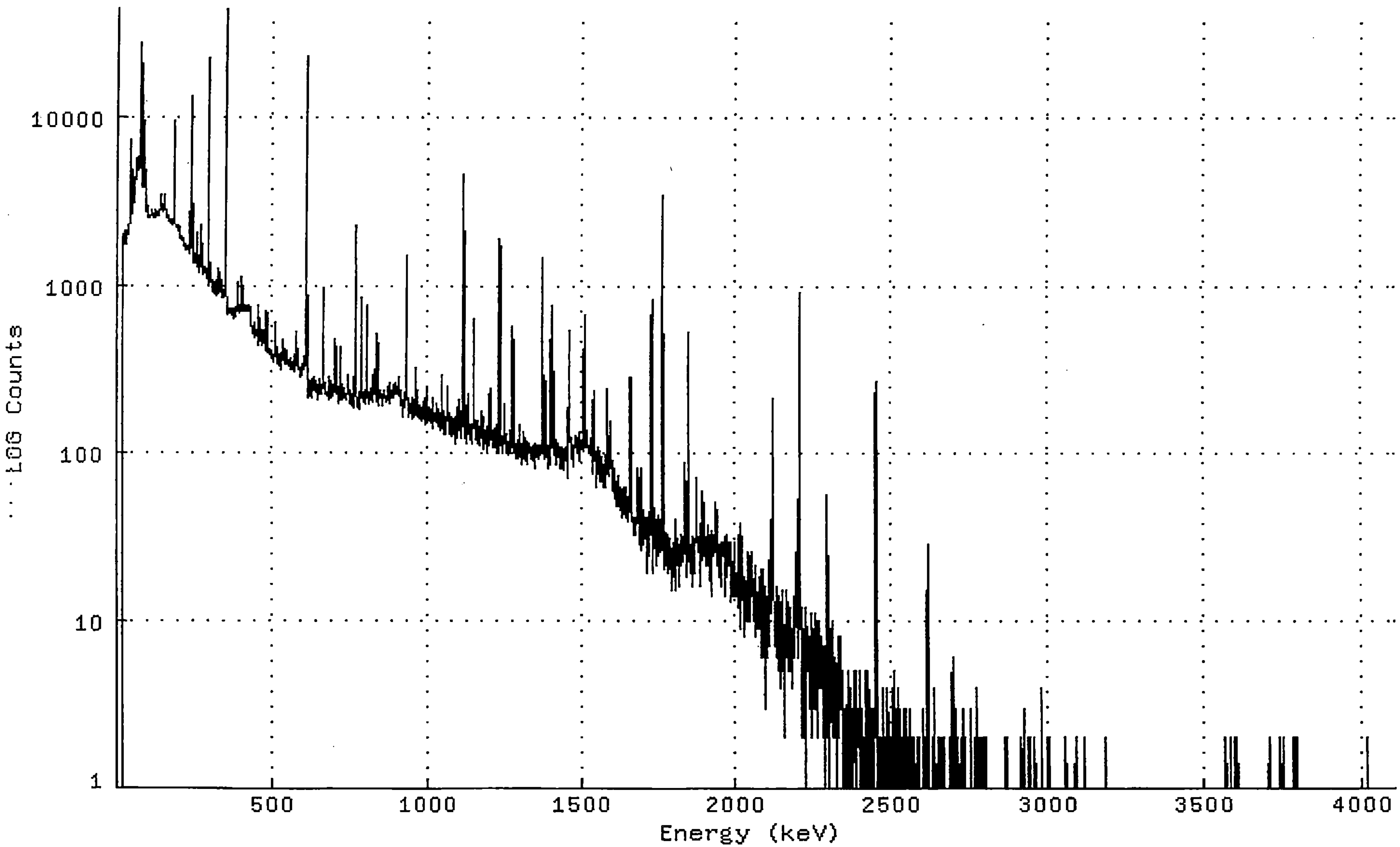
Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
LA-140	12.79D	5.76	9.028E-01	5.200E+00	1.514E+00	29.12	
AM-243	7380.00Y	1.00	4.746E+01	4.746E+01	0.445E+01	9.37	
			---------	---------			
	Total Activity :		4.836E+01	5.266E+01			

Grand Total Activity : 1.384E+03 1.389E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301206_GE1_GAS1202_190099.CNF;1
Title :
Sample Title: S30-61-130228
Start Time: 1-APR-2013 06:52: Sample Time: 28-FEB-2013 00:00 Energy Offset: -2.35223E-01
Real Time : 0 01:00:37.71 Sample ID : 1303012-06 Energy Slope : 1.00007E+00
Live Time : 0 01:00:00.00 Sample Type: SOLID Energy Quad : 0.00000E+00



0145

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301206_GE1_GAS1202_1900

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	1	1338	1898	1847	1955	1831	1745
25:	1797	1860	2053	1983	1832	1725	1882	2059
33:	1922	1874	1998	2044	2180	2007	2142	2241
41:	2317	2353	2517	2620	2759	5506	7225	2644
49:	2761	3521	3119	3031	4715	3916	3049	3136
57:	3358	3712	3992	4319	4521	4700	5582	5493
65:	4596	4711	5023	5714	4787	4794	5063	4946
73:	5396	7887	20157	9200	27435	15520	5151	5221
81:	5436	4279	3805	7355	4043	3801	9289	8321
89:	3811	6076	3784	3440	4485	3493	3878	2660
97:	2678	2909	2755	2543	2517	2548	2537	2578
105:	2516	2480	2519	2490	2567	2612	2598	2612
113:	2735	2638	2520	2624	2515	2492	2487	2488
121:	2518	2611	2744	2604	2596	2529	2568	2639
129:	2666	2656	2589	2583	2579	2674	2593	2581
137:	2753	2712	2754	2829	2805	2778	2781	3415
145:	3136	2702	2752	2849	2848	2894	2956	2967
153:	2850	3424	3299	2774	2822	2757	2690	2609
161:	2629	2510	2544	2551	2498	2373	2486	2358
169:	2390	2431	2301	2398	2330	2382	2362	2310
177:	2268	2354	2317	2429	2362	2418	2416	2382
185:	3045	9478	7239	2321	2187	2236	2261	2229
193:	2265	2206	2233	2210	2259	2194	2076	2151
201:	2163	2167	2061	1877	2030	1983	1861	1918
209:	1819	1866	1930	1843	1704	1771	1764	1762
217:	1842	1702	1647	1699	1644	1747	1615	1704
225:	1658	1650	1646	1660	1586	1598	1608	1599
233:	1640	1532	1669	2666	1989	1629	1942	1625
241:	2820	13320	6091	1468	1370	1333	1388	1336
249:	1348	1335	1409	1352	1341	1349	1374	1680
257:	1657	1404	2008	1467	1258	1249	1199	1221
265:	1220	1160	1178	1222	1835	2256	1988	1739
273:	1246	1403	1713	1300	1133	1185	1132	1140
281:	1242	1203	1182	1265	1207	1249	1217	1135
289:	1116	1075	1165	1150	1172	2516	21984	17667
297:	1608	981	1033	1334	1115	1012	1160	1026
305:	1043	949	894	936	949	932	898	875
313:	991	1017	1021	885	912	869	932	898
321:	850	924	898	1237	972	887	890	887
329:	1041	1162	934	888	915	972	1001	900
337:	855	1046	1014	842	930	914	881	849
345:	933	834	876	901	1060	1154	9372	44849
353:	15484	1003	713	745	714	665	666	665
361:	686	667	707	674	687	715	678	651
369:	707	664	709	712	649	692	705	621
377:	708	704	721	705	682	653	696	645
385:	735	829	1013	832	1034	812	703	680
393:	719	730	721	685	694	715	685	694
401:	843	1122	810	763	969	952	771	698
409:	757	726	698	755	705	725	697	735
417:	687	713	705	751	720	738	740	707
425:	702	732	744	738	700	678	597	578

433:	585	539	511	555	533	565	565	500
441:	480	538	530	501	589	515	513	507
449:	501	508	531	530	447	560	743	539
457:	507	432	497	453	555	620	542	492
465:	494	438	467	471	473	534	466	520
473:	441	484	528	448	460	397	455	641
481:	685	477	416	401	393	429	680	583
489:	404	399	384	385	413	410	406	371
497:	401	377	395	365	375	384	349	368
505:	344	367	378	375	451	594	598	540
513:	442	404	411	331	360	342	344	371
521:	327	339	348	380	383	346	356	375
529:	389	333	354	313	414	474	376	365
537:	421	353	332	345	346	361	403	408
545:	395	356	357	363	333	336	328	346
553:	324	350	326	337	351	313	334	361
561:	318	345	340	337	316	325	319	312
569:	303	317	323	317	378	347	351	354
577:	325	345	356	525	492	332	407	411
585:	352	308	315	317	292	305	304	278
593:	298	314	311	335	287	310	326	331
601:	328	306	312	349	367	326	393	2605
609:	22616	23063	2493	297	248	211	264	310
617:	268	271	256	216	227	232	233	245
625:	207	269	256	245	263	265	238	252
633:	275	238	250	235	246	243	247	266
641:	248	228	251	213	206	230	243	212
649:	270	260	218	231	227	232	229	234
657:	228	220	253	235	278	293	237	307
665:	795	953	292	224	235	219	232	231
673:	224	215	228	215	219	224	213	216
681:	224	240	278	243	205	245	261	247
689:	224	209	228	226	220	225	216	230
697:	248	236	230	225	240	299	468	386
705:	280	243	238	264	219	233	244	195
713:	219	215	209	234	220	204	285	421
721:	294	232	209	231	203	207	250	235
729:	208	219	216	239	209	223	203	216
737:	220	220	210	207	231	268	284	273
745:	239	222	219	193	223	196	204	214
753:	231	217	195	218	189	218	212	182
761:	204	215	215	245	245	316	475	2107
769:	2229	506	229	195	209	184	191	211
777:	203	222	207	225	196	179	210	210
785:	368	823	486	215	224	225	222	228
793:	197	202	222	226	195	191	219	229
801:	213	198	231	211	291	756	571	254
809:	197	207	199	191	226	199	238	224
817:	220	214	206	203	264	286	196	208
825:	247	239	241	223	218	223	249	311
833:	303	210	209	210	196	296	511	399
841:	236	223	188	222	233	233	214	226
849:	207	223	219	221	208	207	188	218
857:	216	226	219	231	211	207	210	216
865:	196	212	211	207	205	204	218	232
873:	242	222	225	256	194	211	227	226
881:	209	225	227	235	224	217	224	207
889:	250	224	210	222	231	248	239	231
897:	251	253	255	218	234	220	228	244
905:	247	243	237	248	221	217	281	270

913:	198	230	188	191	206	191	193	203
921:	186	193	187	159	198	213	188	184
929:	199	228	210	216	494	1467	994	268
937:	202	209	159	184	182	175	187	194
945:	191	183	168	176	183	169	187	180
953:	211	166	158	194	174	177	202	162
961:	196	172	203	311	319	177	165	179
969:	233	195	169	169	195	159	184	189
977:	188	171	159	157	154	164	176	183
985:	168	169	173	201	184	186	169	158
993:	167	144	190	169	172	207	183	184
1001:	246	193	171	149	173	153	183	157
1009:	174	178	161	158	178	173	175	155
1017:	154	138	161	180	209	153	165	163
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1033:	191	168	172	147	153	156	140	178
1041:	153	133	151	169	149	169	142	164
1049:	136	146	189	285	195	158	163	159
1057:	154	128	142	144	136	150	129	163
1065:	161	147	178	152	202	246	184	164
1073:	147	155	170	138	129	152	143	127
1081:	124	159	144	145	155	137	138	133
1089:	146	129	134	142	137	138	112	153
1097:	171	157	132	127	122	141	165	202
1105:	172	161	146	158	134	148	131	143
1113:	122	175	137	140	142	202	979	4375
1121:	4491	946	189	121	132	124	145	111
1129:	134	125	144	140	166	219	171	133
1137:	128	142	144	125	143	144	131	146
1145:	117	135	116	111	135	128	135	133
1153:	158	233	621	568	196	140	131	135
1161:	119	144	137	153	124	129	112	152
1169:	142	147	108	137	133	141	109	110
1177:	132	120	134	128	125	174	151	116
1185:	143	133	103	109	117	131	118	133
1193:	135	122	112	112	115	117	142	112
1201:	99	124	120	130	146	109	207	237
1209:	172	118	128	137	124	116	105	116
1217:	108	133	127	131	137	119	127	107
1225:	110	127	127	116	100	139	147	108
1233:	117	98	115	133	600	1890	1497	343
1241:	120	108	129	131	118	113	105	98
1249:	119	112	113	145	174	194	151	123
1257:	110	97	105	128	120	112	106	112
1265:	95	108	107	111	119	122	135	107
1273:	99	110	115	109	110	105	121	285
1281:	563	391	162	98	121	116	100	102
1289:	90	96	106	111	105	110	118	105
1297:	108	91	108	92	100	109	113	146
1305:	115	112	93	83	95	112	110	114
1313:	108	99	91	127	131	112	105	92
1321:	114	88	91	109	108	93	85	97
1329:	116	112	106	99	106	112	110	105
1337:	107	107	98	91	104	91	90	92
1345:	93	110	107	88	90	102	80	96
1353:	111	100	108	104	103	106	93	106
1361:	109	90	97	104	92	103	91	99
1369:	109	106	96	101	100	98	99	202
1377:	858	1445	624	133	95	98	91	147
1385:	277	252	150	100	116	94	96	106

1393:	80	105	109	86	99	101	83	147
1401:	380	464	245	116	105	129	353	752
1409:	571	155	95	109	102	103	119	141
1417:	98	110	108	83	87	105	113	92
1425:	109	111	98	93	107	105	80	93
1433:	96	86	89	94	80	107	101	87
1441:	87	94	89	103	78	86	88	88
1449:	103	105	102	102	104	70	84	80
1457:	106	104	119	292	534	299	118	115
1465:	123	117	108	104	121	105	97	82
1473:	108	96	104	95	92	115	116	113
1481:	111	124	114	121	109	108	100	103
1489:	104	89	115	130	119	108	103	103
1497:	106	112	119	104	112	109	107	118
1505:	105	114	100	259	665	514	202	132
1513:	124	105	133	111	116	110	114	106
1521:	108	106	99	109	104	108	105	116
1529:	117	110	98	121	74	98	95	108
1537:	111	181	231	138	88	120	206	197
1545:	112	92	94	87	80	61	76	80
1553:	107	74	77	82	94	100	74	82
1561:	70	67	67	82	72	92	66	73
1569:	81	79	83	61	70	64	80	69
1577:	62	72	72	69	78	121	238	203
1585:	112	77	74	76	74	75	82	75
1593:	72	102	154	112	79	88	138	107
1601:	75	71	72	66	59	76	68	79
1609:	53	65	78	58	67	47	53	65
1617:	64	54	67	71	47	51	52	64
1625:	53	53	45	58	58	61	62	52
1633:	42	55	54	60	41	44	62	46
1641:	53	55	51	49	61	58	41	46
1649:	43	52	54	45	52	44	38	47
1657:	59	56	51	127	281	281	111	41
1665:	43	48	44	32	35	32	35	38
1673:	41	35	37	32	41	39	34	41
1681:	41	39	57	80	71	41	33	32
1689:	30	28	51	66	76	80	70	38
1697:	27	26	35	28	45	40	34	31
1705:	30	39	30	40	38	32	36	37
1713:	40	37	19	41	28	31	40	30
1721:	44	33	24	42	35	37	52	138
1729:	543	806	347	71	19	27	31	30
1737:	46	32	27	31	37	33	39	31
1745:	35	21	24	28	42	28	31	24
1753:	38	28	39	27	29	25	38	26
1761:	34	110	730	2714	3440	1401	184	29
1769:	27	26	20	27	22	29	27	33
1777:	25	21	21	20	20	26	19	32
1785:	20	22	30	24	25	26	27	20
1793:	22	21	19	15	23	28	18	29
1801:	23	27	23	39	18	15	23	34
1809:	24	22	27	22	26	30	27	16
1817:	28	27	25	22	19	23	30	32
1825:	22	27	29	23	26	30	28	31
1833:	22	27	28	31	55	83	87	50
1841:	41	18	21	20	30	147	452	517
1849:	189	61	22	22	21	28	26	23
1857:	25	22	16	22	31	23	23	24
1865:	30	19	22	25	28	30	29	40

1873:	70	52	35	29	28	26	27	29
1881:	31	25	29	25	37	16	21	33
1889:	29	59	44	28	25	23	48	50
1897:	44	26	38	24	31	23	23	21
1905:	25	31	23	30	29	21	21	29
1913:	36	25	23	29	18	32	17	18
1921:	21	14	34	22	29	32	27	25
1929:	27	24	26	33	25	31	43	45
1937:	50	42	23	32	23	25	28	24
1945:	18	23	23	28	22	26	29	28
1953:	28	16	17	29	25	29	24	29
1961:	25	25	24	27	22	14	22	31
1969:	18	24	23	27	32	29	24	27
1977:	22	21	23	29	29	19	19	16
1985:	26	13	19	18	14	17	22	14
1993:	17	29	21	17	16	18	14	16
2001:	19	17	19	14	19	16	16	16
2009:	12	31	29	36	23	14	9	33
2017:	37	26	19	21	17	19	21	8
2025:	11	12	11	16	13	18	16	17
2033:	14	12	15	10	12	22	16	10
2041:	15	25	16	10	24	11	12	15
2049:	14	15	17	23	25	24	13	14
2057:	10	17	10	13	8	14	18	21
2065:	11	9	14	10	13	11	12	9
2073:	12	18	9	15	12	10	12	11
2081:	9	6	11	20	12	11	6	13
2089:	18	19	20	13	5	13	6	3
2097:	15	6	12	10	10	12	14	11
2105:	18	20	7	10	23	23	21	13
2113:	16	11	12	21	75	163	208	83
2121:	18	15	11	7	12	8	7	10
2129:	16	9	9	6	8	6	14	10
2137:	5	12	9	12	11	12	13	4
2145:	5	5	7	15	6	10	5	8
2153:	7	5	9	2	9	5	8	11
2161:	15	9	6	6	6	10	5	10
2169:	10	8	13	8	12	5	8	10
2177:	7	8	5	4	9	6	8	8
2185:	11	8	10	6	14	12	16	25
2193:	17	13	10	8	6	7	11	17
2201:	26	105	463	896	638	171	30	9
2209:	10	10	2	10	12	5	9	6
2217:	7	7	5	2	9	10	2	5
2225:	0	12	7	6	6	6	5	8
2233:	5	3	5	4	4	8	6	11
2241:	4	2	6	9	4	9	4	4
2249:	4	8	3	6	3	4	4	11
2257:	5	2	6	9	10	3	4	8
2265:	8	9	10	4	6	8	6	8
2273:	4	7	5	6	4	2	6	7
2281:	5	7	6	4	1	2	4	2
2289:	3	4	8	22	56	43	14	5
2297:	5	1	2	4	4	9	3	3
2305:	5	3	2	2	5	5	6	10
2313:	2	6	3	5	2	2	3	4
2321:	2	1	4	4	8	3	4	2
2329:	2	6	8	5	4	3	5	5
2337:	4	4	5	2	4	3	0	2
2345:	1	3	3	3	0	2	2	3

2353:	1	1	2	5	3	1	3	3
2361:	0	1	4	0	2	2	0	3
2369:	3	3	2	1	2	4	4	2
2377:	4	2	5	2	0	5	3	2
2385:	2	0	3	2	3	2	3	2
2393:	4	3	3	5	2	1	1	2
2401:	1	1	2	3	0	0	1	1
2409:	2	1	0	5	1	4	0	1
2417:	4	2	3	1	1	4	5	3
2425:	1	2	3	2	0	0	2	2
2433:	3	1	2	1	3	1	3	2
2441:	2	3	2	5	17	69	198	265
2449:	110	32	2	0	1	0	0	2
2457:	1	1	0	0	1	1	1	2
2465:	0	1	3	4	0	2	1	0
2473:	2	0	0	0	1	0	0	1
2481:	2	2	2	4	2	1	0	2
2489:	1	2	2	1	0	0	0	2
2497:	2	1	4	1	0	0	3	0
2505:	5	5	5	1	0	1	1	1
2513:	1	2	3	0	2	1	0	1
2521:	4	0	0	0	3	0	0	0
2529:	0	2	1	1	2	0	3	3
2537:	1	1	1	2	0	0	3	1
2545:	1	0	1	2	0	1	2	1
2553:	2	0	1	3	2	1	1	1
2561:	0	2	0	0	0	1	0	0
2569:	0	2	0	0	0	0	1	0
2577:	2	2	2	0	0	1	2	0
2585:	1	1	1	0	0	1	1	0
2593:	1	1	1	2	3	1	2	1
2601:	2	0	2	2	0	0	0	2
2609:	1	1	2	2	8	28	15	15
2617:	1	0	1	1	0	0	1	0
2625:	0	0	0	0	0	2	2	1
2633:	4	1	1	0	1	0	1	1
2641:	1	0	0	0	2	0	1	0
2649:	2	1	0	2	0	0	1	0
2657:	2	0	0	0	0	0	2	0
2665:	1	2	1	0	0	0	0	1
2673:	0	0	0	1	1	0	0	0
2681:	0	1	0	0	2	1	1	1
2689:	0	1	1	1	4	6	3	1
2697:	1	0	3	0	3	0	2	0
2705:	1	0	1	0	0	2	2	0
2713:	0	1	1	0	1	2	2	0
2721:	0	0	2	1	1	0	2	3
2729:	1	0	2	0	0	2	1	0
2737:	0	0	0	0	1	1	0	0
2745:	0	0	0	1	1	0	0	0
2753:	3	1	0	0	0	0	0	0
2761:	0	2	0	0	1	0	2	3
2769:	1	4	4	1	0	2	0	0
2777:	1	0	1	0	1	1	0	0
2785:	2	2	0	1	0	0	0	2
2793:	1	0	0	0	0	0	0	0
2801:	2	0	1	0	0	0	1	1
2809:	0	0	0	1	0	0	1	0
2817:	0	1	0	0	0	0	1	1
2825:	0	0	0	0	1	1	1	0

2833:	0	0	0	0	0	1	1	0
2841:	0	1	0	0	0	0	0	0
2849:	0	0	0	0	0	0	0	0
2857:	1	0	0	0	0	0	0	2
2865:	0	0	0	2	1	1	0	0
2873:	0	1	0	1	0	0	0	1
2881:	0	1	1	0	0	1	0	0
2889:	1	1	0	1	0	1	1	0
2897:	1	0	0	0	0	1	0	0
2905:	0	0	1	1	0	0	2	0
2913:	0	1	0	0	0	1	0	0
2921:	3	2	1	1	0	1	0	0
2929:	0	0	0	0	0	0	0	0
2937:	2	1	0	0	2	1	0	0
2945:	1	0	1	0	0	0	0	1
2953:	0	0	0	0	2	0	0	1
2961:	1	0	0	0	0	0	0	0
2969:	0	0	0	1	0	0	0	1
2977:	4	3	3	0	0	0	0	0
2985:	0	1	0	0	0	0	0	0
2993:	0	0	0	0	0	1	2	1
3001:	2	0	0	0	0	1	0	0
3009:	0	1	1	0	0	0	1	0
3017:	0	0	0	1	0	0	0	0
3025:	1	0	0	0	0	0	0	0
3033:	0	1	0	0	1	0	0	1
3041:	0	0	0	0	0	1	0	0
3049:	0	0	0	0	2	2	2	0
3057:	1	0	0	0	0	0	1	0
3065:	1	0	1	0	0	0	0	0
3073:	0	0	0	0	0	0	0	1
3081:	1	0	1	1	0	0	2	0
3089:	0	0	0	0	1	0	0	0
3097:	0	0	0	0	0	0	0	1
3105:	0	0	0	0	1	0	0	1
3113:	1	0	2	0	0	0	0	0
3121:	0	0	0	1	0	0	0	0
3129:	0	0	0	0	0	0	0	1
3137:	0	1	0	0	1	0	0	0
3145:	1	0	0	1	0	0	0	0
3153:	0	0	1	0	0	0	1	0
3161:	0	0	0	0	0	0	0	0
3169:	0	0	0	0	1	0	0	0
3177:	0	0	0	0	2	0	0	0
3185:	0	0	0	0	0	0	0	0
3193:	0	0	1	0	0	1	1	0
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	1	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	0	0	0	0	0	0	1	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	1	1	0	0	0	0
3257:	0	0	0	1	0	0	0	1
3265:	0	0	1	0	0	0	0	1
3273:	0	0	1	0	0	0	0	0
3281:	1	1	0	0	0	0	0	0
3289:	0	1	0	0	0	0	0	0
3297:	0	0	1	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	0	0	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	1	0	0	0
3345:	0	0	1	0	0	0	0	0
3353:	0	1	0	0	0	0	1	0
3361:	0	0	0	1	0	0	1	0
3369:	0	0	1	1	0	0	0	0
3377:	0	0	0	0	0	0	0	0
3385:	0	0	0	0	0	0	0	0
3393:	0	0	0	0	0	0	0	1
3401:	1	0	0	1	0	0	0	0
3409:	0	0	0	0	1	0	1	1
3417:	0	0	0	0	0	1	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	0	0	1	0	0	0	0
3441:	0	0	0	0	1	0	0	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	0	0	0	0	0
3465:	0	0	1	0	0	0	0	0
3473:	0	0	0	0	0	0	0	0
3481:	0	0	0	0	0	1	1	0
3489:	0	0	0	0	0	0	0	1
3497:	0	0	0	0	1	0	0	1
3505:	0	0	0	0	0	0	1	0
3513:	0	0	0	0	0	0	0	0
3521:	1	0	0	0	1	0	0	0
3529:	0	0	0	0	0	1	0	0
3537:	1	0	0	0	0	0	0	0
3545:	0	0	0	1	0	0	0	0
3553:	1	0	0	0	0	0	0	0
3561:	0	1	0	2	0	0	0	0
3569:	0	0	0	0	1	0	0	0
3577:	0	0	0	2	0	0	0	0
3585:	0	0	0	0	0	0	0	1
3593:	2	0	0	0	0	0	0	0
3601:	2	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	0
3625:	1	0	0	0	1	0	0	0
3633:	0	0	1	0	0	1	0	0
3641:	0	0	0	0	1	0	0	0
3649:	0	0	0	1	0	0	0	0
3657:	0	0	0	0	0	0	1	0
3665:	0	0	1	0	0	0	0	1
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	1
3689:	0	1	0	0	0	0	0	0
3697:	1	0	0	0	2	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	1	0	0	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	2	0	0	0	1
3737:	0	0	0	0	0	0	2	1
3745:	0	0	0	0	0	0	0	1
3753:	0	0	0	1	0	0	0	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	2
3777:	0	0	0	0	2	0	0	0
3785:	0	2	0	0	0	0	0	0

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	1	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	1	0	0	0	1	0
3849:	1	0	0	0	0	0	0	0
3857:	1	0	0	0	0	1	1	0
3865:	0	0	0	0	0	0	1	0
3873:	0	1	0	0	0	0	0	0
3881:	0	0	0	0	0	1	0	0
3889:	0	0	0	0	1	0	0	1
3897:	0	0	1	0	0	0	0	0
3905:	1	0	0	0	0	0	0	0
3913:	0	0	0	0	0	1	0	0
3921:	1	1	0	0	0	0	0	0
3929:	1	0	1	0	0	0	0	0
3937:	0	1	0	0	1	0	0	0
3945:	0	0	1	0	0	1	0	0
3953:	0	1	0	0	0	0	0	0
3961:	0	1	0	0	0	0	0	0
3969:	0	0	0	0	0	0	1	0
3977:	1	0	0	0	0	0	1	0
3985:	0	0	0	1	0	1	0	1
3993:	0	1	1	0	0	0	0	0
4001:	0	1	0	0	0	0	0	1
4009:	0	2	0	0	0	0	1	0
4017:	0	0	0	0	1	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	1	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	1	0	0	0	0
4057:	0	0	0	0	0	0	1	0
4065:	1	0	0	1	0	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	1	0	0	1	0	0	0	1

Sample ID : 1303012-07 Acquisition date : 1-APR-2013 06:53:21

VAX/VMS Peak Search Report Generated 1-APR-2013 07:54:35.56

4/1/13

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301207_GE2_GAS1202_190100.		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: S30-69-130228		
Deposition Date	:		
Sample Date	: 28-FEB-2013 00:00:00	Acquisition date	: 1-APR-2013 06:53:21.
Sample ID	: 1303012-07	Sample Quantity	: 5.27020E+02 GRAM
Sample type	: SOLID	Sample Geometry	: 0
Detector name	: GE2	Detector Geometry	: GAS-1202
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:58.73 1.6%
Start channel	: 5	End channel	: 4096
Sensitivity	: 2.50000	Gaussian	: 15.00000
Critical level	: Yes		

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	26.62	513	17967	1.48	26.74	25	5	78.9		
0	31.98	478	14783	0.95	32.09	30	4	72.4		
0	45.92*	6927	25914	1.70	46.04	45	4	6.7		PB-210
0	52.73*	4530	37020	1.25	52.84	50	6	13.7		
0	62.68*	5578	56061	1.26	62.80	61	6	13.7		TH-234
1	67.81	2905	36436	1.47	67.92	66	17	18.8	5.85E+03	
1	70.89	1275	36036	1.34	71.00	66	17	42.6		
1	75.02*	43377	35200	1.48	75.13	66	17	1.6		AM-243
0	87.94*	6567	50510	1.11	88.06	85	5	10.6		NP-237 SN-126 CD-109
0	93.49	7817	41033	1.68	93.61	91	6	8.6		
0	112.22	1087	32183	1.58	112.33	110	6	52.6		
0	121.74	528	30986	1.45	121.85	120	6	105.7		CO-57
0	143.71*	2302	27785	1.25	143.82	142	5	22.1		U-235
0	153.98	1893	33933	1.18	154.09	152	6	31.2		
0	185.86*	27982	36022	1.33	185.98	182	8	2.6		RA-226
0	195.79	558	21251	2.02	195.91	194	5	78.9		
0	205.40*	785	18590	1.45	205.51	204	5	52.8		U-235
0	225.50	319	16052	1.52	225.61	223	5	119.7		
2	236.08	3186	18228	1.88	236.19	232	15	13.6	2.48E+01	
2	241.69	32839	11259	1.37	241.80	232	15	1.4		RA-224
1	256.05	1541	12420	1.73	256.16	253	10	22.5	2.17E+01	
1	258.82	2476	12106	1.74	258.93	253	10	14.2		
6	269.77	5273	18351	2.82	269.88	266	12	9.3	3.51E+01	
6	274.30	1605	11415	1.69	274.41	266	12	20.8		
0	284.94	736	13049	3.76	285.05	283	6	49.7		PA-231
0	294.86*	71887	16547	1.34	294.97	291	8	1.0		PB-214
0	299.53	521	10264	1.12	299.64	299	5	59.0		
0	303.95	338	9382	3.71	304.06	303	5	87.0		PA-231
0	313.78	554	8776	2.87	313.89	312	5	51.5		
0	323.39	696	10340	1.80	323.49	321	6	46.8		RA-223
0	329.00	446	8817	1.41	329.11	328	5	63.8		
0	338.04	387	8506	1.21	338.14	336	5	72.4		
0	351.50*	124442	15682	1.82	351.61	346	10	0.7		PB-214
0	361.72	242	6552	1.57	361.82	360	5	101.2		

AG 4/1/13

Post-NID Peak Search Report (continued)
Sample ID : 1303012-07

Acquisition date : 1-APR-2013 06:53:21

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	387.59	1763	12388	3.61	387.70	384	9	23.2		
4	401.31	858	7011	1.67	401.41	398	11	30.1	1.95E-01	RN-219
4	404.70	743	7070	1.75	404.81	398	11	35.1		PB-211
0	427.09	596	7371	1.72	427.20	425	6	46.4		
0	454.02	757	6624	1.97	454.13	451	7	36.4		
0	461.07	386	5567	1.90	461.17	459	6	62.0		
0	480.01	1006	5635	1.48	480.11	477	7	25.5		
0	486.65	962	5504	1.88	486.75	484	7	26.4		
0	510.23*	1171	6475	3.37	510.33	506	9	25.5		
0	533.12	360	4233	1.51	533.22	530	6	58.1		
0	542.54	173	4038	1.54	542.64	540	6	117.0		
0	571.29	154	3154	2.72	571.40	570	5	110.6		
0	579.72	532	5197	1.76	579.82	576	8	47.7		
2	604.25	222	1187	1.49	604.35	603	11	38.6	3.42E+00	
2	608.76*	92801	2680	1.64	608.86	603	11	0.7		BI-214
0	615.52	242	2283	2.87	615.62	614	5	60.6		
0	633.20	151	2740	2.03	633.30	631	6	111.3		
0	648.86	236	2990	1.85	648.96	646	7	78.1		
0	664.82	2548	3451	1.52	664.92	661	8	8.9		
0	682.36	160	3115	1.75	682.46	680	7	116.4		
0	702.91	859	4002	2.11	703.01	700	9	27.4		
0	719.02	635	2496	2.02	719.12	716	6	26.1		
0	741.73	486	2924	1.62	741.82	739	7	38.0		
0	767.61*	8489	4187	1.80	767.71	763	10	3.6		
0	785.48	2219	3925	2.06	785.58	781	10	11.4		
0	805.55	2097	3609	2.07	805.65	802	9	11.2		
0	825.29	168	2009	1.75	825.38	824	5	81.4		
3	831.38	356	2433	1.91	831.48	829	15	45.3	1.01E+00	PB-211
3	838.36	1026	2084	1.76	838.45	829	15	14.7		
0	933.37*	4423	3656	2.07	933.46	929	10	5.9		
0	963.17	537	2803	1.93	963.26	960	8	35.2		
2	996.70	113	327	2.27	996.79	996	9	36.1	4.03E+00	
2	1000.48*	559	2205	2.50	1000.57	996	9	29.2		PA-234M
0	1022.19	163	1683	3.90	1022.28	1020	6	81.1		
0	1032.98	219	2541	5.31	1033.07	1029	9	84.4		
0	1051.32	543	2450	2.13	1051.40	1047	9	34.0		
0	1068.63	730	3039	2.04	1068.72	1063	12	31.1		
0	1103.54	255	1835	2.32	1103.63	1100	7	57.0		
0	1119.49*	19800	2648	2.20	1119.57	1114	10	1.7		BI-214
0	1132.65	341	2358	2.37	1132.73	1129	9	52.5		
0	1154.36	2181	2328	2.20	1154.45	1150	9	9.1		
0	1180.99	275	2168	2.45	1181.08	1177	9	62.4		
0	1206.82	556	1724	2.18	1206.91	1203	8	27.2		
0	1237.29*	7370	2324	2.23	1237.38	1233	11	3.4		
0	1252.50	570	2007	2.66	1252.58	1248	10	30.6		
0	1280.13	1604	1872	2.15	1280.22	1276	9	10.9		
0	1303.43	194	1432	2.45	1303.51	1300	8	69.3		
0	1314.09	245	1945	6.55	1314.17	1309	11	70.9		
0	1335.60	121	1279	3.89	1335.68	1333	7	99.7		
2	1376.71*	5201	1266	2.20	1376.79	1370	20	3.6	1.10E+00	
2	1384.33	1011	1264	2.41	1384.41	1370	20	13.2		

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
3	1400.55	1571	1235	2.21	1400.64	1396	17	9.0	6.83E-01	
3	1406.99*	2730	1257	2.23	1407.07	1396	17	5.8		
0	1415.63	146	1001	3.50	1415.71	1413	6	70.5		
0	1423.17	319	1661	5.41	1423.25	1419	10	49.0		
5	1456.44	72	558	2.23	1456.52	1455	10	89.1	2.15E+00	
5	1459.89*	803	1300	2.27	1459.97	1455	10	16.6		K-40
0	1508.19	2549	2339	2.38	1508.26	1503	12	8.5		
2	1537.66	569	1390	2.78	1537.74	1531	17	24.4	1.45E+00	
2	1542.38	498	1297	2.61	1542.46	1531	17	27.5		
0	1582.08	658	1348	2.35	1582.16	1578	10	22.3		
1	1593.69	272	1105	2.55	1593.77	1589	14	44.5	2.61E-01	
1	1598.07	255	978	2.25	1598.15	1589	14	42.9		
0	1660.12	1118	1047	2.37	1660.20	1653	13	13.3		
0	1683.19	187	521	2.37	1683.26	1679	8	44.9		
0	1691.57	315	584	3.28	1691.65	1687	9	29.8		
0	1706.68	66	364	3.67	1706.76	1704	7	99.0		
0	1728.38	3431	622	2.45	1728.45	1723	11	4.4		
0	1763.32*	16287	735	2.52	1763.39	1756	14	1.7		BI-214
1	1837.17	288	386	2.65	1837.24	1833	19	26.4	1.38E+00	
1	1846.16	2168	331	2.46	1846.23	1833	19	5.1		
0	1872.04	241	421	3.19	1872.11	1868	9	33.4		
0	1888.40	100	388	2.66	1888.47	1885	8	70.9		
3	1894.68	143	297	2.57	1894.75	1892	10	41.7	3.26E+00	
3	1897.98	77	350	2.37	1898.05	1892	10	88.0		
0	1934.81	120	494	3.78	1934.87	1930	10	71.8		
0	2014.69	300	547	10.67	2014.76	2004	21	40.8		
0	2058.29	183	439	18.44	2058.35	2047	24	62.8		
0	2107.58	66	170	2.57	2107.64	2105	9	75.0		
0	2117.00	1086	151	2.70	2117.06	2113	11	7.5		
0	2190.50	91	115	2.28	2190.56	2185	10	48.8		
0	2202.57*	4177	193	2.80	2202.63	2198	13	3.4		
0	2291.74	255	84	2.25	2291.80	2285	14	19.7		
0	2311.28	29	38	5.33	2311.34	2306	10	86.2		
0	2445.95	1239	24	2.92	2446.00	2440	14	5.9		
0	2480.47	22	12	3.30	2480.53	2474	12	74.6		
0	2492.42	21	3	7.65	2492.47	2486	13	56.0		
0	2612.71*	82	0	2.75	2612.76	2606	14	23.2		
0	2678.20	8	0	1.33	2678.25	2674	8	70.7		
0	2692.32	22	10	2.83	2692.37	2686	11	70.7		
0	2710.81	7	2	2.91	2710.85	2705	10	114.3		
0	2727.19	9	6	2.40	2727.24	2722	8	115.5		
0	2785.08	8	0	2.22	2785.13	2782	7	70.7		
0	2877.15	10	2	3.92	2877.20	2873	8	79.7		
0	2891.81	8	4	1.97	2891.85	2887	8	107.3		
0	2919.23	14	2	3.87	2919.28	2915	8	63.5		
0	2976.85	9	3	2.38	2976.89	2975	7	111.5		
0	2997.26	10	0	1.92	2997.30	2993	9	63.2		
0	3051.12	25	0	2.71	3051.16	3046	9	40.0		

Sample ID : 1303012-07
Acquisition date : 1-APR-2013 06:53:21

Total number of lines in spectrum	133	
Number of unidentified lines	84	
Number of lines tentatively identified by NID	49	36.84%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.278E+01	2.278E+01	0.437E+01	19.21	
PB-210	22.26Y	1.00	1.179E+02	1.183E+02	0.138E+02	11.66	
PB-211	3.28E+04Y	1.00	2.653E+01	2.653E+01	0.764E+01	28.80	
BI-214	1602.00Y	1.00	3.279E+02	3.280E+02	0.198E+02	6.04	
PB-214	1602.00Y	1.00	3.301E+02	3.301E+02	0.375E+02	11.37	
RN-219	3.28E+04Y	1.00	1.448E+01	1.448E+01	0.463E+01	31.94	
RA-223	3.28E+04Y	1.00	1.674E+01	1.674E+01	0.832E+01	49.69	
RA-224	1.41E+10Y	1.00	6.357E+02	6.357E+02	0.988E+02	15.54	
RA-226	1602.00Y	1.00	5.661E+02	5.662E+02	10.38E+02	183.26	
PA-231	3.28E+04Y	1.00	1.925E+01	1.925E+01	1.015E+01	52.73	
PA-234M	4.47E+09Y	1.00	1.398E+02	1.398E+02	0.432E+02	30.89	
TH-234	4.47E+09Y	1.00	8.894E+01	8.894E+01	1.440E+01	16.19	
U-235	7.04E+08Y	1.00	1.274E+01	1.274E+01	0.330E+01	25.92	
			---------	---------			
	Total Activity :		2.319E+03	2.320E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	3.541E-01	3.846E-01	4.094E-01	106.45	
CD-109	464.00D	1.05	9.897E+01	1.039E+02	0.167E+02	16.07	
SN-126	1.00E+05Y	1.00	9.954E+00	9.954E+00	1.484E+00	14.91	
NP-237	2.14E+06Y	1.00	2.926E+01	2.926E+01	0.434E+01	14.84	
			---------	---------			
	Total Activity :		1.385E+02	1.435E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.779E+01	3.779E+01	0.362E+01	9.58	
			---------	---------			
	Total Activity :		3.779E+01	3.779E+01			

Grand Total Activity : 2.495E+03 2.501E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-07 Acquisition date : 1-APR-2013 06:53:21

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	4.705E-01	2.278E+01	2.278E+01	19.21	OK

Final Mean for 1 Valid Peaks = 2.278E+01+/- 4.375E+00 (19.21%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PB-210	46.50	4.25*	1.969E+00	1.179E+02	1.183E+02	11.66	OK

Final Mean for 1 Valid Peaks = 1.183E+02+/- 1.380E+01 (11.66%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PB-211	404.84	2.90*	1.290E+00	2.831E+01	2.831E+01	36.63	OK
	831.96	2.90	7.168E-01	2.442E+01	2.442E+01	46.30	OK

Final Mean for 2 Valid Peaks = 2.653E+01+/- 7.641E+00 (28.80%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BI-214	609.31	46.30*	9.260E-01	3.083E+02	3.084E+02	10.38	OK
	1120.29	15.10	5.678E-01	3.290E+02	3.290E+02	10.90	OK
	1764.49	15.80	4.183E-01	3.510E+02	3.510E+02	10.11	OK
	2204.22	4.98	3.725E-01	-----	Line Not Found	-----	Absent

Final Mean for 3 Valid Peaks = 3.280E+02+/- 1.981E+01 (6.04%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PB-214	295.21	19.19	1.631E+00	3.272E+02	3.272E+02	18.60	OK
	351.92	37.19*	1.436E+00	3.318E+02	3.318E+02	14.36	OK

Final Mean for 2 Valid Peaks = 3.301E+02+/- 3.751E+01 (11.37%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RN-219	401.80	6.50*	1.298E+00	1.448E+01	1.448E+01	31.94	OK

Final Mean for 1 Valid Peaks = 1.448E+01+/- 4.625E+00 (31.94%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-223	323.87	3.88*	1.527E+00	1.674E+01	1.674E+01	49.69	OK

Final Mean for 1 Valid Peaks = 1.674E+01+/- 8.319E+00 (49.69%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-224	240.98	3.95*	1.863E+00	6.357E+02	6.357E+02	15.54	OK

Final Mean for 1 Valid Peaks = 6.357E+02+/- 9.879E+01 (15.54%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-226	186.21	3.28*	2.147E+00	5.661E+02	5.662E+02	183.26	OK

Final Mean for 1 Valid Peaks = 5.662E+02+/- 1.038E+03 (183.26%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-231	283.67	1.60	1.676E+00	3.911E+01	3.911E+01	53.29	OK
	302.67	2.30*	1.603E+00	1.307E+01	1.307E+01	88.90	OK

Final Mean for 2 Valid Peaks = 1.925E+01+/- 1.015E+01 (52.73%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	6.188E-01	1.398E+02	1.398E+02	30.89	OK

Final Mean for 1 Valid Peaks = 1.398E+02+/- 4.320E+01 (30.89%)

Sample ID : 1303012-07 Acquisition date : 1-APR-2013 06:53:21

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.351E+00	8.894E+01	8.894E+01	16.19	OK

Final Mean for 1 Valid Peaks = 8.894E+01+/- 1.440E+01 (16.19%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-235	143.76	10.50*	2.382E+00	1.311E+01	1.311E+01	29.08	OK
	163.35	4.70	2.275E+00	----- Line	Not Found	-----	Absent
	205.31	4.70	2.043E+00	1.164E+01	1.164E+01	56.77	OK

Final Mean for 2 Valid Peaks = 1.274E+01+/- 3.302E+00 (25.92%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.486E+00	3.541E-01	3.846E-01	106.45	OK
	136.48	10.60	2.420E+00	----- Line	Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 3.846E-01+/- 4.094E-01 (106.45%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.541E+00	9.897E+01	1.039E+02	16.07	OK

Final Mean for 1 Valid Peaks = 1.039E+02+/- 1.669E+01 (16.07%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.540E+00	9.954E+00	9.954E+00	14.91	OK

Final Mean for 1 Valid Peaks = 9.954E+00+/- 1.484E+00 (14.91%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.537E+00	2.926E+01	2.926E+01	14.84	OK

Final Mean for 1 Valid Peaks = 2.926E+01+/- 4.343E+00 (14.84%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.478E+00	3.779E+01	3.779E+01	9.58	OK

Final Mean for 1 Valid Peaks = 3.779E+01+/- 3.621E+00 (9.58%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.278E+01	4.375E+00	4.960E+00	4.380E-01	4.592
CO-57	3.846E-01	4.094E-01	5.072E-01	6.204E-02	0.758
CD-109	1.039E+02	1.669E+01	1.425E+01	1.628E+00	7.286
SN-126	9.954E+00	1.484E+00	1.366E+00	1.329E-01	7.288
PB-210	1.183E+02	1.380E+01	1.162E+01	1.010E+00	10.180
PB-211	2.653E+01	7.641E+00	1.516E+01	1.487E+00	1.750
BI-214	3.280E+02	1.981E+01	8.752E-01	8.361E-02	374.725
PB-214	3.301E+02	3.751E+01	1.091E+00	1.502E-01	302.646
RN-219	1.448E+01	4.625E+00	6.719E+00	6.581E-01	2.156
RA-223	1.674E+01	8.319E+00	1.043E+01	1.682E+00	1.606
RA-224	6.357E+02	9.879E+01	1.048E+01	1.567E+00	60.647
RA-226	5.662E+02	1.038E+03	1.347E+01	2.468E+01	42.025
PA-231	1.925E+01	1.015E+01	1.832E+01	3.235E+00	1.051
PA-234M	1.398E+02	4.320E+01	5.233E+01	4.802E+00	2.672
TH-234	8.894E+01	1.440E+01	1.405E+01	1.083E+00	6.332
U-235	1.274E+01	3.302E+00	4.159E+00	7.668E-01	3.063
NP-237	2.926E+01	4.343E+00	4.463E+00	4.296E-01	6.557
AM-243	3.779E+01	3.621E+00	8.390E-01	7.183E-02	45.038

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	4.046E+00		3.943E+00	6.109E+00	6.104E-01	0.662
NA-22	1.170E-01		3.458E-01	5.066E-01	4.603E-02	0.231
AL-26	-6.067E-02		1.733E-01	2.978E-01	2.732E-02	-0.204
TI-44	1.819E+00	+	3.794E-01	5.846E-01	4.695E-02	3.112
SC-46	-1.328E-01		3.975E-01	6.570E-01	5.572E-02	-0.202
V-48	-1.768E-01		1.190E+00	1.964E+00	1.777E-01	-0.090
CR-51	3.720E+00		7.293E+00	9.212E+00	1.535E+00	0.404
MN-54	4.212E-01		3.511E-01	5.315E-01	4.660E-02	0.792
CO-56	2.932E-01		4.214E-01	6.352E-01	5.533E-02	0.462
CO-58	2.044E-01		4.138E-01	6.240E-01	5.546E-02	0.328
FE-59	-1.266E-01		9.689E-01	1.417E+00	1.484E-01	-0.089
CO-60	-1.112E-01		3.421E-01	4.959E-01	5.128E-02	-0.224
ZN-65	2.127E+01		2.495E+00	1.917E+00	1.911E-01	11.097
SE-75	-1.839E-01		6.359E-01	8.049E-01	1.407E-01	-0.229
RB-82	-9.370E+00		6.898E+00	7.790E+00	6.994E-01	-1.203
RB-83	-4.310E-01		6.396E-01	1.076E+00	1.766E-01	-0.401
KR-85	9.986E+01		5.995E+01	9.264E+01	9.237E+00	1.078
SR-85	6.132E-01		3.681E-01	5.688E-01	5.672E-02	1.078
Y-88	1.245E+00	+	3.513E-01	5.166E-01	4.754E-02	2.409
NB-93M	-5.198E+00		1.258E+01	2.094E+01	8.270E+00	-0.248
NB-94	1.962E-01		2.932E-01	4.913E-01	4.218E-02	0.399
NB-95	2.709E+01		2.783E+00	1.652E+00	1.489E-01	16.395
ZR-95	-7.504E-01		6.909E-01	1.079E+00	1.065E-01	-0.695
RU-103	-5.776E-02		4.468E-01	7.622E-01	1.146E-01	-0.076
RU-106	-2.418E-01		2.638E+00	4.006E+00	5.574E-01	-0.060

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-108M	2.260E-01		3.086E-01	4.699E-01	4.269E-02	0.481
AG-110M	2.255E-01		3.265E-01	4.586E-01	4.191E-02	0.492
SN-113	-5.194E-02		5.151E-01	7.992E-01	7.977E-02	-0.065
TE123M	4.630E-02		4.269E-01	6.340E-01	5.722E-02	0.073
SB-124	1.612E-01		4.059E-01	6.209E-01	5.961E-02	0.260
I-125	-5.349E+00		7.709E+00	1.187E+01	1.325E+00	-0.451
SB-125	2.397E+00	+	1.143E+00	1.561E+00	1.568E-01	1.535
SB-126	1.270E+01	+	3.540E+00	5.232E+00	4.755E-01	2.427
I-129	5.761E-01		8.001E-01	1.104E+00	1.528E-01	0.522
I-131	-7.990E-01		5.001E+00	7.784E+00	9.797E-01	-0.103
BA-133	-1.333E-02		5.231E-01	6.544E-01	1.094E-01	-0.020
CS-134	3.577E-01	+	1.430E-01	6.109E-01	5.868E-02	0.586
CS-135	1.717E+01		3.571E+00	2.868E+00	5.120E-01	5.987
CS-136	4.142E+00		2.336E+00	3.508E+00	3.419E-01	1.181
CS-137	1.240E+00		3.423E-01	5.146E-01	4.692E-02	2.409
LA-138	2.394E-02		4.692E-01	7.609E-01	6.489E-02	0.031
CE-139	-5.360E-01		3.997E-01	6.328E-01	5.308E-02	-0.847
BA-140	-7.451E-01		7.640E+00	9.295E+00	3.114E+00	-0.080
LA-140	8.914E+00		2.323E+00	3.447E+00	3.057E-01	2.586
CE-141	2.566E+00		1.408E+00	1.866E+00	4.815E-01	1.375
CE-144	-4.433E+00		2.624E+00	4.124E+00	4.640E-01	-1.075
PM-144	3.699E-01		2.881E-01	4.415E-01	4.026E-02	0.838
PM-145	-1.481E+00		1.823E+00	2.378E+00	1.555E+00	-0.623
PM-146	2.318E+00	+	8.803E-01	1.082E+00	1.079E-01	2.141
ND-147	3.304E+01		1.568E+01	2.411E+01	2.395E+00	1.370
EU-152	5.423E+01	+	6.977E+00	5.835E+00	6.295E-01	9.293
GD-153	-1.138E+00		1.183E+00	1.909E+00	2.050E-01	-0.596
EU-154	3.155E-01		9.574E-01	1.402E+00	1.274E-01	0.225
EU-155	1.208E+01	+	1.793E+00	1.908E+00	1.837E-01	6.330
EU-156	4.894E+00		1.265E+01	1.899E+01	4.355E+00	0.258
HO-166M	4.002E-01		6.268E-01	7.627E-01	6.937E-02	0.525
HF-172	-2.612E+00		2.502E+00	3.690E+00	4.394E-01	-0.708
LU-172	1.881E+00		1.388E+01	2.181E+01	2.141E+00	0.086
LU-173	1.432E+01		3.006E+00	2.300E+00	4.206E-01	6.229
HF-175	3.939E-01		5.437E-01	6.848E-01	9.948E-02	0.575
LU-176	3.187E-01		2.949E-01	4.228E-01	7.347E-02	0.754
TA-182	1.607E+02		1.751E+01	5.782E+00	5.783E-01	27.800
IR-192	3.047E-01		7.488E-01	1.158E+00	1.157E-01	0.263
HG-203	-3.432E-01		6.839E-01	8.577E-01	1.648E-01	-0.400
BI-207	6.736E-02		2.752E-01	4.215E-01	4.127E-02	0.160
TL-208	6.188E-01		8.895E-01	1.368E+00	1.330E-01	0.452
BI-210M	6.311E-02		6.959E-01	8.865E-01	1.522E-01	0.071
BI-212	-5.047E-01		2.217E+00	3.542E+00	3.216E-01	-0.142
PB-212	1.142E+01		1.857E+00	1.129E+00	1.661E-01	10.113
RA-225	-1.145E+01		4.510E+00	7.145E+00	7.058E-01	-1.603
TH-227	2.092E+01	+	4.237E+00	3.996E+00	5.772E-01	5.235
AC-228	5.814E-01		1.107E+00	1.849E+00	1.576E-01	0.314
TH-230	4.641E+02	+	9.677E+01	1.490E+02	1.194E+01	3.115

Sample ID : 1303012-07 Acquisition date : 1-APR-2013 06:53:21

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
TH-231	4.999E+00	+	4.040E+00	5.361E+00	9.220E-01	0.932
PA-233	1.556E+00		1.699E+00	2.399E+00	6.434E-01	0.649
PA-234	8.098E-01		1.249E+00	2.022E+00	2.316E-01	0.400
AM-241	7.049E+00		1.101E+00	1.468E+00	1.097E-01	4.801
CM-243	9.754E-01		2.027E+00	2.941E+00	5.562E-01	0.332

Summary of Nuclide Activity
Sample ID : 1303012-07

Acquisition date : 1-APR-2013 06:53:21

Total number of lines in spectrum	133	
Number of unidentified lines	84	
Number of lines tentatively identified by NID	49	36.84%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.278E+01	2.278E+01	0.437E+01	19.21	
PB-210	22.26Y	1.00	1.179E+02	1.183E+02	0.138E+02	11.66	
PB-211	3.28E+04Y	1.00	2.653E+01	2.653E+01	0.764E+01	28.80	
BI-214	1602.00Y	1.00	3.279E+02	3.280E+02	0.198E+02	6.04	
PB-214	1602.00Y	1.00	3.301E+02	3.301E+02	0.375E+02	11.37	
RN-219	3.28E+04Y	1.00	1.448E+01	1.448E+01	0.463E+01	31.94	
RA-223	3.28E+04Y	1.00	1.674E+01	1.674E+01	0.832E+01	49.69	
RA-224	1.41E+10Y	1.00	6.357E+02	6.357E+02	0.988E+02	15.54	
RA-226	1602.00Y	1.00	5.661E+02	5.662E+02	10.38E+02	183.26	
PA-231	3.28E+04Y	1.00	1.925E+01	1.925E+01	1.015E+01	52.73	
PA-234M	4.47E+09Y	1.00	1.398E+02	1.398E+02	0.432E+02	30.89	
TH-234	4.47E+09Y	1.00	8.894E+01	8.894E+01	1.440E+01	16.19	
U-235	7.04E+08Y	1.00	1.274E+01	1.274E+01	0.330E+01	25.92	
			---------	---------			
	Total Activity :		2.319E+03	2.320E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	3.541E-01	3.846E-01	4.094E-01	106.45	
CD-109	464.00D	1.05	9.897E+01	1.039E+02	0.167E+02	16.07	
SN-126	1.00E+05Y	1.00	9.954E+00	9.954E+00	1.484E+00	14.91	
NP-237	2.14E+06Y	1.00	2.926E+01	2.926E+01	0.434E+01	14.84	
			---------	---------			
	Total Activity :		1.385E+02	1.435E+02			

Nuclide Type : ACTIVATION

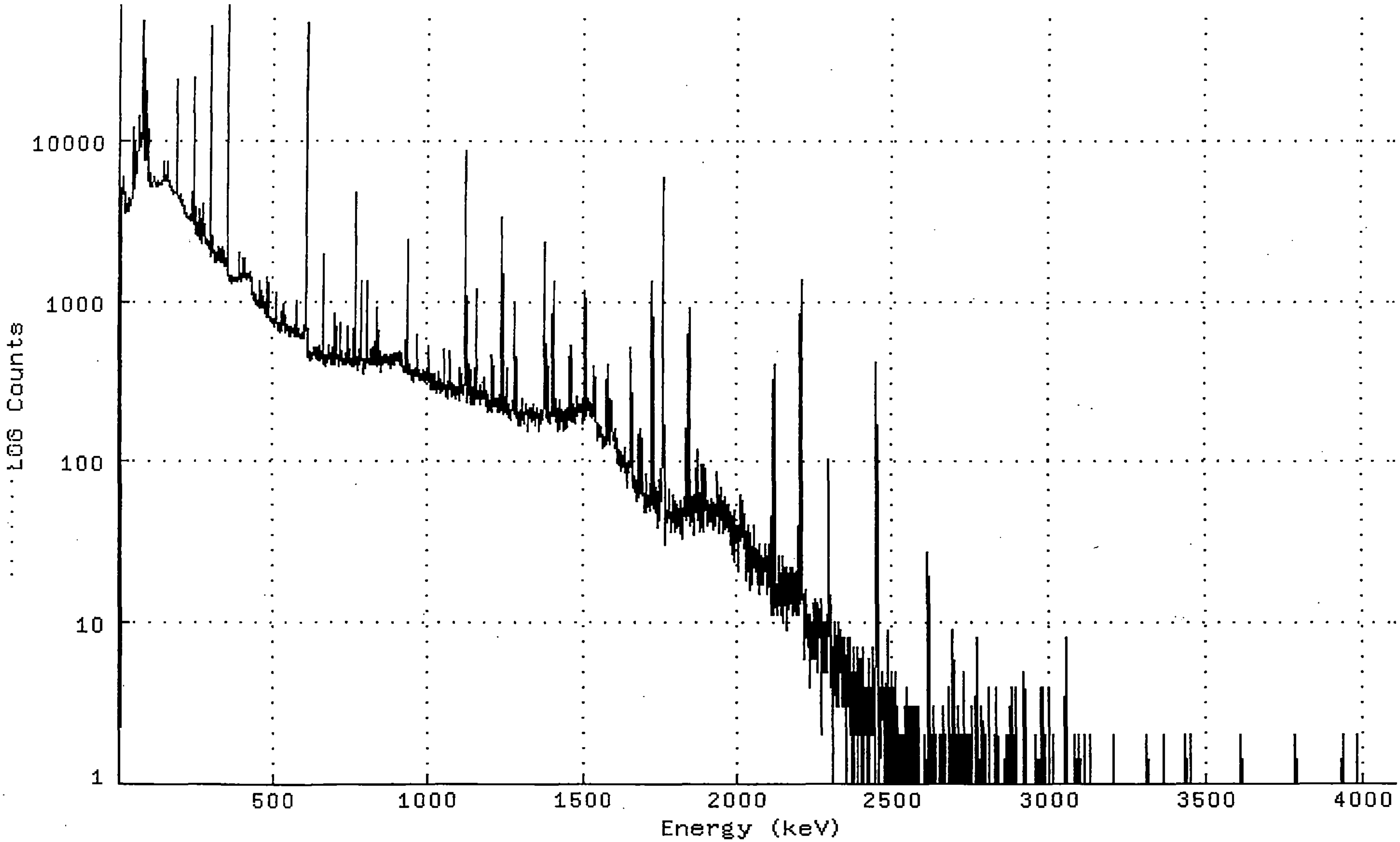
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.779E+01	3.779E+01	0.362E+01	9.58	
			---------	---------			
	Total Activity :		3.779E+01	3.779E+01			

Grand Total Activity : 2.495E+03 2.501E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301207_GE2_GAS1202_190100.CNF;1
Title :
Sample Title: S30-69-130228

Start Time:	1-APR-2013 06:53:	Sample Time:	28-FEB-2013 00:00	Energy Offset:	-1.16012E-01
Real Time :	0 01:00:58.73	Sample ID :	1303012-07	Energy Slope :	1.00003E+00
Live Time :	0 01:00:00.00	Sample Type:	SOLID	Energy Quad :	0.00000E+00



8165

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301207_GE2_GAS1202_1901

Channel

1:	0	0	0	0	5	1682	4229	4899
9:	4799	4987	4606	5733	5707	4576	4713	5131
17:	4309	4031	4053	3900	3671	3490	3560	3634
25:	3625	3727	3929	3678	3521	3618	3616	4259
33:	3768	3781	3833	3992	4095	3953	4031	4204
41:	4280	4550	4802	4931	5213	11018	11658	5000
49:	5309	6703	5813	6118	9480	7381	6062	6522
57:	6659	7423	7872	8693	9009	9346	13978	10978
65:	9309	9075	10305	10907	9513	9469	9889	10022
73:	10738	19958	33831	18687	54236	18497	10950	9205
81:	10521	7488	9124	13190	7354	8786	19751	12623
89:	8575	11381	6763	10453	11583	7312	7241	5498
97:	5417	6148	5728	5215	5107	5078	5194	5277
105:	5325	5201	5079	5317	5432	5563	5540	5611
113:	5876	5462	5218	5322	5332	5180	5128	5159
121:	5280	5472	5226	5241	5136	5222	5342	5295
129:	5427	5426	5411	5153	5354	5196	5276	5444
137:	5327	5558	5507	5670	5508	5675	5937	7206
145:	5837	5456	5613	5684	5828	5849	5927	5952
153:	5729	7160	6038	5513	5434	5488	5281	5194
161:	5096	5046	5314	4953	4922	4842	4759	4830
169:	4782	4815	4581	4592	4572	4576	4548	4659
177:	4616	4677	4671	4657	4711	4691	4794	4741
185:	9301	22896	8772	4556	4348	4321	4337	4476
193:	4406	4314	4517	4476	4277	4225	4131	4145
201:	4169	4135	3928	3858	4229	3929	3742	3622
209:	3590	3764	3657	3513	3420	3516	3482	3412
217:	3400	3312	3260	3265	3212	3303	3245	3264
225:	3306	3377	3179	3157	3259	3183	3091	3167
233:	3089	3102	3703	4642	3259	3297	3316	2980
241:	11758	23993	5411	2638	2794	2685	2621	2560
249:	2594	2708	2483	2581	2612	2611	2704	3409
257:	2789	3161	3706	2423	2377	2298	2330	2382
265:	2373	2235	2320	2595	3991	3415	3785	2677
273:	2500	3007	2955	2307	2271	2283	2223	2256
281:	2323	2177	2333	2380	2351	2366	2222	2133
289:	2106	2164	2053	2190	2284	14673	49821	13467
297:	2089	1874	2187	2514	1945	2025	2114	2020
305:	2001	1852	1733	1782	1815	1753	1777	1823
313:	1936	1948	1876	1747	1705	1792	1771	1766
321:	1745	1741	2110	1998	1743	1699	1702	1752
329:	1942	2131	1704	1734	1840	1849	1794	1731
337:	1735	2019	1770	1638	1684	1742	1717	1622
345:	1646	1780	1808	1868	1953	4353	49015	68318
353:	8281	1411	1368	1420	1433	1327	1304	1362
361:	1349	1428	1355	1300	1291	1334	1350	1367
369:	1323	1381	1321	1380	1374	1392	1311	1396
377:	1399	1333	1306	1318	1327	1343	1395	1350
385:	1340	1733	1765	1886	1983	1437	1312	1345
393:	1414	1414	1416	1453	1388	1388	1396	1477
401:	1805	1758	1462	1635	1816	1519	1431	1458
409:	1399	1399	1429	1334	1380	1445	1435	1449
417:	1378	1427	1391	1447	1368	1412	1486	1353
425:	1298	1416	1518	1290	1289	1156	1170	1161

433:	1078	1075	1102	1012	1114	1049	1047	1069
441:	1032	1021	1013	1006	1068	955	1003	994
449:	929	956	1006	976	1022	1303	1204	978
457:	892	949	905	969	1156	1111	914	898
465:	959	945	889	907	1014	1045	882	927
473:	893	977	909	846	789	854	981	1384
481:	1006	813	814	777	825	1133	1282	876
489:	789	784	775	745	760	778	763	716
497:	759	724	758	737	717	724	762	708
505:	725	710	687	794	1034	1052	1117	904
513:	730	713	729	697	714	654	694	715
521:	627	672	683	651	681	704	646	750
529:	682	683	661	771	957	812	709	737
537:	732	729	694	638	687	743	810	680
545:	653	703	693	688	680	695	647	660
553:	660	687	626	605	676	599	692	637
561:	645	644	633	669	652	669	659	673
569:	623	635	707	677	688	601	663	597
577:	633	631	900	995	661	645	667	664
585:	590	595	606	603	590	577	600	608
593:	585	634	593	587	589	632	608	611
601:	583	596	594	709	615	653	1999	25703
609:	52658	14362	914	476	442	479	562	512
617:	530	442	466	449	468	485	445	417
625:	436	451	469	460	455	470	457	513
633:	512	470	478	461	443	460	476	503
641:	430	451	463	444	418	449	430	498
649:	518	436	471	424	421	455	470	484
657:	444	446	465	429	483	393	493	998
665:	1937	895	409	391	431	451	436	405
673:	459	450	436	432	406	452	417	441
681:	426	526	513	452	474	443	471	466
689:	456	393	440	427	423	410	403	450
697:	505	473	500	402	466	792	828	559
705:	479	442	443	450	430	462	448	427
713:	450	422	385	385	435	499	717	658
721:	437	445	476	395	444	454	443	441
729:	402	408	411	424	437	413	418	397
737:	418	410	419	448	501	683	534	418
745:	407	433	436	405	415	402	402	488
753:	442	410	398	409	386	428	416	384
761:	430	409	422	424	531	838	2804	4737
769:	1649	472	402	400	443	365	401	378
777:	391	395	400	412	428	436	404	610
785:	1319	1164	512	454	426	391	350	430
793:	378	373	398	380	379	430	408	411
801:	393	401	409	526	1176	1316	614	442
809:	412	410	398	398	428	432	405	395
817:	405	412	420	480	507	416	401	408
825:	499	467	404	399	401	453	552	537
833:	458	393	409	391	499	890	813	518
841:	409	420	403	448	421	479	361	430
849:	427	432	389	398	443	409	419	408
857:	408	426	404	440	450	408	431	422
865:	453	431	409	433	420	443	401	430
873:	432	448	407	394	380	428	454	413
881:	452	441	459	433	425	437	435	400
889:	424	433	438	467	403	457	464	453
897:	429	466	421	458	433	462	450	461
905:	456	421	454	427	424	414	476	397

913:	409	463	387	390	386	396	381	365
921:	382	366	377	361	375	375	373	390
929:	378	359	407	777	2351	2057	690	352
937:	354	357	345	387	362	379	398	336
945:	364	320	333	346	359	325	363	348
953:	338	347	309	355	354	342	334	346
961:	373	357	591	606	374	338	355	362
969:	369	352	322	338	330	326	350	324
977:	344	317	337	336	337	326	317	326
985:	317	362	339	349	356	310	312	351
993:	321	329	323	335	376	320	390	518
1001:	513	358	316	331	277	342	319	284
1009:	322	346	308	318	331	345	299	278
1017:	287	298	283	301	345	295	312	314
1025:	279	266	304	296	294	283	329	357
1033:	316	306	290	323	262	283	284	284
1041:	282	294	275	288	306	296	293	299
1049:	280	355	494	421	307	292	252	257
1057:	276	282	267	272	281	247	252	282
1065:	313	303	290	302	475	413	307	278
1073:	305	249	264	280	260	279	257	289
1081:	297	272	276	258	256	274	279	241
1089:	283	284	264	259	262	274	289	278
1097:	286	261	278	235	267	310	373	324
1105:	314	267	266	293	314	258	262	270
1113:	299	270	283	296	378	2058	7528	8428
1121:	2550	428	233	250	258	282	238	273
1129:	269	289	279	347	397	336	279	261
1137:	242	268	225	288	270	249	228	251
1145:	262	238	225	242	265	256	237	283
1153:	522	1173	1064	456	271	247	267	271
1161:	243	260	247	271	242	252	295	228
1169:	249	232	274	241	241	251	248	246
1177:	242	251	276	291	333	296	255	255
1185:	244	233	249	229	201	237	233	222
1193:	258	243	215	240	234	222	217	207
1201:	206	203	210	215	230	366	456	332
1209:	252	219	227	250	243	235	228	222
1217:	231	245	247	207	242	203	225	222
1225:	206	259	211	201	220	216	206	238
1233:	207	210	339	1284	3246	2704	786	280
1241:	239	197	205	202	204	209	218	200
1249:	225	232	279	374	368	273	195	233
1257:	198	190	192	226	184	206	198	209
1265:	207	182	209	200	207	221	218	239
1273:	210	237	226	196	207	230	526	937
1281:	676	293	213	198	213	185	206	178
1289:	201	167	172	189	190	188	199	193
1297:	202	205	167	190	190	194	244	217
1305:	211	195	185	174	184	184	195	207
1313:	199	224	214	223	200	205	155	195
1321:	166	168	181	189	204	194	213	187
1329:	205	211	200	184	178	213	215	204
1337:	218	185	187	181	187	223	184	167
1345:	189	180	201	173	208	187	215	191
1353:	207	200	179	188	183	178	195	155
1361:	198	196	183	170	201	209	205	204
1369:	182	180	202	207	201	216	512	1765
1377:	2329	1167	305	198	184	215	320	541
1385:	528	291	189	203	175	186	206	173

1393:	200	188	171	179	173	206	325	685
1401:	825	394	203	189	267	800	1320	900
1409:	341	177	175	182	181	201	197	200
1417:	212	156	157	193	204	210	194	236
1425:	229	194	205	158	190	208	195	198
1433:	193	180	191	156	196	203	183	188
1441:	158	173	173	196	210	175	190	211
1449:	190	194	161	203	220	183	189	233
1457:	190	250	389	528	367	241	186	175
1465:	196	182	224	178	191	197	192	174
1473:	185	184	190	195	213	206	249	220
1481:	198	194	205	207	203	208	201	224
1489:	209	208	205	214	209	202	225	174
1497:	242	195	215	211	212	190	179	206
1505:	221	287	605	1139	950	422	239	222
1513:	226	192	215	229	212	210	242	206
1521:	207	199	193	220	232	193	225	204
1529:	188	187	190	186	194	209	225	225
1537:	315	392	272	205	243	331	321	216
1545:	178	168	156	152	139	140	133	162
1553:	165	148	148	164	143	152	152	150
1561:	163	144	145	147	130	140	136	121
1569:	145	137	138	125	141	138	133	138
1577:	129	135	133	152	261	402	334	179
1585:	135	142	133	141	132	127	149	163
1593:	220	241	190	164	196	240	217	157
1601:	141	138	144	134	135	137	160	132
1609:	125	140	122	123	117	127	140	122
1617:	130	98	106	104	117	104	94	111
1625:	88	114	105	113	102	115	91	96
1633:	94	105	92	107	94	97	122	88
1641:	85	84	110	85	81	87	68	91
1649:	82	100	89	85	86	89	86	96
1657:	97	110	279	508	385	182	79	85
1665:	83	68	78	64	72	74	81	74
1673:	77	77	61	68	73	69	69	57
1681:	62	127	147	107	79	60	64	65
1689:	74	107	145	159	125	97	63	72
1697:	62	70	55	62	63	58	56	48
1705:	70	66	62	82	54	48	56	62
1713:	59	62	58	52	52	72	61	60
1721:	65	62	49	56	81	131	499	1301
1729:	1207	516	102	60	51	64	73	57
1737:	60	49	48	64	68	49	63	39
1745:	45	62	65	54	54	43	56	49
1753:	76	60	70	57	62	79	74	109
1761:	546	2633	5808	5263	1869	347	83	47
1769:	51	30	53	51	50	50	42	50
1777:	43	48	52	66	63	54	44	48
1785:	43	46	41	43	48	37	46	47
1793:	49	61	51	49	54	57	46	37
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1809:	39	45	43	43	40	51	45	47
1817:	38	56	36	51	53	41	33	42
1825:	48	51	39	52	49	48	60	47
1833:	50	43	66	102	160	117	78	65
1841:	51	45	54	152	419	894	675	231
1849:	81	51	40	53	43	42	59	53
1857:	44	42	62	35	46	47	52	55
1865:	51	68	52	50	48	72	112	118

1873:	105	57	50	50	37	51	55	63
1881:	40	60	51	46	39	41	58	94
1889:	83	75	61	37	70	94	92	89
1897:	61	89	61	50	50	51	40	45
1905:	44	57	49	42	51	43	48	54
1913:	45	42	58	54	42	53	45	38
1921:	41	55	49	51	44	40	41	54
1929:	50	43	49	45	62	84	84	86
1937:	70	48	43	61	45	36	38	59
1945:	46	55	49	50	43	68	47	40
1953:	36	47	54	48	38	49	41	44
1961:	60	49	50	54	52	39	53	47
1969:	41	46	53	37	47	53	43	44
1977:	30	44	44	46	43	33	46	42
1985:	28	35	29	24	39	38	36	49
1993:	40	31	37	33	40	32	34	35
2001:	21	38	38	22	40	34	43	32
2009:	49	62	38	37	34	46	56	52
2017:	49	45	44	38	34	36	29	27
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2033:	24	29	21	27	36	16	25	24
2041:	26	35	26	27	18	25	17	20
2049:	28	31	40	40	34	22	21	27
2057:	29	28	24	25	17	21	25	28
2065:	23	27	29	30	21	15	17	28
2073:	19	25	24	19	26	22	17	23
2081:	20	19	17	20	21	30	24	28
2089:	30	21	25	20	17	21	17	26
2097:	15	18	18	25	20	24	30	21
2105:	11	27	28	42	46	31	23	17
2113:	11	31	87	264	397	260	110	37
2121:	16	13	11	16	17	15	14	11
2129:	14	14	22	15	26	16	15	13
2137:	20	15	16	11	23	10	14	26
2145:	21	19	21	22	21	15	14	17
2153:	9	16	13	19	15	22	12	17
2161:	13	12	16	13	20	15	15	15
2169:	22	14	14	12	19	14	22	13
2177:	11	12	18	17	13	20	12	13
2185:	11	14	21	16	20	22	40	27
2193:	24	11	11	18	18	13	32	143
2201:	535	1272	1342	724	204	50	14	15
2209:	15	14	15	6	9	15	14	16
2217:	16	9	12	8	9	10	9	11
2225:	7	8	8	6	11	10	4	7
2233:	10	7	8	9	10	6	13	6
2241:	7	11	7	8	10	6	10	7
2249:	14	14	14	11	5	13	6	11
2257:	12	12	12	8	9	8	10	11
2265:	14	9	6	2	9	8	8	7
2273:	10	5	10	9	10	5	5	9
2281:	9	5	11	6	7	9	6	11
2289:	11	28	71	102	47	22	10	5
2297:	6	4	7	6	3	4	1	7
2305:	4	3	4	6	7	10	9	10
2313:	7	8	3	5	5	7	5	3
2321:	4	7	10	7	9	5	9	6
2329:	9	7	8	3	7	5	5	4
2337:	4	5	6	8	3	3	8	5
2345:	1	3	5	3	3	4	6	3

2353:	7	3	8	2	2	3	2	4
2361:	8	3	0	4	2	4	1	7
2369:	3	5	5	3	0	4	2	4
2377:	3	5	3	3	7	0	6	3
2385:	4	2	3	4	5	3	6	2
2393:	2	3	4	1	6	4	4	2
2401:	7	1	1	2	3	3	3	2
2409:	4	3	3	1	1	4	4	1
2417:	3	1	6	2	4	2	2	4
2425:	2	3	2	3	2	4	2	4
2433:	7	4	2	3	3	4	4	0
2441:	4	7	23	97	312	405	273	106
2449:	26	4	1	4	1	2	2	2
2457:	4	3	2	3	5	3	3	3
2465:	3	3	4	1	2	0	0	1
2473:	2	1	1	3	2	3	6	2
2481:	9	5	1	1	0	1	0	1
2489:	4	2	4	1	1	5	1	3
2497:	1	0	0	3	1	4	2	5
2505:	1	1	0	4	1	0	1	2
2513:	3	1	2	1	1	1	0	2
2521:	0	1	0	0	0	2	1	2
2529:	1	0	2	2	1	1	1	3
2537:	3	1	0	0	4	2	1	1
2545:	1	0	2	1	1	3	1	1
2553:	2	1	3	1	2	1	2	3
2561:	2	0	2	0	1	0	2	3
2569:	1	0	2	1	2	3	1	0
2577:	3	1	2	1	1	1	0	1
2585:	0	0	0	0	1	0	0	1
2593:	0	0	1	2	1	0	1	2
2601:	2	0	0	1	0	0	1	1
2609:	1	4	11	19	27	14	8	1
2617:	2	1	0	0	1	0	1	2
2625:	1	2	2	3	2	0	1	0
2633:	2	1	2	0	0	1	1	0
2641:	1	0	0	1	0	2	1	2
2649:	0	2	0	2	2	0	1	2
2657:	2	1	3	1	1	0	0	0
2665:	1	1	2	0	0	0	0	1
2673:	0	0	1	0	1	1	4	1
2681:	0	0	0	2	0	0	1	1
2689:	0	2	5	9	7	5	2	0
2697:	4	3	1	0	2	1	1	0
2705:	0	0	0	0	2	2	3	1
2713:	1	0	1	2	0	1	0	0
2721:	2	0	0	2	3	4	5	1
2729:	0	1	1	1	0	0	0	2
2737:	1	1	0	1	0	2	0	0
2745:	2	1	1	1	0	1	0	3
2753:	0	0	0	1	1	1	0	1
2761:	1	2	0	0	0	2	6	8
2769:	3	0	3	1	0	1	1	1
2777:	1	0	0	2	0	0	1	1
2785:	3	2	1	0	0	0	2	0
2793:	1	2	1	1	0	0	1	0
2801:	0	1	1	0	1	4	0	2
2809:	1	0	1	1	0	1	0	0
2817:	0	1	0	0	0	0	0	0
2825:	2	2	0	0	1	0	0	0

2833:	0	4	0	1	0	0	0	0
2841:	1	1	1	0	1	0	0	0
2849:	1	0	1	1	0	1	0	0
2857:	0	0	2	1	0	0	1	0
2865:	0	0	0	1	0	0	2	0
2873:	0	0	2	3	1	4	2	0
2881:	1	0	0	0	2	0	2	0
2889:	1	0	4	4	1	0	0	0
2897:	1	1	0	0	0	0	0	1
2905:	0	0	0	0	0	0	1	0
2913:	0	0	0	0	2	4	2	5
2921:	3	0	1	1	1	0	0	0
2929:	0	0	0	1	0	0	0	1
2937:	1	0	1	0	0	0	0	0
2945:	0	0	0	0	1	0	0	0
2953:	0	1	1	0	2	1	1	1
2961:	0	0	0	0	1	0	0	1
2969:	0	2	0	0	0	0	4	4
2977:	0	2	1	1	0	0	0	2
2985:	0	0	0	1	1	0	0	0
2993:	0	1	0	1	3	4	0	1
3001:	0	0	0	1	1	0	0	0
3009:	2	1	0	0	1	1	0	0
3017:	1	0	0	0	0	0	0	1
3025:	0	0	0	0	0	0	0	1
3033:	0	0	0	0	0	0	0	0
3041:	1	1	1	0	0	0	0	0
3049:	3	4	7	8	3	0	0	0
3057:	0	0	0	1	0	1	1	1
3065:	1	0	0	0	0	0	0	0
3073:	0	0	1	0	1	0	2	0
3081:	0	0	0	0	0	0	0	0
3089:	0	2	0	2	0	0	0	1
3097:	0	0	1	0	1	0	0	1
3105:	0	1	1	0	2	1	0	0
3113:	0	0	0	0	0	1	0	0
3121:	1	0	0	2	1	1	1	1
3129:	1	0	0	1	0	0	0	1
3137:	0	0	1	0	0	0	0	0
3145:	1	0	0	0	0	0	0	0
3153:	0	0	1	0	0	0	0	0
3161:	0	1	0	0	0	0	0	0
3169:	0	0	0	1	1	1	0	0
3177:	1	0	0	0	0	0	0	0
3185:	1	0	0	0	0	0	1	0
3193:	0	0	1	1	0	0	2	0
3201:	0	0	1	0	0	0	0	0
3209:	1	1	0	0	0	0	0	0
3217:	0	1	0	0	1	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	0	1	0	0	0	0	0	0
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3265:	0	0	0	0	0	1	0	0
3273:	0	0	0	0	0	0	1	0
3281:	0	0	0	0	0	0	1	0
3289:	0	0	0	0	0	0	1	0
3297:	0	0	0	1	0	1	2	0
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3345:	0	0	0	0	0	0	0	0
3353:	0	0	0	0	0	2	0	1
3361:	0	0	0	0	1	0	0	0
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3377:	0	0	0	0	0	0	0	0
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3393:	0	0	0	1	0	0	0	0
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3409:	0	0	1	0	1	0	0	0
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3457:	1	0	0	0	1	0	0	0
3465:	0	0	0	0	0	0	1	0
3473:	0	0	0	1	0	0	0	0
3481:	0	0	0	1	0	0	0	0
3489:	0	0	1	1	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	1	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	0	1
3521:	1	0	1	1	1	0	0	0
3529:	0	0	0	1	0	0	1	0
3537:	1	0	0	0	0	0	0	0
3545:	0	0	0	0	0	1	1	0
3553:	0	1	0	0	0	0	0	0
3561:	0	1	0	0	0	0	0	0
3569:	0	0	1	0	0	0	0	0
3577:	0	0	0	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	0	0	0	2	0
3609:	0	0	0	0	1	0	0	0
3617:	1	0	0	0	0	0	1	0
3625:	0	0	0	0	0	0	0	0
3633:	0	0	0	0	0	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	1	0	0	0	0	0
3657:	0	0	0	0	0	0	0	1
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	1	1	0	0	0
3689:	0	0	0	0	1	0	0	0
3697:	1	0	0	0	0	1	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	1
3721:	1	0	0	1	0	0	0	1
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	0	0	0	0	1
3745:	0	0	0	0	0	1	1	1
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	1	0	0	0	0	0
3777:	0	0	2	0	0	0	0	0
3785:	0	0	0	0	1	0	1	0

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	1	1	0	0
3809:	0	0	0	1	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	1	0	0	0	0
3849:	0	0	0	0	1	0	0	0
3857:	0	1	0	0	0	0	0	0
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3873:	0	0	1	0	1	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
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3913:	0	0	0	0	0	0	0	0
3921:	0	0	1	0	0	0	0	2
3929:	0	0	0	0	0	0	0	0
3937:	0	0	1	0	1	0	0	0
3945:	1	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	2	0	0	0	0
3977:	0	0	0	1	0	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	1	1	0	0	0
4001:	0	0	0	0	0	1	0	0
4009:	0	0	0	0	0	0	0	1
4017:	0	0	0	0	1	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	1	0	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	1	0	0	0	0
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4065:	0	0	0	0	1	0	1	0
4073:	1	0	0	0	1	0	0	0
4081:	0	0	0	0	0	1	0	0
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Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

VAX/VMS Peak Search Report Generated 1-APR-2013 07:57:59.65

4/11/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301208_GE3_GAS1202_190101.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-70-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 06:54:13.
Sample ID : 1303012-08 Sample Quantity : 4.75320E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE3 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:03:23.67 5.4%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	26.78	744	19462	1.24	27.10	25	5	56.8		
0	46.06*	11816	22597	1.81	46.38	45	4	4.0		PB-210
0	62.76*	5192	47176	1.27	63.08	61	5	12.8		TH-234
1	67.76	3127	47500	1.52	68.07	66	17	21.2	4.59E+03	
1	74.82*	48213	45855	1.53	75.14	66	17	1.9		AM-243
0	87.86	4400	54806	1.01	88.17	85	5	16.1		NP-237 SN-126 CD-109
0	92.57*	5077	34701	1.61	92.89	92	5	11.3		
0	112.67	527	27336	0.94	112.98	111	5	94.5		
0	121.70	503	26603	1.94	122.01	120	5	97.6		CO-57
0	143.75*	1786	28640	1.29	144.07	142	5	28.8		U-235
0	153.72	1792	34647	1.45	154.04	152	6	33.2		
0	185.86*	25002	42445	1.41	186.18	182	9	3.2		RA-226
0	204.91	566	19286	1.76	205.22	203	5	74.3		U-235
0	210.67	454	17693	1.35	210.98	209	5	88.5		
2	235.78	2953	15341	1.64	236.09	232	15	13.0	9.96E+00	
2	239.02*	1082	18169	1.92	239.33	232	15	42.0		PB-212
2	241.76*	30241	11721	1.34	242.07	232	15	1.5		RA-224
1	255.53	1581	12923	1.76	255.84	253	10	22.0	2.80E+01	
1	258.56	2337	12495	1.76	258.87	253	10	15.2		
7	269.99	5238	20887	3.14	270.30	266	13	10.4	9.24E+00	
7	274.66	1914	13854	1.88	274.96	266	13	20.2		
0	295.00*	64521	24431	1.66	295.30	290	10	1.2		PB-214
0	315.05	558	10644	3.67	315.36	313	6	59.2		
0	323.43	980	10029	1.65	323.73	321	6	32.9		RA-223
0	329.29	468	8889	1.29	329.59	328	5	61.2		
4	351.72*	110812	6199	1.49	352.02	346	14	0.6	3.24E+01	PB-214
4	354.92	2641	9930	2.46	355.22	346	14	26.7		
0	387.91	1666	12315	2.71	388.22	384	9	24.5		
1	401.53	1118	6840	1.75	401.83	399	10	23.0	2.20E+00	RN-219
1	404.87	941	8303	1.85	405.17	399	10	31.8		PB-211
0	416.91	273	8334	3.06	417.21	415	6	106.4		
0	427.54	812	8480	2.28	427.84	425	7	38.4		
0	444.69	206	4832	1.65	444.99	443	5	102.5		
0	454.59	541	6497	1.28	454.89	452	7	50.2		

AG
4/17/13

Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	461.69	423	4506	2.06	461.99	460	5	48.7		
0	473.89	213	5231	1.49	474.19	473	6	108.3		
0	480.30	705	5832	1.79	480.60	478	7	36.8		
0	487.00	722	5592	1.73	487.29	484	7	35.2		
0	510.80*	1019	6375	2.97	511.10	507	9	29.0		
0	533.79	285	4279	1.52	534.09	531	6	73.6		
0	542.50	247	3908	2.81	542.80	541	6	81.0		
0	573.17	187	3796	1.19	573.46	571	6	105.1		
0	580.16	559	4463	1.60	580.46	577	7	40.5		
4	604.89	166	2418	2.02	605.18	603	21	81.8	1.48E+01	
4	609.22*	77371	2622	1.63	609.51	603	21	0.7		BI-214
4	612.69	1777	3109	2.23	612.98	603	21	25.4		
0	638.92	138	2628	1.84	639.22	637	6	119.1		
0	665.42	2299	3852	1.94	665.71	662	9	10.6		
0	703.11	618	2981	1.87	703.40	700	7	30.4		
0	719.58	514	2881	1.79	719.86	716	7	35.7		
0	742.32	524	3168	2.50	742.60	739	8	38.2		
0	768.27	6883	4988	2.00	768.55	763	12	4.8		
1	781.91	94	1172	1.74	782.19	781	11	98.6	6.98E-01	
1	785.88	1577	2339	1.88	786.16	781	11	11.0		
0	806.13	1711	2709	2.02	806.42	803	7	11.2		
0	831.46	314	2778	2.04	831.74	829	7	56.7		PB-211
0	839.07	917	3158	1.84	839.35	836	8	22.3		
0	893.00	146	2437	3.39	893.28	891	6	108.4		
0	899.13*	162	2464	3.03	899.41	897	6	98.1		
0	934.00	3834	4042	2.04	934.28	929	11	7.2		
0	963.85	382	2755	2.26	964.12	961	8	48.7		
0	1001.46*	558	3014	2.11	1001.74	997	10	37.8		PA-234M
0	1032.90	157	1706	2.95	1033.17	1031	6	84.6		
0	1045.10	114	1569	3.57	1045.37	1043	6	111.9		
0	1051.90	416	2135	2.21	1052.17	1049	8	39.6		
0	1069.88	474	2604	2.45	1070.15	1065	10	41.4		
0	1096.89	166	1469	2.10	1097.16	1095	6	75.0		
0	1120.42*	15816	3284	2.10	1120.69	1115	12	2.2		BI-214
0	1133.85	268	2029	1.61	1134.12	1131	8	59.6		
0	1155.24	1709	2320	2.13	1155.50	1151	9	11.3		
0	1182.05	243	1592	1.86	1182.31	1179	7	56.0		
0	1207.97	261	1799	1.46	1208.24	1204	8	57.7		
0	1238.29*	5872	2405	2.22	1238.55	1234	12	4.2		
0	1253.55	438	1700	2.48	1253.81	1250	9	35.3		
0	1281.12	1301	1950	2.14	1281.39	1277	10	13.9		
0	1298.19	122	1059	3.03	1298.45	1296	6	86.7		
0	1304.01	190	1178	2.69	1304.27	1302	7	61.6		
0	1352.76	118	1197	2.36	1353.02	1351	7	98.7		
1	1377.88	3967	1111	2.09	1378.13	1373	18	4.1	1.90E+00	
1	1385.52	740	1261	2.41	1385.78	1373	18	17.7		
0	1392.61	89	1048	1.86	1392.87	1391	6	116.8		
3	1401.69	1265	1198	2.21	1401.94	1397	17	10.7	6.29E-01	
3	1408.24	2143	1189	2.38	1408.50	1397	17	6.9		
0	1415.82	99	1233	3.51	1416.08	1414	7	119.6		
0	1461.57*	599	1672	2.07	1461.82	1458	9	25.9		K-40

Post-NID Peak Search Report (continued)
Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1509.42	1870	2383	2.23	1509.68	1504	12	11.4		
1	1538.95	384	1292	2.48	1539.20	1535	13	32.3	1.35E+00	
1	1543.62	338	1204	2.29	1543.87	1535	13	36.8		
0	1583.52	640	1335	2.23	1583.77	1579	10	22.8		
4	1594.82	217	769	2.13	1595.07	1590	15	41.8	2.46E+00	
4	1599.67	342	1149	3.33	1599.91	1590	15	40.1		
0	1607.43	112	779	2.26	1607.67	1605	7	84.8		
0	1661.70	794	947	2.39	1661.95	1658	11	16.7		
0	1684.70	165	679	2.78	1684.94	1680	10	61.1		
0	1693.68	213	687	2.59	1693.92	1690	11	49.8		
7	1725.04	75	251	2.31	1725.28	1723	16	67.5	2.53E+00	
7	1729.94	2685	370	2.37	1730.18	1723	16	4.5		
0	1764.96*	12177	737	2.37	1765.20	1759	13	2.0		BI-214
1	1838.88	253	360	2.59	1839.11	1833	24	27.8	1.25E+00	
1	1847.91	1676	265	2.38	1848.15	1833	24	5.9		
1	1852.85	63	266	2.59	1853.08	1833	24	125.9		
0	1873.54	125	354	1.91	1873.78	1870	8	55.0		
1	1890.77	73	351	2.61	1891.00	1886	17	90.8	1.75E+00	
1	1897.00	126	335	2.61	1897.24	1886	17	54.1		
0	1937.35	150	369	3.50	1937.58	1933	9	48.9		
0	2011.44	47	247	2.08	2011.67	2009	8	118.2		
0	2088.05	75	166	2.06	2088.27	2083	11	70.0		
2	2110.29	60	106	2.95	2110.52	2107	21	63.6	7.37E-01	
2	2119.08	780	128	2.57	2119.30	2107	21	8.8		
0	2141.07	23	46	2.55	2141.29	2139	6	102.1		
0	2191.39	53	169	3.78	2191.61	2187	11	99.4		
0	2204.74*	3242	248	2.59	2204.96	2199	13	4.0		BI-214
0	2267.87	19	44	3.27	2268.08	2265	7	129.7		
4	2294.05	195	77	2.99	2294.27	2287	22	21.1	3.11E+00	
4	2301.04	23	42	2.75	2301.25	2287	22	122.5		
4	2305.02	17	31	3.66	2305.23	2287	22	140.5		
0	2358.51	14	11	2.82	2358.72	2354	9	101.0		
0	2364.78	10	8	2.88	2364.99	2363	6	107.3		
0	2370.61	12	6	1.95	2370.82	2368	7	91.2		
0	2378.89	32	11	3.28	2379.10	2375	10	51.0		
0	2412.79	11	8	2.78	2413.00	2408	8	107.6		
0	2448.44	933	24	2.61	2448.65	2444	12	6.8		
0	2615.71*	64	6	2.72	2615.91	2610	13	30.5		
0	2696.20	12	8	3.68	2696.40	2692	10	108.0		
0	2729.95	7	0	1.92	2730.14	2726	8	75.6		
0	2770.98	19	3	1.56	2771.17	2766	11	56.9		
0	2828.32	6	2	2.68	2828.51	2823	8	117.9		
0	3001.25	7	0	1.12	3001.43	2998	7	75.6		
0	3054.45	8	0	2.50	3054.63	3050	8	70.7		

Total number of lines in spectrum	129	
Number of unidentified lines	83	
Number of lines tentatively identified by NID	46	35.66%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.472E+01	2.472E+01	0.693E+01	28.03	
PB-210	22.26Y	1.00	1.927E+02	1.933E+02	0.192E+02	9.92	
PB-211	3.28E+04Y	1.00	3.909E+01	3.909E+01	1.156E+01	29.57	
PB-212	1.41E+10Y	1.00	2.275E+00	2.275E+00	1.018E+00	44.75	
BI-214	1602.00Y	1.00	3.721E+02	3.721E+02	0.209E+02	5.63	
PB-214	1602.00Y	1.00	3.758E+02	3.758E+02	0.418E+02	11.13	
RN-219	3.28E+04Y	1.00	2.451E+01	2.451E+01	0.615E+01	25.07	
RA-223	3.28E+04Y	1.00	3.000E+01	3.000E+01	1.103E+01	36.76	
RA-224	1.41E+10Y	1.00	7.231E+02	7.231E+02	1.136E+02	15.71	
RA-226	1602.00Y	1.00	6.069E+02	6.069E+02	11.13E+02	183.31	
PA-234M	4.47E+09Y	1.00	1.964E+02	1.964E+02	0.777E+02	39.57	
TH-234	4.47E+09Y	1.00	8.442E+01	8.442E+01	1.307E+01	15.48	
U-235	7.04E+08Y	1.00	1.147E+01	1.147E+01	0.362E+01	31.51	
			---------	---------			
	Total Activity :		2.684E+03	2.684E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	3.831E-01	4.161E-01	4.092E-01	98.33	
CD-109	464.00D	1.05	7.168E+01	7.523E+01	1.532E+01	20.36	
SN-126	1.00E+05Y	1.00	7.204E+00	7.204E+00	1.401E+00	19.45	
NP-237	2.14E+06Y	1.00	2.113E+01	2.113E+01	0.410E+01	19.39	
			---------	---------			
	Total Activity :		1.004E+02	1.040E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	4.415E+01	4.415E+01	0.432E+01	9.79	
			---------	---------			
	Total Activity :		4.415E+01	4.415E+01			

Grand Total Activity : 2.828E+03 2.832E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	3.586E-01	2.472E+01	2.472E+01	28.03	OK
Final Mean for 1 Valid Peaks = 2.472E+01+/- 6.929E+00 (28.03%)							
PB-210	46.50	4.25*	2.278E+00	1.927E+02	1.933E+02	9.92	OK
Final Mean for 1 Valid Peaks = 1.933E+02+/- 1.918E+01 (9.92%)							
PB-211	404.84	2.90*	1.101E+00	4.655E+01	4.655E+01	33.33	OK
	831.96	2.90	5.742E-01	2.978E+01	2.978E+01	58.18	OK
Final Mean for 2 Valid Peaks = 3.909E+01+/- 1.156E+01 (29.57%)							
PB-212	238.63	44.60*	1.684E+00	2.275E+00	2.275E+00	44.75	OK
	300.09	3.41	1.415E+00	-----	Line Not Found	-----	Absent
Final Mean for 1 Valid Peaks = 2.275E+00+/- 1.018E+00 (44.75%)							
BI-214	609.31	46.30*	7.618E-01	3.465E+02	3.465E+02	12.61	OK
	1120.29	15.10	4.433E-01	3.732E+02	3.732E+02	10.57	OK
	1764.49	15.80	3.132E-01	3.887E+02	3.887E+02	10.42	OK
	2204.22	4.98	2.726E-01	3.772E+02	3.772E+02	11.83	OK
Final Mean for 4 Valid Peaks = 3.721E+02+/- 2.095E+01 (5.63%)							
PB-214	295.21	19.19	1.434E+00	3.704E+02	3.704E+02	18.38	OK
	351.92	37.19*	1.241E+00	3.791E+02	3.791E+02	13.98	OK
Final Mean for 2 Valid Peaks = 3.758E+02+/- 4.183E+01 (11.13%)							
RN-219	401.80	6.50*	1.108E+00	2.451E+01	2.451E+01	25.07	OK
Final Mean for 1 Valid Peaks = 2.451E+01+/- 6.147E+00 (25.07%)							
RA-223	323.87	3.88*	1.330E+00	3.000E+01	3.000E+01	36.76	OK
Final Mean for 1 Valid Peaks = 3.000E+01+/- 1.103E+01 (36.76%)							
RA-224	240.98	3.95*	1.672E+00	7.231E+02	7.231E+02	15.71	OK
Final Mean for 1 Valid Peaks = 7.231E+02+/- 1.136E+02 (15.71%)							
RA-226	186.21	3.28*	1.984E+00	6.069E+02	6.069E+02	183.31	OK
Final Mean for 1 Valid Peaks = 6.069E+02+/- 1.113E+03 (183.31%)							
PA-234M	1001.03	0.92*	4.879E-01	1.964E+02	1.964E+02	39.57	OK
Final Mean for 1 Valid Peaks = 1.964E+02+/- 7.773E+01 (39.57%)							

Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.556E+00	8.442E+01	8.442E+01	15.48	OK

Final Mean for 1 Valid Peaks = 8.442E+01+/- 1.307E+01 (15.48%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-235	143.76	10.50*	2.274E+00	1.182E+01	1.182E+01	34.44	OK
	163.35	4.70	2.136E+00	-----	Line Not Found	-----	Absent
	205.31	4.70	1.866E+00	1.020E+01	1.020E+01	77.29	OK

Final Mean for 2 Valid Peaks = 1.147E+01+/- 3.616E+00 (31.51%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.427E+00	3.831E-01	4.161E-01	98.33	OK
	136.48	10.60	2.326E+00	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 4.161E-01+/- 4.092E-01 (98.33%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.606E+00	7.168E+01	7.523E+01	20.36	OK

Final Mean for 1 Valid Peaks = 7.523E+01+/- 1.532E+01 (20.36%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.607E+00	7.204E+00	7.204E+00	19.45	OK

Final Mean for 1 Valid Peaks = 7.204E+00+/- 1.401E+00 (19.45%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.610E+00	2.113E+01	2.113E+01	19.39	OK

Final Mean for 1 Valid Peaks = 2.113E+01+/- 4.097E+00 (19.39%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.614E+00	4.415E+01	4.415E+01	9.79	OK

Final Mean for 1 Valid Peaks = 4.415E+01+/- 4.323E+00 (9.79%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.472E+01	6.929E+00	7.058E+00	6.925E-01	3.503
CO-57	4.161E-01	4.092E-01	5.916E-01	6.676E-02	0.703
CD-109	7.523E+01	1.532E+01	1.602E+01	1.893E+00	4.696
SN-126	7.204E+00	1.401E+00	1.534E+00	1.560E-01	4.697
PB-210	1.933E+02	1.918E+01	1.187E+01	9.650E-01	16.287
PB-211	3.909E+01	1.156E+01	1.963E+01	1.819E+00	1.991
PB-212	2.275E+00	1.018E+00	1.161E+00	1.731E-01	1.960
BI-214	3.721E+02	2.095E+01	1.143E+00	1.364E-01	325.575
PB-214	3.758E+02	4.183E+01	1.404E+00	1.879E-01	267.707
RN-219	2.451E+01	6.147E+00	8.695E+00	8.018E-01	2.819
RA-223	3.000E+01	1.103E+01	1.337E+01	2.120E+00	2.244
RA-224	7.231E+02	1.136E+02	1.321E+01	1.997E+00	54.738
RA-226	6.069E+02	1.113E+03	1.652E+01	3.026E+01	36.750
PA-234M	1.964E+02	7.773E+01	7.250E+01	7.919E+00	2.710
TH-234	8.442E+01	1.307E+01	1.508E+01	1.156E+00	5.599
U-235	1.147E+01	3.616E+00	4.966E+00	9.140E-01	2.311
NP-237	2.113E+01	4.097E+00	4.758E+00	4.780E-01	4.442
AM-243	4.415E+01	4.323E+00	9.177E-01	8.022E-02	48.106

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	7.974E+00		6.401E+00	7.981E+00	8.234E-01	0.999
NA-22	3.908E-02		4.654E-01	6.818E-01	6.298E-02	0.057
AL-26	-2.341E-01		2.442E-01	4.112E-01	3.833E-02	-0.569
TI-44	2.023E+00	+	4.657E-01	6.322E-01	5.107E-02	3.200
SC-46	1.920E-01		6.015E-01	9.012E-01	1.061E-01	0.213
V-48	-7.500E-01		1.641E+00	2.699E+00	2.991E-01	-0.278
CR-51	6.167E+00		9.185E+00	1.156E+01	1.896E+00	0.533
MN-54	6.042E-01		5.860E-01	7.092E-01	8.616E-02	0.852
CO-56	5.528E-02		5.764E-01	8.634E-01	1.043E-01	0.064
CO-58	4.534E-02		5.628E-01	8.453E-01	1.039E-01	0.054
FE-59	-4.094E-01		1.340E+00	1.960E+00	2.047E-01	-0.209
CO-60	-1.832E-02		4.594E-01	6.739E-01	5.914E-02	-0.027
ZN-65	4.765E+00		1.174E+00	1.714E+00	1.649E-01	2.780
SE-75	-1.186E-01		8.070E-01	1.019E+00	1.773E-01	-0.116
RB-82	1.877E+00		8.994E+00	1.078E+01	1.338E+00	0.174
RB-83	-1.899E-01		8.860E-01	1.439E+00	2.445E-01	-0.132
KR-85	1.959E+02		8.094E+01	1.234E+02	1.333E+01	1.588
SR-85	1.203E+00		4.970E-01	7.577E-01	8.187E-02	1.588
Y-88	1.154E+00		3.799E-01	6.888E-01	6.384E-02	1.675
NB-93M	2.863E+01		1.243E+01	1.606E+01	4.478E+00	1.783
NB-94	-7.505E-02		4.037E-01	6.713E-01	7.998E-02	-0.112
NB-95	2.255E+01		3.091E+00	1.896E+00	2.360E-01	11.893
ZR-95	-8.087E-01		9.306E-01	1.461E+00	1.911E-01	-0.554
RU-103	-2.194E-01		5.919E-01	1.005E+00	1.551E-01	-0.218
RU-106	3.688E-02		3.545E+00	5.397E+00	8.531E-01	0.007

Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-108M	3.463E-01		4.153E-01	6.327E-01	7.916E-02	0.547
AG-110M	-4.080E-02		4.012E-01	6.077E-01	7.556E-02	-0.067
SN-113	4.282E-01		6.646E-01	1.035E+00	9.648E-02	0.414
TE123M	3.582E-01		5.218E-01	7.707E-01	7.382E-02	0.465
SB-124	1.684E-01		5.493E-01	8.394E-01	9.962E-02	0.201
I-125	-1.434E+01		7.057E+00	1.129E+01	1.108E+00	-1.270
SB-125	4.264E+00	+	1.700E+00	2.063E+00	2.014E-01	2.067
SB-126	1.405E+01	+	5.350E+00	6.851E+00	8.572E-01	2.051
I-129	-5.056E-02		6.623E-01	1.019E+00	1.185E-01	-0.050
I-131	-4.503E-01		6.071E+00	1.002E+01	1.215E+00	-0.045
BA-133	5.689E+00	+	1.798E+00	1.027E+00	1.683E-01	5.541
CS-134	3.601E-01	+	2.981E-01	6.887E-01	8.199E-02	0.523
CS-135	2.189E+01		4.522E+00	3.624E+00	6.423E-01	6.039
CS-136	3.939E+00		3.831E+00	4.605E+00	4.908E-01	0.855
CS-137	8.506E-01		4.310E-01	6.536E-01	8.160E-02	1.301
LA-138	-4.378E-01		6.635E-01	1.063E+00	1.018E-01	-0.412
CE-139	-3.762E-01		4.857E-01	7.706E-01	7.101E-02	-0.488
BA-140	2.439E+00		1.009E+01	1.233E+01	4.177E+00	0.198
LA-140	9.414E+00		3.808E+00	4.668E+00	4.473E-01	2.017
CE-141	2.982E+00		1.669E+00	2.208E+00	5.699E-01	1.351
CE-144	-2.028E+00		3.066E+00	4.900E+00	5.284E-01	-0.414
PM-144	1.317E-01		3.811E-01	5.797E-01	7.260E-02	0.227
PM-145	-1.173E+00		1.587E+00	2.289E+00	1.493E+00	-0.513
PM-146	2.174E+00	+	1.116E+00	1.389E+00	1.387E-01	1.566
ND-147	1.889E+01		2.059E+01	3.175E+01	3.500E+00	0.595
EU-152	6.172E+01	+	8.713E+00	7.712E+00	9.001E-01	8.003
GD-153	-1.964E+00		1.362E+00	2.161E+00	2.291E-01	-0.909
EU-154	2.189E-01		1.286E+00	1.888E+00	1.744E-01	0.116
EU-155	8.725E+00	+	1.692E+00	2.120E+00	2.130E-01	4.115
EU-156	-2.575E+00		1.708E+01	2.551E+01	6.240E+00	-0.101
HO-166M	-2.229E-01		7.462E-01	1.023E+00	1.281E-01	-0.218
HF-172	2.305E-01		2.914E+00	4.333E+00	4.817E-01	0.053
LU-172	2.110E+01		2.051E+01	3.079E+01	3.047E+00	0.685
LU-173	1.974E+01		4.052E+00	2.938E+00	5.321E-01	6.721
HF-175	-6.416E-01		5.840E-01	8.894E-01	1.262E-01	-0.721
LU-176	-3.893E-01		3.562E-01	5.422E-01	9.287E-02	-0.718
TA-182	1.965E+02	+	2.075E+01	7.653E+00	7.295E-01	25.677
IR-192	1.534E+00		1.216E+00	1.518E+00	1.546E-01	1.011
HG-203	-3.917E-01		7.661E-01	1.096E+00	2.077E-01	-0.357
BI-207	1.362E-01		3.642E-01	5.585E-01	6.418E-02	0.244
TL-208	1.212E+00		1.217E+00	1.869E+00	2.177E-01	0.649
BI-210M	1.285E+00		9.108E-01	1.137E+00	1.945E-01	1.130
BI-212	-1.150E+00		2.929E+00	4.670E+00	5.842E-01	-0.246
RA-225	-4.408E+00		4.351E+00	7.118E+00	6.360E-01	-0.619
TH-227	2.389E+01	+	4.781E+00	5.009E+00	7.348E-01	4.770
AC-228	6.379E-02		1.523E+00	2.536E+00	2.949E-01	0.025
TH-230	5.160E+02	+	1.187E+02	1.610E+02	1.297E+01	3.205
PA-231	-2.280E+01		1.668E+01	2.295E+01	3.997E+00	-0.993

Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
TH-231	5.987E+00	+	3.509E+00	4.738E+00	6.577E-01	1.264
PA-233	1.387E-01		2.120E+00	3.051E+00	8.134E-01	0.045
PA-234	1.841E-01		1.481E+00	2.384E+00	2.596E-01	0.077
AM-241	8.063E+00		1.190E+00	1.544E+00	1.136E-01	5.223
CM-243	-1.494E+00		2.618E+00	3.740E+00	6.983E-01	-0.400

Summary of Nuclide Activity
Sample ID : 1303012-08 Acquisition date : 1-APR-2013 06:54:13

Total number of lines in spectrum	129	
Number of unidentified lines	83	
Number of lines tentatively identified by NID	46	35.66%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.472E+01	2.472E+01	0.693E+01	28.03	
PB-210	22.26Y	1.00	1.927E+02	1.933E+02	0.192E+02	9.92	
PB-211	3.28E+04Y	1.00	3.909E+01	3.909E+01	1.156E+01	29.57	
PB-212	1.41E+10Y	1.00	2.275E+00	2.275E+00	1.018E+00	44.75	
BI-214	1602.00Y	1.00	3.721E+02	3.721E+02	0.209E+02	5.63	
PB-214	1602.00Y	1.00	3.758E+02	3.758E+02	0.418E+02	11.13	
RN-219	3.28E+04Y	1.00	2.451E+01	2.451E+01	0.615E+01	25.07	
RA-223	3.28E+04Y	1.00	3.000E+01	3.000E+01	1.103E+01	36.76	
RA-224	1.41E+10Y	1.00	7.231E+02	7.231E+02	1.136E+02	15.71	
RA-226	1602.00Y	1.00	6.069E+02	6.069E+02	11.13E+02	183.31	
PA-234M	4.47E+09Y	1.00	1.964E+02	1.964E+02	0.777E+02	39.57	
TH-234	4.47E+09Y	1.00	8.442E+01	8.442E+01	1.307E+01	15.48	
U-235	7.04E+08Y	1.00	1.147E+01	1.147E+01	0.362E+01	31.51	
			---------	---------			
	Total Activity :		2.684E+03	2.684E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	3.831E-01	4.161E-01	4.092E-01	98.33	
CD-109	464.00D	1.05	7.168E+01	7.523E+01	1.532E+01	20.36	
SN-126	1.00E+05Y	1.00	7.204E+00	7.204E+00	1.401E+00	19.45	
NP-237	2.14E+06Y	1.00	2.113E+01	2.113E+01	0.410E+01	19.39	
			---------	---------			
	Total Activity :		1.004E+02	1.040E+02			

Nuclide Type : ACTIVATION

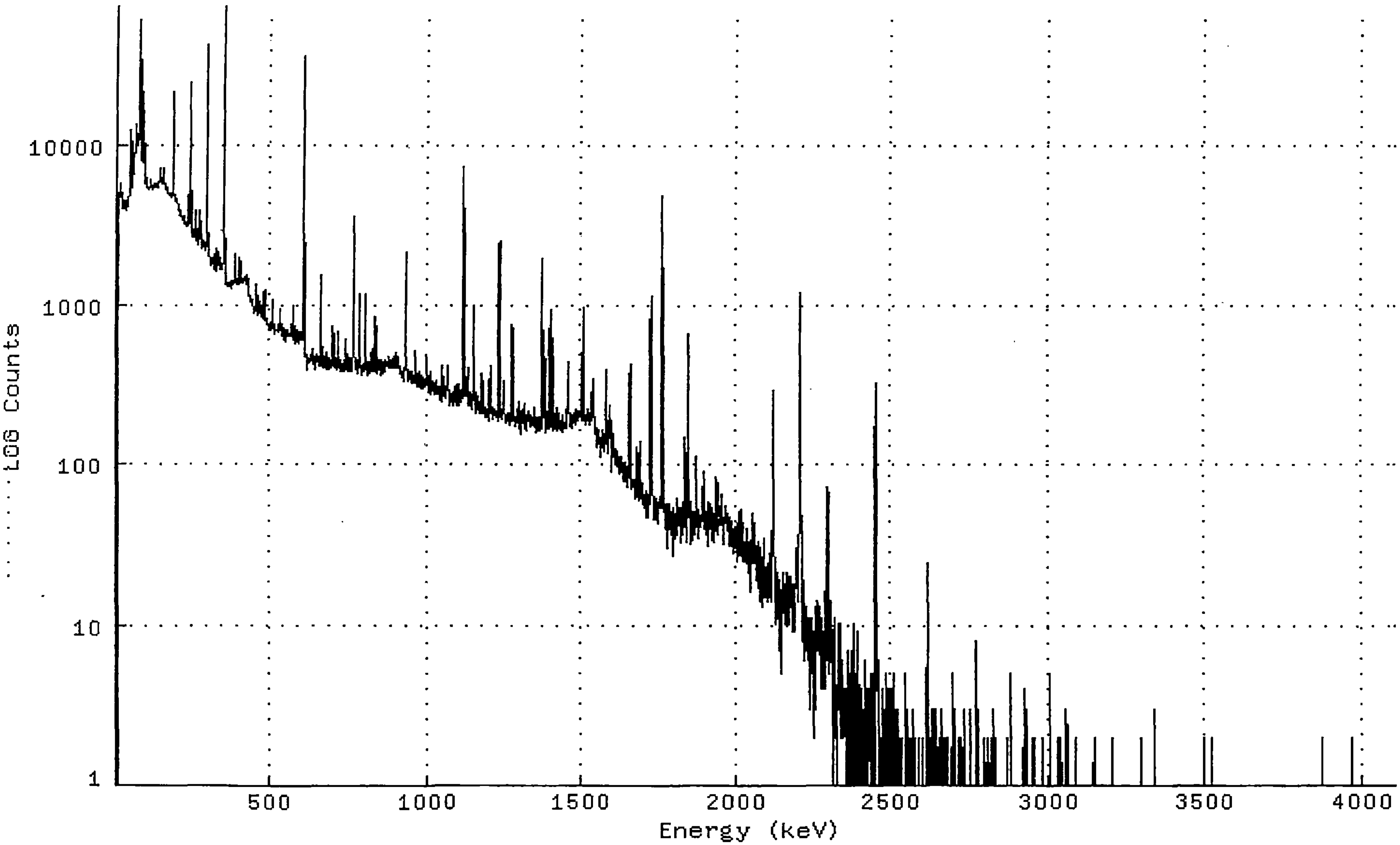
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	4.415E+01	4.415E+01	0.432E+01	9.79	
			---------	---------			
	Total Activity :		4.415E+01	4.415E+01			

Grand Total Activity : 2.828E+03 2.832E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301208_GE3_GAS1202_190101.CNF;1
Title :
Sample Title: S30-70-130228

Start Time:	1-APR-2013 06:54:	Sample Time:	28-FEB-2013 00:00	Energy Offset:	-3.21163E-01
Real Time :	0 01:03:23.67	Sample ID :	1303012-08	Energy Slope :	1.00005E+00
Live Time :	0 01:00:00.00	Sample Type:	SOLID	Energy Quad :	0.00000E+00



Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301208_GE3_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	1
9:	1718	4880	4776	5076	5402	4720	5613	5228
17:	4673	4461	4340	4198	3942	4022	3982	3984
25:	3952	3937	4463	4046	3808	3877	4131	4444
33:	4145	4052	4073	4390	4321	4203	4465	4600
41:	4769	5059	5100	5325	5760	12234	11096	5371
49:	6051	7299	6286	6503	10200	7347	6418	6822
57:	7103	7671	8212	8946	9459	9669	13063	10655
65:	9572	9615	10926	11538	9994	10209	10283	10518
73:	11118	20406	36165	19084	58152	19127	12241	10436
81:	11820	7784	9734	13869	7559	9144	21038	12514
89:	8951	11957	7085	9056	10000	7467	7661	5670
97:	5629	6137	5586	5405	5287	5324	5322	5266
105:	5227	5242	5350	5387	5491	5502	5552	5490
113:	5939	5378	5504	5351	5394	5355	5254	5311
121:	5378	5580	5540	5297	5395	5363	5486	5511
129:	5346	5485	5612	5566	5397	5497	5435	5544
137:	5463	5631	5766	5834	5842	5774	5942	7011
145:	6078	5628	5722	5807	5757	6041	5849	5934
153:	5956	6941	6268	5660	5680	5706	5684	5416
161:	5271	5235	5365	5293	5092	4987	5026	4903
169:	4932	4941	4863	4774	4838	4729	4818	4811
177:	4703	4829	4743	4761	4719	4864	4839	4895
185:	6846	20595	11152	4838	4704	4750	4559	4429
193:	4459	4515	4391	4539	4375	4312	4281	4255
201:	4192	4232	4054	3983	4183	3989	3643	3703
209:	3650	3667	3805	3547	3478	3419	3513	3390
217:	3396	3462	3396	3421	3345	3543	3267	3310
225:	3222	3310	3271	3264	3200	3078	3150	3130
233:	3164	3132	3473	4819	3590	3295	3473	3143
241:	6528	24104	8379	3014	2941	2888	2732	2792
249:	2655	2634	2613	2639	2686	2695	2642	3362
257:	3009	2840	3824	2798	2497	2431	2359	2413
265:	2330	2336	2409	2491	3456	3800	3722	3118
273:	2576	2766	3301	2423	2354	2244	2359	2264
281:	2399	2369	2319	2405	2329	2462	2330	2251
289:	2287	2159	2252	2233	2284	5711	41043	24947
297:	3194	2541	2592	2760	2123	2001	2133	2028
305:	1975	1820	1863	1812	1883	1784	1751	1818
313:	1875	1930	1969	1793	1853	1782	1665	1659
321:	1674	1723	1898	2219	1875	1620	1730	1783
329:	1882	2118	1818	1756	1828	1889	1782	1747
337:	1750	1955	1856	1650	1808	1744	1807	1660
345:	1698	1692	1754	1778	1951	2355	19402	73049
353:	21915	2625	2460	2237	1772	1578	1448	1344
361:	1364	1293	1294	1311	1294	1353	1370	1335
369:	1285	1295	1347	1353	1339	1272	1361	1315
377:	1399	1352	1330	1332	1373	1391	1394	1386
385:	1377	1548	1742	1629	2072	1517	1344	1366
393:	1336	1398	1458	1444	1353	1346	1365	1401
401:	1640	1975	1490	1511	1847	1715	1392	1424
409:	1373	1426	1427	1437	1376	1379	1385	1481
417:	1451	1470	1419	1401	1387	1493	1382	1342
425:	1320	1358	1513	1414	1271	1283	1133	1121

433:	1128	1089	1139	1055	1037	1093	1028	1040
441:	1031	1009	1027	982	1063	1070	896	970
449:	970	878	962	915	960	1031	1314	992
457:	906	920	921	905	1003	1120	1032	869
465:	918	980	877	932	913	1035	910	840
473:	876	999	933	879	888	869	894	1116
481:	1201	816	828	813	789	871	1226	1044
489:	817	754	811	774	798	750	775	754
497:	741	733	705	701	750	716	701	701
505:	766	717	722	707	811	971	1065	966
513:	788	713	721	678	690	659	656	700
521:	684	690	697	701	695	685	681	719
529:	667	733	671	685	818	941	751	698
537:	745	688	694	660	642	732	749	754
545:	667	611	692	700	611	639	646	603
553:	687	609	649	595	655	691	660	662
561:	646	680	654	632	631	639	650	651
569:	634	642	649	647	746	656	646	639
577:	608	618	670	990	831	655	650	647
585:	642	565	599	685	591	598	636	608
593:	629	631	578	672	581	640	622	600
601:	614	619	596	635	674	611	745	4505
609:	34844	35303	4861	1191	1158	859	689	575
617:	515	493	438	483	444	470	392	472
625:	455	440	448	447	432	449	474	465
633:	472	481	487	451	431	464	520	487
641:	424	440	432	474	443	391	429	426
649:	466	484	431	431	449	464	439	423
657:	428	438	412	468	469	412	451	522
665:	1279	1545	630	469	442	401	436	425
673:	436	400	443	417	430	422	467	394
681:	423	424	458	502	434	451	464	445
689:	462	388	414	418	400	407	443	443
697:	406	418	436	413	426	503	736	604
705:	506	411	443	436	428	406	460	461
713:	419	390	402	425	428	424	487	675
721:	559	397	423	432	400	385	405	448
729:	398	383	399	418	396	418	382	389
737:	444	398	384	386	479	559	605	476
745:	416	387	413	377	381	436	416	396
753:	490	438	417	398	384	384	388	404
761:	385	410	430	446	418	514	795	3021
769:	3555	947	469	450	408	418	406	394
777:	421	374	374	408	374	447	431	415
785:	664	1166	841	450	401	385	395	382
793:	378	360	417	388	378	383	384	402
801:	420	393	391	415	517	1174	1030	519
809:	374	392	408	384	418	364	410	419
817:	374	404	377	390	498	502	384	417
825:	432	429	471	376	396	423	445	517
833:	537	383	391	419	407	504	834	650
841:	462	396	403	371	425	453	425	395
849:	390	408	425	412	404	371	358	372
857:	442	423	374	432	396	385	405	384
865:	395	399	444	453	398	425	425	433
873:	407	415	414	473	408	401	396	440
881:	423	412	425	405	435	419	410	443
889:	422	401	412	452	426	458	429	406
897:	406	466	439	467	421	431	397	444
905:	504	428	398	433	405	422	470	452

913:	387	366	398	394	381	388	354	363
921:	349	353	376	356	335	354	345	361
929:	350	402	375	390	819	2108	1708	572
937:	396	388	368	388	357	330	354	380
945:	343	377	366	339	355	342	375	323
953:	320	346	323	322	337	361	353	351
961:	327	364	400	511	488	383	324	340
969:	357	371	346	321	326	303	327	352
977:	375	309	348	343	362	307	312	314
985:	298	346	307	351	301	329	334	328
993:	307	303	313	323	309	339	338	363
1001:	486	422	345	317	355	300	279	341
1009:	317	303	309	291	323	298	378	277
1017:	315	328	289	297	301	318	316	292
1025:	299	282	273	327	271	277	284	328
1033:	336	327	296	292	282	308	301	274
1041:	273	277	252	306	285	303	292	245
1049:	274	300	310	406	411	295	279	276
1057:	269	276	264	268	271	302	284	279
1065:	262	281	289	302	344	408	345	293
1073:	291	263	241	278	250	234	262	266
1081:	273	259	276	246	280	231	243	250
1089:	260	237	296	273	243	262	251	304
1097:	310	265	271	234	240	254	258	289
1105:	314	235	252	230	266	249	280	243
1113:	289	272	277	258	299	346	1332	5790
1121:	7168	2166	449	394	344	279	267	265
1129:	265	273	270	268	313	401	308	232
1137:	255	250	231	244	285	256	244	261
1145:	235	240	246	271	223	226	267	257
1153:	253	397	879	985	437	300	254	282
1161:	277	261	254	209	243	242	242	219
1169:	225	269	213	211	237	215	246	245
1177:	236	234	230	211	270	365	304	245
1185:	210	238	230	231	203	199	220	206
1193:	229	195	214	209	216	211	198	218
1201:	209	217	206	228	188	207	285	414
1209:	285	225	228	235	218	190	212	211
1217:	197	223	229	210	206	219	216	205
1225:	208	216	217	198	199	211	216	217
1233:	187	196	203	281	771	2363	2465	802
1241:	314	259	212	199	213	200	193	218
1249:	192	201	220	226	292	334	262	228
1257:	189	186	180	203	192	198	209	185
1265:	201	185	195	199	178	198	205	189
1273:	195	210	199	196	188	190	212	349
1281:	757	669	296	188	209	193	202	189
1289:	192	177	198	173	193	197	181	191
1297:	195	221	202	204	168	172	210	222
1305:	245	187	177	155	179	167	182	181
1313:	194	193	190	184	211	240	183	178
1321:	167	178	188	191	163	162	180	165
1329:	178	195	213	199	189	194	208	194
1337:	181	204	182	171	180	177	191	188
1345:	176	175	183	196	175	175	171	196
1353:	225	213	181	168	161	178	190	175
1361:	166	186	199	183	180	172	163	189
1369:	188	162	172	200	178	169	177	278
1377:	989	1953	1289	384	203	200	208	220
1385:	423	464	302	240	161	165	192	188

1393:	202	214	172	169	175	169	185	229
1401:	492	713	457	227	172	215	436	936
1409:	933	418	207	191	174	164	200	210
1417:	210	203	175	170	193	175	175	185
1425:	204	227	191	163	198	187	189	181
1433:	209	169	184	166	165	166	175	171
1441:	201	182	167	191	158	182	172	176
1449:	181	167	174	166	170	192	196	201
1457:	204	167	204	239	432	368	247	210
1465:	209	198	174	192	211	203	190	176
1473:	174	193	202	170	195	182	208	210
1481:	189	187	181	178	189	208	203	219
1489:	192	185	192	190	201	216	203	209
1497:	202	211	198	201	215	204	190	205
1505:	218	189	220	331	765	965	507	255
1513:	213	188	197	202	179	199	185	188
1521:	196	201	197	207	188	223	193	200
1529:	176	211	200	203	206	200	187	204
1537:	192	235	343	287	219	197	263	315
1545:	212	184	162	165	154	153	181	142
1553:	168	149	128	133	127	135	146	134
1561:	153	164	141	144	147	122	141	148
1569:	113	140	152	144	143	163	154	122
1577:	146	132	127	136	131	180	342	392
1585:	227	153	152	135	139	142	119	132
1593:	117	151	234	170	148	145	207	211
1601:	171	142	135	90	119	110	139	153
1609:	133	115	122	111	114	116	107	123
1617:	100	109	98	120	108	112	111	107
1625:	89	88	88	93	112	93	110	89
1633:	105	89	112	97	89	86	79	92
1641:	78	102	81	96	79	103	91	82
1649:	101	95	73	88	85	72	79	97
1657:	103	89	82	126	323	427	267	118
1665:	82	76	70	81	78	73	81	79
1673:	72	76	65	80	62	64	78	66
1681:	81	63	74	127	126	104	77	60
1689:	66	63	60	103	138	111	91	76
1697:	64	61	67	66	56	67	76	63
1705:	64	59	53	55	59	62	60	46
1713:	64	59	49	69	62	49	58	50
1721:	61	54	46	72	56	75	65	135
1729:	591	1134	786	272	89	67	73	55
1737:	58	53	58	56	45	47	56	45
1745:	51	52	61	52	52	53	43	46
1753:	54	63	54	62	61	56	60	54
1761:	57	106	586	2453	4837	3391	870	196
1769:	138	107	61	50	54	40	56	55
1777:	51	43	56	41	47	41	30	50
1785:	44	48	57	40	41	55	40	41
1793:	36	47	50	41	49	47	53	50
1801:	44	27	49	39	40	37	35	40
1809:	47	39	36	41	47	54	62	44
1817:	54	42	51	48	52	39	53	41
1825:	42	44	33	39	58	49	57	43
1833:	51	49	42	41	63	96	147	95
1841:	60	54	44	33	43	114	408	655
1849:	528	146	51	46	58	42	43	33
1857:	32	44	51	34	39	44	44	47
1865:	47	36	51	44	47	42	46	44

1873:	84	113	69	42	39	49	46	52
1881:	40	35	46	48	43	48	41	42
1889:	47	59	73	62	45	44	58	70
1897:	89	56	63	62	40	44	36	37
1905:	50	43	49	40	51	31	54	48
1913:	58	40	40	57	47	52	43	48
1921:	37	50	51	53	34	42	43	33
1929:	34	49	44	43	46	39	58	61
1937:	83	73	68	55	36	40	49	45
1945:	45	44	44	55	42	43	49	64
1953:	42	45	45	50	43	44	45	45
1961:	32	39	46	55	49	55	49	46
1969:	44	49	45	46	41	39	36	38
1977:	46	32	31	46	42	35	41	35
1985:	37	31	37	36	31	31	37	40
1993:	28	31	36	41	35	32	33	43
2001:	35	33	36	26	25	33	31	29
2009:	27	30	49	52	37	40	27	32
2017:	34	40	39	25	43	35	29	30
2025:	25	27	27	31	26	27	40	29
2033:	31	28	24	30	25	28	33	21
2041:	24	27	31	34	29	28	16	27
2049:	24	36	25	33	37	49	39	30
2057:	28	24	30	33	30	24	21	19
2065:	28	25	28	33	25	20	23	17
2073:	27	20	23	14	30	27	21	23
2081:	26	13	15	22	17	23	21	22
2089:	31	35	15	23	17	15	19	17
2097:	20	14	23	16	20	17	23	26
2105:	19	15	15	18	24	32	39	26
2113:	18	14	14	20	50	149	290	262
2121:	89	35	20	19	19	19	10	24
2129:	11	15	15	15	21	16	14	11
2137:	13	12	7	19	15	14	6	8
2145:	5	15	12	17	21	16	16	14
2153:	14	12	17	11	15	10	18	14
2161:	10	12	21	15	17	16	20	13
2169:	13	10	13	14	13	19	20	17
2177:	16	13	15	16	15	9	18	13
2185:	17	9	14	14	18	17	22	25
2193:	29	30	19	18	16	22	14	21
2201:	21	65	265	849	1201	708	187	61
2209:	37	38	24	16	10	8	10	14
2217:	19	6	13	12	13	7	7	8
2225:	8	8	6	11	8	8	11	9
2233:	11	4	10	3	9	6	10	7
2241:	5	11	9	8	9	7	5	5
2249:	2	5	4	13	3	13	9	6
2257:	10	7	8	14	10	8	12	10
2265:	7	11	13	12	10	4	6	4
2273:	11	8	6	9	8	4	6	5
2281:	7	4	15	4	8	16	9	7
2289:	7	8	6	27	43	72	61	24
2297:	9	9	7	5	14	7	10	8
2305:	7	11	3	3	5	1	8	8
2313:	11	10	2	3	6	6	3	3
2321:	4	1	2	3	5	4	10	6
2329:	6	3	8	8	10	10	6	2
2337:	3	2	6	3	5	2	2	3
2345:	3	3	3	4	4	1	4	2

2353:	2	1	3	2	2	7	4	5
2361:	1	0	2	4	5	4	2	1
2369:	2	7	5	2	1	0	1	2
2377:	6	10	6	6	3	3	5	1
2385:	2	4	1	3	5	4	2	9
2393:	2	3	3	2	0	4	4	1
2401:	1	2	2	2	3	3	0	2
2409:	0	3	1	5	2	6	0	2
2417:	4	0	3	1	2	1	4	2
2425:	4	4	3	3	2	0	2	0
2433:	2	4	5	1	3	5	5	4
2441:	1	4	3	0	9	38	117	251
2449:	321	157	46	9	5	3	1	3
2457:	6	2	1	2	2	0	2	1
2465:	1	2	1	4	1	1	2	1
2473:	1	2	2	3	1	0	2	0
2481:	3	2	5	1	4	0	3	3
2489:	0	2	0	1	4	1	0	1
2497:	1	1	1	4	2	2	0	1
2505:	5	3	3	3	1	1	0	3
2513:	1	1	1	1	2	0	2	3
2521:	1	1	0	1	1	2	0	1
2529:	1	0	2	1	0	1	1	1
2537:	1	1	1	0	0	1	2	5
2545:	1	3	1	1	0	2	1	0
2553:	0	2	0	1	2	0	0	0
2561:	0	0	2	1	0	0	3	1
2569:	0	2	2	1	0	0	0	0
2577:	0	1	1	1	0	0	1	2
2585:	1	2	0	0	1	1	1	1
2593:	0	1	0	1	0	2	2	1
2601:	1	0	0	1	0	0	1	0
2609:	1	1	1	0	5	6	24	16
2617:	13	3	1	2	1	0	0	0
2625:	1	2	0	0	3	1	0	1
2633:	0	1	1	0	3	1	0	0
2641:	1	1	1	3	1	0	1	0
2649:	0	0	2	2	0	0	2	1
2657:	0	2	2	1	1	3	1	2
2665:	0	0	1	1	0	1	0	2
2673:	1	0	0	2	0	0	1	0
2681:	0	0	1	0	0	0	0	0
2689:	1	0	0	0	1	3	2	5
2697:	5	1	1	2	0	3	0	1
2705:	0	1	0	0	0	0	0	0
2713:	0	1	2	1	1	0	1	2
2721:	0	0	0	1	0	0	1	0
2729:	0	3	2	1	0	0	0	0
2737:	0	0	0	0	0	1	0	0
2745:	0	0	0	0	0	0	3	0
2753:	0	0	0	0	0	0	0	1
2761:	1	0	1	0	0	0	1	0
2769:	2	3	8	3	3	1	1	0
2777:	1	0	0	1	1	0	0	1
2785:	1	0	0	0	0	1	0	0
2793:	0	0	1	0	2	0	0	1
2801:	0	0	0	1	0	0	0	1
2809:	2	0	0	0	0	0	0	0
2817:	2	1	1	1	0	0	1	0
2825:	0	0	3	2	2	0	0	0

2833:	0	0	0	0	0	0	0	1
2841:	0	0	0	0	0	0	0	0
2849:	0	0	1	0	1	1	0	0
2857:	0	0	1	0	1	0	0	0
2865:	1	0	0	2	1	0	0	0
2873:	1	0	0	1	0	0	0	5
2881:	0	2	1	0	1	0	0	0
2889:	1	0	0	0	0	0	0	1
2897:	0	0	1	0	1	1	0	1
2905:	0	0	0	1	0	0	0	0
2913:	0	0	0	0	0	0	0	0
2921:	3	2	4	4	2	1	1	0
2929:	3	0	0	0	1	0	1	0
2937:	1	0	0	1	1	0	0	0
2945:	0	0	0	0	2	0	0	0
2953:	0	2	0	0	0	0	0	0
2961:	1	0	1	0	1	0	0	0
2969:	0	0	0	0	0	0	0	0
2977:	0	2	2	1	1	1	1	0
2985:	0	0	0	0	0	1	0	0
2993:	0	0	1	0	0	0	1	0
3001:	1	5	0	0	0	0	1	0
3009:	0	0	1	0	0	0	0	0
3017:	0	0	0	0	0	0	0	1
3025:	1	0	0	0	0	2	0	0
3033:	0	0	0	2	0	0	0	1
3041:	0	0	0	0	0	0	0	0
3049:	0	0	0	1	0	2	3	2
3057:	0	0	0	0	0	1	0	1
3065:	0	0	0	0	0	0	0	0
3073:	0	0	0	0	1	0	0	1
3081:	0	0	2	1	1	0	0	0
3089:	0	0	0	0	0	0	1	0
3097:	0	1	0	0	0	0	0	0
3105:	0	0	0	0	0	0	0	0
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	1	1	1	0
3129:	0	0	0	0	0	0	0	0
3137:	0	0	0	0	0	2	0	0
3145:	0	0	1	0	0	0	0	0
3153:	0	0	0	0	0	0	0	1
3161:	0	0	1	0	0	0	0	0
3169:	0	1	0	0	0	0	0	0
3177:	0	0	0	0	0	0	1	0
3185:	0	0	0	0	1	0	0	0
3193:	0	0	0	0	0	1	2	0
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	1
3217:	0	0	0	0	0	0	0	0
3225:	1	0	0	1	0	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	1	0	0	0	1	0	0	0
3249:	0	0	1	0	0	0	0	1
3257:	0	0	0	0	1	0	0	1
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	1
3281:	0	0	0	1	0	0	1	0
3289:	0	1	0	2	0	0	0	0
3297:	0	1	0	0	0	0	0	0
3305:	0	0	0	0	0	0	1	0

3313:	0	0	1	0	0	0	0	0
3321:	1	0	0	0	0	0	0	0
3329:	0	0	0	1	3	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	0	1	0	1	0
3353:	0	0	1	0	0	0	0	0
3361:	0	0	0	1	0	0	0	0
3369:	1	0	1	0	0	0	0	0
3377:	1	0	0	0	1	0	0	0
3385:	0	0	0	0	0	0	0	0
3393:	0	1	0	0	0	0	0	0
3401:	1	0	0	0	0	0	0	0
3409:	0	0	0	0	0	0	0	0
3417:	0	0	0	0	0	0	1	0
3425:	0	0	0	0	0	0	0	1
3433:	0	0	1	0	0	0	0	0
3441:	0	1	0	0	0	0	0	1
3449:	0	0	1	0	0	0	0	0
3457:	0	0	0	0	0	0	0	1
3465:	0	0	0	0	1	0	0	0
3473:	0	0	0	0	0	1	0	0
3481:	0	0	0	0	0	0	1	0
3489:	0	0	0	0	2	0	1	0
3497:	0	0	1	0	0	0	0	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	2	0	0
3521:	0	0	0	0	1	0	0	0
3529:	0	0	0	0	0	1	0	0
3537:	0	0	0	0	0	0	0	1
3545:	0	0	0	1	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	1	0	0	0	0	0	0
3569:	1	0	0	0	0	0	0	0
3577:	0	0	1	0	0	0	1	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	1	0
3601:	0	0	1	0	0	0	0	0
3609:	1	0	0	0	0	0	0	0
3617:	1	0	0	1	0	0	0	0
3625:	1	0	0	0	0	0	0	0
3633:	0	1	0	0	0	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	0
3665:	0	0	0	1	0	0	0	0
3673:	0	0	1	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	0	0	1	0
3697:	0	1	1	0	1	1	1	0
3705:	0	1	0	0	1	0	0	0
3713:	1	0	0	0	0	0	0	1
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	0	1	0	0	0
3745:	1	0	0	0	1	0	0	1
3753:	0	0	0	0	1	0	0	0
3761:	0	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	0	1	1	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	1
3825:	1	0	0	0	0	0	0	0
3833:	0	0	0	0	0	1	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	0	0	0	0	0	0
3857:	0	0	0	0	0	0	0	1
3865:	0	0	0	1	2	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	1	0	0	0	0	0
3889:	0	0	0	0	0	1	0	0
3897:	0	0	0	1	0	0	1	0
3905:	0	0	0	0	0	0	1	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	1	0
3929:	0	0	0	0	0	0	0	0
3937:	0	1	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	2	0	0	0	0	0	0	0
3969:	0	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	1	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	1	0	0	0	1	0	0	0
4009:	0	0	1	0	0	0	0	0
4017:	0	0	0	0	0	0	0	0
4025:	0	0	1	0	0	0	1	0
4033:	0	1	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	1	0	0	0	1	0	1	0
4057:	0	0	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	0
4073:	1	1	0	0	1	0	0	0
4081:	1	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

VAX/VMS Peak Search Report Generated 1-APR-2013 08:56:47.56

4/1/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301209_GE1_GAS1202_190103.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-83-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 07:55:53.
Sample ID : 1303012-09 Sample Quantity : 4.28950E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:38.73 1.1%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	26.86	437	9198	2.41	27.09	25	5	66.5		TH-231
0	46.14*	6146	17730	1.68	46.37	44	6	7.3		PB-210
0	53.53*	1567	16566	1.21	53.76	51	5	25.2		
0	62.70*	2054	29113	1.67	62.93	61	6	26.6		TH-234
0	67.62*	1214	20127	1.20	67.85	67	4	33.6		
0	76.13*	55918	46936	3.19	76.36	71	9	1.6		AM-243
9	84.07*	4281	12387	0.87	84.30	83	9	7.4	6.34E+02	TH-231
9	86.97*	10581	16021	1.29	87.20	83	9	3.9		NP-237 SN-126 CD-109
0	93.44*	3760	15697	2.57	93.67	92	5	10.7		
0	143.78*	1403	19678	1.54	144.01	141	7	33.6		
0	154.46	894	20472	1.89	154.68	152	7	53.6		
3	182.45	255	4853	1.89	182.67	182	8	67.5	7.35E-01	
3	186.12*	14088	9489	1.37	186.35	182	8	2.6		RA-226
0	209.67	311	10887	2.65	209.90	208	6	106.8		
2	235.83	1774	8025	1.52	236.05	233	14	15.7	4.92E+01	
2	239.12*	1435	9508	1.95	239.34	233	14	23.0		PB-212
2	241.94*	18783	6133	1.39	242.16	233	14	1.9		RA-224
1	255.94	832	6564	1.53	256.16	254	9	30.2	2.54E+01	
1	258.62	1414	6490	1.79	258.84	254	9	18.2		
6	270.17	3383	8297	2.88	270.38	267	11	9.6	3.49E+00	
6	274.63	1081	5911	1.83	274.84	267	11	22.7		
0	295.16*	40179	8350	1.81	295.38	292	7	1.2		PB-214
0	304.04	335	5902	2.83	304.26	302	6	73.6		
0	314.14	346	5610	2.71	314.35	312	6	69.3		
0	324.21	509	4494	1.44	324.42	323	5	40.5		RA-223
0	329.52	502	4535	1.36	329.73	328	5	41.2		LA-140
0	338.32*	394	4477	1.93	338.53	337	5	52.0		AC-228
0	351.86*	70216	6467	1.36	352.07	348	8	0.9		PB-214
0	388.30	1220	6355	3.48	388.51	385	9	24.2		
3	401.73	674	4280	2.00	401.94	399	11	31.8	8.53E-01	RN-219
3	405.11	599	5094	2.29	405.31	399	11	41.0		PB-211
0	427.00	294	4001	1.95	427.21	425	6	69.5		
0	437.88	205	3199	3.13	438.09	436	6	88.6		
0	444.85	178	3105	3.01	445.06	443	6	99.9		

AG 4/1/13

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	454.79	430	3535	1.25	454.99	452	7	46.9		
0	462.08	379	3227	2.87	462.28	459	7	51.0		
0	469.93	132	2285	2.61	470.13	469	5	109.9		
2	480.51	463	1816	1.45	480.71	476	15	27.4	2.13E+00	
2	487.10	556	2514	1.89	487.30	476	15	30.2		LA-140
0	510.45*	753	3425	3.30	510.65	506	9	29.1		
0	533.96	371	2784	2.05	534.16	531	8	50.2		
0	542.85	144	2530	3.07	543.05	540	7	116.7		
1	576.99	98	655	1.99	577.18	576	11	65.3	8.20E+00	
1	579.99	571	1918	1.88	580.18	576	11	25.7		
1	582.99*	266	1866	1.99	583.18	576	11	55.8		TL-208
3	605.33	129	637	1.50	605.52	604	11	49.2	4.68E+00	
3	609.29*	50602	1488	1.55	609.49	604	11	0.9		BI-214
0	648.58	92	1098	2.43	648.77	647	5	110.0		
0	665.54	1333	1897	1.92	665.73	662	8	12.6		
0	703.58	367	1974	2.03	703.77	700	8	43.2		
0	719.87	419	1945	1.55	720.06	716	9	39.1		
0	741.93	270	1525	1.79	742.11	739	7	49.4		
0	768.34	4823	2475	2.01	768.52	763	12	5.0		
0	785.98	1136	1904	1.67	786.16	782	9	15.1		
0	806.17	1043	1855	2.00	806.35	802	9	16.1		
0	821.06	185	1509	1.97	821.24	818	7	71.2		
0	831.65	203	1523	1.39	831.83	829	7	65.3		PB-211
0	839.07	660	1694	1.48	839.25	836	8	23.0		
0	910.71*	204	1703	2.08	910.88	908	8	71.7		AC-228
0	934.13*	2360	1402	1.91	934.30	931	7	6.7		
0	962.95*	167	1859	1.87	963.12	960	9	94.1		
0	969.65*	145	1075	1.79	969.82	968	6	73.8		AC-228
0	1001.82*	160	1348	2.37	1001.98	998	8	81.4		PA-234M
0	1052.21	118	1091	1.80	1052.37	1049	7	94.4		
0	1070.16	178	1157	1.44	1070.32	1067	8	67.8		
0	1096.09	107	974	2.82	1096.25	1094	7	98.9		
0	1104.02	129	972	1.94	1104.18	1101	7	81.7		
0	1120.30*	10906	1534	2.12	1120.46	1114	12	2.4		BI-214
0	1134.61	108	1165	1.61	1134.77	1131	8	111.4		
0	1155.11	1151	1599	2.07	1155.27	1149	11	14.7		
0	1182.26	115	1035	2.04	1182.41	1179	8	98.7		
0	1208.01	193	1053	1.58	1208.16	1204	8	60.1		
0	1238.19	3890	1444	2.11	1238.34	1232	12	5.1		
0	1253.21	289	928	3.36	1253.36	1249	9	39.9		
0	1281.34	858	1134	1.99	1281.49	1276	10	16.2		
4	1377.76*	2748	616	1.91	1377.90	1372	19	4.8	1.41E+00	
4	1385.33	554	689	2.23	1385.46	1372	19	17.9		
0	1401.50	838	1022	2.07	1401.64	1396	10	15.9		
0	1408.13	1395	850	2.15	1408.26	1405	8	9.0		
0	1425.22	86	568	1.36	1425.36	1423	6	90.4		
0	1460.93*	847	983	2.22	1461.07	1457	10	15.5		K-40
0	1509.18	1357	1014	2.30	1509.31	1504	10	10.3		
2	1538.78	283	674	2.61	1538.91	1533	16	34.3	2.06E+00	
2	1543.55	337	630	2.59	1543.67	1533	16	28.9		
0	1576.60	54	401	2.97	1576.73	1574	6	120.3		

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1583.29	391	663	2.29	1583.42	1579	9	25.8		
1	1595.00	184	462	2.39	1595.12	1591	13	41.3	1.70E+00	LA-140
1	1599.67	276	433	2.40	1599.79	1591	13	28.4		
0	1620.76	55	381	2.04	1620.89	1618	7	120.4		
0	1661.40	571	455	2.18	1661.52	1657	10	16.4		
2	1684.14	149	297	2.66	1684.26	1680	20	42.5	1.07E+00	
2	1693.06	162	272	2.67	1693.18	1680	20	39.8		
0	1729.63	1991	326	2.18	1729.75	1724	12	5.8		
0	1764.59*	8737	303	2.28	1764.70	1760	11	2.3		BI-214
2	1838.58	211	206	2.80	1838.69	1831	23	26.9	1.60E+00	
2	1847.55	1178	185	2.20	1847.66	1831	23	6.9		
0	1873.21	162	209	2.25	1873.31	1869	9	35.8		
0	1889.91	55	222	2.06	1890.01	1887	8	96.3		
0	1897.35	86	212	2.62	1897.45	1894	9	65.3		
0	1934.60	206	354	11.46	1934.70	1924	18	45.2		
0	2015.95	39	152	3.97	2016.04	2014	8	112.3		
0	2053.37	50	125	1.27	2053.46	2048	9	86.3		
2	2110.23	47	45	2.80	2110.32	2107	20	52.6	1.10E+00	
2	2118.51*	632	55	2.54	2118.60	2107	20	9.0		
1	2147.88	31	40	2.56	2147.96	2145	11	69.6	6.18E+00	
1	2151.15	17	47	2.56	2151.23	2145	11	154.8		
0	2192.82	31	72	4.04	2192.90	2188	9	105.0		
0	2204.11*	2367	114	2.45	2204.20	2198	13	4.5		BI-214
0	2293.52	151	36	2.47	2293.59	2288	13	23.1		
0	2332.13	18	31	1.14	2332.21	2327	10	130.1		
0	2447.68	718	12	2.52	2447.74	2442	13	7.7		
0	2480.77	16	15	3.20	2480.83	2474	12	108.2		
0	2510.33	12	8	5.36	2510.39	2506	9	113.4		
0	2614.60*	102	6	1.90	2614.66	2611	8	22.1		TL-208
0	2650.75	10	0	1.33	2650.80	2647	8	63.2		
0	2695.64	15	3	2.97	2695.68	2692	8	69.3		
0	2770.46	10	0	2.00	2770.50	2767	8	63.2		
0	2880.06	11	0	4.66	2880.09	2875	9	60.3		
0	2920.79	11	0	2.02	2920.82	2917	7	60.3		

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

Total number of lines in spectrum	119	
Number of unidentified lines	67	
Number of lines tentatively identified by NID	52	43.70%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.753E+01	2.753E+01	0.514E+01	18.68	
TL-208	1.41E+10Y	1.00	1.425E+00	1.425E+00	0.327E+00	22.92	
PB-210	22.26Y	1.00	9.820E+01	9.847E+01	1.129E+01	11.46	
PB-211	3.28E+04Y	1.00	2.028E+01	2.028E+01	0.747E+01	36.82	
PB-212	1.41E+10Y	1.00	2.737E+00	2.737E+00	0.878E+00	32.09	
BI-214	1602.00Y	1.00	2.053E+02	2.053E+02	0.108E+02	5.27	
PB-214	1602.00Y	1.00	2.083E+02	2.083E+02	0.341E+02	16.36	
RN-219	3.28E+04Y	1.00	1.276E+01	1.276E+01	0.431E+01	33.79	
RA-223	3.28E+04Y	1.00	1.372E+01	1.372E+01	0.651E+01	47.47	
RA-224	1.41E+10Y	1.00	4.070E+02	4.070E+02	0.934E+02	22.94	
RA-226	1602.00Y	1.00	3.173E+02	3.173E+02	5.820E+02	183.40	
AC-228	1.41E+10Y	1.00	2.264E+00	2.264E+00	0.909E+00	40.14	
PA-234M	4.47E+09Y	1.00	4.496E+01	4.496E+01	3.687E+01	82.00	
TH-234	4.47E+09Y	1.00	3.282E+01	3.282E+01	0.916E+01	27.91	
	Total Activity :		1.395E+03	1.395E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	1.681E+02	1.764E+02	0.222E+02	12.58	
SN-126	1.00E+05Y	1.00	1.689E+01	1.689E+01	0.187E+01	11.06	
TH-231	7.04E+08Y	1.00	3.301E+00	3.301E+00	2.241E+00	67.89	
NP-237	2.14E+06Y	1.00	4.958E+01	4.958E+01	0.544E+01	10.97	
	Total Activity :		2.378E+02	2.462E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
LA-140	12.79D	5.77	1.018E+00	5.879E+00	1.509E+00	25.67	
AM-243	7380.00Y	1.00	5.019E+01	5.019E+01	0.471E+01	9.39	
	Total Activity :		5.121E+01	5.607E+01			

Grand Total Activity : 1.684E+03 1.697E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.753E+01	2.753E+01	18.68	OK
	Final Mean for 1 Valid Peaks = 2.753E+01+/- 5.144E+00 (18.68%)						
TL-208	583.14	30.22*	1.055E+00	1.460E+00	1.460E+00	56.82	OK
	860.37	4.48	7.641E-01	----- Line Not Found		-----	Absent
	2614.66	35.85	3.498E-01	1.419E+00	1.419E+00	25.05	OK
	Final Mean for 2 Valid Peaks = 1.425E+00+/- 3.267E-01 (22.92%)						
PB-210	46.50	4.25*	2.577E+00	9.820E+01	9.847E+01	11.46	OK
	Final Mean for 1 Valid Peaks = 9.847E+01+/- 1.129E+01 (11.46%)						
PB-211	404.84	2.90*	1.415E+00	2.554E+01	2.554E+01	42.52	OK
	831.96	2.90	7.856E-01	1.557E+01	1.557E+01	66.07	OK
	Final Mean for 2 Valid Peaks = 2.028E+01+/- 7.468E+00 (36.82%)						
PB-212	238.63	44.60*	2.057E+00	2.737E+00	2.737E+00	32.09	OK
	300.09	3.41	1.767E+00	----- Line Not Found		-----	Absent
	Final Mean for 1 Valid Peaks = 2.737E+00+/- 8.781E-01 (32.09%)						
BI-214	609.31	46.30*	1.017E+00	1.881E+02	1.881E+02	10.72	OK
	1120.29	15.10	6.174E-01	2.047E+02	2.047E+02	9.59	OK
	1764.49	15.80	4.419E-01	2.190E+02	2.190E+02	10.30	OK
	2204.22	4.98	3.841E-01	2.165E+02	2.165E+02	11.83	OK
	Final Mean for 4 Valid Peaks = 2.053E+02+/- 1.082E+01 (5.27%)						
PB-214	295.21	19.19	1.787E+00	2.050E+02	2.050E+02	29.26	OK
	351.92	37.19*	1.574E+00	2.099E+02	2.099E+02	19.72	OK
	Final Mean for 2 Valid Peaks = 2.083E+02+/- 3.407E+01 (16.36%)						
RN-219	401.80	6.50*	1.423E+00	1.276E+01	1.276E+01	33.79	OK
	Final Mean for 1 Valid Peaks = 1.276E+01+/- 4.311E+00 (33.79%)						
RA-223	323.87	3.88*	1.674E+00	1.372E+01	1.372E+01	47.47	OK
	Final Mean for 1 Valid Peaks = 1.372E+01+/- 6.514E+00 (47.47%)						
RA-224	240.98	3.95*	2.045E+00	4.070E+02	4.070E+02	22.94	OK
	Final Mean for 1 Valid Peaks = 4.070E+02+/- 9.338E+01 (22.94%)						
RA-226	186.21	3.28*	2.369E+00	3.173E+02	3.173E+02	183.40	OK
	Final Mean for 1 Valid Peaks = 3.173E+02+/- 5.820E+02 (183.40%)						

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AC-228	338.32	11.40	1.621E+00	3.729E+00	3.729E+00	56.58	OK
	911.07	27.70*	7.291E-01	1.764E+00	1.764E+00	72.33	OK
	969.11	16.60	6.934E-01	2.205E+00	2.205E+00	74.40	OK

Final Mean for 3 Valid Peaks = 2.264E+00+/- 9.090E-01 (40.14%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	6.754E-01	4.496E+01	4.496E+01	82.00	OK

Final Mean for 1 Valid Peaks = 4.496E+01+/- 3.687E+01 (82.00%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.882E+00	3.282E+01	3.282E+01	27.91	OK

Final Mean for 1 Valid Peaks = 3.282E+01+/- 9.159E+00 (27.91%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.962E+00	1.681E+02	1.764E+02	12.58	OK

Final Mean for 1 Valid Peaks = 1.764E+02+/- 2.219E+01 (12.58%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.963E+00	1.689E+01	1.689E+01	11.06	OK

Final Mean for 1 Valid Peaks = 1.689E+01+/- 1.869E+00 (11.06%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-231	25.64	14.70*	1.576E+00	3.301E+00	3.301E+00	67.89	OK
	84.21	6.40	2.966E+00	3.947E+01	3.947E+01	12.46	<<WM N-Sigma

Final Mean for 1 Valid Peaks = 3.301E+00+/- 2.241E+00 (67.89%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.964E+00	4.958E+01	4.958E+01	10.97	OK

Final Mean for 1 Valid Peaks = 4.958E+01+/- 5.439E+00 (10.97%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
LA-140	328.77	20.50	1.655E+00	2.591E+00	1.496E+01	47.65	OK
	487.03	45.50	1.222E+00	1.749E+00	1.010E+01	32.33	OK
	815.85	23.50	7.984E-01	-----	Line Not Found	-----	Absent
	1596.49	95.49*	4.734E-01	7.127E-01	4.115E+00	42.59	OK

Final Mean for 3 Valid Peaks = 5.879E+00+/- 1.509E+00 (25.67%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.955E+00	5.019E+01	5.019E+01	9.39	OK

Final Mean for 1 Valid Peaks = 5.019E+01+/- 4.712E+00 (9.39%)

Flag: "*" = Keyline

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.753E+01	5.144E+00	3.935E+00	3.803E-01	6.997
CD-109	1.764E+02	2.219E+01	1.103E+01	1.243E+00	15.997
SN-126	1.689E+01	1.869E+00	1.056E+00	1.008E-01	16.000
LA-140	5.879E+00	1.509E+00	2.346E+00	2.207E-01	2.506
TL-208	1.425E+00	3.267E-01	1.105E+00	1.123E-01	1.289
PB-210	9.847E+01	1.129E+01	8.293E+00	6.541E-01	11.875
PB-211	2.028E+01	7.468E+00	1.229E+01	1.309E+00	1.650
PB-212	2.737E+00	8.781E-01	7.756E-01	1.708E-01	3.529
BI-214	2.053E+02	1.082E+01	7.132E-01	7.065E-02	287.893
PB-214	2.083E+02	3.407E+01	9.009E-01	1.738E-01	231.235
RN-219	1.276E+01	4.311E+00	5.450E+00	5.796E-01	2.341
RA-223	1.372E+01	6.514E+00	8.684E+00	2.125E+00	1.580
RA-224	4.070E+02	9.338E+01	8.816E+00	1.985E+00	46.170
RA-226	3.173E+02	5.820E+02	1.113E+01	2.040E+01	28.520
AC-228	2.264E+00	9.090E-01	1.455E+00	1.267E-01	1.556
TH-231	3.301E+00	2.241E+00	3.119E+00	4.023E-01	1.059
PA-234M	4.496E+01	3.687E+01	4.273E+01	3.698E+00	1.052
TH-234	3.282E+01	9.159E+00	1.052E+01	7.808E-01	3.121
NP-237	4.958E+01	5.439E+00	3.097E+00	2.925E-01	16.007
AM-243	5.019E+01	4.712E+00	6.388E-01	5.325E-02	78.566

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	-2.575E+00		4.057E+00	4.905E+00	5.250E-01	-0.525
NA-22	-2.155E-02		2.721E-01	4.030E-01	3.601E-02	-0.053
AL-26	-4.819E-02		1.557E-01	2.551E-01	2.330E-02	-0.189
TI-44	7.715E-01	+	2.675E-01	4.486E-01	3.486E-02	1.720
SC-46	-1.602E-01		3.218E-01	5.357E-01	4.689E-02	-0.299
V-48	-7.227E-01		9.443E-01	1.555E+00	1.349E-01	-0.465
CR-51	2.744E+00		6.012E+00	7.554E+00	1.909E+00	0.363
MN-54	2.002E-01		3.424E-01	4.195E-01	3.779E-02	0.477
CO-56	6.273E-02		3.266E-01	4.963E-01	4.447E-02	0.126
CO-57	4.365E-02		2.537E-01	4.068E-01	4.520E-02	0.107
CO-58	-5.914E-02		3.309E-01	4.990E-01	4.549E-02	-0.119
FE-59	5.705E-01		9.459E-01	1.150E+00	1.054E-01	0.496
CO-60	3.572E-02		2.601E-01	4.152E-01	3.403E-02	0.086
ZN-65	1.547E+00		6.130E-01	9.573E-01	8.050E-02	1.616
SE-75	-4.928E-02		5.267E-01	6.639E-01	1.840E-01	-0.074
RB-82	2.594E+00		5.241E+00	6.441E+00	5.920E-01	0.403
RB-83	-1.623E-01		5.247E-01	8.938E-01	1.501E-01	-0.182
KR-85	8.014E+01		4.943E+01	7.721E+01	8.185E+00	1.038
SR-85	4.923E-01		3.037E-01	4.743E-01	5.028E-02	1.038
Y-88	7.200E-01		2.414E-01	4.344E-01	3.945E-02	1.658
NB-93M	-7.602E+01		1.887E+01	2.272E+00	5.496E-01	-33.462
NB-94	-6.173E-02		2.342E-01	3.924E-01	3.472E-02	-0.157
NB-95	1.177E+01		1.316E+00	1.200E+00	1.106E-01	9.815

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
ZR-95	-4.211E-01		5.491E-01	8.706E-01	8.751E-02	-0.484
RU-103	2.143E-01		3.624E-01	6.241E-01	9.666E-02	0.343
RU-106	-1.193E+00		1.965E+00	3.304E+00	4.667E-01	-0.361
AG-108M	1.148E-01		2.500E-01	3.846E-01	3.565E-02	0.298
AG-110M	7.761E-02		2.389E-01	3.683E-01	3.432E-02	0.211
SN-113	6.105E-01		4.254E-01	6.647E-01	7.189E-02	0.918
TE123M	2.476E-01		3.533E-01	5.196E-01	4.918E-02	0.477
SB-124	1.614E-01		3.279E-01	5.071E-01	5.058E-02	0.318
I-125	-6.142E+00		4.899E+00	7.877E+00	7.402E-01	-0.780
SB-125	1.322E+00	+	9.312E-01	1.281E+00	1.388E-01	1.033
SB-126	9.408E+00	+	3.798E+00	4.237E+00	3.929E-01	2.220
I-129	-2.199E-01		4.594E-01	6.929E-01	7.608E-02	-0.317
I-131	-2.054E-01		3.715E+00	6.414E+00	1.073E+00	-0.032
BA-133	4.290E-01		3.567E-01	5.466E-01	1.148E-01	0.785
CS-134	2.328E-01	+	1.173E-01	4.021E-01	4.010E-02	0.579
CS-135	1.127E+01		3.586E+00	2.392E+00	6.823E-01	4.711
CS-136	1.552E+00		1.745E+00	2.678E+00	2.368E-01	0.580
CS-137	2.299E-01		2.490E-01	3.876E-01	3.596E-02	0.593
LA-138	-3.319E-02		3.820E-01	6.306E-01	5.949E-02	-0.053
CE-139	-4.629E-01		3.293E-01	5.130E-01	4.683E-02	-0.902
BA-140	-2.097E-01		6.182E+00	7.580E+00	2.552E+00	-0.028
CE-141	2.591E+00		1.210E+00	1.507E+00	3.882E-01	1.720
CE-144	-2.224E+00		2.100E+00	3.307E+00	3.511E-01	-0.672
PM-144	4.202E-02		2.292E-01	3.513E-01	3.265E-02	0.120
PM-145	-1.171E+00		1.245E+00	1.593E+00	1.038E+00	-0.735
PM-146	1.473E+00	+	7.112E-01	8.933E-01	9.578E-02	1.649
ND-147	7.360E+00		1.219E+01	1.896E+01	1.995E+00	0.388
EU-152	3.168E+01	+	4.811E+00	4.875E+00	5.634E-01	6.498
GD-153	-6.414E-01		9.389E-01	1.498E+00	1.525E-01	-0.428
EU-154	1.674E-01		7.462E-01	1.117E+00	9.985E-02	0.150
EU-155	2.047E+01	+	2.246E+00	1.512E+00	1.427E-01	13.542
EU-156	1.425E+00		1.093E+01	1.520E+01	3.500E+00	0.094
HO-166M	1.432E-02		5.109E-01	6.196E-01	5.749E-02	0.023
HF-172	-9.507E-02		1.846E+00	2.954E+00	3.233E-01	-0.032
LU-172	1.855E+01		1.199E+01	1.859E+01	1.574E+00	0.997
LU-173	1.247E+01		3.875E+00	1.968E+00	5.791E-01	6.338
HF-175	-2.588E-01		4.611E-01	5.658E-01	1.185E-01	-0.457
LU-176	2.635E-01		2.498E-01	3.494E-01	9.519E-02	0.754
TA-182	1.078E+02	+	1.034E+01	4.971E+00	4.167E-01	21.692
IR-192	1.191E+00		7.270E-01	9.231E-01	9.892E-02	1.290
HG-203	-4.909E-01		5.181E-01	7.041E-01	2.196E-01	-0.697
BI-207	7.797E-04		2.055E-01	3.357E-01	3.447E-02	0.002
BI-210M	5.775E-01		6.014E-01	7.451E-01	2.019E-01	0.775
BI-212	3.936E-01		1.871E+00	2.864E+00	2.655E-01	0.137
RA-225	-3.369E+00		3.335E+00	4.969E+00	4.280E-01	-0.678
TH-227	1.304E+01	+	3.511E+00	3.367E+00	7.232E-01	3.872
TH-230	1.967E+02	+	6.821E+01	1.143E+02	8.864E+00	1.721
PA-231	1.451E+01	+	1.144E+01	1.498E+01	4.175E+00	0.969

Sample ID : 1303012-09 Acquisition date : 1-APR-2013 07:55:53

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-233	1.032E+00		1.405E+00	1.978E+00	6.646E-01	0.521
PA-234	-7.864E-02		1.004E+00	1.604E+00	1.719E-01	-0.049
U-235	8.796E+00	+	3.386E+00	3.495E+00	6.403E-01	2.517
AM-241	4.423E+00		7.892E-01	1.095E+00	7.845E-02	4.038
CM-243	3.627E-01		1.684E+00	2.431E+00	7.474E-01	0.149

Summary of Nuclide Activity
Sample ID : 1303012-09

Acquisition date : 1-APR-2013 07:55:53

Total number of lines in spectrum	119	
Number of unidentified lines	67	
Number of lines tentatively identified by NID	52	43.70%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.753E+01	2.753E+01	0.514E+01	18.68	
TL-208	1.41E+10Y	1.00	1.425E+00	1.425E+00	0.327E+00	22.92	
PB-210	22.26Y	1.00	9.820E+01	9.847E+01	1.129E+01	11.46	
PB-211	3.28E+04Y	1.00	2.028E+01	2.028E+01	0.747E+01	36.82	
PB-212	1.41E+10Y	1.00	2.737E+00	2.737E+00	0.878E+00	32.09	
BI-214	1602.00Y	1.00	2.053E+02	2.053E+02	0.108E+02	5.27	
PB-214	1602.00Y	1.00	2.083E+02	2.083E+02	0.341E+02	16.36	
RN-219	3.28E+04Y	1.00	1.276E+01	1.276E+01	0.431E+01	33.79	
RA-223	3.28E+04Y	1.00	1.372E+01	1.372E+01	0.651E+01	47.47	
RA-224	1.41E+10Y	1.00	4.070E+02	4.070E+02	0.934E+02	22.94	
RA-226	1602.00Y	1.00	3.173E+02	3.173E+02	5.820E+02	183.40	
AC-228	1.41E+10Y	1.00	2.264E+00	2.264E+00	0.909E+00	40.14	
PA-234M	4.47E+09Y	1.00	4.496E+01	4.496E+01	3.687E+01	82.00	
TH-234	4.47E+09Y	1.00	3.282E+01	3.282E+01	0.916E+01	27.91	
	Total Activity :		1.395E+03	1.395E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	1.681E+02	1.764E+02	0.222E+02	12.58	
SN-126	1.00E+05Y	1.00	1.689E+01	1.689E+01	0.187E+01	11.06	
TH-231	7.04E+08Y	1.00	3.301E+00	3.301E+00	2.241E+00	67.89	
NP-237	2.14E+06Y	1.00	4.958E+01	4.958E+01	0.544E+01	10.97	
	Total Activity :		2.378E+02	2.462E+02			

Nuclide Type : ACTIVATION

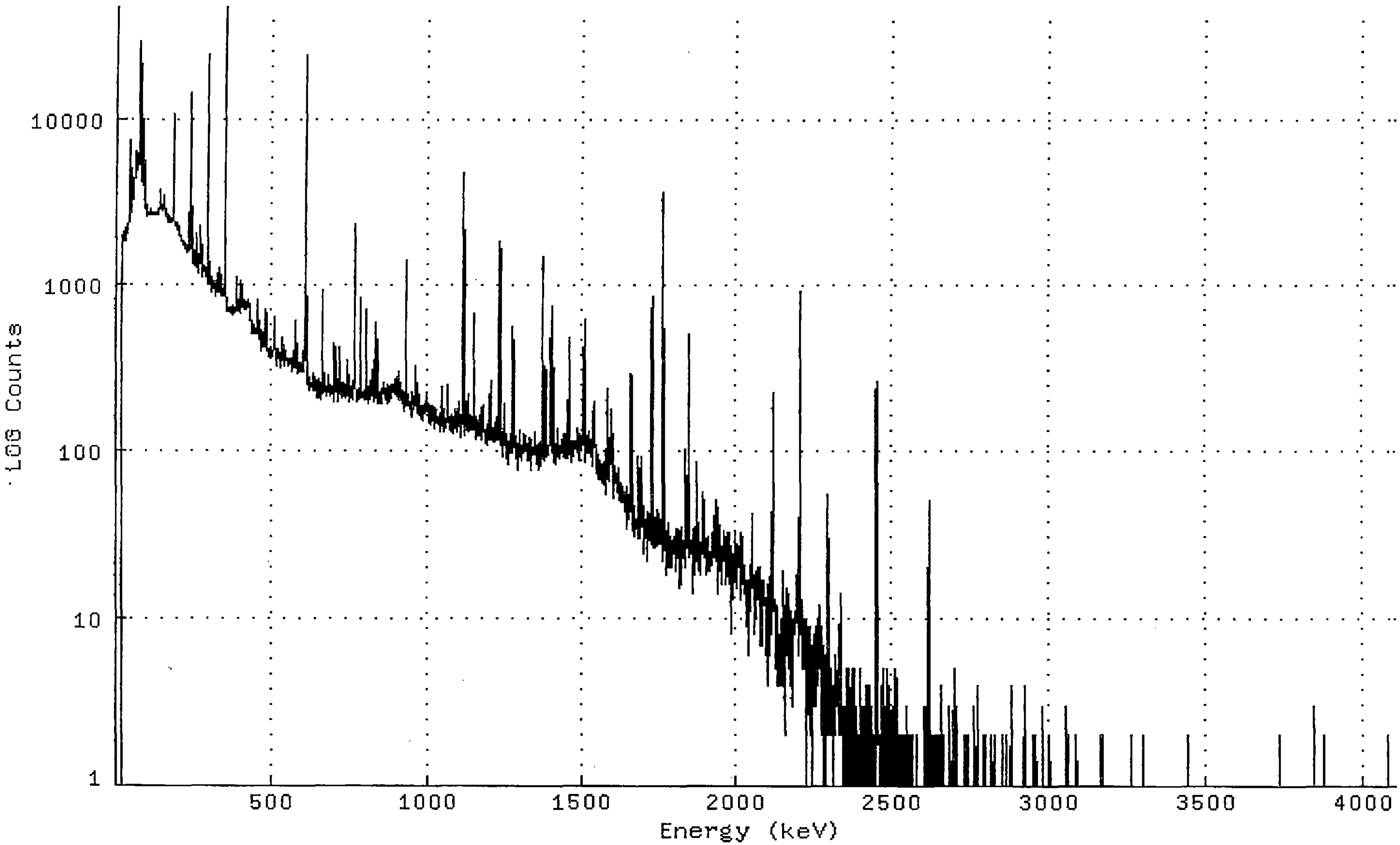
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
LA-140	12.79D	5.77	1.018E+00	5.879E+00	1.509E+00	25.67	
AM-243	7380.00Y	1.00	5.019E+01	5.019E+01	0.471E+01	9.39	
	Total Activity :		5.121E+01	5.607E+01			

Grand Total Activity : 1.684E+03 1.697E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301209_GE1_GAS1202_190103.CNF;1
Title :
Sample Title: S30-83-130228

Start Time:	1-APR-2013 07:55:	Sample Time:	28-FEB-2013 00:00	Energy Offset:	-2.35223E-01
Real Time :	0 01:00:38.73	Sample ID :	1303012-09	Energy Slope :	1.00007E+00
Live Time :	0 01:00:00.00	Sample Type:	SOLID	Energy Quad :	0.00000E+00



9070

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301209_GE1_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	1	3	1421	1955	1900	1934	1880	1874
25:	1807	1970	2052	1992	1814	1864	1931	2176
33:	2067	1952	2029	2144	2177	2049	2074	2320
41:	2386	2414	2717	2682	2797	5810	7185	2750
49:	2707	3575	3088	3028	4897	3917	3209	3392
57:	3387	3831	4128	4470	4703	4840	6254	5768
65:	4884	4835	5250	5979	5125	4993	5058	5175
73:	5399	8131	20559	9421	28313	15427	5390	5468
81:	5567	4316	4113	7495	4303	3912	9695	8511
89:	4087	6258	3794	3789	5411	3601	3985	2822
97:	2705	2967	2805	2553	2575	2636	2616	2602
105:	2593	2635	2604	2671	2632	2807	2646	2748
113:	2843	2742	2592	2648	2652	2639	2665	2626
121:	2608	2695	2681	2711	2619	2691	2629	2671
129:	2633	2650	2646	2666	2653	2672	2647	2687
137:	2803	2869	2770	2840	2930	2929	2856	3650
145:	3238	2745	2753	2760	2840	2933	3016	3035
153:	2898	3379	3366	2958	2860	2870	2832	2677
161:	2625	2573	2646	2649	2377	2484	2460	2450
169:	2490	2584	2406	2441	2330	2369	2346	2374
177:	2459	2332	2444	2443	2393	2491	2548	2414
185:	3075	10559	7503	2459	2279	2330	2334	2256
193:	2252	2355	2175	2367	2273	2262	2153	2166
201:	2120	2212	2062	2080	2151	2011	1889	1883
209:	1925	1914	1943	1794	1739	1791	1828	1783
217:	1811	1778	1780	1674	1751	1736	1683	1733
225:	1621	1625	1723	1656	1626	1664	1565	1678
233:	1589	1644	1760	2725	1923	1774	2165	1652
241:	2992	13889	6039	1450	1461	1407	1532	1479
249:	1321	1384	1398	1296	1361	1304	1457	1778
257:	1706	1423	2033	1456	1255	1286	1259	1240
265:	1229	1199	1177	1271	1825	2262	2055	1713
273:	1315	1500	1737	1328	1204	1157	1103	1209
281:	1227	1228	1251	1288	1234	1209	1276	1196
289:	1158	1100	1203	1161	1184	2700	23284	17599
297:	1625	989	994	1349	1125	993	1175	1066
305:	1105	974	924	941	934	886	951	933
313:	1030	1048	1057	933	955	905	969	922
321:	969	848	941	1170	1011	992	889	914
329:	1028	1246	957	892	929	998	963	920
337:	884	1078	1124	943	847	935	919	846
345:	922	906	924	891	1065	1260	9870	46513
353:	15396	1010	693	725	695	724	711	709
361:	724	693	694	718	713	698	692	712
369:	695	677	708	730	677	663	709	710
377:	688	752	708	711	687	680	699	726
385:	689	803	1072	816	1104	873	741	755
393:	722	688	692	744	736	720	681	727
401:	872	1042	866	831	992	905	811	763
409:	720	765	723	704	798	726	796	706
417:	735	793	726	783	747	760	780	736
425:	740	731	804	746	642	632	607	666

433:	600	601	507	563	592	582	567	540
441:	560	504	545	554	574	567	525	518
449:	507	505	527	498	525	578	807	551
457:	506	500	499	493	516	605	556	535
465:	402	464	500	443	454	531	501	509
473:	422	503	518	454	467	422	454	637
481:	710	450	394	463	437	481	671	607
489:	418	396	402	366	392	387	402	386
497:	417	398	394	356	406	374	366	368
505:	397	375	373	427	505	631	618	534
513:	465	343	409	371	364	385	324	388
521:	392	381	361	386	407	333	377	391
529:	361	318	336	366	425	481	396	380
537:	419	352	377	322	382	405	412	431
545:	368	354	387	360	354	382	338	339
553:	328	325	326	336	343	339	358	330
561:	363	347	328	358	310	326	299	332
569:	363	329	349	318	394	339	344	318
577:	378	324	377	611	472	368	443	403
585:	343	314	291	343	304	298	316	307
593:	297	301	326	322	307	309	338	308
601:	329	300	325	313	396	346	429	2680
609:	23670	23075	2462	302	255	271	283	301
617:	278	250	273	247	230	273	242	238
625:	256	242	241	242	242	255	241	256
633:	290	247	235	228	256	250	278	229
641:	261	247	220	221	250	225	210	258
649:	266	248	208	234	224	244	244	201
657:	250	239	233	253	263	219	223	290
665:	767	914	328	254	235	233	235	227
673:	223	226	220	241	239	242	213	232
681:	232	242	273	281	230	235	248	240
689:	235	245	212	245	231	220	227	223
697:	226	254	250	234	196	287	444	410
705:	271	250	249	252	256	227	271	244
713:	223	203	199	215	221	231	271	425
721:	306	230	229	236	211	207	248	258
729:	227	218	213	234	216	258	222	249
737:	214	206	224	243	232	306	350	228
745:	212	228	215	202	212	198	208	218
753:	283	205	207	221	217	216	216	204
761:	221	211	220	214	228	306	497	2145
769:	2313	485	247	214	230	199	198	219
777:	220	214	236	204	209	218	222	208
785:	383	831	518	221	228	211	209	215
793:	217	220	221	223	200	224	230	206
801:	206	215	205	200	324	709	589	252
809:	211	193	212	197	241	219	238	209
817:	212	204	224	229	306	282	238	211
825:	232	243	266	226	195	243	251	347
833:	257	215	218	228	206	295	597	370
841:	247	221	190	217	218	194	204	225
849:	210	217	212	234	194	226	222	191
857:	234	228	229	221	226	228	253	205
865:	208	205	221	237	210	190	236	221
873:	237	242	249	245	231	225	211	216
881:	235	199	207	240	248	232	219	232
889:	240	237	245	226	224	252	258	221
897:	239	226	219	266	247	242	219	279
905:	250	220	203	229	225	241	290	299

913:	216	204	208	213	200	209	219	220
921:	192	211	201	229	174	175	205	191
929:	214	225	207	217	484	1396	1001	273
937:	187	188	216	195	204	191	208	179
945:	195	177	181	176	179	226	179	159
953:	188	192	190	200	179	176	189	190
961:	214	185	218	324	313	196	205	185
969:	256	250	170	193	168	170	174	163
977:	183	176	174	218	162	166	170	178
985:	170	157	184	152	186	171	183	177
993:	191	168	180	193	183	171	171	197
1001:	220	226	178	173	176	148	170	161
1009:	169	194	179	142	170	187	160	163
1017:	147	151	177	172	186	176	181	169
1025:	151	155	165	183	135	152	173	179
1033:	169	161	166	151	150	154	145	158
1041:	146	132	134	131	152	168	140	165
1049:	154	141	161	245	233	137	138	168
1057:	137	145	157	130	156	155	157	144
1065:	136	151	149	149	157	249	190	168
1073:	134	139	142	149	158	137	148	163
1081:	129	133	155	147	136	160	136	127
1089:	129	131	140	157	153	140	176	178
1097:	176	141	132	138	130	152	151	197
1105:	184	141	146	139	144	159	128	141
1113:	129	121	158	170	144	176	1022	4626
1121:	4567	1025	173	138	123	139	138	137
1129:	133	173	161	132	184	219	165	135
1137:	146	131	129	137	166	139	139	134
1145:	164	156	132	142	133	139	152	158
1153:	137	268	671	598	212	134	148	159
1161:	145	138	129	116	123	128	145	141
1169:	150	135	130	165	135	124	141	155
1177:	128	129	117	126	146	176	188	131
1185:	136	130	139	131	122	132	122	123
1193:	119	111	132	107	129	118	135	144
1201:	119	118	136	117	116	132	185	262
1209:	174	129	131	141	117	126	115	129
1217:	135	136	128	147	121	113	131	138
1225:	130	125	121	118	125	161	130	127
1233:	125	133	118	172	629	1836	1505	323
1241:	135	119	112	112	101	92	128	100
1249:	114	103	115	161	190	173	148	111
1257:	102	98	113	125	96	89	98	105
1265:	113	83	111	102	99	97	117	121
1273:	100	118	139	99	100	96	122	272
1281:	555	387	143	106	112	104	111	113
1289:	100	103	123	89	91	99	101	77
1297:	91	103	111	92	116	110	133	117
1305:	101	89	107	91	101	92	87	105
1313:	123	103	105	115	126	122	106	101
1321:	100	121	99	105	98	96	104	107
1329:	112	87	93	106	119	88	97	121
1337:	111	102	98	77	113	117	95	97
1345:	99	102	95	106	95	100	130	106
1353:	108	123	98	96	82	85	103	98
1361:	90	95	111	89	103	76	112	81
1369:	93	90	113	100	94	90	100	207
1377:	810	1477	623	161	92	88	104	158
1385:	321	288	141	118	92	98	96	94

1393:	99	107	94	109	101	120	109	124
1401:	367	479	238	117	96	110	347	741
1409:	569	175	104	103	109	85	97	132
1417:	95	101	94	93	102	82	97	110
1425:	107	135	104	101	96	109	90	104
1433:	102	98	109	97	100	97	118	112
1441:	102	102	93	93	108	125	96	108
1449:	89	114	127	109	100	102	112	106
1457:	90	93	132	306	474	305	132	119
1465:	100	87	110	91	85	115	108	106
1473:	95	115	96	99	93	112	111	108
1481:	110	115	108	114	98	116	106	135
1489:	120	121	102	121	126	88	127	121
1497:	120	108	122	101	115	102	109	107
1505:	126	114	112	289	624	596	216	102
1513:	85	105	106	118	105	98	122	101
1521:	129	117	109	98	115	108	118	91
1529:	96	103	107	100	80	115	116	98
1537:	108	163	186	154	105	112	187	196
1545:	117	100	76	77	73	91	77	89
1553:	67	95	70	80	83	72	87	85
1561:	68	71	79	83	80	83	64	76
1569:	75	86	77	63	73	70	84	74
1577:	86	69	72	55	80	129	235	231
1585:	110	67	75	78	78	65	75	67
1593:	74	99	146	103	83	89	139	175
1601:	89	76	52	65	82	76	73	65
1609:	81	70	73	70	58	57	71	72
1617:	58	56	61	69	79	64	51	56
1625:	49	61	50	61	56	55	64	59
1633:	57	49	54	50	52	45	56	43
1641:	49	56	49	42	55	51	34	60
1649:	38	53	46	52	51	39	51	60
1657:	49	43	51	109	291	280	98	37
1665:	35	33	44	31	44	47	36	34
1673:	36	35	37	35	36	38	39	38
1681:	30	45	68	91	77	43	43	30
1689:	39	37	59	68	91	83	54	42
1697:	39	39	30	34	34	31	24	47
1705:	33	34	31	33	30	33	37	22
1713:	30	43	42	29	29	35	32	36
1721:	42	37	29	28	33	42	50	157
1729:	616	862	357	81	34	31	26	26
1737:	31	29	34	40	36	30	30	29
1745:	27	42	44	40	28	31	34	36
1753:	29	32	30	39	33	37	33	22
1761:	37	103	736	2791	3597	1467	200	35
1769:	26	28	27	27	23	28	18	27
1777:	33	33	22	25	20	37	22	31
1785:	26	31	28	29	20	21	29	26
1793:	26	27	24	20	28	31	28	29
1801:	29	26	25	24	34	24	32	19
1809:	24	28	23	26	34	23	30	24
1817:	27	15	33	23	25	21	16	22
1825:	35	30	30	29	23	26	25	23
1833:	25	20	23	21	55	83	102	51
1841:	31	30	29	26	37	130	419	499
1849:	212	31	38	23	25	29	26	26
1857:	25	25	34	18	26	29	24	14
1865:	23	35	29	28	25	23	40	45

1873:	86	69	40	24	19	22	20	29
1881:	24	37	18	20	19	24	22	25
1889:	32	55	56	31	32	24	39	50
1897:	41	33	32	33	28	18	23	25
1905:	18	23	30	21	23	24	22	31
1913:	19	20	25	19	20	19	23	27
1921:	32	30	27	21	26	27	26	41
1929:	35	31	23	22	29	22	38	50
1937:	50	41	34	30	14	17	25	25
1945:	21	21	36	19	22	28	16	27
1953:	23	27	27	25	28	30	33	22
1961:	30	27	25	22	31	23	16	29
1969:	30	28	32	19	22	19	16	31
1977:	32	20	26	21	27	17	20	8
1985:	16	16	25	24	13	15	22	18
1993:	15	33	24	20	17	19	23	24
2001:	21	16	15	22	28	20	25	20
2009:	25	27	25	27	18	13	27	32
2017:	29	31	26	17	16	27	21	15
2025:	17	21	14	21	15	18	16	17
2033:	9	11	14	15	14	17	17	10
2041:	6	13	11	18	11	21	21	18
2049:	18	15	18	21	42	17	18	8
2057:	11	17	13	14	10	10	14	12
2065:	16	19	16	13	13	14	14	16
2073:	20	16	11	7	9	10	20	14
2081:	7	12	11	10	13	14	14	12
2089:	17	15	15	12	10	10	9	11
2097:	9	4	9	15	16	6	12	11
2105:	10	7	8	6	12	27	24	13
2113:	8	8	12	25	75	215	227	107
2121:	20	11	13	7	8	5	8	10
2129:	4	12	9	6	10	7	8	4
2137:	8	4	6	4	6	9	10	6
2145:	9	4	11	19	10	4	13	10
2153:	6	10	2	8	3	6	12	6
2161:	15	8	12	14	6	14	9	7
2169:	5	13	6	6	7	4	9	11
2177:	10	3	6	8	7	10	8	9
2185:	8	11	8	8	9	10	13	15
2193:	18	10	14	6	10	7	10	11
2201:	18	90	478	927	704	177	28	8
2209:	12	13	5	6	7	9	8	9
2217:	10	8	7	5	10	4	9	6
2225:	7	1	7	9	5	3	5	5
2233:	2	7	9	5	5	4	0	7
2241:	6	3	5	6	5	8	4	4
2249:	3	4	6	9	8	4	5	3
2257:	5	4	8	6	10	9	7	5
2265:	12	6	6	6	7	8	6	5
2273:	9	2	5	3	7	6	1	4
2281:	5	1	5	4	6	2	3	2
2289:	6	3	6	24	54	46	20	6
2297:	9	6	2	3	3	4	5	4
2305:	2	2	2	4	1	0	4	3
2313:	5	5	2	3	5	6	4	4
2321:	4	3	4	3	5	4	4	4
2329:	2	6	14	3	6	4	4	2
2337:	3	3	2	2	2	1	2	3
2345:	1	2	1	3	3	3	3	1

2353:	2	3	5	1	3	5	1	1
2361:	0	0	2	2	2	3	3	5
2369:	3	1	1	3	3	2	2	5
2377:	3	2	2	0	1	2	2	2
2385:	1	3	0	2	2	1	2	1
2393:	1	4	5	2	3	2	2	2
2401:	2	0	0	3	1	1	2	1
2409:	1	3	2	4	0	2	0	1
2417:	0	2	2	2	4	3	3	1
2425:	4	1	1	0	0	2	2	1
2433:	3	0	0	0	0	2	0	2
2441:	2	1	3	2	13	70	219	259
2449:	126	27	4	2	3	1	0	2
2457:	1	1	1	4	4	0	2	1
2465:	2	1	1	2	5	2	4	2
2473:	1	2	3	1	3	0	3	3
2481:	5	5	4	1	1	1	2	2
2489:	2	4	2	1	2	0	1	0
2497:	3	2	3	1	0	2	1	4
2505:	3	2	1	5	4	3	2	1
2513:	2	0	0	2	0	1	1	1
2521:	2	1	0	2	1	0	0	1
2529:	2	0	2	2	0	0	0	2
2537:	1	1	0	0	3	1	2	3
2545:	2	1	0	2	1	0	1	1
2553:	1	2	0	0	0	2	2	1
2561:	1	0	1	0	1	0	1	1
2569:	0	0	1	1	1	2	0	0
2577:	1	1	1	0	0	0	0	0
2585:	1	1	0	0	0	0	0	0
2593:	0	1	0	1	1	3	0	1
2601:	0	0	0	2	3	1	1	0
2609:	4	2	0	3	14	30	50	12
2617:	4	0	1	1	2	1	1	0
2625:	0	2	2	2	0	0	1	0
2633:	0	1	1	2	0	0	2	1
2641:	0	0	1	1	2	0	0	2
2649:	0	1	4	1	2	0	0	0
2657:	0	1	2	0	0	0	0	0
2665:	1	0	0	1	1	0	0	1
2673:	1	1	1	0	3	0	0	2
2681:	0	0	0	0	0	1	0	0
2689:	1	1	2	0	2	4	4	5
2697:	1	2	0	0	0	0	3	1
2705:	0	0	1	0	0	1	0	1
2713:	0	1	0	0	0	0	1	1
2721:	0	1	1	0	2	0	1	0
2729:	2	2	1	0	1	0	1	1
2737:	0	2	0	2	1	0	0	0
2745:	0	1	0	0	0	0	0	0
2753:	0	1	1	1	1	1	0	3
2761:	0	1	1	0	0	0	0	0
2769:	2	4	2	1	1	0	0	0
2777:	0	0	1	0	1	1	0	0
2785:	0	1	2	0	0	0	0	0
2793:	1	0	2	2	0	0	1	0
2801:	0	1	1	0	1	0	0	0
2809:	0	1	0	0	1	0	2	1
2817:	0	1	0	0	1	1	2	1
2825:	0	0	1	1	0	0	0	1

2833:	0	0	0	0	0	0	0	1
2841:	0	0	0	1	0	0	1	0
2849:	2	1	0	1	0	0	0	0
2857:	0	0	0	0	0	2	0	0
2865:	0	1	0	1	0	0	0	0
2873:	0	0	0	0	0	3	0	4
2881:	1	3	0	0	0	0	1	1
2889:	0	0	1	0	1	0	0	1
2897:	0	0	0	1	1	0	0	0
2905:	0	0	0	0	1	0	0	0
2913:	1	1	0	0	0	1	1	1
2921:	4	4	0	0	0	0	0	0
2929:	1	1	0	0	0	0	0	0
2937:	0	1	1	0	1	0	0	0
2945:	0	0	2	0	0	1	1	0
2953:	0	0	0	0	2	0	0	0
2961:	0	0	0	1	0	0	0	0
2969:	0	1	0	0	0	0	1	1
2977:	1	2	1	3	0	0	0	0
2985:	0	1	1	0	0	0	1	1
2993:	0	0	0	0	0	1	1	2
3001:	1	0	0	0	0	0	0	1
3009:	0	1	0	0	0	0	0	1
3017:	0	0	0	0	0	0	0	0
3025:	0	0	0	1	1	0	1	0
3033:	1	0	1	0	0	0	0	0
3041:	1	0	1	1	0	0	1	0
3049:	0	0	0	0	3	1	2	1
3057:	2	1	0	0	1	0	0	1
3065:	0	0	0	0	0	0	0	0
3073:	0	0	1	1	0	0	0	0
3081:	2	1	1	0	0	2	1	0
3089:	0	0	1	0	0	0	1	0
3097:	0	0	0	0	0	0	0	0
3105:	0	1	0	0	1	0	0	0
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3121:	0	1	0	0	0	1	0	1
3129:	0	0	0	1	0	0	0	1
3137:	0	0	0	0	0	0	0	0
3145:	0	0	0	0	0	0	0	0
3153:	0	1	0	0	1	0	1	0
3161:	0	2	0	0	0	2	0	0
3169:	1	0	0	0	0	0	0	0
3177:	0	0	0	0	0	0	0	1
3185:	1	0	0	0	0	0	0	0
3193:	0	0	0	0	1	0	0	0
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	0	0	0	1
3225:	1	1	0	0	0	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	1	1	0	0	0	0
3249:	0	0	0	1	0	0	0	0
3257:	1	0	0	0	0	2	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	1	1	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	2	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0

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3329:	1	0	0	0	0	0	0	1
3337:	0	0	1	0	0	0	0	0
3345:	1	0	1	0	0	1	0	0
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	0	0	0	0	1
3369:	1	0	1	0	0	0	0	0
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3385:	0	0	1	1	0	0	1	0
3393:	0	0	0	0	0	0	0	0
3401:	1	1	0	0	0	0	1	0
3409:	1	0	0	0	0	0	0	1
3417:	0	1	0	0	0	0	0	0
3425:	0	0	1	0	0	0	0	0
3433:	0	0	0	0	0	0	2	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	0	0	0	1	1
3465:	0	0	0	1	1	1	1	0
3473:	0	0	1	0	1	0	0	0
3481:	1	0	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	1	0
3505:	1	1	0	0	0	1	0	0
3513:	0	0	0	0	0	0	0	0
3521:	1	0	0	1	0	0	0	0
3529:	0	1	1	0	0	1	1	0
3537:	0	0	1	0	0	0	0	0
3545:	0	0	0	0	0	0	0	1
3553:	0	0	0	0	0	1	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	1	1	1	0	0
3577:	0	0	1	1	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	1	0	0	1	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	0	1	0	0	0
3633:	0	1	0	1	0	0	0	1
3641:	0	1	0	0	0	0	1	1
3649:	0	1	0	1	0	0	0	0
3657:	0	0	0	0	0	0	1	0
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	1
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	0	0	0	0	0
3705:	0	0	0	0	0	1	1	0
3713:	0	0	0	1	0	0	0	0
3721:	0	1	0	0	0	2	0	0
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3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	1	0	0	0	0	0	0	1
3761:	0	0	0	0	0	0	0	0
3769:	1	0	1	0	0	0	0	0
3777:	0	0	0	0	1	0	0	0
3785:	0	0	0	0	1	0	0	1

3793:	0	1	0	1	0	1	0	0
3801:	0	0	0	0	0	0	1	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	1	0	3	0	0	0
3841:	0	0	1	0	0	0	0	0
3849:	0	0	1	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	0	0	2	0	0	0	0	1
3873:	0	0	0	0	0	0	0	0
3881:	1	0	0	0	0	0	0	0
3889:	0	0	0	0	1	0	1	0
3897:	0	0	0	1	1	1	0	0
3905:	1	0	0	0	0	0	0	0
3913:	0	0	0	0	0	0	1	0
3921:	0	0	0	1	0	0	0	0
3929:	0	0	0	0	1	0	0	0
3937:	0	0	0	1	0	0	1	0
3945:	0	1	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	1
3961:	0	0	1	0	0	0	0	0
3969:	0	1	0	0	0	0	0	0
3977:	0	0	0	0	0	0	1	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	1	0	0
4001:	0	0	1	0	0	0	0	0
4009:	0	0	0	0	0	0	1	0
4017:	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	0	1	0	0	0	0
4049:	1	0	1	1	0	0	0	0
4057:	0	0	0	0	1	0	1	0
4065:	0	0	0	0	0	2	1	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	1	1	0
4089:	0	0	0	1	0	0	0	1

Sample ID : 1303012-10 Acquisition date : 1-APR-2013 07:56:56

VAX/VMS Peak Search Report Generated 1-APR-2013 08:57:58.52

4/1/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301210_GE2_GAS1202_190104.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-90-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 07:56:56.
Sample ID : 1303012-10 Sample Quantity : 4.31300E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE2 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:45.77 1.3%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	16.19*	1971	16802	1.43	16.31	15	5	20.4		NB-93M
0	45.99*	5890	24905	1.70	46.10	44	5	8.0		PB-210
0	53.07*	3485	19141	1.19	53.18	52	4	11.7		
0	63.02*	7127	34768	1.38	63.13	61	5	8.2		TH-234
0	76.15*	86863	85700	2.74	76.26	71	12	1.5		AM-243
0	93.42	8292	31359	1.73	93.53	91	6	7.2		
0	112.50	591	23653	1.26	112.62	111	6	82.9		
0	143.73*	2164	24737	1.31	143.84	142	6	23.4		U-235
0	153.93	2072	24910	1.32	154.04	152	6	24.5		
0	162.78*	410	18437	1.68	162.89	162	5	99.9		U-235
0	185.84*	23656	26784	1.33	185.95	182	8	2.7		RA-226
0	195.27	489	19222	3.45	195.38	193	6	90.2		
0	205.11*	404	14332	1.47	205.22	203	5	89.8		U-235
0	220.67	324	14434	2.25	220.78	219	6	117.8		
1	236.05	3417	11629	1.71	236.16	232	15	9.8	5.27E+01	
1	241.73	27114	8424	1.41	241.84	232	15	1.5		RA-224
0	257.23	3437	16693	4.22	257.34	253	9	14.0		
6	269.83	5392	13739	2.82	269.94	264	14	8.0	2.89E+01	
6	274.36	1384	8436	1.68	274.47	264	14	21.0		
0	284.72	754	9881	3.68	284.83	282	6	42.4		
0	294.86*	57959	12784	1.34	294.97	291	8	1.1		PB-214
0	300.75	587	9193	1.06	300.85	299	6	52.3		
0	313.80	273	6739	1.61	313.91	312	5	91.0		
0	323.51	663	7824	1.69	323.62	322	6	42.9		RA-223
0	329.09	361	8148	1.60	329.20	327	6	79.5		
0	351.49*	100087	12657	1.83	351.60	346	11	0.8		PB-214
0	387.69	1524	13606	3.61	387.80	382	13	31.9		
3	401.39	1108	5161	1.64	401.50	399	9	20.4	1.48E+00	RN-219
3	404.68	892	5174	1.69	404.79	399	9	25.7		
0	426.59	512	6740	1.37	426.70	424	7	54.2		
0	454.38	548	5929	1.78	454.49	451	8	49.5		
0	461.77	425	4897	1.86	461.87	459	7	55.6		
0	468.81	182	4049	1.38	468.92	467	6	111.9		
1	474.07	173	1943	1.83	474.18	472	19	67.7	1.52E+00	
1	480.07	733	3699	1.94	480.18	472	19	27.1		
1	486.72	830	3490	1.94	486.82	472	19	23.9		

AG 4/1/13

Sample ID : 1303012-10 Acquisition date : 1-APR-2013 07:56:56

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	510.14*	927	4828	3.48	510.24	506	9	27.9		
0	524.17*	137	2551	2.47	524.27	522	5	112.0		
0	532.87	425	3000	1.71	532.97	530	6	41.9		
0	543.20	190	3615	1.83	543.30	540	7	105.9		
0	580.28	846	4234	1.72	580.38	576	9	28.6		
2	603.92	133	1375	2.23	604.02	603	10	73.4	1.65E+01	SB-124
2	608.73*	73296	2343	1.64	608.83	603	10	0.8		BI-214
0	615.09	125	2266	1.62	615.19	614	6	121.6		
1	664.81	2091	1729	1.72	664.91	660	10	7.4	2.43E+00	
0	702.51	638	2435	2.03	702.61	700	7	26.7		
0	719.36	560	2593	1.91	719.46	716	8	32.6		
0	742.11	395	2484	1.76	742.21	739	8	44.9		
0	751.89	180	1838	2.44	751.98	749	6	76.8		
0	767.56*	7124	3449	1.91	767.66	762	11	4.0		
0	785.15	1653	2650	2.02	785.25	781	9	12.2		
0	805.80	1543	3338	2.09	805.89	800	11	15.4		
0	820.34	237	1522	1.79	820.44	818	5	51.1		
0	825.65	132	1626	1.25	825.75	824	5	93.5		
0	838.41	812	2554	2.15	838.51	836	8	22.7		
0	910.73*	108	1615	2.60	910.82	909	5	113.5		
0	933.26*	3702	2838	2.08	933.36	929	10	6.3		
0	963.14	388	2142	1.98	963.23	960	8	42.6		
0	1000.24*	386	1901	2.07	1000.33	997	8	40.4		PA-234M
0	1051.03	333	1494	1.95	1051.12	1048	7	40.0		
0	1069.00	336	1672	2.39	1069.09	1065	8	43.6		
0	1102.91	227	1609	2.31	1103.00	1100	8	62.4		
0	1119.44*	15832	2602	2.21	1119.53	1113	13	2.1		BI-214
0	1133.58	177	1469	1.47	1133.67	1130	7	73.6		
0	1154.42	1734	2054	2.24	1154.51	1150	10	10.9		
0	1180.52	302	1387	3.00	1180.61	1177	8	44.2		
0	1207.10	374	1606	1.99	1207.18	1203	9	40.0		
6	1237.24*	5787	843	2.13	1237.33	1225	19	3.1	4.79E+00	
0	1252.44	367	1374	2.27	1252.52	1248	9	37.9		
0	1280.08	1392	1615	2.23	1280.16	1276	10	12.1		
0	1302.55	194	1281	2.86	1302.63	1299	9	67.9		
1	1376.70*	4081	1002	2.23	1376.78	1373	17	4.0	1.91E+00	
1	1384.14	783	960	2.46	1384.22	1373	17	15.2		
3	1400.55	1198	997	2.40	1400.63	1396	17	10.5	8.05E-01	
3	1406.96*	2022	1048	2.27	1407.04	1396	17	6.9		
0	1460.22*	836	1595	2.24	1460.30	1455	11	19.8		K-40
0	1494.21	135	1390	5.06	1494.29	1490	9	101.1		
0	1508.05	1896	1895	2.45	1508.13	1502	12	10.3		
0	1542.14	396	897	2.19	1542.22	1540	6	26.4		
0	1582.13	595	1017	2.55	1582.21	1578	10	21.7		
3	1593.42	253	767	2.72	1593.50	1589	14	40.2	2.92E-01	
3	1598.15	290	691	2.30	1598.23	1589	14	32.6		
1	1656.16	79	403	2.58	1656.23	1653	13	80.7	2.23E+00	
1	1660.16	885	407	2.40	1660.23	1653	13	10.2		
0	1682.70	178	475	2.12	1682.77	1679	9	46.6		
0	1691.88	234	635	3.17	1691.96	1688	13	46.6		SB-124
0	1728.44	2808	437	2.45	1728.52	1724	11	4.8		

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1763.31*	12673	566	2.51	1763.38	1757	13	1.9		BI-214
1	1831.17	54	76	2.36	1831.24	1830	23	48.5	1.30E+00	
1	1837.14	320	211	2.65	1837.21	1830	23	20.2		
1	1841.69	59	221	2.65	1841.76	1830	23	122.5		
1	1846.16	1723	218	2.48	1846.23	1830	23	5.6		
0	1871.45	196	398	1.47	1871.52	1867	10	40.6		
0	1888.68	104	295	2.19	1888.75	1886	7	57.9		
0	1895.91	106	312	1.54	1895.98	1892	8	61.4		
0	1934.85	107	360	3.47	1934.92	1931	9	66.5		
1	2008.94	96	211	2.72	2009.01	2001	21	54.6	1.48E+00	
1	2015.70	78	180	2.72	2015.76	2001	21	66.9		
3	2049.94	52	126	2.49	2050.00	2044	12	78.3	3.42E+00	
3	2052.19	29	147	2.81	2052.26	2044	12	152.2		
0	2088.36	30	100	2.77	2088.42	2086	6	114.8		
6	2107.92	53	110	4.44	2107.98	2103	21	76.0	8.27E-01	
6	2117.07	873	86	2.82	2117.13	2103	21	7.7		
0	2148.51	46	94	6.80	2148.57	2144	11	87.3		
0	2190.85	73	79	3.93	2190.91	2186	10	51.1		
0	2202.51*	3485	114	2.73	2202.57	2196	15	3.6		
0	2248.48	26	34	1.16	2248.54	2244	8	88.3		
0	2291.95	226	50	2.63	2292.01	2286	14	18.9		
0	2420.93	17	8	2.74	2420.99	2417	7	76.3		
0	2445.88	977	10	2.92	2445.94	2439	13	6.5		
0	2576.72	10	5	1.15	2576.77	2570	11	112.0		
0	2612.22*	53	2	2.66	2612.27	2605	12	32.4		
0	2632.12	6	0	2.74	2632.17	2627	8	81.6		
0	2693.27	10	7	1.26	2693.32	2688	10	122.1		
0	2718.82	9	5	3.11	2718.87	2716	6	110.1		
0	2757.64	6	2	1.58	2757.69	2753	8	112.0		
0	2769.23	17	6	3.24	2769.27	2762	10	69.9		
0	2919.76	10	0	1.66	2919.80	2915	10	63.2		
0	2976.16	5	0	2.31	2976.20	2972	7	89.4		
0	2995.10	7	0	2.98	2995.14	2991	8	75.6		
0	3051.04	13	0	1.35	3051.08	3046	9	55.5		

Sample ID : 1303012-10 Acquisition date : 1-APR-2013 07:56:56

Total number of lines in spectrum	121	
Number of unidentified lines	75	
Number of lines tentatively identified by NID	46	38.02%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.899E+01	2.899E+01	0.639E+01	22.03	
PB-210	22.26Y	1.00	1.225E+02	1.229E+02	0.153E+02	12.47	
BI-214	1602.00Y	1.00	3.162E+02	3.162E+02	0.192E+02	6.06	
PB-214	1602.00Y	1.00	3.247E+02	3.247E+02	0.369E+02	11.37	
RN-219	3.28E+04Y	1.00	2.286E+01	2.286E+01	0.525E+01	22.95	
RA-223	3.28E+04Y	1.00	1.946E+01	1.946E+01	0.896E+01	46.03	
RA-224	1.41E+10Y	1.00	6.414E+02	6.414E+02	0.997E+02	15.55	
RA-226	1602.00Y	1.00	5.848E+02	5.849E+02	10.72E+02	183.26	
PA-234M	4.47E+09Y	1.00	1.182E+02	1.182E+02	0.492E+02	41.66	
TH-234	4.47E+09Y	1.00	1.389E+02	1.389E+02	0.166E+02	11.94	
U-235	7.04E+08Y	1.00	1.126E+01	1.126E+01	0.329E+01	29.21	
			---------	---------			
	Total Activity :		2.329E+03	2.330E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NB-93M	14.60Y	1.00	8.397E+01	8.432E+01	3.763E+01	44.63	
SB-124	60.20D	1.45	2.541E-01	3.687E-01	2.734E-01	74.14	
			---------	---------			
	Total Activity :		8.422E+01	8.469E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	9.246E+01	9.246E+01	0.885E+01	9.57	
			---------	---------			
	Total Activity :		9.246E+01	9.246E+01			

Grand Total Activity : 2.506E+03 2.507E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-10 Acquisition date : 1-APR-2013 07:56:56

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	4.705E-01	2.899E+01	2.899E+01	22.03	OK
	Final Mean for 1 Valid Peaks = 2.899E+01+/- 6.387E+00 (22.03%)						
PB-210	46.50	4.25*	1.969E+00	1.225E+02	1.229E+02	12.47	OK
	Final Mean for 1 Valid Peaks = 1.229E+02+/- 1.533E+01 (12.47%)						
BI-214	609.31	46.30*	9.260E-01	2.976E+02	2.976E+02	10.39	OK
	1120.29	15.10	5.678E-01	3.214E+02	3.214E+02	10.96	OK
	1764.49	15.80	4.183E-01	3.338E+02	3.338E+02	10.15	OK
	2204.22	4.98	3.725E-01	----- Line Not Found		-----	Absent
	Final Mean for 3 Valid Peaks = 3.162E+02+/- 1.916E+01 (6.06%)						
PB-214	295.21	19.19	1.631E+00	3.223E+02	3.224E+02	18.61	OK
	351.92	37.19*	1.436E+00	3.261E+02	3.261E+02	14.36	OK
	Final Mean for 2 Valid Peaks = 3.247E+02+/- 3.691E+01 (11.37%)						
RN-219	401.80	6.50*	1.298E+00	2.286E+01	2.286E+01	22.95	OK
	Final Mean for 1 Valid Peaks = 2.286E+01+/- 5.246E+00 (22.95%)						
RA-223	323.87	3.88*	1.527E+00	1.946E+01	1.946E+01	46.03	OK
	Final Mean for 1 Valid Peaks = 1.946E+01+/- 8.959E+00 (46.03%)						
RA-224	240.98	3.95*	1.863E+00	6.414E+02	6.414E+02	15.55	OK
	Final Mean for 1 Valid Peaks = 6.414E+02+/- 9.973E+01 (15.55%)						
RA-226	186.21	3.28*	2.147E+00	5.848E+02	5.849E+02	183.26	OK
	Final Mean for 1 Valid Peaks = 5.849E+02+/- 1.072E+03 (183.26%)						
PA-234M	1001.03	0.92*	6.188E-01	1.182E+02	1.182E+02	41.66	OK
	Final Mean for 1 Valid Peaks = 1.182E+02+/- 4.923E+01 (41.66%)						
TH-234	63.29	3.80*	2.351E+00	1.389E+02	1.389E+02	11.94	OK
	Final Mean for 1 Valid Peaks = 1.389E+02+/- 1.658E+01 (11.94%)						
U-235	143.76	10.50*	2.382E+00	1.505E+01	1.505E+01	30.04	OK
	163.35	4.70	2.275E+00	6.682E+00	6.682E+00	101.82	OK
	205.31	4.70	2.043E+00	7.326E+00	7.326E+00	92.17	OK
	Final Mean for 3 Valid Peaks = 1.126E+01+/- 3.290E+00 (29.21%)						

Sample ID : 1303012-10 Acquisition date : 1-APR-2013 07:56:56

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NB-93M	16.57	9.43*	4.334E-01	8.397E+01	8.432E+01	44.63	OK

Final Mean for 1 Valid Peaks = 8.432E+01+/- 3.763E+01 (44.63%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SB-124	602.71	97.87*	9.344E-01	2.541E-01	3.687E-01	74.14	OK
	645.85	7.26	8.824E-01	----- Line	Not Found	-----	Absent
	722.78	11.10	8.041E-01	----- Line	Not Found	-----	Absent
	1691.02	49.00	4.289E-01	1.935E+00	2.809E+00	47.66	<<WM N-Sigma

Final Mean for 1 Valid Peaks = 3.687E-01+/- 2.734E-01 (74.14%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.478E+00	9.246E+01	9.246E+01	9.57	OK

Final Mean for 1 Valid Peaks = 9.246E+01+/- 8.848E+00 (9.57%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.899E+01	6.387E+00	5.183E+00	4.578E-01	5.593
NB-93M	8.432E+01	3.763E+01	2.273E+01	8.975E+00	3.710
SB-124	3.687E-01	2.734E-01	6.647E-01	6.382E-02	0.555
PB-210	1.229E+02	1.533E+01	1.328E+01	1.154E+00	9.255
BI-214	3.162E+02	1.916E+01	9.290E-01	8.876E-02	340.372
PB-214	3.247E+02	3.691E+01	1.153E+00	1.588E-01	281.492
RN-219	2.286E+01	5.246E+00	7.089E+00	6.943E-01	3.225
RA-223	1.946E+01	8.959E+00	1.101E+01	1.777E+00	1.767
RA-224	6.414E+02	9.973E+01	1.108E+01	1.656E+00	57.894
RA-226	5.849E+02	1.072E+03	1.419E+01	2.600E+01	41.206
PA-234M	1.182E+02	4.923E+01	5.630E+01	5.166E+00	2.099
TH-234	1.389E+02	1.658E+01	1.534E+01	1.183E+00	9.050
U-235	1.126E+01	3.290E+00	4.391E+00	8.096E-01	2.565
AM-243	9.246E+01	8.848E+00	9.226E-01	7.899E-02	100.219

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	1.451E+01		4.286E+00	6.474E+00	6.469E-01	2.242
NA-22	2.003E-01		3.724E-01	5.500E-01	4.997E-02	0.364
AL-26	7.866E-02		1.956E-01	3.462E-01	3.176E-02	0.227
TI-44	2.056E+00		4.961E-01	6.379E-01	5.123E-02	3.224
SC-46	2.168E-01		4.273E-01	7.157E-01	6.070E-02	0.303
V-48	-2.349E-01		1.291E+00	2.132E+00	1.930E-01	-0.110
CR-51	-2.600E+00		7.748E+00	9.693E+00	1.615E+00	-0.268
MN-54	-6.980E-02		3.847E-01	5.725E-01	5.019E-02	-0.122
CO-56	2.363E-01		4.472E-01	6.748E-01	5.878E-02	0.350
CO-57	4.088E-01		3.337E-01	5.390E-01	6.592E-02	0.758
CO-58	-2.111E-01		4.354E-01	6.449E-01	5.731E-02	-0.327
FE-59	-1.275E-01		1.037E+00	1.520E+00	1.592E-01	-0.084
CO-60	2.137E-01		3.559E-01	5.296E-01	5.477E-02	0.403
ZN-65	2.149E+01		2.552E+00	2.103E+00	2.097E-01	10.220
SE-75	-2.497E-01		6.750E-01	8.529E-01	1.491E-01	-0.293
RB-82	1.525E+00		7.057E+00	8.465E+00	7.600E-01	0.180
RB-83	-2.902E-01		7.625E-01	1.162E+00	1.906E-01	-0.250
KR-85	9.178E+01		6.359E+01	9.878E+01	9.849E+00	0.929
SR-85	5.638E-01		3.907E-01	6.068E-01	6.050E-02	0.929
Y-88	1.691E+00	+	3.809E-01	5.797E-01	5.335E-02	2.916
NB-94	5.790E-02		3.210E-01	5.362E-01	4.603E-02	0.108
NB-95	2.772E+01		2.865E+00	1.827E+00	1.647E-01	15.171
ZR-95	7.246E-03		9.630E-01	1.149E+00	1.134E-01	0.006
RU-103	4.325E-02		4.724E-01	8.090E-01	1.216E-01	0.053
RU-106	-4.089E-01		2.875E+00	4.366E+00	6.075E-01	-0.094
AG-108M	5.475E-01		3.299E-01	5.081E-01	4.616E-02	1.078
CD-109	2.071E+02		2.745E+01	1.837E+01	2.098E+00	11.274
AG-110M	9.997E-02		3.248E-01	4.959E-01	4.532E-02	0.202
SN-113	6.778E-01		4.985E-01	8.599E-01	8.583E-02	0.788

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
TE123M	2.158E-01		5.156E-01	6.743E-01	6.085E-02	0.320
I-125	-1.046E+01		7.804E+00	1.279E+01	1.428E+00	-0.818
SB-125	2.516E+00	+	1.390E+00	1.671E+00	1.678E-01	1.506
SB-126	1.370E+01	+	4.666E+00	5.689E+00	5.170E-01	2.408
SN-126	1.804E+01		2.176E+00	1.739E+00	1.692E-01	10.371
I-129	-4.491E-01		7.264E-01	1.210E+00	1.675E-01	-0.371
I-131	2.198E+00		4.863E+00	8.428E+00	1.061E+00	0.261
BA-133	3.344E-01		4.837E-01	6.961E-01	1.164E-01	0.480
CS-134	2.632E-01	+	1.951E-01	6.713E-01	6.448E-02	0.392
CS-135	2.131E+01		4.308E+00	3.155E+00	5.632E-01	6.755
CS-136	3.645E+00		2.485E+00	3.753E+00	3.658E-01	0.971
CS-137	1.603E+00		3.856E-01	5.765E-01	5.256E-02	2.781
LA-138	3.772E-02		5.195E-01	8.444E-01	7.201E-02	0.045
CE-139	2.641E-01		4.514E-01	6.713E-01	5.631E-02	0.393
BA-140	-3.636E+00		8.166E+00	9.749E+00	3.266E+00	-0.373
LA-140	9.830E+00		2.488E+00	3.753E+00	3.328E-01	2.619
CE-141	3.390E+00		1.581E+00	1.987E+00	5.128E-01	1.706
CE-144	3.926E-01		2.711E+00	4.394E+00	4.944E-01	0.089
PM-144	3.992E-01		3.012E-01	4.645E-01	4.236E-02	0.859
PM-145	-1.084E+00		1.692E+00	2.559E+00	1.673E+00	-0.424
PM-146	2.049E+00	+	1.037E+00	1.162E+00	1.158E-01	1.764
ND-147	3.257E+01		2.038E+01	2.558E+01	2.542E+00	1.273
EU-152	4.908E+01	+	6.585E+00	6.251E+00	6.743E-01	7.852
GD-153	-2.243E+00		1.272E+00	2.012E+00	2.161E-01	-1.114
EU-154	5.408E-01		1.031E+00	1.522E+00	1.383E-01	0.355
EU-155	2.926E-01		1.364E+00	2.068E+00	1.990E-01	0.142
EU-156	4.643E+00		1.439E+01	1.982E+01	4.547E+00	0.234
HO-166M	-2.519E-01		6.005E-01	8.200E-01	7.458E-02	-0.307
HF-172	-2.191E+00		2.422E+00	3.884E+00	4.624E-01	-0.564
LU-172	1.616E+01		1.515E+01	2.420E+01	2.375E+00	0.668
LU-173	1.767E+01		3.618E+00	2.531E+00	4.628E-01	6.982
HF-175	2.839E-01		5.082E-01	7.329E-01	1.065E-01	0.387
LU-176	-1.918E-01		3.128E-01	4.460E-01	7.750E-02	-0.430
TA-182	1.561E+02		1.705E+01	6.303E+00	6.304E-01	24.770
IR-192	7.738E-01	+	8.700E-01	1.225E+00	1.223E-01	0.632
HG-203	-3.200E-01		7.248E-01	9.106E-01	1.749E-01	-0.351
BI-207	1.467E-01		2.708E-01	4.430E-01	4.337E-02	0.331
TL-208	2.235E+00		9.635E-01	1.487E+00	1.445E-01	1.503
BI-210M	-6.170E-02		7.428E-01	9.448E-01	1.622E-01	-0.065
PB-211	4.148E+01	+	1.152E+01	1.729E+01	1.696E+00	2.399
BI-212	-1.302E+00		2.510E+00	3.741E+00	3.397E-01	-0.348
PB-212	1.156E+01		1.891E+00	1.215E+00	1.787E-01	9.511
RA-225	-3.668E+00		5.041E+00	7.741E+00	7.647E-01	-0.474
TH-227	2.741E+01	+	4.913E+00	4.395E+00	6.349E-01	6.238
AC-228	1.021E+00	+	1.162E+00	2.024E+00	1.725E-01	0.504
TH-230	5.110E+02		1.260E+02	1.626E+02	1.303E+01	3.144
PA-231	3.880E+01		1.466E+01	1.926E+01	3.400E+00	2.015
TH-231	8.981E+00		3.783E+00	5.878E+00	1.011E+00	1.528

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-233	2.217E+00		1.843E+00	2.555E+00	6.853E-01	0.868
PA-234	1.799E-01		1.314E+00	2.131E+00	2.440E-01	0.084
NP-237	7.270E-01		3.304E+00	5.009E+00	4.822E-01	0.145
AM-241	7.171E+00		1.166E+00	1.586E+00	1.185E-01	4.522
CM-243	-9.807E-01		2.466E+00	3.104E+00	5.872E-01	-0.316

Summary of Nuclide Activity
Sample ID : 1303012-10
Acquisition date : 1-APR-2013 07:56:56

Total number of lines in spectrum	121	
Number of unidentified lines	75	
Number of lines tentatively identified by NID	46	38.02%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.899E+01	2.899E+01	0.639E+01	22.03	
PB-210	22.26Y	1.00	1.225E+02	1.229E+02	0.153E+02	12.47	
BI-214	1602.00Y	1.00	3.162E+02	3.162E+02	0.192E+02	6.06	
PB-214	1602.00Y	1.00	3.247E+02	3.247E+02	0.369E+02	11.37	
RN-219	3.28E+04Y	1.00	2.286E+01	2.286E+01	0.525E+01	22.95	
RA-223	3.28E+04Y	1.00	1.946E+01	1.946E+01	0.896E+01	46.03	
RA-224	1.41E+10Y	1.00	6.414E+02	6.414E+02	0.997E+02	15.55	
RA-226	1602.00Y	1.00	5.848E+02	5.849E+02	10.72E+02	183.26	
PA-234M	4.47E+09Y	1.00	1.182E+02	1.182E+02	0.492E+02	41.66	
TH-234	4.47E+09Y	1.00	1.389E+02	1.389E+02	0.166E+02	11.94	
U-235	7.04E+08Y	1.00	1.126E+01	1.126E+01	0.329E+01	29.21	
	Total Activity :		2.329E+03	2.330E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NB-93M	14.60Y	1.00	8.397E+01	8.432E+01	3.763E+01	44.63	
SB-124	60.20D	1.45	2.541E-01	3.687E-01	2.734E-01	74.14	
	Total Activity :		8.422E+01	8.469E+01			

Nuclide Type : ACTIVATION

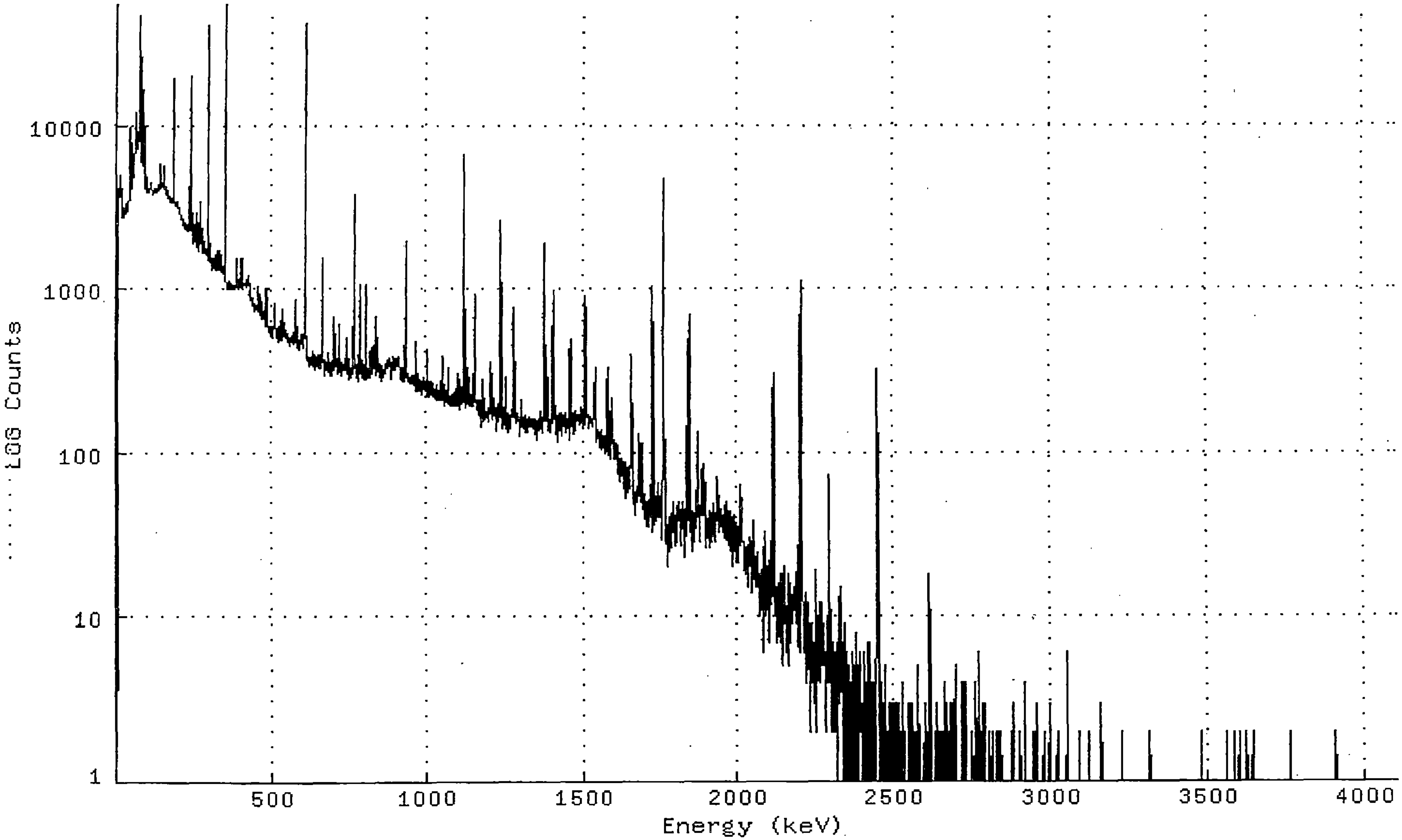
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	9.246E+01	9.246E+01	0.885E+01	9.57	
	Total Activity :		9.246E+01	9.246E+01			

Grand Total Activity : 2.506E+03 2.507E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301210_GE2_GAS1202_190104.CNF;1
Title :
Sample Title: S30-90-130228

Start Time: 1-APR-2013 07:56:	Sample Time: 28-FEB-2013 00:00	Energy Offset: -1.16012E-01
Real Time : 0 01:00:45.77	Sample ID : 1303012-10	Energy Slope : 1.00003E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301210_GE2_GAS1202_1901

Channel

1:	0	0	0	0	13	1611	3614	3999
9:	3942	4095	3918	4922	4810	3605	4020	4546
17:	3619	3462	3167	3022	2837	2742	2737	3002
25:	2973	2926	3116	3020	2865	2863	2921	3302
33:	2973	2902	2920	3194	3167	2988	3103	3270
41:	3450	3548	3703	3952	4170	9235	9491	3995
49:	4122	5578	4668	4617	7615	5678	4722	5013
57:	5202	5732	6362	6696	6932	7471	11721	8848
65:	6979	7120	8432	8870	7279	7453	7610	7828
73:	8440	16217	27388	14810	44775	14472	8594	7583
81:	9038	5852	7810	11583	5607	6807	15941	9761
89:	6739	8919	5258	8596	9823	5992	5935	4047
97:	4132	4797	4256	3981	3789	3842	4020	3820
105:	3814	3946	3928	3958	4001	4065	4113	4093
113:	4351	3995	3875	3817	3865	3741	3806	3824
121:	3906	4036	3968	3898	3926	3859	3831	3933
129:	3925	3926	4028	4033	3895	4043	4015	3950
137:	3976	4095	4228	4111	4093	4074	4595	5667
145:	4338	4126	4124	4176	4379	4289	4262	4279
153:	4468	5494	4507	4234	4000	4140	4084	3896
161:	3878	3779	4041	3904	3582	3547	3647	3662
169:	3512	3651	3511	3530	3417	3413	3404	3492
177:	3370	3379	3582	3518	3433	3515	3526	3664
185:	7459	18806	6962	3326	3277	3204	3228	3252
193:	3302	3389	3234	3353	3228	3205	3099	3197
201:	2984	3123	2995	2986	3099	2893	2769	2715
209:	2707	2773	2774	2648	2597	2567	2645	2542
217:	2486	2420	2476	2532	2531	2426	2384	2409
225:	2343	2429	2375	2416	2331	2272	2467	2394
233:	2283	2348	3028	4107	2442	2598	2470	2282
241:	9292	19131	4112	2006	1953	1989	1896	1921
249:	1950	2043	1912	1974	1906	2006	2143	2850
257:	2242	2532	2790	1899	1762	1811	1784	1726
265:	1743	1762	1691	1902	3382	2978	3263	2142
273:	1872	2288	2293	1725	1661	1682	1639	1753
281:	1793	1637	1899	1789	1808	1924	1578	1619
289:	1660	1675	1619	1625	1817	12037	40075	10570
297:	1551	1466	1638	1884	1448	1609	1638	1563
305:	1474	1339	1364	1310	1338	1384	1347	1378
313:	1379	1511	1428	1316	1360	1301	1296	1303
321:	1297	1307	1557	1698	1313	1310	1302	1309
329:	1572	1672	1305	1349	1442	1442	1319	1312
337:	1275	1589	1287	1279	1260	1362	1310	1299
345:	1229	1281	1307	1430	1600	3456	39814	54527
353:	6142	1129	1030	1058	1034	1014	1024	983
361:	1037	1012	1059	990	998	1105	1043	1038
369:	1038	993	1046	1061	981	1033	1022	1034
377:	1045	1000	1044	981	1031	1016	1022	1029
385:	1031	1328	1384	1461	1511	1070	1119	1051
393:	1085	1023	1110	1058	1007	1055	1005	1086
401:	1527	1525	1124	1304	1500	1198	997	1077
409:	1041	1073	1082	1047	1086	1074	1067	1070
417:	1064	1047	1133	1032	1094	1087	1057	1080
425:	1071	1067	1200	986	956	892	886	921

433:	840	828	861	818	859	836	784	792
441:	730	797	781	766	800	765	769	774
449:	751	734	772	765	722	1015	950	761
457:	753	739	725	693	916	872	732	692
465:	692	660	714	646	813	744	663	651
473:	682	728	675	643	618	600	782	990
481:	800	587	639	623	636	851	988	700
489:	576	585	545	580	578	584	573	551
497:	579	559	528	568	562	530	502	574
505:	554	510	565	608	763	809	812	676
513:	574	533	547	541	532	496	568	511
521:	527	471	587	548	562	522	514	555
529:	492	483	517	560	747	637	481	538
537:	539	495	536	522	508	582	616	540
545:	520	517	497	553	531	494	504	477
553:	503	523	511	477	465	493	473	504
561:	451	446	516	479	472	468	498	473
569:	493	479	455	539	542	476	469	473
577:	481	475	699	839	507	521	587	498
585:	442	453	437	441	423	481	446	464
593:	485	462	465	481	455	518	485	469
601:	434	436	480	528	468	491	1712	21232
609:	41241	10982	719	358	368	379	452	418
617:	398	368	376	385	347	355	363	335
625:	383	368	356	342	375	370	335	376
633:	375	414	368	390	348	387	353	315
641:	323	359	347	332	352	353	346	367
649:	394	328	354	338	348	356	333	328
657:	396	337	351	371	396	351	394	865
665:	1498	675	385	343	300	359	358	340
673:	296	338	349	327	316	323	341	343
681:	310	363	402	307	335	355	348	347
689:	347	333	296	305	314	295	323	357
697:	360	367	317	314	345	602	658	429
705:	374	351	393	349	330	399	343	312
713:	327	324	302	308	311	369	594	523
721:	351	349	348	331	342	334	309	292
729:	323	338	324	325	341	335	337	330
737:	317	331	318	339	402	491	375	330
745:	305	319	281	322	322	313	353	372
753:	374	284	306	319	317	320	292	301
761:	309	309	320	324	492	694	2426	3719
769:	1277	374	325	316	320	305	299	342
777:	286	309	297	268	280	293	320	480
785:	1050	858	406	302	314	310	298	301
793:	358	300	327	287	305	342	341	306
801:	296	281	301	359	934	1047	512	278
809:	285	282	289	305	322	289	348	286
817:	298	312	312	400	432	303	305	326
825:	350	414	332	335	328	356	444	429
833:	320	302	346	296	405	662	665	383
841:	332	318	305	331	321	341	325	298
849:	327	282	339	271	321	323	322	333
857:	323	302	320	310	286	314	306	313
865:	340	321	304	321	310	340	354	361
873:	353	328	338	373	345	369	336	330
881:	353	351	347	311	316	278	336	332
889:	385	321	349	341	356	343	316	364
897:	367	356	325	345	340	337	363	353
905:	376	332	358	358	330	379	366	353

913:	298	321	308	309	280	285	269	280
921:	300	325	280	285	299	331	306	267
929:	314	312	316	652	1906	1666	532	287
937:	284	273	284	276	285	298	277	263
945:	277	281	282	262	270	275	278	289
953:	270	269	261	279	290	260	264	271
961:	257	308	467	410	303	275	239	297
969:	273	284	238	285	254	261	260	235
977:	266	274	258	236	270	264	267	273
985:	257	227	260	274	254	282	240	250
993:	246	264	248	252	238	240	281	423
1001:	405	255	228	220	244	250	218	269
1009:	244	246	237	234	267	257	244	237
1017:	223	221	234	261	216	234	259	214
1025:	246	223	224	217	237	215	253	259
1033:	225	208	221	239	230	208	211	215
1041:	216	229	231	208	267	239	215	205
1049:	230	248	381	331	239	193	239	219
1057:	254	227	239	205	204	225	235	215
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1073:	213	190	215	199	204	221	197	215
1081:	190	223	213	206	207	218	193	203
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1145:	191	206	216	219	215	203	193	227
1153:	412	917	820	393	201	213	209	196
1161:	200	192	181	184	186	207	194	205
1169:	169	200	195	203	203	181	206	144
1177:	195	155	198	261	274	251	186	169
1185:	184	157	176	187	170	172	172	175
1193:	171	164	166	184	164	155	170	176
1201:	183	176	192	171	178	268	354	264
1209:	201	172	180	168	159	189	169	190
1217:	185	193	215	167	167	179	175	144
1225:	135	169	178	181	198	195	164	162
1233:	202	165	250	1002	2553	2095	570	211
1241:	158	153	144	139	170	162	166	148
1249:	166	183	195	239	288	210	171	141
1257:	157	153	172	139	151	131	158	163
1265:	162	138	166	143	176	172	172	183
1273:	164	178	165	167	174	188	452	759
1281:	541	236	168	155	167	149	164	159
1289:	153	162	156	167	172	149	145	142
1297:	165	125	142	143	174	170	208	167
1305:	169	158	144	155	141	146	161	157
1313:	138	148	131	167	169	137	151	158
1321:	133	141	154	152	156	152	154	164
1329:	144	151	148	145	145	144	161	155
1337:	159	144	150	142	143	140	147	130
1345:	157	144	134	137	147	153	135	128
1353:	128	120	150	140	149	160	160	135
1361:	156	170	141	148	179	140	154	153
1369:	163	163	139	162	132	179	451	1345
1377:	1854	875	249	154	165	158	251	447
1385:	400	208	165	138	134	137	150	143

1393:	141	131	142	136	157	151	263	545
1401:	581	328	158	160	230	629	970	682
1409:	256	146	143	153	155	129	189	128
1417:	150	154	167	149	169	115	153	155
1425:	171	167	157	144	155	160	126	137
1433:	146	170	154	144	147	164	144	166
1441:	154	151	131	132	173	148	139	150
1449:	161	157	161	152	148	149	148	119
1457:	161	184	367	485	308	183	168	166
1465:	154	130	158	142	143	170	171	154
1473:	172	137	154	176	161	163	169	155
1481:	153	165	162	163	167	145	149	166
1489:	164	151	166	167	188	179	186	165
1497:	183	140	164	159	151	142	174	148
1505:	172	213	526	884	664	344	197	164
1513:	163	175	162	140	168	152	138	157
1521:	165	153	150	161	159	164	149	154
1529:	144	154	158	158	159	185	172	192
1537:	244	265	199	198	234	323	269	153
1545:	116	125	136	122	129	121	133	110
1553:	112	122	117	107	132	137	107	110
1561:	126	105	110	107	118	111	122	110
1569:	125	125	98	111	117	108	111	116
1577:	100	104	107	110	241	329	258	137
1585:	117	102	107	96	92	94	104	127
1593:	178	177	134	113	155	212	184	133
1601:	101	91	110	96	104	119	107	98
1609:	92	101	100	96	83	74	86	82
1617:	84	109	66	92	89	88	72	87
1625:	78	71	81	80	92	84	79	70
1633:	77	60	77	68	86	84	86	72
1641:	65	52	71	61	60	80	61	56
1649:	65	63	69	81	59	66	66	93
1657:	87	97	229	392	325	122	66	73
1665:	48	52	52	53	52	50	57	50
1673:	41	56	52	61	61	51	54	51
1681:	73	93	128	90	60	55	49	57
1689:	54	62	112	114	114	68	55	53
1697:	50	44	47	39	53	49	39	55
1705:	36	47	47	47	49	35	48	43
1713:	35	44	40	51	42	40	63	59
1721:	55	45	58	32	65	119	400	1031
1729:	960	398	109	47	48	36	36	45
1737:	53	42	54	38	45	65	46	43
1745:	55	50	40	44	54	40	52	52
1753:	45	42	29	52	51	48	48	92
1761:	446	2081	4567	4040	1434	316	46	42
1769:	34	38	36	36	20	26	31	35
1777:	30	36	34	39	38	40	25	40
1785:	33	26	41	42	37	29	34	34
1793:	45	33	49	32	35	41	36	35
1801:	33	27	36	46	35	38	41	28
1809:	47	40	42	49	38	44	39	38
1817:	35	33	41	44	27	41	35	41
1825:	39	36	50	32	23	27	45	35
1833:	43	31	40	91	142	118	54	46
1841:	38	51	39	111	354	676	535	204
1849:	54	38	32	33	36	25	36	43
1857:	33	39	42	28	41	30	37	28
1865:	43	34	37	47	48	54	64	133

1873:	75	52	44	40	47	28	38	33
1881:	40	36	49	47	41	42	53	73
1889:	83	54	53	41	44	61	85	50
1897:	48	49	40	26	35	39	31	34
1905:	30	37	39	36	39	28	26	43
1913:	36	32	28	34	30	37	42	37
1921:	38	37	48	31	41	28	35	41
1929:	41	33	42	43	38	68	69	70
1937:	57	39	41	43	53	45	32	34
1945:	42	40	35	39	45	38	34	38
1953:	36	32	41	38	40	36	45	30
1961:	47	40	29	36	42	42	42	50
1969:	38	33	38	37	27	30	43	30
1977:	33	26	25	35	21	40	30	28
1985:	26	23	20	33	25	27	40	25
1993:	41	34	31	26	27	22	26	35
2001:	26	28	29	21	28	27	41	39
2009:	63	32	29	28	32	31	48	52
2017:	30	27	28	21	21	19	23	22
2025:	22	21	18	26	23	23	21	27
2033:	20	21	15	22	28	26	24	30
2041:	25	28	14	20	20	21	28	23
2049:	17	38	37	26	32	18	15	23
2057:	19	18	16	23	17	24	19	15
2065:	23	22	10	14	16	14	18	13
2073:	15	15	18	17	14	11	19	12
2081:	6	19	18	22	26	18	28	23
2089:	32	19	10	17	17	11	20	13
2097:	13	14	7	15	22	16	9	15
2105:	27	14	25	28	25	23	14	13
2113:	15	21	69	200	304	232	93	28
2121:	13	12	8	11	8	15	8	7
2129:	8	16	11	13	13	11	11	7
2137:	12	14	14	18	10	13	15	5
2145:	18	15	20	19	12	9	16	12
2153:	8	6	9	11	8	10	10	13
2161:	9	16	18	5	12	8	8	8
2169:	7	16	14	9	12	12	13	9
2177:	12	15	13	12	11	12	15	12
2185:	10	9	14	14	13	27	16	22
2193:	18	12	7	6	11	21	38	127
2201:	468	1024	1114	548	162	34	17	14
2209:	11	7	10	10	7	6	12	14
2217:	9	4	8	13	11	6	11	12
2225:	6	11	2	9	9	7	4	7
2233:	7	7	4	4	9	9	5	5
2241:	4	7	4	3	5	11	7	5
2249:	19	8	2	8	7	6	10	8
2257:	7	9	12	4	6	10	6	10
2265:	12	5	5	5	7	7	7	9
2273:	5	6	5	5	4	5	3	6
2281:	2	9	10	4	5	5	8	4
2289:	10	25	66	72	38	24	5	7
2297:	6	4	2	3	7	2	6	5
2305:	6	7	3	2	4	5	6	3
2313:	4	4	3	7	1	2	13	6
2321:	3	6	5	3	4	4	5	5
2329:	15	6	7	1	4	5	1	1
2337:	5	5	1	6	3	9	0	6
2345:	2	2	0	3	2	3	5	0

2353:	3	0	3	4	2	2	4	4
2361:	1	3	2	1	6	2	3	2
2369:	3	5	5	4	1	8	5	5
2377:	1	2	3	4	5	2	4	0
2385:	3	2	6	3	4	3	3	2
2393:	2	0	3	3	0	1	6	2
2401:	1	0	1	6	1	4	1	1
2409:	1	1	1	2	7	2	3	3
2417:	1	3	4	5	5	7	0	1
2425:	0	1	1	3	4	2	4	1
2433:	2	0	3	3	2	0	1	3
2441:	3	10	17	85	232	315	217	76
2449:	22	6	0	2	2	1	2	4
2457:	1	1	1	1	1	0	3	1
2465:	1	3	5	1	2	2	2	3
2473:	1	0	1	1	1	2	1	0
2481:	1	3	1	0	2	3	2	3
2489:	0	3	1	3	3	1	1	1
2497:	1	1	1	3	1	3	3	3
2505:	2	3	0	1	3	2	2	1
2513:	1	2	1	2	0	1	1	0
2521:	1	2	1	1	1	4	4	0
2529:	2	0	0	1	1	1	1	0
2537:	0	1	0	1	2	1	3	0
2545:	1	1	0	1	3	1	1	3
2553:	2	2	1	1	0	0	0	0
2561:	1	1	2	2	1	1	2	1
2569:	1	1	1	1	0	2	1	5
2577:	1	2	1	0	0	0	0	0
2585:	0	0	0	0	0	0	0	1
2593:	0	0	3	2	0	2	1	3
2601:	1	0	2	0	0	1	1	1
2609:	1	4	8	18	15	8	6	0
2617:	1	0	0	0	1	0	1	0
2625:	1	0	0	0	0	0	2	1
2633:	3	0	0	1	0	0	1	0
2641:	2	2	0	0	1	0	1	2
2649:	0	0	0	2	0	0	0	1
2657:	2	0	1	4	0	2	3	1
2665:	1	0	0	2	0	1	0	1
2673:	2	0	0	0	3	0	1	0
2681:	1	0	3	1	1	0	1	1
2689:	1	1	3	2	2	5	1	1
2697:	0	1	0	0	0	0	1	1
2705:	0	0	1	1	0	0	0	0
2713:	2	1	3	0	4	4	4	2
2721:	0	1	0	1	1	1	4	0
2729:	1	0	1	1	1	0	1	1
2737:	0	0	0	0	0	0	0	1
2745:	0	0	0	2	1	1	0	0
2753:	0	1	0	0	2	4	1	0
2761:	1	1	0	1	0	2	3	6
2769:	4	6	0	0	1	2	0	1
2777:	1	0	0	0	3	0	1	2
2785:	0	1	3	0	0	0	0	0
2793:	0	1	0	1	1	0	2	0
2801:	1	0	0	1	1	1	1	0
2809:	0	2	2	0	0	0	0	1
2817:	0	1	1	0	0	0	0	2
2825:	0	0	0	2	0	1	2	0

2833:	0	1	0	1	2	1	0	2
2841:	1	0	0	0	0	0	1	1
2849:	0	0	0	1	1	0	0	0
2857:	0	1	0	1	0	0	0	0
2865:	1	0	0	0	0	0	1	1
2873:	1	0	2	1	1	1	3	1
2881:	2	1	0	0	1	0	1	0
2889:	1	0	1	1	0	0	0	0
2897:	1	1	0	1	2	0	0	1
2905:	0	0	0	0	1	0	0	1
2913:	0	0	0	0	0	2	4	1
2921:	1	1	1	0	0	0	0	0
2929:	1	0	0	0	1	0	0	1
2937:	1	1	0	2	1	0	0	1
2945:	1	0	0	2	1	1	0	1
2953:	0	3	1	0	1	0	0	1
2961:	0	0	1	0	0	1	0	1
2969:	0	0	0	0	0	0	1	2
2977:	2	0	0	0	0	1	0	0
2985:	0	0	0	0	0	0	0	0
2993:	0	3	1	2	1	0	0	0
3001:	0	0	0	0	1	1	0	0
3009:	1	0	0	0	0	0	0	0
3017:	0	0	2	0	0	0	0	0
3025:	0	0	0	0	0	0	1	0
3033:	1	0	0	0	0	0	0	1
3041:	0	0	0	0	0	0	1	0
3049:	0	2	6	1	3	0	0	0
3057:	0	0	0	0	1	1	0	0
3065:	1	0	0	0	0	0	0	0
3073:	0	0	1	0	1	0	0	0
3081:	0	0	0	1	1	1	0	1
3089:	2	0	0	1	0	0	0	0
3097:	0	0	0	0	0	0	0	0
3105:	0	0	0	1	0	0	0	0
3113:	0	0	0	0	0	0	2	0
3121:	1	1	0	0	0	1	0	0
3129:	1	0	0	1	0	0	0	1
3137:	0	0	1	0	0	0	1	1
3145:	0	0	0	0	0	0	0	0
3153:	0	0	1	0	0	1	3	0
3161:	1	0	0	1	0	0	0	0
3169:	0	0	0	0	0	0	0	0
3177:	0	0	0	0	1	1	0	0
3185:	0	0	1	0	0	0	1	1
3193:	0	0	0	0	1	0	0	0
3201:	0	0	0	1	0	1	0	0
3209:	0	0	0	0	0	0	1	0
3217:	0	0	0	1	0	0	2	0
3225:	1	1	0	0	0	0	0	0
3233:	0	1	0	0	0	0	0	0
3241:	1	0	0	0	0	1	1	0
3249:	0	0	0	1	0	0	0	0
3257:	0	0	1	1	1	0	1	0
3265:	0	1	0	0	0	0	0	0
3273:	0	1	0	0	0	0	0	0
3281:	0	0	0	0	0	0	0	0
3289:	0	0	1	0	1	0	0	0
3297:	0	0	1	0	0	0	0	0
3305:	1	0	0	0	0	0	1	0

3313:	2	0	0	0	0	0	1	0
3321:	0	0	0	1	0	1	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	1	0	0	1	0	0
3353:	0	0	0	0	0	1	0	0
3361:	0	0	0	1	0	0	0	0
3369:	0	0	0	0	0	0	0	0
3377:	0	0	0	0	0	0	0	0
3385:	0	0	0	1	0	0	0	0
3393:	0	1	0	0	0	0	0	0
3401:	0	0	0	0	0	0	0	0
3409:	1	1	0	0	0	0	0	0
3417:	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	0	0	0	0	0	0	0
3441:	0	0	0	1	0	0	1	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	1	0	0	0	0
3465:	0	0	0	0	0	1	0	0
3473:	0	0	2	0	0	0	0	0
3481:	0	0	1	0	0	0	0	1
3489:	1	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	1	0	0	0	0	1	0	0
3513:	0	0	0	0	0	0	0	1
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	1	0	0	0	0	0	0
3545:	0	0	0	0	1	0	0	0
3553:	0	0	0	0	2	0	0	0
3561:	0	0	0	0	0	1	0	0
3569:	0	0	0	0	0	1	0	0
3577:	0	0	2	0	0	0	1	0
3585:	0	0	0	0	0	1	0	0
3593:	0	0	0	2	1	0	0	1
3601:	0	0	0	0	0	0	0	1
3609:	0	0	1	0	0	0	1	0
3617:	0	0	0	2	0	0	0	0
3625:	0	0	0	0	0	0	0	0
3633:	1	0	0	0	1	0	2	0
3641:	1	0	0	0	0	1	1	0
3649:	0	1	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	1
3665:	1	0	0	0	0	0	0	0
3673:	0	0	1	0	0	0	0	0
3681:	0	0	0	0	1	1	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	1	0	0	0	0
3705:	0	0	0	0	0	0	1	0
3713:	0	0	0	1	0	1	0	0
3721:	0	0	1	0	0	1	0	0
3729:	0	0	0	0	1	0	0	0
3737:	0	0	1	0	0	0	0	0
3745:	0	0	1	0	0	0	0	0
3753:	0	1	0	0	1	0	2	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	1	0	0	0	0	1
3777:	0	0	0	1	0	0	0	0
3785:	0	0	0	0	0	0	0	1

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	0	0	1	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	1	0	1	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	1	0	1	0	0	0
3857:	0	0	0	1	0	0	0	0
3865:	1	0	0	0	1	0	0	0
3873:	1	0	0	0	0	1	0	0
3881:	0	1	0	0	0	0	1	0
3889:	0	0	0	0	0	0	0	0
3897:	0	1	0	0	0	2	0	0
3905:	0	0	0	0	0	0	1	0
3913:	0	1	1	0	1	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	1	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	0	1	0	0	0	0
3969:	0	0	0	0	0	0	1	0
3977:	0	0	0	0	0	1	0	0
3985:	0	0	0	0	1	0	1	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	0
4017:	1	0	0	0	0	0	0	0
4025:	0	0	0	0	1	0	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	0	0	0	0	1	1
4049:	0	0	0	0	0	0	0	0
4057:	0	0	1	0	0	0	0	0
4065:	0	0	0	1	0	0	0	0
4073:	0	1	0	0	0	0	1	0
4081:	0	1	0	0	0	0	0	0
4089:	0	0	0	0	0	0	1	0

Sample ID : 1303012-11 Acquisition date : 1-APR-2013 07:58:15

VAX/VMS Peak Search Report Generated 1-APR-2013 09:01:31.54

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4/1/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301211_GE3_GAS1202_190105.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-90-2-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 07:58:15.
Sample ID : 1303012-11 Sample Quantity : 4.36310E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE3 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:03:01.81 4.8%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	31.25	564	17780	1.43	31.57	30	5	71.4		
0	46.04*	11111	24056	1.82	46.36	44	5	4.6		PB-210
0	62.75*	5760	42064	1.23	63.07	61	5	11.0		TH-234
5	67.43	3920	25665	2.22	67.75	66	17	11.1	4.11E+03	
5	74.68*	33952	33222	1.39	75.00	66	17	1.9		AM-243
0	87.70	5886	46917	1.03	88.02	85	5	11.4		NP-237
										SN-126
										CD-109
0	93.37*	6274	37637	1.74	93.69	91	6	10.3		
0	112.17	1041	23943	1.88	112.49	111	5	45.1		
0	130.96	636	28315	2.30	131.27	129	6	84.1		
0	143.71*	2006	24855	1.31	144.03	142	5	24.0		U-235
0	153.92	2218	29918	1.41	154.24	152	6	25.1		
2	182.53	288	4192	1.68	182.85	182	9	50.4	1.57E+00	
2	185.85*	22707	16506	1.39	186.16	182	9	2.1		RA-226
0	197.13*	743	22405	1.30	197.44	195	6	64.3		
0	205.29	525	16723	2.05	205.60	204	5	74.6		U-235
2	235.88	2789	13472	1.60	236.19	233	14	12.9	1.86E+01	
2	241.74*	26834	10471	1.36	242.05	233	14	1.6		RA-224
1	255.62	1330	11277	1.76	255.93	253	10	24.5	7.87E+00	
1	258.59	1946	10959	1.76	258.89	253	10	17.1		
6	269.91	4615	14224	2.85	270.22	267	11	9.1	1.20E+01	
6	274.35	1428	10017	1.67	274.66	267	11	22.1		
0	285.39	336	9897	4.35	285.70	284	5	89.7		
0	294.98*	56589	19034	1.62	295.28	291	9	1.2		PB-214
0	313.43	331	7759	2.18	313.74	312	5	80.6		PA-233
0	323.67	516	8992	1.17	323.98	322	6	58.7		RA-223
0	329.32	579	7495	1.40	329.63	328	5	45.6		
0	337.98*	329	6055	1.50	338.28	337	4	67.8		
4	351.70*	97699	5342	1.48	352.01	347	13	0.7	3.33E+01	PB-214
4	354.92	2356	8439	2.46	355.22	347	13	28.0		
0	388.08	1415	9517	3.03	388.39	385	8	24.5		
1	401.53	995	5988	1.78	401.83	399	10	24.2	2.54E+00	RN-219
1	404.87	713	6097	1.63	405.17	399	10	33.7		PB-211
0	426.68	290	6650	1.34	426.98	425	6	90.0		
0	444.88	189	4981	2.22	445.18	443	6	119.0		

AG
4/1/13

Post-NID Peak Search Report (continued)
Sample ID : 1303012-11

Acquisition date : 1-APR-2013 07:58:15

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	454.50	497	5775	1.41	454.80	452	7	51.6		
0	461.61	344	4671	1.82	461.91	460	6	63.7		
0	469.41*	292	5343	2.37	469.71	467	7	83.8		
0	480.20	759	4314	1.99	480.50	478	6	28.3		
0	486.77	905	4850	1.74	487.07	484	7	26.4		
0	510.55*	828	5569	3.16	510.84	507	9	33.2		
0	533.64	269	4303	1.30	533.94	531	7	81.7		
0	579.73	402	3349	1.55	580.03	577	6	46.6		
4	609.20*	67622	2315	1.61	609.49	603	16	0.8	1.39E+01	BI-214
4	612.71	1091	2483	1.85	613.00	603	16	37.4		
0	632.39	194	2652	1.85	632.68	630	7	89.2		
0	665.43	1958	3470	1.97	665.72	662	9	11.8		
0	684.06	160	2170	1.91	684.35	682	6	93.6		
0	703.23	494	3106	1.59	703.51	700	8	40.1		
0	719.86	462	2528	1.49	720.15	717	7	37.3		
0	742.56	481	3671	2.25	742.85	738	11	49.6		
0	753.41	149	2041	1.53	753.69	751	6	97.1		
0	768.22	6388	3807	2.02	768.51	763	11	4.5		
0	785.76	1515	3038	1.85	786.05	781	9	14.1		
0	806.13	1307	3066	1.97	806.42	802	9	16.2		
0	820.96	198	1735	2.16	821.24	819	5	64.5		
0	825.47*	165	2050	2.64	825.75	824	6	88.5		
0	831.76	263	1779	1.97	832.04	830	5	49.4		PB-211
0	839.03	645	2919	1.87	839.32	836	8	30.1		
0	923.24	222	2351	4.13	923.51	920	8	77.1		
2	930.10	97	861	1.77	930.38	929	11	82.5	3.23E+00	
2	934.07	3290	1767	1.97	934.35	929	11	5.3		
0	964.05	457	2045	1.99	964.33	961	7	34.1		
0	1001.19*	275	2225	2.53	1001.47	998	8	60.8		PA-234M
0	1031.91	143	1905	1.21	1032.18	1029	8	106.8		
0	1052.19	340	1864	1.97	1052.47	1049	8	45.4		
0	1069.89	241	1963	2.01	1070.17	1067	8	65.0		
0	1104.60	203	1552	2.96	1104.86	1102	7	66.1		
0	1112.19	120	1325	3.40	1112.46	1110	6	97.4		
0	1120.39*	13821	2541	2.11	1120.66	1116	11	2.2		BI-214
0	1133.35	143	1336	1.58	1133.62	1131	6	82.6		
0	1155.31	1629	2302	2.17	1155.57	1151	11	12.5		
0	1182.23	300	1510	2.16	1182.49	1179	8	46.2		
0	1198.97	143	1403	4.39	1199.23	1196	8	92.4		
0	1207.96	632	1663	2.00	1208.22	1204	10	25.4		
0	1238.29*	4986	1825	2.17	1238.55	1235	10	4.3		
0	1253.94	491	1951	3.62	1254.20	1249	12	37.1		
0	1281.17	1128	1769	2.00	1281.43	1277	10	15.2		
0	1303.77	133	890	2.36	1304.03	1302	6	72.9		
0	1337.39	116	911	3.02	1337.65	1335	6	84.4		
1	1377.88	3255	941	2.10	1378.14	1373	16	4.6	1.93E+00	
1	1385.52	566	944	1.98	1385.78	1373	16	19.1		
2	1401.82	1175	953	2.32	1402.08	1397	22	10.5	4.38E+00	
2	1408.13	1967	976	2.45	1408.39	1397	22	6.9		
0	1425.60	81	967	2.55	1425.85	1423	6	123.3		
0	1461.08*	530	1466	2.25	1461.33	1457	9	27.5		K-40

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1509.56	1576	1663	2.30	1509.82	1505	10	10.9		
0	1522.20	94	1142	3.52	1522.46	1520	7	121.6		
0	1538.57	258	994	1.75	1538.82	1536	6	40.6		
0	1543.59	251	875	2.45	1543.84	1542	6	39.6		
0	1583.44	427	1202	1.96	1583.69	1579	10	31.9		
0	1598.71	471	1645	6.27	1598.95	1590	15	38.7		
0	1644.11	126	646	5.44	1644.36	1640	10	77.9		
0	1661.69	800	815	1.97	1661.93	1657	11	15.6		
0	1684.39	137	472	2.04	1684.64	1681	8	57.3		
0	1693.26	197	532	3.44	1693.51	1689	9	44.7		
0	1729.92	2293	668	2.37	1730.16	1725	12	6.1		
0	1752.25	64	287	3.96	1752.49	1750	7	91.7		
0	1764.89*	10906	657	2.39	1765.13	1759	13	2.1		BI-214
0	1777.42*	47	201	2.30	1777.66	1776	6	100.6		
0	1838.59	213	464	1.98	1838.83	1834	11	41.3		
0	1847.79	1393	421	2.52	1848.02	1844	10	7.7		
0	1873.82	118	329	2.24	1874.05	1870	8	56.4		
0	1895.96	273	780	10.30	1896.19	1885	22	53.7		
0	1937.03	109	325	3.03	1937.26	1933	9	62.7		
0	1995.74	78	193	4.60	1995.97	1992	9	69.5		
0	2011.01	49	173	1.36	2011.24	2009	7	92.5		
0	2018.81	53	204	3.62	2019.04	2015	8	97.3		
0	2091.81	33	126	2.90	2092.03	2088	8	125.5		
2	2113.78	32	102	2.44	2114.00	2107	21	114.2	2.99E+00	
2	2119.16	693	107	2.67	2119.38	2107	21	9.2		
2	2192.82	50	59	2.98	2193.04	2189	25	67.0	5.50E+00	
2	2197.30	52	59	2.98	2197.52	2189	25	66.7		
2	2204.62*	2814	63	2.59	2204.84	2189	25	3.9		BI-214
0	2222.52	20	50	3.01	2222.74	2220	7	122.6		
0	2293.95	169	65	2.46	2294.17	2287	13	25.0		
0	2333.79	25	27	1.94	2334.00	2329	9	84.9		
5	2376.57	15	20	4.06	2376.78	2372	13	114.7	2.51E+00	
5	2382.28	13	4	2.39	2382.49	2372	13	80.3		
0	2403.19	23	10	7.79	2403.40	2398	11	70.5		
0	2410.77	10	4	1.21	2410.97	2409	5	87.4		
0	2434.66	12	16	2.85	2434.86	2430	9	127.8		
0	2448.52	851	27	2.70	2448.72	2443	14	7.3		
0	2484.22	10	6	1.91	2484.43	2480	8	106.8		
0	2507.13	13	2	3.12	2507.33	2504	7	64.7		
0	2555.25	11	0	4.00	2555.45	2552	8	60.3		
0	2575.47	12	0	3.06	2575.67	2571	10	57.7		
0	2587.14	10	2	4.29	2587.34	2584	7	74.2		
0	2601.37	7	0	2.22	2601.57	2598	7	75.6		
0	2615.27*	67	0	3.30	2615.46	2610	11	25.1		
0	2695.63	23	6	2.09	2695.83	2691	11	57.0		

Summary of Nuclide Activity
Sample ID : 1303012-11
Acquisition date : 1-APR-2013 07:58:15

Total number of lines in spectrum	130	
Number of unidentified lines	82	
Number of lines tentatively identified by NID	48	36.92%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.384E+01	2.384E+01	0.702E+01	29.44	
PB-210	22.26Y	1.00	1.974E+02	1.980E+02	0.201E+02	10.16	
PB-211	3.28E+04Y	1.00	3.298E+01	3.298E+01	0.970E+01	29.40	
BI-214	1602.00Y	1.00	3.558E+02	3.559E+02	0.200E+02	5.63	
PB-214	1602.00Y	1.00	3.603E+02	3.603E+02	0.401E+02	11.13	
RN-219	3.28E+04Y	1.00	2.378E+01	2.378E+01	0.622E+01	26.17	
RA-223	3.28E+04Y	1.00	1.722E+01	1.722E+01	1.050E+01	60.98	
RA-224	1.41E+10Y	1.00	6.990E+02	6.990E+02	1.099E+02	15.72	
RA-226	1602.00Y	1.00	6.005E+02	6.005E+02	11.01E+02	183.29	
PA-233	27.00D	2.29	1.076E+00	2.468E+00	2.098E+00	84.98	
PA-234M	4.47E+09Y	1.00	1.053E+02	1.053E+02	0.652E+02	61.90	
TH-234	4.47E+09Y	1.00	1.020E+02	1.020E+02	0.143E+02	13.99	
U-235	7.04E+08Y	1.00	1.349E+01	1.349E+01	0.386E+01	28.64	
			---------	---------			
	Total Activity :		2.533E+03	2.535E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	1.045E+02	1.096E+02	0.185E+02	16.87	
SN-126	1.00E+05Y	1.00	1.050E+01	1.050E+01	0.165E+01	15.76	
NP-237	2.14E+06Y	1.00	3.080E+01	3.080E+01	0.483E+01	15.68	
			---------	---------			
	Total Activity :		1.458E+02	1.509E+02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.387E+01	3.387E+01	0.332E+01	9.81	
			---------	---------			
	Total Activity :		3.387E+01	3.387E+01			

Grand Total Activity : 2.712E+03 2.720E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-11 Acquisition date : 1-APR-2013 07:58:15

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	3.586E-01	2.384E+01	2.384E+01	29.44	OK
Final Mean for 1 Valid Peaks = 2.384E+01+/- 7.019E+00 (29.44%)							
PB-210	46.50	4.25*	2.278E+00	1.974E+02	1.980E+02	10.16	OK
Final Mean for 1 Valid Peaks = 1.980E+02+/- 2.012E+01 (10.16%)							
PB-211	404.84	2.90*	1.101E+00	3.843E+01	3.843E+01	35.21	OK
	831.96	2.90	5.742E-01	2.723E+01	2.723E+01	51.07	OK
Final Mean for 2 Valid Peaks = 3.298E+01+/- 9.697E+00 (29.40%)							
BI-214	609.31	46.30*	7.618E-01	3.299E+02	3.299E+02	12.62	OK
	1120.29	15.10	4.433E-01	3.553E+02	3.553E+02	10.58	OK
	1764.49	15.80	3.132E-01	3.793E+02	3.793E+02	10.44	OK
	2204.22	4.98	2.726E-01	3.566E+02	3.567E+02	11.78	OK
Final Mean for 4 Valid Peaks = 3.559E+02+/- 2.004E+01 (5.63%)							
PB-214	295.21	19.19	1.434E+00	3.539E+02	3.539E+02	18.38	OK
	351.92	37.19*	1.241E+00	3.641E+02	3.642E+02	13.98	OK
Final Mean for 2 Valid Peaks = 3.603E+02+/- 4.010E+01 (11.13%)							
RN-219	401.80	6.50*	1.108E+00	2.378E+01	2.378E+01	26.17	OK
Final Mean for 1 Valid Peaks = 2.378E+01+/- 6.224E+00 (26.17%)							
RA-223	323.87	3.88*	1.330E+00	1.722E+01	1.722E+01	60.98	OK
Final Mean for 1 Valid Peaks = 1.722E+01+/- 1.050E+01 (60.98%)							
RA-224	240.98	3.95*	1.672E+00	6.990E+02	6.990E+02	15.72	OK
Final Mean for 1 Valid Peaks = 6.990E+02+/- 1.099E+02 (15.72%)							
RA-226	186.21	3.28*	1.984E+00	6.005E+02	6.005E+02	183.29	OK
Final Mean for 1 Valid Peaks = 6.005E+02+/- 1.101E+03 (183.29%)							
PA-233	311.98	38.60*	1.372E+00	1.076E+00	2.468E+00	84.98	OK
Final Mean for 1 Valid Peaks = 2.468E+00+/- 2.098E+00 (84.98%)							
PA-234M	1001.03	0.92*	4.879E-01	1.053E+02	1.053E+02	61.90	OK
Final Mean for 1 Valid Peaks = 1.053E+02+/- 6.519E+01 (61.90%)							

Sample ID : 1303012-11 Acquisition date : 1-APR-2013 07:58:15

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.556E+00	1.020E+02	1.020E+02	13.99	OK

Final Mean for 1 Valid Peaks = 1.020E+02+/- 1.427E+01 (13.99%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-235	143.76	10.50*	2.274E+00	1.446E+01	1.446E+01	30.51	OK
	163.35	4.70	2.136E+00	-----	Line Not Found	-----	Absent
	205.31	4.70	1.866E+00	1.030E+01	1.030E+01	77.56	OK

Final Mean for 2 Valid Peaks = 1.349E+01+/- 3.862E+00 (28.64%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.606E+00	1.045E+02	1.096E+02	16.87	OK

Final Mean for 1 Valid Peaks = 1.096E+02+/- 1.850E+01 (16.87%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.607E+00	1.050E+01	1.050E+01	15.76	OK

Final Mean for 1 Valid Peaks = 1.050E+01+/- 1.655E+00 (15.76%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.610E+00	3.080E+01	3.080E+01	15.68	OK

Final Mean for 1 Valid Peaks = 3.080E+01+/- 4.830E+00 (15.68%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.614E+00	3.387E+01	3.387E+01	9.81	OK

Final Mean for 1 Valid Peaks = 3.387E+01+/- 3.322E+00 (9.81%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.384E+01	7.019E+00	6.942E+00	6.812E-01	3.434
CD-109	1.096E+02	1.850E+01	1.629E+01	1.925E+00	6.729
SN-126	1.050E+01	1.655E+00	1.560E+00	1.587E-01	6.730
PB-210	1.980E+02	2.012E+01	1.259E+01	1.024E+00	15.728
PB-211	3.298E+01	9.697E+00	1.999E+01	1.853E+00	1.649
BI-214	3.559E+02	2.004E+01	1.168E+00	1.394E-01	304.729
PB-214	3.603E+02	4.010E+01	1.425E+00	1.907E-01	252.789
RN-219	2.378E+01	6.224E+00	8.857E+00	8.167E-01	2.685
RA-223	1.722E+01	1.050E+01	1.353E+01	2.144E+00	1.273
RA-224	6.990E+02	1.099E+02	1.346E+01	2.035E+00	51.931
RA-226	6.005E+02	1.101E+03	1.689E+01	3.094E+01	35.559
PA-233	2.468E+00	2.098E+00	3.065E+00	8.172E-01	0.805
PA-234M	1.053E+02	6.519E+01	7.567E+01	8.266E+00	1.392
TH-234	1.020E+02	1.427E+01	1.556E+01	1.193E+00	6.557
U-235	1.349E+01	3.862E+00	5.038E+00	9.273E-01	2.677
NP-237	3.080E+01	4.830E+00	5.149E+00	5.173E-01	5.981
AM-243	3.387E+01	3.322E+00	9.462E-01	8.271E-02	35.793

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	5.630E+00		6.500E+00	8.097E+00	8.354E-01	0.695
NA-22	1.092E-01		4.816E-01	7.090E-01	6.550E-02	0.154
AL-26	-4.127E-02		2.433E-01	4.249E-01	3.961E-02	-0.097
TI-44	2.763E+00	+	3.957E-01	6.522E-01	5.268E-02	4.237
SC-46	2.468E-01		5.563E-01	9.319E-01	1.097E-01	0.265
V-48	1.275E+00		1.687E+00	2.825E+00	3.131E-01	0.451
CR-51	-4.782E+00		9.612E+00	1.193E+01	1.956E+00	-0.401
MN-54	2.891E-01		6.154E-01	7.385E-01	8.973E-02	0.391
CO-56	3.065E-01		5.785E-01	8.733E-01	1.055E-01	0.351
CO-57	1.704E-01		3.775E-01	6.094E-01	6.876E-02	0.280
CO-58	1.585E-01		5.695E-01	8.591E-01	1.056E-01	0.184
FE-59	1.104E+00		1.361E+00	2.040E+00	2.131E-01	0.541
CO-60	2.913E-01		4.656E-01	6.949E-01	6.099E-02	0.419
ZN-65	4.347E+00		1.405E+00	1.729E+00	1.663E-01	2.514
SE-75	-7.674E-02		8.261E-01	1.045E+00	1.817E-01	-0.073
RB-82	3.147E+00		9.006E+00	1.086E+01	1.347E+00	0.290
RB-83	-2.474E-01		9.112E-01	1.479E+00	2.513E-01	-0.167
KR-85	1.437E+02		8.217E+01	1.268E+02	1.370E+01	1.134
SR-85	8.830E-01		5.048E-01	7.787E-01	8.413E-02	1.134
Y-88	1.031E+00		4.284E-01	7.107E-01	6.587E-02	1.451
NB-93M	3.049E+01		1.299E+01	1.658E+01	4.624E+00	1.839
NB-94	4.119E-01		4.159E-01	6.989E-01	8.326E-02	0.589
NB-95	2.245E+01		3.087E+00	1.963E+00	2.443E-01	11.437
ZR-95	-3.320E-01		1.088E+00	1.486E+00	1.944E-01	-0.223
RU-103	-1.633E-01		6.069E-01	1.033E+00	1.595E-01	-0.158
RU-106	7.740E-01		3.663E+00	5.599E+00	8.850E-01	0.138

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-108M	4.147E-01		4.237E-01	6.470E-01	8.095E-02	0.641
AG-110M	8.018E-03		4.080E-01	6.199E-01	7.708E-02	0.013
SN-113	5.878E-01		6.819E-01	1.063E+00	9.913E-02	0.553
TE123M	7.151E-01		5.318E-01	7.836E-01	7.505E-02	0.913
SB-124	2.585E-01		5.487E-01	8.411E-01	9.981E-02	0.307
I-125	-9.589E+00		7.684E+00	1.158E+01	1.137E+00	-0.828
SB-125	1.660E+00	+	1.504E+00	2.070E+00	2.021E-01	0.802
SB-126	1.379E+01	+	5.451E+00	7.060E+00	8.834E-01	1.953
I-129	1.068E+00	+	7.739E-01	1.055E+00	1.227E-01	1.013
I-131	3.708E+00		6.211E+00	1.029E+01	1.247E+00	0.361
BA-133	5.528E+00	+	1.807E+00	1.033E+00	1.693E-01	5.351
CS-134	2.318E+00		5.140E-01	6.966E-01	8.293E-02	3.327
CS-135	2.001E+01		4.349E+00	3.716E+00	6.585E-01	5.384
CS-136	3.508E-01		3.145E+00	4.665E+00	4.973E-01	0.075
CS-137	6.150E-01		4.286E-01	6.563E-01	8.193E-02	0.937
LA-138	-1.682E-02		6.819E-01	1.111E+00	1.065E-01	-0.015
CE-139	-6.471E-01		4.948E-01	7.783E-01	7.173E-02	-0.831
BA-140	-8.087E-02		8.195E+00	1.255E+01	4.251E+00	-0.006
LA-140	1.031E+01		3.211E+00	4.846E+00	4.644E-01	2.127
CE-141	3.557E+00		1.771E+00	2.262E+00	5.840E-01	1.572
CE-144	-2.034E+00		3.382E+00	4.988E+00	5.379E-01	-0.408
PM-144	-5.713E-02		3.935E-01	5.941E-01	7.440E-02	-0.096
PM-145	-2.948E+00		2.468E+00	2.335E+00	1.523E+00	-1.263
PM-146	2.177E+00	+	1.148E+00	1.436E+00	1.434E-01	1.516
ND-147	2.248E+01		2.096E+01	3.239E+01	3.570E+00	0.694
EU-152	6.171E+01	+	8.725E+00	7.862E+00	9.177E-01	7.850
GD-153	-1.431E+00		1.391E+00	2.227E+00	2.361E-01	-0.643
EU-154	1.397E-01		1.338E+00	1.963E+00	1.813E-01	0.071
EU-155	1.271E+01	+	1.994E+00	2.180E+00	2.190E-01	5.831
EU-156	5.896E+00		1.733E+01	2.610E+01	6.383E+00	0.226
HO-166M	-9.277E-02		8.848E-01	1.058E+00	1.324E-01	-0.088
HF-172	-1.589E+00		2.995E+00	4.430E+00	4.925E-01	-0.359
LU-172	-1.538E+01		1.886E+01	3.058E+01	3.026E+00	-0.503
LU-173	1.970E+01		4.057E+00	2.999E+00	5.432E-01	6.568
HF-175	5.118E-01		7.226E-01	9.082E-01	1.288E-01	0.563
LU-176	-6.194E-01		4.027E-01	5.482E-01	9.389E-02	-1.130
TA-182	1.871E+02	+	1.978E+01	7.786E+00	7.421E-01	24.034
IR-192	1.463E+00	+	1.236E+00	1.544E+00	1.573E-01	0.948
HG-203	-8.988E-01		8.994E-01	1.099E+00	2.084E-01	-0.817
BI-207	2.712E-01		3.344E-01	5.712E-01	6.563E-02	0.475
TL-208	1.288E+00		1.242E+00	1.911E+00	2.226E-01	0.674
BI-210M	9.290E-01		9.180E-01	1.160E+00	1.984E-01	0.801
BI-212	1.468E+00		3.190E+00	4.854E+00	6.071E-01	0.302
PB-212	9.665E+00		1.695E+00	1.372E+00	2.045E-01	7.044
RA-225	-6.837E-02		4.752E+00	7.274E+00	6.500E-01	-0.009
TH-227	2.458E+01	+	4.908E+00	5.116E+00	7.506E-01	4.805
AC-228	1.651E+00		1.553E+00	2.605E+00	3.028E-01	0.634
TH-230	7.046E+02	+	1.008E+02	1.662E+02	1.340E+01	4.239

Sample ID : 1303012-11 Acquisition date : 1-APR-2013 07:58:15

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-231	-9.079E+00		1.646E+01	2.345E+01	4.083E+00	-0.387
TH-231	4.504E+00		3.192E+00	4.876E+00	6.770E-01	0.924
PA-234	2.269E+00	+	1.926E+00	2.437E+00	2.653E-01	0.931
AM-241	8.058E+00		1.211E+00	1.587E+00	1.167E-01	5.079
CM-243	5.296E-01		2.609E+00	3.776E+00	7.051E-01	0.140

Summary of Nuclide Activity
Sample ID : 1303012-11
Acquisition date : 1-APR-2013 07:58:15

Total number of lines in spectrum	130	
Number of unidentified lines	82	
Number of lines tentatively identified by NID	48	36.92%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.384E+01	2.384E+01	0.702E+01	29.44	
PB-210	22.26Y	1.00	1.974E+02	1.980E+02	0.201E+02	10.16	
PB-211	3.28E+04Y	1.00	3.298E+01	3.298E+01	0.970E+01	29.40	
BI-214	1602.00Y	1.00	3.558E+02	3.559E+02	0.200E+02	5.63	
PB-214	1602.00Y	1.00	3.603E+02	3.603E+02	0.401E+02	11.13	
RN-219	3.28E+04Y	1.00	2.378E+01	2.378E+01	0.622E+01	26.17	
RA-223	3.28E+04Y	1.00	1.722E+01	1.722E+01	1.050E+01	60.98	
RA-224	1.41E+10Y	1.00	6.990E+02	6.990E+02	1.099E+02	15.72	
RA-226	1602.00Y	1.00	6.005E+02	6.005E+02	11.01E+02	183.29	
PA-233	27.00D	2.29	1.076E+00	2.468E+00	2.098E+00	84.98	
PA-234M	4.47E+09Y	1.00	1.053E+02	1.053E+02	0.652E+02	61.90	
TH-234	4.47E+09Y	1.00	1.020E+02	1.020E+02	0.143E+02	13.99	
U-235	7.04E+08Y	1.00	1.349E+01	1.349E+01	0.386E+01	28.64	
			---------	---------			
	Total Activity :		2.533E+03	2.535E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	1.045E+02	1.096E+02	0.185E+02	16.87	
SN-126	1.00E+05Y	1.00	1.050E+01	1.050E+01	0.165E+01	15.76	
NP-237	2.14E+06Y	1.00	3.080E+01	3.080E+01	0.483E+01	15.68	
			---------	---------			
	Total Activity :		1.458E+02	1.509E+02			

Nuclide Type : ACTIVATION

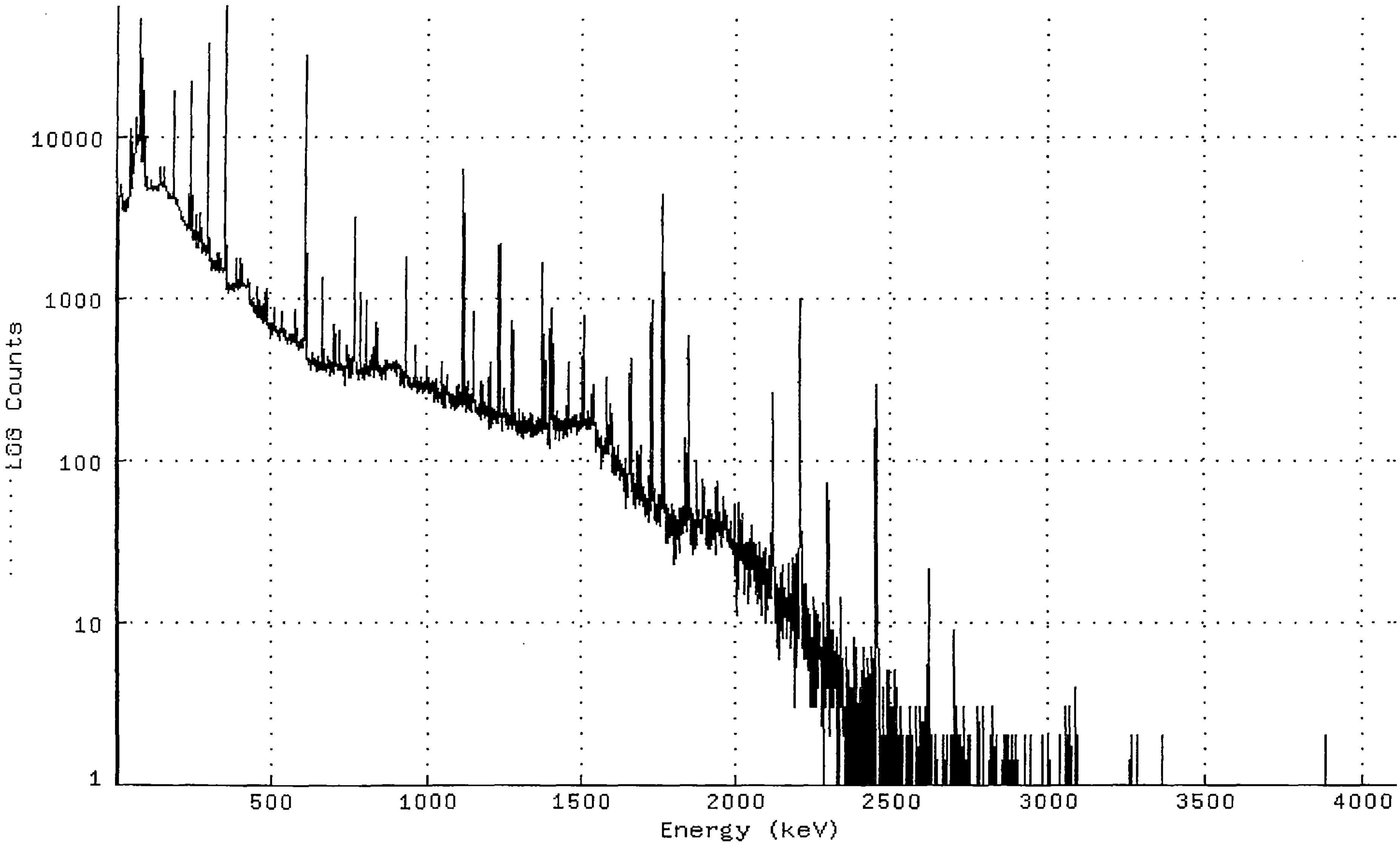
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.387E+01	3.387E+01	0.332E+01	9.81	
			---------	---------			
	Total Activity :		3.387E+01	3.387E+01			

Grand Total Activity :	2.712E+03	2.720E+03

Flags: "K" = Keyline not found   "M" = Manually accepted
"E" = Manually edited   "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301211_GE3_GAS1202_190105.CNF;1
Title :
Sample Title: S30-90-2-130228

Start Time:	1-APR-2013 07:58:	Sample Time:	28-FEB-2013 00:00	Energy Offset:	-3.21163E-01
Real Time :	0 01:03:01.81	Sample ID :	1303012-11	Energy Slope :	1.00005E+00
Live Time :	0 01:00:00.00	Sample Type:	SOLID	Energy Quad :	0.00000E+00



8246

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301211_GE3_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	2
9:	1457	4228	4312	4423	4830	4286	5050	4748
17:	4147	4014	3837	3615	3573	3608	3405	3548
25:	3550	3586	3912	3548	3501	3451	3747	4014
33:	3584	3548	3671	3759	3959	3610	3842	4060
41:	4274	4373	4596	4736	5089	10928	9733	4729
49:	5109	6579	5384	5842	8994	6349	5891	5900
57:	6365	6780	7452	7994	8262	8627	12822	9747
65:	8416	8799	9983	10203	9021	8917	9167	9235
73:	9519	18521	31261	16908	51903	16710	10785	9264
81:	10655	7006	8830	12463	6971	8199	18820	10800
89:	8013	10275	6314	9198	9982	6832	6714	4947
97:	5082	5598	5030	4753	4674	4721	4705	4770
105:	4704	4782	4800	4715	4850	4818	4971	5124
113:	5332	4934	4623	4817	4840	4675	4702	4720
121:	4802	4884	4786	4717	4808	4798	4820	4656
129:	4800	4815	4939	4840	4809	4748	4678	4883
137:	4870	4983	5002	5011	5058	4988	5274	6378
145:	5333	4895	4978	5068	5211	5115	5192	5115
153:	5236	6406	5532	4962	4885	4856	4898	4799
161:	4677	4573	4665	4496	4342	4402	4269	4199
169:	4342	4221	4347	4207	4258	4147	4154	4185
177:	4166	4309	4217	4187	4168	4237	4360	4181
185:	6306	19058	9605	4179	4147	4075	4019	3888
193:	3913	3879	3840	4071	3853	3850	3800	3737
201:	3556	3634	3541	3499	3634	3515	3350	3250
209:	3214	3121	3331	3132	3150	3174	3009	3017
217:	2999	3074	2958	2886	2908	2898	2889	2944
225:	2850	2848	2796	2642	2781	2714	2657	2739
233:	2714	2673	3045	4341	3094	2919	2949	2661
241:	6154	21413	7328	2589	2585	2620	2482	2395
249:	2301	2352	2304	2317	2308	2299	2420	2956
257:	2624	2565	3293	2471	2069	2136	2096	2173
265:	2076	2066	2053	2115	3182	3380	3357	2664
273:	2218	2487	2733	2160	1919	2053	1904	1962
281:	1984	1934	2035	2151	1996	2119	2109	1858
289:	1955	1946	1885	1891	1896	5187	36585	21238
297:	2595	2145	2206	2382	1902	1774	1868	1713
305:	1762	1599	1535	1646	1513	1541	1525	1575
313:	1629	1708	1657	1521	1585	1549	1546	1502
321:	1537	1492	1591	1910	1527	1512	1476	1499
329:	1648	1907	1571	1449	1564	1672	1543	1562
337:	1557	1734	1608	1490	1484	1552	1513	1489
345:	1521	1506	1448	1496	1723	2017	17537	65137
353:	18234	2192	2115	1936	1530	1313	1224	1144
361:	1089	1202	1224	1150	1106	1166	1165	1131
369:	1159	1169	1190	1209	1172	1211	1138	1188
377:	1220	1195	1241	1113	1188	1207	1249	1212
385:	1183	1216	1580	1420	1774	1393	1234	1132
393:	1235	1197	1224	1197	1214	1173	1192	1225
401:	1411	1737	1339	1268	1610	1476	1204	1224
409:	1245	1246	1235	1217	1249	1197	1215	1187
417:	1156	1217	1193	1216	1179	1242	1284	1213
425:	1175	1172	1314	1162	1093	1024	1077	1006

433:	929	957	951	906	957	955	912	876
441:	948	838	827	869	916	914	811	833
449:	824	836	874	889	827	961	1158	880
457:	766	791	778	769	864	971	866	770
465:	775	789	745	812	846	898	827	767
473:	744	777	919	698	754	721	782	1035
481:	1089	762	684	728	766	778	1127	935
489:	738	683	683	681	690	642	660	657
497:	654	702	636	579	646	696	615	624
505:	618	589	601	640	698	871	852	814
513:	693	641	657	619	623	611	606	632
521:	589	614	587	635	591	606	615	575
529:	612	629	554	630	688	824	624	616
537:	636	629	579	580	604	597	614	648
545:	620	549	617	572	577	549	560	561
553:	544	563	519	536	587	554	578	554
561:	584	590	555	557	552	525	564	601
569:	571	542	536	601	591	546	565	542
577:	529	546	594	857	715	510	641	599
585:	525	530	534	508	524	517	494	534
593:	481	541	526	513	494	526	536	566
601:	538	498	533	523	526	567	603	4133
609:	31394	30191	3954	937	970	754	557	507
617:	471	427	390	417	402	411	417	403
625:	408	392	405	391	359	363	390	460
633:	426	412	401	394	391	382	417	421
641:	409	376	360	387	408	411	350	374
649:	408	430	357	404	386	360	390	361
657:	383	394	372	392	395	375	360	409
665:	1203	1337	561	421	381	381	391	361
673:	358	372	345	367	347	366	387	364
681:	388	369	431	412	376	376	366	334
689:	405	383	397	370	365	363	352	363
697:	397	392	389	374	341	448	686	534
705:	441	393	383	404	378	401	389	372
713:	381	383	357	369	359	354	456	635
721:	447	376	363	355	382	368	389	362
729:	347	354	368	327	373	368	341	346
737:	360	290	337	364	399	448	513	391
745:	372	371	350	317	365	353	329	331
753:	441	394	371	324	355	338	317	361
761:	368	339	346	336	381	509	788	2697
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777:	361	313	309	327	313	361	328	352
785:	611	1084	738	428	338	371	358	322
793:	349	337	328	344	312	341	388	359
801:	340	350	348	338	448	963	818	428
809:	340	340	334	353	336	361	350	340
817:	341	332	333	376	438	430	356	358
825:	415	395	377	353	319	344	390	490
833:	459	359	386	381	363	453	709	592
841:	344	365	357	345	364	347	341	373
849:	360	350	340	310	364	363	349	323
857:	355	337	375	366	362	345	345	375
865:	314	369	358	327	410	376	370	372
873:	405	354	357	384	371	381	366	391
881:	372	385	367	356	371	363	383	378
889:	387	369	385	383	370	393	391	351
897:	396	393	366	376	334	362	366	382
905:	404	355	365	373	365	377	373	391

913:	363	358	342	328	291	327	297	317
921:	309	353	310	353	340	308	283	285
929:	285	339	312	322	691	1785	1435	477
937:	358	290	290	320	288	313	333	302
945:	303	324	301	299	284	286	297	272
953:	288	289	271	281	322	309	307	310
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969:	315	317	260	292	264	316	295	271
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993:	299	269	277	265	306	273	293	342
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1073:	261	242	238	255	247	236	208	249
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1129:	224	240	199	257	261	307	244	211
1137:	239	235	235	224	228	210	255	212
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1153:	226	378	814	828	329	271	199	229
1161:	198	204	199	219	205	193	201	192
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1281:	716	548	254	164	203	183	179	149
1289:	193	159	174	171	166	143	160	171
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1313:	147	150	158	185	191	171	162	153
1321:	173	159	167	147	171	156	153	159
1329:	147	167	156	149	173	162	161	166
1337:	190	189	183	138	152	173	156	141
1345:	185	141	153	166	151	155	153	162
1353:	143	144	162	144	145	163	151	174
1361:	149	169	148	158	172	176	180	171
1369:	153	160	152	152	161	177	146	245
1377:	776	1656	1018	345	186	181	157	204
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1393:	142	155	148	126	142	153	117	177
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1409:	791	348	160	175	176	158	157	172
1417:	167	152	134	162	188	151	161	149
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1433:	167	133	163	163	169	162	174	160
1441:	174	158	134	146	169	167	157	147
1449:	156	143	152	177	166	169	141	164
1457:	165	142	182	253	395	336	212	159
1465:	155	168	170	145	171	167	178	180
1473:	160	165	160	175	165	170	169	186
1481:	159	169	159	160	166	171	144	186
1489:	168	167	151	166	174	172	162	167
1497:	175	186	179	158	156	192	183	186
1505:	160	180	180	282	666	792	424	213
1513:	175	167	154	176	178	173	159	168
1521:	183	183	187	195	155	165	161	154
1529:	172	167	167	176	187	176	162	166
1537:	186	223	290	215	172	162	241	255
1545:	200	145	123	143	128	135	111	150
1553:	130	125	122	124	139	136	136	121
1561:	128	124	129	107	126	111	130	139
1569:	89	117	121	106	122	121	118	108
1577:	110	131	116	131	126	152	244	318
1585:	180	135	117	110	125	115	108	112
1593:	110	157	173	159	125	126	192	220
1601:	168	114	120	117	83	122	116	111
1609:	117	108	105	82	107	94	104	81
1617:	102	107	95	122	107	86	87	86
1625:	99	86	75	93	90	91	96	86
1633:	78	92	91	82	92	77	85	63
1641:	89	88	75	100	81	84	71	71
1649:	50	65	72	66	64	81	76	82
1657:	84	90	89	127	274	420	206	98
1665:	64	81	82	52	59	81	78	54
1673:	66	53	59	57	51	70	71	50
1681:	64	60	65	103	111	70	75	61
1689:	60	70	53	94	121	107	104	64
1697:	56	60	68	58	51	55	51	55
1705:	60	51	47	46	45	55	55	57
1713:	46	55	53	49	41	43	64	71
1721:	52	78	51	54	49	63	67	142
1729:	505	958	691	209	91	65	55	66
1737:	52	66	62	56	43	40	47	42
1745:	43	43	52	54	41	44	60	55
1753:	50	61	40	41	39	50	50	61
1761:	50	103	511	2345	4396	2953	719	148
1769:	110	65	54	48	45	43	31	36
1777:	53	50	42	37	31	36	42	50
1785:	35	39	46	33	44	40	34	40
1793:	37	51	52	38	48	37	37	34
1801:	23	47	28	43	29	31	25	40
1809:	45	41	32	33	43	41	38	27
1817:	44	36	40	39	50	34	42	34
1825:	42	50	38	37	40	40	49	51
1833:	35	46	45	39	48	87	134	88
1841:	63	51	40	36	51	118	359	584
1849:	411	111	43	56	45	45	35	42
1857:	37	30	39	36	38	43	26	46
1865:	39	28	36	36	42	36	30	45

1873:	89	97	64	43	43	43	43	49
1881:	48	38	40	41	40	36	35	40
1889:	46	67	75	65	36	35	55	62
1897:	57	53	67	49	44	45	38	37
1905:	41	30	32	40	33	48	43	28
1913:	42	49	43	34	44	28	37	38
1921:	32	45	32	30	46	37	32	42
1929:	40	36	42	43	26	46	43	58
1937:	62	73	50	40	36	39	41	44
1945:	47	44	40	42	45	34	37	29
1953:	41	31	40	32	37	46	58	40
1961:	47	33	41	44	45	37	48	39
1969:	37	45	35	42	40	33	29	37
1977:	29	30	30	33	33	29	41	34
1985:	28	30	33	32	27	26	30	29
1993:	31	29	52	33	26	28	32	11
2001:	21	31	25	28	27	27	27	21
2009:	16	28	54	34	34	32	24	35
2017:	26	46	34	33	36	23	24	25
2025:	30	26	20	15	26	20	27	23
2033:	23	24	31	21	31	15	23	29
2041:	28	13	20	26	32	18	20	27
2049:	21	29	25	30	30	39	24	26
2057:	21	18	28	23	18	24	20	30
2065:	25	15	20	15	13	14	23	15
2073:	21	31	17	19	24	14	16	18
2081:	11	22	23	25	17	17	26	18
2089:	25	17	27	19	28	15	10	13
2097:	23	20	13	14	18	19	12	20
2105:	16	16	14	14	23	29	35	31
2113:	14	27	16	25	38	127	260	210
2121:	101	30	16	20	17	13	10	14
2129:	17	8	16	11	14	8	6	16
2137:	11	11	12	11	9	11	20	11
2145:	12	16	15	14	13	22	12	8
2153:	14	16	16	13	15	13	14	10
2161:	8	12	10	14	9	11	11	23
2169:	11	14	13	15	13	7	12	15
2177:	9	9	10	22	12	14	25	8
2185:	11	23	8	10	3	9	6	16
2193:	26	11	15	8	27	10	18	15
2201:	17	47	249	791	1008	599	161	46
2209:	28	30	20	12	7	11	17	7
2217:	10	9	6	7	13	8	17	11
2225:	8	6	9	9	12	6	8	5
2233:	11	4	5	9	3	3	5	3
2241:	7	8	3	5	9	6	6	3
2249:	5	8	14	10	3	9	8	7
2257:	7	9	7	6	4	11	9	7
2265:	6	9	10	8	7	7	6	6
2273:	4	5	5	1	10	13	3	4
2281:	6	3	5	6	7	4	8	7
2289:	4	5	6	19	41	70	45	20
2297:	3	4	2	6	9	7	3	8
2305:	8	4	4	3	6	8	3	9
2313:	5	5	4	5	5	5	6	5
2321:	1	4	3	8	5	4	4	5
2329:	1	4	3	5	14	10	6	6
2337:	3	3	6	2	2	3	3	3
2345:	3	2	1	1	2	2	1	7

2353:	5	2	3	4	5	1	4	1
2361:	1	4	1	2	2	3	3	3
2369:	3	0	4	2	4	1	6	8
2377:	2	5	4	1	2	7	6	0
2385:	1	5	2	1	1	2	2	1
2393:	0	3	4	4	1	2	1	5
2401:	5	5	1	3	2	2	6	1
2409:	0	7	3	4	0	2	1	0
2417:	2	4	2	1	5	1	6	4
2425:	2	1	0	3	1	3	1	2
2433:	5	3	7	3	3	1	2	1
2441:	6	4	1	5	6	30	106	228
2449:	290	153	29	14	8	6	1	1
2457:	2	0	3	1	2	0	0	2
2465:	0	3	4	0	2	2	0	2
2473:	2	0	2	1	1	0	0	1
2481:	0	2	3	5	2	3	0	2
2489:	1	5	1	2	0	1	3	1
2497:	3	0	1	3	1	1	0	0
2505:	2	2	5	2	4	0	1	1
2513:	0	0	2	1	2	1	0	0
2521:	0	0	0	1	3	1	0	1
2529:	2	0	0	2	1	0	0	0
2537:	0	1	0	1	0	1	1	1
2545:	2	1	0	1	1	2	0	0
2553:	1	2	3	2	2	1	0	0
2561:	2	1	1	1	1	0	1	0
2569:	0	0	0	0	1	2	3	3
2577:	1	1	1	0	0	1	1	0
2585:	2	2	3	3	2	0	0	1
2593:	2	0	2	1	0	0	0	1
2601:	2	3	1	0	0	1	0	0
2609:	0	0	2	1	2	15	13	21
2617:	10	6	1	0	0	0	0	2
2625:	1	0	1	1	1	1	0	1
2633:	0	0	0	0	2	1	0	0
2641:	0	0	1	0	0	0	0	1
2649:	1	0	1	0	0	1	1	0
2657:	0	1	1	2	0	2	1	1
2665:	1	0	0	0	0	2	1	0
2673:	2	0	1	0	0	1	0	1
2681:	1	2	1	0	0	1	1	2
2689:	1	0	0	2	1	1	4	9
2697:	6	1	3	1	1	1	0	3
2705:	0	1	0	1	0	0	2	1
2713:	0	2	0	1	0	0	0	0
2721:	0	1	0	3	0	2	0	0
2729:	2	1	1	1	1	0	1	0
2737:	1	0	1	2	1	1	0	1
2745:	2	1	0	1	0	0	0	0
2753:	0	0	1	0	0	1	0	0
2761:	0	0	0	0	0	0	1	1
2769:	2	2	1	3	2	0	0	0
2777:	0	1	0	0	0	1	0	1
2785:	0	1	3	0	2	1	0	0
2793:	1	0	1	0	0	1	0	0
2801:	0	0	0	1	1	0	0	1
2809:	0	2	0	0	0	0	0	0
2817:	0	0	0	0	1	3	0	0
2825:	0	0	1	0	0	0	2	1

2833:	0	0	0	1	0	0	0	0
2841:	0	0	0	0	1	1	1	1
2849:	0	1	0	0	2	1	0	1
2857:	0	1	1	2	0	0	1	0
2865:	0	0	0	1	1	0	2	1
2873:	1	0	1	0	0	0	0	2
2881:	1	2	2	0	1	0	0	1
2889:	0	0	0	0	0	2	2	0
2897:	1	1	0	1	0	0	0	0
2905:	0	0	0	0	0	1	1	0
2913:	0	0	0	0	0	0	0	0
2921:	0	1	1	0	2	0	0	1
2929:	0	0	1	0	0	0	0	0
2937:	0	0	0	2	0	0	0	1
2945:	1	0	0	0	1	0	1	0
2953:	0	1	1	0	0	0	0	0
2961:	0	0	0	0	1	1	0	0
2969:	0	0	0	0	0	1	0	0
2977:	2	0	1	2	1	0	1	0
2985:	0	0	0	0	0	1	1	0
2993:	0	0	0	1	0	0	0	2
3001:	0	0	1	0	0	0	0	0
3009:	0	0	0	0	0	0	0	0
3017:	1	1	0	0	0	0	0	1
3025:	0	1	0	0	0	1	1	2
3033:	0	0	0	0	0	0	0	1
3041:	0	0	0	0	0	0	1	0
3049:	0	1	1	0	2	2	3	0
3057:	2	0	0	0	1	1	0	0
3065:	0	0	3	0	0	0	0	0
3073:	1	0	0	0	0	0	0	1
3081:	1	0	4	0	0	0	0	2
3089:	0	0	1	0	0	0	0	0
3097:	0	0	0	0	1	0	0	0
3105:	0	0	0	0	0	0	0	1
3113:	0	0	0	0	0	0	0	0
3121:	0	0	1	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0
3137:	0	0	0	0	0	0	0	1
3145:	0	0	1	0	0	0	0	0
3153:	0	0	0	0	0	0	0	0
3161:	0	0	0	0	0	0	0	0
3169:	0	0	0	0	0	0	1	0
3177:	0	0	0	0	0	1	0	0
3185:	1	0	0	0	0	0	0	0
3193:	0	0	0	0	0	0	1	0
3201:	0	0	1	0	0	0	1	0
3209:	0	0	0	0	0	1	0	0
3217:	0	0	0	0	0	0	0	0
3225:	0	0	1	0	0	1	0	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	1	0	0	0	0	0
3249:	0	0	0	0	0	1	0	0
3257:	0	2	1	0	0	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	2
3281:	0	0	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	1	1	0	0	0	0	1
3305:	0	0	0	0	0	0	1	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	1	1	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	1	0
3345:	0	0	0	0	1	0	0	0
3353:	0	0	0	0	0	0	2	0
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	1	0	1	0
3377:	0	0	0	0	1	1	0	0
3385:	1	1	0	0	1	0	0	0
3393:	1	0	0	0	0	0	0	0
3401:	0	0	1	0	0	0	0	0
3409:	0	1	0	0	0	0	0	0
3417:	0	0	0	0	0	1	0	0
3425:	0	0	0	0	0	1	0	0
3433:	0	0	0	0	0	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	0	0	1	0	0
3457:	0	0	0	0	0	0	0	0
3465:	0	0	0	0	1	0	0	0
3473:	0	1	0	0	0	0	0	0
3481:	0	1	0	0	0	0	0	0
3489:	0	0	0	0	1	0	0	0
3497:	0	0	1	0	0	0	0	0
3505:	0	1	0	0	0	0	0	0
3513:	0	0	1	0	1	0	0	0
3521:	0	0	0	0	1	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	1	0	1	0	0	0	0	0
3545:	0	1	0	0	0	0	1	0
3553:	0	0	0	1	0	0	0	0
3561:	0	0	0	0	0	0	1	0
3569:	0	0	0	0	0	1	1	0
3577:	0	0	0	0	0	0	1	1
3585:	0	0	0	0	0	1	0	1
3593:	0	0	0	0	0	0	0	1
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	1	0	0	0	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	0	0	0	0	0
3633:	1	0	0	0	0	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	0
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	0	1	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	1	0	0	0	0	0	0
3729:	0	1	0	0	0	0	0	0
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	1	1	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	1	0	0	0	0
3785:	1	0	1	0	0	0	0	0

3793:	0	0	1	0	0	0	0	0
3801:	0	0	0	0	0	0	1	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	1	0	0	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	0	0	0	0	0	0	0	1
3873:	0	0	0	2	0	0	0	1
3881:	0	0	1	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	0	0
3905:	0	0	0	0	0	0	0	1
3913:	0	0	0	0	1	0	1	0
3921:	1	0	1	0	0	0	0	0
3929:	0	1	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	0	0	1	0	0	0
3969:	0	0	0	0	0	0	1	1
3977:	0	1	0	1	0	0	0	0
3985:	0	0	0	0	0	0	1	0
3993:	0	0	0	0	0	1	0	0
4001:	0	0	0	1	0	0	0	0
4009:	0	0	0	1	0	0	0	0
4017:	0	0	0	0	1	0	0	0
4025:	1	0	1	0	0	1	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	1	0	0	1	1
4065:	0	0	0	0	0	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

Sample ID : 1303012-12 Acquisition date : 1-APR-2013 08:59:48

C
4/1/13

VAX/VMS Peak Search Report Generated 1-APR-2013 10:00:52.29

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301212_GE1_GAS1202_190107.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-91-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 08:59:48.
Sample ID : 1303012-12 Sample Quantity : 4.75260E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:45.51 1.2%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	31.54	532	11578	1.12	31.78	31	5	61.2		
0	46.30*	9100	16043	1.77	46.53	44	5	4.7		PB-210
0	52.58*	2948	23785	1.32	52.82	50	6	16.9		
0	63.08*	4601	28881	1.72	63.31	61	5	11.5		TH-234
0	67.48*	1166	24701	1.17	67.71	67	4	38.6		
0	76.14*	61705	56470	3.18	76.37	71	9	1.6		AM-243
0	86.45*	4772	25735	1.46	86.68	86	4	9.6		NP-237 SN-126
0	93.84*	4238	26828	1.12	94.06	91	6	12.8		
0	112.65*	474	19796	1.21	112.88	111	6	94.5		
0	122.37	326	16149	1.68	122.59	121	5	117.5		CO-57
0	143.84*	1389	17338	1.40	144.07	142	5	29.0		U-235
0	154.03	1302	17281	1.95	154.25	152	5	30.8		
0	186.08*	16947	25359	1.65	186.31	182	9	3.7		RA-226
0	206.01*	356	14167	2.40	206.23	203	6	106.5		U-235
0	209.50	292	11008	1.69	209.73	209	5	108.6		
3	235.95	1743	7668	1.39	236.17	233	14	14.8	1.98E+00	
3	238.78*	614	9327	1.61	239.00	233	14	49.9		PB-212
3	241.95*	20623	7116	1.35	242.17	233	14	1.8		RA-224
1	255.94	922	6237	1.46	256.16	254	9	25.1	1.51E+01	
1	258.62	1612	7642	1.79	258.84	254	9	17.4		
1	270.02	3471	12941	2.89	270.24	264	14	12.3	7.82E+00	
1	274.57	1088	7051	1.78	274.79	264	14	24.5		
0	295.15*	44819	12417	1.81	295.36	291	9	1.3		PB-214
0	314.79	351	5414	2.41	315.00	313	5	63.9		
0	323.92	434	6467	1.21	324.13	322	6	59.3		RA-223
0	329.55	353	5390	1.31	329.77	328	5	63.3		
0	337.95*	349	5236	1.80	338.16	337	5	63.2		
0	351.86*	77749	7771	1.35	352.07	348	8	0.8		PB-214
0	372.27	278	4751	3.46	372.48	370	6	79.5		
0	387.82	1330	7161	3.58	388.03	384	9	23.6		
0	396.22	259	4848	2.09	396.43	394	6	86.0		
1	401.68	875	4192	1.66	401.89	399	10	23.1	1.02E+01	RN-219
1	404.79	601	5173	1.89	405.00	399	10	39.4		PB-211
0	427.70	344	5427	2.39	427.91	425	7	72.2		
0	455.15	378	2845	1.72	455.35	453	5	43.6		

AG
4/11/13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	462.05	417	3913	2.42	462.25	459	7	50.7		
0	470.00	183	2794	1.41	470.20	468	5	87.7		
0	480.43	554	3453	1.66	480.63	478	7	36.3		
0	487.06	564	3505	1.78	487.26	484	7	35.8		
0	511.00*	807	3956	3.28	511.20	507	9	29.1		
0	534.07	360	3425	1.73	534.27	531	8	57.3		
0	579.90	365	2499	1.48	580.09	577	6	44.6		
0	609.28*	56915	2692	1.98	609.48	606	8	0.9		BI-214
0	665.42	1540	1987	1.90	665.61	662	7	10.9		
0	687.96	117	1270	2.02	688.14	686	5	93.6		
0	703.09	515	2285	1.48	703.27	700	8	33.3		
0	720.04	388	2111	1.65	720.22	717	8	42.3		
0	742.68	366	2213	3.05	742.87	739	9	47.5		
0	753.67	146	1810	1.55	753.85	750	7	97.9		
0	768.26	5444	2955	2.02	768.44	762	12	4.8		
0	786.05	1328	2167	1.90	786.23	782	9	13.8		
0	806.13	1268	2141	2.00	806.31	802	9	14.3		
0	826.15	99	973	1.76	826.33	825	4	91.3		
0	831.51	326	1441	1.70	831.69	829	6	38.4		PB-211
0	839.04	637	1978	1.83	839.21	836	8	25.5		
0	911.26*	262	1922	3.57	911.43	908	8	59.3		
0	934.08*	2852	2500	1.98	934.25	929	11	7.8		
0	963.76*	398	1905	2.32	963.93	959	9	40.8		
4	997.37	48	201	2.24	997.53	997	8	66.9	2.02E+00	
4	1001.23*	313	1129	1.85	1001.40	997	8	35.8		PA-234M
0	1052.29	175	1221	2.12	1052.45	1049	7	68.2		
0	1069.95	174	1554	2.00	1070.11	1065	9	83.1		
0	1120.34*	12244	1521	2.11	1120.49	1116	10	2.2		BI-214
0	1155.57	1246	1968	2.04	1155.72	1150	12	15.3		
0	1182.08	139	1168	2.06	1182.24	1178	8	87.2		
0	1208.00	366	1308	2.38	1208.15	1203	10	38.4		
0	1217.78	131	1025	3.17	1217.93	1214	8	86.3		
0	1238.19	4344	1320	2.10	1238.34	1234	10	4.4		
0	1253.86	270	1163	2.90	1254.01	1250	9	47.2		
0	1281.09	1028	1357	2.06	1281.23	1276	10	14.8		
0	1317.81	127	739	4.24	1317.96	1315	7	73.4		
3	1377.75*	3108	684	2.04	1377.89	1373	18	4.5	7.53E-01	
3	1385.39	637	896	2.66	1385.53	1373	18	18.1		
2	1401.61	840	730	1.87	1401.75	1397	16	12.2	8.19E-01	
2	1408.06	1597	691	2.02	1408.20	1397	16	7.3		
0	1415.45	93	686	2.93	1415.59	1413	6	90.8		
0	1460.85*	895	1178	1.83	1460.98	1456	10	15.8		K-40
0	1491.87	65	572	1.49	1492.00	1490	5	113.2		
0	1509.32	1493	1178	2.32	1509.45	1505	10	10.0		
3	1538.78	292	816	2.18	1538.91	1535	13	34.2	8.78E-01	
3	1543.39	320	649	1.94	1543.52	1535	13	27.9		
0	1583.11	572	950	2.42	1583.24	1578	12	23.2		
3	1594.68	164	575	2.24	1594.80	1591	12	50.5	1.49E+00	
3	1599.24	199	545	2.20	1599.36	1591	12	42.1		
0	1661.40	635	577	2.19	1661.52	1656	11	16.7		
0	1683.93	122	333	2.07	1684.05	1680	8	55.0		

Post-NID Peak Search Report (continued) Page : 3
Sample ID : 1303012-12 Acquisition date : 1-APR-2013 08:59:48

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1693.06	197	409	3.24	1693.17	1689	10	40.9		
0	1729.62	2069	457	2.36	1729.73	1725	11	5.9		
0	1764.55*	10204	443	2.29	1764.67	1758	13	2.2		BI-214
0	1802.47	54	224	4.72	1802.58	1799	9	102.6		
3	1838.40	233	228	2.74	1838.51	1833	21	25.5	8.48E-01	
3	1847.46	1415	186	2.24	1847.56	1833	21	6.2		
0	1873.10	112	272	2.32	1873.20	1870	9	56.3		
0	1889.25	94	234	1.34	1889.35	1885	9	62.4		
0	1896.81	75	190	4.63	1896.92	1894	7	64.7		
0	1936.32	84	228	2.18	1936.42	1932	8	66.5		
0	2010.15	67	136	2.06	2010.24	2006	8	65.3		
3	2016.66	64	88	3.05	2016.76	2014	16	50.0	1.36E+00	
3	2026.15	27	123	3.05	2026.24	2014	16	140.3		
0	2052.49	36	114	1.29	2052.58	2050	8	108.2		
0	2089.01	48	101	3.15	2089.10	2084	10	84.2		
2	2110.12	38	130	2.80	2110.21	2106	18	94.9	2.36E+00	
2	2118.59*	638	84	2.41	2118.68	2106	18	9.1		
0	2147.27	36	83	5.44	2147.35	2142	10	100.0		
0	2194.41	33	98	5.14	2194.49	2186	12	125.2		
0	2204.08*	2686	62	2.55	2204.16	2198	13	4.0		BI-214
0	2293.44	116	44	2.23	2293.51	2289	9	26.3		
0	2339.46	15	3	3.40	2339.53	2337	6	67.8		
0	2423.23	33	10	13.09	2423.30	2416	18	55.5		
0	2447.55	779	13	2.47	2447.62	2441	13	7.4		
0	2483.01	11	8	2.66	2483.08	2479	7	106.5		
0	2506.07	20	7	4.71	2506.13	2501	13	70.4		
0	2614.58*	50	3	2.14	2614.63	2611	10	32.3		
0	2648.78	6	0	1.98	2648.83	2645	7	81.6		
0	2696.45	9	4	1.57	2696.50	2691	9	108.7		
0	2703.85	6	2	2.15	2703.89	2701	7	112.0		
0	2770.71	10	8	2.31	2770.76	2764	10	116.1		
0	2920.84	8	0	2.09	2920.88	2917	7	70.7		
0	3052.98	7	0	1.16	3053.00	3049	7	75.6		

Summary of Nuclide Activity
Sample ID : 1303012-12
Acquisition date : 1-APR-2013 08:59:48

Total number of lines in spectrum	119	
Number of unidentified lines	74	
Number of lines tentatively identified by NID	45	37.82%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.627E+01	2.627E+01	0.499E+01	18.98	
PB-210	22.26Y	1.00	1.312E+02	1.316E+02	0.132E+02	10.00	
PB-211	3.28E+04Y	1.00	2.285E+01	2.285E+01	0.652E+01	28.52	
PB-212	1.41E+10Y	1.00	1.057E+00	1.057E+00	0.578E+00	54.67	
BI-214	1602.00Y	1.00	2.103E+02	2.103E+02	0.110E+02	5.25	
PB-214	1602.00Y	1.00	2.087E+02	2.087E+02	0.341E+02	16.36	
RN-219	3.28E+04Y	1.00	1.494E+01	1.494E+01	0.385E+01	25.75	
RA-223	3.28E+04Y	1.00	1.057E+01	1.057E+01	0.679E+01	64.24	
RA-224	1.41E+10Y	1.00	4.034E+02	4.034E+02	0.925E+02	22.94	
RA-226	1602.00Y	1.00	3.445E+02	3.445E+02	6.319E+02	183.42	
PA-234M	4.47E+09Y	1.00	7.955E+01	7.955E+01	2.949E+01	37.07	
TH-234	4.47E+09Y	1.00	6.637E+01	6.637E+01	0.944E+01	14.23	
U-235	7.04E+08Y	1.00	7.405E+00	7.405E+00	2.457E+00	33.18	
			---------	---------			
	Total Activity :		1.527E+03	1.527E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	2.146E-01	2.331E-01	2.752E-01	118.07	
SN-126	1.00E+05Y	1.00	6.876E+00	6.876E+00	0.972E+00	14.14	
NP-237	2.14E+06Y	1.00	2.018E+01	2.018E+01	0.284E+01	14.07	
			---------	---------			
	Total Activity :		2.727E+01	2.729E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	4.999E+01	4.999E+01	0.469E+01	9.38	
			---------	---------			
	Total Activity :		4.999E+01	4.999E+01			

Grand Total Activity : 1.604E+03 1.605E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-12 Acquisition date : 1-APR-2013 08:59:48

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.627E+01	2.627E+01	18.98	OK
	Final Mean for 1 Valid Peaks = 2.627E+01+/- 4.987E+00 (18.98%)						
PB-210	46.50	4.25*	2.577E+00	1.312E+02	1.316E+02	10.00	OK
	Final Mean for 1 Valid Peaks = 1.316E+02+/- 1.316E+01 (10.00%)						
PB-211	404.84	2.90*	1.415E+00	2.313E+01	2.313E+01	41.05	OK
	831.96	2.90	7.856E-01	2.260E+01	2.260E+01	39.66	OK
	Final Mean for 2 Valid Peaks = 2.285E+01+/- 6.518E+00 (28.52%)						
PB-212	238.63	44.60*	2.057E+00	1.057E+00	1.057E+00	54.67	OK
	300.09	3.41	1.767E+00	----- Line Not Found -----			Absent
	Final Mean for 1 Valid Peaks = 1.057E+00+/- 5.780E-01 (54.67%)						
BI-214	609.31	46.30*	1.017E+00	1.909E+02	1.909E+02	10.72	OK
	1120.29	15.10	6.174E-01	2.075E+02	2.075E+02	9.54	OK
	1764.49	15.80	4.419E-01	2.308E+02	2.308E+02	10.27	OK
	2204.22	4.98	3.841E-01	2.218E+02	2.218E+02	11.66	OK
	Final Mean for 4 Valid Peaks = 2.103E+02+/- 1.103E+01 (5.25%)						
PB-214	295.21	19.19	1.787E+00	2.064E+02	2.064E+02	29.26	OK
	351.92	37.19*	1.574E+00	2.098E+02	2.098E+02	19.72	OK
	Final Mean for 2 Valid Peaks = 2.087E+02+/- 3.413E+01 (16.36%)						
RN-219	401.80	6.50*	1.423E+00	1.494E+01	1.494E+01	25.75	OK
	Final Mean for 1 Valid Peaks = 1.494E+01+/- 3.846E+00 (25.75%)						
RA-223	323.87	3.88*	1.674E+00	1.057E+01	1.057E+01	64.24	OK
	Final Mean for 1 Valid Peaks = 1.057E+01+/- 6.790E+00 (64.24%)						
RA-224	240.98	3.95*	2.045E+00	4.034E+02	4.034E+02	22.94	OK
	Final Mean for 1 Valid Peaks = 4.034E+02+/- 9.251E+01 (22.94%)						
RA-226	186.21	3.28*	2.369E+00	3.445E+02	3.445E+02	183.42	OK
	Final Mean for 1 Valid Peaks = 3.445E+02+/- 6.319E+02 (183.42%)						
PA-234M	1001.03	0.92*	6.754E-01	7.955E+01	7.955E+01	37.07	OK
	Final Mean for 1 Valid Peaks = 7.955E+01+/- 2.949E+01 (37.07%)						

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.882E+00	6.637E+01	6.637E+01	14.23	OK

Final Mean for 1 Valid Peaks = 6.637E+01+/- 9.444E+00 (14.23%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-235	143.76	10.50*	2.659E+00	7.858E+00	7.858E+00	34.51	OK
	163.35	4.70	2.523E+00	-----	Line Not Found	-----	Absent
	205.31	4.70	2.248E+00	5.327E+00	5.327E+00	109.07	OK

Final Mean for 2 Valid Peaks = 7.405E+00+/- 2.457E+00 (33.18%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.806E+00	2.146E-01	2.331E-01	118.07	OK
	136.48	10.60	2.710E+00	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 2.331E-01+/- 2.752E-01 (118.07%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.963E+00	6.876E+00	6.876E+00	14.14	OK

Final Mean for 1 Valid Peaks = 6.876E+00+/- 9.723E-01 (14.14%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.964E+00	2.018E+01	2.018E+01	14.07	OK

Final Mean for 1 Valid Peaks = 2.018E+01+/- 2.839E+00 (14.07%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.955E+00	4.999E+01	4.999E+01	9.38	OK

Final Mean for 1 Valid Peaks = 4.999E+01+/- 4.691E+00 (9.38%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.627E+01	4.987E+00	3.901E+00	3.770E-01	6.735
CO-57	2.331E-01	2.752E-01	4.038E-01	4.487E-02	0.577
SN-126	6.876E+00	9.723E-01	1.121E+00	1.071E-01	6.131
PB-210	1.316E+02	1.316E+01	8.666E+00	6.835E-01	15.186
PB-211	2.285E+01	6.518E+00	1.199E+01	1.277E+00	1.905
PB-212	1.057E+00	5.780E-01	7.613E-01	1.677E-01	1.389
BI-214	2.103E+02	1.103E+01	7.006E-01	6.940E-02	300.216
PB-214	2.087E+02	3.413E+01	8.709E-01	1.680E-01	239.637
RN-219	1.494E+01	3.846E+00	5.317E+00	5.654E-01	2.809
RA-223	1.057E+01	6.790E+00	8.379E+00	2.051E+00	1.261
RA-224	4.034E+02	9.251E+01	8.654E+00	1.948E+00	46.611
RA-226	3.445E+02	6.319E+02	1.086E+01	1.991E+01	31.719
PA-234M	7.955E+01	2.949E+01	4.110E+01	3.556E+00	1.936
TH-234	6.637E+01	9.444E+00	1.047E+01	7.770E-01	6.341
U-235	7.405E+00	2.457E+00	3.332E+00	6.105E-01	2.222
NP-237	2.018E+01	2.839E+00	3.495E+00	3.300E-01	5.775
AM-243	4.999E+01	4.691E+00	6.310E-01	5.260E-02	79.212

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	4.307E-02		3.316E+00	4.694E+00	5.025E-01	0.009
NA-22	2.690E-02		2.652E-01	3.947E-01	3.527E-02	0.068
AL-26	3.381E-03		1.599E-01	2.374E-01	2.169E-02	0.014
TI-44	6.689E-01	+	2.645E-01	4.459E-01	3.466E-02	1.500
SC-46	1.354E-01		3.048E-01	5.159E-01	4.516E-02	0.262
V-48	1.166E-01		9.346E-01	1.570E+00	1.362E-01	0.074
CR-51	-1.931E+00		5.902E+00	7.326E+00	1.852E+00	-0.264
MN-54	1.631E-01		3.336E-01	4.063E-01	3.661E-02	0.401
CO-56	2.143E-01		3.219E-01	4.929E-01	4.416E-02	0.435
CO-58	-1.624E-01		3.214E-01	4.799E-01	4.375E-02	-0.338
FE-59	-1.070E+00		6.937E-01	1.105E+00	1.013E-01	-0.968
CO-60	-7.551E-04		2.625E-01	3.911E-01	3.206E-02	-0.002
ZN-65	1.594E+00		6.113E-01	9.472E-01	7.965E-02	1.683
SE-75	2.513E-02		5.241E-01	6.618E-01	1.834E-01	0.038
RB-82	1.159E+00		5.226E+00	6.343E+00	5.830E-01	0.183
RB-83	1.307E-01		5.360E-01	8.796E-01	1.477E-01	0.149
KR-85	8.302E+01		4.887E+01	7.602E+01	8.059E+00	1.092
SR-85	5.102E-01		3.003E-01	4.672E-01	4.953E-02	1.092
Y-88	8.580E-01		2.386E-01	4.262E-01	3.871E-02	2.013
NB-93M	-8.479E+01		2.100E+01	2.246E+00	5.433E-01	-37.760
NB-94	1.165E-01		2.300E-01	3.898E-01	3.449E-02	0.299
NB-95	1.196E+01		1.326E+00	1.158E+00	1.067E-01	10.331
ZR-95	2.177E-01		7.089E-01	8.642E-01	8.686E-02	0.252
RU-103	-1.030E-01		3.537E-01	6.033E-01	9.344E-02	-0.171
RU-106	-8.131E-01		1.920E+00	3.245E+00	4.584E-01	-0.251
AG-108M	4.244E-01		2.438E-01	3.796E-01	3.519E-02	1.118

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CD-109	1.045E+02		1.500E+01	1.309E+01	1.476E+00	7.987
AG-110M	2.231E-01		2.356E-01	3.660E-01	3.410E-02	0.610
SN-113	5.245E-01		5.017E-01	6.323E-01	6.839E-02	0.829
TE123M	3.870E-01		3.515E-01	5.160E-01	4.884E-02	0.750
SB-124	-9.615E-02		3.277E-01	4.986E-01	4.973E-02	-0.193
I-125	-9.409E+00		5.262E+00	7.703E+00	7.238E-01	-1.221
SB-125	1.397E+00	+	1.021E+00	1.251E+00	1.356E-01	1.116
SB-126	7.866E+00	+	3.420E+00	4.142E+00	3.841E-01	1.899
I-129	4.201E-01		4.511E-01	6.862E-01	7.535E-02	0.612
I-131	5.254E-02		3.767E+00	6.226E+00	1.041E+00	0.008
BA-133	7.120E-01		3.676E-01	5.353E-01	1.125E-01	1.330
CS-134	5.887E-01		2.504E-01	3.867E-01	3.856E-02	1.522
CS-135	1.192E+01		3.747E+00	2.347E+00	6.694E-01	5.081
CS-136	9.979E-01		1.751E+00	2.658E+00	2.350E-01	0.375
CS-137	2.030E-01		2.474E-01	3.834E-01	3.557E-02	0.529
LA-138	-1.743E-01		3.698E-01	6.027E-01	5.686E-02	-0.289
CE-139	2.450E-01		3.245E-01	5.167E-01	4.717E-02	0.474
BA-140	-1.332E+00		4.862E+00	7.409E+00	2.495E+00	-0.180
LA-140	5.242E+00		1.745E+00	2.717E+00	2.556E-01	1.929
CE-141	2.124E+00		1.150E+00	1.503E+00	3.874E-01	1.413
CE-144	-1.387E+00		2.093E+00	3.319E+00	3.524E-01	-0.418
PM-144	1.546E-01		2.248E-01	3.472E-01	3.226E-02	0.445
PM-145	-2.532E+00		1.964E+00	1.571E+00	1.024E+00	-1.611
PM-146	1.170E+00	+	5.274E-01	8.526E-01	9.143E-02	1.373
ND-147	1.436E+01		1.225E+01	1.908E+01	2.007E+00	0.753
EU-152	3.273E+01	+	4.656E+00	4.661E+00	5.387E-01	7.023
GD-153	-1.990E+00		9.730E-01	1.503E+00	1.530E-01	-1.324
EU-154	1.639E-01		7.322E-01	1.094E+00	9.775E-02	0.150
EU-155	8.332E+00	+	1.172E+00	1.473E+00	1.391E-01	5.655
EU-156	-8.565E+00		9.970E+00	1.447E+01	3.331E+00	-0.592
HO-166M	-2.499E-01		5.035E-01	5.974E-01	5.543E-02	-0.418
HF-172	-1.014E-01		2.017E+00	2.972E+00	3.253E-01	-0.034
LU-172	5.030E+00		1.037E+01	1.748E+01	1.480E+00	0.288
LU-173	1.067E+01		3.391E+00	1.899E+00	5.590E-01	5.620
HF-175	-5.911E-02		4.465E-01	5.562E-01	1.165E-01	-0.106
LU-176	-3.808E-01		2.465E-01	3.425E-01	9.333E-02	-1.112
TA-182	1.093E+02	+	1.042E+01	4.773E+00	4.001E-01	22.897
IR-192	4.199E-01		7.324E-01	9.145E-01	9.800E-02	0.459
HG-203	-2.391E-01		4.932E-01	6.986E-01	2.179E-01	-0.342
BI-207	2.243E-01		1.983E-01	3.409E-01	3.501E-02	0.658
TL-208	6.898E-01		7.259E-01	1.127E+00	1.145E-01	0.612
BI-210M	4.004E-01		5.857E-01	7.340E-01	1.989E-01	0.546
BI-212	6.370E-01		1.786E+00	2.739E+00	2.539E-01	0.233
RA-225	3.408E+00		3.272E+00	4.959E+00	4.272E-01	0.687
TH-227	1.156E+01	+	3.051E+00	3.267E+00	7.018E-01	3.539
AC-228	2.049E+00	+	1.231E+00	1.507E+00	1.313E-01	1.359
TH-230	1.706E+02	+	6.744E+01	1.137E+02	8.814E+00	1.501
PA-231	2.994E+01		1.300E+01	1.478E+01	4.119E+00	2.026

Sample ID : 1303012-12 Acquisition date : 1-APR-2013 08:59:48

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
TH-231	2.194E+00		1.887E+00	3.089E+00	3.985E-01	0.710
PA-233	8.410E-01		1.364E+00	1.933E+00	6.495E-01	0.435
PA-234	-8.904E-01		1.020E+00	1.613E+00	1.729E-01	-0.552
AM-241	4.143E+00		7.779E-01	1.086E+00	7.780E-02	3.814
CM-243	-1.937E-01		1.661E+00	2.390E+00	7.347E-01	-0.081

Total number of lines in spectrum	119	
Number of unidentified lines	74	
Number of lines tentatively identified by NID	45	37.82%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.627E+01	2.627E+01	0.499E+01	18.98	
PB-210	22.26Y	1.00	1.312E+02	1.316E+02	0.132E+02	10.00	
PB-211	3.28E+04Y	1.00	2.285E+01	2.285E+01	0.652E+01	28.52	
PB-212	1.41E+10Y	1.00	1.057E+00	1.057E+00	0.578E+00	54.67	
BI-214	1602.00Y	1.00	2.103E+02	2.103E+02	0.110E+02	5.25	
PB-214	1602.00Y	1.00	2.087E+02	2.087E+02	0.341E+02	16.36	
RN-219	3.28E+04Y	1.00	1.494E+01	1.494E+01	0.385E+01	25.75	
RA-223	3.28E+04Y	1.00	1.057E+01	1.057E+01	0.679E+01	64.24	
RA-224	1.41E+10Y	1.00	4.034E+02	4.034E+02	0.925E+02	22.94	
RA-226	1602.00Y	1.00	3.445E+02	3.445E+02	6.319E+02	183.42	
PA-234M	4.47E+09Y	1.00	7.955E+01	7.955E+01	2.949E+01	37.07	
TH-234	4.47E+09Y	1.00	6.637E+01	6.637E+01	0.944E+01	14.23	
U-235	7.04E+08Y	1.00	7.405E+00	7.405E+00	2.457E+00	33.18	
			---------	---------			
	Total Activity :		1.527E+03	1.527E+03			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.09	2.146E-01	2.331E-01	2.752E-01	118.07	
SN-126	1.00E+05Y	1.00	6.876E+00	6.876E+00	0.972E+00	14.14	
NP-237	2.14E+06Y	1.00	2.018E+01	2.018E+01	0.284E+01	14.07	
			---------	---------			
	Total Activity :		2.727E+01	2.729E+01			

Nuclide Type : ACTIVATION

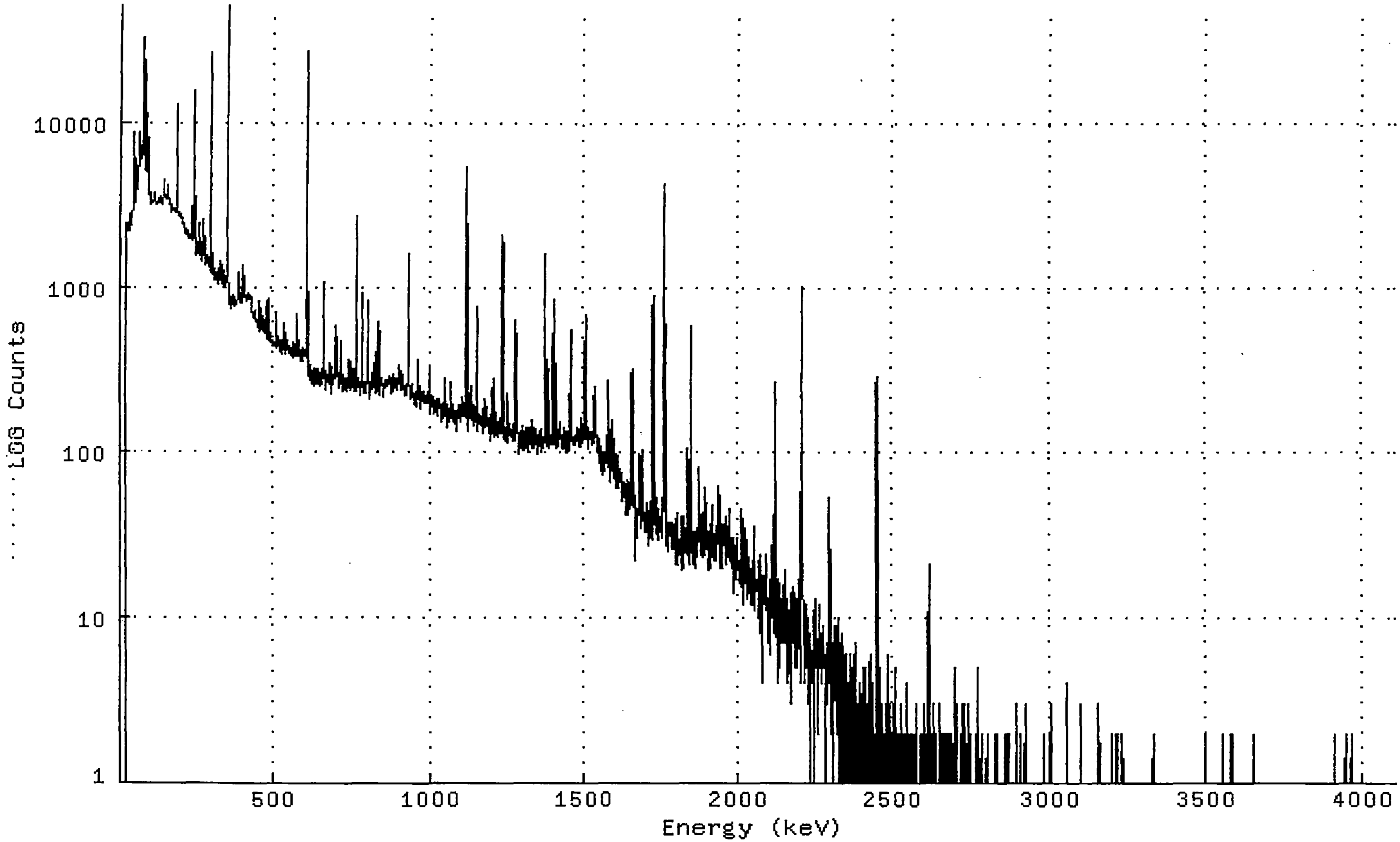
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	4.999E+01	4.999E+01	0.469E+01	9.38	
			---------	---------			
	Total Activity :		4.999E+01	4.999E+01			

Grand Total Activity : 1.604E+03 1.605E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301212_GE1_GAS1202_190107.CNF;1
Title :
Sample Title: S30-91-130228

Start Time: 1-APR-2013 08:59:	Sample Time: 28-FEB-2013 00:00	Energy Offset: -2.35223E-01
Real Time : 0 01:00:45.51	Sample ID : 1303012-12	Energy Slope : 1.00007E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



0256

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301212_GE1_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	1	2	1718	2443	2307	2246	2188	2190
25:	2254	2244	2371	2413	2230	2156	2287	2763
33:	2385	2350	2325	2429	2588	2603	2545	2757
41:	2913	2956	3044	3104	3358	7017	8467	3252
49:	3379	4412	3829	3855	5901	4811	3931	4099
57:	4284	4561	4948	5517	5641	5911	8541	7632
65:	5875	5955	6382	7169	6242	6080	6278	6238
73:	6523	9588	23068	10836	31790	17521	6352	6408
81:	6725	5222	5107	9006	5169	4906	11149	9557
89:	4900	7287	4785	5358	7885	4702	4909	3578
97:	3377	3727	3680	3410	3131	3189	3273	3252
105:	3237	3235	3250	3246	3416	3438	3363	3417
113:	3701	3347	3221	3230	3228	3123	3179	3207
121:	3213	3346	3435	3256	3225	3261	3359	3469
129:	3365	3319	3268	3399	3174	3292	3298	3335
137:	3317	3393	3365	3518	3461	3577	3561	4375
145:	3835	3399	3468	3424	3529	3612	3564	3468
153:	3654	4134	3945	3382	3450	3328	3358	3364
161:	3289	3105	3201	3177	3061	3126	3052	3029
169:	2859	2949	2979	2943	2871	2925	2897	2916
177:	2845	2810	3008	2872	2943	2925	2833	3060
185:	3902	12762	8376	2952	2771	2788	2654	2653
193:	2694	2701	2676	2767	2733	2676	2609	2623
201:	2525	2633	2434	2439	2531	2510	2376	2240
209:	2243	2435	2355	2116	2151	2201	2103	2144
217:	2081	2172	2169	2076	2063	2010	2083	2050
225:	1979	1942	1994	1976	1957	1967	2047	2042
233:	1885	1883	2115	3043	2337	2018	2240	1976
241:	3551	15443	6683	1806	1647	1683	1641	1675
249:	1554	1662	1655	1698	1608	1565	1630	2095
257:	1966	1764	2393	1758	1547	1478	1491	1471
265:	1526	1552	1417	1489	2266	2557	2272	1989
273:	1527	1758	2016	1492	1401	1385	1476	1364
281:	1480	1484	1443	1537	1370	1531	1477	1363
289:	1328	1378	1354	1331	1377	3176	26194	19424
297:	1976	1221	1195	1589	1317	1301	1386	1263
305:	1265	1191	1090	1079	1139	1194	1085	1119
313:	1116	1198	1222	1144	1085	1035	1067	1082
321:	1084	1030	1154	1408	1107	1102	1100	1085
329:	1158	1341	1122	1037	1100	1233	1131	1031
337:	1070	1243	1243	993	1041	1049	1166	1057
345:	1011	1078	1104	1081	1252	1451	11173	51582
353:	16884	1245	868	833	778	819	852	796
361:	803	811	841	860	740	761	847	779
369:	807	809	889	830	870	828	803	758
377:	846	819	811	819	811	779	802	785
385:	851	943	1130	974	1225	995	796	792
393:	803	816	849	879	922	837	804	810
401:	904	1352	1019	914	1163	1052	868	882
409:	886	814	888	895	848	878	843	861
417:	834	864	887	920	845	890	850	830
425:	843	850	877	869	775	791	766	697

433:	692	697	642	645	657	683	656	617
441:	617	616	637	641	724	618	602	633
449:	569	589	573	634	545	626	813	702
457:	537	573	554	569	656	732	683	563
465:	573	538	541	586	550	665	610	566
473:	545	605	627	516	491	530	483	701
481:	814	499	509	471	491	568	838	711
489:	488	502	516	470	477	455	459	457
497:	434	452	469	454	474	443	450	455
505:	433	456	432	423	538	703	674	642
513:	516	488	440	432	471	471	453	448
521:	398	465	426	431	455	389	439	433
529:	423	442	425	436	510	600	491	454
537:	459	410	438	387	471	435	445	526
545:	430	413	449	466	410	434	424	424
553:	422	399	433	387	420	419	409	419
561:	414	385	372	408	385	402	396	462
569:	443	430	404	407	446	432	377	389
577:	422	380	443	688	548	383	467	413
585:	378	382	378	369	395	381	368	411
593:	355	349	354	405	418	382	400	411
601:	383	400	385	392	406	373	446	3326
609:	26642	25547	2674	326	288	304	327	342
617:	321	324	295	286	336	280	301	272
625:	272	257	271	300	260	310	261	274
633:	312	280	268	251	277	271	315	287
641:	288	258	262	292	272	261	314	256
649:	301	278	274	250	270	273	314	255
657:	305	289	289	286	317	275	311	310
665:	928	1073	371	259	288	237	277	295
673:	268	267	262	289	286	279	286	294
681:	278	255	342	285	282	246	284	325
689:	306	226	269	269	254	259	274	266
697:	275	320	286	274	306	312	580	425
705:	331	290	282	298	282	281	296	251
713:	262	243	269	265	260	273	320	470
721:	364	258	295	259	271	278	228	256
729:	269	236	241	244	256	274	280	233
737:	261	263	249	266	296	344	356	307
745:	277	242	242	234	277	244	246	295
753:	348	285	270	268	246	263	246	232
761:	257	237	273	261	277	362	625	2334
769:	2659	620	231	276	244	247	265	264
777:	254	243	263	222	257	250	220	253
785:	520	913	591	261	248	239	222	249
793:	223	266	247	257	241	265	224	263
801:	262	228	270	260	383	824	689	276
809:	246	233	231	241	264	207	254	245
817:	286	258	241	269	346	296	241	269
825:	253	306	290	223	243	280	282	404
833:	328	230	261	252	230	327	617	483
841:	247	238	221	260	240	246	270	275
849:	251	247	276	228	245	247	259	212
857:	251	245	244	273	271	265	248	253
865:	262	251	261	246	268	264	285	268
873:	255	286	261	249	276	255	255	256
881:	227	256	233	279	289	256	261	280
889:	254	278	263	259	245	241	236	262
897:	247	262	255	279	257	289	267	298
905:	330	266	246	238	270	291	303	311

913:	274	265	238	240	255	254	231	251
921:	223	239	219	231	221	255	224	226
929:	219	237	239	246	625	1580	1150	333
937:	254	244	228	235	205	229	233	253
945:	238	224	215	241	225	193	225	208
953:	216	211	198	184	208	218	191	231
961:	221	233	275	364	345	240	207	229
969:	239	247	186	224	216	182	227	213
977:	200	202	230	213	216	206	205	232
985:	204	199	209	202	204	197	199	217
993:	212	200	202	197	209	229	192	215
1001:	335	305	194	169	194	191	194	217
1009:	203	199	212	205	187	214	195	168
1017:	209	188	187	173	195	174	201	176
1025:	163	206	192	181	182	183	190	206
1033:	194	183	182	193	174	152	175	158
1041:	175	162	186	157	160	196	180	201
1049:	172	164	222	274	239	159	166	165
1057:	170	170	141	173	180	162	153	183
1065:	150	176	161	201	199	261	242	171
1073:	167	189	150	166	156	164	148	176
1081:	179	174	165	174	160	179	132	159
1089:	154	164	157	167	187	166	190	165
1097:	149	171	174	163	163	172	175	207
1105:	210	183	174	164	189	174	171	172
1113:	166	196	165	158	179	228	1194	5093
1121:	5301	1136	182	166	131	158	171	166
1129:	166	184	176	158	203	248	177	176
1137:	171	174	154	159	142	191	146	168
1145:	160	149	172	167	188	154	156	166
1153:	133	266	756	665	264	167	169	157
1161:	161	155	147	162	162	165	154	153
1169:	153	142	154	159	180	162	143	128
1177:	154	142	138	165	181	208	171	155
1185:	147	142	158	150	160	151	140	149
1193:	128	141	158	150	166	151	138	155
1201:	117	144	130	131	128	167	220	280
1209:	213	142	142	121	130	124	137	134
1217:	173	155	157	148	128	130	126	123
1225:	123	143	157	151	129	145	130	138
1233:	134	130	132	164	696	2067	1676	387
1241:	162	130	120	144	120	116	116	137
1249:	124	139	113	139	224	218	213	130
1257:	131	126	129	145	137	141	132	125
1265:	123	125	130	122	130	132	128	137
1273:	115	146	133	142	126	115	145	344
1281:	635	447	161	130	140	128	129	128
1289:	115	120	116	122	97	131	103	122
1297:	118	127	104	101	103	110	128	143
1305:	126	125	112	124	101	133	101	127
1313:	118	118	103	132	139	141	130	122
1321:	99	105	104	118	139	130	113	115
1329:	119	110	126	108	134	124	104	153
1337:	125	105	105	132	125	116	110	111
1345:	137	117	112	112	118	107	124	102
1353:	114	96	132	125	119	133	122	108
1361:	121	124	124	121	121	135	100	108
1369:	114	118	112	123	108	112	143	238
1377:	937	1574	733	182	107	115	130	190
1385:	322	320	203	121	116	104	119	122

1393:	111	127	115	126	125	109	123	174
1401:	384	525	252	111	133	140	396	845
1409:	591	197	115	105	116	128	138	143
1417:	128	126	108	135	136	136	124	136
1425:	126	150	128	118	127	118	114	120
1433:	104	108	104	109	129	116	141	122
1441:	119	131	132	98	111	119	117	99
1449:	128	132	108	125	112	139	130	102
1457:	130	121	162	311	549	317	145	128
1465:	117	122	114	117	111	122	118	121
1473:	115	124	110	117	110	122	127	130
1481:	129	117	140	131	108	125	120	122
1489:	109	108	124	158	133	114	123	131
1497:	133	144	116	122	145	126	135	120
1505:	120	128	140	322	682	642	252	124
1513:	133	128	104	123	132	126	132	140
1521:	125	119	125	131	128	130	130	125
1529:	125	126	110	131	131	121	128	114
1537:	136	192	247	171	128	123	245	225
1545:	149	105	100	106	105	99	100	118
1553:	91	94	92	84	97	76	92	82
1561:	99	107	92	85	99	83	100	91
1569:	72	82	75	97	100	93	93	84
1577:	86	88	116	85	100	162	256	267
1585:	127	83	81	93	64	82	88	89
1593:	80	120	155	120	75	113	150	148
1601:	98	68	83	84	83	75	82	96
1609:	92	88	60	88	86	95	88	68
1617:	60	69	66	65	70	77	68	76
1625:	56	60	73	64	57	50	58	63
1633:	57	61	53	58	64	61	51	52
1641:	52	63	41	66	57	41	58	53
1649:	42	64	45	53	60	46	58	49
1657:	54	65	47	121	290	312	112	54
1665:	62	46	57	53	49	47	46	53
1673:	22	40	42	41	45	44	45	41
1681:	41	55	59	96	79	50	34	47
1689:	37	44	59	88	102	89	63	43
1697:	43	38	42	39	38	37	43	33
1705:	34	38	33	40	41	48	27	30
1713:	44	40	32	34	50	39	36	30
1721:	33	37	45	49	29	38	56	193
1729:	700	886	429	80	36	37	42	45
1737:	32	33	53	41	37	29	39	45
1745:	34	35	41	33	33	40	33	33
1753:	35	37	47	52	30	42	39	47
1761:	47	130	861	3337	4162	1680	211	35
1769:	27	31	33	29	25	28	28	30
1777:	34	37	31	34	35	37	35	35
1785:	34	32	26	26	28	37	36	32
1793:	26	35	36	27	31	27	21	29
1801:	39	30	43	33	36	26	21	30
1809:	33	25	26	26	24	29	24	34
1817:	29	29	29	40	19	27	40	30
1825:	28	20	22	26	30	33	34	26
1833:	32	31	24	38	57	104	105	51
1841:	40	24	21	24	43	188	511	575
1849:	213	44	28	27	21	29	24	26
1857:	33	29	24	28	33	20	28	24
1865:	32	23	28	33	34	27	29	52

1873:	80	76	34	32	28	26	34	41
1881:	24	30	34	28	23	37	36	42
1889:	34	40	60	27	29	24	44	43
1897:	48	37	43	26	29	27	33	33
1905:	33	19	32	28	26	32	20	36
1913:	31	36	33	23	38	47	29	24
1921:	22	25	32	31	29	26	26	22
1929:	35	22	34	28	33	37	38	46
1937:	62	48	20	33	33	28	31	26
1945:	36	27	29	20	27	30	29	27
1953:	31	34	36	31	33	25	24	31
1961:	21	40	31	34	35	34	28	23
1969:	45	33	33	29	28	22	26	23
1977:	26	21	20	30	23	14	21	24
1985:	30	24	19	25	19	18	17	19
1993:	27	19	30	26	27	24	21	17
2001:	16	22	21	18	17	16	25	15
2009:	26	30	45	34	12	23	18	36
2017:	37	32	26	18	16	24	25	22
2025:	18	22	29	19	13	22	14	21
2033:	16	15	19	23	17	12	19	20
2041:	16	13	17	20	14	12	22	16
2049:	13	11	20	20	35	17	15	17
2057:	15	17	15	17	12	13	10	22
2065:	19	13	13	13	24	19	8	15
2073:	14	11	15	14	18	4	15	18
2081:	13	13	15	12	16	15	11	24
2089:	19	19	14	12	7	8	12	7
2097:	8	12	14	15	15	6	16	18
2105:	15	19	10	14	23	32	20	21
2113:	13	12	8	21	82	204	262	109
2121:	22	14	4	7	11	7	9	17
2129:	12	5	16	6	7	9	9	9
2137:	13	13	10	7	8	7	10	8
2145:	15	13	19	15	9	16	7	11
2153:	10	13	8	11	8	8	4	5
2161:	6	11	5	6	8	14	10	6
2169:	11	3	10	7	15	13	11	7
2177:	11	14	14	8	5	6	12	13
2185:	13	12	11	11	5	8	13	16
2193:	17	11	9	13	5	4	9	14
2201:	35	93	563	1009	754	201	36	16
2209:	10	6	4	8	6	8	8	12
2217:	6	5	8	6	6	10	6	9
2225:	3	10	1	6	3	6	4	8
2233:	5	5	4	4	5	5	4	4
2241:	11	1	2	7	5	5	7	7
2249:	5	13	5	7	2	6	5	4
2257:	5	11	5	12	6	5	6	7
2265:	7	7	8	6	4	9	5	8
2273:	6	8	6	4	1	5	3	6
2281:	4	5	6	3	4	6	7	4
2289:	5	6	6	24	52	35	19	11
2297:	2	3	2	4	6	7	3	7
2305:	1	2	5	5	7	5	5	9
2313:	8	3	9	7	2	5	3	5
2321:	10	2	1	5	7	5	1	2
2329:	4	4	3	5	8	3	4	3
2337:	0	6	5	4	3	0	0	2
2345:	1	2	6	1	4	1	4	2

2353:	3	4	3	1	4	2	2	4
2361:	6	1	1	0	2	1	5	3
2369:	3	4	2	1	6	3	4	1
2377:	7	3	2	4	2	3	1	2
2385:	0	2	4	3	1	2	0	4
2393:	3	2	1	2	1	1	4	5
2401:	4	0	3	4	2	2	3	1
2409:	5	3	2	2	3	2	0	0
2417:	1	3	3	3	3	5	5	6
2425:	1	1	1	2	2	2	4	1
2433:	0	2	2	1	1	1	2	1
2441:	1	1	4	6	15	88	241	281
2449:	121	29	2	3	0	2	2	3
2457:	0	0	5	0	3	0	0	1
2465:	1	2	2	0	2	1	2	1
2473:	2	0	2	3	1	1	3	1
2481:	1	6	4	4	0	1	3	1
2489:	2	1	2	0	0	2	0	0
2497:	3	2	1	1	0	3	0	4
2505:	5	5	2	2	2	1	1	1
2513:	0	1	2	2	0	2	1	1
2521:	1	3	1	2	2	0	0	0
2529:	2	0	0	0	2	0	1	1
2537:	2	1	1	2	4	1	4	2
2545:	1	2	0	1	1	1	1	0
2553:	1	0	0	2	1	2	0	2
2561:	2	0	1	2	2	1	0	1
2569:	2	0	3	1	1	0	2	0
2577:	0	0	1	0	0	1	1	0
2585:	0	2	2	2	1	1	2	0
2593:	1	2	1	1	3	0	1	1
2601:	0	2	1	2	1	1	1	2
2609:	1	0	0	3	7	17	21	3
2617:	6	1	1	0	1	0	1	0
2625:	2	1	0	0	0	3	1	1
2633:	2	0	2	1	0	1	0	0
2641:	1	0	0	0	0	0	0	2
2649:	3	1	0	0	0	1	0	2
2657:	1	0	0	1	2	1	1	2
2665:	0	1	2	0	0	2	1	0
2673:	1	0	2	0	1	0	0	0
2681:	1	0	1	0	2	0	0	0
2689:	0	1	1	0	0	3	5	1
2697:	1	2	0	0	0	1	2	3
2705:	1	1	0	1	0	0	0	0
2713:	2	1	0	1	1	0	1	3
2721:	1	0	0	2	1	0	1	1
2729:	3	1	0	0	1	0	1	1
2737:	1	0	0	0	3	0	0	1
2745:	2	0	0	1	1	0	0	0
2753:	1	0	0	1	0	0	1	0
2761:	0	0	2	0	1	2	0	3
2769:	3	5	2	2	0	1	0	0
2777:	0	0	0	1	0	0	1	2
2785:	1	1	1	1	1	1	0	1
2793:	0	0	1	0	0	2	0	0
2801:	0	0	0	1	0	0	1	1
2809:	1	0	0	1	1	0	0	1
2817:	0	0	1	1	1	0	0	0
2825:	0	2	0	0	1	1	2	1

2833:	0	0	0	0	0	0	0	0
2841:	0	1	1	0	0	0	0	1
2849:	0	0	1	1	1	0	0	1
2857:	2	1	0	0	0	2	1	0
2865:	0	0	0	2	0	1	1	0
2873:	0	1	1	1	0	0	0	1
2881:	0	0	0	0	1	1	1	1
2889:	1	1	1	0	1	3	1	0
2897:	0	0	0	1	0	0	2	1
2905:	0	0	0	0	0	1	0	1
2913:	0	0	0	0	0	1	0	1
2921:	3	3	0	0	1	0	1	0
2929:	0	1	0	0	0	0	1	0
2937:	1	0	0	0	0	1	0	0
2945:	1	0	0	0	1	0	1	0
2953:	1	1	0	0	0	0	1	1
2961:	0	0	0	1	0	0	0	0
2969:	0	0	0	0	1	0	0	0
2977:	1	1	2	2	1	0	0	1
2985:	0	0	0	1	1	1	1	0
2993:	0	0	0	1	0	2	1	1
3001:	3	0	0	0	0	0	0	0
3009:	0	0	0	0	1	0	0	1
3017:	0	0	1	0	0	0	1	0
3025:	0	0	0	0	0	1	1	0
3033:	0	0	1	0	0	1	0	0
3041:	1	1	1	1	0	1	0	0
3049:	0	1	0	1	1	4	0	0
3057:	0	1	0	0	0	1	0	1
3065:	0	0	0	0	0	0	0	0
3073:	0	1	0	0	1	0	1	0
3081:	0	0	1	1	0	0	1	0
3089:	0	0	1	0	0	0	1	0
3097:	3	0	0	0	0	0	0	1
3105:	0	0	0	1	0	0	0	0
3113:	0	1	1	0	0	0	0	0
3121:	0	0	0	0	0	0	0	1
3129:	1	0	0	0	0	1	1	0
3137:	1	0	0	0	0	1	0	1
3145:	0	0	0	0	0	0	0	0
3153:	3	0	0	0	0	0	0	1
3161:	0	0	0	0	1	0	0	0
3169:	0	0	1	0	0	1	0	0
3177:	0	0	0	0	0	0	1	0
3185:	1	0	0	0	0	0	0	0
3193:	2	0	1	1	0	0	0	0
3201:	1	0	0	1	2	0	0	1
3209:	0	0	0	0	2	0	0	0
3217:	0	0	0	1	0	1	0	0
3225:	0	0	2	0	0	0	0	0
3233:	0	1	1	0	0	0	0	0
3241:	0	0	0	0	1	0	0	0
3249:	0	0	1	0	0	1	0	0
3257:	0	0	0	0	0	0	0	0
3265:	0	0	0	0	1	0	0	0
3273:	0	0	0	0	1	0	0	0
3281:	0	0	0	0	1	0	1	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	1	0	1	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	0	0	2	0	0
3329:	0	1	0	0	0	0	0	0
3337:	0	0	1	0	0	0	0	0
3345:	1	0	0	1	0	0	1	0
3353:	1	0	0	1	0	0	1	0
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	0	0	0	0
3377:	0	0	1	1	0	0	0	0
3385:	0	0	0	1	1	0	0	0
3393:	1	0	0	0	0	0	0	0
3401:	0	0	0	0	0	0	0	0
3409:	1	0	0	0	0	0	0	1
3417:	0	0	0	0	0	0	0	0
3425:	0	0	1	0	0	0	0	0
3433:	1	0	1	0	1	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	1	0	0	0	0
3457:	0	0	0	0	1	0	0	1
3465:	0	0	0	0	0	1	0	1
3473:	0	0	0	0	1	1	0	0
3481:	1	0	0	0	0	0	0	0
3489:	0	0	0	0	2	0	1	0
3497:	0	0	0	0	0	0	0	0
3505:	1	0	0	1	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	1	0	0	0	0	0	1	1
3529:	0	0	1	0	1	0	0	0
3537:	0	0	0	0	1	0	0	1
3545:	0	0	0	0	0	2	1	0
3553:	0	1	0	0	0	0	1	0
3561:	0	1	0	0	0	1	0	1
3569:	0	0	0	0	0	1	0	0
3577:	2	0	0	2	0	0	0	0
3585:	0	0	0	0	0	0	0	1
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	0	0	1	0	0
3609:	0	0	0	0	1	0	0	1
3617:	1	1	0	0	1	0	0	0
3625:	0	0	0	0	0	1	0	0
3633:	0	0	0	0	0	0	0	0
3641:	0	0	0	0	0	2	0	0
3649:	0	1	0	0	0	0	0	1
3657:	1	0	0	0	0	0	0	0
3665:	0	0	0	0	0	0	1	0
3673:	0	1	0	0	1	0	0	0
3681:	0	0	0	0	1	0	0	0
3689:	0	0	1	0	0	0	0	0
3697:	0	0	1	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	1	0	0	0	0	0	0
3721:	0	1	0	1	0	1	0	0
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	1	0	0	0	0
3745:	0	0	0	0	0	1	0	0
3753:	0	0	1	0	0	0	0	0
3761:	0	0	0	0	0	1	0	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	1	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	1	0	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	1	1	1	1	0	0
3833:	0	0	0	1	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	1	0	0	1	0	0	0
3857:	0	0	0	0	1	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	1	0	0	0	1	0	0	0
3889:	0	0	0	0	1	0	0	0
3897:	0	0	1	0	0	0	0	0
3905:	2	0	0	0	0	0	0	1
3913:	0	1	0	0	1	0	0	0
3921:	0	1	0	0	0	1	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	1	0	2	0	0	0	0
3945:	0	0	1	0	0	0	0	0
3953:	0	0	0	0	0	2	0	1
3961:	1	0	0	0	0	0	0	0
3969:	1	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	1
3985:	0	0	0	0	0	0	1	0
3993:	0	0	0	0	0	1	0	0
4001:	1	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	0
4017:	0	0	0	1	1	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	0	1	0	0	0
4041:	0	1	0	0	0	0	0	0
4049:	1	0	0	1	0	0	0	0
4057:	0	0	0	0	0	1	0	1
4065:	1	0	0	0	0	0	0	0
4073:	0	0	1	0	0	1	0	0
4081:	0	0	1	0	0	0	0	0
4089:	0	0	0	0	1	1	0	0

Sample ID : 1303012-13 Acquisition date : 1-APR-2013 09:00:53

C
4/1/13

VAX/VMS Peak Search Report Generated 1-APR-2013 10:01:58.17

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301213_GE2_GAS1202_190108.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-94-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 09:00:53.
Sample ID : 1303012-13 Sample Quantity : 4.93650E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE2 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:50.05 1.4%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	27.01	358	15226	1.24	27.12	25	5	103.9		
0	32.36	344	12453	1.14	32.48	31	4	92.3		
0	45.99*	5855	26164	1.69	46.11	44	5	8.2		PB-210
0	62.96*	1961	30526	1.16	63.07	61	4	25.6		TH-234
0	67.31	2021	39146	1.76	67.42	66	5	29.7		
0	75.99*	88974	81490	2.72	76.11	71	10	1.4		AM-243
0	87.71*	4717	43891	1.04	87.83	85	5	13.5		NP-237
										SN-126
										CD-109
0	93.43	4262	24573	3.32	93.55	92	5	11.6		
0	111.84	463	21638	1.73	111.95	110	5	95.8		
0	143.68*	1391	23050	1.24	143.79	142	5	33.2		U-235
0	154.01	1791	28329	1.27	154.12	152	6	30.1		
0	163.90*	606	24585	2.79	164.02	162	6	82.4		U-235
0	185.93*	20564	31392	1.30	186.04	182	8	3.3		RA-226
0	195.76	596	18004	1.43	195.87	194	5	68.1		
2	236.11	3007	15211	1.88	236.22	232	15	13.2	2.98E+01	
2	241.68	29603	9371	1.37	241.79	232	15	1.5		RA-224
0	257.67	3213	18667	3.96	257.78	254	9	15.8		
6	269.77	4851	15684	2.82	269.88	266	12	9.4	3.26E+01	
6	274.27	1465	9683	1.58	274.38	266	12	21.0		
0	286.56	285	11310	1.13	286.67	284	6	118.8		
0	294.85*	64382	14311	1.34	294.96	291	8	1.0		PB-214
0	299.84	303	8665	1.19	299.94	299	5	92.9		
0	312.95	241	7785	1.42	313.06	312	5	110.5		PA-233
0	323.50	648	7334	1.76	323.60	322	5	40.4		RA-223
0	328.77	369	7493	1.59	328.88	328	5	71.1		
0	338.25	403	8780	1.06	338.36	336	6	74.4		
0	351.49*	111091	13172	1.85	351.60	346	10	0.7		PB-214
0	387.47	1914	11576	3.89	387.58	383	10	21.5		
3	401.33	1120	5841	1.75	401.44	398	12	21.3	1.78E+00	RN-219
3	404.92	917	8267	2.24	405.02	398	12	33.8		PB-211
0	427.22	477	6285	2.01	427.32	425	6	53.6		
0	454.22	614	5646	1.94	454.32	451	7	41.4		
0	461.54	591	5468	2.11	461.64	459	7	42.4		
0	469.08	289	4452	2.09	469.19	467	6	73.9		

AG
4/1/13

Sample ID : 1303012-13 Acquisition date : 1-APR-2013 09:00:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
2	474.26	313	2885	2.07	474.36	472	12	49.3	8.63E-01	
2	479.98	841	3478	1.52	480.08	472	12	22.2		
0	486.42	890	4044	1.69	486.52	484	6	23.6		
0	510.25*	1420	5730	3.51	510.35	506	10	20.7		
0	533.29	468	4061	1.87	533.39	530	7	46.0		
0	544.38	186	3999	1.38	544.48	541	7	113.8		
0	580.13	620	4345	1.81	580.23	576	8	37.6		
0	608.73*	82735	3874	1.68	608.84	605	8	0.7		BI-214
0	616.24	203	2446	1.92	616.34	614	6	78.6		
0	664.81	2236	3474	1.70	664.91	661	9	10.4		
0	670.49	106	1736	1.84	670.59	669	5	120.1		
0	702.45	703	2648	2.11	702.54	700	7	25.4		NB-94
0	719.25	582	2927	1.99	719.35	716	8	33.2		
0	741.72	492	3176	2.38	741.82	738	9	42.4		
0	767.59*	7710	3691	1.84	767.69	762	11	3.8		
0	785.10	1699	3443	1.99	785.20	781	10	13.8		
0	805.49	1893	2991	2.05	805.59	802	9	11.4		
0	820.16	200	1753	2.03	820.26	818	5	64.2		
3	825.27	248	1749	2.28	825.37	823	12	52.2	8.43E-01	
3	831.17	385	2452	2.36	831.26	823	12	43.7		PB-211
0	838.42	998	2869	1.92	838.51	835	8	19.6		
0	871.56	128	2167	2.73	871.66	870	6	115.9		NB-94
0	890.05	107	1838	2.14	890.14	888	5	121.2		SC-46
0	909.10	182	2487	3.15	909.20	907	7	92.2		
0	933.30*	3952	3278	2.09	933.39	929	10	6.3		
0	963.17	405	2143	1.95	963.27	960	7	39.2		
0	1000.28*	192	1972	1.51	1000.37	997	7	78.1		PA-234M
0	1021.94	165	1944	4.69	1022.03	1019	8	93.9		
0	1031.44	95	1231	2.99	1031.53	1030	5	113.0		
0	1051.14	444	2175	1.65	1051.23	1047	9	39.1		
0	1068.85	359	2414	1.77	1068.94	1063	10	52.3		
0	1094.15	131	1609	3.38	1094.23	1092	7	102.9		
0	1103.26	213	1621	2.39	1103.35	1100	7	64.2		
0	1119.46*	17631	2766	2.21	1119.55	1114	12	1.9		BI-214 SC-46
0	1132.91	328	1731	3.31	1132.99	1129	8	45.2		
0	1154.31	2036	2185	2.27	1154.39	1150	10	9.7		
0	1172.59*	155	1531	4.70	1172.68	1169	8	89.4		
0	1180.88	422	1807	3.01	1180.96	1177	10	38.9		
0	1206.55	532	2099	2.09	1206.64	1201	11	34.4		
0	1237.20*	6481	1830	2.23	1237.28	1232	10	3.5		
0	1252.31	382	1560	2.92	1252.40	1248	9	38.7		
0	1280.03	1531	1310	2.14	1280.12	1276	8	9.7		
0	1316.23	119	914	3.01	1316.31	1314	6	83.2		
2	1376.68*	4702	1055	2.28	1376.76	1371	19	3.7	9.44E-01	
2	1384.32	922	1004	2.38	1384.40	1371	19	13.2		
3	1400.53	1385	1102	2.34	1400.61	1396	16	9.6	1.67E+00	
3	1406.95*	2391	1146	2.21	1407.03	1396	16	6.2		
0	1460.02*	639	1596	2.07	1460.10	1456	9	23.9		K-40
0	1508.00	2227	1667	2.34	1508.07	1503	10	8.1		
3	1537.36	455	1410	3.06	1537.44	1532	16	31.2	2.66E+00	

Sample ID : 1303012-13 Acquisition date : 1-APR-2013 09:00:53

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
3	1542.26	473	1319	3.06	1542.33	1532	16	30.2		
0	1582.29	642	1044	2.40	1582.37	1578	9	19.8		
4	1593.65	226	975	2.59	1593.72	1589	14	49.3	2.24E+00	
4	1598.22	300	931	2.82	1598.29	1589	14	38.0		
0	1607.64	133	895	3.87	1607.71	1604	9	83.3		
0	1660.15	976	954	2.41	1660.22	1653	13	14.5		
0	1682.39	217	579	2.54	1682.46	1677	11	45.0		
0	1691.61	289	504	3.49	1691.69	1687	10	31.3		
2	1723.38	70	174	1.92	1723.45	1722	15	57.3	3.79E+00	
2	1728.40	3088	305	2.49	1728.48	1722	15	4.1		
0	1763.28*	14121	537	2.61	1763.35	1757	12	1.8		BI-214
0	1812.99	46	260	2.47	1813.06	1810	7	119.1		
2	1837.21	294	273	2.47	1837.28	1833	19	22.3	9.93E-01	
2	1846.13	1910	346	2.69	1846.20	1833	19	5.7		
0	1872.05	214	420	1.63	1872.12	1867	10	38.4		
3	1888.74	131	405	3.23	1888.80	1882	21	59.6	2.53E+00	
3	1894.57	134	301	2.65	1894.64	1882	21	49.9		
3	1898.17	88	363	3.24	1898.24	1882	21	89.6		
0	1935.12	204	444	3.83	1935.19	1930	11	42.4		
0	2008.63	64	214	2.53	2008.69	2005	8	83.3		
0	2017.75	85	254	6.49	2017.81	2013	10	73.9		
0	2028.54	35	158	3.43	2028.61	2027	7	124.4		
0	2051.65	88	211	3.60	2051.72	2046	11	68.1		
0	2093.16	77	249	9.11	2093.22	2084	16	96.8		
2	2108.46	76	76	3.03	2108.53	2105	22	44.8	1.31E+00	
2	2117.02	941	91	2.89	2117.08	2105	22	7.5		
0	2146.32	46	58	2.63	2146.38	2143	7	63.5		
2	2190.60	54	116	3.07	2190.66	2186	24	74.3	1.50E+00	
2	2202.54*	3756	101	2.94	2202.60	2186	24	3.4		
0	2260.93	64	124	19.21	2260.99	2250	24	95.7		
0	2291.81	235	83	2.80	2291.87	2286	14	20.9		
0	2367.76	10	7	3.37	2367.82	2365	6	97.4		
0	2445.91	1054	36	3.05	2445.97	2439	13	6.6		
0	2501.45	16	8	2.49	2501.51	2495	11	85.1		
0	2589.04	6	4	4.19	2589.09	2585	7	141.4		
0	2613.16*	53	14	2.69	2613.21	2607	11	39.9		
0	2666.95	7	0	2.50	2667.00	2664	6	75.6		
0	2693.42	15	14	3.81	2693.47	2686	14	117.8		
0	2725.63	9	3	2.51	2725.68	2722	8	100.3		
0	2768.86	19	5	3.83	2768.91	2763	10	63.9		
0	2783.61	11	2	2.91	2783.66	2778	9	80.7		
0	2802.81	7	0	1.98	2802.86	2799	7	75.6		
0	2832.67	7	0	3.31	2832.71	2829	7	75.6		
0	2879.40	8	2	1.05	2879.44	2874	9	99.5		
0	2890.54	8	2	2.71	2890.59	2886	8	91.3		
0	2920.01	12	4	3.89	2920.05	2915	9	86.5		
0	2976.06	10	0	2.38	2976.10	2972	9	63.2		
0	2997.10	7	0	1.98	2997.14	2993	8	75.6		
0	3052.23	8	4	1.76	3052.27	3048	7	110.4		

Summary of Nuclide Activity
Sample ID : 1303012-13
Acquisition date : 1-APR-2013 09:00:53

Total number of lines in spectrum	133	
Number of unidentified lines	80	
Number of lines tentatively identified by NID	53	39.85%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.937E+01	1.937E+01	0.500E+01	25.80	
PB-210	22.26Y	1.00	1.064E+02	1.067E+02	0.135E+02	12.62	
PB-211	3.28E+04Y	1.00	3.249E+01	3.249E+01	0.912E+01	28.07	
BI-214	1602.00Y	1.00	3.080E+02	3.080E+02	0.224E+02	7.26	
PB-214	1602.00Y	1.00	3.150E+02	3.150E+02	0.358E+02	11.37	
RN-219	3.28E+04Y	1.00	2.019E+01	2.019E+01	0.480E+01	23.80	
RA-223	3.28E+04Y	1.00	1.662E+01	1.662E+01	0.727E+01	43.72	
RA-224	1.41E+10Y	1.00	6.118E+02	6.118E+02	0.951E+02	15.54	
RA-226	1602.00Y	1.00	4.442E+02	4.442E+02	8.141E+02	183.27	
PA-233	27.00D	2.30	6.061E-01	1.392E+00	1.584E+00	113.77	
PA-234M	4.47E+09Y	1.00	5.130E+01	5.130E+01	4.041E+01	78.77	
TH-234	4.47E+09Y	1.00	3.337E+01	3.337E+01	0.901E+01	26.99	
U-235	7.04E+08Y	1.00	8.482E+00	8.482E+00	2.952E+00	34.81	
			---------	---------			
	Total Activity :		1.968E+03	1.969E+03			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
SC-46	83.83D	1.31	2.406E-01	3.146E-01	3.824E-01	121.57	
NB-94	20300.00Y	1.00	2.824E-01	2.824E-01	3.283E-01	116.24	
AM-243	7380.00Y	1.00	8.274E+01	8.274E+01	0.790E+01	9.55	
			---------	---------			
	Total Activity :		8.327E+01	8.334E+01			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.589E+01	7.965E+01	1.442E+01	18.11	
SN-126	1.00E+05Y	1.00	7.633E+00	7.633E+00	1.304E+00	17.09	
NP-237	2.14E+06Y	1.00	2.244E+01	2.244E+01	0.382E+01	17.03	
			---------	---------			
	Total Activity :		1.060E+02	1.097E+02			

Grand Total Activity : 2.157E+03 2.162E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	4.705E-01	1.937E+01	1.937E+01	25.80	OK
	Final Mean for 1 Valid Peaks = 1.937E+01+/- 4.998E+00 (25.80%)						
PB-210	46.50	4.25*	1.969E+00	1.064E+02	1.067E+02	12.62	OK
	Final Mean for 1 Valid Peaks = 1.067E+02+/- 1.347E+01 (12.62%)						
PB-211	404.84	2.90*	1.290E+00	3.726E+01	3.726E+01	35.46	OK
	831.96	2.90	7.168E-01	2.814E+01	2.814E+01	44.79	OK
	Final Mean for 2 Valid Peaks = 3.249E+01+/- 9.120E+00 (28.07%)						
BI-214	609.31	46.30*	9.260E-01	2.935E+02	2.935E+02	10.38	OK
	1120.29	15.10	5.678E-01	3.127E+02	3.128E+02	10.94	<<WM Interf
	1764.49	15.80	4.183E-01	3.249E+02	3.249E+02	10.12	OK
	2204.22	4.98	3.725E-01	-----	Line Not Found	-----	Absent
	Final Mean for 2 Valid Peaks = 3.080E+02+/- 2.236E+01 (7.26%)						
PB-214	295.21	19.19	1.631E+00	3.128E+02	3.129E+02	18.61	OK
	351.92	37.19*	1.436E+00	3.163E+02	3.163E+02	14.36	OK
	Final Mean for 2 Valid Peaks = 3.150E+02+/- 3.580E+01 (11.37%)						
RN-219	401.80	6.50*	1.298E+00	2.019E+01	2.019E+01	23.80	OK
	Final Mean for 1 Valid Peaks = 2.019E+01+/- 4.804E+00 (23.80%)						
RA-223	323.87	3.88*	1.527E+00	1.662E+01	1.662E+01	43.72	OK
	Final Mean for 1 Valid Peaks = 1.662E+01+/- 7.265E+00 (43.72%)						
RA-224	240.98	3.95*	1.863E+00	6.118E+02	6.118E+02	15.54	OK
	Final Mean for 1 Valid Peaks = 6.118E+02+/- 9.511E+01 (15.54%)						
RA-226	186.21	3.28*	2.147E+00	4.442E+02	4.442E+02	183.27	OK
	Final Mean for 1 Valid Peaks = 4.442E+02+/- 8.141E+02 (183.27%)						
PA-233	311.98	38.60*	1.569E+00	6.061E-01	1.392E+00	113.77	OK
	Final Mean for 1 Valid Peaks = 1.392E+00+/- 1.584E+00 (113.77%)						
PA-234M	1001.03	0.92*	6.188E-01	5.130E+01	5.130E+01	78.77	OK
	Final Mean for 1 Valid Peaks = 5.130E+01+/- 4.041E+01 (78.77%)						

Sample ID : 1303012-13 Acquisition date : 1-APR-2013 09:00:53

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.351E+00	3.337E+01	3.337E+01	26.99	OK

Final Mean for 1 Valid Peaks = 3.337E+01+/- 9.007E+00 (26.99%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-235	143.76	10.50*	2.382E+00	8.455E+00	8.455E+00	38.18	OK
	163.35	4.70	2.275E+00	8.615E+00	8.615E+00	84.69	OK
	205.31	4.70	2.043E+00	----- Line	Not Found	-----	Absent

Final Mean for 2 Valid Peaks = 8.482E+00+/- 2.952E+00 (34.81%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SC-46	889.25	99.98*	6.794E-01	2.406E-01	3.146E-01	121.57	OK
	1120.51	99.99	5.677E-01	4.724E+01	6.175E+01	10.94	<<WM Interf

Final Mean for 1 Valid Peaks = 3.146E-01+/- 3.824E-01 (121.57%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NB-94	702.63	100.00	8.231E-01	1.299E+00	1.299E+00	27.28	<<WM N-Sigma
	871.10	100.00*	6.907E-01	2.824E-01	2.824E-01	116.24	OK

Final Mean for 1 Valid Peaks = 2.824E-01+/- 3.283E-01 (116.24%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.478E+00	8.274E+01	8.274E+01	9.55	OK

Final Mean for 1 Valid Peaks = 8.274E+01+/- 7.902E+00 (9.55%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.541E+00	7.589E+01	7.965E+01	18.11	OK

Final Mean for 1 Valid Peaks = 7.965E+01+/- 1.442E+01 (18.11%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.540E+00	7.633E+00	7.633E+00	17.09	OK

Final Mean for 1 Valid Peaks = 7.633E+00+/- 1.304E+00 (17.09%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.537E+00	2.244E+01	2.244E+01	17.03	OK

Final Mean for 1 Valid Peaks = 2.244E+01+/- 3.821E+00 (17.03%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.937E+01	4.998E+00	4.951E+00	4.373E-01	3.913
SC-46	3.146E-01	3.824E-01	6.677E-01	5.662E-02	0.471
NB-94	2.824E-01	3.283E-01	4.789E-01	4.112E-02	0.590
CD-109	7.965E+01	1.442E+01	1.377E+01	1.573E+00	5.785
SN-126	7.633E+00	1.304E+00	1.319E+00	1.283E-01	5.787
PB-210	1.067E+02	1.347E+01	1.175E+01	1.022E+00	9.081
PB-211	3.249E+01	9.120E+00	1.486E+01	1.457E+00	2.186
BI-214	3.080E+02	2.236E+01	8.990E-01	8.589E-02	342.608
PB-214	3.150E+02	3.580E+01	1.063E+00	1.463E-01	296.424
RN-219	2.019E+01	4.804E+00	6.585E+00	6.450E-01	3.066
RA-223	1.662E+01	7.265E+00	1.019E+01	1.644E+00	1.631
RA-224	6.118E+02	9.511E+01	1.031E+01	1.541E+00	59.341
RA-226	4.442E+02	8.141E+02	1.336E+01	2.447E+01	33.251
PA-233	1.392E+00	1.584E+00	2.318E+00	6.216E-01	0.601
PA-234M	5.130E+01	4.041E+01	5.229E+01	4.798E+00	0.981
TH-234	3.337E+01	9.007E+00	1.332E+01	1.027E+00	2.505
U-235	8.482E+00	2.952E+00	4.052E+00	7.470E-01	2.093
NP-237	2.244E+01	3.821E+00	4.109E+00	3.955E-01	5.460
AM-243	8.274E+01	7.902E+00	7.589E-01	6.497E-02	109.032

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	9.848E+00		4.846E+00	6.075E+00	6.070E-01	1.621
NA-22	8.204E-02		3.329E-01	4.877E-01	4.432E-02	0.168
AL-26	1.333E-02		1.985E-01	3.064E-01	2.811E-02	0.043
TI-44	1.351E+00	+	4.187E-01	5.713E-01	4.588E-02	2.365
V-48	2.647E-01		1.173E+00	1.949E+00	1.764E-01	0.136
CR-51	-3.404E+00		7.216E+00	8.993E+00	1.499E+00	-0.378
MN-54	7.871E-01		4.306E-01	5.296E-01	4.643E-02	1.486
CO-56	6.167E-02		4.112E-01	6.157E-01	5.364E-02	0.100
CO-57	1.195E-01		3.041E-01	4.943E-01	6.046E-02	0.242
CO-58	9.755E-02		4.087E-01	6.148E-01	5.464E-02	0.159
FE-59	-1.097E-01		1.238E+00	1.427E+00	1.494E-01	-0.077
CO-60	4.347E-01	+	3.915E-01	4.901E-01	5.068E-02	0.887
ZN-65	2.166E+01		2.533E+00	1.954E+00	1.948E-01	11.082
SE-75	1.324E-01		6.231E-01	7.945E-01	1.389E-01	0.167
RB-82	-4.710E+00		6.531E+00	7.566E+00	6.793E-01	-0.623
RB-83	6.441E-01		6.662E-01	1.086E+00	1.782E-01	0.593
KR-85	7.943E+01		5.870E+01	9.102E+01	9.075E+00	0.873
SR-85	4.882E-01		3.607E-01	5.594E-01	5.578E-02	0.873
Y-88	1.359E+00	+	3.324E-01	5.210E-01	4.794E-02	2.609
NB-93M	3.907E+00		1.222E+01	2.054E+01	8.111E+00	0.190
NB-95	2.613E+01		2.693E+00	1.664E+00	1.500E-01	15.699
ZR-95	-8.412E-01		7.446E-01	1.086E+00	1.072E-01	-0.774
RU-103	-3.258E-01		4.440E-01	7.480E-01	1.125E-01	-0.436
RU-106	1.283E-01		2.579E+00	3.930E+00	5.469E-01	0.033

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-108M	1.279E-01		3.034E-01	4.610E-01	4.188E-02	0.277
AG-110M	2.057E-01		2.970E-01	4.555E-01	4.164E-02	0.451
SN-113	6.190E-01		5.080E-01	7.931E-01	7.916E-02	0.780
TE123M	1.740E-01		4.758E-01	6.218E-01	5.612E-02	0.280
SB-124	-2.292E-02		4.081E-01	6.208E-01	5.960E-02	-0.037
I-125	-1.485E+01		7.712E+00	1.148E+01	1.282E+00	-1.293
SB-125	2.048E+00	+	1.119E+00	1.539E+00	1.546E-01	1.331
SB-126	1.248E+01	+	4.330E+00	5.200E+00	4.726E-01	2.400
I-129	-4.035E-01		7.898E-01	1.080E+00	1.494E-01	-0.374
I-131	1.207E+00		4.497E+00	7.786E+00	9.799E-01	0.155
BA-133	3.147E-01		4.470E-01	6.427E-01	1.074E-01	0.490
CS-134	5.273E+00		6.481E-01	6.242E-01	5.996E-02	8.449
CS-135	1.623E+01		3.412E+00	2.844E+00	5.078E-01	5.707
CS-136	2.618E+00		2.316E+00	3.476E+00	3.388E-01	0.753
CS-137	1.386E+00		3.500E-01	5.241E-01	4.778E-02	2.644
LA-138	-8.690E-02		4.788E-01	7.728E-01	6.591E-02	-0.112
CE-139	7.009E-01		4.192E-01	6.212E-01	5.211E-02	1.128
BA-140	4.697E+00		7.532E+00	9.135E+00	3.060E+00	0.514
LA-140	8.673E+00		2.475E+00	3.453E+00	3.062E-01	2.512
CE-141	1.758E+00		1.285E+00	1.806E+00	4.664E-01	0.974
CE-144	-1.158E+00		2.499E+00	4.030E+00	4.535E-01	-0.287
PM-144	3.368E-01		2.820E-01	4.333E-01	3.951E-02	0.777
PM-145	-3.895E+00		2.966E+00	2.298E+00	1.503E+00	-1.695
PM-146	2.005E+00	+	8.582E-01	1.066E+00	1.063E-01	1.880
ND-147	2.799E+01		1.547E+01	2.391E+01	2.376E+00	1.170
EU-152	5.070E+01	+	6.626E+00	5.838E+00	6.297E-01	8.684
GD-153	-1.181E+00		1.135E+00	1.828E+00	1.964E-01	-0.646
EU-154	2.151E-01		9.214E-01	1.350E+00	1.226E-01	0.159
EU-155	9.264E+00	+	1.578E+00	1.884E+00	1.814E-01	4.916
EU-156	5.353E+00		1.376E+01	1.892E+01	4.339E+00	0.283
HO-166M	-7.545E-02		5.515E-01	7.586E-01	6.900E-02	-0.099
HF-172	-8.585E-01		2.222E+00	3.593E+00	4.278E-01	-0.239
LU-172	1.573E+01	+	1.627E+01	2.240E+01	2.199E+00	0.702
LU-173	1.366E+01		2.890E+00	2.284E+00	4.176E-01	5.982
HF-175	-2.058E-01		5.363E-01	6.675E-01	9.698E-02	-0.308
LU-176	-1.644E-01		2.916E-01	4.164E-01	7.237E-02	-0.395
TA-182	1.520E+02		1.658E+01	5.818E+00	5.819E-01	26.120
IR-192	1.078E+00	+	8.051E-01	1.137E+00	1.135E-01	0.949
HG-203	-4.400E-01		6.818E-01	8.505E-01	1.634E-01	-0.517
BI-207	4.379E-01		2.577E-01	4.214E-01	4.126E-02	1.039
TL-208	1.289E+00		8.852E-01	1.368E+00	1.330E-01	0.943
BI-210M	6.023E-01		6.913E-01	8.798E-01	1.510E-01	0.685
BI-212	9.981E-02		2.284E+00	3.447E+00	3.129E-01	0.029
PB-212	1.068E+01		1.748E+00	1.117E+00	1.643E-01	9.565
RA-225	3.571E+00		4.555E+00	7.069E+00	6.984E-01	0.505
TH-227	2.108E+01	+	4.215E+00	3.939E+00	5.690E-01	5.351
AC-228	1.052E+00		1.244E+00	1.872E+00	1.596E-01	0.562
TH-230	3.447E+02	+	1.068E+02	1.457E+02	1.168E+01	2.366

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-231	2.329E+01		1.270E+01	1.769E+01	3.124E+00	1.316
TH-231	3.724E+00	+	3.926E+00	5.272E+00	9.065E-01	0.706
PA-234	-1.494E+00		1.225E+00	1.949E+00	2.232E-01	-0.767
AM-241	7.138E+00		1.075E+00	1.420E+00	1.062E-01	5.025
CM-243	-1.443E+00		2.020E+00	2.882E+00	5.452E-01	-0.501

Summary of Nuclide Activity
Sample ID : 1303012-13

Acquisition date : 1-APR-2013 09:00:53

Total number of lines in spectrum	133	
Number of unidentified lines	80	
Number of lines tentatively identified by NID	53	39.85%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.937E+01	1.937E+01	0.500E+01	25.80	
PB-210	22.26Y	1.00	1.064E+02	1.067E+02	0.135E+02	12.62	
PB-211	3.28E+04Y	1.00	3.249E+01	3.249E+01	0.912E+01	28.07	
BI-214	1602.00Y	1.00	3.080E+02	3.080E+02	0.224E+02	7.26	
PB-214	1602.00Y	1.00	3.150E+02	3.150E+02	0.358E+02	11.37	
RN-219	3.28E+04Y	1.00	2.019E+01	2.019E+01	0.480E+01	23.80	
RA-223	3.28E+04Y	1.00	1.662E+01	1.662E+01	0.727E+01	43.72	
RA-224	1.41E+10Y	1.00	6.118E+02	6.118E+02	0.951E+02	15.54	
RA-226	1602.00Y	1.00	4.442E+02	4.442E+02	8.141E+02	183.27	
PA-233	27.00D	2.30	6.061E-01	1.392E+00	1.584E+00	113.77	
PA-234M	4.47E+09Y	1.00	5.130E+01	5.130E+01	4.041E+01	78.77	
TH-234	4.47E+09Y	1.00	3.337E+01	3.337E+01	0.901E+01	26.99	
U-235	7.04E+08Y	1.00	8.482E+00	8.482E+00	2.952E+00	34.81	
			---------	---------			
	Total Activity :		1.968E+03	1.969E+03			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
SC-46	83.83D	1.31	2.406E-01	3.146E-01	3.824E-01	121.57	
NB-94	20300.00Y	1.00	2.824E-01	2.824E-01	3.283E-01	116.24	
AM-243	7380.00Y	1.00	8.274E+01	8.274E+01	0.790E+01	9.55	
			---------	---------			
	Total Activity :		8.327E+01	8.334E+01			

Nuclide Type : FISSION

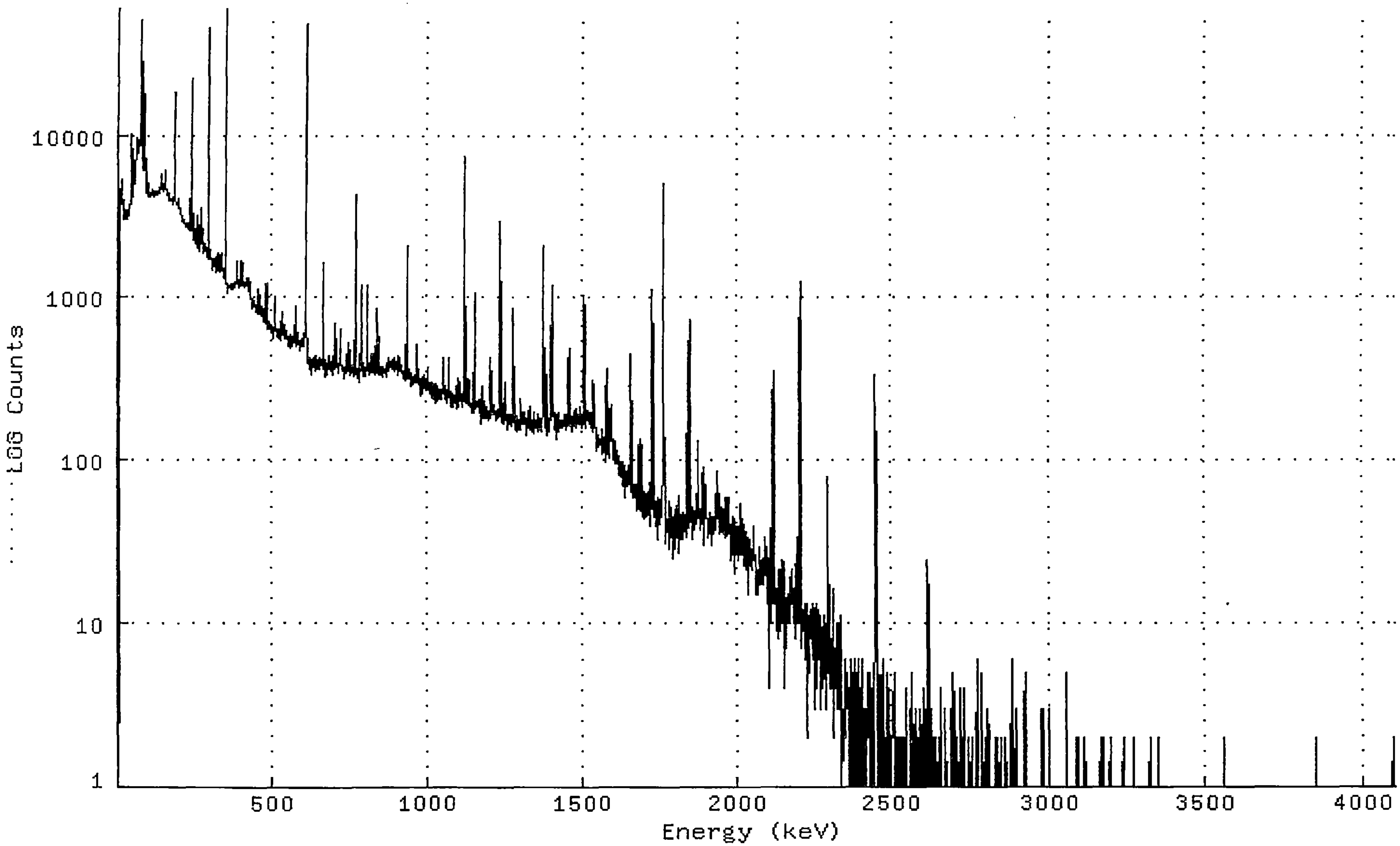
Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	7.589E+01	7.965E+01	1.442E+01	18.11	
SN-126	1.00E+05Y	1.00	7.633E+00	7.633E+00	1.304E+00	17.09	
NP-237	2.14E+06Y	1.00	2.244E+01	2.244E+01	0.382E+01	17.03	
			---------	---------			
	Total Activity :		1.060E+02	1.097E+02			

Grand Total Activity : 2.157E+03 2.162E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301213_GE2_GAS1202_190108.CNF;1
Title :
Sample Title: S30-94-130228

Start Time: 1-APR-2013 09:00:	Sample Time: 28-FEB-2013 00:00	Energy Offset: -1.16012E-01
Real Time : 0 01:00:50.05	Sample ID : 1303012-13	Energy Slope : 1.00003E+00
Live Time : 0 01:00:00.00	Sample Type: SOLID	Energy Quad : 0.00000E+00



0286

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301213_GE2_GAS1202_1901

Channel

1:	0	0	0	0	6	1650	3853	4413
9:	4227	4551	4085	5200	4944	3725	4105	4253
17:	3569	3458	3293	3157	3011	2963	2971	3162
25:	2986	3101	3422	3131	2944	3108	2986	3433
33:	3243	3135	3172	3284	3282	3254	3335	3690
41:	3674	3848	3960	4143	4355	9537	9876	4157
49:	4390	5651	4711	4855	8041	5953	4963	5214
57:	5352	6098	6635	6988	7362	7645	9306	8229
65:	7621	7574	8729	9138	7955	7771	8194	8389
73:	8721	17780	29780	16446	48854	15596	9012	7737
81:	8873	6035	7715	10834	5964	7397	17613	10524
89:	7121	9521	5317	6224	6694	5737	5820	4360
97:	4472	4892	4398	4246	4093	4164	4291	4128
105:	4189	4220	4261	4219	4313	4442	4386	4469
113:	4526	4278	4311	4127	4421	4295	4287	4298
121:	4233	4508	4378	4255	4380	4264	4453	4446
129:	4425	4262	4487	4320	4316	4491	4476	4422
137:	4458	4636	4670	4710	4616	4602	4874	5709
145:	4772	4507	4714	4658	4798	4743	4952	4851
153:	5004	5975	5013	4663	4614	4581	4465	4414
161:	4256	4258	4357	4309	4208	4012	4053	3921
169:	4009	3896	3921	3988	3880	3946	3847	3863
177:	3712	3882	3809	3942	4154	4066	3982	4040
185:	7077	17962	7232	3885	3807	3725	3720	3667
193:	3718	3678	3786	3958	3615	3563	3511	3524
201:	3518	3474	3387	3243	3402	3313	3033	3097
209:	3022	3094	3072	2921	2966	2828	2897	2938
217:	2851	2862	2864	2728	2828	2730	2740	2685
225:	2747	2802	2714	2726	2665	2643	2654	2568
233:	2613	2629	3176	4035	2691	2802	2766	2532
241:	10476	21374	4605	2321	2277	2208	2200	2218
249:	2194	2235	2198	2115	2244	2194	2335	2947
257:	2289	2795	3139	2182	2017	1982	1946	2092
265:	1995	1971	1896	2185	3490	3031	3250	2269
273:	2118	2655	2546	1891	1880	1967	1865	1958
281:	2055	1916	2029	1951	1951	2083	1891	1869
289:	1850	1774	1848	1769	1973	13490	44571	11539
297:	1821	1699	1837	1955	1685	1787	1704	1717
305:	1702	1585	1532	1458	1529	1554	1533	1610
313:	1638	1714	1545	1519	1576	1428	1487	1494
321:	1431	1481	1710	1824	1481	1486	1462	1509
329:	1667	1788	1480	1418	1596	1603	1545	1489
337:	1476	1827	1500	1454	1437	1415	1431	1306
345:	1446	1431	1459	1551	1639	4078	45198	59700
353:	6861	1239	1137	1206	1133	1163	1175	1057
361:	1154	1159	1163	1176	1153	1140	1097	1169
369:	1123	1161	1200	1179	1198	1116	1204	1169
377:	1157	1114	1150	1153	1229	1161	1168	1197
385:	1235	1538	1557	1600	1638	1199	1212	1146
393:	1158	1280	1168	1160	1159	1154	1167	1217
401:	1665	1645	1208	1395	1613	1369	1214	1235
409:	1172	1213	1218	1223	1240	1152	1210	1207
417:	1261	1285	1197	1181	1231	1252	1161	1217
425:	1080	1199	1310	1174	1016	983	976	964

433:	1027	889	839	951	968	896	953	929
441:	871	933	908	864	944	945	852	855
449:	856	832	808	820	870	1117	1043	814
457:	788	805	791	842	1026	1005	818	795
465:	782	756	752	786	863	879	753	708
473:	759	849	796	748	725	714	800	1207
481:	908	688	664	704	702	975	1190	736
489:	627	707	627	669	650	689	659	611
497:	616	598	637	644	627	629	621	615
505:	574	555	633	667	859	984	909	798
513:	611	632	597	563	575	572	619	631
521:	571	608	600	569	557	598	574	583
529:	602	534	620	619	814	737	617	588
537:	591	605	578	604	550	584	674	612
545:	571	612	582	552	584	561	551	501
553:	570	525	571	563	581	576	524	561
561:	566	486	523	559	495	526	553	561
569:	585	543	561	664	567	536	528	527
577:	522	492	768	868	605	598	585	527
585:	515	516	506	512	513	470	517	489
593:	519	546	530	492	517	545	512	501
601:	500	527	555	598	542	579	1889	23954
609:	46423	12037	808	394	419	410	484	476
617:	419	436	424	382	393	364	385	365
625:	400	334	395	410	406	402	408	389
633:	420	370	380	392	396	405	430	373
641:	405	348	408	361	396	399	392	415
649:	425	375	371	361	378	377	390	379
657:	408	401	389	388	428	359	400	995
665:	1633	783	398	359	355	383	411	369
673:	324	358	355	334	390	395	340	373
681:	370	421	440	398	374	405	373	387
689:	361	346	351	357	353	354	336	386
697:	436	420	378	364	413	689	667	465
705:	383	370	397	396	403	411	384	391
713:	363	343	365	360	385	411	629	595
721:	387	377	365	372	347	360	380	360
729:	372	318	356	360	350	354	359	337
737:	377	357	384	424	482	526	412	367
745:	364	352	332	359	399	370	357	468
753:	396	341	358	385	352	368	355	342
761:	336	322	334	368	433	691	2617	4211
769:	1380	390	335	323	361	317	323	328
777:	325	298	327	324	322	320	358	556
785:	1174	946	423	353	359	331	392	354
793:	355	324	360	323	341	360	374	344
801:	343	320	358	439	1073	1171	501	362
809:	330	330	336	360	380	393	344	345
817:	356	348	377	446	445	337	362	391
825:	427	440	375	335	362	388	503	472
833:	373	354	347	345	417	852	734	430
841:	384	358	372	350	331	347	362	350
849:	368	332	343	331	341	336	348	323
857:	374	348	360	360	354	356	343	376
865:	320	378	389	368	338	348	423	379
873:	413	359	373	375	372	397	383	379
881:	402	389	388	414	395	402	382	356
889:	393	427	423	346	387	402	357	372
897:	389	397	378	378	377	328	438	402
905:	411	340	350	397	393	424	387	376

913:	342	384	377	353	340	348	347	311
921:	345	316	340	331	331	306	310	334
929:	331	332	359	726	2076	1865	589	315
937:	323	316	332	323	357	324	326	344
945:	300	307	298	284	320	326	314	307
953:	303	326	288	316	334	329	301	309
961:	301	346	512	466	317	297	317	356
969:	312	309	302	306	299	299	279	319
977:	256	278	267	247	254	321	263	270
985:	299	283	331	297	278	307	307	319
993:	270	304	313	299	277	314	299	368
1001:	319	304	286	268	286	265	295	279
1009:	261	257	240	259	290	273	269	274
1017:	295	272	234	289	287	280	271	290
1025:	233	225	246	258	248	264	282	278
1033:	271	231	249	248	268	233	244	245
1041:	238	267	256	260	260	241	232	268
1049:	267	284	427	336	277	283	245	247
1057:	254	258	234	268	221	244	222	228
1065:	270	252	262	265	419	357	258	240
1073:	258	219	241	215	253	212	213	213
1081:	233	252	249	224	234	228	248	240
1089:	240	235	207	227	255	243	284	271
1097:	225	235	244	213	250	274	317	288
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1129:	214	232	230	300	311	305	253	214
1137:	220	212	240	195	222	210	219	209
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1153:	502	1045	933	405	239	206	210	220
1161:	214	215	230	212	216	222	232	226
1169:	197	222	225	230	234	208	212	165
1177:	188	216	220	255	286	247	211	226
1185:	200	180	188	218	212	200	205	197
1193:	193	181	206	197	185	183	182	182
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1209:	212	206	196	209	190	188	191	215
1217:	215	194	194	192	181	177	182	196
1225:	198	205	187	184	192	192	180	183
1233:	185	184	316	1203	2882	2302	658	225
1241:	175	194	185	171	202	197	169	168
1249:	165	199	248	278	295	209	204	176
1257:	179	175	181	151	187	174	180	164
1265:	178	182	191	191	163	173	177	175
1273:	192	186	169	171	170	193	483	853
1281:	583	237	151	165	178	170	175	160
1289:	163	165	148	186	173	166	152	152
1297:	161	174	173	154	153	218	236	191
1305:	153	180	171	165	197	176	174	172
1313:	170	166	187	195	178	163	144	140
1321:	171	173	179	182	166	157	183	165
1329:	173	199	166	158	153	210	166	169
1337:	156	164	174	148	173	159	193	169
1345:	167	159	157	145	160	176	166	160
1353:	164	167	187	160	165	148	156	168
1361:	159	162	168	164	154	170	179	154
1369:	176	162	150	155	170	195	507	1597
1377:	2038	991	295	160	161	157	248	489
1385:	458	239	147	146	143	140	155	168

1393:	181	154	150	159	170	175	281	639
1401:	675	347	191	184	257	723	1162	796
1409:	252	151	153	181	184	181	172	170
1417:	168	184	135	172	152	191	148	192
1425:	172	194	149	177	171	166	166	156
1433:	173	172	159	167	162	174	171	175
1441:	161	186	184	192	179	170	176	167
1449:	155	169	179	190	161	180	188	171
1457:	165	188	382	482	296	200	175	188
1465:	163	181	181	150	167	148	185	180
1473:	165	160	199	170	190	177	204	167
1481:	171	159	187	185	186	169	182	187
1489:	164	210	179	171	171	178	164	191
1497:	192	186	180	157	186	158	164	196
1505:	182	276	561	1022	800	327	208	158
1513:	186	175	182	175	173	201	193	173
1521:	197	167	186	176	179	193	185	194
1529:	194	180	178	156	186	147	217	210
1537:	269	304	210	180	245	293	285	183
1545:	157	159	128	149	114	139	149	135
1553:	134	128	129	142	119	135	130	123
1561:	130	135	132	134	128	121	107	118
1569:	154	121	112	136	121	127	119	130
1577:	115	123	97	146	227	357	340	152
1585:	126	118	109	132	124	112	102	122
1593:	205	199	158	131	172	216	197	149
1601:	118	109	113	99	118	134	132	119
1609:	115	110	106	95	94	95	95	98
1617:	115	103	96	81	103	84	93	104
1625:	87	82	90	89	98	79	85	69
1633:	92	93	98	72	88	77	84	91
1641:	81	77	59	77	75	78	70	86
1649:	71	71	85	77	90	93	91	64
1657:	80	92	253	447	355	148	81	72
1665:	64	63	58	65	71	62	59	63
1673:	63	58	63	55	54	70	48	57
1681:	70	120	125	88	66	50	48	54
1689:	68	94	104	135	114	65	55	56
1697:	47	45	64	48	59	44	44	62
1705:	59	45	54	58	53	60	64	46
1713:	47	51	51	60	68	50	57	54
1721:	48	39	73	50	61	125	472	1111
1729:	1088	434	125	72	58	61	49	39
1737:	48	52	56	47	53	52	58	32
1745:	46	52	43	50	43	53	48	57
1753:	40	49	47	51	57	51	53	92
1761:	537	2445	4938	4486	1621	287	66	31
1769:	38	34	43	36	42	38	39	38
1777:	37	44	28	48	55	47	36	38
1785:	47	41	33	49	51	50	34	45
1793:	36	41	37	25	36	50	44	28
1801:	46	36	43	46	53	41	41	52
1809:	33	34	27	60	54	53	40	38
1817:	42	46	44	41	32	37	39	32
1825:	47	39	38	41	46	40	43	36
1833:	40	33	43	95	145	131	63	46
1841:	38	56	52	154	411	724	551	251
1849:	76	41	41	53	51	38	39	48
1857:	32	43	48	39	37	43	44	39
1865:	43	40	43	41	53	54	71	129

1873:	80	73	45	45	40	50	44	37
1881:	48	39	44	40	55	45	44	83
1889:	80	70	61	30	47	90	74	68
1897:	60	64	43	49	50	36	33	43
1905:	37	44	42	35	40	43	46	39
1913:	47	43	30	41	40	36	33	37
1921:	38	44	45	36	35	37	44	45
1929:	44	40	61	44	52	71	86	85
1937:	73	53	48	35	43	42	44	51
1945:	42	51	42	41	45	36	36	35
1953:	45	50	38	41	33	36	44	39
1961:	59	44	46	34	40	54	58	34
1969:	59	49	41	37	43	40	30	39
1977:	40	24	40	33	32	39	35	32
1985:	26	45	32	36	20	37	39	43
1993:	44	36	34	29	34	26	30	26
2001:	39	27	39	24	29	31	26	54
2009:	36	41	33	28	26	26	38	44
2017:	39	36	40	27	36	26	22	29
2025:	30	21	26	31	33	36	31	21
2033:	15	29	22	24	25	25	22	23
2041:	29	32	22	22	24	21	22	28
2049:	24	29	38	39	35	25	23	15
2057:	18	15	26	21	15	19	21	21
2065:	20	17	18	17	29	24	28	25
2073:	18	24	22	21	17	21	17	17
2081:	20	23	25	25	17	21	25	33
2089:	29	20	22	17	14	14	16	29
2097:	13	18	13	4	17	10	25	12
2105:	10	15	30	33	38	24	13	14
2113:	21	21	79	212	349	214	95	32
2121:	17	13	16	10	10	10	9	13
2129:	15	10	8	14	10	21	16	11
2137:	12	11	9	21	13	10	12	12
2145:	17	24	23	12	4	9	12	12
2153:	7	14	13	11	10	9	7	14
2161:	14	15	14	10	12	12	14	10
2169:	19	13	10	18	18	15	13	21
2177:	13	14	13	10	16	14	10	21
2185:	18	8	17	13	23	22	33	26
2193:	18	13	10	10	12	10	44	151
2201:	522	1059	1218	636	182	45	7	15
2209:	9	10	12	11	12	10	13	7
2217:	9	6	8	10	13	9	12	2
2225:	13	8	5	9	11	7	8	7
2233:	9	12	11	8	9	10	9	9
2241:	7	13	6	8	7	8	7	12
2249:	9	3	12	13	12	7	4	10
2257:	8	10	6	8	8	12	8	11
2265:	6	11	5	3	11	8	4	4
2273:	4	5	4	5	11	6	5	5
2281:	11	5	10	6	3	5	6	5
2289:	12	37	65	79	43	16	17	8
2297:	5	9	11	4	4	8	7	7
2305:	7	8	5	2	8	6	16	6
2313:	5	7	4	4	5	7	5	5
2321:	5	10	6	3	4	5	3	4
2329:	10	6	5	11	5	2	4	3
2337:	0	2	3	3	3	2	2	3
2345:	2	6	2	5	3	5	3	3

2353:	4	4	5	3	3	1	2	4
2361:	2	6	1	0	1	3	4	5
2369:	4	0	3	3	4	3	6	4
2377:	4	2	2	1	1	5	0	2
2385:	4	1	2	1	1	3	2	6
2393:	1	1	0	4	0	3	3	4
2401:	1	2	6	1	0	2	3	2
2409:	1	0	2	1	3	2	2	2
2417:	3	2	2	3	2	3	5	1
2425:	5	3	2	5	1	0	4	2
2433:	3	2	3	4	0	4	3	4
2441:	4	8	26	110	238	332	242	93
2449:	27	2	1	3	6	4	1	2
2457:	2	0	3	1	2	1	2	1
2465:	4	6	2	2	3	1	1	1
2473:	0	1	1	1	2	0	3	5
2481:	2	4	2	1	4	0	1	1
2489:	0	1	1	1	1	2	1	2
2497:	2	2	2	2	3	3	5	2
2505:	0	0	1	1	2	2	0	0
2513:	0	1	2	2	0	1	2	1
2521:	0	0	0	2	1	1	1	2
2529:	2	1	1	1	2	2	0	2
2537:	0	0	2	1	2	1	2	4
2545:	0	1	0	0	0	1	0	1
2553:	3	1	0	0	2	1	3	0
2561:	1	0	5	1	0	2	2	1
2569:	1	2	3	0	0	1	1	1
2577:	0	2	2	1	1	0	3	1
2585:	0	2	0	3	2	2	0	1
2593:	0	0	1	2	2	2	1	0
2601:	4	1	2	0	1	3	2	0
2609:	1	2	8	24	22	13	2	1
2617:	0	0	2	0	0	1	1	3
2625:	1	1	0	1	0	2	0	1
2633:	2	2	0	0	2	1	0	1
2641:	1	1	1	1	1	2	2	1
2649:	0	1	4	0	2	1	1	1
2657:	1	1	0	1	0	0	0	0
2665:	0	2	3	2	0	0	1	1
2673:	1	0	1	1	0	1	1	0
2681:	1	3	2	1	0	2	0	1
2689:	0	3	4	5	5	3	2	1
2697:	1	2	0	2	0	0	1	0
2705:	1	0	0	0	1	1	0	2
2713:	0	1	2	3	4	0	1	1
2721:	2	0	1	4	3	2	1	1
2729:	0	0	0	1	0	1	0	1
2737:	1	0	0	2	2	2	1	1
2745:	1	0	0	0	0	2	0	0
2753:	0	0	1	0	0	0	0	0
2761:	1	2	0	2	0	2	4	6
2769:	4	4	2	0	0	0	0	0
2777:	1	0	1	1	0	3	1	5
2785:	2	0	0	1	1	1	0	2
2793:	0	0	2	0	1	0	0	0
2801:	1	1	3	2	0	0	0	0
2809:	1	0	1	0	1	1	0	1
2817:	0	0	0	0	1	0	0	2
2825:	2	0	1	0	0	0	1	2

2833:	2	2	0	0	0	1	0	0
2841:	0	1	2	1	0	0	1	0
2849:	0	0	1	0	0	0	2	0
2857:	0	2	0	0	0	1	1	1
2865:	0	1	0	1	0	0	1	0
2873:	1	0	1	0	0	6	1	0
2881:	2	0	0	0	0	0	0	1
2889:	1	3	3	2	0	1	0	0
2897:	1	0	1	0	1	0	0	1
2905:	0	1	0	0	1	0	0	0
2913:	0	0	0	1	0	3	2	3
2921:	5	2	0	2	0	1	0	0
2929:	0	0	1	1	1	1	0	0
2937:	0	1	1	0	0	0	0	0
2945:	0	0	1	0	1	1	0	0
2953:	0	0	0	0	1	1	0	0
2961:	0	0	1	1	0	0	0	0
2969:	0	1	0	0	0	1	3	3
2977:	1	1	1	0	0	0	0	0
2985:	0	0	0	0	0	0	0	0
2993:	0	0	0	2	3	1	1	0
3001:	0	0	0	0	0	1	0	0
3009:	0	0	0	0	0	0	0	0
3017:	0	0	0	0	0	0	0	0
3025:	1	0	1	1	0	0	0	1
3033:	0	0	0	0	0	0	0	0
3041:	0	0	0	0	0	0	1	0
3049:	0	1	5	3	2	0	1	0
3057:	0	0	0	1	0	0	0	0
3065:	0	0	0	0	0	0	1	1
3073:	1	0	0	0	0	1	0	0
3081:	1	0	0	0	0	2	1	0
3089:	0	1	2	1	0	0	0	0
3097:	1	0	0	0	0	1	0	0
3105:	0	0	0	0	0	2	0	1
3113:	0	1	0	1	0	0	0	0
3121:	0	0	0	1	0	0	0	0
3129:	0	1	0	1	0	1	1	0
3137:	0	0	0	0	0	0	0	0
3145:	0	1	1	0	1	0	0	1
3153:	0	0	0	0	0	0	1	2
3161:	0	0	0	0	0	1	0	2
3169:	0	0	1	0	0	1	1	0
3177:	0	0	0	0	0	1	1	0
3185:	0	0	0	1	0	0	2	0
3193:	1	1	2	0	0	0	0	1
3201:	1	0	0	0	0	0	0	0
3209:	0	0	0	1	0	1	0	0
3217:	0	1	0	0	0	0	0	0
3225:	0	1	0	0	0	1	1	1
3233:	0	2	0	0	0	0	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	0	1	0	0	0	0
3257:	1	0	0	1	1	1	0	0
3265:	0	2	0	0	0	0	0	1
3273:	0	1	0	0	0	0	0	1
3281:	1	0	0	0	0	0	0	0
3289:	1	0	0	0	0	0	0	0
3297:	0	0	0	1	0	0	0	0
3305:	1	0	1	0	0	0	0	0

3313:	0	0	0	0	1	0	0	2
3321:	0	1	0	0	1	0	0	0
3329:	1	0	0	0	0	0	0	0
3337:	0	0	1	0	0	0	0	0
3345:	1	0	0	0	2	0	0	0
3353:	0	0	0	0	0	1	0	1
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	1	0	0	0
3377:	0	0	0	0	0	1	0	0
3385:	0	0	0	0	1	0	0	0
3393:	0	0	1	0	0	0	0	1
3401:	0	0	0	0	0	0	0	0
3409:	0	0	1	0	0	0	0	0
3417:	0	0	0	0	1	0	0	0
3425:	0	0	0	0	0	0	0	1
3433:	0	0	0	0	0	0	0	0
3441:	0	0	0	0	1	0	0	0
3449:	0	0	0	0	0	0	1	0
3457:	0	0	0	1	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	1	0	0	0	0	0	0	0
3481:	0	0	1	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	1	0	0
3513:	0	0	0	0	1	1	0	0
3521:	0	0	0	1	0	0	0	0
3529:	0	1	0	0	0	0	0	0
3537:	0	0	1	0	0	0	0	0
3545:	0	1	1	0	0	0	0	0
3553:	0	1	0	2	0	0	0	0
3561:	0	0	0	0	0	1	0	0
3569:	0	0	0	0	1	0	0	0
3577:	1	0	1	0	0	1	0	0
3585:	1	0	0	0	0	0	0	0
3593:	0	0	0	0	0	1	0	1
3601:	1	0	0	0	0	0	1	0
3609:	1	0	0	0	0	0	0	0
3617:	0	0	0	0	0	1	1	1
3625:	0	0	0	0	0	0	0	0
3633:	0	0	0	0	1	0	1	0
3641:	0	1	0	1	0	0	0	0
3649:	0	1	0	0	0	0	0	0
3657:	0	0	0	1	0	0	0	1
3665:	0	0	0	0	0	1	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	1	0	0	0	1	1	0	0
3697:	0	0	0	0	1	0	0	0
3705:	0	0	0	0	1	0	0	0
3713:	0	0	0	0	0	0	0	1
3721:	1	0	0	1	0	1	0	0
3729:	0	0	0	0	0	1	0	0
3737:	0	0	0	0	1	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	0	1	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	1	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	1	0	0	0	0
3817:	0	0	0	0	0	0	1	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	1	0	0	0	0
3841:	0	0	1	0	2	0	0	0
3849:	0	0	1	0	0	0	0	0
3857:	0	0	0	1	1	0	1	0
3865:	0	0	0	1	0	0	0	0
3873:	0	0	0	0	0	0	1	1
3881:	0	0	0	1	0	1	0	0
3889:	0	0	0	1	1	0	0	0
3897:	0	0	1	0	0	0	0	0
3905:	0	0	0	1	1	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	1	0	0
3945:	0	0	1	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	1	0	0	0	0
3977:	0	0	0	0	1	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	0
4017:	0	1	0	0	0	0	0	1
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	0	1	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	1	0	0	0	0	0
4065:	0	0	1	0	0	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	1	0	0	0	0	0	2	0
4089:	0	0	0	0	0	0	1	0

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

VAX/VMS Peak Search Report Generated 1-APR-2013 10:03:34.33

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4/1/13

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301214_GE3_GAS1202_190109.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-95-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 09:02:05.
Sample ID : 1303012-14 Sample Quantity : 4.28190E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE3 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:03.27 1.7%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	26.66	211	6560	2.04	26.98	25	6	121.9		
0	46.13*	3962	7664	1.84	46.45	44	5	7.4		PB-210
0	53.11*	769	11178	1.12	53.43	51	6	44.1		
0	62.89*	3300	12797	1.36	63.21	61	5	10.9		TH-234
0	76.00	30290	29803	2.78	76.32	71	12	2.6		AM-243
0	88.29	1196	14678	1.01	88.60	85	5	31.0		SN-126
										CD-109
0	92.41*	4489	14231	1.64	92.73	90	7	9.5		
0	113.07	520	8654	1.72	113.39	111	6	57.3		
0	143.44*	581	8950	1.19	143.76	142	6	52.2		
0	153.85	429	7371	1.21	154.16	152	5	61.0		
0	185.88*	7653	9807	1.36	186.19	182	8	5.0		RA-226
0	209.98	278	5422	3.17	210.29	208	6	84.8		
1	235.85	907	3918	1.66	236.16	232	15	21.6	2.16E+01	
1	238.85*	1031	3824	1.74	239.16	232	15	19.8		PB-212
1	241.76*	8364	2926	1.43	242.07	232	15	2.8		RA-224
1	255.53	447	3141	1.76	255.84	253	10	38.8	8.02E+00	
1	258.53	593	3157	1.76	258.84	253	10	29.9		
7	270.00	1560	5264	3.14	270.30	265	13	17.6	4.24E+00	
7	274.60	438	3460	2.12	274.91	265	13	44.3		
0	295.00*	17233	4300	1.68	295.31	291	8	2.0		PB-214
0	323.73	153	2282	1.46	324.04	323	5	94.9		RA-223
0	329.04	124	2288	1.34	329.35	328	5	117.0		
0	351.72*	28252	3437	1.34	352.02	348	8	1.4		PB-214
0	387.69	505	2705	2.76	388.00	384	8	36.7		
1	401.53	245	2190	1.88	401.83	399	10	61.4	3.79E+00	RN-219
1	404.87	156	2181	1.89	405.17	399	10	97.4		PB-211
0	426.95	119	1922	1.68	427.25	425	6	118.3		
0	454.16	221	1369	1.47	454.46	452	6	54.8		
0	461.74	364	1912	4.28	462.04	458	9	44.6		
0	480.43	147	1292	1.83	480.73	478	6	79.2		
0	486.76	198	1374	1.70	487.06	484	7	63.7		
0	510.35*	350	1780	3.29	510.65	506	10	46.6		
0	533.71	162	1400	3.08	534.00	530	8	81.3		
3	579.94	192	1108	2.43	580.24	576	12	60.8	4.19E+00	
3	583.08*	270	1112	2.43	583.38	576	12	43.6		TL-208

AG
4/1/13

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	609.20*	19818	1769	1.99	609.49	603	12	1.7		BI-214
0	665.38	507	1128	1.89	665.67	662	9	25.6		
0	703.26	243	1025	1.53	703.54	699	9	49.3		
0	720.31	181	980	1.61	720.60	716	9	64.1		
0	742.69	114	852	2.06	742.98	739	8	90.8		
3	762.71	45	198	1.93	763.00	762	14	79.5	4.94E+00	
3	768.28	1920	589	2.03	768.56	762	14	6.1		
0	786.14	363	931	2.01	786.43	781	9	32.1		
0	806.04	408	1014	1.88	806.32	802	10	30.8		
1	832.53	87	670	1.84	832.82	829	15	95.0	1.74E+00	PB-211
1	838.91	232	540	1.80	839.20	829	15	32.5		
0	866.29	87	702	2.26	866.57	864	7	103.3		
0	910.87*	194	697	1.85	911.15	908	7	47.6		
0	934.12	920	903	2.12	934.40	930	10	13.9		
0	963.78	94	712	1.94	964.06	961	7	95.7		
0	1000.32	211	715	2.19	1000.59	997	9	47.6		PA-234M
0	1051.51	119	677	2.97	1051.78	1048	9	81.2		
0	1120.36*	3897	770	2.10	1120.63	1115	11	4.2		BI-214
0	1155.17	437	678	2.19	1155.44	1151	10	24.2		
0	1182.46	78	554	2.04	1182.73	1178	9	110.8		
0	1208.03	154	533	2.88	1208.30	1204	10	58.5		
0	1238.17*	1523	627	2.21	1238.43	1233	12	8.3		
0	1253.78	156	465	4.56	1254.04	1250	10	54.0		
0	1281.54	421	581	2.18	1281.80	1277	11	24.3		
3	1375.03	53	291	2.92	1375.29	1372	19	151.3	2.42E+00	
3	1377.82	1025	266	2.00	1378.08	1372	19	8.1		
3	1385.58	157	351	2.28	1385.84	1372	19	41.2		
2	1401.73	317	333	2.29	1401.99	1396	18	21.8	2.06E+00	
2	1408.37	579	353	2.56	1408.63	1396	18	13.9		
0	1429.21	69	354	3.79	1429.47	1426	9	100.8		
0	1460.86*	713	492	2.51	1461.11	1455	12	14.5		K-40
0	1509.50	447	574	2.39	1509.75	1505	12	23.4		
1	1538.60	137	324	2.33	1538.85	1532	16	46.3	1.61E+00	
1	1543.56	120	310	2.46	1543.81	1532	16	52.8		
0	1582.71	176	291	2.79	1582.96	1578	10	39.2		
0	1600.52	65	240	1.86	1600.76	1598	8	87.5		
0	1661.78	232	179	2.83	1662.02	1658	9	24.6		
0	1684.73	66	163	3.02	1684.98	1680	10	76.3		
0	1694.22	69	183	5.99	1694.46	1690	12	82.7		
0	1710.91	27	61	2.07	1711.15	1709	6	99.8		
0	1717.66	42	89	2.54	1717.90	1715	8	83.8		
0	1729.89	700	149	2.59	1730.13	1724	12	10.3		
2	1764.80*	3180	63	2.36	1765.04	1758	18	3.6	1.96E+00	BI-214
2	1773.19	33	45	2.82	1773.43	1758	18	75.2		
0	1813.33	22	45	2.38	1813.57	1811	6	106.3		
2	1838.12	54	121	2.85	1838.36	1832	24	73.6	1.65E+00	
2	1847.82	383	76	2.39	1848.06	1832	24	12.7		
2	1852.76	27	58	2.36	1853.00	1832	24	136.5		
0	1872.99	66	122	4.04	1873.22	1868	11	68.9		
0	1890.29	27	88	2.83	1890.53	1887	7	123.4		
0	1897.63	43	88	4.33	1897.86	1894	9	86.4		

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	1937.89	55	108	3.69	1938.12	1930	12	80.4		
0	2012.17	48	68	6.76	2012.40	2006	13	76.3		
0	2110.95	28	34	3.21	2111.17	2107	8	84.8		
0	2118.83	216	37	3.39	2119.06	2115	10	17.1		
4	2193.85	20	43	3.61	2194.07	2187	24	124.4	2.44E+00	
4	2204.62*	810	25	2.54	2204.84	2187	24	7.3		BI-214
3	2273.54	17	11	3.31	2273.76	2270	18	78.5	2.15E+00	
3	2280.03	15	10	2.74	2280.25	2270	18	86.1		
0	2293.61	45	19	2.17	2293.83	2288	10	47.8		
0	2321.53	12	9	4.22	2321.74	2317	11	112.8		
0	2335.64	14	8	2.25	2335.86	2331	8	88.1		
0	2347.81	19	9	5.44	2348.02	2343	12	79.3		
0	2448.24	255	3	2.82	2448.45	2441	14	12.9		
0	2483.79	8	0	2.09	2484.00	2481	6	70.7		
0	2516.00	5	3	1.01	2516.20	2512	6	141.4		
0	2615.11*	83	2	3.54	2615.31	2611	9	23.4		TL-208
0	2999.82	5	0	1.50	3000.00	2997	6	89.4		

Summary of Nuclide Activity
Sample ID : 1303012-14

Acquisition date : 1-APR-2013 09:02:05

Total number of lines in spectrum	103	
Number of unidentified lines	61	
Number of lines tentatively identified by NID	42	40.78%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.267E+01	3.267E+01	0.588E+01	17.99	
TL-208	1.41E+10Y	1.00	1.695E+00	1.695E+00	0.387E+00	22.80	
PB-210	22.26Y	1.00	7.174E+01	7.194E+01	0.840E+01	11.68	
PB-211	3.28E+04Y	1.00	8.856E+00	8.856E+00	6.071E+00	68.55	
PB-212	1.41E+10Y	1.00	2.407E+00	2.407E+00	0.605E+00	25.13	
BI-214	1602.00Y	1.00	1.044E+02	1.044E+02	0.062E+02	5.95	
PB-214	1602.00Y	1.00	1.082E+02	1.082E+02	0.121E+02	11.17	
RN-219	3.28E+04Y	1.00	5.965E+00	5.965E+00	3.714E+00	62.25	
RA-223	3.28E+04Y	1.00	5.196E+00	5.196E+00	5.004E+00	96.31	
RA-224	1.41E+10Y	1.00	2.220E+02	2.220E+02	0.353E+02	15.89	
RA-226	1602.00Y	1.00	2.062E+02	2.062E+02	3.781E+02	183.35	
PA-234M	4.47E+09Y	1.00	8.251E+01	8.251E+01	4.042E+01	48.99	
TH-234	4.47E+09Y	1.00	5.958E+01	5.958E+01	0.827E+01	13.89	
	Total Activity :		9.115E+02	9.117E+02			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	2.164E+01	2.271E+01	0.758E+01	33.38	
SN-126	1.00E+05Y	1.00	2.174E+00	2.174E+00	0.714E+00	32.84	
	Total Activity :		2.381E+01	2.488E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.079E+01	3.079E+01	0.306E+01	9.95	
	Total Activity :		3.079E+01	3.079E+01			

Grand Total Activity : 9.661E+02 9.673E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	3.586E-01	3.267E+01	3.267E+01	17.99	OK
	Final Mean for 1 Valid Peaks = 3.267E+01+/- 5.877E+00 (17.99%)						
TL-208	583.14	30.22*	7.930E-01	1.974E+00	1.974E+00	45.30	OK
	860.37	4.48	5.573E-01	----- Line Not Found		-----	Absent
	2614.66	35.85	2.495E-01	1.631E+00	1.631E+00	26.28	OK
	Final Mean for 2 Valid Peaks = 1.695E+00+/- 3.865E-01 (22.80%)						
PB-210	46.50	4.25*	2.278E+00	7.174E+01	7.194E+01	11.68	OK
	Final Mean for 1 Valid Peaks = 7.194E+01+/- 8.399E+00 (11.68%)						
PB-211	404.84	2.90*	1.101E+00	8.569E+00	8.569E+00	97.96	OK
	831.96	2.90	5.742E-01	9.171E+00	9.171E+00	95.84	OK
	Final Mean for 2 Valid Peaks = 8.856E+00+/- 6.071E+00 (68.55%)						
PB-212	238.63	44.60*	1.684E+00	2.407E+00	2.407E+00	25.13	OK
	300.09	3.41	1.415E+00	----- Line Not Found		-----	Absent
	Final Mean for 1 Valid Peaks = 2.407E+00+/- 6.049E-01 (25.13%)						
BI-214	609.31	46.30*	7.618E-01	9.851E+01	9.851E+01	12.70	OK
	1120.29	15.10	4.433E-01	1.021E+02	1.021E+02	11.18	OK
	1764.49	15.80	3.132E-01	1.127E+02	1.127E+02	10.84	OK
	2204.22	4.98	2.726E-01	1.046E+02	1.046E+02	13.32	OK
	Final Mean for 4 Valid Peaks = 1.044E+02+/- 6.212E+00 (5.95%)						
PB-214	295.21	19.19	1.434E+00	1.098E+02	1.098E+02	18.45	OK
	351.92	37.19*	1.241E+00	1.073E+02	1.073E+02	14.04	OK
	Final Mean for 2 Valid Peaks = 1.082E+02+/- 1.209E+01 (11.17%)						
RN-219	401.80	6.50*	1.108E+00	5.965E+00	5.965E+00	62.25	OK
	Final Mean for 1 Valid Peaks = 5.965E+00+/- 3.714E+00 (62.25%)						
RA-223	323.87	3.88*	1.330E+00	5.196E+00	5.196E+00	96.31	OK
	Final Mean for 1 Valid Peaks = 5.196E+00+/- 5.004E+00 (96.31%)						
RA-224	240.98	3.95*	1.672E+00	2.220E+02	2.220E+02	15.89	OK
	Final Mean for 1 Valid Peaks = 2.220E+02+/- 3.528E+01 (15.89%)						
RA-226	186.21	3.28*	1.984E+00	2.062E+02	2.062E+02	183.35	OK
	Final Mean for 1 Valid Peaks = 2.062E+02+/- 3.781E+02 (183.35%)						

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234M	1001.03	0.92*	4.879E-01	8.251E+01	8.251E+01	48.99	OK

Final Mean for 1 Valid Peaks = 8.251E+01+/- 4.042E+01 (48.99%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	2.556E+00	5.958E+01	5.958E+01	13.89	OK

Final Mean for 1 Valid Peaks = 5.958E+01+/- 8.272E+00 (13.89%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.606E+00	2.164E+01	2.271E+01	33.38	OK

Final Mean for 1 Valid Peaks = 2.271E+01+/- 7.580E+00 (33.38%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.607E+00	2.174E+00	2.174E+00	32.84	OK

Final Mean for 1 Valid Peaks = 2.174E+00+/- 7.140E-01 (32.84%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.614E+00	3.079E+01	3.079E+01	9.95	OK

Final Mean for 1 Valid Peaks = 3.079E+01+/- 3.063E+00 (9.95%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	3.267E+01	5.877E+00	3.726E+00	3.656E-01	8.770
CD-109	2.271E+01	7.580E+00	9.422E+00	1.113E+00	2.410
SN-126	2.174E+00	7.140E-01	9.019E-01	9.174E-02	2.411
TL-208	1.695E+00	3.865E-01	1.018E+00	1.185E-01	1.666
PB-210	7.194E+01	8.399E+00	7.258E+00	5.903E-01	9.911
PB-211	8.856E+00	6.071E+00	1.108E+01	1.027E+00	0.799
PB-212	2.407E+00	6.049E-01	6.533E-01	9.738E-02	3.684
BI-214	1.044E+02	6.212E+00	6.825E-01	8.148E-02	153.038
PB-214	1.082E+02	1.209E+01	8.112E-01	1.086E-01	133.382
RN-219	5.965E+00	3.714E+00	4.907E+00	4.525E-01	1.216
RA-223	5.196E+00	5.004E+00	7.669E+00	1.216E+00	0.678
RA-224	2.220E+02	3.528E+01	7.433E+00	1.124E+00	29.864
RA-226	2.062E+02	3.781E+02	9.366E+00	1.716E+01	22.018
PA-234M	8.251E+01	4.042E+01	4.190E+01	4.576E+00	1.969
TH-234	5.958E+01	8.272E+00	9.157E+00	7.021E-01	6.506
AM-243	3.079E+01	3.063E+00	5.277E-01	4.613E-02	58.341

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	4.133E-01		2.885E+00	4.489E+00	4.631E-01	0.092
NA-22	1.979E-02		2.843E-01	4.225E-01	3.903E-02	0.047
AL-26	1.041E-01		1.552E-01	2.632E-01	2.453E-02	0.396
TI-44	5.956E-01		2.707E-01	3.627E-01	2.930E-02	1.642
SC-46	8.134E-02		3.101E-01	5.255E-01	6.187E-02	0.155
V-48	-1.189E-01		9.620E-01	1.609E+00	1.783E-01	-0.074
CR-51	2.893E-01		4.546E+00	6.579E+00	1.079E+00	0.044
MN-54	2.459E-01		2.440E-01	4.193E-01	5.095E-02	0.586
CO-56	-1.437E-01		3.205E-01	4.758E-01	5.747E-02	-0.302
CO-57	1.125E-01		2.104E-01	3.414E-01	3.853E-02	0.330
CO-58	-2.753E-01		3.298E-01	4.817E-01	5.921E-02	-0.572
FE-59	-3.622E-01		6.857E-01	1.124E+00	1.174E-01	-0.322
CO-60	1.221E-01		2.647E-01	4.025E-01	3.533E-02	0.303
ZN-65	6.228E-01		6.131E-01	9.467E-01	9.105E-02	0.658
SE-75	3.685E-02		4.539E-01	5.787E-01	1.007E-01	0.064
RB-82	2.567E+00		5.057E+00	6.267E+00	7.776E-01	0.410
RB-83	-3.256E-01		5.113E-01	8.229E-01	1.398E-01	-0.396
KR-85	5.337E+01		4.494E+01	7.109E+01	7.681E+00	0.751
SR-85	3.280E-01		2.762E-01	4.369E-01	4.721E-02	0.751
Y-88	3.832E-01		2.072E-01	4.025E-01	3.730E-02	0.952
NB-93M	1.532E+01		7.099E+00	9.703E+00	2.706E+00	1.579
NB-94	1.007E-01		2.561E-01	3.914E-01	4.664E-02	0.257
NB-95	6.817E+00		1.037E+00	1.095E+00	1.362E-01	6.227
ZR-95	4.811E-01		5.628E-01	8.773E-01	1.148E-01	0.548
RU-103	-1.258E-01		3.386E-01	5.779E-01	8.920E-02	-0.218
RU-106	3.230E-01		1.894E+00	3.255E+00	5.145E-01	0.099
AG-108M	2.972E-02		2.450E-01	3.750E-01	4.692E-02	0.079

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
AG-110M	-9.755E-03		2.337E-01	3.578E-01	4.449E-02	-0.027
SN-113	1.654E-01		3.717E-01	5.848E-01	5.451E-02	0.283
TE123M	-9.702E-02		2.941E-01	4.332E-01	4.150E-02	-0.224
SB-124	2.162E-01		3.051E-01	4.771E-01	5.663E-02	0.453
I-125	-6.371E+00		4.090E+00	6.598E+00	6.476E-01	-0.966
SB-125	6.948E-01	+	8.252E-01	1.148E+00	1.121E-01	0.605
SB-126	5.511E+00	+	3.607E+00	4.039E+00	5.054E-01	1.364
I-129	-2.848E-01		3.939E-01	6.007E-01	6.988E-02	-0.474
I-131	-2.172E+00		3.331E+00	5.709E+00	6.922E-01	-0.381
BA-133	8.115E-01		3.475E-01	5.236E-01	8.582E-02	1.550
CS-134	6.686E-01		2.462E-01	3.832E-01	4.562E-02	1.745
CS-135	7.370E+00		1.806E+00	2.073E+00	3.674E-01	3.555
CS-136	1.037E+00		1.865E+00	2.847E+00	3.035E-01	0.364
CS-137	3.125E-01		2.476E-01	3.895E-01	4.863E-02	0.802
LA-138	1.730E-01		4.062E-01	6.129E-01	5.872E-02	0.282
CE-139	-1.733E-01		2.739E-01	4.356E-01	4.014E-02	-0.398
BA-140	-2.814E+00		4.758E+00	7.077E+00	2.397E+00	-0.398
LA-140	2.492E+00		1.733E+00	2.721E+00	2.607E-01	0.916
CE-141	1.189E+00		8.993E-01	1.272E+00	3.286E-01	0.935
CE-144	-1.948E-01		1.747E+00	2.816E+00	3.037E-01	-0.069
PM-144	-6.782E-02		2.222E-01	3.361E-01	4.209E-02	-0.202
PM-145	-1.124E+00		1.093E+00	1.327E+00	8.652E-01	-0.847
PM-146	9.856E-01	+	5.502E-01	7.953E-01	7.942E-02	1.239
ND-147	4.958E+00		1.171E+01	1.828E+01	2.015E+00	0.271
EU-152	1.851E+01	+	3.446E+00	4.356E+00	5.084E-01	4.249
GD-153	-3.223E-01		7.769E-01	1.256E+00	1.332E-01	-0.257
EU-154	4.423E-01		7.688E-01	1.170E+00	1.081E-01	0.378
EU-155	5.657E-01		8.098E-01	1.221E+00	1.227E-01	0.463
EU-156	-2.951E+00		9.888E+00	1.479E+01	3.616E+00	-0.200
HO-166M	3.119E-01		4.786E-01	5.997E-01	7.506E-02	0.520
HF-172	-9.783E-01		1.550E+00	2.484E+00	2.762E-01	-0.394
LU-172	3.302E+00		1.026E+01	1.737E+01	1.719E+00	0.190
LU-173	6.448E+00		1.543E+00	1.677E+00	3.037E-01	3.846
HF-175	-4.848E-01		3.343E-01	4.988E-01	7.075E-02	-0.972
LU-176	-1.945E-01		2.012E-01	3.071E-01	5.261E-02	-0.633
TA-182	5.379E+01	+	6.007E+00	4.263E+00	4.063E-01	12.618
IR-192	9.119E-02		5.357E-01	8.352E-01	8.507E-02	0.109
HG-203	-1.179E-01		4.230E-01	6.103E-01	1.156E-01	-0.193
BI-207	1.605E-01		1.976E-01	3.285E-01	3.775E-02	0.489
BI-210M	5.294E-02		4.995E-01	6.374E-01	1.090E-01	0.083
BI-212	7.872E-01		1.845E+00	2.851E+00	3.567E-01	0.276
RA-225	-5.118E-02		2.714E+00	4.169E+00	3.726E-01	-0.012
TH-227	8.148E+00	+	2.151E+00	2.915E+00	4.276E-01	2.795
AC-228	2.323E+00	+	1.142E+00	1.598E+00	1.857E-01	1.454
TH-230	1.487E+02		6.895E+01	9.241E+01	7.446E+00	1.609
PA-231	-8.794E+00		8.543E+00	1.300E+01	2.264E+00	-0.676
TH-231	1.890E+00	+	2.320E+00	2.785E+00	3.866E-01	0.679
PA-233	6.127E-01		1.096E+00	1.722E+00	4.592E-01	0.356

Sample ID : 1303012-14 Acquisition date : 1-APR-2013 09:02:05

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-234	-2.516E-01		8.475E-01	1.364E+00	1.485E-01	-0.185
U-235	4.268E+00	+	2.367E+00	2.939E+00	5.410E-01	1.452
NP-237	1.374E+00		1.961E+00	2.959E+00	2.972E-01	0.464
AM-241	1.568E+00		6.685E-01	9.028E-01	6.643E-02	1.737
CM-243	1.445E-02		1.431E+00	2.079E+00	3.882E-01	0.007

Summary of Nuclide Activity
Sample ID : 1303012-14

Acquisition date : 1-APR-2013 09:02:05

Total number of lines in spectrum	103	
Number of unidentified lines	61	
Number of lines tentatively identified by NID	42	40.78%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.267E+01	3.267E+01	0.588E+01	17.99	
TL-208	1.41E+10Y	1.00	1.695E+00	1.695E+00	0.387E+00	22.80	
PB-210	22.26Y	1.00	7.174E+01	7.194E+01	0.840E+01	11.68	
PB-211	3.28E+04Y	1.00	8.856E+00	8.856E+00	6.071E+00	68.55	
PB-212	1.41E+10Y	1.00	2.407E+00	2.407E+00	0.605E+00	25.13	
BI-214	1602.00Y	1.00	1.044E+02	1.044E+02	0.062E+02	5.95	
PB-214	1602.00Y	1.00	1.082E+02	1.082E+02	0.121E+02	11.17	
RN-219	3.28E+04Y	1.00	5.965E+00	5.965E+00	3.714E+00	62.25	
RA-223	3.28E+04Y	1.00	5.196E+00	5.196E+00	5.004E+00	96.31	
RA-224	1.41E+10Y	1.00	2.220E+02	2.220E+02	0.353E+02	15.89	
RA-226	1602.00Y	1.00	2.062E+02	2.062E+02	3.781E+02	183.35	
PA-234M	4.47E+09Y	1.00	8.251E+01	8.251E+01	4.042E+01	48.99	
TH-234	4.47E+09Y	1.00	5.958E+01	5.958E+01	0.827E+01	13.89	
	Total Activity :		9.115E+02	9.117E+02			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	2.164E+01	2.271E+01	0.758E+01	33.38	
SN-126	1.00E+05Y	1.00	2.174E+00	2.174E+00	0.714E+00	32.84	
	Total Activity :		2.381E+01	2.488E+01			

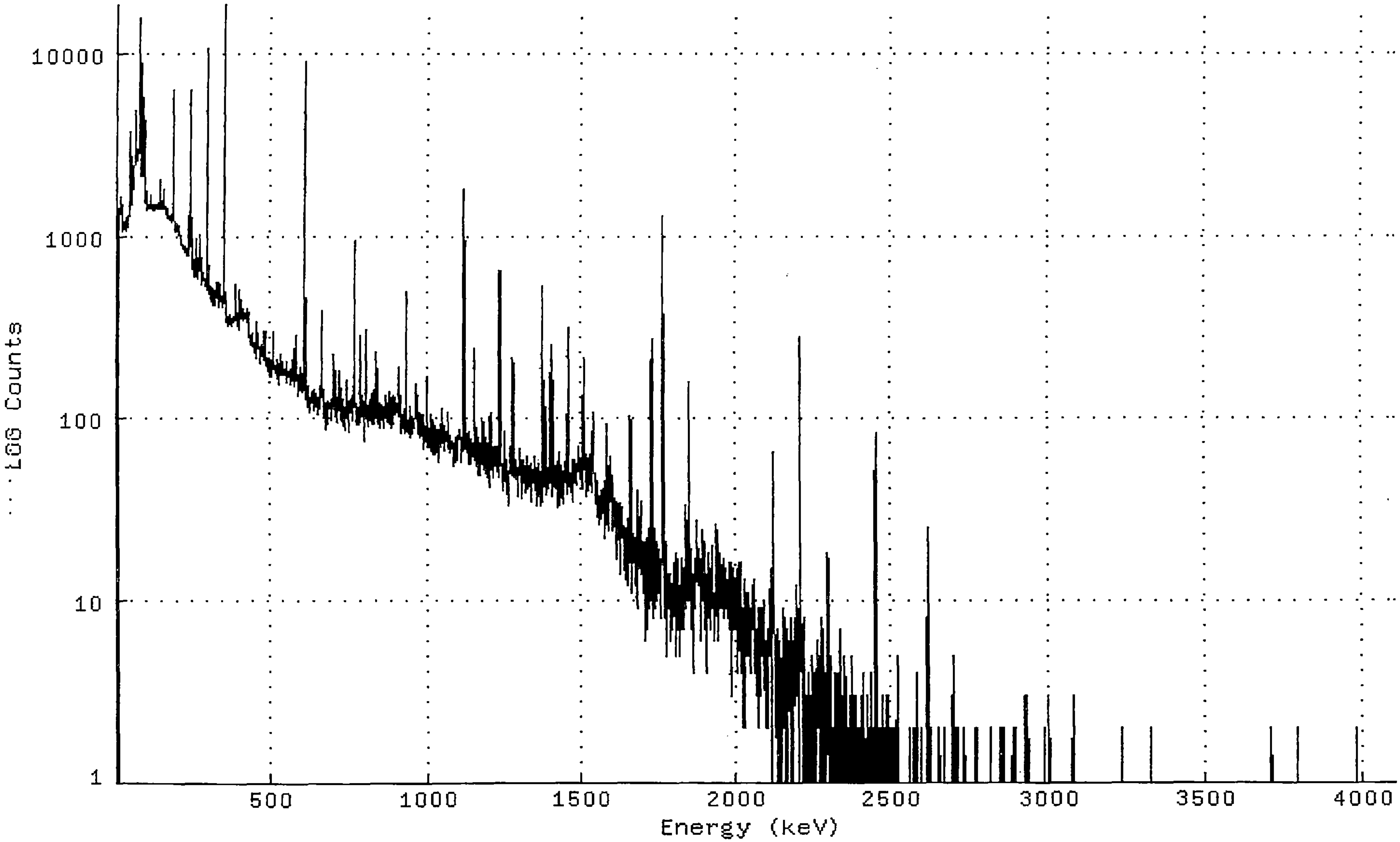
Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.079E+01	3.079E+01	0.306E+01	9.95	
	Total Activity :		3.079E+01	3.079E+01			

Grand Total Activity : 9.661E+02 9.673E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum   : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301214_GE3_GAS1202_190109.CNF;1
Title   :
Sample Title: S30-95-130228
Start Time: 1-APR-2013 09:02:   Sample Time: 28-FEB-2013 00:00   Energy Offset: -3.21163E-01
Real Time : 0 01:01:03.27   Sample ID : 1303012-14   Energy Slope : 1.00005E+00
Live Time : 0 01:00:00.00   Sample Type: SOLID   Energy Quad : 0.00000E+00



Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301214_GE3_GAS1202_1901

Channel

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9:	459	1414	1369	1440	1590	1316	1521	1637
17:	1374	1298	1213	1172	1070	1131	1119	1091
25:	1092	1125	1204	1179	1099	1072	1117	1246
33:	1167	1195	1124	1203	1132	1139	1224	1300
41:	1275	1380	1520	1482	1545	3691	3452	1504
49:	1610	2013	1677	1816	2741	2067	1838	1815
57:	1937	2114	2303	2499	2539	2691	4856	3499
65:	2562	2613	2967	2993	2654	2697	2669	2888
73:	2971	5343	9875	4661	15675	5094	3040	2624
81:	3121	2132	2517	3943	2129	2355	5631	3385
89:	2374	3352	1964	3517	4245	2131	2073	1514
97:	1544	1740	1577	1420	1380	1411	1451	1428
105:	1476	1428	1403	1443	1407	1464	1481	1556
113:	1661	1515	1503	1458	1384	1402	1370	1419
121:	1434	1471	1485	1372	1441	1426	1446	1466
129:	1488	1427	1472	1469	1435	1435	1490	1467
137:	1484	1473	1514	1432	1528	1456	1561	2043
145:	1599	1432	1447	1536	1502	1566	1573	1528
153:	1494	1819	1556	1403	1446	1412	1436	1391
161:	1375	1327	1454	1418	1251	1323	1265	1273
169:	1255	1277	1245	1237	1244	1247	1225	1192
177:	1215	1204	1198	1267	1285	1325	1222	1217
185:	2015	6296	3010	1228	1182	1130	1101	1134
193:	1148	1076	1125	1165	1180	1060	1109	1101
201:	1151	1063	1086	1064	1123	1057	940	943
209:	1012	949	991	904	901	854	909	896
217:	873	886	880	832	846	862	849	814
225:	850	813	779	853	831	837	786	832
233:	829	785	893	1288	914	1020	1288	879
241:	1669	6284	2225	701	708	719	661	707
249:	687	662	679	606	645	676	682	848
257:	741	709	968	671	604	626	644	592
265:	598	620	609	613	954	1005	1012	844
273:	643	720	767	610	597	549	565	569
281:	622	565	593	619	567	603	569	588
289:	538	531	546	549	615	1357	10640	6633
297:	694	503	570	698	526	488	596	516
305:	517	526	453	439	473	468	454	474
313:	431	515	471	476	421	456	415	460
321:	455	422	458	555	503	460	459	475
329:	476	560	489	412	491	466	478	436
337:	437	538	526	439	449	438	468	410
345:	413	442	406	434	511	607	4626	18861
353:	5655	550	455	423	410	359	383	338
361:	326	361	318	334	337	346	354	364
369:	333	374	354	374	343	348	355	331
377:	327	322	364	361	335	357	342	338
385:	349	414	447	400	548	389	325	348
393:	348	367	351	378	305	356	377	341
401:	393	501	366	407	450	415	358	369
409:	355	342	399	356	343	379	368	375
417:	380	364	360	362	353	377	395	351
425:	350	336	376	383	293	303	297	305

433:	278	272	279	284	265	252	278	268
441:	292	245	278	260	280	252	244	237
449:	256	230	235	245	269	273	337	250
457:	216	224	256	256	258	293	279	265
465:	233	212	201	236	246	236	232	236
473:	226	233	254	218	232	231	207	278
481:	301	228	194	214	195	229	297	244
489:	206	187	194	199	187	215	179	209
497:	182	193	215	168	186	200	211	174
505:	175	169	200	184	232	271	298	264
513:	202	192	187	179	184	190	181	170
521:	165	190	176	177	210	192	184	171
529:	193	153	198	191	212	225	225	179
537:	179	174	174	185	199	197	206	205
545:	174	179	180	181	177	181	161	205
553:	174	182	158	161	179	175	170	173
561:	172	170	185	174	174	153	181	167
569:	207	170	170	181	172	162	165	150
577:	178	164	184	243	230	166	286	238
585:	183	167	170	149	160	133	155	155
593:	172	145	147	189	164	143	143	151
601:	176	146	140	176	172	143	180	1097
609:	9013	9064	1059	197	193	161	144	149
617:	143	127	129	150	138	125	116	130
625:	119	107	116	129	128	124	138	127
633:	122	123	121	133	127	144	125	124
641:	110	118	124	128	135	116	120	123
649:	117	105	112	115	123	115	151	118
657:	111	112	130	113	145	130	138	133
665:	332	389	163	125	108	117	116	106
673:	100	120	112	99	117	105	86	98
681:	109	98	124	118	109	111	117	120
689:	116	114	114	124	111	108	110	96
697:	125	122	119	119	112	155	227	151
705:	150	133	102	115	123	119	128	128
713:	110	95	111	95	127	109	126	181
721:	144	122	125	132	96	107	145	147
729:	98	124	91	125	107	126	108	99
737:	99	92	100	86	112	150	160	119
745:	123	116	115	100	113	90	84	109
753:	120	125	115	116	113	115	112	98
761:	96	102	121	100	122	142	229	792
769:	935	271	120	108	119	108	102	93
777:	107	110	115	110	102	100	92	109
785:	168	284	213	132	94	108	102	120
793:	103	103	131	111	104	113	74	122
801:	114	96	125	100	136	303	230	139
809:	97	106	90	107	97	113	124	116
817:	111	98	124	117	136	133	99	93
825:	131	125	130	100	129	92	116	133
833:	158	120	107	118	99	132	230	154
841:	127	99	105	104	93	105	119	88
849:	89	101	100	106	110	98	118	106
857:	99	116	96	103	113	115	88	108
865:	108	110	132	127	110	94	110	121
873:	121	121	112	96	112	138	124	125
881:	129	93	89	124	88	129	104	108
889:	118	118	106	131	98	93	117	115
897:	105	109	129	115	121	107	119	118
905:	108	119	122	104	144	101	190	163

913:	110	83	97	109	107	95	101	103
921:	95	94	88	105	105	97	106	109
929:	111	82	106	109	204	490	412	156
937:	85	97	82	89	83	85	86	82
945:	98	84	114	79	80	101	87	88
953:	87	83	87	95	99	94	88	92
961:	94	103	108	141	152	108	100	117
969:	131	99	89	89	82	88	83	85
977:	84	108	78	93	90	98	84	105
985:	81	86	72	80	104	83	67	93
993:	88	79	87	74	77	85	100	112
1001:	167	152	87	70	76	89	88	79
1009:	78	69	105	66	67	79	70	77
1017:	87	69	78	73	96	82	63	91
1025:	87	83	63	78	68	68	69	87
1033:	73	86	70	57	86	86	79	75
1041:	77	70	74	92	84	85	83	72
1049:	89	89	101	112	109	74	77	73
1057:	74	66	72	79	85	75	85	82
1065:	84	82	68	73	82	107	94	79
1073:	68	69	80	72	65	69	72	72
1081:	73	67	72	74	71	54	72	57
1089:	70	61	64	67	79	58	57	72
1097:	80	75	59	65	63	67	68	86
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1113:	57	78	63	67	73	82	317	1529
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1129:	82	65	74	70	74	84	74	76
1137:	70	56	73	71	74	58	76	66
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1153:	73	100	234	241	117	59	85	66
1161:	75	55	76	88	56	69	49	78
1169:	57	63	59	71	73	70	66	48
1177:	72	56	64	65	73	99	91	61
1185:	61	62	57	52	50	59	53	79
1193:	51	54	59	51	47	72	58	52
1201:	47	49	68	42	56	74	97	107
1209:	84	63	56	52	56	48	47	65
1217:	52	70	54	63	57	59	70	62
1225:	54	61	51	57	61	56	70	50
1233:	47	64	54	68	207	641	644	196
1241:	56	54	63	57	54	51	50	50
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1257:	47	54	46	51	38	48	46	46
1265:	33	49	50	51	50	50	70	62
1273:	50	62	70	65	48	59	59	103
1281:	216	186	86	64	70	64	47	53
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1297:	37	37	52	48	53	59	52	68
1305:	48	50	47	58	48	36	36	55
1313:	55	44	58	46	59	51	53	43
1321:	44	55	39	43	52	45	41	46
1329:	42	62	46	42	43	50	54	54
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1345:	47	45	46	44	61	52	40	45
1353:	50	47	51	45	53	50	33	52
1361:	56	56	37	51	50	46	37	45
1369:	49	47	33	46	51	35	67	65
1377:	269	528	318	83	50	42	44	58
1385:	94	116	82	48	38	43	61	41

1393:	41	50	53	47	47	47	44	67
1401:	127	176	125	60	37	49	110	232
1409:	255	101	55	55	42	42	59	52
1417:	50	49	41	52	45	54	42	57
1425:	32	40	41	39	65	55	46	58
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1441:	34	43	39	51	47	47	46	52
1449:	44	53	50	57	40	38	45	41
1457:	44	50	60	187	313	258	81	47
1465:	42	40	41	42	39	39	50	49
1473:	49	56	35	58	37	51	46	50
1481:	57	48	59	45	51	51	52	43
1489:	56	53	70	52	68	52	52	48
1497:	59	53	58	46	47	56	48	47
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1513:	60	60	60	37	63	44	47	55
1521:	46	56	49	60	40	60	45	52
1529:	46	63	54	43	57	54	46	39
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1561:	37	27	37	29	40	38	28	39
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1577:	22	32	35	31	33	61	70	92
1585:	52	35	26	36	43	38	24	41
1593:	37	50	61	44	39	35	48	58
1601:	40	28	40	29	27	24	26	36
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1625:	25	32	33	30	14	34	32	22
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1641:	25	23	16	13	24	23	15	25
1649:	19	21	28	19	26	12	22	23
1657:	22	29	16	29	103	93	73	39
1665:	18	11	18	22	18	16	21	20
1673:	23	20	18	22	16	14	19	12
1681:	20	9	31	40	32	28	18	20
1689:	19	15	18	24	35	32	24	14
1697:	23	26	17	13	11	17	19	17
1705:	21	21	16	6	15	14	22	19
1713:	11	7	13	15	17	21	25	16
1721:	15	9	15	15	22	10	18	51
1729:	165	271	196	58	20	15	8	12
1737:	19	16	9	24	25	16	14	10
1745:	10	14	21	11	14	16	19	15
1753:	15	10	15	17	12	8	14	17
1761:	17	28	167	744	1286	823	174	33
1769:	17	9	10	8	21	14	10	5
1777:	17	15	11	14	9	10	14	11
1785:	14	7	11	12	6	13	12	9
1793:	12	9	7	10	12	10	12	16
1801:	9	13	5	11	11	12	18	14
1809:	12	11	7	13	17	14	8	8
1817:	5	9	12	11	11	13	13	7
1825:	17	13	13	7	13	14	15	14
1833:	13	9	10	12	22	33	30	25
1841:	11	15	10	14	11	24	107	157
1849:	104	36	20	10	19	9	7	9
1857:	12	7	13	4	13	9	8	13
1865:	15	13	9	9	17	12	13	17

1873:	27	23	21	22	15	12	14	18
1881:	19	13	12	6	15	14	11	17
1889:	12	24	17	23	10	15	10	20
1897:	21	16	19	14	7	9	7	10
1905:	12	14	4	18	15	13	15	12
1913:	8	10	15	13	12	7	8	10
1921:	11	10	20	9	13	7	8	10
1929:	11	8	6	11	9	11	16	18
1937:	26	18	24	10	6	11	10	11
1945:	11	11	18	9	15	11	15	11
1953:	12	10	9	15	17	8	10	10
1961:	12	9	15	11	9	14	10	11
1969:	12	11	13	13	10	8	13	13
1977:	16	10	14	7	16	3	9	10
1985:	11	8	6	15	8	10	13	9
1993:	7	10	7	8	9	11	12	15
2001:	9	10	6	13	4	7	9	8
2009:	10	6	16	16	10	8	6	4
2017:	14	2	8	9	8	9	6	9
2025:	2	7	13	10	4	5	7	8
2033:	5	6	11	5	8	11	8	9
2041:	7	5	5	7	4	6	5	9
2049:	8	12	9	7	10	8	13	5
2057:	8	9	4	5	7	6	3	7
2065:	4	7	4	9	8	6	7	5
2073:	2	9	4	4	3	7	6	6
2081:	7	9	7	5	7	6	5	8
2089:	4	10	5	2	6	5	5	4
2097:	5	6	2	6	7	6	4	10
2105:	6	7	7	5	9	15	9	10
2113:	6	1	4	6	18	59	64	58
2121:	27	7	6	4	5	5	6	3
2129:	1	7	5	6	5	4	1	3
2137:	3	5	1	6	1	4	4	4
2145:	3	4	6	2	9	2	3	5
2153:	6	1	3	4	8	5	4	0
2161:	3	7	1	6	2	3	5	6
2169:	6	5	5	7	4	5	0	3
2177:	8	1	4	6	5	2	1	7
2185:	3	4	4	8	3	5	3	3
2193:	12	8	11	3	1	7	4	9
2201:	2	8	69	244	278	181	41	8
2209:	7	0	5	3	6	3	1	8
2217:	1	2	5	3	2	1	3	3
2225:	3	2	4	3	2	1	3	3
2233:	2	3	2	0	1	1	2	2
2241:	3	0	5	4	2	3	4	3
2249:	2	3	0	1	3	3	1	3
2257:	3	6	5	3	2	3	3	4
2265:	4	2	5	1	3	0	0	3
2273:	8	4	5	3	1	3	1	7
2281:	2	2	4	4	4	2	0	2
2289:	2	5	2	7	7	18	16	5
2297:	0	6	1	4	2	2	2	5
2305:	4	0	1	1	1	1	1	0
2313:	4	1	2	0	0	1	2	3
2321:	4	4	3	1	1	2	0	3
2329:	4	0	2	2	1	0	7	6
2337:	4	0	2	3	3	0	1	2
2345:	3	2	1	4	5	3	3	2

2353:	1	1	1	1	2	2	2	2
2361:	1	1	1	1	1	0	3	3
2369:	2	0	5	1	1	2	1	0
2377:	2	3	1	3	2	2	3	1
2385:	1	2	2	2	0	1	1	2
2393:	1	1	0	0	2	0	1	1
2401:	3	0	1	0	1	4	0	2
2409:	1	1	1	0	1	0	1	1
2417:	3	2	0	0	1	1	1	0
2425:	1	1	0	2	1	4	0	2
2433:	2	1	0	1	2	1	1	0
2441:	0	1	2	3	4	6	37	69
2449:	82	41	10	2	1	0	1	2
2457:	1	0	0	0	2	0	1	0
2465:	0	1	0	0	2	1	1	3
2473:	0	2	0	1	0	0	0	0
2481:	0	1	1	3	3	0	0	0
2489:	0	1	0	2	0	0	0	1
2497:	1	1	2	0	0	0	0	1
2505:	1	1	2	2	1	0	1	0
2513:	1	1	1	5	0	1	0	1
2521:	0	0	0	1	0	1	0	0
2529:	0	0	1	0	1	1	0	0
2537:	0	0	0	0	1	0	0	1
2545:	1	0	1	0	0	0	0	0
2553:	0	2	0	0	0	1	0	1
2561:	0	0	1	0	0	0	0	0
2569:	1	2	0	2	1	0	0	0
2577:	1	4	0	0	0	0	0	0
2585:	0	0	0	1	0	2	0	0
2593:	0	0	0	1	0	1	1	0
2601:	0	0	1	1	1	1	1	0
2609:	1	1	0	2	3	22	25	21
2617:	13	3	0	0	0	2	0	0
2625:	0	0	0	1	0	0	1	0
2633:	1	0	0	1	0	0	0	0
2641:	1	0	1	0	0	0	0	1
2649:	0	2	0	0	0	1	0	0
2657:	1	0	1	0	1	0	0	1
2665:	1	0	2	0	0	0	0	0
2673:	0	0	0	0	0	0	0	0
2681:	0	0	0	1	0	0	0	0
2689:	3	0	2	2	0	2	5	2
2697:	1	0	0	0	1	0	1	0
2705:	2	0	0	2	0	1	0	1
2713:	0	1	0	1	1	0	1	0
2721:	1	0	0	0	1	0	2	1
2729:	2	1	1	0	0	1	0	0
2737:	0	1	0	0	0	1	0	0
2745:	0	1	1	0	0	0	0	1
2753:	0	0	0	1	1	1	0	0
2761:	0	0	0	0	2	1	0	0
2769:	2	2	2	0	0	1	1	0
2777:	0	0	0	0	0	0	1	0
2785:	0	0	0	1	0	0	1	0
2793:	0	0	0	0	0	0	0	0
2801:	0	0	0	1	0	0	0	0
2809:	0	0	0	0	2	0	1	0
2817:	0	0	0	0	1	1	0	0
2825:	0	0	0	0	0	0	1	0

2833:	0	0	0	0	0	0	1	0
2841:	0	0	0	2	0	0	0	2
2849:	1	1	0	0	2	0	0	0
2857:	0	0	0	0	0	0	1	0
2865:	0	0	0	1	0	1	1	0
2873:	0	0	1	0	0	1	1	0
2881:	1	0	1	2	0	0	0	0
2889:	1	0	1	0	1	2	0	0
2897:	1	0	0	0	0	0	0	1
2905:	0	0	0	0	0	0	0	0
2913:	1	0	0	0	0	0	0	0
2921:	1	0	3	0	0	1	0	0
2929:	0	0	0	3	0	0	0	0
2937:	0	1	0	0	0	0	0	0
2945:	0	0	0	0	0	0	0	0
2953:	0	0	0	0	1	1	0	0
2961:	0	0	1	0	0	0	0	0
2969:	0	0	0	0	1	0	0	0
2977:	1	1	1	1	1	0	0	0
2985:	1	2	0	0	1	0	0	0
2993:	0	0	1	0	0	0	1	3
3001:	1	0	0	0	0	0	0	0
3009:	1	0	0	0	0	0	0	0
3017:	1	0	1	0	0	0	0	0
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	1	0	0	0	0
3041:	0	0	1	0	0	0	0	1
3049:	0	1	0	0	0	1	0	1
3057:	1	0	0	0	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	1	3	0	0	0	0	0	0
3081:	0	1	0	0	0	0	1	0
3089:	0	0	0	0	0	0	1	0
3097:	0	0	0	0	0	0	0	0
3105:	1	0	0	1	0	0	0	0
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0
3137:	1	0	0	0	0	0	1	0
3145:	0	0	0	0	0	0	0	0
3153:	0	1	0	1	0	0	0	0
3161:	0	1	1	0	0	0	0	0
3169:	1	1	1	0	0	0	0	1
3177:	0	0	1	0	0	0	0	0
3185:	0	0	0	0	0	0	0	1
3193:	0	0	0	0	0	0	0	0
3201:	0	1	0	0	0	0	0	0
3209:	1	1	0	0	0	0	0	0
3217:	0	0	0	0	0	0	0	0
3225:	0	0	0	1	0	1	1	2
3233:	0	0	0	1	0	1	0	0
3241:	0	0	0	0	0	0	1	0
3249:	0	0	0	0	0	0	0	0
3257:	0	0	0	0	0	0	0	0
3265:	0	0	0	0	0	0	1	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	0	0	1	0	0	0
3289:	0	0	0	0	1	0	1	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	1	0	0	0	0	0

3313:	0	0	0	0	0	0	0	0
3321:	0	2	0	0	0	0	0	0
3329:	0	0	0	0	1	1	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	0	0	0	0	1
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	1	0	0	0	0
3369:	0	0	0	1	1	0	0	0
3377:	0	0	0	0	0	0	0	1
3385:	1	0	0	0	0	0	0	0
3393:	0	0	0	0	0	0	0	1
3401:	0	0	0	1	0	0	0	1
3409:	0	0	0	0	0	0	0	0
3417:	0	0	0	0	1	0	0	0
3425:	0	0	1	1	0	0	1	0
3433:	0	0	0	0	0	1	0	0
3441:	0	0	0	0	0	0	0	0
3449:	0	1	1	0	0	1	0	1
3457:	1	0	0	0	0	0	0	0
3465:	0	1	0	0	0	0	0	0
3473:	0	0	0	0	0	1	0	0
3481:	0	1	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	1	0	0	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	0	0	1	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	1
3577:	0	0	0	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	1	1	0	0	0
3617:	0	1	0	0	0	0	0	0
3625:	0	0	0	0	0	1	0	0
3633:	0	0	0	0	0	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	0	1	0	0
3657:	1	0	0	0	0	0	0	1
3665:	0	0	0	0	0	0	0	1
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	1	0	0	0
3697:	1	0	1	1	0	0	0	0
3705:	0	2	0	0	0	0	0	0
3713:	0	0	0	0	1	0	0	1
3721:	0	0	0	0	0	1	0	0
3729:	0	0	0	1	0	0	0	0
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	1	1	0	0
3785:	0	0	0	1	0	2	0	0

3793:	0	0	0	1	0	0	0	0
3801:	0	0	0	0	0	0	0	1
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	1	0
3825:	0	1	0	1	0	0	1	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	0	0	0	0	0	1
3857:	1	0	0	0	0	0	0	0
3865:	0	0	0	0	1	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	1	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	1	1
3905:	0	0	1	0	0	0	0	0
3913:	0	0	0	0	0	1	0	1
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	1	0
3961:	0	0	1	0	0	0	0	0
3969:	0	0	1	0	1	2	0	0
3977:	0	0	0	0	0	1	0	0
3985:	0	1	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	0	1
4017:	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	1	0	0	0	0	0
4041:	0	1	0	0	0	1	0	0
4049:	1	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

C 4/11/13

VAX/VMS Peak Search Report Generated 1-APR-2013 11:02:47.60

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301215_GE1_GAS1202_190110.
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : S30-BKGD-N-130228
Deposition Date :
Sample Date : 28-FEB-2013 00:00:00 Acquisition date : 1-APR-2013 10:02:28.
Sample ID : 1303012-15 Sample Quantity : 4.62260E+02 GRAM
Sample type : SOLID Sample Geometry : 0
Detector name : GE1 Detector Geometry: GAS-1202
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.12 0.0%
Start channel : 5 End channel : 4096
Sensitivity : 2.50000 Gaussian : 15.00000
Critical level : Yes

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	75.61*	1059	1387	3.68	75.84	71	13	15.8		AM-243
2	87.03*	168	397	1.77	87.26	83	14	40.4	8.11E+00	NP-237 SN-126 CD-109
2	89.46	140	380	1.78	89.69	83	14	48.8		
2	92.82*	201	352	1.78	93.05	83	14	35.8		
0	185.99*	149	284	1.61	186.22	183	6	41.0		RA-226
0	209.38	58	324	1.83	209.60	206	7	105.8		
0	215.54	50	237	2.65	215.76	213	6	101.7		
0	228.01	55	307	1.41	228.23	225	8	113.4		
4	235.21	42	184	2.35	235.43	233	14	98.7	2.23E+01	
4	238.76*	654	167	1.63	238.98	233	14	9.8		PB-212
4	241.80*	234	186	2.00	242.02	233	14	29.6		RA-224
0	259.66	61	250	3.32	259.87	257	9	96.6		
0	295.16*	294	234	1.87	295.38	292	8	21.7		PB-214
0	301.09	32	149	1.61	301.31	299	6	126.6		PB-212
0	327.81	33	123	1.95	328.02	325	6	113.6		
0	338.39*	94	232	1.45	338.60	335	9	62.2		AC-228
0	351.94*	509	158	1.36	352.15	348	8	12.5		PB-214
0	408.86	37	134	1.43	409.07	406	8	113.1		
0	439.43	24	74	1.60	439.63	437	6	120.9		
0	464.02	66	70	4.35	464.22	460	8	50.3		
0	470.24	23	57	2.02	470.44	469	6	112.2		
0	510.93*	79	135	2.06	511.13	506	11	66.8		
0	565.37	51	98	9.88	565.57	560	13	85.3		
0	583.43*	201	106	1.84	583.62	579	11	24.7		TL-208
0	609.29*	371	97	1.93	609.49	606	9	14.3		BI-214
0	664.28	69	75	6.32	664.47	658	13	56.9		
1	712.00	25	10	2.06	712.19	711	8	39.3	7.26E+00	
1	715.63	17	36	2.06	715.81	711	8	120.7		
0	727.89	51	71	2.01	728.08	724	9	66.5		BI-212
0	756.00	24	36	1.42	756.18	753	6	92.0		
0	768.22	105	81	6.99	768.40	760	17	43.8		
1	795.01	45	28	2.09	795.19	792	20	45.9	2.29E+00	
0	860.07	47	43	2.03	860.24	856	9	58.6		TL-208
2	906.68	11	4	2.36	906.86	906	17	36.0	2.26E+00	

AG 4/11/13

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
2	911.21*	157	26	2.05	911.38	906	17	19.2		AC-228
0	969.56*	73	77	1.54	969.73	965	10	54.3		AC-228
0	1003.01	24	44	3.15	1003.18	998	10	109.8		
0	1010.94	23	28	4.66	1011.11	1007	8	89.9		
1	1120.64*	80	37	2.18	1120.80	1117	13	34.5	1.80E+00	BI-214
1	1126.05	21	30	2.23	1126.20	1117	13	102.5		
0	1155.59	30	52	4.02	1155.74	1151	11	99.6		
0	1170.30	22	47	3.44	1170.45	1165	10	125.7		
0	1238.37	56	48	2.55	1238.52	1233	11	54.9		
0	1296.59	16	22	3.54	1296.73	1294	7	106.7		
0	1378.82*	16	17	2.70	1378.96	1373	10	110.8		
0	1460.84*	768	17	2.00	1460.98	1456	11	7.5		K-40
0	1509.22	11	7	1.39	1509.35	1505	7	99.0		
0	1588.09	16	4	2.88	1588.21	1585	7	63.3		
0	1621.93	8	6	2.76	1622.05	1617	8	126.3		BI-212
0	1631.34	12	4	1.45	1631.46	1628	8	81.6		
0	1683.75	15	2	5.15	1683.86	1680	9	61.9		
0	1729.24	12	6	2.71	1729.35	1725	11	98.2		
0	1764.92*	68	13	1.87	1765.03	1760	11	32.5		BI-214
0	1832.51	5	3	2.92	1832.62	1829	6	134.7		
0	1847.60	9	2	4.27	1847.71	1844	7	80.9		
0	2104.07	17	2	1.51	2104.16	2100	8	56.2		
0	2204.54*	14	6	1.73	2204.62	2201	6	83.8		BI-214
0	2304.93	7	0	1.88	2305.00	2301	7	75.6		
0	2316.93	5	0	1.50	2317.00	2314	6	89.4		
0	2407.49	6	1	3.30	2407.56	2405	6	103.9		
0	2447.29	14	0	2.17	2447.36	2443	9	53.5		
0	2614.41*	62	3	2.18	2614.46	2611	9	28.2		TL-208

Summary of Nuclide Activity
Sample ID : 1303012-15
Acquisition date : 1-APR-2013 10:02:28

Total number of lines in spectrum 62
Number of unidentified lines 29
Number of lines tentatively identified by NID 33 53.23%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.316E+01	2.316E+01	0.299E+01	12.90	
TL-208	1.41E+10Y	1.00	9.227E-01	9.227E-01	1.815E-01	19.67	
BI-212	1.41E+10Y	1.00	8.272E-01	8.272E-01	4.936E-01	59.67	
PB-212	1.41E+10Y	1.00	1.138E+00	1.138E+00	0.274E+00	24.08	
BI-214	1602.00Y	1.00	1.328E+00	1.328E+00	0.190E+00	14.28	
PB-214	1602.00Y	1.00	1.406E+00	1.407E+00	0.276E+00	19.63	
RA-224	1.41E+10Y	1.00	4.700E+00	4.700E+00	1.758E+00	37.42	
RA-226	1602.00Y	1.00	3.115E+00	3.115E+00	5.853E+00	187.91	
AC-228	1.41E+10Y	1.00	1.157E+00	1.157E+00	0.224E+00	19.32	
		Total Activity :	3.776E+01	3.776E+01			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	2.480E+00	2.603E+00	1.097E+00	42.12	
SN-126	1.00E+05Y	1.00	2.493E-01	2.493E-01	1.039E-01	41.69	
NP-237	2.14E+06Y	1.00	7.317E-01	7.317E-01	3.049E-01	41.67	
		Total Activity :	3.461E+00	3.584E+00			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	8.823E-01	8.823E-01	1.615E-01	18.30	
		Total Activity :	8.823E-01	8.823E-01			

Grand Total Activity : 4.210E+01 4.222E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.045E-01	2.316E+01	2.316E+01	12.90	OK

Final Mean for 1 Valid Peaks = 2.316E+01+/- 2.988E+00 (12.90%)

TL-208	583.14	30.22*	1.055E+00	1.023E+00	1.023E+00	27.04	OK
	860.37	4.48	7.641E-01	2.208E+00	2.208E+00	59.43	OK
	2614.66	35.85	3.498E-01	7.996E-01	7.996E-01	30.61	OK

Final Mean for 3 Valid Peaks = 9.227E-01+/- 1.815E-01 (19.67%)

BI-212	727.17	11.80*	8.782E-01	7.945E-01	7.945E-01	67.24	OK
	1620.62	2.75	4.685E-01	1.018E+00	1.018E+00	126.76	OK

Final Mean for 2 Valid Peaks = 8.272E-01+/- 4.936E-01 (59.67%)

PB-212	238.63	44.60*	2.057E+00	1.157E+00	1.157E+00	24.45	OK
	300.09	3.41	1.767E+00	8.554E-01	8.554E-01	129.80	OK

Final Mean for 2 Valid Peaks = 1.138E+00+/- 2.741E-01 (24.08%)

BI-214	609.31	46.30*	1.017E+00	1.280E+00	1.280E+00	17.82	OK
	1120.29	15.10	6.174E-01	1.389E+00	1.390E+00	35.73	OK
	1764.49	15.80	4.419E-01	1.577E+00	1.578E+00	33.99	OK
	2204.22	4.98	3.841E-01	1.148E+00	1.148E+00	84.51	OK

Final Mean for 4 Valid Peaks = 1.328E+00+/- 1.896E-01 (14.28%)

PB-214	295.21	19.19	1.787E+00	1.394E+00	1.394E+00	36.39	OK
	351.92	37.19*	1.574E+00	1.412E+00	1.412E+00	23.31	OK

Final Mean for 2 Valid Peaks = 1.407E+00+/- 2.761E-01 (19.63%)

RA-224	240.98	3.95*	2.045E+00	4.700E+00	4.700E+00	37.42	OK

Final Mean for 1 Valid Peaks = 4.700E+00+/- 1.758E+00 (37.42%)

RA-226	186.21	3.28*	2.369E+00	3.115E+00	3.115E+00	187.91	OK

Final Mean for 1 Valid Peaks = 3.115E+00+/- 5.853E+00 (187.91%)

AC-228	338.32	11.40	1.621E+00	8.281E-01	8.281E-01	66.10	OK
	911.07	27.70*	7.291E-01	1.266E+00	1.266E+00	21.42	OK
	969.11	16.60	6.934E-01	1.035E+00	1.035E+00	55.17	OK

Final Mean for 3 Valid Peaks = 1.157E+00+/- 2.235E-01 (19.32%)

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CD-109	88.03	3.72*	2.962E+00	2.480E+00	2.603E+00	42.12	OK

Final Mean for 1 Valid Peaks = 2.603E+00+/- 1.097E+00 (42.12%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
SN-126	87.57	37.00*	2.963E+00	2.493E-01	2.493E-01	41.69	OK

Final Mean for 1 Valid Peaks = 2.493E-01+/- 1.039E-01 (41.69%)

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NP-237	86.50	12.60*	2.964E+00	7.317E-01	7.317E-01	41.67	OK

Final Mean for 1 Valid Peaks = 7.317E-01+/- 3.049E-01 (41.67%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	2.955E+00	8.823E-01	8.823E-01	18.30	OK

Final Mean for 1 Valid Peaks = 8.823E-01+/- 1.615E-01 (18.30%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.316E+01	2.988E+00	5.841E-01	5.645E-02	39.656
CD-109	2.603E+00	1.097E+00	1.454E+00	1.639E-01	1.790
SN-126	2.493E-01	1.039E-01	1.392E-01	1.330E-02	1.791
TL-208	9.227E-01	1.815E-01	1.956E-01	1.987E-02	4.718
BI-212	8.272E-01	4.936E-01	5.611E-01	5.200E-02	1.474
PB-212	1.138E+00	2.741E-01	1.081E-01	2.381E-02	10.528
BI-214	1.328E+00	1.896E-01	1.454E-01	1.441E-02	9.130
PB-214	1.407E+00	2.761E-01	1.441E-01	2.780E-02	9.763
RA-224	4.700E+00	1.758E+00	1.229E+00	2.767E-01	3.824
RA-226	3.115E+00	5.853E+00	1.591E+00	2.916E+00	1.958
AC-228	1.157E+00	2.235E-01	2.464E-01	2.146E-02	4.697
NP-237	7.317E-01	3.049E-01	3.950E-01	3.730E-02	1.852
AM-243	8.823E-01	1.615E-01	9.112E-02	7.596E-03	9.682

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	-7.466E-03		4.673E-01	7.643E-01	8.181E-02	-0.010
NA-22	-5.070E-02		4.928E-02	7.670E-02	6.854E-03	-0.661
AL-26	-4.763E-04		1.979E-02	4.144E-02	3.786E-03	-0.011
TI-44	-4.622E-02		4.364E-02	6.350E-02	4.935E-03	-0.728
SC-46	-3.092E-02		4.773E-02	8.042E-02	7.040E-03	-0.384
V-48	-4.447E-03		1.483E-01	2.698E-01	2.340E-02	-0.016
CR-51	5.017E-01		7.659E-01	1.202E+00	3.039E-01	0.417
MN-54	-2.633E-02		4.693E-02	7.975E-02	7.185E-03	-0.330
CO-56	-4.916E-02		5.695E-02	9.368E-02	8.394E-03	-0.525
CO-57	1.583E-02		3.698E-02	6.195E-02	6.884E-03	0.255
CO-58	-1.486E-02		5.377E-02	8.432E-02	7.687E-03	-0.176
FE-59	1.189E-02		1.346E-01	2.436E-01	2.232E-02	0.049
CO-60	2.937E-02		5.275E-02	9.299E-02	7.621E-03	0.316
ZN-65	-6.622E-02		1.152E-01	1.686E-01	1.418E-02	-0.393
SE-75	-4.526E-02		7.005E-02	9.806E-02	2.718E-02	-0.461
RB-82	2.938E-01		6.777E-01	1.174E+00	1.079E-01	0.250
RB-83	-2.107E-02		9.816E-02	1.565E-01	2.628E-02	-0.135
KR-85	1.716E+01		9.565E+00	1.735E+01	1.839E+00	0.989
SR-85	1.055E-01		5.881E-02	1.067E-01	1.131E-02	0.989
Y-88	-5.634E-03		4.336E-02	7.126E-02	6.472E-03	-0.079
NB-93M	-3.446E+00		1.025E+00	4.274E-01	1.034E-01	-8.063
NB-94	-2.214E-03		3.674E-02	6.630E-02	5.866E-03	-0.033
NB-95	1.059E-01		8.565E-02	1.558E-01	1.437E-02	0.679
ZR-95	1.162E-01	+	1.077E-01	1.822E-01	1.831E-02	0.638
RU-103	1.315E-02		6.834E-02	1.245E-01	1.929E-02	0.106
RU-106	-9.856E-02		3.784E-01	6.688E-01	9.448E-02	-0.147
AG-108M	2.040E-02		5.320E-02	7.386E-02	6.848E-03	0.276
AG-110M	-1.019E-02		4.263E-02	6.757E-02	6.295E-03	-0.151
SN-113	2.825E-02		5.405E-02	1.009E-01	1.092E-02	0.280
TE123M	9.428E-03		4.404E-02	7.288E-02	6.898E-03	0.129

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
SB-124	1.673E-03		6.041E-02	9.797E-02	9.772E-03	0.017
I-125	-3.048E-01		7.794E-01	1.290E+00	1.212E-01	-0.236
SB-125	7.331E-02		1.026E-01	1.941E-01	2.103E-02	0.378
SB-126	3.602E-01		5.061E-01	7.507E-01	6.962E-02	0.480
I-129	-4.008E-02		6.990E-02	1.149E-01	1.262E-02	-0.349
I-131	-1.718E-01		5.636E-01	1.002E+00	1.675E-01	-0.172
BA-133	7.264E-03		5.269E-02	8.701E-02	1.828E-02	0.083
CS-134	-3.625E-03		4.229E-02	6.787E-02	6.769E-03	-0.053
CS-135	2.420E-01		2.359E-01	3.631E-01	1.036E-01	0.666
CS-136	-1.856E-01		3.127E-01	5.250E-01	4.641E-02	-0.354
CS-137	1.971E-02		4.381E-02	8.198E-02	7.606E-03	0.240
LA-138	3.037E-02		5.327E-02	1.081E-01	1.020E-02	0.281
CE-139	3.177E-02		4.539E-02	7.659E-02	6.991E-03	0.415
BA-140	1.215E-01		6.867E-01	1.266E+00	4.265E-01	0.096
LA-140	1.989E-01		1.985E-01	4.248E-01	3.997E-02	0.468
CE-141	-7.116E-02		1.316E-01	2.109E-01	5.438E-02	-0.337
CE-144	-2.600E-01		3.083E-01	4.855E-01	5.154E-02	-0.536
PM-144	-1.058E-02		3.794E-02	6.693E-02	6.220E-03	-0.158
PM-145	-1.130E-01		1.738E-01	2.567E-01	1.673E-01	-0.440
PM-146	-6.232E-03		8.066E-02	1.389E-01	1.489E-02	-0.045
ND-147	1.796E-02		1.913E+00	3.465E+00	3.645E-01	0.005
EU-152	-3.759E-02		2.867E-01	5.118E-01	5.915E-02	-0.073
GD-153	-7.845E-02		1.434E-01	2.309E-01	2.350E-02	-0.340
EU-154	-1.847E-01		1.420E-01	2.116E-01	1.891E-02	-0.873
EU-155	3.021E-01	+	1.259E-01	2.104E-01	1.987E-02	1.436
EU-156	-9.573E-01		1.700E+00	2.527E+00	5.818E-01	-0.379
HO-166M	8.325E-02	+	3.379E-02	1.193E-01	1.107E-02	0.698
HF-172	-1.029E-01		2.854E-01	4.614E-01	5.050E-02	-0.223
LU-172	1.359E+00		2.153E+00	4.086E+00	3.459E-01	0.332
LU-173	1.243E-01		1.763E-01	2.917E-01	8.585E-02	0.426
HF-175	-7.316E-03		7.040E-02	9.064E-02	1.899E-02	-0.081
LU-176	3.843E-03		3.484E-02	5.289E-02	1.441E-02	0.073
TA-182	7.322E-01	+	2.616E-01	4.877E-01	4.088E-02	1.501
IR-192	1.376E-01		8.520E-02	1.450E-01	1.554E-02	0.949
HG-203	4.379E-02		6.857E-02	1.141E-01	3.558E-02	0.384
BI-207	3.257E-03		3.418E-02	5.683E-02	5.836E-03	0.057
BI-210M	1.422E-02		7.098E-02	1.171E-01	3.172E-02	0.121
PB-210	1.018E+00		8.238E-01	1.465E+00	1.155E-01	0.695
PB-211	-3.467E-01		1.154E+00	1.832E+00	1.950E-01	-0.189
RN-219	3.283E-01		5.136E-01	8.785E-01	9.342E-02	0.374
RA-223	-2.038E-01		8.114E-01	1.298E+00	3.177E-01	-0.157
RA-225	1.467E-01		4.900E-01	8.335E-01	7.181E-02	0.176
TH-227	2.849E-01	+	2.880E-01	6.461E-01	1.388E-01	0.441
TH-230	-1.119E+01		1.114E+01	1.625E+01	1.260E+00	-0.688
PA-231	1.379E+00		1.517E+00	2.373E+00	6.615E-01	0.581
TH-231	1.954E-01		3.329E-01	5.747E-01	7.413E-02	0.340
PA-233	8.488E-03		1.791E-01	2.941E-01	9.881E-02	0.029
PA-234	7.763E-02		1.502E-01	2.516E-01	2.697E-02	0.309

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
PA-234M	4.467E+00		4.950E+00	9.108E+00	7.882E-01	0.490
TH-234	9.431E-01		1.022E+00	1.807E+00	1.342E-01	0.522
U-235	-7.566E-02		2.940E-01	4.817E-01	8.825E-02	-0.157
AM-241	-2.475E-01		1.093E-01	1.646E-01	1.179E-02	-1.504
CM-243	2.679E-02		2.330E-01	3.824E-01	1.176E-01	0.070

Sample ID : 1303012-15 Acquisition date : 1-APR-2013 10:02:28

Total number of lines in spectrum	62	
Number of unidentified lines	29	
Number of lines tentatively identified by NID	33	53.23%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.316E+01	2.316E+01	0.299E+01	12.90	
TL-208	1.41E+10Y	1.00	9.227E-01	9.227E-01	1.815E-01	19.67	
BI-212	1.41E+10Y	1.00	8.272E-01	8.272E-01	4.936E-01	59.67	
PB-212	1.41E+10Y	1.00	1.138E+00	1.138E+00	0.274E+00	24.08	
BI-214	1602.00Y	1.00	1.328E+00	1.328E+00	0.190E+00	14.28	
PB-214	1602.00Y	1.00	1.406E+00	1.407E+00	0.276E+00	19.63	
RA-224	1.41E+10Y	1.00	4.700E+00	4.700E+00	1.758E+00	37.42	
RA-226	1602.00Y	1.00	3.115E+00	3.115E+00	5.853E+00	187.91	
AC-228	1.41E+10Y	1.00	1.157E+00	1.157E+00	0.224E+00	19.32	
		Total Activity :	3.776E+01	3.776E+01			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CD-109	464.00D	1.05	2.480E+00	2.603E+00	1.097E+00	42.12	
SN-126	1.00E+05Y	1.00	2.493E-01	2.493E-01	1.039E-01	41.69	
NP-237	2.14E+06Y	1.00	7.317E-01	7.317E-01	3.049E-01	41.67	
		Total Activity :	3.461E+00	3.584E+00			

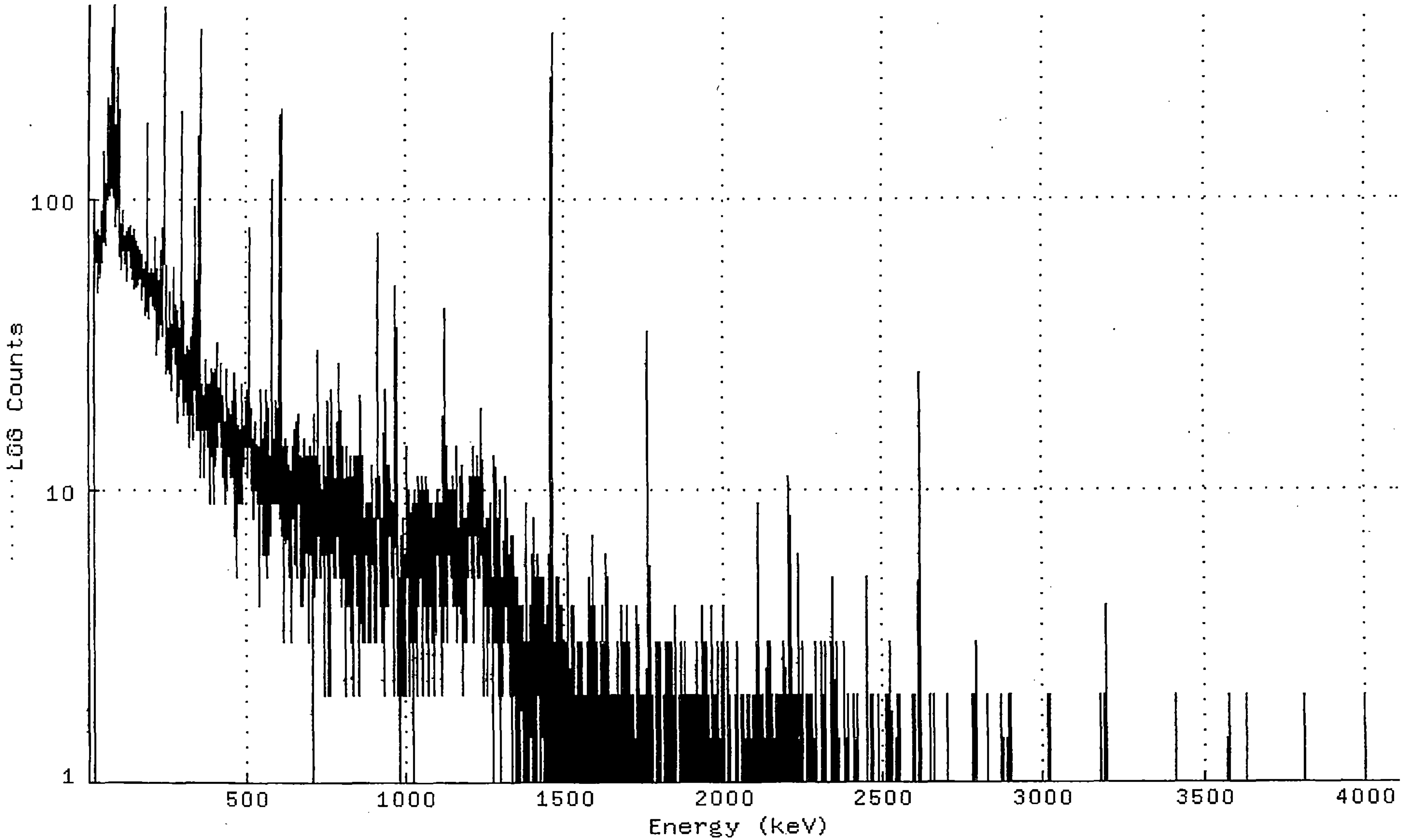
Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	8.823E-01	8.823E-01	1.615E-01	18.30	
		Total Activity :	8.823E-01	8.823E-01			

Grand Total Activity : 4.210E+01 4.222E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301215_GE1_GAS1202_190110.CNF;1
Title :
Sample Title: S30-BKGD-N-130228
Start Time: 1-APR-2013 10:02: Sample Time: 28-FEB-2013 00:00 Energy Offset: -2.35223E-01
Real Time : 0 01:00:01.12 Sample ID : 1303012-15 Energy Slope : 1.00007E+00
Live Time : 0 01:00:00.00 Sample Type: SOLID Energy Quad : 0.00000E+00



0325

Channel Contents for DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_130301215_GE1_GAS1202_1901

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	47	99	82	73	61	73
25:	62	75	71	78	56	56	49	61
33:	48	63	59	65	59	54	62	90
41:	70	61	66	75	67	113	143	80
49:	86	73	71	69	112	71	80	76
57:	94	106	99	113	119	106	218	193
65:	102	128	115	115	125	109	109	136
73:	168	199	380	194	461	322	103	114
81:	105	93	81	129	121	107	178	155
89:	114	149	92	147	277	147	95	63
97:	65	87	85	73	79	57	65	69
105:	75	90	66	74	90	84	77	69
113:	68	75	70	68	60	58	52	53
121:	62	77	67	73	70	66	77	72
129:	78	81	71	71	65	59	62	53
137:	63	68	71	65	75	65	49	78
145:	73	57	63	50	71	58	66	59
153:	69	62	55	51	68	59	59	62
161:	53	57	57	66	59	61	54	64
169:	54	45	61	50	50	50	51	55
177:	54	61	43	42	53	54	40	52
185:	68	179	116	41	54	50	55	55
193:	43	39	47	50	46	56	56	57
201:	48	50	49	44	54	43	55	46
209:	73	74	44	47	42	51	57	51
217:	43	43	29	36	48	52	37	39
225:	40	41	50	49	66	43	37	36
233:	39	44	34	62	37	171	448	83
241:	82	154	82	43	30	25	34	28
249:	31	30	32	33	26	31	36	34
257:	25	48	37	45	37	37	35	22
265:	25	28	33	37	37	58	50	38
273:	31	35	43	27	40	27	32	35
281:	41	19	27	17	25	35	23	36
289:	21	36	31	28	24	37	198	176
297:	30	30	18	40	44	21	30	28
305:	23	20	25	22	29	18	23	20
313:	31	21	23	25	14	20	21	24
321:	29	31	18	22	22	19	29	39
329:	30	17	22	15	25	26	25	28
337:	22	58	94	29	28	27	21	31
345:	16	28	20	24	19	16	71	374
353:	145	22	11	24	22	23	20	16
361:	21	17	19	19	15	21	14	20
369:	11	28	16	18	19	23	18	19
377:	22	14	16	17	23	16	9	16
385:	23	18	18	14	26	13	22	18
393:	18	21	19	9	18	23	25	18
401:	20	26	17	20	12	16	20	17
409:	32	24	24	21	17	21	17	17
417:	18	18	14	27	17	16	18	11
425:	19	21	18	17	15	15	13	17

433:	9	11	17	10	13	12	19	26
441:	15	13	13	18	17	19	14	17
449:	17	11	14	18	12	12	13	18
457:	20	14	17	7	18	18	21	25
465:	18	22	7	5	7	18	21	13
473:	9	12	12	11	10	11	16	13
481:	9	15	13	16	10	9	16	12
489:	23	12	14	13	13	14	14	17
497:	20	17	14	18	16	22	16	15
505:	14	11	18	14	24	41	79	50
513:	26	14	15	14	10	15	18	8
521:	10	9	12	11	15	15	15	14
529:	12	10	17	12	12	14	9	11
537:	12	14	8	9	4	11	7	12
545:	17	9	22	11	11	15	7	6
553:	13	13	13	8	16	17	8	6
561:	11	20	22	16	7	11	5	7
569:	9	10	19	6	10	8	9	7
577:	13	12	9	9	14	17	115	91
585:	13	15	15	10	9	9	10	14
593:	9	11	14	20	16	9	16	13
601:	11	13	19	12	10	8	10	22
609:	183	201	27	15	7	10	14	14
617:	10	10	13	14	3	14	14	7
625:	10	15	12	8	14	11	7	9
633:	9	5	10	8	12	8	9	11
641:	3	11	9	9	11	12	8	8
649:	10	14	10	16	7	7	13	9
657:	6	5	9	10	7	12	17	15
665:	18	11	9	13	10	8	4	13
673:	10	7	4	10	6	5	12	4
681:	11	15	12	6	10	5	6	12
689:	12	8	13	13	12	3	6	10
697:	7	11	13	6	8	6	7	12
705:	14	12	10	11	9	10	0	18
713:	5	11	11	15	7	8	5	13
721:	13	5	10	7	10	11	30	26
729:	12	9	12	5	10	11	5	10
737:	9	8	6	7	9	8	9	6
745:	2	14	8	9	10	11	8	11
753:	6	12	11	20	9	2	7	2
761:	8	9	14	10	4	9	17	21
769:	22	13	12	13	11	7	9	5
777:	5	8	9	7	6	5	7	17
785:	12	15	8	7	7	7	5	5
793:	5	8	27	13	9	9	6	4
801:	8	7	14	9	5	13	12	10
809:	4	9	2	5	9	5	5	4
817:	14	8	8	7	8	11	5	4
825:	8	9	10	3	13	13	7	2
833:	11	6	10	11	8	10	6	13
841:	13	6	13	4	7	4	13	4
849:	11	10	10	9	13	13	2	6
857:	9	8	6	21	19	9	9	3
865:	8	5	4	5	6	3	7	8
873:	8	6	9	7	6	7	7	8
881:	8	9	3	6	4	9	6	5
889:	3	6	5	6	8	6	9	12
897:	8	7	6	3	7	3	8	3
905:	6	3	10	6	5	24	76	64

913:	12	8	9	11	4	4	5	8
921:	10	3	5	7	8	7	4	6
929:	2	3	6	6	11	22	10	4
937:	9	6	11	8	5	4	10	12
945:	11	7	12	7	8	11	12	7
953:	8	5	7	5	7	9	9	8
961:	2	8	3	13	22	7	10	16
969:	50	26	6	5	8	2	2	3
977:	5	5	3	1	5	5	7	2
985:	5	6	2	6	7	8	5	4
993:	2	3	5	2	6	5	5	5
1001:	14	7	10	8	7	5	2	5
1009:	8	8	10	7	8	3	4	7
1017:	4	6	1	8	9	8	4	3
1025:	5	6	10	6	7	7	9	5
1033:	3	2	3	10	10	4	5	11
1041:	5	6	5	8	10	6	5	6
1049:	7	2	9	11	6	10	9	7
1057:	7	4	5	7	8	3	11	8
1065:	6	9	8	10	3	2	8	5
1073:	9	6	6	4	6	9	3	7
1081:	5	8	6	3	8	4	7	8
1089:	2	5	9	9	7	8	4	10
1097:	7	6	7	7	6	6	7	4
1105:	8	6	9	5	2	7	9	4
1113:	2	5	5	10	3	7	10	32
1121:	42	23	4	6	5	14	7	9
1129:	3	5	6	6	9	10	10	7
1137:	10	5	5	7	9	10	8	7
1145:	4	7	6	11	6	4	6	5
1153:	10	10	6	14	9	9	5	3
1161:	5	4	5	6	4	6	7	8
1169:	9	11	10	5	7	2	7	12
1177:	4	3	5	7	8	7	3	5
1185:	6	7	4	8	3	8	6	7
1193:	9	7	7	5	5	11	8	9
1201:	9	7	8	8	10	11	5	5
1209:	6	10	10	3	14	12	9	8
1217:	8	7	11	8	11	5	12	9
1225:	10	7	13	9	6	11	8	7
1233:	5	7	11	8	11	19	18	9
1241:	5	9	2	4	11	5	6	6
1249:	4	6	7	8	8	6	6	8
1257:	2	6	6	6	8	3	5	4
1265:	5	4	4	9	7	3	4	4
1273:	4	1	5	3	6	6	6	7
1281:	13	11	5	5	3	3	9	7
1289:	3	2	2	8	4	1	10	8
1297:	6	8	3	2	5	5	2	4
1305:	3	4	3	4	5	4	4	11
1313:	8	4	7	7	5	8	4	3
1321:	3	6	5	6	4	3	2	2
1329:	4	7	5	0	6	1	0	4
1337:	2	7	3	3	3	4	0	5
1345:	3	2	2	0	2	4	5	5
1353:	3	2	2	4	2	1	1	3
1361:	2	2	2	4	4	1	4	1
1369:	3	1	3	2	2	2	3	0
1377:	9	8	7	3	1	0	3	3
1385:	3	3	1	1	2	2	2	3

1393:	2	4	2	1	0	6	2	1
1401:	1	8	4	2	3	5	3	5
1409:	5	1	1	2	2	4	5	6
1417:	5	3	5	4	0	2	3	1
1425:	2	2	4	5	4	2	3	2
1433:	1	5	2	4	3	2	2	2
1441:	1	1	1	1	3	4	0	2
1449:	3	2	3	1	2	6	0	2
1457:	3	3	25	183	365	183	23	3
1465:	1	2	2	1	1	1	2	3
1473:	1	2	2	3	1	5	1	5
1481:	3	3	2	2	0	1	4	2
1489:	0	1	4	1	1	1	1	4
1497:	1	2	3	0	3	2	2	2
1505:	1	3	2	1	4	7	0	1
1513:	1	3	2	2	1	0	0	1
1521:	3	4	1	3	1	3	4	0
1529:	2	3	0	2	0	1	1	1
1537:	1	2	0	0	1	3	2	2
1545:	0	3	2	2	3	0	2	3
1553:	1	0	2	0	1	2	0	1
1561:	0	2	0	0	0	2	0	2
1569:	0	1	2	0	0	3	2	1
1577:	5	3	1	0	4	1	3	0
1585:	0	0	7	5	6	2	0	2
1593:	2	4	2	4	2	1	0	3
1601:	0	1	0	2	2	1	1	2
1609:	2	0	0	2	2	0	3	0
1617:	2	0	1	1	4	3	3	0
1625:	1	2	1	0	3	1	6	3
1633:	1	2	0	1	0	5	0	2
1641:	2	1	1	1	0	1	2	2
1649:	0	2	0	1	0	2	0	0
1657:	1	1	1	2	1	2	0	0
1665:	0	3	1	0	0	0	2	1
1673:	2	1	0	0	2	3	0	1
1681:	1	4	2	3	2	3	1	0
1689:	0	2	3	3	1	2	2	1
1697:	0	1	4	1	1	1	2	3
1705:	0	0	0	1	0	0	2	2
1713:	1	0	1	0	0	2	0	1
1721:	1	1	0	0	0	2	1	1
1729:	4	4	3	1	1	1	0	2
1737:	0	1	2	1	2	0	2	2
1745:	1	1	0	0	1	0	2	1
1753:	2	1	0	2	2	1	2	2
1761:	3	0	5	22	35	10	3	1
1769:	2	0	1	0	2	1	1	1
1777:	1	0	0	0	0	0	0	0
1785:	0	0	1	3	1	1	3	1
1793:	3	1	0	0	1	3	0	1
1801:	2	1	0	1	0	1	0	0
1809:	0	0	1	2	1	0	0	3
1817:	0	1	1	0	1	3	0	0
1825:	0	1	1	2	0	1	3	1
1833:	3	0	0	1	0	2	2	2
1841:	2	1	0	0	2	0	2	4
1849:	3	0	1	0	0	1	0	0
1857:	1	0	0	1	0	2	0	1
1865:	0	3	1	0	1	0	0	2

1873:	0	0	1	3	1	0	1	1
1881:	0	1	2	0	1	2	2	2
1889:	1	1	0	0	0	1	2	1
1897:	1	1	2	2	0	0	0	0
1905:	1	1	2	1	1	0	3	3
1913:	0	0	0	1	2	1	1	1
1921:	1	1	0	0	2	0	2	1
1929:	1	1	0	1	2	4	0	1
1937:	1	3	0	0	2	1	3	2
1945:	1	1	1	0	1	1	0	2
1953:	1	1	0	0	1	0	0	0
1961:	4	0	1	0	2	1	0	0
1969:	1	0	0	2	1	1	1	0
1977:	3	1	0	3	1	2	1	1
1985:	1	1	1	0	0	1	3	0
1993:	1	2	0	1	0	4	0	0
2001:	0	0	0	1	0	1	0	0
2009:	3	0	1	0	0	0	0	0
2017:	2	1	1	1	0	1	0	0
2025:	0	1	0	0	1	0	1	0
2033:	1	0	0	2	1	0	0	2
2041:	3	0	1	0	1	0	0	1
2049:	0	2	2	0	0	0	1	0
2057:	2	0	1	2	0	1	0	0
2065:	0	1	1	0	2	0	0	0
2073:	2	1	2	0	0	2	0	1
2081:	0	1	1	0	2	0	1	1
2089:	2	1	0	2	0	1	2	0
2097:	3	1	0	0	0	1	4	9
2105:	2	3	0	1	0	0	2	0
2113:	2	2	1	1	0	2	1	1
2121:	1	1	1	0	1	1	2	1
2129:	0	0	1	2	3	0	2	2
2137:	1	2	2	3	2	1	2	1
2145:	1	0	2	0	0	2	1	0
2153:	0	0	0	1	0	1	1	2
2161:	0	1	1	0	0	1	1	2
2169:	0	2	1	1	1	0	0	2
2177:	0	0	0	0	0	2	2	1
2185:	0	3	2	1	1	2	0	0
2193:	1	1	1	2	0	1	2	2
2201:	1	0	4	11	6	0	1	0
2209:	0	1	1	0	0	1	2	1
2217:	0	2	1	1	1	0	1	0
2225:	1	0	0	2	1	6	0	2
2233:	1	1	2	1	1	2	1	1
2241:	0	3	1	2	1	1	0	0
2249:	1	1	1	1	1	2	0	0
2257:	1	0	2	1	1	0	1	0
2265:	1	0	2	0	0	0	1	1
2273:	0	0	0	2	1	0	1	0
2281:	1	0	1	3	0	1	2	0
2289:	1	1	0	1	0	1	1	1
2297:	0	0	1	0	0	1	0	0
2305:	3	3	0	0	0	2	1	0
2313:	0	0	0	1	3	1	0	0
2321:	0	0	1	1	1	0	1	0
2329:	0	0	0	2	0	3	0	0
2337:	1	2	1	1	0	5	0	1
2345:	1	0	0	0	0	3	0	0

2353:	0	2	0	0	1	0	0	1
2361:	1	1	1	0	1	1	0	1
2369:	1	1	1	1	0	0	1	0
2377:	3	2	0	1	1	0	0	1
2385:	0	1	2	1	1	0	0	1
2393:	0	0	0	0	0	1	0	1
2401:	0	1	0	1	0	2	2	2
2409:	1	0	0	1	1	0	2	1
2417:	1	0	0	1	1	0	0	0
2425:	0	1	0	1	0	1	0	1
2433:	0	0	0	1	0	0	0	0
2441:	0	0	0	0	0	4	5	2
2449:	2	1	0	0	1	0	0	0
2457:	0	0	0	0	1	2	0	1
2465:	2	0	1	1	0	0	0	1
2473:	0	0	1	1	0	0	0	0
2481:	1	1	0	2	1	0	1	0
2489:	0	0	0	0	1	0	0	0
2497:	0	0	0	1	1	0	0	0
2505:	0	0	1	2	0	1	0	0
2513:	0	2	0	0	0	0	1	1
2521:	0	3	1	0	0	0	0	0
2529:	0	0	0	0	0	0	1	0
2537:	0	0	0	1	2	0	0	0
2545:	0	0	0	0	0	2	0	0
2553:	0	0	0	0	1	1	0	0
2561:	1	0	0	0	0	0	0	0
2569:	0	1	1	0	0	1	1	0
2577:	0	0	0	1	0	0	0	1
2585:	0	0	1	0	0	0	0	0
2593:	2	0	0	0	2	0	0	0
2601:	0	1	0	0	0	1	0	1
2609:	0	0	0	4	6	25	25	6
2617:	2	1	1	0	1	0	1	0
2625:	0	1	1	0	0	0	0	1
2633:	0	1	1	0	0	0	0	1
2641:	0	0	0	0	0	2	1	0
2649:	0	1	0	0	0	0	0	2
2657:	0	0	0	0	1	1	0	0
2665:	0	0	0	0	0	1	0	0
2673:	0	0	1	0	0	0	0	0
2681:	0	0	0	0	1	0	0	0
2689:	0	1	0	0	0	0	0	0
2697:	0	0	0	1	2	1	0	1
2705:	0	1	0	0	1	1	0	1
2713:	0	0	0	0	0	0	0	1
2721:	0	0	0	1	0	1	0	0
2729:	0	0	0	0	1	0	1	0
2737:	0	1	0	0	0	0	1	0
2745:	1	1	0	0	0	1	0	1
2753:	0	1	1	0	1	1	0	0
2761:	0	0	1	0	0	0	1	1
2769:	0	1	0	0	0	1	0	0
2777:	1	0	2	1	1	0	2	0
2785:	2	0	0	1	3	0	0	1
2793:	0	0	1	0	0	1	1	0
2801:	0	0	0	0	0	0	0	0
2809:	1	0	0	1	1	0	1	0
2817:	0	0	0	0	0	0	0	0
2825:	2	0	0	0	0	0	0	1

2833:	1	0	0	0	0	0	0	0
2841:	0	0	0	0	0	0	0	0
2849:	0	0	0	0	0	0	0	0
2857:	0	0	0	0	0	1	0	0
2865:	0	1	1	0	2	0	0	1
2873:	0	0	0	1	1	0	0	1
2881:	0	0	0	0	0	0	0	2
2889:	0	1	0	0	1	0	0	1
2897:	1	2	0	0	0	0	0	0
2905:	0	0	1	0	0	1	0	0
2913:	0	0	0	0	0	1	0	0
2921:	0	0	0	0	0	1	0	0
2929:	1	0	0	1	0	1	0	0
2937:	0	0	0	0	0	0	0	0
2945:	0	1	1	1	0	0	0	1
2953:	0	0	0	0	0	0	1	0
2961:	0	0	0	0	0	0	1	0
2969:	0	0	0	0	0	1	0	1
2977:	0	0	0	1	0	0	0	0
2985:	0	0	0	0	1	0	1	0
2993:	1	0	0	0	0	0	0	0
3001:	0	0	0	0	0	1	0	0
3009:	0	0	0	2	0	0	0	0
3017:	0	2	0	0	0	1	0	0
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	0	0	1	0	1
3041:	0	0	0	0	0	1	0	0
3049:	0	0	0	1	0	0	0	1
3057:	1	0	0	1	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	0	0	0	0	1	0	1	0
3081:	1	0	0	0	0	0	0	1
3089:	0	0	0	0	0	0	0	0
3097:	0	0	0	0	0	0	0	0
3105:	0	1	0	0	0	0	1	0
3113:	0	0	0	0	0	0	0	1
3121:	1	0	1	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0
3137:	0	1	0	0	0	0	0	1
3145:	0	0	0	0	0	0	0	0
3153:	0	0	0	0	0	0	0	0
3161:	0	0	0	0	0	0	0	0
3169:	0	0	0	2	0	1	0	0
3177:	0	0	0	0	0	0	0	0
3185:	1	0	0	4	0	0	0	0
3193:	0	0	1	1	1	1	0	0
3201:	0	0	0	0	0	1	0	0
3209:	0	0	0	0	0	1	1	0
3217:	0	0	1	0	0	0	0	0
3225:	0	1	1	0	0	1	0	1
3233:	0	0	0	0	0	0	0	0
3241:	0	0	1	1	0	0	0	0
3249:	0	0	0	0	0	1	0	1
3257:	0	1	0	0	0	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	1	0	0	0	0	0
3281:	0	0	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	1

3313:	1	0	0	0	0	0	0	1
3321:	0	0	0	0	0	0	0	0
3329:	0	0	0	1	0	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	1	0	0	0	0	1	0	1
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	0	0	1	0
3377:	1	0	0	0	0	0	0	0
3385:	0	0	1	0	0	1	0	1
3393:	0	0	0	0	0	0	0	0
3401:	0	0	0	0	0	2	0	0
3409:	0	0	0	0	0	0	0	0
3417:	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	0	0	0	1	0	0	0
3441:	0	1	0	0	1	0	0	0
3449:	0	0	0	0	0	0	0	0
3457:	0	0	0	0	0	0	0	0
3465:	0	0	0	0	0	1	1	0
3473:	0	0	0	0	0	0	1	1
3481:	0	0	0	0	0	1	1	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	1	1	1	1
3505:	1	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	1	0
3521:	0	0	1	0	1	0	1	0
3529:	0	0	0	0	0	0	0	0
3537:	0	0	0	0	0	0	0	0
3545:	0	0	0	1	0	0	0	1
3553:	0	0	1	0	0	0	0	0
3561:	0	1	1	1	1	0	0	0
3569:	1	1	1	2	0	0	1	0
3577:	0	0	1	0	1	0	1	1
3585:	0	0	0	0	0	1	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	1	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	1
3617:	0	0	0	0	1	0	0	0
3625:	0	0	0	2	0	0	0	0
3633:	0	0	0	0	0	0	0	1
3641:	0	0	0	1	0	0	0	0
3649:	1	0	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	1
3665:	0	0	0	0	0	1	0	0
3673:	0	0	0	0	0	0	0	0
3681:	1	0	0	0	0	0	1	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	1	0	0	0	0	1
3705:	0	0	0	0	0	0	0	0
3713:	1	0	1	0	1	0	0	1
3721:	0	0	0	1	0	0	0	0
3729:	0	0	0	0	0	1	0	1
3737:	1	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	1	0	0	0	0	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	1	0	0
3785:	0	0	0	0	1	0	0	0

3793:	0	0	0	1	1	0	0	1
3801:	0	0	0	0	0	0	0	0
3809:	2	0	0	1	0	1	0	0
3817:	0	0	0	0	0	0	0	0
3825:	1	0	0	0	0	0	0	1
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	1	0	0	0	0
3849:	0	0	0	0	0	0	0	0
3857:	0	0	1	0	0	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	1	0	0	1	0	1
3881:	0	0	0	0	0	0	0	0
3889:	1	0	0	0	0	0	0	0
3897:	0	1	0	0	0	1	0	1
3905:	0	0	0	0	0	1	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	1	0	0	1	0
3929:	0	0	1	0	1	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	1
3953:	1	1	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	1	0	0	0	0	0	0	0
3977:	0	0	1	0	0	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	2	0	0	0	0	0
4001:	0	0	0	0	0	0	1	1
4009:	0	0	1	0	0	0	0	0
4017:	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	1	0	1	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	1	0	1	0	0	0
4057:	0	1	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	1
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	1	0	0	0

```
QA filename        : DKA100:[GAMMA.SCUSR.QA]QCB_GE1.QAF;1

Sample ID          : Bkgrnd Check           Sample quantity  : 1.00 EACH
Sample date        : 29-MAR-2013 07:15:58 Acquisition date : 29-MAR-2013 07:15:58
Elapsed live time: 0 00:15:00.00          Elapsed real time: 0 00:15:00.10

Out-of-range Test: N-SIGMA

Parameter Description                     Value       Deviation      Flag
   [Mean+/-Stdev]
 Background Counts                    2248                 1.82
   [1838+/-225]
 Background Rate                      2.50                 1.88
   [2.05+/-0.24]

Flags: "*" means the out-of-range test is parameter-dependent
```

Approved by: AG   Approval Date: 3 / 29 / 13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCB_GE2.QAF;1

Sample ID : Bkgrnd Check
Sample quantity : 1.00 EACH
Sample date : 29-MAR-2013 07:16:13
Acquisition date : 29-MAR-2013 07:16:13
Elapsed live time: 0 00:15:00.00
Elapsed real time: 0 00:15:00.15

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Background Counts [3039+/-3853]	2427	-0.16	
*Background Rate [33+/-558]	2.7	-0.05	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: AG Approval Date: 3 / 29 / 13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCC_GE1_GAS1202.QAF;1

Sample ID : Calib Check
Sample date : 1-JAN-2012 00:00:00
Elapsed live time: 0 00:15:00.00

Sample quantity : 736. GRAM
Acquisition date : 29-MAR-2013 08:14:31
Elapsed real time: 0 00:15:18.48

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*Peak Centroid 59.54 kev	58	61	60	
*Peak Centroid 661.65 kev	660	663	662	
*Peak Centroid 1173.22 kev	1172	1175	1173	
*Peak Centroid 1332.49 kev	1331	1334	1333	
*Peak Centroid 1836.01 kev	1834.5	1838.0	1836.1	
*Peak FWHM Am-241 59.54 kev	0.5	3.0	1.6	
*Peak FWHM Cs-137 661.65 kev	0.5	3.0	1.6	
*Peak FWHM Co-60 1173.22 kev	0.5	3.0	1.9	
*Peak FWHM Co-60 1332.49 kev	0.5	3.0	2.0	
*Peak FWHM Y-88 1836.01 kev	0.5	3.0	2.3	
*DC Activity Am-241 59.54 kev	162	242	202	
*DC Activity Cs-137 661.65 kev	66	100	88	
*DC Activity Co-60 1173.22 kev	104	156	134	
*DC Activity Co-60 1332.49 kev	104	156	135	
*DC Activity Y-88 1836.01 kev	226	338	282	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: AG Approval Date: 3 / 29 / 13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCC_GE2_GAS1202.QAF;1

Sample ID : Calib Check
Sample date : 1-JAN-2012 00:00:00
Elapsed live time: 0 00:15:00.00

Sample quantity : 736. GRAM
Acquisition date : 29-MAR-2013 08:35:34
Elapsed real time: 0 00:15:14.30

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*Peak Centroid 59.54 kev	58	61	59	
*Peak Centroid 661.65 kev	660	663	661	
*Peak Centroid 1173.22 kev	1172	1175	1172	
*Peak Centroid 1332.49 kev	1331	1334	1332	
*Peak Centroid 1836.01 kev	1835	1838	1835	
*Peak FWHM Am-241 59.54 kev	0.5	3.0	1.6	
*Peak FWHM Cs-137 661.65 kev	0.5	3.0	1.7	
*Peak FWHM Co-60 1173.22 kev	0.5	3.0	2.1	
*Peak FWHM Co-60 1332.49 kev	0.5	3.0	2.2	
*Peak FWHM Y-88 1836.01 kev	0.5	3.0	2.6	
*DC Activity Am-241 59.54 kev	162	242	178	
*DC Activity Cs-137 661.65 kev	66	100	84	
*DC Activity Co-60 1173.22 kev	104	156	132	
*DC Activity Co-60 1332.49 kev	104	156	133	
*DC Activity Y-88 1836.01 kev	226	338	281	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: KB Approval Date: 3 / 29 / 13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCC_GE2_GAS1202.QAF;1

Sample ID : Calib Check
Sample date : 1-JAN-2012 00:00:00
Elapsed live time: 0 00:15:00.00

Sample quantity : 736. GRAM
Acquisition date : 1-APR-2013 05:27:51
Elapsed real time: 0 00:15:14.16

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*Peak Centroid 59.54 kev	58	61	59	
*Peak Centroid 661.65 kev	660	663	661	
*Peak Centroid 1173.22 kev	1172	1175	1172	
*Peak Centroid 1332.49 kev	1331	1334	1332	
*Peak Centroid 1836.01 kev	1835	1838	1835	
*Peak FWHM Am-241 59.54 kev	0.5	3.0	1.6	
*Peak FWHM Cs-137 661.65 kev	0.5	3.0	1.7	
*Peak FWHM Co-60 1173.22 kev	0.5	3.0	2.0	
*Peak FWHM Co-60 1332.49 kev	0.5	3.0	2.2	
*Peak FWHM Y-88 1836.01 kev	0.5	3.0	2.6	
*DC Activity Am-241 59.54 kev	162	242	183	
*DC Activity Cs-137 661.65 kev	66	100	85	
*DC Activity Co-60 1173.22 kev	104	156	132	
*DC Activity Co-60 1332.49 kev	104	156	132	
*DC Activity Y-88 1836.01 kev	226	338	286	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ______C______ Approval Date: 4/ 1 / 12

QA filename : DKA100:[GAMMA.SCUSR.QA]QCC_GE3_GAS1202.QAF;1

Sample ID : Calib Check Sample quantity : 736. GRAM
Sample date : 1-JAN-2012 00:00:00 Acquisition date : 1-APR-2013 05:53:19
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:38.25

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*Peak Centroid 59.54 kev	58	61	59	
*Peak Centroid 661.65 kev	660	663	662	
*Peak Centroid 1173.22 kev	1172	1175	1174	
*Peak Centroid 1332.49 kev	1331	1334	1333	
*Peak Centroid 1836.01 kev	1835	1838	1837	
*Peak FWHM Am-241 59.54 kev	0.5	3.0	1.7	
*Peak FWHM Cs-137 661.65 kev	0.5	3.0	1.6	
*Peak FWHM Co-60 1173.22 kev	0.5	3.0	2.0	
*Peak FWHM Co-60 1332.49 kev	0.5	3.0	2.1	
*Peak FWHM Y-88 1836.01 kev	0.5	3.0	2.4	
*DC Activity Am-241 59.54 kev	162	242	177	
*DC Activity Cs-137 661.65 kev	66	100	85	
*DC Activity Co-60 1173.22 kev	104	156	135	
*DC Activity Co-60 1332.49 kev	104	156	135	
*DC Activity Y-88 1836.01 kev	226	338	305	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ______________ Approval Date: 4 / 1 / 13

QA ~~file~~name : DKA100:[GAMMA.SCUSR.QA]QCC_GE1_GAS1202.QAF;1

Sample ID : Calib Check
Sample quantity : 736. GRAM
Sample date : 1-JAN-2012 00:00:00
Acquisition date : 1-APR-2013 06:32:03
Elapsed live time: 0 00:15:00.00
Elapsed real time: 0 00:15:18.28

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*Peak Centroid 59.54 kev	58	61	60	
*Peak Centroid 661.65 kev	660	663	662	
*Peak Centroid 1173.22 kev	1172	1175	1173	
*Peak Centroid 1332.49 kev	1331	1334	1333	
*Peak Centroid 1836.01 kev	1834.5	1838.0	1836.2	
*Peak FWHM Am-241 59.54 kev	0.5	3.0	1.6	
*Peak FWHM Cs-137 661.65 kev	0.5	3.0	1.6	
*Peak FWHM Co-60 1173.22 kev	0.5	3.0	1.9	
*Peak FWHM Co-60 1332.49 kev	0.5	3.0	2.0	
*Peak FWHM Y-88 1836.01 kev	0.5	3.0	2.3	
*DC Activity Am-241 59.54 kev	162	242	203	
*DC Activity Cs-137 661.65 kev	66	100	87	
*DC Activity Co-60 1173.22 kev	104	156	135	
*DC Activity Co-60 1332.49 kev	104	156	135	
*DC Activity Y-88 1836.01 kev	226	338	286	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ________ Approval Date: 4/ 1 /13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCB_GE1.QAF;1

Sample ID : Bkgrnd Check
Sample date : 1-APR-2013 05:52:22
Elapsed live time: 0 00:15:00.00

Sample quantity : 1.00 EACH
Acquisition date : 1-APR-2013 05:52:22
Elapsed real time: 0 00:15:00.09

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
Background Counts [1838+/-225]	1856	0.08	
Background Rate [2.05+/-0.24]	2.06	0.07	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ____________ Approval Date: 4/1/13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCB_GE2.QAF;1

Sample ID : Bkgrnd Check
Sample date : 1-APR-2013 06:13:45
Elapsed live time: 0 00:15:00.00
Sample quantity : 1.00 EACH
Acquisition date : 1-APR-2013 06:13:45
Elapsed real time: 0 00:15:00.16

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Background Counts [3039+/-3853]	2303	-0.19	
*Background Rate [33+/-558]	2.6	-0.05	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ______________ Approval Date: 4/1/13

QA filename : DKA100:[GAMMA.SCUSR.QA]QCB_GE3.QAF;1

Sample ID : Bkgrnd Check   Sample quantity : 1.00 EACH
Sample date : 1-APR-2013 06:32:59   Acquisition date : 1-APR-2013 06:32:59
Elapsed live time: 0 00:15:00.00   Elapsed real time: 0 00:15:03.24

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
Background Counts [2.96E+03+/-4.23E+04]	1.79E+03	-0.03	
*Background Rate [3.3+/-47]	2.0	-0.03	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: ______________________   Approval Date: 4/ 1 /13

ALS Environmental

Metals
Case Narrative

Weston Solutions, Inc.
Section 30 Mine DRS

Work Order Number: 1303060

1. This report consists of 12 soil samples.

2. The samples were received cool and intact by ALS on 03/05/13.

3. The samples were prepared and analyzed based on SW-846, 3rd Edition procedures.

   The samples were aliquoted as received and corrected for percent moisture.

   For analysis by Trace ICP and ICP-MS, the samples were digested following method 3050B and the current revision of SOP 806.

   For analysis by Cold Vapor AA (CVAA), the samples were digested following method 7471A and the current revision of SOP 812.

4. Analysis by Trace ICP followed method 6010B and the current revision of SOP 834.

   Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.

   Analysis by CVAA followed method 7471A and the current revision of SOP 812.

5. All standards and solutions are NIST traceable and were used within their recommended shelf life.

6. The samples were prepared and analyzed within the established hold times.

All in house quality control procedures were followed, as described below.

7. General quality control procedures.
   - A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in each digestion batch.

- The preparation (method) blank associated with each digestion batch was below the reporting limit for the requested analytes.
- All laboratory control sample criteria were met.
- All initial and continuing calibration blanks were below the reporting limit for the requested analytes with the exception of CCB12 for selenium. The analyte that exceeded acceptance criteria was not reported from the samples bracketed by this CCB.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analytes.
- The interference check samples and high standard readbacks associated with Method 6010B were within acceptance criteria.
- The interference check samples associated with Method 6020A were analyzed.

8. Matrix specific quality control procedures.

   Sample 1303060-1 was designated as the quality control sample for each ICP analysis. Sample 1303060-12 was designated as the quality control sample for the mercury analysis.

   Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

- A matrix spike and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for accuracy were met with the following exceptions:

Analyte	Sample ID
Antimony	1303060-1MS & MSD

  The native sample result is flagged for matrix spike failure and an analytical post spike was performed. The result of the spike was acceptable indicating that the matrix was not significantly affecting quantitation of this analyte.

- Matrix spike recoveries could not be evaluated for the following analytes:

Analyte	Sample ID
Aluminum	1303060-1
Calcium	1303060-1
Iron	1303060-1
Uranium	1303060-1

  The concentrations of these analytes in the native sample were greater than four times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The laboratory control samples indicate that the digestion and analysis were in control.

- A sample duplicate and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for precision were met.

- A serial dilution was analyzed with each ICP batch. All acceptance criteria were met with the following exception:

Analyte	Sample ID
Potassium	1303060-1L

The native sample result is flagged for serial dilution failure.

9. Samples 1303060-1, -4, and -9 through -12 were diluted for thallium, due to an unknown spectral interference.

   It is a standard practice that samples for ICP-MS are analyzed at a dilution.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Megan Johnson
Megan Johnson
Inorganics Primary Data Reviewer

3/12/13
Date

Inorganics Final Data Reviewer

3/12/13
Date

Inorganic Data Reporting Qualifiers

The following qualifiers are used by the laboratory when reporting results of inorganic analyses.

- Result qualifier -- If the analyte was analyzed for but not detected a "U" is entered.
- QC qualifier -- Specified entries and their meanings are as follows:

  E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

  M - Duplicate injection precision was not met.

  N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

  Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

  * - Duplicate analysis (relative percent difference) not within control limits.

  S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Chain of Custody

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1303060
Client Name: Weston Solutions, Inc.
Client Project Name: Section 30 Mine DRS
Client Project Number:
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
S30-04-130228	1303060-1		SOIL	28-Feb-13	11:00
S30-53-130228	1303060-2		SOIL	28-Feb-13	10:30
S30-61-130228	1303060-3		SOIL	28-Feb-13	9:00
S30-69-130228	1303060-4		SOIL	28-Feb-13	10:00
S30-70-130228	1303060-5		SOIL	28-Feb-13	9:55
S30-83-130228	1303060-6		SOIL	28-Feb-13	9:45
S30-90-130228	1303060-7		SOIL	28-Feb-13	10:45
S30-90-2-130228	1303060-8		SOIL	28-Feb-13	10:45
S30-91-130228	1303060-9		SOIL	28-Feb-13	10:40
S30-94-130228	1303060-10		SOIL	28-Feb-13	9:35
S30-95-130228	1303060-11		SOIL	28-Feb-13	9:40
S30-BKGD-N-130228	1303060-12		SOIL	28-Feb-13	12:50

1303060

USEPA
DateShipped: 3/4/2013
CarrierName: FedEx
AirbillNo: 794879667553

CHAIN OF CUSTODY RECORD
Section 30 Mine DRS
Contact Name: Kristie Warr
Contact Phone: 713-985-6600

No: 1-0035121104-130304-0002
Cooler #: 1
Lab: ALS Laboratory Group
Lab Phone: 970-490-1511

Lab #	Sample #	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	Sample_Remarks	MS/MSD
1	S30-04-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	141,119 CPM	N
2	S30-53-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	295,687 CPM	N
3	S30-61-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	235,886 CPM	N
4	S30-69-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	245,958 CPM	N
5	S30-70-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	360,259 CPM	N
6	S30-83-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	261,077 CPM	N
7	S30-90-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	391,816 CPM	N
8	S30-90-2-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	391,816 CPM	N
9	S30-91-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	321,783 CPM	N
10	S30-94-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	298,647 CPM	N
11	S30-95-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	284,513 CPM	N
12 ~~13~~ CD 3-5-13	S30-BKGD-N-130228	Metals, Mercury, Molybdenum, Tin, Total Uranium	Soil	2/28/2013	1	Jar	Ice	15,026 CPM	N

Special Instructions: Standard TAT, SW846 6010/6020 SW846 7470/7471	SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
12/samples	TR	3/4/13	fedex				FEDEX		C Trumble	3-5-13	0810

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: Weston — Workorder No: 1303060

Project Manager: AW — Initials: CDT — Date: 3-5-13

1. Does this project require any special handling in addition to standard ALS procedures?		YES		NO
2. Are custody seals on shipping containers intact?	NONE	YES		NO
3. Are Custody seals on sample containers intact?	NONE	YES		NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		YES		NO
5. Are the COC and bottle labels complete and legible?		YES		NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		YES		NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	YES		NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	YES		NO
9. Are all aqueous non-preserved samples pH 4-9?	N/A	YES		NO
10. Is there sufficient sample for the requested analyses?		YES		NO
11. Were all samples placed in the proper containers for the requested analyses?		YES		NO
12. Are all samples within holding times for the requested analyses?		YES		NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		YES		NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	N/A	YES		NO
15. Do any water samples contain sediment? Amount. Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES		NO
16. Were the samples shipped on ice?		YES		NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 #4	RAD ONLY	YES		NO

Cooler #:	1						
Temperature (°C):	3.8						
No. of custody seals on cooler:	1						
External µR/hr reading:	22						
Background µR/hr reading:	12						

DOT Survey/ Acceptance Information

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES / NO / NA (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Times taken from bottles
Sample 3 did not have a number after the 530-
put it in AS '61' since a jar with the ID of
"530-61-130228" was not received.
AW 3/5/13

If applicable, was the client contacted? YES / NO / NA Contact: Kristie Warr Date/Time: 3/5/13 e-mail

Project Manager Signature / Date: [signature] 3/5/13

*IR Gun #2: Oakton, SN 29922500201-0066
*IR Gun #4: Oakton, SN 2372220101-0002

Form 201r24.xls (06/04/2012)

1303060

#2

From: (903) 348-3917 Origin ID: GUPA
Patrick Buster
START6 - Weston Solutions, Inc.
825 E. Sante Fe Ave.

Grants, NM 87020

FedEx. Express

E

J13101212190326

Ship Date: 04MAR13
ActWgt: 40.0 LB
CAD: 2557564/INET3370

22

Delivery Address Bar Code

SHIP TO: (970) 490-1511 BILL SENDER
Lance Steere
ALS Laboratory Group
225 Commerce Drive

Fort Collins, CO 80524

Ref # 20406.012.035.0784.01
Invoice #
PO #
Dept # San Mateo START 6

3.8

TUE - 05 MAR 8:30A
FIRST OVERNIGHT

TRK# 7948 7966 6925
0201

X1 FTCA 12@1

80524
CO-US
DEN

518G2/DCF8/93AB

After printing this label:

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Sample Results

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
Lab ID: 1303060-1

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	6800	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	N
7440-38-2	ARSENIC	1	5.9	1.1		
7440-39-3	BARIUM	1	82	11		
7440-41-7	BERYLLIUM	1	0.69	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	15000	110		
7440-47-3	CHROMIUM	1	6.6	1.1		
7440-48-4	COBALT	1	5.6	1.1		
7440-50-8	COPPER	1	10	1.1		
7439-89-6	IRON	1	16000	11		
7439-92-1	LEAD	1	11	0.32		
7439-95-4	MAGNESIUM	1	4300	110		
7439-96-5	MANGANESE	1	210	1.1		
7439-98-7	MOLYBDENUM	1	1.3	1.1		
7440-02-0	NICKEL	1	9.5	2.1		
7440-09-7	POTASSIUM	1	2100	110		E
7782-49-2	SELENIUM	1	2.6	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	110	110	U	
7440-28-0	THALLIUM	5	5.3	5.3	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	19	1.1		
7440-66-6	ZINC	1	41	2.1		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-53-130228
Lab ID: 1303060-2

Sample Matrix: SOIL
% Moisture: 3.6
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4800	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	23	1		
7440-39-3	BARIUM	1	99	10		
7440-41-7	BERYLLIUM	1	1.2	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	12000	100		
7440-47-3	CHROMIUM	1	3.1	1		
7440-48-4	COBALT	1	3.7	1		
7440-50-8	COPPER	1	6.1	1		
7439-89-6	IRON	1	12000	10		
7439-92-1	LEAD	1	29	0.31		
7439-95-4	MAGNESIUM	1	2300	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	38	1		
7440-02-0	NICKEL	1	4.4	2		
7440-09-7	POTASSIUM	1	1600	100		
7782-49-2	SELENIUM	1	87	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	310	1		
7440-66-6	ZINC	1	24	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-61-130228
Lab ID: 1303060-3

Sample Matrix: SOIL
% Moisture: 2.8
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.037 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5000	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	9.2	0.99		
7440-39-3	BARIUM	1	77	9.9		
7440-41-7	BERYLLIUM	1	0.68	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	7200	99		
7440-47-3	CHROMIUM	1	4.3	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	7.2	0.99		
7439-89-6	IRON	1	11000	9.9		
7439-92-1	LEAD	1	23	0.3		
7439-95-4	MAGNESIUM	1	2400	99		
7439-96-5	MANGANESE	1	160	0.99		
7439-98-7	MOLYBDENUM	1	4	0.99		
7440-02-0	NICKEL	1	5.4	2		
7440-09-7	POTASSIUM	1	1400	99		
7782-49-2	SELENIUM	1	32	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	1	0.99	0.99	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	120	0.99		
7440-66-6	ZINC	1	28	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-69-130228
Lab ID: 1303060-4

Sample Matrix: SOIL
% Moisture: 2.8
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.035 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3800	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	18	0.99		
7440-39-3	BARIUM	1	68	9.9		
7440-41-7	BERYLLIUM	1	0.74	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	28000	99		
7440-47-3	CHROMIUM	1	3.2	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	5.5	0.99		
7439-89-6	IRON	1	10000	9.9		
7439-92-1	LEAD	1	17	0.3		
7439-95-4	MAGNESIUM	1	2600	99		
7439-96-5	MANGANESE	1	350	0.99		
7439-98-7	MOLYBDENUM	1	49	0.99		
7440-02-0	NICKEL	1	4.9	2		
7440-09-7	POTASSIUM	1	1500	99		
7782-49-2	SELENIUM	1	43	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	5	5	5	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	150	0.99		
7440-66-6	ZINC	1	25	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-70-130228
Lab ID: 1303060-5

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.027 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5300	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	22	1		
7440-39-3	BARIUM	1	110	10		
7440-41-7	BERYLLIUM	1	1.1	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	11000	100		
7440-47-3	CHROMIUM	1	3.8	1		
7440-48-4	COBALT	1	4	1		
7440-50-8	COPPER	1	7	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	27	0.3		
7439-95-4	MAGNESIUM	1	2600	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	25	1		
7440-02-0	NICKEL	1	5.2	2		
7440-09-7	POTASSIUM	1	1800	100		
7782-49-2	SELENIUM	1	84	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	280	1		
7440-66-6	ZINC	1	30	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-83-130228
Lab ID: 1303060-6

Sample Matrix: SOIL
% Moisture: 6.0
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.002 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	7900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	120	11		
7440-41-7	BERYLLIUM	1	0.89	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	15000	110		
7440-47-3	CHROMIUM	1	7.5	1.1		
7440-48-4	COBALT	1	5.8	1.1		
7440-50-8	COPPER	1	13	1.1		
7439-89-6	IRON	1	17000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3500	110		
7439-96-5	MANGANESE	1	240	1.1		
7439-98-7	MOLYBDENUM	1	7.9	1.1		
7440-02-0	NICKEL	1	9.2	2.1		
7440-09-7	POTASSIUM	1	2800	110		
7782-49-2	SELENIUM	1	16	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	110	110	U	
7440-28-0	THALLIUM	1	1.1	1.1	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	88	1.1		
7440-66-6	ZINC	1	42	2.1		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-90-130228
Lab ID: 1303060-7

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4600	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	16	1		
7440-39-3	BARIUM	1	80	10		
7440-41-7	BERYLLIUM	1	0.81	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	18000	100		
7440-47-3	CHROMIUM	1	4.4	1		
7440-48-4	COBALT	1	3.8	1		
7440-50-8	COPPER	1	9.2	1		
7439-89-6	IRON	1	12000	10		
7439-92-1	LEAD	1	21	0.31		
7439-95-4	MAGNESIUM	1	2500	100		
7439-96-5	MANGANESE	1	200	1		
7439-98-7	MOLYBDENUM	1	14	1		
7440-02-0	NICKEL	1	6.2	2.1		
7440-09-7	POTASSIUM	1	1900	100		
7782-49-2	SELENIUM	1	49	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	160	1		
7440-66-6	ZINC	1	29	2.1		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-90-2-130228
Lab ID: 1303060-8

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.035 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4800	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	17	1		
7440-39-3	BARIUM	1	78	10		
7440-41-7	BERYLLIUM	1	0.9	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	15000	100		
7440-47-3	CHROMIUM	1	4.3	1		
7440-48-4	COBALT	1	3.9	1		
7440-50-8	COPPER	1	8	1		
7439-89-6	IRON	1	12000	10		
7439-92-1	LEAD	1	23	0.3		
7439-95-4	MAGNESIUM	1	2500	100		
7439-96-5	MANGANESE	1	200	1		
7439-98-7	MOLYBDENUM	1	13	1		
7440-02-0	NICKEL	1	5.7	2		
7440-09-7	POTASSIUM	1	1800	100		
7782-49-2	SELENIUM	1	47	0.5		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	190	1		
7440-66-6	ZINC	1	36	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID:	S30-91-130228
Lab ID:	1303060-9

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3900	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	4.2	1		
7440-39-3	BARIUM	1	210	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	5300	100		
7440-47-3	CHROMIUM	1	3.3	1		
7440-48-4	COBALT	1	2.7	1		
7440-50-8	COPPER	1	4.6	1		
7439-89-6	IRON	1	11000	10		
7439-92-1	LEAD	1	11	0.3		
7439-95-4	MAGNESIUM	1	1800	100		
7439-96-5	MANGANESE	1	170	1		
7439-98-7	MOLYBDENUM	1	2.7	1		
7440-02-0	NICKEL	1	2.9	2		
7440-09-7	POTASSIUM	1	780	100		
7782-49-2	SELENIUM	1	53	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.1	5.1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	88	1		
7440-66-6	ZINC	1	28	2		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-94-130228
Lab ID: 1303060-10

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.002 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5100	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	15	1		
7440-39-3	BARIUM	1	93	10		
7440-41-7	BERYLLIUM	1	0.83	0.52		
7440-43-9	CADMIUM	1	0.52	0.52	U	
7440-70-2	CALCIUM	1	17000	100		
7440-47-3	CHROMIUM	1	4.8	1		
7440-48-4	COBALT	1	3.4	1		
7440-50-8	COPPER	1	12	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	21	0.31		
7439-95-4	MAGNESIUM	1	2800	100		
7439-96-5	MANGANESE	1	220	1		
7439-98-7	MOLYBDENUM	1	13	1		
7440-02-0	NICKEL	1	4.9	2.1		
7440-09-7	POTASSIUM	1	2100	100		
7782-49-2	SELENIUM	1	37	0.52		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.2	5.2	U	
7440-31-5	TIN	1	5.2	5.2	U	
7440-62-2	VANADIUM	1	170	1		
7440-66-6	ZINC	1	45	2.1		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-95-130228
Lab ID: 1303060-11

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	8900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	110	11		
7440-41-7	BERYLLIUM	1	0.9	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	12000	110		
7440-47-3	CHROMIUM	1	8.1	1.1		
7440-48-4	COBALT	1	5.7	1.1		
7440-50-8	COPPER	1	12	1.1		
7439-89-6	IRON	1	18000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3800	110		
7439-96-5	MANGANESE	1	220	1.1		
7439-98-7	MOLYBDENUM	1	15	1.1		
7440-02-0	NICKEL	1	9.8	2.1		
7440-09-7	POTASSIUM	1	2900	110		
7782-49-2	SELENIUM	1	26	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	340	110		
7440-28-0	THALLIUM	5	5.3	5.3	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	70	1.1		
7440-66-6	ZINC	1	48	2.1		

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-BKGD-N-130228
Lab ID: 1303060-12

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.007 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3200	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	3.4	1		
7440-39-3	BARIUM	1	79	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	19000	100		
7440-47-3	CHROMIUM	1	3.3	1		
7440-48-4	COBALT	1	3.3	1		
7440-50-8	COPPER	1	4.4	1		
7439-89-6	IRON	1	9200	10		
7439-92-1	LEAD	1	5.9	0.31		
7439-95-4	MAGNESIUM	1	3900	100		
7439-96-5	MANGANESE	1	120	1		
7439-98-7	MOLYBDENUM	1	1	1	U	
7440-02-0	NICKEL	1	5.6	2.1		
7440-09-7	POTASSIUM	1	870	100		
7782-49-2	SELENIUM	1	0.51	0.51	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.1	5.1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	9	1		
7440-66-6	ZINC	1	21	2.1		

Data Package ID: *it1303060-1*

Total URANIUM

Method SW6020 Revision A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: SW3050B
Analyst: Ross Miller

Final Volume: 100 ml
Matrix: SOIL
Result Units: UG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/07/2013	03/08/2013	7.7	100	12000	110		1.019 g
S30-53-130228	1303060-2	02/28/2013	03/07/2013	03/08/2013	3.6	100	560000	100		1.019 g
S30-61-130228	1303060-3	02/28/2013	03/07/2013	03/08/2013	2.8	100	51000	99		1.037 g
S30-69-130228	1303060-4	02/28/2013	03/07/2013	03/08/2013	2.8	100	130000	99		1.035 g
S30-70-130228	1303060-5	02/28/2013	03/07/2013	03/08/2013	3.9	100	310000	100		1.027 g
S30-83-130228	1303060-6	02/28/2013	03/07/2013	03/08/2013	6.0	100	92000	110		1.002 g
S30-90-130228	1303060-7	02/28/2013	03/07/2013	03/08/2013	3.2	100	190000	100		1.006 g
S30-90-2-130228	1303060-8	02/28/2013	03/07/2013	03/08/2013	3.5	100	260000	100		1.035 g
S30-91-130228	1303060-9	02/28/2013	03/07/2013	03/08/2013	3.2	100	110000	100		1.019 g
S30-94-130228	1303060-10	02/28/2013	03/07/2013	03/08/2013	3.9	100	120000	100		1.002 g
S30-95-130228	1303060-11	02/28/2013	03/07/2013	03/08/2013	6.9	100	120000	110		1.006 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/07/2013	03/08/2013	3.5	100	2500	100		1.007 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *im1303060-1*

Total MERCURY

Method SW7471 Revision A

Sample Results

Lab Name: **ALS Environmental -- FC**
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: METHOD
Analyst: Sheri Lafferty

Final Volume: 100 g
Matrix: SOIL
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/11/2013	03/12/2013	7.7	1	0.038	0.035		0.611 g
S30-53-130228	1303060-2	02/28/2013	03/11/2013	03/12/2013	3.6	1	0.078	0.034		0.615 g
S30-61-130228	1303060-3	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.063	0.034		0.61 g
S30-69-130228	1303060-4	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.09	0.034		0.604 g
S30-70-130228	1303060-5	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.076	0.034		0.604 g
S30-83-130228	1303060-6	02/28/2013	03/11/2013	03/12/2013	6.0	1	0.048	0.035		0.611 g
S30-90-130228	1303060-7	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.067	0.034		0.613 g
S30-90-2-130228	1303060-8	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.068	0.034		0.611 g
S30-91-130228	1303060-9	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.034	0.034	U	0.616 g
S30-94-130228	1303060-10	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.051	0.034		0.61 g
S30-95-130228	1303060-11	02/28/2013	03/11/2013	03/12/2013	6.9	1	0.041	0.035		0.614 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.034	0.034	U	0.604 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *hg1303060-1*

Summary Report Forms

ICP Metals

Method SW6010B
Method Blank

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: IP130307-4MB

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: N/A
File Name: 130311A.

Sample Aliquot: 1 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	20	20	U	
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	1	1	U	
7440-39-3	BARIUM	1	10	10	U	
7440-41-7	BERYLLIUM	1	0.5	0.5	U	
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	100	100	U	
7440-47-3	CHROMIUM	1	1	1	U	
7440-48-4	COBALT	1	1	1	U	
7440-50-8	COPPER	1	1	1	U	
7439-89-6	IRON	1	10	10	U	
7439-92-1	LEAD	1	0.3	0.3	U	
7439-95-4	MAGNESIUM	1	100	100	U	
7439-96-5	MANGANESE	1	1	1	U	
7439-98-7	MOLYBDENUM	1	1	1	U	
7440-02-0	NICKEL	1	2	2	U	
7440-09-7	POTASSIUM	1	100	100	U	
7782-49-2	SELENIUM	1	0.5	0.5	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	1	1	U	
7440-66-6	ZINC	1	2	2	U	

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010B

Laboratory Control Sample

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: IP130307-4LCS

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03/07/2013
Date Analyzed: 03/11/2013
Prep Method: SW3050B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: N/A
File Name: 130311A.

Sample Aliquot: 1 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7429-90-5	ALUMINUM	200	192	20		96	80 - 120%
7440-36-0	ANTIMONY	50	46.6	2		93	80 - 120%
7440-38-2	ARSENIC	100	97.8	1		98	80 - 120%
7440-39-3	BARIUM	100	101	10		101	80 - 120%
7440-41-7	BERYLLIUM	5	4.85	0.5		97	80 - 120%
7440-43-9	CADMIUM	5	5.01	0.5		100	80 - 120%
7440-70-2	CALCIUM	4000	3850	100		96	80 - 120%
7440-47-3	CHROMIUM	20	19.4	1		97	80 - 120%
7440-48-4	COBALT	50	47.4	1		95	80 - 120%
7440-50-8	COPPER	25	25.5	1		102	80 - 120%
7439-89-6	IRON	100	100	10		100	80 - 120%
7439-92-1	LEAD	50	47.5	0.3		95	80 - 120%
7439-95-4	MAGNESIUM	4000	3760	100		94	80 - 120%
7439-96-5	MANGANESE	50	48.2	1		96	80 - 120%
7439-98-7	MOLYBDENUM	100	97.6	1		98	80 - 120%
7440-02-0	NICKEL	50	49.3	2		99	80 - 120%
7440-09-7	POTASSIUM	4000	3610	100		90	80 - 120%
7782-49-2	SELENIUM	200	167	0.5		83	80 - 120%
7440-22-4	SILVER	10	9.03	1		90	80 - 120%
7440-23-5	SODIUM	4000	3550	100		89	80 - 120%
7440-28-0	THALLIUM	200	188	1		94	80 - 120%
7440-31-5	TIN	50	50.3	5		101	80 - 120%
7440-62-2	VANADIUM	50	49.5	1		99	80 - 120%
7440-66-6	ZINC	50	47.3	2		95	80 - 120%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010B

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
LabID: 1303060-1MS

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 1.003 g
Final Volume: 100 ml
Result Units: MG/KG
File Name: 130311A.

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7429-90-5	ALUMINUM	6800		9430		21.6	216	1225	80 - 120%
7440-36-0	ANTIMONY	2.1	U	33.1	N	2.16	54	61	80 - 120%
7440-38-2	ARSENIC	5.9		113		1.08	108	99	80 - 120%
7440-39-3	BARIUM	82		193		10.8	108	102	80 - 120%
7440-41-7	BERYLLIUM	0.69		6.11		0.54	5.4	100	80 - 120%
7440-43-9	CADMIUM	0.53	U	5.71		0.54	5.4	106	80 - 120%
7440-70-2	CALCIUM	15000		19600		108	4320	96	80 - 120%
7440-47-3	CHROMIUM	6.6		29.3		1.08	21.6	105	80 - 120%
7440-48-4	COBALT	5.6		57.5		1.08	54	96	80 - 120%
7440-50-8	COPPER	10		38.9		1.08	27	106	80 - 120%
7439-89-6	IRON	16000		17000		10.8	108	769	80 - 120%
7439-92-1	LEAD	11		64.1		0.324	54	98	80 - 120%
7439-95-4	MAGNESIUM	4300		8760		108	4320	103	80 - 120%
7439-96-5	MANGANESE	210		255		1.08	54	87	80 - 120%
7439-98-7	MOLYBDENUM	1.3		99.7		1.08	108	91	80 - 120%
7440-02-0	NICKEL	9.5		64.7		2.16	54	102	80 - 120%
7440-09-7	POTASSIUM	2100		6720		108	4320	106	80 - 120%
7782-49-2	SELENIUM	2.6		182		0.54	216	83	80 - 120%
7440-22-4	SILVER	1.1	U	10.1		1.08	10.8	93	80 - 120%
7440-23-5	SODIUM	110	U	4370		108	4320	101	80 - 120%
7440-28-0	THALLIUM	5.3	U	204		1.08	216	95	80 - 120%
7440-31-5	TIN	5.3	U	54.5		5.4	54	101	80 - 120%
7440-62-2	VANADIUM	19		74.6		1.08	54	103	80 - 120%
7440-66-6	ZINC	41		93.8		2.16	54	97	80 - 120%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010B

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
LabID: 1303060-1MSD

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 1.009 g
Final Volume: 100 ml
Result Units: MG/KG
File Name: 130311A.

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7429-90-5	ALUMINUM	9470		215	1250	21.5	20	0
7440-36-0	ANTIMONY	31.8	N	53.7	59	2.15	20	4
7440-38-2	ARSENIC	109		107	96	1.07	20	3
7440-39-3	BARIUM	189		107	100	10.7	20	2
7440-41-7	BERYLLIUM	5.98		5.37	99	0.537	20	2
7440-43-9	CADMIUM	5.51		5.37	103	0.537	20	4
7440-70-2	CALCIUM	19400		4290	94	107	20	1
7440-47-3	CHROMIUM	28.6		21.5	102	1.07	20	3
7440-48-4	COBALT	56.2		53.7	94	1.07	20	2
7440-50-8	COPPER	38		26.8	104	1.07	20	2
7439-89-6	IRON	17000		107	743	10.7	20	0
7439-92-1	LEAD	61		53.7	93	0.322	20	5
7439-95-4	MAGNESIUM	8630		4290	101	107	20	1
7439-96-5	MANGANESE	254		53.7	86	1.07	20	0
7439-98-7	MOLYBDENUM	96.9		107	89	1.07	20	3
7440-02-0	NICKEL	63.1		53.7	100	2.15	20	2
7440-09-7	POTASSIUM	6650		4290	105	107	20	1
7782-49-2	SELENIUM	178		215	82	0.537	20	2
7440-22-4	SILVER	9.96		10.7	93	1.07	20	1
7440-23-5	SODIUM	4270		4290	100	107	20	2
7440-28-0	THALLIUM	198		215	92	1.07	20	3
7440-31-5	TIN	53.2		53.7	99	5.37	20	2
7440-62-2	VANADIUM	73.2		53.7	100	1.07	20	2
7440-66-6	ZINC	95.9		53.7	101	2.15	20	2

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Analytical Spike Sample Recovery

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
LabID: 1303060-1A

Run ID: IT130311-2A1
Date Analyzed: 11-Mar-13
Result Units: mg/l

Target Analyte	Sample Result	Samp Qual	PS Result	PS Qual	Spike Added	PS % Rec.	Control Limits
ANTIMONY	0.0200	U	0.404		0.5	81	75 - 125%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Duplicate Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
Lab ID: 1303060-1D

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 02/28/2013
Date Extracted: 03/07/2013
Date Analyzed: 03/11/2013

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Sample Aliquot: 1.008 g
Final Volume: 100 ml
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Sample Result	Samp Qual	Duplicate Result	Dup Qual	Reporting Limit	Dilution Factor	RPD	RPD Limit
7429-90-5	ALUMINUM	6800		6800		21.5	1	0	20
7440-36-0	ANTIMONY	2.1	U	2.15	U	2.15	1		20
7440-38-2	ARSENIC	5.9		6.07		1.07	1	3	20
7440-39-3	BARIUM	82		82.5		10.7	1	0	20
7440-41-7	BERYLLIUM	0.69		0.7		0.537	1		20
7440-43-9	CADMIUM	0.53	U	0.537	U	0.537	1		20
7440-70-2	CALCIUM	15000		15500		107	1	1	20
7440-47-3	CHROMIUM	6.6		6.59		1.07	1	0	20
7440-48-4	COBALT	5.6		5.6		1.07	1	1	20
7440-50-8	COPPER	10		10.1		1.07	1	0	20
7439-89-6	IRON	16000		16100		10.7	1	0	20
7439-92-1	LEAD	11		11.3		0.322	1	1	20
7439-95-4	MAGNESIUM	4300		4300		107	1	0	20
7439-96-5	MANGANESE	210		204		1.07	1	2	20
7439-98-7	MOLYBDENUM	1.3		1.23		1.07	1		20
7440-02-0	NICKEL	9.5		9.57		2.15	1		20
7440-09-7	POTASSIUM	2100		2140		107	1	0	20
7782-49-2	SELENIUM	2.6		2.03		0.537	1		20
7440-22-4	SILVER	1.1	U	1.07	U	1.07	1		20
7440-23-5	SODIUM	110	U	107	U	107	1		20
7440-28-0	THALLIUM	5.3	U	5.37	U	5.37	5		20
7440-31-5	TIN	5.3	U	5.37	U	5.37	1		20
7440-62-2	VANADIUM	19		19.7		1.07	1	2	20
7440-66-6	ZINC	41		41.8		2.15	1	1	20

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Serial Dilution

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
Lab ID: 1303060-1L

Run ID: IT130311-2A1
Date Analyzed: 11-Mar-13
Result Units: mg/l

CASNO	Target Analyte	Sample Result	Samp Qual	SD Result	SD Qual	EPA Qualifier	%D
7429-90-5	ALUMINUM	63.9		67.1			5
7440-36-0	ANTIMONY	0.0200	U	0.100	U		
7440-38-2	ARSENIC	0.0553		0.0606			
7440-39-3	BARIUM	0.776		0.812			
7440-41-7	BERYLLIUM	0.00652		0.0250	U		
7440-43-9	CADMIUM	0.00500	U	0.0250	U		
7440-70-2	CALCIUM	145		150			3
7440-47-3	CHROMIUM	0.0619		0.0618			
7440-48-4	COBALT	0.0522		0.0517			
7440-50-8	COPPER	0.0958		0.0819			
7439-89-6	IRON	152		148			3
7439-92-1	LEAD	0.107		0.106			0
7439-95-4	MAGNESIUM	40.5		43.3			7
7439-96-5	MANGANESE	1.96		2.10			8
7439-98-7	MOLYBDENUM	0.0119		0.0500	U		
7440-02-0	NICKEL	0.0895		0.100	U		
7440-09-7	POTASSIUM	20.1		16.5		E	18
7782-49-2	SELENIUM	0.0244		0.0480			
7440-22-4	SILVER	0.0100	U	0.0500	U		
7440-23-5	SODIUM	1.00	U	5.00	U		
7440-28-0	THALLIUM	0.0100	U	0.0500	U		
7440-31-5	TIN	0.0500	U	0.250	U		
7440-62-2	VANADIUM	0.182		0.186			2
7440-66-6	ZINC	0.390		0.426			9

Data Package ID: *it1303060-1*

Prep Batch ID: IP130307-4

Start Date: 03/07/13 **End Date:** 03/07/13 **Concentration Method:** NONE **Batch Created By:** bas
Start Time: 15:00 **End Time:** 18:00 **Extract Method:** SW3050B **Date Created:** 03/07/13
Prep Analyst: Brent A. Stanfield **Initial Volume Units:** g **Time Created:** 13:54
Final Volume Units: ml **Validated By:** bas
Date Validated: 03/07/13
Time Validated: 14:18

Comments:

QC Batch ID: IP130307-4-1

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP130307-4	MB	XXXXXX	SOIL	XXXXXX	1	100	NONE	1	1303060
IP130307-4	LCS	XXXXXX	SOIL	XXXXXX	1	100	NONE	1	1303060
1303060-1	MS	S30-04-130228	SOIL	2/28/2013	1.003	100	NONE	1	1303060
1303060-1	MSD	S30-04-130228	SOIL	2/28/2013	1.009	100	NONE	1	1303060
1303060-1	DUP	S30-04-130228	SOIL	2/28/2013	1.008	100	NONE	1	1303060
1303060-1	SMP	S30-04-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060
1303060-10	SMP	S30-94-130228	SOIL	2/28/2013	1.002	100	NONE	1	1303060
1303060-11	SMP	S30-95-130228	SOIL	2/28/2013	1.006	100	NONE	1	1303060
1303060-12	SMP	S30-BKGD-N-130228	SOIL	2/28/2013	1.007	100	NONE	1	1303060
1303060-2	SMP	S30-53-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060
1303060-3	SMP	S30-61-130228	SOIL	2/28/2013	1.037	100	NONE	1	1303060
1303060-4	SMP	S30-69-130228	SOIL	2/28/2013	1.035	100	NONE	1	1303060
1303060-5	SMP	S30-70-130228	SOIL	2/28/2013	1.027	100	NONE	1	1303060
1303060-6	SMP	S30-83-130228	SOIL	2/28/2013	1.002	100	NONE	1	1303060
1303060-7	SMP	S30-90-130228	SOIL	2/28/2013	1.006	100	NONE	1	1303060
1303060-8	SMP	S30-90-2-130228	SOIL	2/28/2013	1.035	100	NONE	1	1303060
1303060-9	SMP	S30-91-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060

QC Types

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicate
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standard	SMP	Field Sample
SYS	Sample Yield Spike		

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: ICV
QC Type: Initial Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 12:35
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	25	25.8	0.2		103	90 - 110%
7440-36-0	ANTIMONY	0.25	0.250	0.02		100	90 - 110%
7440-38-2	ARSENIC	0.25	0.262	0.01		105	90 - 110%
7440-39-3	BARIUM	0.5	0.522	0.1		104	90 - 110%
7440-41-7	BERYLLIUM	0.25	0.255	0.005		102	90 - 110%
7440-43-9	CADMIUM	0.25	0.258	0.005		103	90 - 110%
7440-70-2	CALCIUM	25	25.7	1		103	90 - 110%
7440-47-3	CHROMIUM	0.5	0.506	0.01		101	90 - 110%
7440-48-4	COBALT	0.25	0.250	0.01		100	90 - 110%
7440-50-8	COPPER	0.5	0.513	0.01		103	90 - 110%
7439-89-6	IRON	10	10.3	0.1		103	90 - 110%
7439-92-1	LEAD	0.5	0.500	0.003		100	90 - 110%
7439-95-4	MAGNESIUM	25	25.2	1		101	90 - 110%
7439-96-5	MANGANESE	0.5	0.502	0.01		100	90 - 110%
7439-98-7	MOLYBDENUM	0.5	0.498	0.01		100	90 - 110%
7440-02-0	NICKEL	0.5	0.505	0.02		101	90 - 110%
7440-09-7	POTASSIUM	25	23.7	1		95	90 - 110%
7782-49-2	SELENIUM	0.5	0.513	0.005		103	90 - 110%
7440-22-4	SILVER	0.1	0.0993	0.01		99	90 - 110%
7440-23-5	SODIUM	25	23.4	1		93	90 - 110%
7440-28-0	THALLIUM	0.25	0.251	0.01		101	90 - 110%
7440-31-5	TIN	0.5	0.518	0.05		104	90 - 110%
7440-62-2	VANADIUM	0.25	0.250	0.01		100	90 - 110%
7440-66-6	ZINC	0.5	0.495	0.02		99	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV1
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 12:44
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.7	0.2		99	90 - 110%
7440-36-0	ANTIMONY	0.5	0.485	0.02		97	90 - 110%
7440-38-2	ARSENIC	0.5	0.509	0.01		102	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.486	0.005		97	90 - 110%
7440-43-9	CADMIUM	0.5	0.505	0.005		101	90 - 110%
7440-70-2	CALCIUM	50	50.0	1		100	90 - 110%
7440-47-3	CHROMIUM	1	0.969	0.01		97	90 - 110%
7440-48-4	COBALT	0.5	0.480	0.01		96	90 - 110%
7440-50-8	COPPER	1	0.992	0.01		99	90 - 110%
7439-89-6	IRON	20	20.1	0.1		100	90 - 110%
7439-92-1	LEAD	1	0.963	0.003		96	90 - 110%
7439-95-4	MAGNESIUM	50	49.1	1		98	90 - 110%
7439-96-5	MANGANESE	1	0.961	0.01		96	90 - 110%
7439-98-7	MOLYBDENUM	1	0.969	0.01		97	90 - 110%
7440-02-0	NICKEL	1	0.980	0.02		98	90 - 110%
7440-09-7	POTASSIUM	50	48.9	1		98	90 - 110%
7782-49-2	SELENIUM	1	0.983	0.005		98	90 - 110%
7440-22-4	SILVER	0.2	0.193	0.01		96	90 - 110%
7440-23-5	SODIUM	50	47.7	1		95	90 - 110%
7440-28-0	THALLIUM	0.5	0.513	0.01		103	90 - 110%
7440-31-5	TIN	1	1.02	0.05		102	90 - 110%
7440-62-2	VANADIUM	0.5	0.482	0.01		96	90 - 110%
7440-66-6	ZINC	1	0.947	0.02		95	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV2
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 13:10
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.0	0.2		100	90 - 110%
7440-36-0	ANTIMONY	0.5	0.497	0.02		99	90 - 110%
7440-38-2	ARSENIC	0.5	0.523	0.01		105	90 - 110%
7440-39-3	BARIUM	1	1.03	0.1		103	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.490	0.005		98	90 - 110%
7440-43-9	CADMIUM	0.5	0.514	0.005		103	90 - 110%
7440-70-2	CALCIUM	50	50.6	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.976	0.01		98	90 - 110%
7440-48-4	COBALT	0.5	0.485	0.01		97	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	20.2	0.1		101	90 - 110%
7439-92-1	LEAD	1	0.967	0.003		97	90 - 110%
7439-95-4	MAGNESIUM	50	49.4	1		99	90 - 110%
7439-96-5	MANGANESE	1	0.966	0.01		97	90 - 110%
7439-98-7	MOLYBDENUM	1	0.983	0.01		98	90 - 110%
7440-02-0	NICKEL	1	1.01	0.02		101	90 - 110%
7440-09-7	POTASSIUM	50	49.3	1		99	90 - 110%
7782-49-2	SELENIUM	1	0.990	0.005		99	90 - 110%
7440-22-4	SILVER	0.2	0.195	0.01		98	90 - 110%
7440-23-5	SODIUM	50	48.3	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.513	0.01		103	90 - 110%
7440-31-5	TIN	1	1.04	0.05		104	90 - 110%
7440-62-2	VANADIUM	0.5	0.485	0.01		97	90 - 110%
7440-66-6	ZINC	1	0.956	0.02		96	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV3
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 13:32
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.0	0.2		98	90 - 110%
7440-36-0	ANTIMONY	0.5	0.488	0.02		98	90 - 110%
7440-38-2	ARSENIC	0.5	0.514	0.01		103	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.475	0.005		95	90 - 110%
7440-43-9	CADMIUM	0.5	0.511	0.005		102	90 - 110%
7440-70-2	CALCIUM	50	49.3	1		99	90 - 110%
7440-47-3	CHROMIUM	1	0.951	0.01		95	90 - 110%
7440-48-4	COBALT	0.5	0.474	0.01		95	90 - 110%
7440-50-8	COPPER	1	0.997	0.01		100	90 - 110%
7439-89-6	IRON	20	19.5	0.1		97	90 - 110%
7439-92-1	LEAD	1	0.937	0.003		94	90 - 110%
7439-95-4	MAGNESIUM	50	48.1	1		96	90 - 110%
7439-96-5	MANGANESE	1	0.937	0.01		94	90 - 110%
7439-98-7	MOLYBDENUM	1	0.962	0.01		96	90 - 110%
7440-02-0	NICKEL	1	0.998	0.02		100	90 - 110%
7440-09-7	POTASSIUM	50	48.8	1		98	90 - 110%
7782-49-2	SELENIUM	1	0.957	0.005		96	90 - 110%
7440-22-4	SILVER	0.2	0.191	0.01		96	90 - 110%
7440-23-5	SODIUM	50	48.0	1		96	90 - 110%
7440-28-0	THALLIUM	0.5	0.498	0.01		100	90 - 110%
7440-31-5	TIN	1	1.01	0.05		101	90 - 110%
7440-62-2	VANADIUM	0.5	0.475	0.01		95	90 - 110%
7440-66-6	ZINC	1	0.921	0.02		92	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV4
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 13:54
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.1	0.2		98	90 - 110%
7440-36-0	ANTIMONY	0.5	0.493	0.02		99	90 - 110%
7440-38-2	ARSENIC	0.5	0.521	0.01		104	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.477	0.005		95	90 - 110%
7440-43-9	CADMIUM	0.5	0.519	0.005		104	90 - 110%
7440-70-2	CALCIUM	50	49.7	1		99	90 - 110%
7440-47-3	CHROMIUM	1	0.957	0.01		96	90 - 110%
7440-48-4	COBALT	0.5	0.478	0.01		96	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	19.5	0.1		98	90 - 110%
7439-92-1	LEAD	1	0.937	0.003		94	90 - 110%
7439-95-4	MAGNESIUM	50	48.4	1		97	90 - 110%
7439-96-5	MANGANESE	1	0.939	0.01		94	90 - 110%
7439-98-7	MOLYBDENUM	1	0.970	0.01		97	90 - 110%
7440-02-0	NICKEL	1	1.02	0.02		102	90 - 110%
7440-09-7	POTASSIUM	50	49.1	1		98	90 - 110%
7782-49-2	SELENIUM	1	0.966	0.005		97	90 - 110%
7440-22-4	SILVER	0.2	0.194	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.3	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.519	0.01		104	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.477	0.01		95	90 - 110%
7440-66-6	ZINC	1	0.921	0.02		92	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV5
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 15:23
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	48.8	0.2		98	90 - 110%
7440-36-0	ANTIMONY	0.5	0.492	0.02		98	90 - 110%
7440-38-2	ARSENIC	0.5	0.518	0.01		104	90 - 110%
7440-39-3	BARIUM	1	0.991	0.1		99	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.478	0.005		96	90 - 110%
7440-43-9	CADMIUM	0.5	0.516	0.005		103	90 - 110%
7440-70-2	CALCIUM	50	48.8	1		98	90 - 110%
7440-47-3	CHROMIUM	1	0.958	0.01		96	90 - 110%
7440-48-4	COBALT	0.5	0.482	0.01		96	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	19.1	0.1		95	90 - 110%
7439-92-1	LEAD	1	0.933	0.003		93	90 - 110%
7439-95-4	MAGNESIUM	50	47.5	1		95	90 - 110%
7439-96-5	MANGANESE	1	0.951	0.01		95	90 - 110%
7439-98-7	MOLYBDENUM	1	0.962	0.01		96	90 - 110%
7440-02-0	NICKEL	1	1.01	0.02		101	90 - 110%
7440-09-7	POTASSIUM	50	49.3	1		99	90 - 110%
7782-49-2	SELENIUM	1	0.963	0.005		96	90 - 110%
7440-22-4	SILVER	0.2	0.198	0.01		99	90 - 110%
7440-23-5	SODIUM	50	48.5	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.514	0.01		103	90 - 110%
7440-31-5	TIN	1	1.02	0.05		102	90 - 110%
7440-62-2	VANADIUM	0.5	0.479	0.01		96	90 - 110%
7440-66-6	ZINC	1	0.937	0.02		94	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV6
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 15:35
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	48.7	0.2		97	90 - 110%
7440-36-0	ANTIMONY	0.5	0.483	0.02		97	90 - 110%
7440-38-2	ARSENIC	0.5	0.509	0.01		102	90 - 110%
7440-39-3	BARIUM	1	0.995	0.1		100	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.477	0.005		95	90 - 110%
7440-43-9	CADMIUM	0.5	0.516	0.005		103	90 - 110%
7440-70-2	CALCIUM	50	48.9	1		98	90 - 110%
7440-47-3	CHROMIUM	1	0.958	0.01		96	90 - 110%
7440-48-4	COBALT	0.5	0.481	0.01		96	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	19.1	0.1		96	90 - 110%
7439-92-1	LEAD	1	0.929	0.003		93	90 - 110%
7439-95-4	MAGNESIUM	50	47.5	1		95	90 - 110%
7439-96-5	MANGANESE	1	0.950	0.01		95	90 - 110%
7439-98-7	MOLYBDENUM	1	0.968	0.01		97	90 - 110%
7440-02-0	NICKEL	1	1.01	0.02		101	90 - 110%
7440-09-7	POTASSIUM	50	49.0	1		98	90 - 110%
7782-49-2	SELENIUM	1	0.951	0.005		95	90 - 110%
7440-22-4	SILVER	0.2	0.198	0.01		99	90 - 110%
7440-23-5	SODIUM	50	48.4	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.505	0.01		101	90 - 110%
7440-31-5	TIN	1	1.01	0.05		101	90 - 110%
7440-62-2	VANADIUM	0.5	0.478	0.01		96	90 - 110%
7440-66-6	ZINC	1	0.934	0.02		93	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV7
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 15:55
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.2	0.2		98	90 - 110%
7440-36-0	ANTIMONY	0.5	0.498	0.02		100	90 - 110%
7440-38-2	ARSENIC	0.5	0.525	0.01		105	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.495	0.005		99	90 - 110%
7440-43-9	CADMIUM	0.5	0.524	0.005		105	90 - 110%
7440-70-2	CALCIUM	50	49.5	1		99	90 - 110%
7440-47-3	CHROMIUM	1	0.989	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.493	0.01		99	90 - 110%
7440-50-8	COPPER	1	1.02	0.01		102	90 - 110%
7439-89-6	IRON	20	19.4	0.1		97	90 - 110%
7439-92-1	LEAD	1	0.975	0.003		97	90 - 110%
7439-95-4	MAGNESIUM	50	49.0	1		98	90 - 110%
7439-96-5	MANGANESE	1	0.978	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.995	0.01		99	90 - 110%
7440-02-0	NICKEL	1	1.03	0.02		103	90 - 110%
7440-09-7	POTASSIUM	50	49.3	1		99	90 - 110%
7782-49-2	SELENIUM	1	0.981	0.005		98	90 - 110%
7440-22-4	SILVER	0.2	0.199	0.01		99	90 - 110%
7440-23-5	SODIUM	50	48.7	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.515	0.01		103	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.493	0.01		99	90 - 110%
7440-66-6	ZINC	1	0.962	0.02		96	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV8
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 16:17
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.2	0.2		98	90 - 110%
7440-36-0	ANTIMONY	0.5	0.496	0.02		99	90 - 110%
7440-38-2	ARSENIC	0.5	0.526	0.01		105	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.496	0.005		99	90 - 110%
7440-43-9	CADMIUM	0.5	0.525	0.005		105	90 - 110%
7440-70-2	CALCIUM	50	49.7	1		99	90 - 110%
7440-47-3	CHROMIUM	1	0.992	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.494	0.01		99	90 - 110%
7440-50-8	COPPER	1	1.02	0.01		102	90 - 110%
7439-89-6	IRON	20	19.4	0.1		97	90 - 110%
7439-92-1	LEAD	1	0.973	0.003		97	90 - 110%
7439-95-4	MAGNESIUM	50	49.1	1		98	90 - 110%
7439-96-5	MANGANESE	1	0.981	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	1.00	0.01		100	90 - 110%
7440-02-0	NICKEL	1	1.03	0.02		103	90 - 110%
7440-09-7	POTASSIUM	50	49.5	1		99	90 - 110%
7782-49-2	SELENIUM	1	0.969	0.005		97	90 - 110%
7440-22-4	SILVER	0.2	0.201	0.01		100	90 - 110%
7440-23-5	SODIUM	50	48.8	1		98	90 - 110%
7440-28-0	THALLIUM	0.5	0.517	0.01		103	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.496	0.01		99	90 - 110%
7440-66-6	ZINC	1	0.969	0.02		97	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV9
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 16:39
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.5	0.2		99	90 - 110%
7440-36-0	ANTIMONY	0.5	0.504	0.02		101	90 - 110%
7440-38-2	ARSENIC	0.5	0.527	0.01		105	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.499	0.005		100	90 - 110%
7440-43-9	CADMIUM	0.5	0.532	0.005		106	90 - 110%
7440-70-2	CALCIUM	50	50.1	1		100	90 - 110%
7440-47-3	CHROMIUM	1	1.00	0.01		100	90 - 110%
7440-48-4	COBALT	0.5	0.499	0.01		100	90 - 110%
7440-50-8	COPPER	1	1.03	0.01		103	90 - 110%
7439-89-6	IRON	20	19.5	0.1		98	90 - 110%
7439-92-1	LEAD	1	0.979	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	49.6	1		99	90 - 110%
7439-96-5	MANGANESE	1	0.987	0.01		99	90 - 110%
7439-98-7	MOLYBDENUM	1	1.01	0.01		101	90 - 110%
7440-02-0	NICKEL	1	1.05	0.02		105	90 - 110%
7440-09-7	POTASSIUM	50	49.7	1		99	90 - 110%
7782-49-2	SELENIUM	1	0.983	0.005		98	90 - 110%
7440-22-4	SILVER	0.2	0.202	0.01		101	90 - 110%
7440-23-5	SODIUM	50	49.1	1		98	90 - 110%
7440-28-0	THALLIUM	0.5	0.517	0.01		103	90 - 110%
7440-31-5	TIN	1	1.05	0.05		105	90 - 110%
7440-62-2	VANADIUM	0.5	0.498	0.01		100	90 - 110%
7440-66-6	ZINC	1	0.979	0.02		98	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV10
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 17:21
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.9	0.2		102	90 - 110%
7440-36-0	ANTIMONY	0.5	0.483	0.02		97	90 - 110%
7440-38-2	ARSENIC	0.5	0.521	0.01		104	90 - 110%
7440-39-3	BARIUM	1	1.02	0.1		102	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.500	0.005		100	90 - 110%
7440-43-9	CADMIUM	0.5	0.501	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.7	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.992	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.491	0.01		98	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	20.2	0.1		101	90 - 110%
7439-92-1	LEAD	1	0.985	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	50.4	1		101	90 - 110%
7439-96-5	MANGANESE	1	0.985	0.01		99	90 - 110%
7439-98-7	MOLYBDENUM	1	0.980	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.973	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	49.1	1		98	90 - 110%
7782-49-2	SELENIUM	1	1.01	0.005		101	90 - 110%
7440-22-4	SILVER	0.2	0.195	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.6	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.510	0.01		102	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.491	0.01		98	90 - 110%
7440-66-6	ZINC	1	1.01	0.02		101	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV11
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 17:33
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.8	0.2		102	90 - 110%
7440-36-0	ANTIMONY	0.5	0.483	0.02		97	90 - 110%
7440-38-2	ARSENIC	0.5	0.522	0.01		104	90 - 110%
7440-39-3	BARIUM	1	1.01	0.1		101	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.499	0.005		100	90 - 110%
7440-43-9	CADMIUM	0.5	0.502	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.6	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.989	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.491	0.01		98	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	20.2	0.1		101	90 - 110%
7439-92-1	LEAD	1	0.974	0.003		97	90 - 110%
7439-95-4	MAGNESIUM	50	50.4	1		101	90 - 110%
7439-96-5	MANGANESE	1	0.984	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.981	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.971	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	49.1	1		98	90 - 110%
7782-49-2	SELENIUM	1	1.00	0.005		100	90 - 110%
7440-22-4	SILVER	0.2	0.195	0.01		98	90 - 110%
7440-23-5	SODIUM	50	48.6	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.517	0.01		103	90 - 110%
7440-31-5	TIN	1	1.04	0.05		104	90 - 110%
7440-62-2	VANADIUM	0.5	0.490	0.01		98	90 - 110%
7440-66-6	ZINC	1	1.01	0.02		101	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV12
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 17:55
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.7	0.2		101	90 - 110%
7440-36-0	ANTIMONY	0.5	0.485	0.02		97	90 - 110%
7440-38-2	ARSENIC	0.5	0.520	0.01		104	90 - 110%
7440-39-3	BARIUM	1	1.02	0.1		102	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.498	0.005		100	90 - 110%
7440-43-9	CADMIUM	0.5	0.502	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.5	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.987	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.489	0.01		98	90 - 110%
7440-50-8	COPPER	1	1.01	0.01		101	90 - 110%
7439-89-6	IRON	20	20.2	0.1		101	90 - 110%
7439-92-1	LEAD	1	0.979	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	50.3	1		101	90 - 110%
7439-96-5	MANGANESE	1	0.982	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.980	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.973	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	48.9	1		98	90 - 110%
7782-49-2	SELENIUM	1	1.00	0.005		100	90 - 110%
7440-22-4	SILVER	0.2	0.194	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.5	1		97	90 - 110%
7440-28-0	THALLIUM	0.5	0.506	0.01		101	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.490	0.01		98	90 - 110%
7440-66-6	ZINC	1	1.01	0.02		101	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV13
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 18:17
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	49.5	0.2		99	90 - 110%
7440-36-0	ANTIMONY	0.5	0.467	0.02		93	90 - 110%
7440-38-2	ARSENIC	0.5	0.503	0.01		101	90 - 110%
7440-39-3	BARIUM	1	0.982	0.1		98	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.487	0.005		97	90 - 110%
7440-43-9	CADMIUM	0.5	0.489	0.005		98	90 - 110%
7440-70-2	CALCIUM	50	49.3	1		99	90 - 110%
7440-47-3	CHROMIUM	1	0.968	0.01		97	90 - 110%
7440-48-4	COBALT	0.5	0.478	0.01		96	90 - 110%
7440-50-8	COPPER	1	0.980	0.01		98	90 - 110%
7439-89-6	IRON	20	19.6	0.1		98	90 - 110%
7439-92-1	LEAD	1	0.952	0.003		95	90 - 110%
7439-95-4	MAGNESIUM	50	49.1	1		98	90 - 110%
7439-96-5	MANGANESE	1	0.959	0.01		96	90 - 110%
7439-98-7	MOLYBDENUM	1	0.954	0.01		95	90 - 110%
7440-02-0	NICKEL	1	0.945	0.02		95	90 - 110%
7440-09-7	POTASSIUM	50	48.1	1		96	90 - 110%
7782-49-2	SELENIUM	1	0.972	0.005		97	90 - 110%
7440-22-4	SILVER	0.2	0.191	0.01		96	90 - 110%
7440-23-5	SODIUM	50	47.7	1		95	90 - 110%
7440-28-0	THALLIUM	0.5	0.504	0.01		101	90 - 110%
7440-31-5	TIN	1	1.00	0.05		100	90 - 110%
7440-62-2	VANADIUM	0.5	0.478	0.01		96	90 - 110%
7440-66-6	ZINC	1	0.984	0.02		98	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV14
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 18:38
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.2	0.2		100	90 - 110%
7440-36-0	ANTIMONY	0.5	0.476	0.02		95	90 - 110%
7440-38-2	ARSENIC	0.5	0.514	0.01		103	90 - 110%
7440-39-3	BARIUM	1	0.998	0.1		100	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.496	0.005		99	90 - 110%
7440-43-9	CADMIUM	0.5	0.498	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.3	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.983	0.01		98	90 - 110%
7440-48-4	COBALT	0.5	0.487	0.01		97	90 - 110%
7440-50-8	COPPER	1	0.998	0.01		100	90 - 110%
7439-89-6	IRON	20	20.0	0.1		100	90 - 110%
7439-92-1	LEAD	1	0.977	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	50.0	1		100	90 - 110%
7439-96-5	MANGANESE	1	0.976	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.973	0.01		97	90 - 110%
7440-02-0	NICKEL	1	0.964	0.02		96	90 - 110%
7440-09-7	POTASSIUM	50	48.6	1		97	90 - 110%
7782-49-2	SELENIUM	1	0.997	0.005		100	90 - 110%
7440-22-4	SILVER	0.2	0.193	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.1	1		96	90 - 110%
7440-28-0	THALLIUM	0.5	0.508	0.01		102	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.486	0.01		97	90 - 110%
7440-66-6	ZINC	1	1.01	0.02		101	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV15
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 19:14
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.2	0.2		100	90 - 110%
7440-36-0	ANTIMONY	0.5	0.478	0.02		96	90 - 110%
7440-38-2	ARSENIC	0.5	0.519	0.01		104	90 - 110%
7440-39-3	BARIUM	1	0.998	0.1		100	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.496	0.005		99	90 - 110%
7440-43-9	CADMIUM	0.5	0.499	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.3	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.984	0.01		98	90 - 110%
7440-48-4	COBALT	0.5	0.488	0.01		98	90 - 110%
7440-50-8	COPPER	1	0.998	0.01		100	90 - 110%
7439-89-6	IRON	20	20.0	0.1		100	90 - 110%
7439-92-1	LEAD	1	0.979	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	50.0	1		100	90 - 110%
7439-96-5	MANGANESE	1	0.975	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.976	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.967	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	48.5	1		97	90 - 110%
7782-49-2	SELENIUM	1	1.00	0.005		100	90 - 110%
7440-22-4	SILVER	0.2	0.194	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.1	1		96	90 - 110%
7440-28-0	THALLIUM	0.5	0.502	0.01		100	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.487	0.01		97	90 - 110%
7440-66-6	ZINC	1	1.01	0.02		101	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV16
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 19:35
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.3	0.2		101	90 - 110%
7440-36-0	ANTIMONY	0.5	0.479	0.02		96	90 - 110%
7440-38-2	ARSENIC	0.5	0.512	0.01		102	90 - 110%
7440-39-3	BARIUM	1	1.00	0.1		100	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.494	0.005		99	90 - 110%
7440-43-9	CADMIUM	0.5	0.500	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.1	1		100	90 - 110%
7440-47-3	CHROMIUM	1	0.980	0.01		98	90 - 110%
7440-48-4	COBALT	0.5	0.486	0.01		97	90 - 110%
7440-50-8	COPPER	1	1.00	0.01		100	90 - 110%
7439-89-6	IRON	20	19.9	0.1		100	90 - 110%
7439-92-1	LEAD	1	0.973	0.003		97	90 - 110%
7439-95-4	MAGNESIUM	50	49.8	1		100	90 - 110%
7439-96-5	MANGANESE	1	0.972	0.01		97	90 - 110%
7439-98-7	MOLYBDENUM	1	0.976	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.966	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	48.6	1		97	90 - 110%
7782-49-2	SELENIUM	1	1.00	0.005		100	90 - 110%
7440-22-4	SILVER	0.2	0.194	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.2	1		96	90 - 110%
7440-28-0	THALLIUM	0.5	0.508	0.01		102	90 - 110%
7440-31-5	TIN	1	1.03	0.05		103	90 - 110%
7440-62-2	VANADIUM	0.5	0.485	0.01		97	90 - 110%
7440-66-6	ZINC	1	1.00	0.02		100	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Verifications

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCV17
QC Type: Continuing Calibration
File Name: 130311A.

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 19:50
Result Units: MG/L

CASNO	Target Analyte	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
7429-90-5	ALUMINUM	50	50.4	0.2		101	90 - 110%
7440-36-0	ANTIMONY	0.5	0.481	0.02		96	90 - 110%
7440-38-2	ARSENIC	0.5	0.521	0.01		104	90 - 110%
7440-39-3	BARIUM	1	1.00	0.1		100	90 - 110%
7440-41-7	BERYLLIUM	0.5	0.499	0.005		100	90 - 110%
7440-43-9	CADMIUM	0.5	0.501	0.005		100	90 - 110%
7440-70-2	CALCIUM	50	50.6	1		101	90 - 110%
7440-47-3	CHROMIUM	1	0.989	0.01		99	90 - 110%
7440-48-4	COBALT	0.5	0.491	0.01		98	90 - 110%
7440-50-8	COPPER	1	1.00	0.01		100	90 - 110%
7439-89-6	IRON	20	20.1	0.1		100	90 - 110%
7439-92-1	LEAD	1	0.979	0.003		98	90 - 110%
7439-95-4	MAGNESIUM	50	50.4	1		101	90 - 110%
7439-96-5	MANGANESE	1	0.981	0.01		98	90 - 110%
7439-98-7	MOLYBDENUM	1	0.979	0.01		98	90 - 110%
7440-02-0	NICKEL	1	0.975	0.02		97	90 - 110%
7440-09-7	POTASSIUM	50	48.6	1		97	90 - 110%
7782-49-2	SELENIUM	1	1.01	0.005		101	90 - 110%
7440-22-4	SILVER	0.2	0.195	0.01		97	90 - 110%
7440-23-5	SODIUM	50	48.1	1		96	90 - 110%
7440-28-0	THALLIUM	0.5	0.511	0.01		102	90 - 110%
7440-31-5	TIN	1	1.04	0.05		104	90 - 110%
7440-62-2	VANADIUM	0.5	0.489	0.01		98	90 - 110%
7440-66-6	ZINC	1	1.02	0.02		102	90 - 110%

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: ICB
QC Type: Initial Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 12:37:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB1
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 12:51:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB2
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 1:12:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB3
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 1:34:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB4
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 3:21:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB5
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 3:25:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB6
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 3:37:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB7
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 3:57:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB8
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 4:19:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB9
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 4:40:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB10
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 5:23:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB11
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 5:36:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB12
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 5:57:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.00552	0.005	
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB13
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 6:18:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB14
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 6:52:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB15
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 7:15:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB16
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 7:37:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010
Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: CCB17
QC Type: Continuing Calibration

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Time Analyzed: 7:52:00 PM
Result Units: MG/L

CASNO	Target Analyte	Result	Reporting Limit	Result Qualifier
7429-90-5	ALUMINUM	0.2	0.2	U
7440-36-0	ANTIMONY	0.02	0.02	U
7440-38-2	ARSENIC	0.01	0.01	U
7440-39-3	BARIUM	0.1	0.1	U
7440-41-7	BERYLLIUM	0.005	0.005	U
7440-43-9	CADMIUM	0.005	0.005	U
7440-70-2	CALCIUM	1	1	U
7440-47-3	CHROMIUM	0.01	0.01	U
7440-48-4	COBALT	0.01	0.01	U
7440-50-8	COPPER	0.01	0.01	U
7439-89-6	IRON	0.1	0.1	U
7439-92-1	LEAD	0.003	0.003	U
7439-95-4	MAGNESIUM	1	1	U
7439-96-5	MANGANESE	0.01	0.01	U
7439-98-7	MOLYBDENUM	0.01	0.01	U
7440-02-0	NICKEL	0.02	0.02	U
7440-09-7	POTASSIUM	1	1	U
7782-49-2	SELENIUM	0.005	0.005	U
7440-22-4	SILVER	0.01	0.01	U
7440-23-5	SODIUM	1	1	U
7440-28-0	THALLIUM	0.01	0.01	U
7440-31-5	TIN	0.05	0.05	U
7440-62-2	VANADIUM	0.01	0.01	U
7440-66-6	ZINC	0.02	0.02	U

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA1	ICSAB1	ICSA1	ICSAB1	
7429-90-5	ALUMINUM	250	250	273	262	105
7440-36-0	ANTIMONY		0.6		0.59200	99
7440-38-2	ARSENIC		0.1		0.10400	104
7440-39-3	BARIUM		0.5		0.50900	102
7440-41-7	BERYLLIUM		0.5		0.49300	99
7440-43-9	CADMIUM		1		1	100
7440-70-2	CALCIUM	250	250	269	259	103
7440-47-3	CHROMIUM		0.5		0.47900	96
7440-48-4	COBALT		0.5		0.47600	95
7440-50-8	COPPER		0.5		0.533	107
7439-89-6	IRON	100	100	110	106	106
7439-92-1	LEAD		0.05		0.0455	91
7439-95-4	MAGNESIUM	250	250	270	261	104
7439-96-5	MANGANESE		0.5		0.487	97
7439-98-7	MOLYBDENUM		1		0.96	96
7440-02-0	NICKEL		1		0.955	95
7440-09-7	POTASSIUM					
7782-49-2	SELENIUM		0.05		0.05200	104
7440-22-4	SILVER		0.2		0.198	99
7440-23-5	SODIUM					
7440-28-0	THALLIUM		0.1		0.08020	80
7440-31-5	TIN		1		1.02	102
7440-62-2	VANADIUM		0.5		0.48100	96
7440-66-6	ZINC		1		0.926	93

Data Package ID: *it1303060-1*

ICP Metals

Method SW6010

ICP Interference Check Sample

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: IT130311-2A1
Date Analyzed: 03/11/2013
Result Units: MG/L

CASNO	Target Analyte	Spike Added		Results		% Rec.
		ICSA2	ICSAB2	ICSA2	ICSAB2	
7429-90-5	ALUMINUM	250	250	266	264	106
7440-36-0	ANTIMONY		0.6		0.579	96
7440-38-2	ARSENIC		0.1		0.109	109
7440-39-3	BARIUM		0.5		0.50400	101
7440-41-7	BERYLLIUM		0.5		0.502	100
7440-43-9	CADMIUM		1		0.98900	99
7440-70-2	CALCIUM	250	250	261	260	104
7440-47-3	CHROMIUM		0.5		0.48600	97
7440-48-4	COBALT		0.5		0.48300	97
7440-50-8	COPPER		0.5		0.53600	107
7439-89-6	IRON	100	100	106	105	105
7439-92-1	LEAD		0.05		0.0442	88
7439-95-4	MAGNESIUM	250	250	266	266	106
7439-96-5	MANGANESE		0.5		0.49300	99
7439-98-7	MOLYBDENUM		1		0.96600	97
7440-02-0	NICKEL		1		0.942	94
7440-09-7	POTASSIUM					
7782-49-2	SELENIUM		0.05		0.05000	100
7440-22-4	SILVER		0.2		0.19900	99
7440-23-5	SODIUM					
7440-28-0	THALLIUM		0.1		0.102	102
7440-31-5	TIN		1		1.03	103
7440-62-2	VANADIUM		0.5		0.484	97
7440-66-6	ZINC		1		0.979	98

Data Package ID: *it1303060-1*

Metals Linear Ranges

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Instrument ID: ICPTrace2
Active Date: 03/02/2010
Expiration Date: 05/31/2015

CASNO	Target Analyte	Concentration (ppm)
7429-90-5	ALUMINUM	500
7440-36-0	ANTIMONY	2
7440-38-2	ARSENIC	5
7440-39-3	BARIUM	10
7440-41-7	BERYLLIUM	1
7440-43-9	CADMIUM	5
7440-70-2	CALCIUM	500
7440-47-3	CHROMIUM	10
7440-48-4	COBALT	5
7440-50-8	COPPER	10
7439-89-6	IRON	200
7439-92-1	LEAD	10
7439-95-4	MAGNESIUM	500
7439-96-5	MANGANESE	10
7439-98-7	MOLYBDENUM	10
7440-02-0	NICKEL	10
7440-09-7	POTASSIUM	250
7782-49-2	SELENIUM	5
7440-22-4	SILVER	2
7440-23-5	SODIUM	150
7440-28-0	THALLIUM	5
7440-31-5	TIN	10
7440-61-1	URANIUM	50
7440-62-2	VANADIUM	5
7440-66-6	ZINC	10

ICP Interelement Correction Factors

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Instrument ID: ICPTrace2
Active Date: 11/9/2012
Expiration Date: 11/9/2013

Analyte	Lamda (nm)	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	Th
ALUMINUM																	
ANTIMONY									0.015350								
ARSENIC																	
BERYLLIUM																	
CADMIUM				0.006851													
CHROMIUM																	
COBALT					-0.00140												
COPPER																	
LEAD		-7.6E-05										3.04E-05					
MANGANESE																	
SELENIUM												-0.00025					
SILVER																	
THALLIUM												-0.00052			0.000225		
TIN																	
URANIUM												0.000181					
VANADIUM									0.0012			-0.00016					
ZINC																	

ICP Interelement Correction Factors

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Instrument ID: ICPTrace2
Active Date: 11/9/2012
Expiration Date: 11/9/2013

Analyte	Lamda (nm)	K	Se	Ag	Na	Tl	V	Zn	Sn	Ti	Mo	Li	Sr	B	Si	U	Zr
ALUMINUM							0.012552				0.003324					-0.02791	
ANTIMONY											-0.00561						
ARSENIC																	
BERYLLIUM							0.000551									-0.00025	
CADMIUM																	
CHROMIUM																0.000673	
COBALT										0.002105							
COPPER																0.001073	
LEAD							0.001051			-0.00053	-0.00029					0.000717	
MANGANESE																	
SELENIUM																-0.00095	
SILVER																0.000698	0.003897
THALLIUM						0.003416	0.002636			0.001416						-0.00058	
TIN										0.001163							
URANIUM																	
VANADIUM																	
ZINC																	

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		MIXAHIGH	1	3/11/2013	12:30
		MIXBHIGH	1	3/11/2013	12:31
		MIXCHIGH	1	3/11/2013	12:33
		ICV	1	3/11/2013	12:35
		ICB	1	3/11/2013	12:37
		CRI1	1	3/11/2013	12:39
		ICSA1	1	3/11/2013	12:41
		ICSAB1	1	3/11/2013	12:43
		CCV1	1	3/11/2013	12:44
		CCB1	1	3/11/2013	12:51
		F130301-1MB	1	3/11/2013	12:53
		IP130307-2MB	1	3/11/2013	12:55
		IP130307-2LCS	1	3/11/2013	12:56
		IP130307-3MB	1	3/11/2013	12:58
		IP130307-3LCS	1	3/11/2013	13:00
		IP130307-4MB	1	3/11/2013	13:02
		IP130307-4LCS	1	3/11/2013	13:03
- Fe,Pb,Se,Tl,U,V		1303058-1	1	3/11/2013	13:05
- Fe,Pb,Se,Tl,U,V		1303058-1DUP	1	3/11/2013	13:07
- Fe,Pb,Se,Tl,U,V		1303058-1SER	5	3/11/2013	13:08
		CCV2	1	3/11/2013	13:10
		CCB2	1	3/11/2013	13:12
- Fe,Pb,Se,Tl,U,V		1303058-1MS	1	3/11/2013	13:14
- Fe,Pb,Se,Tl,U,V		1303058-1MSD	1	3/11/2013	13:16
- Tl		1303058-2	1	3/11/2013	13:17
- Tl		1303058-3	1	3/11/2013	13:19
- Fe,Pb,Se,Tl,U,V		1303058-4	1	3/11/2013	13:21
- Tl		1303058-5	1	3/11/2013	13:23
- Tl		1303058-6	1	3/11/2013	13:24
- Tl		1303058-7	1	3/11/2013	13:26
- Tl		1303058-8	1	3/11/2013	13:28
- Tl		1303058-9	1	3/11/2013	13:30
		CCV3	1	3/11/2013	13:32
		CCB3	1	3/11/2013	13:34
- Tl		1303058-10	1	3/11/2013	13:36

Data Package ID: IT1303060-1

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
- Tl		1303058-11	1	3/11/2013	13:37
- Tl		1303058-12	1	3/11/2013	13:39
- Tl		1303058-13	1	3/11/2013	13:41
- Tl		1303058-14	1	3/11/2013	13:43
		1303059-1	1	3/11/2013	13:44
		1303059-1DUP	1	3/11/2013	13:46
		1303059-1SER	5	3/11/2013	13:48
		1303059-1MS	1	3/11/2013	13:50
		1303059-1MSD	1	3/11/2013	13:51
		CCV4	1	3/11/2013	13:54
		CCB4	1	3/11/2013	15:21
		CCV5	1	3/11/2013	15:23
		CCB5	1	3/11/2013	15:25
		1303059-2	1	3/11/2013	15:27
		ZZZ	1	3/11/2013	15:28
		ZZZ	1	3/11/2013	15:33
		CCV6	1	3/11/2013	15:35
		CCB6	1	3/11/2013	15:37
		1303059-3	1	3/11/2013	15:39
		1303059-4	1	3/11/2013	15:40
- Tl		1303059-5	1	3/11/2013	15:42
		1303059-6	1	3/11/2013	15:44
- Tl		1303059-7	1	3/11/2013	15:46
		1303059-8	1	3/11/2013	15:48
- Tl		1303059-9	1	3/11/2013	15:49
		1303059-10	1	3/11/2013	15:51
- Tl		1303059-11	1	3/11/2013	15:53
		CCV7	1	3/11/2013	15:55
		CCB7	1	3/11/2013	15:57
- Tl		1303059-12	1	3/11/2013	15:59
- Tl		1303059-13	1	3/11/2013	16:01
- Tl		1303059-14	1	3/11/2013	16:02
		1303059-15	1	3/11/2013	16:04
	S30-04-130228	1303060-1	1	3/11/2013	16:06
	S30-04-130228	1303060-1DUP	1	3/11/2013	16:08

Data Package ID: IT1303060-1

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
	S30-04-130228	1303060-1SER	5	3/11/2013	16:09
	S30-04-130228	1303060-1MS	1	3/11/2013	16:11
	S30-04-130228	1303060-1MSD	1	3/11/2013	16:13
	S30-53-130228	1303060-2	1	3/11/2013	16:15
		CCV8	1	3/11/2013	16:17
		CCB8	1	3/11/2013	16:19
	S30-61-130228	1303060-3	1	3/11/2013	16:20
	S30-69-130228	1303060-4	1	3/11/2013	16:22
	S30-70-130228	1303060-5	1	3/11/2013	16:24
	S30-83-130228	1303060-6	1	3/11/2013	16:26
	S30-90-130228	1303060-7	1	3/11/2013	16:28
	S30-90-2-130228	1303060-8	1	3/11/2013	16:29
	S30-91-130228	1303060-9	1	3/11/2013	16:31
	S30-94-130228	1303060-10	1	3/11/2013	16:33
	S30-95-130228	1303060-11	1	3/11/2013	16:35
	S30-BKGD-N-130228	1303060-12	1	3/11/2013	16:36
		CCV9	1	3/11/2013	16:39
		CCB9	1	3/11/2013	16:40
		ZZZ	1	3/11/2013	16:42
		ZZZ	1	3/11/2013	16:45
		ZZZ	1	3/11/2013	16:49
+ Ca,Tl		1303057-1	5	3/11/2013	17:08
+ Ca,Tl		1303057-1DUP	5	3/11/2013	17:10
+ Ca,Tl		1303057-1SER	25	3/11/2013	17:11
+ Ca,Tl		1303057-1MS	5	3/11/2013	17:13
+ Ca,Tl		1303057-1MSD	5	3/11/2013	17:15
		ZZZ	1	3/11/2013	17:17
		CCV10	1	3/11/2013	17:21
		CCB10	1	3/11/2013	17:23
+ Fe,Pb,Se,Tl,U,V		1303058-1	5	3/11/2013	17:24
+ Fe,Pb,Se,Tl,U,V		1303058-1DUP	5	3/11/2013	17:26
+ Fe,Pb,Se,Tl,U,V		1303058-1SER	25	3/11/2013	17:28
+ Fe,Pb,Se,Tl,U,V		1303058-1MS	5	3/11/2013	17:29
+ Fe,Pb,Se,Tl,U,V		1303058-1MSD	5	3/11/2013	17:31
		CCV11	1	3/11/2013	17:33

Data Package ID: IT1303060-1

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCB11	1	3/11/2013	17:36
+ Sb		1303058-1A	1	3/11/2013	17:38
+ Fe,Pb,Se,Tl,V		1303058-1A	5	3/11/2013	17:39
+ Ca,Mn,Sb,V		1303059-1A	1	3/11/2013	17:41
+ Sb,Zr	S30-04-130228	1303060-1A	1	3/11/2013	17:43
+ Tl		1303058-2	5	3/11/2013	17:45
+ Tl		1303058-3	5	3/11/2013	17:46
+ Fe,Pb,Se,Tl,U,V		1303058-4	5	3/11/2013	17:48
+ Tl		1303058-5	5	3/11/2013	17:50
+ Tl		1303058-6	5	3/11/2013	17:52
+ Tl		1303058-7	5	3/11/2013	17:53
		CCV12	1	3/11/2013	17:55
		CCB12	1	3/11/2013	17:57
+ Tl		1303058-8	5	3/11/2013	17:59
+ Tl		1303058-9	5	3/11/2013	18:01
+ Tl		1303058-10	5	3/11/2013	18:02
+ Tl		1303058-11	5	3/11/2013	18:04
+ Tl		1303058-12	5	3/11/2013	18:06
+ Tl		1303058-13	5	3/11/2013	18:08
+ Tl		1303058-14	5	3/11/2013	18:09
+ Tl		1303059-5	5	3/11/2013	18:11
+ Tl		1303059-7	5	3/11/2013	18:13
+ Tl		1303059-9	5	3/11/2013	18:15
		CCV13	1	3/11/2013	18:17
		CCB13	1	3/11/2013	18:18
+ Tl		1303059-11	5	3/11/2013	18:20
+ Tl		1303059-12	5	3/11/2013	18:22
+ Tl		1303059-13	5	3/11/2013	18:24
+ Tl		1303059-14	5	3/11/2013	18:26
+ Tl	S30-91-130228	1303060-9	5	3/11/2013	18:27
+ Tl	S30-94-130228	1303060-10	5	3/11/2013	18:29
+ Tl	S30-04-130228	1303060-1	5	3/11/2013	18:31
+ Tl	S30-04-130228	1303060-1DUP	5	3/11/2013	18:33
+ Tl	S30-04-130228	1303060-1SER	25	3/11/2013	18:34
+ Tl	S30-04-130228	1303060-1MS	5	3/11/2013	18:36

Data Package ID: IT1303060-1

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		CCV14	1	3/11/2013	18:38
		CCB14	1	3/11/2013	18:52
+Tl	S30-04-130228	1303060-1MSD	5	3/11/2013	18:56
+Tl	S30-53-130228	1303060-2	5	3/11/2013	18:57
+Tl	S30-61-130228	1303060-3	5	3/11/2013	18:59
+Tl	S30-69-130228	1303060-4	5	3/11/2013	19:01
+Tl	S30-70-130228	1303060-5	5	3/11/2013	19:03
+Tl	S30-83-130228	1303060-6	5	3/11/2013	19:05
+Tl	S30-90-130228	1303060-7	5	3/11/2013	19:06
+Tl	S30-90-2-130228	1303060-8	5	3/11/2013	19:08
+Tl	S30-95-130228	1303060-11	5	3/11/2013	19:10
+Tl	S30-BKGD-N-130228	1303060-12	5	3/11/2013	19:12
		CCV15	1	3/11/2013	19:14
		CCB15	1	3/11/2013	19:15
+Tl		1303057-2	5	3/11/2013	19:17
+Tl		1303057-3	5	3/11/2013	19:19
+Tl		1303057-4	5	3/11/2013	19:21
+Tl		1303057-5	5	3/11/2013	19:23
+Tl		1303057-6	5	3/11/2013	19:24
+Tl		1303057-7	5	3/11/2013	19:26
+Tl		1303057-8	5	3/11/2013	19:28
+Tl		1303057-10	5	3/11/2013	19:30
+Tl		1303057-11	5	3/11/2013	19:32
+Tl		1303057-12	5	3/11/2013	19:33
		CCV16	1	3/11/2013	19:35
		CCB16	1	3/11/2013	19:37
+Tl		1303057-13	5	3/11/2013	19:39
+Tl		1303057-14	5	3/11/2013	19:41
+Tl		1303057-15	5	3/11/2013	19:42
		CRI2	1	3/11/2013	19:44
		ICSA2	1	3/11/2013	19:46
		ICSAB2	1	3/11/2013	19:48
		CCV17	1	3/11/2013	19:50
		CCB17	1	3/11/2013	19:52

Data Package ID: IT1303060-1

ICPMS Metals

Method SW6020A
Method Blank

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: IP130307-4MB

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 07-Mar-13
Date Analyzed: 08-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-2
Run ID: IM130308-10A1
Cleanup: NONE
Basis: N/A
File Name: 003SMPL_

Sample Aliquot: 1 g
Final Volume: 100 ml
Result Units: UG/KG
Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7440-61-1	URANIUM	10	10	10	U	

Data Package ID: *im1303060-1*

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: IM130307-4LCS

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03/07/2013
Date Analyzed: 03/08/2013
Prep Method: SW3050B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-2
Run ID: IM130308-10A1
Cleanup: NONE
Basis: N/A
File Name: 006SMPL_

Sample Aliquot: 1 g
Final Volume: 100 ml
Result Units: UG/KG
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7440-61-1	URANIUM	1000	985	10		99	80 - 120%

Data Package ID: *im1303060-1*

ICPMS Metals

Method SW6020A
Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
LabID: 1303060-1MS

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 08-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-2
Run ID: IM130308-10A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 1.003 g
Final Volume: 100 ml
Result Units: UG/KG
File Name: 057SMPL_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7440-61-1	URANIUM	12000		13200		108	1080	138	75 - 125%

Field ID: S30-04-130228
LabID: 1303060-1MSD

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 08-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-2
Run ID: IM130308-10A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 1.009 g
Final Volume: 100 ml
Result Units: UG/KG
File Name: 058SMPL_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7440-61-1	URANIUM	14600		1070	274	107	20	10

Data Package ID: *im1303060-1*

ICPMS Metals

Method SW6020

Duplicate Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
Lab ID: 1303060-1D

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 02/28/2013
Date Extracted: 03/07/2013
Date Analyzed: 03/08/2013

Prep Batch: IP130307-4
QCBatchID: IP130307-4-2
Run ID: IM130308-10A1
Cleanup: NONE
Basis: Dry Weight
File Name: 055SMPL_

Sample Aliquot: 1.008 g
Final Volume: 100 ml
Result Units: UG/KG
Clean DF: 1

CASNO	Target Analyte	Sample Result	Samp Qual	Duplicate Result	Dup Qual	Reporting Limit	Dilution Factor	RPD	RPD Limit
7440-61-1	URANIUM	12000		13400		107	100	14	20

Data Package ID: *im1303060-1*

ICPMS Metals

Method SW6020
Serial Dilution

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-04-130228
Lab ID: 1303060-1L

Run ID: IM130308-10A1
Date Analyzed: 08-Mar-13
Result Units: mg/l

CASNO	Target Analyte	Sample Result	Samp Qual	SD Result	SD Qual	EPA Qualifier	%D
7440-61-1	URANIUM	0.00110		0.00110			0

Data Package ID: *im1303060-1*

Prep Batch ID: IP130307-4

Start Date: 03/07/13
Start Time: 15:00
Prep Analyst: Brent A. Stanfield
End Date: 03/07/13
End Time: 18:00
Concentration Method: NONE
Extract Method: SW3050B
Initial Volume Units: g
Final Volume Units: ml
Batch Created By: bas
Date Created: 03/07/13
Time Created: 13:54
Validated By: bas
Date Validated: 03/07/13
Time Validated: 14:18

Comments:

QC Batch ID: IP130307-4-2

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
IP130307-4	MB	XXXXXX	SOIL	XXXXXX	1	100	NONE	1	1303060
IM130307-4	LCS	XXXXXX	SOIL	XXXXXX	1	100	NONE	1	1303060
1303060-1	MS	S30-04-130228	SOIL	2/28/2013	1.003	100	NONE	1	1303060
1303060-1	MSD	S30-04-130228	SOIL	2/28/2013	1.009	100	NONE	1	1303060
1303060-1	DUP	S30-04-130228	SOIL	2/28/2013	1.008	100	NONE	1	1303060
1303060-1	SMP	S30-04-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060
1303060-10	SMP	S30-94-130228	SOIL	2/28/2013	1.002	100	NONE	1	1303060
1303060-11	SMP	S30-95-130228	SOIL	2/28/2013	1.006	100	NONE	1	1303060
1303060-12	SMP	S30-BKGD-N-130228	SOIL	2/28/2013	1.007	100	NONE	1	1303060
1303060-2	SMP	S30-53-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060
1303060-3	SMP	S30-61-130228	SOIL	2/28/2013	1.037	100	NONE	1	1303060
1303060-4	SMP	S30-69-130228	SOIL	2/28/2013	1.035	100	NONE	1	1303060
1303060-5	SMP	S30-70-130228	SOIL	2/28/2013	1.027	100	NONE	1	1303060
1303060-6	SMP	S30-83-130228	SOIL	2/28/2013	1.002	100	NONE	1	1303060
1303060-7	SMP	S30-90-130228	SOIL	2/28/2013	1.006	100	NONE	1	1303060
1303060-8	SMP	S30-90-2-130228	SOIL	2/28/2013	1.035	100	NONE	1	1303060
1303060-9	SMP	S30-91-130228	SOIL	2/28/2013	1.019	100	NONE	1	1303060

QC Types

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicate
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standard	SMP	Field Sample
SYS	Sample Yield Spike		

URANIUM

Method SW6020

Calibration Verifications

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: IM130308-10A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
ICV	Initial Calibration	3/8/2013	13:02	0.002	0.00200	0.00001	N/A	100	90 - 110
CCV1	Continuing Calibration	3/8/2013	14:03	0.001	0.000975	0.00001	N/A	97	90 - 110
CCV2	Continuing Calibration	3/8/2013	14:47	0.001	0.000967	0.00001	N/A	97	90 - 110
CCV3	Continuing Calibration	3/8/2013	15:41	0.001	0.000978	0.00001	N/A	98	90 - 110
CCV4	Continuing Calibration	3/8/2013	16:34	0.001	0.000988	0.00001	N/A	99	90 - 110
CCV5	Continuing Calibration	3/8/2013	17:02	0.001	0.000986	0.00001	N/A	99	90 - 110
CCV6	Continuing Calibration	3/8/2013	17:31	0.001	0.000982	0.00001	N/A	98	90 - 110
CCV7	Continuing Calibration	3/8/2013	17:59	0.001	0.000985	0.00001	N/A	99	90 - 110
CCV8	Continuing Calibration	3/8/2013	18:27	0.001	0.000984	0.00001	N/A	98	90 - 110
CCV9	Continuing Calibration	3/8/2013	18:55	0.001	0.000980	0.00001	N/A	98	90 - 110
CCV10	Continuing Calibration	3/8/2013	19:08	0.001	0.000974	0.00001	N/A	97	90 - 110

Data Package ID: *im1303060-1*

URANIUM

Method SW6020

Calibration Blanks

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: IM130308-10A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/8/2013	13:18	0.00001	0.00001	U
CCB1	Continuing Calibration	3/8/2013	14:16	0.00001	0.00001	U
CCB2	Continuing Calibration	3/8/2013	14:58	0.00001	0.00001	U
CCB3	Continuing Calibration	3/8/2013	15:53	0.00001	0.00001	U
CCB4	Continuing Calibration	3/8/2013	16:36	0.00001	0.00001	U
CCB5	Continuing Calibration	3/8/2013	17:04	0.00001	0.00001	U
CCB6	Continuing Calibration	3/8/2013	17:33	0.00001	0.00001	U
CCB7	Continuing Calibration	3/8/2013	18:01	0.00001	0.00001	U
CCB8	Continuing Calibration	3/8/2013	18:29	0.00001	0.00001	U
CCB9	Continuing Calibration	3/8/2013	18:57	0.00001	0.00001	U
CCB10	Continuing Calibration	3/8/2013	19:10	0.00001	0.00001	U

Data Package ID: *im1303060-1*

ICPMS Metals

Method SW6020

ICP Interference Check Sample

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: IM130308-10A1
Date Analyzed: 03/08/2013
Result Units: MG/L

CASNO	Target Analyte	Spike Added ICSA1	Spike Added ICSAB1	Results ICSA1	Results ICSAB1	% Rec.
7440-61-1	URANIUM		0.001		0.00104	104

Data Package ID: *im1303060-1*

Metals Linear Ranges

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Instrument ID: ICPMS2
Active Date: 04/01/2010
Expiration Date: 04/01/2015

CASNO	Target Analyte	Concentration (ppm)
7429-90-5	ALUMINUM	50
7440-36-0	ANTIMONY	0.3
7440-38-2	ARSENIC	1
7440-39-3	BARIUM	1
7440-41-7	BERYLLIUM	0.5
7440-43-9	CADMIUM	0.3
7440-70-2	CALCIUM	500
7440-47-3	CHROMIUM	5
7440-48-4	COBALT	1
7440-50-8	COPPER	10
7439-89-6	IRON	50
7439-92-1	LEAD	0.5
7439-95-4	MAGNESIUM	100
7439-96-5	MANGANESE	2
7439-98-7	MOLYBDENUM	1
7440-02-0	NICKEL	5
7440-09-7	POTASSIUM	500
7782-49-2	SELENIUM	1
7440-22-4	SILVER	0.1
7440-23-5	SODIUM	1000
7440-28-0	THALLIUM	0.02
7440-31-5	TIN	5
7440-61-1	URANIUM	0.1
7440-62-2	VANADIUM	1
7440-66-6	ZINC	20

ICPMS2 Run Log -- 3/8/2013

Instrument ID: ICPMS2
File Name: 003CALB.
AnalRunID: IM130308-10A1
CalibRefID: IM130308-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		blank	1	3/8/2013	12:35
		H/1000	1	3/8/2013	12:38
		H/100	1	3/8/2013	12:41
		H/10	1	3/8/2013	12:44
		HIGH	1	3/8/2013	12:47
		ZZZZZZ	1	3/8/2013	12:54
		ICV	1	3/8/2013	13:02
		ICB	1	3/8/2013	13:18
		CRI1	1	3/8/2013	13:21
		ICSA1	1	3/8/2013	13:24
		ICSAB1	1	3/8/2013	13:27
		ZZZZZZ	1	3/8/2013	13:39
		IP130307-1MB	10	3/8/2013	13:42
		1302343-1	10	3/8/2013	13:45
		1302347-1	10	3/8/2013	13:48
		1303056-2	10	3/8/2013	13:51
		1303056-2DUP	10	3/8/2013	13:54
		1303056-2SER	50	3/8/2013	14:00
		CCV1	1	3/8/2013	14:03
		CCB1	1	3/8/2013	14:16
		F130301-1MB	10	3/8/2013	14:19
		1303056-2MS	10	3/8/2013	14:22
		1303056-2MSD	10	3/8/2013	14:25
		FM130301-1LCS	10	3/8/2013	14:29
		IP130307-1LCS	10	3/8/2013	14:32
		1303045-1	10	3/8/2013	14:41
		1303044-1	10	3/8/2013	14:44
		CCV2	1	3/8/2013	14:47
		CCB2	1	3/8/2013	14:58
		1303028-3	10	3/8/2013	15:01
		1303028-3SER	50	3/8/2013	15:04
		1303028-3MS	10	3/8/2013	15:07
		1303028-1	10	3/8/2013	15:11
		1303028-2	10	3/8/2013	15:14
		1303046-1	10	3/8/2013	15:17

Data Package ID: IM1303060-1

ICPMS2 Run Log -- 3/8/2013

Instrument ID: ICPMS2
File Name: 008SMPL_
AnalRunID: IM130308-10A1
CalibRefID: IM130308-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1303029-1	10	3/8/2013	15:20
		1303029-2	10	3/8/2013	15:23
		1303030-1	10	3/8/2013	15:26
		1303028-3MSD	10	3/8/2013	15:38
		CCV3	1	3/8/2013	15:41
		CCB3	1	3/8/2013	15:53
		IP130307-2MB	10	3/8/2013	16:10
		IP130307-3MB	10	3/8/2013	16:12
		IP130307-4MB	10	3/8/2013	16:14
		IM130307-2LCS	10	3/8/2013	16:16
		IM130307-3LCS	10	3/8/2013	16:18
		IM130307-4LCS	10	3/8/2013	16:20
		1303058-1	100	3/8/2013	16:22
		1303058-1DUP	100	3/8/2013	16:24
		1303058-1SER	500	3/8/2013	16:26
		1303058-1MS	100	3/8/2013	16:28
		CCV4	1	3/8/2013	16:34
		CCB4	1	3/8/2013	16:36
		1303058-1MSD	100	3/8/2013	16:38
		1303058-1A	100	3/8/2013	16:40
		1303058-2	100	3/8/2013	16:42
		1303058-3	100	3/8/2013	16:44
		1303058-4	100	3/8/2013	16:46
		1303058-5	100	3/8/2013	16:48
		1303058-6	100	3/8/2013	16:50
		1303058-7	100	3/8/2013	16:52
		1303058-8	100	3/8/2013	16:54
		1303058-9	100	3/8/2013	16:56
		CCV5	1	3/8/2013	17:02
		CCB5	1	3/8/2013	17:04
		1303058-10	100	3/8/2013	17:06
		1303058-11	100	3/8/2013	17:08
		1303058-12	100	3/8/2013	17:10
		1303058-13	100	3/8/2013	17:12
		1303058-14	100	3/8/2013	17:14

Data Package ID: IM1303060-1

ICPMS2 Run Log -- 3/8/2013

Instrument ID: ICPMS2
File Name: 030SMPL_
AnalRunID: IM130308-10A1
CalibRefID: IM130308-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1303059-1	100	3/8/2013	17:16
		1303059-1DUP	100	3/8/2013	17:18
		1303059-1SER	500	3/8/2013	17:20
		1303059-1MS	100	3/8/2013	17:22
		1303059-1MSD	100	3/8/2013	17:24
		CCV6	1	3/8/2013	17:31
		CCB6	1	3/8/2013	17:33
		1303059-1A	100	3/8/2013	17:35
		1303059-2	100	3/8/2013	17:37
		1303059-3	100	3/8/2013	17:39
		1303059-4	100	3/8/2013	17:41
		1303059-5	100	3/8/2013	17:43
		1303059-6	100	3/8/2013	17:45
		1303059-7	100	3/8/2013	17:47
		1303059-8	100	3/8/2013	17:49
		1303059-9	100	3/8/2013	17:51
		1303059-10	100	3/8/2013	17:53
		CCV7	1	3/8/2013	17:59
		CCB7	1	3/8/2013	18:01
		1303059-11	100	3/8/2013	18:03
		1303059-12	100	3/8/2013	18:05
		1303059-13	100	3/8/2013	18:07
		1303059-14	100	3/8/2013	18:09
		1303059-15	100	3/8/2013	18:11
	S30-04-130228	1303060-1	100	3/8/2013	18:13
	S30-04-130228	1303060-1DUP	100	3/8/2013	18:15
	S30-04-130228	1303060-1SER	50	3/8/2013	18:17
	S30-04-130228	1303060-1MS	100	3/8/2013	18:19
	S30-04-130228	1303060-1MSD	100	3/8/2013	18:21
		CCV8	1	3/8/2013	18:27
		CCB8	1	3/8/2013	18:29
	S30-04-130228	1303060-1A	100	3/8/2013	18:31
	S30-53-130228	1303060-2	100	3/8/2013	18:33
	S30-61-130228	1303060-3	100	3/8/2013	18:35
	S30-69-130228	1303060-4	100	3/8/2013	18:37

Data Package ID: IM1303060-1

ICPMS2 Run Log -- 3/8/2013

Instrument ID: ICPMS2
File Name: 065SMPL_
AnalRunID: IM130308-10A1
CalibRefID: IM130308-10A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
	S30-70-130228	1303060-5	100	3/8/2013	18:39
	S30-83-130228	1303060-6	100	3/8/2013	18:41
	S30-90-130228	1303060-7	100	3/8/2013	18:43
	S30-90-2-130228	1303060-8	100	3/8/2013	18:45
	S30-91-130228	1303060-9	100	3/8/2013	18:47
	S30-94-130228	1303060-10	100	3/8/2013	18:49
		CCV9	1	3/8/2013	18:55
		CCB9	1	3/8/2013	18:57
	S30-95-130228	1303060-11	100	3/8/2013	18:59
	S30-BKGD-N-130228	1303060-12	100	3/8/2013	19:01
		CCV10	1	3/8/2013	19:08
		CCB10	1	3/8/2013	19:10

Data Package ID: IM1303060-1

Mercury

Method SW7471A
Method Blank

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: HG130311-2MB

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 11-Mar-13
Date Analyzed: 12-Mar-13
Prep Method: METHOD

Prep Batch: HG130311-1
QCBatchID: HG130311-1-2
Run ID: HG130312-1A1
Cleanup: NONE
Basis: N/A
File Name: HG130311-1

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	DF	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7439-97-6	MERCURY	1	0.033	0.033	U	

Data Package ID: *hg1303060-1*

Mercury

Method SW7471A

Laboratory Control Sample

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Lab ID: HG130311-2LCS

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 03/11/2013
Date Analyzed: 03/12/2013
Prep Method: METHOD

Prep Batch: HG130311-1
QCBatchID: HG130311-1-2
Run ID: HG130312-1A1
Cleanup: NONE
Basis: N/A
File Name: HG130311-1

Sample Aliquot: 0.6 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7439-97-6	MERCURY	0.167	0.164	0.0333		99	80 - 120%

Data Package ID: *hg1303060-1*

Mercury

Method SW7471A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-BKGD-N-130228
LabID: 1303060-12MS

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 11-Mar-13
Date Analyzed: 12-Mar-13
Prep Method: METHOD

Prep Batch: HG130311-1
QCBatchID: HG130311-1-2
Run ID: HG130312-1A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 0.606 g
Final Volume: 100 g
Result Units: MG/KG
File Name: HG130311-1

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7439-97-6	MERCURY	0.034	U	0.351		0.0342	0.342	102	80 - 120%

Field ID: S30-BKGD-N-130228
LabID: 1303060-12MSD

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 11-Mar-13
Date Analyzed: 12-Mar-13
Prep Method: METHOD

Prep Batch: HG130311-1
QCBatchID: HG130311-1-2
Run ID: HG130312-1A1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 0.612 g
Final Volume: 100 g
Result Units: MG/KG
File Name: HG130311-1

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7439-97-6	MERCURY	0.352		0.339	104	0.0339	20	0

Data Package ID: *hg1303060-1*

Mercury

Method SW7471
Duplicate Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Field ID: S30-BKGD-N-130228
Lab ID: 1303060-12D

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 02/28/2013
Date Extracted: 03/11/2013
Date Analyzed: 03/12/2013

Prep Batch: HG130311-1
QCBatchID: HG130311-1-2
Run ID: HG130312-1A1
Cleanup: NONE
Basis: Dry Weight
File Name: HG130311-1

Sample Aliquot: 0.605 g
Final Volume: 100 g
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Sample Result	Samp Qual	Duplicate Result	Dup Qual	Reporting Limit	Dilution Factor	RPD	RPD Limit
7439-97-6	MERCURY	0.034	U	0.0343	U	0.0343	1		20

Data Package ID: *hg1303060-1*

Prep Batch ID: HG130311-1

Start Date: 03/11/13
Start Time: 8:12
Prep Analyst: Sheri Lafferty

End Date: 03/11/13
End Time: 12:00

Concentration Method: NONE
Extract Method: METHOD
Initial Volume Units: g
Final Volume Units: g

Batch Created By: skl
Date Created: 03/11/13
Time Created: 8:12
Validated By: skl
Date Validated: 03/12/13
Time Validated: 11:58

Comments:

QC Batch ID: HG130311-1-2

Lab ID	QC Type	Field ID	Matrix	Date Collected	Initial Wt/Vol	Final Wt/Vol	Cleanup Method	Cleanup DF	Order Number
HG130311-2	MB	XXXXXX	SOIL	XXXXXX	0.6	100	NONE	1	1303060
HG130311-2	LCS	XXXXXX	SOIL	XXXXXX	0.6	100	NONE	1	1303060
1303060-12	MS	S30-BKGD-N-130228	SOIL	2/28/2013	0.606	100	NONE	1	1303060
1303060-12	MSD	S30-BKGD-N-130228	SOIL	2/28/2013	0.612	100	NONE	1	1303060
1303060-12	DUP	S30-BKGD-N-130228	SOIL	2/28/2013	0.605	100	NONE	1	1303060
1303060-1	SMP	S30-04-130228	SOIL	2/28/2013	0.611	100	NONE	1	1303060
1303060-10	SMP	S30-94-130228	SOIL	2/28/2013	0.61	100	NONE	1	1303060
1303060-11	SMP	S30-95-130228	SOIL	2/28/2013	0.614	100	NONE	1	1303060
1303060-12	SMP	S30-BKGD-N-130228	SOIL	2/28/2013	0.604	100	NONE	1	1303060
1303060-2	SMP	S30-53-130228	SOIL	2/28/2013	0.615	100	NONE	1	1303060
1303060-3	SMP	S30-61-130228	SOIL	2/28/2013	0.61	100	NONE	1	1303060
1303060-4	SMP	S30-69-130228	SOIL	2/28/2013	0.604	100	NONE	1	1303060
1303060-5	SMP	S30-70-130228	SOIL	2/28/2013	0.604	100	NONE	1	1303060
1303060-6	SMP	S30-83-130228	SOIL	2/28/2013	0.611	100	NONE	1	1303060
1303060-7	SMP	S30-90-130228	SOIL	2/28/2013	0.613	100	NONE	1	1303060
1303060-8	SMP	S30-90-2-130228	SOIL	2/28/2013	0.611	100	NONE	1	1303060
1303060-9	SMP	S30-91-130228	SOIL	2/28/2013	0.616	100	NONE	1	1303060

QC Types

CAR	Carrier reference sample	DUP	Laboratory Duplicate
LCS	Laboratory Control Sample	LCSD	Laboratory Control Sample Duplicate
MB	Method Blank	MS	Laboratory Matrix Spike
MSD	Laboratory Matrix Spike Duplicate	REP	Sample replicate
RVS	Reporting Level Verification Standard	SMP	Field Sample
SYS	Sample Yield Spike		

MERCURY

Method SW7471

Calibration Verifications

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: HG130312-1A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Spike Added	Result	Reporting Limit	Result Qualifier	% Rec.	Control Limits
ICV	Initial Calibration	3/12/2013	9:30	0.001	0.000985	0.0002	N/A	99	90 - 110
CCV1	Continuing Calibration	3/12/2013	10:01	0.002	0.00194	0.0002	N/A	97	80 - 120
CCV2	Continuing Calibration	3/12/2013	10:27	0.002	0.00196	0.0002	N/A	98	80 - 120
CCV3	Continuing Calibration	3/12/2013	10:52	0.002	0.00198	0.0002	N/A	99	80 - 120
CCV4	Continuing Calibration	3/12/2013	11:18	0.002	0.00199	0.0002	N/A	99	80 - 120

Data Package ID: *hg1303060-1*

MERCURY

Method SW7471

Calibration Blanks

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Run ID: HG130312-1A1
Result Units: MG/L

Lab ID	Verification Type	Date Analyzed	Time Analyzed	Result	Reporting Limit	Flag
ICB	Initial Calibration	3/12/2013	9:35	0.0002	0.0002	U
CCB1	Continuing Calibration	3/12/2013	10:03	0.0002	0.0002	U
CCB2	Continuing Calibration	3/12/2013	10:29	0.0002	0.0002	U
CCB3	Continuing Calibration	3/12/2013	10:55	0.0002	0.0002	U
CCB4	Continuing Calibration	3/12/2013	11:20	0.0002	0.0002	U

Data Package ID: *hg1303060-1*

Metals Linear Ranges

Lab Name: **ALS Environmental -- FC**
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

Instrument ID: CETAC750
Active Date: 07/19/2010
Expiration Date: 10/17/2020

CASNO	Target Analyte	Concentration (ppm)
7439-97-6	MERCURY	0.01

Mercury Run Log -- 3/12/2013

Instrument ID: CETAC7500
File Name: HG130311-1
AnalRunID: HG130312-1A1
CalibRefID: HG130312-1A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		STD0	1	3/12/2013	9:15
		STD1	1	3/12/2013	9:17
		STD2	1	3/12/2013	9:19
		STD3	1	3/12/2013	9:21
		STD4	1	3/12/2013	9:23
		STD5	1	3/12/2013	9:25
		STD6	1	3/12/2013	9:28
		ICV	1	3/12/2013	9:30
		ICB	1	3/12/2013	9:35
		CRA1	1	3/12/2013	9:40
		HG130311-1MB	1	3/12/2013	9:42
		HG130311-1LCS	1	3/12/2013	9:44
		HG130311-2MB	1	3/12/2013	9:46
		HG130311-2LCS	1	3/12/2013	9:48
		1303058-1	1	3/12/2013	9:50
		1303058-2	1	3/12/2013	9:52
		1303058-3	1	3/12/2013	9:55
		1303058-4	1	3/12/2013	9:57
		1303058-5	1	3/12/2013	9:59
		CCV1	1	3/12/2013	10:01
		CCB1	1	3/12/2013	10:03
		1303058-6	1	3/12/2013	10:05
		1303058-7	1	3/12/2013	10:07
		1303058-8	1	3/12/2013	10:10
		1303058-9	1	3/12/2013	10:12
		1303058-10	1	3/12/2013	10:14
		1303058-11	1	3/12/2013	10:16
		1303058-12	1	3/12/2013	10:18
		1303058-13	1	3/12/2013	10:20
		1303058-14	1	3/12/2013	10:22
		1303058-14DUP	1	3/12/2013	10:25
		CCV2	1	3/12/2013	10:27
		CCB2	1	3/12/2013	10:29
		1303058-14L	5	3/12/2013	10:31
		1303058-14MS	1	3/12/2013	10:33

Data Package ID: HG1303060-1

Mercury Run Log -- 3/12/2013

Instrument ID: CETAC7500
File Name: HG130311-1
AnalRunID: HG130312-1A1
CalibRefID: HG130312-1A1

Comment	Field ID	Lab ID	DF	Date Analyzed	Time Analyzed
		1303058-14MSD	1	3/12/2013	10:35
	S30-04-130228	1303060-1	1	3/12/2013	10:37
	S30-53-130228	1303060-2	1	3/12/2013	10:39
	S30-61-130228	1303060-3	1	3/12/2013	10:42
	S30-69-130228	1303060-4	1	3/12/2013	10:44
	S30-70-130228	1303060-5	1	3/12/2013	10:46
	S30-83-130228	1303060-6	1	3/12/2013	10:48
	S30-90-130228	1303060-7	1	3/12/2013	10:50
		CCV3	1	3/12/2013	10:52
		CCB3	1	3/12/2013	10:55
	S30-90-2-130228	1303060-8	1	3/12/2013	10:57
	S30-91-130228	1303060-9	1	3/12/2013	10:59
	S30-94-130228	1303060-10	1	3/12/2013	11:01
	S30-95-130228	1303060-11	1	3/12/2013	11:03
	S30-BKGD-N-130228	1303060-12	1	3/12/2013	11:05
	S30-BKGD-N-130228	1303060-12DUP	1	3/12/2013	11:07
		1303060-12L	5	3/12/2013	11:09
	S30-BKGD-N-130228	1303060-12MS	1	3/12/2013	11:12
	S30-BKGD-N-130228	1303060-12MSD	1	3/12/2013	11:14
		CRA2	1	3/12/2013	11:16
		CCV4	1	3/12/2013	11:18
		CCB4	1	3/12/2013	11:20

Data Package ID: HG1303060-1

Raw Data

HEADER INFORMATION FOR ANALYTICAL SEQUENCE 130311A

Instrument: Trace2

Analyst: Mike Lundgreen

STANDARD SOLUTION CODES

Stock A (ST120423-6) Exp. 4-23-2013

Element	ug/ml
Al, Ca, Mg	1000
K	500
Na	300
Fe	400
Li	20

Standard	Dilution	Procedure
A1	1/2 of Stock A	5ml of Stock A to 10ml final volume.
A2	1/2.5 of Stock A	2ml of Stock A1 to a 5ml final volume.
A3	1/5 of Stock A	1ml of Stock A1 to a 5ml final volume.
A4	1/10 of A1	1ml of Standard A1 up to a 10ml final volume.
A5	1/10 of A4	1ml of Standard A4 up to a 10ml final volume.

Stock B (ST110316-5) Exp. 2-28-15

Element	ug/ml
P, Si	100
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Sn, Sr, Ti ,Zn	20
As, Cd, Co, Se, Tl, V	10
Sb	4
Be	2

Stock Ag- 1000 ug/ml (ST100407-4) Exp. 2-28-15

Stock Th – 1000 ug/ml (ST100407-5) Exp. 2-28-15

The following dilutions of Stock Ag and Stock Th are made to provide the daily calibration Standards.

Standard	Dilution	Procedure
B1	1/2 of Stock B 1/500 Ag and 1/500 Th	5ml of Stock B, 0.02ml of Stock Ag and 0.02ml of Stock Th up to a 10ml final volume.
B2	1/10 of B1	1.0ml of Standard B1 up to a 10ml final volume.
B3	1/10 of B2	1.0ml of Standard B2 up to a 10ml final volume.

Stock C (ST120813-5) Exp. 6/30/15

Element	ug/ml
S, U	100
Bi, Zr	10

Standard	Dilution	Procedure
C1	1/2 of Stock C	5ml of Stock C up to a 10ml final volume.
C2	1/10 of C1	1.0ml of Standard C1 up to a 10ml final volume.
C3	1/10 of C2	1.0ml of Standard C2 up to a 10ml final volume.

RL STD (Reporting Limit Standard) Intermediate.
(ST100301-54) Exp. 2-28-15

Element	ug/ml
K, Na	500
Ca, Mg	200
Al, U	100
B, Fe, P, S, Si	50
Li, Mo, Sn, Sr, Ti	10
Sb	8
Ni, As, Bi, Se, Tl, Zn, Zr	5
Pb	3
Ag, Ba, Co, Cr, Cu, Mn, V, Th	2
Be, Cd	1

RL STD (working standard) made daily by diluting the intermediate above 1000 fold. This working standard has concentration levels at the normal ALS-FC reporting limits for all elements except Ca, Mg and Na, K which are at 0.2ppm and 0.5ppm; this is below the normal ALS-FC reporting limit.

RL2 (working standard) made daily by diluting the intermediate above 333 fold.

Blank Solution

Double D.I. water, 3% HNO_3 and 5%HCl
Used for Std. Blank, ICB and CCB

CCV (ST120621-3) Exp. 12-18-13

Element	ug/ml
Al, Ca, Mg, K, Na	50
Fe	20
U, P, S, Si	5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	1
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.5
Ag, Th	0.2

ICV (ST120621-3) Exp. 12-18-13
Prepared daily by diluting the CCV (described above) ½.
The 1/2 dilution is made by diluting 5ml of the CCV to a 10ml final volume.
The resulting concentrations are:

Element	ug/ml
Al, Ca, Mg, K, Na	25
Fe	10
U, P, S, Si	2.5
B, Ba, Cr, Cu, Mn, Mo, Ni, Pb, Se, Sn, Zn, Zr	0.5
As, Be, Bi, Cd, Co, Li, Sb, Sr, Ti, Tl, V	0.25
Ag, Th	0.1

CRI (ST120621-6) Exp. 12-18-13
Made By diluting
1.0ml of CRI Stock (ST120621-5) Exp. 12-18-13
to a 100ml final volume.

Element	ug/ml
Ca, Mg, K, Na	5.0
Al, B, Ba	0.4
Fe, U, P, S	0.2
Sb	0.12
Co, Si,, Sn, V, Th	0.1
Ni	0.08
Cu, Bi, Zr	0.05
Zn	0.04
Mn	0.03
Ag, Cr, Li, Mo, Sr, Ti, Tl	0.02
Be, Cd, As, Se,	0.01
Pb	0.006

ICSA (ST120621-1) Exp. 12-18-13

Element	ug/ml
Ca, Mg, Al	250
Fe	100

ICSAB (ST120621-2) Exp. 12-18-13

Element	ug/ml
Ca, Mg, Al	250
Fe	100
U	10
B, Si, Li, Mo, Sn, Sr, Ti, Cd, Zn, Ni, P, S	1.0

Sb	0.6
Ba, Be, Co, V, Cr, Cu, Mn, Bi, Zr	0.5
Ag	0.2
As, Tl	0.1
Se, Pb, Th	0.05

Pipette ID Numbers

1.0ml to 5.0ml --- M-55
0.1ml to 1.0ml --- M-61
0.01ml to 0.1ml --- M-57

Acid Lot Numbers

HCl – J35042
HNO_3 – J41037

Inter Element Correction Information

The following table summarizes spectral interferences that have been identified and for which IEC's are used. If a sample contains a concentration of an interfering element that exceeds the upper analytical range, and an affected element is being determined, it is necessary to dilute the sample to bring the interfering element into analytical range.

Interfering Element (ug/ml)	Affected Element
Al (500)	Pb
Mg (500)	Th
Fe (200)	Se, Tl, V, Pb, U
Si (50)	Zr
U (50)	Al, Cr, Cu, Bi, Pb, Se, Ag, Tl, Si, Be
Ba (10)	Co
Cr (10)	Sb
Cu (10)	Bi
Mn (10)	Tl
Mo (10)	Al, Si, Pb,, Sb
Ti (10)	Co, Bi, Si, Sn, Tl, Pb, Zr
As (5)	Cd
V (5)	Al, Be, Tl
Zr (5)	Ag

The following table lists element concentrations (ug/ml) that no significant spectral interferences have been observed.

Element	Concentration	Element	Concentration	Element	Concentration
K	500	Se	10		
Na	500	Pb	10	Li	5
Ca	500	Zn	10	Cd	5
P	50	Sr	10	Co	5
S	50	Sn	10	Ag	2
Ni	10	Bi	5	Sb	2
B	10	Tl	5	Be	1

2X – Dilution made by diluting 2.5ml of sample up to a 5ml final volume.
3X - Dilution made by diluting 2.0ml of sample up to a 6ml final volume.
4X - Dilution made by diluting 2.0ml of sample up to a 8ml final volume.
5X - Dilution made by diluting 1.0ml of sample to a 5ml final volume.
10X - Dilution made by diluting 0.5ml of sample to a 5ml final volume.
20X – Dilution made by diluting 0.25ml of sample to a 5ml final volume.
25X – Dilution made by diluting 0.2ml of sample to a 5ml final volume.
50X – Dilution made by diluting 0.1ml of sample to a 5ml final volume.

100X – Dilution made by diluting 0.05ml of sample to a 5ml final volume.
500X – Dilution made by diluting 0.02ml of sample to a 10ml final volume.
1000X – Dilution made by diluting a 10X dilution 100X.

Comments

1303058-1 was post spiked for Sb by spiking 0.1mL ST121101-7 and 0.1mL ST121231-2 onto 4.8mL sample, 5mL final volume.

1303059-1 was post spiked for Sb, Ca, V and Mn by spiking 0.1mL ST121101- and 0.1mL ST121231-2 onto 4.8mL sample, 5mL final volume.

1303060-1 was post spiked for Sb by spiking 0.1mL ST121101-7 and 0.1mL ST121231-2 onto 4.8mL sample, 5mL final volume.

1. Please see run log and work orders for elements of interest.

Daily Maintenance

1. Check/ Change Peristaltic pump tubing.
2. Check the torch for deposits, clean if necessary.
3. Check/ Empty drain water.

Daily Maintenance done by ______MTL_____.

Monthly Maintenance

1. Check/Clean nebulizer and spray chamber.
2. Clean air filters
3. Check/Clean entrance slit.
4. Fill water recirculating reservoir.

Monthly maintenance done by: MTL 3-08-2013.

Major problems / adjustments / repairs recorded in the ICP Maintenance Log (3716).

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	MIXAHIGH	MIXAHIGH	1	3/11/2013	12:30
	MIXBHIGH	MIXBHIGH	1	3/11/2013	12:31
	MIXCHIGH	MIXCHIGH	1	3/11/2013	12:33
	ICV	ICV	1	3/11/2013	12:35
	ICB	ICB	1	3/11/2013	12:37
	CRI	CRI1	1	3/11/2013	12:39
	ICSA	ICSA1	1	3/11/2013	12:41
	ICSAB	ICSAB1	1	3/11/2013	12:43
	CCV	CCV1	1	3/11/2013	12:44
	CCB	CCB1	1	3/11/2013	12:51
	F130301-1MB	F130301-1MB	1	3/11/2013	12:53
	IP130307-2MB	IP130307-2MB	1	3/11/2013	12:55
	IP130307-2LCS	IP130307-2LCS	1	3/11/2013	12:56
	IP130307-3MB	IP130307-3MB	1	3/11/2013	12:58
	IP130307-3LCS	IP130307-3LCS	1	3/11/2013	13:00
	IP130307-4MB	IP130307-4MB	1	3/11/2013	13:02
	IP130307-4LCS	IP130307-4LCS	1	3/11/2013	13:03
- Fe,Pb,Se,Tl,U,V	1303058-1	1303058-1	1	3/11/2013	13:05
- Fe,Pb,Se,Tl,U,V	1303058-1D	1303058-1DUP	1	3/11/2013	13:07
- Fe,Pb,Se,Tl,U,V	1303058-1L 5X	1303058-1SER	5	3/11/2013	13:08
	CCV	CCV2	1	3/11/2013	13:10
	CCB	CCB2	1	3/11/2013	13:12
- Fe,Pb,Se,Tl,U,V	1303058-1MS	1303058-1MS	1	3/11/2013	13:14
- Fe,Pb,Se,Tl,U,V	1303058-1MSD	1303058-1MSD	1	3/11/2013	13:16
- Tl	1303058-2	1303058-2	1	3/11/2013	13:17
- Tl	1303058-3	1303058-3	1	3/11/2013	13:19
- Fe,Pb,Se,Tl,U,V	1303058-4	1303058-4	1	3/11/2013	13:21
- Tl	1303058-5	1303058-5	1	3/11/2013	13:23
- Tl	1303058-6	1303058-6	1	3/11/2013	13:24
- Tl	1303058-7	1303058-7	1	3/11/2013	13:26
- Tl	1303058-8	1303058-8	1	3/11/2013	13:28
- Tl	1303058-9	1303058-9	1	3/11/2013	13:30
	CCV	CCV3	1	3/11/2013	13:32
	CCB	CCB3	1	3/11/2013	13:34
- Tl	1303058-10	1303058-10	1	3/11/2013	13:36

Data Package ID:

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
- Tl	1303058-11	1303058-11	1	3/11/2013	13:37
- Tl	1303058-12	1303058-12	1	3/11/2013	13:39
- Tl	1303058-13	1303058-13	1	3/11/2013	13:41
- Tl	1303058-14	1303058-14	1	3/11/2013	13:43
	1303059-1	1303059-1	1	3/11/2013	13:44
	1303059-1D	1303059-1DUP	1	3/11/2013	13:46
	1303059-1L 5X	1303059-1SER	5	3/11/2013	13:48
	1303059-1MS	1303059-1MS	1	3/11/2013	13:50
	1303059-1MSD	1303059-1MSD	1	3/11/2013	13:51
	CCV	CCV4	1	3/11/2013	13:54
	CCB	CCB4	1	3/11/2013	15:21
	CCV	CCV5	1	3/11/2013	15:23
	CCB	CCB5	1	3/11/2013	15:25
	1303059-2	1303059-2	1	3/11/2013	15:27
	ZZZ	ZZZ	1	3/11/2013	15:28
	ZZZ	ZZZ	1	3/11/2013	15:33
	CCV	CCV6	1	3/11/2013	15:35
	CCB	CCB6	1	3/11/2013	15:37
	1303059-3	1303059-3	1	3/11/2013	15:39
	1303059-4	1303059-4	1	3/11/2013	15:40
- Tl	1303059-5	1303059-5	1	3/11/2013	15:42
	1303059-6	1303059-6	1	3/11/2013	15:44
- Tl	1303059-7	1303059-7	1	3/11/2013	15:46
	1303059-8	1303059-8	1	3/11/2013	15:48
- Tl	1303059-9	1303059-9	1	3/11/2013	15:49
	1303059-10	1303059-10	1	3/11/2013	15:51
- Tl	1303059-11	1303059-11	1	3/11/2013	15:53
	CCV	CCV7	1	3/11/2013	15:55
	CCB	CCB7	1	3/11/2013	15:57
- Tl	1303059-12	1303059-12	1	3/11/2013	15:59
- Tl	1303059-13	1303059-13	1	3/11/2013	16:01
- Tl	1303059-14	1303059-14	1	3/11/2013	16:02
	1303059-15	1303059-15	1	3/11/2013	16:04
	1303060-1	1303060-1	1	3/11/2013	16:06
	1303060-1D	1303060-1DUP	1	3/11/2013	16:08

Data Package ID:

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	1303060-1L 5X	1303060-1SER	5	3/11/2013	16:09
	1303060-1MS	1303060-1MS	1	3/11/2013	16:11
	1303060-1MSD	1303060-1MSD	1	3/11/2013	16:13
	1303060-2	1303060-2	1	3/11/2013	16:15
	CCV	CCV8	1	3/11/2013	16:17
	CCB	CCB8	1	3/11/2013	16:19
	1303060-3	1303060-3	1	3/11/2013	16:20
	1303060-4	1303060-4	1	3/11/2013	16:22
	1303060-5	1303060-5	1	3/11/2013	16:24
	1303060-6	1303060-6	1	3/11/2013	16:26
	1303060-7	1303060-7	1	3/11/2013	16:28
	1303060-8	1303060-8	1	3/11/2013	16:29
	1303060-9	1303060-9	1	3/11/2013	16:31
	1303060-10	1303060-10	1	3/11/2013	16:33
	1303060-11	1303060-11	1	3/11/2013	16:35
	1303060-12	1303060-12	1	3/11/2013	16:36
	CCV	CCV9	1	3/11/2013	16:39
	CCB	CCB9	1	3/11/2013	16:40
	ZZZ	ZZZ	1	3/11/2013	16:42
	ZZZ	ZZZ	1	3/11/2013	16:45
	ZZZ	ZZZ	1	3/11/2013	16:49
+ Ca,Tl	1303057-1 5X	1303057-1	5	3/11/2013	17:08
+ Ca,Tl	1303057-1D 5X	1303057-1DUP	5	3/11/2013	17:10
+ Ca,Tl	1303057-1L 25X	1303057-1SER	25	3/11/2013	17:11
+ Ca,Tl	1303057-1MS 5X	1303057-1MS	5	3/11/2013	17:13
+ Ca,Tl	1303057-1MSD 5X	1303057-1MSD	5	3/11/2013	17:15
	ZZZ	ZZZ	1	3/11/2013	17:17
	CCV	CCV10	1	3/11/2013	17:21
	CCB	CCB10	1	3/11/2013	17:23
+ Fe,Pb,Se,Tl,U,V	1303058-1 5X	1303058-1	5	3/11/2013	17:24
+ Fe,Pb,Se,Tl,U,V	1303058-1D 5X	1303058-1DUP	5	3/11/2013	17:26
+ Fe,Pb,Se,Tl,U,V	1303058-1L 25X	1303058-1SER	25	3/11/2013	17:28
+ Fe,Pb,Se,Tl,U,V	1303058-1MS 5X	1303058-1MS	5	3/11/2013	17:29
+ Fe,Pb,Se,Tl,U,V	1303058-1MSD 5X	1303058-1MSD	5	3/11/2013	17:31
	CCV	CCV11	1	3/11/2013	17:33

Data Package ID:

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	CCB	CCB11	1	3/11/2013	17:36
+ Sb	1303058-1A	1303058-1A	1	3/11/2013	17:38
+ Fe,Pb,Se,Tl,V	1303058-1A 5X	1303058-1A	5	3/11/2013	17:39
+ Ca,Mn,Sb,V	1303059-1A	1303059-1A	1	3/11/2013	17:41
+ Sb,Zr	1303060-1A	1303060-1A	1	3/11/2013	17:43
+ Tl	1303058-2 5X	1303058-2	5	3/11/2013	17:45
+ Tl	1303058-3 5X	1303058-3	5	3/11/2013	17:46
+ Fe,Pb,Se,Tl,U,V	1303058-4 5X	1303058-4	5	3/11/2013	17:48
+ Tl	1303058-5 5X	1303058-5	5	3/11/2013	17:50
+ Tl	1303058-6 5X	1303058-6	5	3/11/2013	17:52
+ Tl	1303058-7 5X	1303058-7	5	3/11/2013	17:53
	CCV	CCV12	1	3/11/2013	17:55
	CCB	CCB12	1	3/11/2013	17:57
+ Tl	1303058-8 5X	1303058-8	5	3/11/2013	17:59
+ Tl	1303058-9 5X	1303058-9	5	3/11/2013	18:01
+ Tl	1303058-10 5X	1303058-10	5	3/11/2013	18:02
+ Tl	1303058-11 5X	1303058-11	5	3/11/2013	18:04
+ Tl	1303058-12 5X	1303058-12	5	3/11/2013	18:06
+ Tl	1303058-13 5X	1303058-13	5	3/11/2013	18:08
+ Tl	1303058-14 5X	1303058-14	5	3/11/2013	18:09
+ Tl	1303059-5 5X	1303059-5	5	3/11/2013	18:11
+ Tl	1303059-7 5X	1303059-7	5	3/11/2013	18:13
+ Tl	1303059-9 5X	1303059-9	5	3/11/2013	18:15
	CCV	CCV13	1	3/11/2013	18:17
	CCB	CCB13	1	3/11/2013	18:18
+ Tl	1303059-11 5X	1303059-11	5	3/11/2013	18:20
+ Tl	1303059-12 5X	1303059-12	5	3/11/2013	18:22
+ Tl	1303059-13 5X	1303059-13	5	3/11/2013	18:24
+ Tl	1303059-14 5X	1303059-14	5	3/11/2013	18:26
+ Tl	1303060-9 5X	1303060-9	5	3/11/2013	18:27
+ Tl	1303060-10 5X	1303060-10	5	3/11/2013	18:29
+ Tl	1303060-1 5X	1303060-1	5	3/11/2013	18:31
+ Tl	1303060-1D 5X	1303060-1DUP	5	3/11/2013	18:33
+ Tl	1303060-1L 25X	1303060-1SER	25	3/11/2013	18:34
+ Tl	1303060-1MS 5X	1303060-1MS	5	3/11/2013	18:36

Data Package ID:

ICPTrace2 Run Log -- 3/11/2013

Instrument ID: ICPTrace2
File Name: 130311A.
AnalRunID: IT130311-2A1
CalibRefID: IT130311-2A1

Comment	Inst Sample Name	Lab ID	DF	Date Analyzed	Time Analyzed
	CCV	CCV14	1	3/11/2013	18:38
	CCB	CCB14	1	3/11/2013	18:52
+Tl	1303060-1MSD 5X	1303060-1MSD	5	3/11/2013	18:56
+Tl	1303060-2 5X	1303060-2	5	3/11/2013	18:57
+Tl	1303060-3 5X	1303060-3	5	3/11/2013	18:59
+Tl	1303060-4 5X	1303060-4	5	3/11/2013	19:01
+Tl	1303060-5 5X	1303060-5	5	3/11/2013	19:03
+Tl	1303060-6 5X	1303060-6	5	3/11/2013	19:05
+Tl	1303060-7 5X	1303060-7	5	3/11/2013	19:06
+Tl	1303060-8 5X	1303060-8	5	3/11/2013	19:08
+Tl	1303060-11 5X	1303060-11	5	3/11/2013	19:10
+Tl	1303060-12 5X	1303060-12	5	3/11/2013	19:12
	CCV	CCV15	1	3/11/2013	19:14
	CCB	CCB15	1	3/11/2013	19:15
+Tl	1303057-2 5X	1303057-2	5	3/11/2013	19:17
+Tl	1303057-3 5X	1303057-3	5	3/11/2013	19:19
+Tl	1303057-4 5X	1303057-4	5	3/11/2013	19:21
+Tl	1303057-5 5X	1303057-5	5	3/11/2013	19:23
+Tl	1303057-6 5X	1303057-6	5	3/11/2013	19:24
+Tl	1303057-7 5X	1303057-7	5	3/11/2013	19:26
+Tl	1303057-8 5X	1303057-8	5	3/11/2013	19:28
+Tl	1303057-10 5X	1303057-10	5	3/11/2013	19:30
+Tl	1303057-11 5X	1303057-11	5	3/11/2013	19:32
+Tl	1303057-12 5X	1303057-12	5	3/11/2013	19:33
	CCV	CCV16	1	3/11/2013	19:35
	CCB	CCB16	1	3/11/2013	19:37
+Tl	1303057-13 5X	1303057-13	5	3/11/2013	19:39
+Tl	1303057-14 5X	1303057-14	5	3/11/2013	19:41
+Tl	1303057-15 5X	1303057-15	5	3/11/2013	19:42
	CRI	CRI2	1	3/11/2013	19:44
	ICSA	ICSA2	1	3/11/2013	19:46
	ICSAB	ICSAB2	1	3/11/2013	19:48
	CCV	CCV17	1	3/11/2013	19:50
	CCB	CCB17	1	3/11/2013	19:52

Data Package ID:

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li
MIXAHIGH	0.0012	500.0262	0.0048	-0.0088	-0.0006	0.0005	0.0237	496.4546	0.0004	0.0013	0.0006	-0.0084	197.5316	9.8024
MIXBHIGH	1.9944	0.2236	4.9976	9.954	9.9131	0.9853	0.0055	0.0514	4.9835	4.9539	9.8979	9.9766	0.0318	-0.0007
MIXCHIGH	-0.0044	0.3768	-0.0012	0.0212	-0.001	0.0163	5.0302	-0.0569	-0.0014	0.0051	-0.0137	-0.0115	-0.0115	-0.0011
ICV	0.0993	25.7989	0.2619	0.5121	0.5217	0.255	0.2606	25.7153	0.2581	0.25	0.5061	0.5133	10.3148	0.2475
ICB	-0.0001	0.045	-0.0038	-0.0014	0.001	0	-0.0022	-0.0427	0.0001	-0.0004	-0.0002	-0.0005	0.0103	-0.0026
CRI	0.0209	0.4453	0.0119	0.4125	0.4259	0.0119	0.0561	5.2266	0.0116	0.1031	0.0218	0.053	0.2086	0.0149
ICSA	-0.0004	272.8268	-0.0016	0.0009	-0.0003	0.0003	0.0072	269.1345	0.0003	0.0025	-0.0018	-0.0064	110.2203	-0.0027
ICSAB	0.1983	261.7423	0.104	0.9946	0.5086	0.4934	0.54	258.7213	1.002	0.4759	0.4789	0.5333	106.1611	1.0532
CCV	0.1925	49.6602	0.5094	0.993	1.013	0.4864	0.5196	50.0162	0.5047	0.4803	0.969	0.9919	20.0699	0.5121
CCB	-0.0002	0.0243	-0.0002	-0.0064	-0.0001	0	-0.0016	-0.063	0	-0.0008	-0.0006	-0.0016	0.003	-0.0027
F130301-1MB	-0.0001	-0.0029	-0.0013	-0.0073	-0.0012	-0.0002	0.0014	-0.1017	-0.0006	-0.001	-0.0013	-0.0021	-0.0117	-0.003
IP130307-2MB	0.0001	0.0091	-0.0003	-0.0067	-0.0011	-0.0002	-0.0006	-0.0872	-0.0006	-0.0013	-0.0014	-0.0021	0.0182	-0.0031
IP130307-2LCS	0.0897	1.9114	0.9671	0.8882	0.9956	0.0476	0.0001	37.8342	0.0493	0.4683	0.1909	0.2514	0.99	0.4729
IP130307-3MB	-0.0002	0.0172	-0.0005	-0.0059	-0.0009	-0.0002	-0.0019	-0.0766	-0.0004	-0.001	-0.0009	-0.0021	0.01	-0.0029
IP130307-3LCS	0.091	1.9391	0.9848	0.9012	1.0044	0.0486	0.0032	38.7298	0.0502	0.4781	0.1947	0.2543	1.0007	0.4746
IP130307-4MB	-0.0004	0.0068	0.0011	-0.0062	-0.0011	-0.0002	-0.0033	-0.0664	-0.0005	-0.0017	-0.001	-0.0014	0.0157	-0.003
IP130307-4LCS	0.0903	1.9174	0.9775	0.8934	1.008	0.0485	-0.0039	38.4682	0.0501	0.4737	0.1945	0.2552	1.0008	0.4837
1303058-1	-0.002	99.2744	0.0852	0.0295	0.9725	0.0086	0.0137	51.1374	0.0007	0.0702	0.0809	0.0973	229.2645	0.1104
1303058-1D	-0.0038	99.7122	0.0859	0.0256	0.9814	0.0086	0.0076	50.7366	0.0002	0.0678	0.08	0.098	229.4472	0.1127
1303058-1L 5X	-0.0005	19.716	0.0128	0.0006	0.1994	0.0017	0.0066	10.406	-0.0002	0.0142	0.016	0.0184	41.4743	0.0167
CCV	0.1953	50.0239	0.5234	1.0033	1.0259	0.4896	0.5242	50.6395	0.5136	0.485	0.9761	1.0089	20.1537	0.5175
CCB	-0.0008	0.058	-0.0012	-0.0071	-0.0002	0.0002	-0.0028	-0.0619	-0.0004	-0.0008	-0.0005	-0.0008	0.0037	-0.0027
1303058-1MS	0.0911	129.5595	1.0698	0.7878	1.9939	0.0571	0.0163	86.1843	0.0523	0.5416	0.2816	0.358	225.4524	0.6587
1303058-1MSD	0.0882	126.1509	1.0394	0.7673	1.944	0.0559	0.0163	86.2635	0.0506	0.5277	0.2754	0.3512	220.0904	0.6433
1303058-2	-0.0019	55.3815	0.0649	0.0175	1.2213	0.0056	0.0072	89.4339	-0.0002	0.0372	0.0419	0.048	137.1289	0.061
1303058-3	-0.0017	69.6614	0.0639	0.0189	2.1019	0.0056	0.0086	103.2203	-0.0002	0.0394	0.0549	0.0588	150.4766	0.0869
1303058-4	-0.0021	78.0686	0.0735	0.0193	0.9072	0.0081	0.013	130.567	0.0004	0.0548	0.0607	0.0759	208.0173	0.105
1303058-5	-0.001	64.8893	0.0619	0.015	1.7906	0.0064	0.0089	81.7537	0.0005	0.0438	0.0532	0.066	159.6101	0.0779
1303058-6	-0.0013	51.0684	0.0785	0.0097	0.6089	0.0076	0.0108	62.7897	0.0003	0.0432	0.0438	0.0519	182.0365	0.0687
1303058-7	-0.0005	54.7396	0.0709	0.0152	0.7579	0.0063	0.0131	85.3776	0.0004	0.0438	0.0413	0.047	144.6723	0.0694
1303058-8	-0.0012	54.3591	0.0624	0.0126	1.1107	0.0056	0.0109	96.0533	0.0001	0.0409	0.0443	0.0477	128.6216	0.0688
1303058-9	-0.0021	24.9022	0.1298	0.0096	0.4922	0.013	0.0018	332.5581	-0.0006	0.0181	0.0124	0.0171	69.3396	0.0293
CCV	0.1914	48.9991	0.5141	0.9844	1.0072	0.4747	0.5289	49.3208	0.5109	0.4741	0.9505	0.9968	19.46	0.5099
CCB	-0.0002	0.0862	-0.0033	-0.0056	0.0001	0.0003	-0.0005	-0.0436	-0.0001	-0.0009	-0.0002	-0.0015	0.0128	-0.0026
1303058-10	-0.0019	17.2628	0.1301	0.009	0.3056	0.0124	0.0035	357.9069	-0.0007	0.0158	0.005	0.0099	65.1319	0.0208
1303058-11	-0.0011	62.7936	0.0791	0.0134	1.9961	0.0048	0.0139	77.1748	0.0004	0.0324	0.0449	0.0437	137.2263	0.0679
1303058-12	-0.0019	35.1871	0.0386	0.008	0.7023	0.0031	0.0037	61.8674	-0.0001	0.0322	0.0232	0.0333	101.5901	0.0522
1303058-13	-0.0013	54.9439	0.0543	0.0161	0.7465	0.0052	0.0021	120.5174	0.0001	0.0411	0.0392	0.0398	139.337	0.0711

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li
1303058-14	-0.0011	43.0899	0.035	0.0125	0.5824	0.0042	0.0073	14.9256	0.0013	0.0434	0.0504	0.0826	114.5642	0.0431
1303059-1	-0.001	27.7704	0.9211	0.0088	0.4312	0.0048	0.008	110.7303	0.0002	0.0168	0.0119	0.027	91.2147	0.0254
1303059-1D	-0.0016	27.1072	0.8653	0.0075	0.4144	0.0045	0.0076	135.8309	0	0.0155	0.0116	0.027	90.5635	0.0251
1303059-1L 5X	-0.0013	5.7149	0.1859	-0.0063	0.0863	0.0011	0.0002	22.1414	-0.0004	0.0024	0.0011	0.0032	17.3831	0.002
1303059-1MS	0.0913	42.3762	1.8855	0.8068	1.4584	0.0534	0.0071	166.1165	0.0519	0.4843	0.2073	0.2896	95.6592	0.5476
1303059-1MSD	0.0903	42.4068	1.828	0.7918	1.421	0.0527	0.0104	287.7196	0.0514	0.4762	0.2024	0.2875	94.3092	0.5577
CCV	0.194	49.1161	0.5208	0.9963	1.0136	0.4765	0.5318	49.7068	0.5192	0.4782	0.9566	1.0094	19.5122	0.5133
CCB	0.0008	0.0897	0.0019	-0.0072	-0.0001	0.0006	0.0034	-0.0602	-0.0004	-0.0002	0.0002	-0.002	0.0063	-0.0029
CCV	0.1983	48.8248	0.5175	0.9824	0.9911	0.4781	0.5358	48.7894	0.5162	0.4825	0.9577	1.0061	19.084	0.5143
CCB	-0.0002	0.0695	-0.0023	-0.0068	-0.0002	0.0006	-0.0016	-0.0571	-0.0001	-0.0007	-0.0003	-0.0024	0.008	-0.0027
1303059-2	0.0008	17.1485	0.0221	0.0017	0.336	0.0022	0.0021	19.9705	0	0.0105	0.0127	0.0127	32.0243	0.011
ZZZ	-0.004	26.9493	1.1149	0.0254	0.3499	0.0277	0.0011	49.3451	-0.0011	0.0201	0.0001	0.005	67.2212	0.027
ZZZ	-0.0019	25.859	0.9901	0.0205	0.3489	0.0214	0.0025	54.1309	-0.0004	0.0171	0.003	0.0112	72.063	0.0261
CCV	0.1977	48.677	0.5093	0.979	0.9955	0.4774	0.5386	48.8956	0.5163	0.481	0.9585	1.0058	19.1214	0.5115
CCB	0.0001	0.0727	-0.0003	-0.0066	-0.0001	0.0006	0.0019	-0.0533	-0.0003	-0.0008	-0.0002	-0.0022	0.0095	-0.0027
1303059-3	-0.0041	27.2638	1.1331	0.0264	0.3542	0.0287	0.0052	50.1859	-0.0009	0.0206	0.0013	0.0051	68.2691	0.0273
1303059-4	-0.0023	26.4047	1.0176	0.0193	0.3554	0.0226	0.0035	55.3793	-0.001	0.0178	0.0042	0.0111	73.7484	0.0267
1303059-5	-0.0019	17.0289	0.0635	0.001	0.3543	0.0037	0.0025	62.7778	-0.0002	0.0122	0.012	0.0193	32.672	0.0114
1303059-6	-0.0009	24.7228	0.206	0.0014	0.2304	0.0063	0.0018	59.7883	0	0.0295	0.0122	0.0444	57.0885	0.0297
1303059-7	-0.0009	23.7328	0.103	0.0054	0.3778	0.0046	0.0003	48.6698	-0.0002	0.0168	0.0139	0.0253	48.296	0.0201
1303059-8	-0.0048	20.3308	0.1916	0.0181	0.3118	0.0198	-0.0019	28.0794	-0.0007	0.0189	0.001	0.006	44.9354	0.0176
1303059-9	-0.001	16.1121	0.0571	0.0017	0.3192	0.0031	0.002	40.8994	-0.0001	0.0112	0.0111	0.0146	34.5144	0.0121
1303059-10	-0.0015	17.9079	0.0626	0.0016	0.3442	0.0031	0.0025	58.305	0	0.0168	0.0142	0.0276	39.2801	0.0134
1303059-11	-0.0006	15.4488	0.0824	0.0009	0.269	0.0037	0.0047	45.9854	-0.0004	0.012	0.01	0.0182	36.5325	0.0118
CCV	0.1988	49.1612	0.5249	0.9944	1.0096	0.4948	0.5352	49.5206	0.5245	0.4927	0.9886	1.0215	19.3608	0.5186
CCB	-0.0003	0.0839	0.0016	-0.0071	0	0.0009	0.0004	-0.0464	-0.0004	-0.0008	-0.0001	-0.0021	0.0126	-0.0026
1303059-12	-0.0009	27.0059	0.0178	0.0036	0.4502	0.0031	-0.0003	11.3514	0	0.0171	0.0227	0.0315	44.6769	0.0165
1303059-13	-0.0018	59.7653	0.0531	0.0161	0.8391	0.006	0.0053	175.5696	0.0007	0.0449	0.0579	0.0774	147.0268	0.0818
1303059-14	-0.0011	8.327	0.0069	-0.0072	0.2399	0.0013	-0.0047	2.5554	-0.0005	0.0046	0.005	0.0027	21.2316	0.0017
1303059-15	-0.001	8.1307	0.0075	-0.0066	0.1596	0.0012	-0.0017	2.0499	-0.0003	0.0045	0.0058	0.0045	18.6479	0.0019
1303060-1	-0.0022	63.8524	0.0553	0.0262	0.7761	0.0065	0.008	145.0178	0.0006	0.0522	0.0619	0.0958	151.9947	0.0785
1303060-1D	-0.0022	63.304	0.0565	0.0262	0.7678	0.0065	0.0062	144.7299	0.0009	0.0521	0.0614	0.0943	150.0758	0.0777
1303060-1L 5X	-0.0012	13.4139	0.0121	-0.002	0.1623	0.0014	-0.0008	29.9973	-0.0003	0.0103	0.0124	0.0164	29.5455	0.0115
1303060-1MS	0.0931	87.3424	1.0422	0.8416	1.7843	0.0566	0.0072	181.2491	0.0529	0.5326	0.2715	0.3605	157.3018	0.6224
1303060-1MSD	0.0928	88.2155	1.015	0.8229	1.7637	0.0557	0.0029	181.1486	0.0513	0.5237	0.2661	0.354	157.9329	0.613
1303060-2	-0.0026	47.3767	0.2262	0.0173	0.9733	0.0114	0.008	119.6886	0.0006	0.036	0.0308	0.0599	122.1685	0.0647
CCV	0.2006	49.1911	0.5259	0.9933	1.0098	0.496	0.5348	49.7067	0.5253	0.4942	0.9921	1.0196	19.3668	0.5177
CCB	0.0003	0.0919	-0.0007	-0.0059	0.0002	0.0004	-0.0022	-0.0355	0	-0.0005	-0.0001	-0.002	0.0181	-0.0025

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li
1303060-3	-0.0013	50.8568	0.0931	0.0202	0.7778	0.0069	-0.0006	73.0503	0.0009	0.0348	0.0432	0.0729	115.7981	0.0551
1303060-4	-0.0013	38.6134	0.179	0.017	0.6835	0.0074	0.0046	282.1307	0.0007	0.035	0.0318	0.0549	103.6307	0.0567
1303060-5	-0.0015	52.6371	0.2194	0.0213	1.1089	0.0109	0.0089	111.5327	0.0009	0.0394	0.0376	0.0695	129.1461	0.0669
1303060-6	-0.0013	74.2469	0.1244	0.0422	1.1182	0.0084	0.0076	138.0318	0.0012	0.0542	0.0703	0.1195	160.7279	0.0897
1303060-7	-0.0011	45.155	0.153	0.0251	0.7822	0.0079	-0.003	178.36	0.0009	0.0368	0.0431	0.0894	116.6545	0.0561
1303060-8	-0.0019	48.3526	0.1746	0.0239	0.776	0.009	0.0069	153.6373	0.0008	0.0386	0.0428	0.0796	116.3236	0.0581
1303060-9	-0.001	38.0672	0.0416	0.0046	2.0597	0.005	0.0055	52.6074	0.001	0.0266	0.0323	0.0453	107.9429	0.0486
1303060-10	-0.0005	49.1841	0.1404	0.0248	0.896	0.0079	0.0089	159.8964	0.0016	0.0327	0.0463	0.1125	123.4264	0.0658
1303060-11	-0.0016	83.1953	0.1206	0.0551	1.0472	0.0084	0.0091	115.4879	0.0012	0.0535	0.0755	0.1142	171.1152	0.0947
1303060-12	-0.0014	31.0065	0.0334	0.0124	0.7632	0.0037	0.0011	181.1676	0	0.0325	0.032	0.0426	89.0392	0.0459
CCV	0.202	49.4925	0.5268	1.0067	1.0144	0.4995	0.5485	50.1014	0.5324	0.4993	1.0012	1.0312	19.5145	0.5219
CCB	0.0005	0.1101	-0.0005	-0.0065	0.0003	0.0005	0.0034	-0.0241	0.0002	0.0002	0.0005	-0.0014	0.0265	-0.0025
ZZZ	-0.0009	12.6199	0.0147	-0.0045	0.196	0.0015	0.0026	136.9959	-0.0002	0.0062	0.0084	0.0064	24.1697	0.0114
ZZZ	-0.0001	13.9824	0.018	-0.004	0.2172	0.0015	0.0032	43.3607	-0.0003	0.0082	0.0093	0.0088	28.8272	0.0107
ZZZ	-0.0007	13.2318	0.0164	-0.0045	0.2057	0.0017	0.0044	97.3049	0.0002	0.0072	0.0094	0.008	26.0848	0.0113
1303057-1 5X	-0.0004	12.8929	0.01	-0.0052	0.2002	0.0016	0.0023	140.2001	-0.0004	0.0069	0.0084	0.0063	24.6749	0.0115
1303057-1D 5X	-0.0004	13.8597	0.0161	-0.0044	0.216	0.0015	0.0009	42.9145	-0.0004	0.0079	0.0091	0.0074	28.5236	0.0105
1303057-1L 25X	-0.0006	2.683	-0.0026	-0.0094	0.0395	0.0004	-0.0005	27.3989	-0.0008	0.0005	0.0006	-0.003	4.9289	-0.0005
1303057-1MS 5X	0.0187	18.4578	0.2219	0.1697	0.4556	0.0115	0.0047	25.2362	0.0105	0.1072	0.0508	0.0628	23.9374	0.1062
1303057-1MSD 5X	0.0186	19.7307	0.2279	0.1701	0.414	0.0117	0.0018	21.8586	0.0102	0.1076	0.0512	0.062	28.9172	0.1082
ZZZ	0.1946	49.1536	0.5267	0.9976	1.0073	0.4718	0.544	49.7352	0.5307	0.4801	0.9523	1.0237	19.3119	0.5196
CCV	0.1949	50.8531	0.5212	0.9893	1.0158	0.4999	0.5142	50.6536	0.5014	0.491	0.9921	1.0086	20.2133	0.522
CCB	0.0001	0.055	-0.0015	-0.0051	0.0006	0.0002	0.0024	0.0089	0	-0.0005	0.0004	-0.0001	0.0463	-0.0024
1303058-1 5X	0.0008	19.9173	0.0188	0.0006	0.1975	0.0014	0.0092	10.3834	0	0.0152	0.0171	0.0196	41.3038	0.0169
1303058-1D 5X	-0.0012	19.9266	0.0165	-0.0014	0.199	0.0014	0.0024	10.3696	-0.0005	0.0142	0.0164	0.0183	41.774	0.0172
1303058-1L 25X	-0.0008	3.9171	0.0038	-0.0067	0.0383	-0.0002	-0.0035	2.018	-0.0005	0.0017	0.002	0.001	7.9206	0.0006
1303058-1MS 5X	0.0177	25.7275	0.2157	0.1539	0.4016	0.0117	-0.0005	17.5083	0.0098	0.1127	0.0591	0.0694	41.5468	0.1135
1303058-1MSD 5X	0.0178	25.4342	0.2158	0.1526	0.3949	0.0117	0.003	17.8187	0.0099	0.1125	0.0586	0.0684	41.2106	0.1115
CCV	0.1953	50.7567	0.5216	0.9866	1.0146	0.4994	0.5114	50.6219	0.5017	0.4905	0.9891	1.0062	20.194	0.5209
CCB	0.001	0.0642	-0.0019	-0.0061	0.001	0.0002	0.0016	0.015	0.0001	-0.0001	0.0008	0.0002	0.0507	-0.0024
1303058-1A	-0.0018	98.8067	1.0351	0.9201	1.8784	0.0545	0.0128	88.3452	0.0493	0.5232	0.2614	0.3447	213.8544	0.6393
1303058-1A 5X	-0.0001	22.0518	0.9841	0.9031	1.1691	0.0497	0.0022	10.464	0.0482	0.4858	0.2078	0.2665	42.8863	0.0174
1303059-1A	-0.0013	28.7267	1.7924	0.8672	1.312	0.0486	0.0077	146.08	0.0473	0.4489	0.1872	0.2623	87.7759	0.5407
1303060-1A	-0.0011	64.1215	0.9106	0.8211	1.594	0.0479	0.005	176.1355	0.0442	0.4572	0.224	0.3151	149.3114	0.5513
1303058-2 5X	-0.0002	11.3169	0.0156	0	0.2469	0.0007	0.0019	17.8751	-0.0003	0.0074	0.0081	0.0083	25.4684	0.0087
1303058-3 5X	-0.0005	14.2334	0.0164	-0.0013	0.426	0.0007	0.0018	20.7634	-0.0005	0.0082	0.0109	0.0103	28.1958	0.0129
1303058-4 5X	-0.0005	16.1102	0.0168	-0.0024	0.1853	0.0012	0.0016	26.5635	-0.0004	0.0118	0.0128	0.0138	39.1754	0.0161
1303058-5 5X	-0.0016	13.2417	0.0108	-0.0044	0.3622	0.0008	0.0066	16.5798	-0.0003	0.0084	0.0101	0.0113	29.9463	0.0113

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li
1303058-6 5X	-0.0007	10.6796	0.0168	-0.0054	0.1256	0.001	0.0048	13.0934	-0.0003	0.0089	0.0087	0.0093	34.6657	0.01
1303058-7 5X	-0.0012	11.4075	0.0118	-0.005	0.1557	0.0008	-0.0008	17.4551	-0.0005	0.0083	0.0082	0.0083	27.6657	0.01
CCV	0.194	50.702	0.5198	0.9891	1.0151	0.4981	0.5186	50.5458	0.5016	0.4894	0.987	1.0093	20.156	0.5201
CCB	0	0.0612	0.0015	-0.0065	0.0008	0.0002	0.0001	0.0151	0.0001	-0.0004	0.0002	-0.0001	0.0521	-0.0023
1303058-8 5X	-0.0002	11.1821	0.0104	-0.0037	0.2237	0.0006	0.0014	19.4678	-0.0005	0.008	0.0087	0.0079	24.4741	0.0097
1303058-9 5X	-0.0006	5.2704	0.0289	-0.0049	0.1008	0.0022	0.0004	64.9841	-0.0006	0.0036	0.0019	0.0022	14.0231	0.0028
1303058-10 5X	0.0009	3.7554	0.0283	-0.0045	0.0643	0.0022	0.0043	72.1368	-0.0001	0.0038	0.0018	0.0027	13.7143	0.0015
1303058-11 5X	-0.0005	13.2037	0.0188	-0.0054	0.4146	0.0005	0.0006	16.0719	-0.0006	0.006	0.0088	0.0077	26.7855	0.0099
1303058-12 5X	-0.0002	7.3155	0.0065	-0.0061	0.1424	0.0002	-0.0008	12.7386	-0.0003	0.0063	0.0044	0.0053	19.7422	0.007
1303058-13 5X	-0.0009	11.3671	0.0141	-0.0046	0.1507	0.0006	0.004	24.2482	-0.0001	0.0085	0.0079	0.0066	26.5377	0.01
1303058-14 5X	0.0003	8.9597	0.0102	-0.0049	0.1195	0.0004	0.0027	3.1107	0.0002	0.0099	0.0111	0.0164	22.2167	0.0054
1303059-5 5X	-0.0008	3.532	0.0128	-0.0072	0.0716	0.0001	0.0008	12.7983	-0.0007	0.0019	0.0014	0.0029	6.698	-0.0003
1303059-7 5X	0.0003	4.9529	0.0173	-0.0058	0.0763	0.0003	0	10.0133	-0.0002	0.0032	0.0027	0.0047	9.7624	0.0012
1303059-9 5X	-0.0005	3.3383	0.0107	-0.0064	0.0638	0	-0.0021	8.3924	-0.0005	0.0015	0.0011	0.0014	7.062	-0.0001
CCV	0.1913	49.4746	0.5034	0.9595	0.9817	0.4875	0.4964	49.2597	0.489	0.4778	0.9678	0.9801	19.6214	0.5095
CCB	-0.0006	-0.004	-0.0005	-0.0075	-0.0006	-0.0003	-0.0034	-0.0687	-0.0006	-0.0007	-0.0005	-0.0012	0.0061	-0.0027
1303059-11 5X	-0.0001	3.1745	0.0174	-0.0058	0.0533	0	0.0043	9.2431	-0.0006	0.0017	0.0013	0.0025	7.3306	-0.0003
1303059-12 5X	-0.0002	5.7372	0.002	-0.0055	0.0942	0.0001	0.0013	2.3706	-0.0004	0.0027	0.004	0.0057	9.2994	0.0008
1303059-13 5X	-0.0004	12.8905	0.013	-0.004	0.1774	0.0007	-0.0002	36.3397	-0.0006	0.0092	0.0119	0.0149	29.663	0.0123
1303059-14 5X	-0.0004	1.8158	-0.0013	-0.0094	0.0508	-0.0003	-0.0009	0.4933	-0.0006	0.0004	0	-0.0007	4.6058	-0.0019
1303060-9 5X	-0.0006	8.3289	0.0061	-0.0071	0.4413	0.0005	0.0031	11.445	-0.0004	0.0041	0.0061	0.0084	22.3096	0.0067
1303060-10 5X	-0.0009	11.0121	0.0271	-0.0031	0.1941	0.001	0.0018	34.4676	0	0.0066	0.0096	0.0219	26.1147	0.0096
1303060-1 5X	-0.0004	13.8765	0.0099	-0.0012	0.1626	0.0009	0.0016	30.3655	-0.0003	0.0107	0.0129	0.0185	30.7357	0.0118
1303060-1D 5X	-0.0008	13.5829	0.0104	-0.0015	0.1597	0.0008	0.0025	30.0492	0.0002	0.0106	0.0127	0.0173	30.0103	0.0115
1303060-1L 25X	-0.0018	2.7092	0.0007	-0.0086	0.0314	-0.0002	-0.0015	6.0161	-0.0007	0.001	0.0009	0.0015	5.9708	-0.0003
1303060-1MS 5X	0.0186	18.7771	0.2179	0.1708	0.3754	0.0116	0.0045	37.7673	0.0105	0.113	0.0577	0.0717	31.8725	0.1104
CCV	0.1931	50.2414	0.5138	0.979	0.9978	0.4962	0.5128	50.2568	0.4976	0.4869	0.9827	0.9981	19.9805	0.5165
CCB	0.0002	-0.005	-0.0018	-0.0088	-0.0006	-0.0003	-0.0051	-0.0708	-0.0003	-0.0009	-0.0005	-0.0013	0.0054	-0.0028
1303060-1MSD 5X	0.0191	19.3638	0.2253	0.1706	0.3793	0.0118	0.0041	38.5129	0.0106	0.1143	0.0581	0.0729	32.6443	0.111
1303060-2 5X	0.0004	10.2719	0.0494	-0.0034	0.2048	0.0015	0.0011	25.0413	-0.0002	0.0081	0.0067	0.012	24.5807	0.0092
1303060-3 5X	0	10.9359	0.0194	-0.0035	0.1621	0.0008	-0.005	15.4067	-0.0002	0.0064	0.0085	0.0134	23.1783	0.0076
1303060-4 5X	-0.0008	8.1876	0.0344	-0.0048	0.1383	0.0008	0.0015	54.8791	-0.0004	0.006	0.006	0.0097	20.4837	0.0073
1303060-5 5X	-0.0011	11.049	0.0439	-0.0032	0.2253	0.0013	0.0038	22.4996	-0.0003	0.0075	0.0067	0.012	24.9909	0.0093
1303060-6 5X	-0.001	15.9296	0.0238	0.0005	0.2331	0.0011	-0.0011	28.5976	-0.0002	0.0108	0.0138	0.0225	32.017	0.0137
1303060-7 5X	-0.0007	9.9483	0.0296	-0.0033	0.165	0.0009	0.0001	37.082	-0.0001	0.0072	0.0086	0.0169	23.8876	0.0077
1303060-8 5X	-0.0004	10.7861	0.0349	-0.0028	0.1654	0.0011	0.0046	32.3594	0.0002	0.0081	0.0089	0.0154	23.9177	0.0083
1303060-11 5X	-0.0013	18.0107	0.0247	0.005	0.2228	0.0012	-0.0026	24.4873	-0.0002	0.0109	0.0155	0.0222	34.4581	0.0148
1303060-12 5X	0.0005	6.9191	0.008	-0.0043	0.1642	0.0003	0.0007	38.3777	-0.0003	0.007	0.0073	0.0092	18.8557	0.0061

Sample Id1	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Li
CCV	0.1942	50.2481	0.5186	0.9801	0.9979	0.4959	0.5056	50.3028	0.4986	0.488	0.9837	0.9981	19.9856	0.5164
CCB	-0.0006	0.0012	-0.0073	-0.0078	-0.0005	-0.0002	0.0042	-0.0658	-0.0002	-0.0009	-0.0007	-0.0014	0.0081	-0.0027
1303057-2 5X	-0.0001	7.9297	0.0143	-0.0045	0.1964	0.0006	0.0021	18.3354	-0.0003	0.0038	0.0048	0.0085	16.36	0.0051
1303057-3 5X	-0.0001	6.5663	0.0131	-0.0051	0.2686	0.0003	0.0014	16.4071	-0.0002	0.0033	0.0033	0.0059	16.8214	0.0052
1303057-4 5X	-0.0004	5.8733	0.0107	-0.0076	0.3985	0.0003	-0.0018	15.663	-0.0003	0.0025	0.0014	0.0037	12.3633	0.0042
1303057-5 5X	-0.0001	6.2984	0.01	-0.0071	0.2879	0.0005	-0.0009	16.3381	-0.0004	0.0029	0.0019	0.0047	12.4669	0.0049
1303057-6 5X	-0.0007	4.2257	0.0089	-0.0079	0.0992	0.0008	-0.0052	15.2385	-0.0006	0.0019	0.0002	0.002	11.5775	0.0022
1303057-7 5X	0.0005	5.3627	0.0132	-0.0063	0.2341	0.0009	0.0045	16.417	-0.0003	0.0031	0.0024	0.0033	13.4183	0.0035
1303057-8 5X	-0.0006	9.1918	0.0158	-0.0063	0.2827	0.0009	-0.0002	15.7478	-0.0001	0.0059	0.0046	0.0083	27.3842	0.0063
1303057-10 5X	-0.0007	3.4152	0.0168	-0.0078	0.136	0.0009	-0.0029	15.4273	-0.0004	0.0022	0.001	0.0024	11.6667	0.0012
1303057-11 5X	-0.0004	2.9984	0.0136	-0.0092	0.0983	0.0008	0.0005	18.6585	-0.0005	0.0021	0.0003	0.0023	10.4689	0.0008
1303057-12 5X	0.0011	16.737	0.0126	-0.001	0.1617	0.0011	0.01	5.2526	0.0006	0.0137	0.0167	0.0202	30.9765	0.0107
CCV	0.1938	50.2747	0.5121	0.9798	1.001	0.4941	0.513	50.0979	0.4998	0.4857	0.98	1.0018	19.9407	0.518
CCB	-0.0007	-0.0031	0.0004	-0.0089	-0.0007	-0.0003	-0.0016	-0.0678	-0.0004	-0.0011	-0.0011	-0.0016	0.0074	-0.0027
1303057-13 5X	-0.0006	19.1962	0.0142	-0.002	0.2021	0.0011	0.0033	24.9764	-0.0002	0.0118	0.0172	0.0254	35.6479	0.0149
1303057-14 5X	-0.0007	14.3281	0.0115	0.0008	0.1708	0.0006	-0.0005	63.8594	0	0.0082	0.0111	0.0158	24.9904	0.013
1303057-15 5X	-0.0011	12.636	0.007	-0.0017	0.1685	0.0007	0.0001	5.2851	-0.0001	0.0105	0.0119	0.0213	27.2227	0.0079
CRI	0.0205	0.3949	0.0107	0.3917	0.4103	0.0115	0.0526	5.0719	0.0111	0.1013	0.021	0.0516	0.1978	0.0147
ICSA	-0.0001	265.8531	0.0002	-0.0033	-0.0005	0.0001	0.0047	261.2686	0.0004	0.0031	-0.0012	-0.0054	105.5023	-0.0027
ICSAB	0.199	264.4318	0.1094	0.9819	0.5038	0.5022	0.5294	259.584	0.9891	0.4827	0.4857	0.5359	105.3266	1.0558
CCV	0.195	50.3524	0.5208	0.9853	0.9995	0.4991	0.5118	50.6122	0.5015	0.4908	0.989	1.0006	20.0986	0.5165
CCB	0.0016	0.017	0.001	-0.005	-0.0002	-0.0002	0.0109	-0.0641	0.0003	0.0009	0.0006	0.0007	0.0097	-0.0027

Sample Id1	K	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II	S	Sb	Se	Se I
MIXAHIGH	249.5111	495.5976	0.0062	-0.002	150.7543	0.0012	0.0036	-0.0081	0.0358	-0.0301	0.1183	0.0179	0.0042	0.0267
MIXBHIGH	0.0108	0.0204	9.8523	9.9588	0.0863	10.0757	49.3322	9.7977	9.9197	9.7368	0.0064	1.8983	4.8938	4.9655
MIXCHIGH	-0.0877	-0.2282	0.0039	0.003	0.0276	-0.0019	0.0254	0.0011	-0.0233	0.0133	49.7547	0.0031	0.0041	-0.0053
ICV	23.7293	25.2439	0.5025	0.4981	23.3633	0.5049	2.515	0.5004	0.5037	0.4988	2.6144	0.2498	0.5133	0.5182
ICB	-0.1141	0.0038	-0.0002	-0.0006	0.0458	-0.0012	-0.0037	-0.0012	-0.001	-0.0014	-0.0029	-0.0011	0.0025	0.001
CRI	3.8434	5.2248	0.032	0.0217	4.0319	0.0841	0.1971	0.0071	0.0111	0.0051	0.275	0.1256	0.0137	0.0135
ICSA	-0.2192	270.2143	0.0035	-0.0015	0.0737	0.0002	0.0152	-0.0038	0.0116	-0.0115	0.0363	0.0028	0.0034	0.0139
ICSAB	-0.191	261.0681	0.4867	0.9597	0.0327	0.9549	0.9875	0.0455	0.06	0.0382	1.0643	0.5922	0.052	0.0567
CCV	48.8943	49.1006	0.9605	0.9685	47.7418	0.9796	4.8839	0.9633	0.9725	0.9587	5.0402	0.485	0.983	0.9984
CCB	-0.0849	-0.0129	-0.0006	-0.0012	0.0238	-0.0019	-0.0104	-0.0008	-0.0003	-0.0011	-0.0103	0.0005	0.0029	0.0043
F130301-1MB	-0.1367	-0.0464	-0.0011	-0.0024	-0.0036	-0.0028	-0.0174	-0.0021	-0.0008	-0.0028	-0.0159	0.0043	-0.0007	-0.0037
IP130307-2MB	-0.1689	-0.0407	-0.0009	-0.0032	0.0025	-0.0015	0	-0.0017	-0.0021	-0.0015	-0.0122	-0.001	-0.0006	-0.0035
IP130307-2LCS	36.1515	37.3139	0.475	0.962	35.0686	0.4878	0.0052	0.4645	0.4689	0.4623	-0.0215	0.4653	1.7015	1.7364
IP130307-3MB	-0.1314	-0.0296	-0.0008	-0.0013	0.0197	-0.0017	0.0045	-0.0024	-0.0025	-0.0023	-0.0122	-0.0008	0.0012	-0.0056
IP130307-3LCS	36.8429	38.0681	0.4843	0.9778	35.45	0.4979	0.0081	0.4763	0.4825	0.4732	-0.0234	0.4754	1.7184	1.7498
IP130307-4MB	-0.1579	-0.0335	-0.0004	-0.0012	0.0055	-0.0007	-0.0029	0	-0.0025	0.0012	-0.0085	-0.0045	-0.0009	-0.0066
IP130307-4LCS	36.0555	37.6412	0.4822	0.9756	35.5067	0.4925	0.0036	0.4745	0.479	0.4723	-0.0141	0.4662	1.6699	1.702
1303058-1	37.5781	28.0286	3.0461	0.0083	0.6156	0.1031	3.7354	0.1455	0.1525	0.1421	6.2593	0.003	0.0823	0.0784
1303058-1D	37.8798	27.9855	3.0411	0.0069	0.5764	0.102	3.7032	0.1485	0.1438	0.1508	6.8853	0.001	0.0826	0.0701
1303058-1L 5X	6.2587	5.7592	0.6293	0.0012	0.1129	0.021	0.7562	0.0289	0.0312	0.0277	1.2977	-0.0002	0.0148	0.0175
CCV	49.2866	49.4491	0.9655	0.983	48.3168	1.0053	4.9265	0.9665	0.9834	0.9581	5.0776	0.4968	0.9902	1.0198
CCB	-0.1249	-0.0123	-0.0006	-0.0004	0.0235	-0.001	-0.0154	-0.0002	-0.0029	0.0011	-0.0103	-0.0019	0.0022	-0.0029
1303058-1MS	81.906	68.4004	3.2797	0.8685	40.522	0.6017	3.5825	0.6078	0.6304	0.5966	6.2631	0.2964	1.7805	1.8262
1303058-1MSD	80.0894	67.0415	3.274	0.8458	39.5028	0.59	3.5007	0.5988	0.6157	0.5904	6.3867	0.2863	1.7295	1.7638
1303058-2	15.8604	18.0164	1.6236	0.0045	0.246	0.0596	2.1787	0.0941	0.097	0.0926	6.8309	0.0012	0.0842	0.0853
1303058-3	18.2743	25.5287	1.8551	0.0021	0.2875	0.0721	2.7156	0.0893	0.0944	0.0867	5.3603	0.0026	0.081	0.0782
1303058-4	25.9187	25.9086	2.1547	0.0045	0.573	0.0817	3.3496	0.1256	0.1336	0.1216	12.6029	0.0056	0.1729	0.1693
1303058-5	17.2715	21.6616	2.0721	0.0053	0.2825	0.0701	3.3816	0.1204	0.1289	0.1161	15.8328	0.0044	0.2777	0.2864
1303058-6	15.512	16.5445	1.7325	0.0063	0.3433	0.059	2.5805	0.1517	0.1594	0.1479	15.4612	0.0053	0.3009	0.309
1303058-7	13.3153	18.3993	1.5179	0.0047	0.3612	0.0623	2.058	0.0916	0.1043	0.0852	8.5677	0.0071	0.124	0.1289
1303058-8	15.1111	18.9945	1.6083	0.0017	0.2354	0.0668	2.2348	0.0857	0.0925	0.0823	6.5085	0.0044	0.1528	0.1512
1303058-9	6.1632	7.3191	5.4303	0.2461	0.1607	0.0226	1.3606	0.2146	0.2144	0.2147	18.7903	0.0011	0.2134	0.2195
CCV	48.8478	48.1096	0.9374	0.9622	48.0199	0.998	4.761	0.937	0.956	0.9275	4.8811	0.4876	0.9575	0.99
CCB	-0.106	0.001	-0.0002	-0.0003	0.0323	-0.0009	-0.0125	0.0009	-0.0012	0.002	-0.0122	-0.0017	0.0039	0.0064
1303058-10	4.1216	5.0216	5.7046	0.3294	0.1549	0.0141	1.2205	0.1999	0.1988	0.2004	25.2767	0.0011	0.2643	0.2754
1303058-11	12.0053	17.9699	2.0094	0.0037	0.1894	0.0551	2.0834	0.0761	0.0835	0.0725	5.9165	0.0008	0.1157	0.1111
1303058-12	7.0064	17.17	1.3099	0.0031	0.126	0.0416	2.4509	0.0738	0.0792	0.0712	1.7887	0.0016	0.0312	0.0292
1303058-13	14.5857	19.9895	1.5042	0.0017	0.2981	0.0599	2.0137	0.0859	0.094	0.0818	1.8223	0.004	0.0091	0.0098

Sample Id1	K	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II	S	Sb	Se	Se I
1303058-14	14.5883	13.7881	2.3317	0.004	0.3768	0.0651	3.005	0.0945	0.1018	0.0909	3.0331	0.0029	0.011	0.0101
1303059-1	10.4432	9.0826	0.8717	1.3521	0.7954	0.0195	2.0687	0.0951	0.1038	0.0908	37.1054	0.003	0.4214	0.4398
1303059-1D	10.6465	9.0078	0.9088	1.2797	0.7928	0.0194	2.0643	0.0937	0.0984	0.0914	34.6886	-0.0035	0.3787	0.387
1303059-1L 5X	1.6515	1.8583	0.1804	0.2779	0.1394	0.0034	0.4145	0.0177	0.0178	0.0177	7.5658	-0.0015	0.0905	0.0971
1303059-1MS	52.5183	48.3715	1.3385	2.3244	39.6972	0.5249	2.018	0.5451	0.5741	0.5307	36.5042	0.3118	2.0407	2.1183
1303059-1MSD	54.234	47.8372	1.5483	2.2716	40.6022	0.5119	2.15	0.5424	0.5629	0.5321	34.0291	0.2978	2.0516	2.119
CCV	49.1164	48.3954	0.9386	0.9699	48.2525	1.0201	4.7684	0.9372	0.9637	0.9239	4.896	0.4926	0.9663	0.9973
CCB	-0.1696	-0.0017	-0.0004	-0.0006	0.0168	0	-0.0096	-0.001	0.0036	-0.0033	-0.0159	0.0004	-0.0023	0.001
CCV	49.2505	47.5364	0.951	0.9616	48.4754	1.0054	4.8026	0.9332	0.9664	0.9167	4.8567	0.4924	0.9629	0.9877
CCB	-0.149	-0.0126	-0.0003	0.0001	0.0219	-0.0007	-0.0139	0.0006	-0.0003	0.001	-0.0103	-0.002	0.0006	-0.0031
1303059-2	4.2074	6.1012	0.6407	0.0207	0.0809	0.0165	1.2802	0.028	0.0324	0.0258	0.7564	0.0035	0.0255	0.0258
ZZZ	7.6994	6.2756	0.7253	8.0311	0.3398	0.0119	1.6421	0.7643	0.7877	0.7526	27.8355	-0.0277	0.599	0.619
ZZZ	7.4275	6.6461	0.8106	7.1061	0.2578	0.0151	1.6613	0.5779	0.5962	0.5687	25.2995	-0.0205	0.5284	0.5444
CCV	49.008	47.4656	0.9505	0.9675	48.3573	1.0051	4.7881	0.929	0.9646	0.9112	4.8361	0.4832	0.9509	0.9836
CCB	-0.1308	-0.0037	-0.0003	0.0015	0.0236	-0.0007	-0.0097	0.0001	-0.001	0.0006	-0.0141	0.0012	-0.0005	-0.0024
1303059-3	7.7815	6.4938	0.7486	8.2953	0.345	0.0132	1.6694	0.7972	0.8183	0.7866	28.1781	-0.0056	0.6046	0.6268
1303059-4	7.5461	6.9391	0.8422	7.389	0.2631	0.0158	1.6908	0.6052	0.6243	0.5956	25.8656	-0.0026	0.5412	0.5631
1303059-5	3.9784	6.1614	0.8103	0.05	0.1169	0.0176	1.197	0.0592	0.0618	0.0579	3.4817	0.0126	0.2221	0.222
1303059-6	4.8436	9.8145	1.4161	2.1958	0.1903	0.0252	1.6692	0.0916	0.0976	0.0886	9.9853	0.005	0.4571	0.468
1303059-7	8.1789	10.6765	1.2108	0.187	0.1354	0.0204	2.0305	0.0997	0.1028	0.0981	8.5132	0.0127	0.3169	0.3229
1303059-8	5.6068	6.7838	0.8267	0.4675	0.1533	0.0166	1.7201	0.1824	0.1695	0.1889	8.9374	0.0076	0.3596	0.3634
1303059-9	5.0744	6.5713	0.7667	0.0739	0.093	0.0155	1.4669	0.046	0.0478	0.0452	2.2912	0.0069	0.1023	0.0992
1303059-10	5.6921	10.4181	0.9226	0.0653	0.2407	0.0322	1.4467	0.0496	0.0521	0.0484	3.8875	0.0068	0.1345	0.139
1303059-11	3.9292	6.7157	0.8011	0.0919	0.1212	0.0184	1.4558	0.068	0.0714	0.0663	4.0428	0.0059	0.2373	0.2422
CCV	49.3122	48.9562	0.9779	0.9946	48.7194	1.0299	4.8207	0.9747	0.9963	0.9639	4.8998	0.498	0.9806	1.0054
CCB	-0.1193	0.0002	-0.0002	0	0.0307	-0.001	-0.0125	0.0011	0.0012	0.0011	-0.001	0.0068	0.0009	-0.0047
1303059-12	6.4217	7.7621	1.0942	0.0009	0.1136	0.0284	1.7153	0.0456	0.0468	0.045	0.8031	0.0051	0.0021	-0.0026
1303059-13	19.1558	61.0082	1.8968	0.0038	0.5906	0.0813	4.5753	0.1019	0.1088	0.0985	2.4089	0.0084	0.0097	0.0038
1303059-14	1.0658	2.1648	0.3583	0.0005	0.0459	0.0091	0.444	0.0139	0.0128	0.0145	0.1333	0.0027	-0.0003	-0.0101
1303059-15	1.5815	1.8153	0.4902	0.0009	0.0453	0.0075	0.5497	0.0126	0.0104	0.0137	0.1109	0.0039	0.0036	-0.0019
1303060-1	20.0605	40.5108	1.956	0.0119	0.5973	0.0895	3.6714	0.1068	0.1128	0.1038	4.4188	0.0094	0.0244	0.0171
1303060-1D	19.875	40.0089	1.8967	0.0115	0.5964	0.0891	3.7156	0.1047	0.113	0.1006	4.3926	0.009	0.0189	0.0086
1303060-1L 5X	3.3042	8.6584	0.4209	0.0016	0.1053	0.0183	0.7851	0.0213	0.0216	0.0212	0.9318	0.0045	0.0096	0.012
1303060-1MS	62.2296	81.1643	2.3596	0.923	40.4874	0.5993	3.701	0.5937	0.6238	0.5787	4.8212	0.3064	1.6868	1.7384
1303060-1MSD	61.9432	80.4499	2.3662	0.9028	39.8265	0.5882	3.6786	0.5682	0.5929	0.5559	4.387	0.2966	1.6615	1.6914
1303060-2	15.3765	23.0236	1.8541	0.3741	0.4173	0.0436	2.8548	0.2876	0.3003	0.2813	34.767	0.0115	0.8569	0.8706
CCV	49.4837	49.1494	0.9806	1.0023	48.826	1.0272	4.6712	0.973	1.0035	0.9578	4.8043	0.4957	0.9687	0.9966
CCB	-0.1031	0.0084	0	0.001	0.0367	-0.0004	-0.0139	0.0008	0.0001	0.0012	-0.0178	0.0042	0.0006	0.0014

Sample Id1	K	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II	S	Sb	Se	Se I
1303060-3	14.2395	24.5768	1.6283	0.0404	0.4025	0.0546	3.0411	0.2313	0.247	0.2235	18.0229	0.0075	0.3235	0.3335
1303060-4	14.7939	26.4662	3.5059	0.4899	0.5112	0.0489	2.6687	0.1734	0.1838	0.1682	20.4985	0.0058	0.4342	0.4396
1303060-5	18.0316	26.0853	1.9092	0.2444	0.4099	0.051	3.0555	0.2667	0.2831	0.2585	32.8849	0.0097	0.8264	0.8454
1303060-6	26.0211	33.3573	2.2498	0.0741	0.9221	0.087	3.6986	0.1708	0.1894	0.1615	11.506	0.0124	0.1544	0.1522
1303060-7	18.0231	24.4837	1.9898	0.1335	0.4643	0.06	3.5817	0.2045	0.216	0.1988	19.4522	0.0069	0.4741	0.4865
1303060-8	18.3394	24.836	2.0381	0.1261	0.4468	0.0567	3.5289	0.228	0.2381	0.2229	19.4446	0.0085	0.4654	0.4767
1303060-9	7.6444	17.6876	1.6554	0.0267	0.2588	0.0284	2.2174	0.1116	0.1205	0.1072	7.3333	0.0067	0.5254	0.5366
1303060-10	20.1175	26.9617	2.1188	0.1276	0.4479	0.047	3.1459	0.2041	0.2197	0.1963	22.2979	0.008	0.3549	0.3628
1303060-11	26.7284	35.4138	2.0781	0.1445	3.199	0.0922	3.3756	0.1706	0.1854	0.1631	27.7956	0.0112	0.2438	0.2434
1303060-12	8.4138	37.4524	1.1889	0.0019	0.4346	0.0542	2.4028	0.0573	0.0605	0.0557	2.082	0.009	0.0027	0.0008
CCV	49.6959	49.6413	0.9872	1.0115	49.0873	1.0485	4.7096	0.979	1.012	0.9626	4.8885	0.5043	0.9829	1.0164
CCB	-0.1199	0.0188	0.0003	0.0016	0.0381	0.0004	-0.0103	0.0004	0.0025	-0.0007	-0.0178	0.0071	0.0024	0.0028
ZZZ	3.0878	5.5662	1.7026	0.0014	0.0878	0.0099	0.5751	0.0228	0.0225	0.0229	1.841	0.0036	0.0337	0.035
ZZZ	3.0366	5.4766	0.4701	0.0012	0.1324	0.0136	0.5985	0.0304	0.0327	0.0293	2.749	0.0072	0.0388	0.042
ZZZ	3.0771	5.5672	1.1933	0.0014	0.1233	0.0125	0.5989	0.0281	0.0314	0.0264	2.2314	0.007	0.036	0.0374
1303057-1 5X	3.1115	5.5851	1.6461	-0.001	0.0656	0.0101	0.5732	0.0211	0.023	0.0201	1.884	0.0008	0.0331	0.0337
1303057-1D 5X	2.9885	5.3126	0.44	0.0009	0.1278	0.0123	0.5763	0.0277	0.0336	0.0248	2.6873	-0.0016	0.0386	0.0342
1303057-1L 25X	0.424	1.1128	0.3383	-0.0014	0.0296	-0.0005	0.1057	0.0041	0.0036	0.0044	0.3758	-0.0013	0.0071	0.0043
1303057-1MS 5X	10.6658	13.1415	0.5512	0.1858	7.0731	0.1197	0.4268	0.1198	0.1258	0.1168	2.1903	0.0669	0.4168	0.4351
1303057-1MSD 5X	10.7725	13.8233	0.5469	0.1868	7.0778	0.1223	0.4931	0.1209	0.1289	0.1169	2.5528	0.0684	0.3994	0.415
ZZZ	49.5519	48.203	0.9281	0.963	48.8517	1.0378	4.5879	0.9202	0.9598	0.9004	4.8754	0.4969	0.9523	1.0051
CCV	49.0914	50.4303	0.9853	0.9795	48.6055	0.973	4.9018	0.9849	0.993	0.9809	5.248	0.4832	1.0124	1.0266
CCB	-0.0997	0.0325	0.0007	-0.0008	0.0502	-0.0008	-0.0071	-0.0009	0.0007	-0.0017	0.0008	0.0001	0.0029	0.0019
1303058-1 5X	6.1713	5.8684	0.6389	0.001	0.1072	0.0196	0.7498	0.0277	0.0372	0.023	1.3555	0.0021	0.0133	0.0119
1303058-1D 5X	6.2161	5.8919	0.6432	0.0002	0.1	0.0193	0.748	0.0285	0.0301	0.0277	1.434	-0.0038	0.0164	0.0157
1303058-1L 25X	0.9796	1.14	0.1281	-0.0025	0.026	0.0016	0.1373	0.0041	0.0026	0.0048	0.2564	-0.001	0.0037	-0.0029
1303058-1MS 5X	14.2314	14.3046	0.6976	0.1745	7.0227	0.1194	0.7307	0.1277	0.13	0.1266	1.3238	0.0567	0.3818	0.3852
1303058-1MSD 5X	13.9923	14.3125	0.7067	0.175	6.8952	0.12	0.7249	0.1281	0.1333	0.1256	1.3798	0.0583	0.3804	0.3817
CCV	49.0697	50.377	0.9843	0.9809	48.6229	0.9711	4.9029	0.9744	0.9895	0.9669	5.2049	0.4826	1.0029	1.0335
CCB	-0.0986	0.0431	0.001	-0.0004	0.0522	-0.0004	-0.0015	-0.0004	0.0025	-0.0019	0.0008	-0.0014	0.0023	0.0036
1303058-1A	77.4022	66.8591	3.375	0.9298	41.0119	0.5538	3.5565	0.5897	0.6038	0.5826	6.3268	0.4526	1.7995	1.8423
1303058-1A 5X	6.2735	5.9088	1.1209	0.9357	0.1165	0.4995	0.7672	0.4989	0.5066	0.495	1.3387	0.4528	1.8188	1.8495
1303059-1A	50.552	47.8909	1.2898	2.1631	39.6656	0.4545	2.0287	0.5263	0.5358	0.5215	37.6054	0.4332	2.0768	2.1238
1303060-1A	56.2775	74.7373	2.257	0.843	36.5835	0.4888	3.6496	0.5047	0.515	0.4996	4.5161	0.4043	1.5375	1.5614
1303058-2 5X	2.5426	3.7967	0.3423	0.0001	0.0687	0.0104	0.4377	0.0173	0.0196	0.0161	1.4302	0.0001	0.0192	0.0162
1303058-3 5X	2.9202	5.3824	0.3948	-0.0006	0.0628	0.0134	0.538	0.0182	0.0188	0.0179	1.1315	0.0003	0.0182	0.0184
1303058-4 5X	4.2211	5.5628	0.4664	-0.001	0.1043	0.0148	0.6901	0.0265	0.0297	0.0249	2.706	0.0017	0.0392	0.0416
1303058-5 5X	2.7354	4.5783	0.4416	-0.0003	0.0538	0.0122	0.6918	0.0245	0.0242	0.0247	3.3565	0.0024	0.0592	0.0596

Sample Id1	K	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II	S	Sb	Se	Se I
1303058-6 5X	2.5525	3.5762	0.3778	0.0003	0.079	0.01	0.5337	0.0327	0.0348	0.0317	3.3452	-0.0023	0.0688	0.0704
1303058-7 5X	2.1065	3.9298	0.3275	-0.0013	0.0685	0.0113	0.4274	0.0186	0.019	0.0183	1.8466	-0.0026	0.0259	0.0242
CCV	48.9387	50.2695	0.9815	0.9802	48.5115	0.9733	4.8734	0.9787	0.989	0.9736	5.2611	0.4852	1.002	1.0005
CCB	-0.0663	0.0395	0.0009	0.0001	0.0524	-0.0012	-0.0042	0.0007	-0.0002	0.0011	-0.0066	-0.0017	0.0055	0.0062
1303058-8 5X	2.4386	4.0247	0.3444	-0.0013	0.0568	0.0104	0.4522	0.0171	0.0177	0.0169	1.3294	0.0014	0.0337	0.0313
1303058-9 5X	0.9344	1.5709	1.194	0.0495	0.0406	0.0027	0.2794	0.0451	0.046	0.0446	4.0222	0.0007	0.0464	0.0425
1303058-10 5X	0.6069	1.1196	1.3004	0.0719	0.0322	0.0034	0.2593	0.0437	0.0526	0.0392	5.6206	0.0027	0.0625	0.0754
1303058-11 5X	1.9125	3.8926	0.4409	-0.0014	0.0432	0.0092	0.4457	0.0147	0.0148	0.0147	1.2902	-0.0004	0.026	0.0264
1303058-12 5X	1.0697	3.6563	0.2829	-0.001	0.0286	0.007	0.5099	0.0136	0.0165	0.0122	0.3739	0.0003	0.0051	0.0041
1303058-13 5X	2.2979	4.2471	0.3232	-0.0014	0.0582	0.0106	0.4115	0.0169	0.0184	0.0161	0.3851	0.0008	0.0001	-0.0012
1303058-14 5X	2.3731	2.9683	0.5072	-0.0004	0.0686	0.0127	0.6219	0.019	0.0258	0.0156	0.6463	0.002	0.0035	0.0061
1303059-5 5X	0.6628	1.2663	0.166	0.0082	0.1068	0.0021	0.2313	0.0104	0.0117	0.0097	0.7415	-0.0013	0.0475	0.0432
1303059-7 5X	1.3138	2.23	0.2491	0.0347	0.0292	0.0033	0.408	0.0192	0.0256	0.0161	1.8298	0.0019	0.0685	0.0719
1303059-9 5X	0.8117	1.3505	0.1572	0.0127	0.0253	0.0011	0.2958	0.0072	0.0069	0.0074	0.4896	0.0003	0.0224	0.019
CCV	48.1122	49.0907	0.959	0.9539	47.6826	0.9452	4.7609	0.9523	0.966	0.9454	5.0851	0.4674	0.9725	0.9898
CCB	-0.1226	-0.0221	-0.0005	-0.001	0.0135	-0.0017	-0.0127	-0.0018	-0.0029	-0.0013	-0.0234	-0.0007	0.0025	0.0031
1303059-11 5X	0.5607	1.3608	0.1616	0.0169	0.0252	0.0021	0.2893	0.0121	0.0152	0.0105	0.8572	-0.0013	0.0502	0.0477
1303059-12 5X	1.0419	1.6537	0.2312	-0.0019	0.0509	0.0039	0.3513	0.0078	0.0099	0.0067	0.1762	0.0009	0.0016	0.0012
1303059-13 5X	3.1244	13.1088	0.409	-0.0016	0.1157	0.0151	0.9871	0.0195	0.0211	0.0187	0.5344	-0.0012	0.0027	0.0041
1303059-14 5X	0.1119	0.4506	0.0762	-0.0021	0.016	-0.0004	0.0927	0.0002	-0.0003	0.0005	0.0158	-0.0007	-0.0014	-0.0076
1303060-9 5X	1.257	3.9222	0.3604	0.0038	0.0647	0.004	0.5038	0.0232	0.0234	0.0231	1.7178	0.0013	0.1205	0.1191
1303060-10 5X	3.7159	6.1184	0.4734	0.0256	0.122	0.0083	0.7098	0.0445	0.0428	0.0453	5.3172	-0.0023	0.0853	0.0842
1303060-1 5X	3.3361	8.886	0.4219	0.0005	0.1039	0.0168	0.8055	0.0211	0.0224	0.0205	1.0046	0.0004	0.0064	0.0011
1303060-1D 5X	3.2897	8.6721	0.4058	0.0006	0.1012	0.0164	0.8054	0.0206	0.0246	0.0185	0.9691	-0.0026	0.0048	0.0063
1303060-1L 25X	0.4871	1.745	0.0848	-0.0022	0.0272	0.0013	0.1465	0.0019	-0.0027	0.0042	0.1911	-0.0049	0.0028	-0.0033
1303060-1MS 5X	11.0549	17.6039	0.5102	0.1898	7.2528	0.1212	0.8144	0.1266	0.1299	0.125	1.1091	0.0594	0.3886	0.3936
CCV	48.5554	49.9929	0.9756	0.9733	48.1335	0.9637	4.8636	0.977	0.9853	0.9729	5.2124	0.4758	0.9973	1.0125
CCB	-0.1272	-0.0204	-0.0006	-0.0025	0.0108	-0.0011	-0.0089	-0.0018	0.0003	-0.0028	-0.0178	-0.0037	0.0002	-0.0061
1303060-1MSD 5X	11.1828	17.814	0.5216	0.1883	7.275	0.1213	0.8217	0.1239	0.1262	0.1227	1.0233	0.0607	0.3866	0.3889
1303060-2 5X	2.5128	5.0118	0.3961	0.076	0.0866	0.008	0.6303	0.0589	0.0655	0.0556	7.986	-0.0003	0.1935	0.2012
1303060-3 5X	2.3402	5.2982	0.3456	0.0056	0.0756	0.0088	0.6599	0.0473	0.0477	0.0472	4.1083	-0.0009	0.0707	0.068
1303060-4 5X	2.2946	5.5862	0.7299	0.0954	0.0883	0.0075	0.5603	0.0346	0.036	0.0339	4.4263	-0.0002	0.0967	0.0919
1303060-5 5X	2.9276	5.4587	0.3945	0.0469	0.0744	0.0082	0.6395	0.0548	0.0538	0.0553	7.2264	-0.0007	0.1802	0.1772
1303060-6 5X	4.4043	7.2272	0.4808	0.0118	0.1612	0.0152	0.7991	0.0349	0.0343	0.0352	2.6051	-0.0018	0.0352	0.0308
1303060-7 5X	2.9921	5.3864	0.4309	0.0258	0.0908	0.01	0.7813	0.0434	0.0437	0.0432	4.4431	-0.0027	0.1065	0.1073
1303060-8 5X	3.1222	5.4961	0.4435	0.025	0.1058	0.0101	0.7808	0.0475	0.0501	0.0462	4.5068	-0.0008	0.11	0.1132
1303060-11 5X	4.5522	7.7797	0.4493	0.0282	0.5859	0.017	0.7387	0.0344	0.036	0.0335	6.4467	-0.0029	0.0562	0.0547
1303060-12 5X	1.365	8.3649	0.2615	-0.0014	0.097	0.0105	0.5289	0.0101	0.0171	0.0066	0.4746	0.0042	-0.0022	0

Sample Id1	K	Mg	Mn	Mo	Na	Ni	P	Pb	Pb I	Pb II	S	Sb	Se	Se I
CCV	48.5011	49.9984	0.9751	0.9758	48.128	0.967	4.7586	0.9785	0.9854	0.9751	5.1581	0.478	1.0045	1.0227
CCB	-0.1183	-0.0194	-0.0005	-0.0012	0.0145	-0.0019	-0.0111	-0.0003	0.0005	-0.0006	-0.0066	-0.0013	-0.0009	-0.0049
1303057-2 5X	1.642	4.5946	0.4156	0.0007	0.0604	0.0049	0.566	0.0296	0.0306	0.0291	2.8985	-0.0032	0.091	0.0914
1303057-3 5X	1.9317	3.6056	0.363	0.0027	0.0519	0.004	0.5462	0.0268	0.0282	0.0261	4.3477	-0.0003	0.0808	0.0822
1303057-4 5X	0.9826	2.321	0.4046	0.0002	0.0371	0.0009	0.3699	0.023	0.0223	0.0234	1.8616	-0.0046	0.0806	0.08
1303057-5 5X	0.7399	2.2237	0.4221	0.001	0.0675	0.0009	0.3384	0.0228	0.0248	0.0218	1.6431	-0.0014	0.1458	0.1456
1303057-6 5X	0.7257	1.576	0.3094	0.0074	0.0336	0.0004	0.3818	0.0311	0.0305	0.0315	5.497	0.0006	0.0765	0.0755
1303057-7 5X	0.7512	2.0904	0.37	0.0016	0.036	0.0013	0.4478	0.0296	0.035	0.0269	4.7238	0.0004	0.1416	0.1508
1303057-8 5X	1.6208	4.0293	0.4849	0.0002	0.0551	0.0062	0.4821	0.0386	0.0378	0.039	12.3601	0.0004	0.137	0.1356
1303057-10 5X	0.3089	1.0708	0.328	0.0694	0.0369	0.0005	0.2175	0.0242	0.0269	0.0229	3.1807	-0.002	0.2736	0.2761
1303057-11 5X	0.3025	0.9445	0.4104	0.0221	0.0309	-0.0003	0.2373	0.0229	0.0217	0.0236	3.1359	-0.0016	0.2604	0.2645
1303057-12 5X	5.2202	5.6583	0.4863	-0.0003	0.0892	0.018	0.5845	0.0235	0.0353	0.0176	0.9094	0.0035	0.0034	0.0097
CCV	48.611	49.8275	0.9724	0.9761	48.2163	0.9664	4.7588	0.9726	0.9752	0.9712	5.1787	0.4791	1.0016	1.0097
CCB	-0.1168	-0.0226	-0.0006	-0.0013	0.0133	-0.0018	-0.0126	0.0003	-0.002	0.0014	-0.0197	-0.0018	-0.0018	-0.0043
1303057-13 5X	4.2895	8.6228	0.4245	-0.0007	0.0828	0.0199	0.7085	0.0247	0.0273	0.0235	2.7583	0.0016	0.003	0.0032
1303057-14 5X	2.7362	12.8328	0.3786	-0.0009	0.0757	0.0138	0.8309	0.025	0.0292	0.0229	0.8385	-0.0017	0.0079	0.0101
1303057-15 5X	3.8568	4.8666	0.5816	-0.0004	0.1322	0.0159	0.8704	0.0231	0.0229	0.0231	0.7396	-0.0029	0.003	0.0031
CRI	3.7105	5.1269	0.0312	0.0207	3.9176	0.0804	0.1794	0.0053	0.008	0.004	0.2079	0.1161	0.013	0.0146
ICSA	-0.2136	266.0985	0.0038	-0.0005	0.0501	0.0003	0.0166	-0.0029	0.0211	-0.0148	0.0139	0.0045	-0.0005	0.0018
ICSAB	-0.1921	266.227	0.4931	0.9657	0.0177	0.9416	0.952	0.0442	0.0638	0.0343	1.0625	0.5786	0.05	0.0547
CCV	48.5516	50.3766	0.9805	0.9791	48.0824	0.9748	4.7902	0.9787	0.9931	0.9715	5.1993	0.4813	1.0058	1.0145
CCB	-0.1011	-0.004	-0.0004	-0.0009	0.0152	-0.0004	-0.0072	-0.0029	0.0076	-0.0081	-0.0122	0.0028	0.0029	0.0122

Sample Id1	Se II	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
MIXAHIGH	-0.0071	-0.0216	0.0021	-0.0016	0.0002	-0.0212	0.2382	-0.0021	-0.0044	0.0042
MIXBHIGH	4.858	49.3348	9.9456	9.9716	9.7738	4.9656	-0.0982	4.9363	9.8396	-0.0177
MIXCHIGH	0.0088	-0.0123	0.0191	-0.002	0.0058	-0.003	49.9141	-0.0068	-0.0008	4.9898
ICV	0.5108	2.532	0.5184	0.2522	0.2587	0.2514	2.5315	0.25	0.4948	0.502
ICB	0.0032	-0.0118	-0.0001	-0.0011	-0.0026	-0.0016	-0.0281	0.0002	-0.0018	0.0005
CRI	0.0137	0.1006	0.1058	0.0186	0.0196	0.0197	0.2011	0.1053	0.0395	0.0534
ICSA	-0.0019	-0.0093	0.0036	-0.0018	-0.0018	-0.0121	0.1078	-0.0028	-0.0037	0.0021
ICSAB	0.0497	0.9645	1.0183	0.9859	0.9787	0.0802	9.7124	0.481	0.9257	0.4829
CCV	0.9753	4.8289	1.0242	0.4978	0.4947	0.5129	4.8388	0.4815	0.9466	0.9628
CCB	0.0022	-0.016	0.0005	-0.003	-0.0027	-0.0048	-0.0345	-0.0006	-0.0011	0
F130301-1MB	0.0008	-0.0179	-0.0003	-0.0045	-0.0029	-0.0052	-0.0378	-0.0008	-0.0026	-0.0006
IP130307-2MB	0.0008	-0.0125	0.0005	-0.0044	-0.0032	-0.0028	-0.0303	-0.001	-0.0019	-0.0005
IP130307-2LCS	1.6841	1.0679	0.4962	0.4841	0.4885	1.8633	-0.0292	0.486	0.4703	-0.0003
IP130307-3MB	0.0045	-0.0094	-0.0014	-0.0043	-0.0029	-0.0025	-0.0248	0	-0.0012	-0.0003
IP130307-3LCS	1.7028	1.0876	0.5052	0.4919	0.4965	1.8957	-0.0224	0.4957	0.4824	-0.0006
IP130307-4MB	0.0019	-0.0036	-0.0015	-0.0023	-0.0032	-0.0047	-0.0326	-0.0005	-0.0005	-0.0005
IP130307-4LCS	1.6538	1.1224	0.5026	0.4928	0.4964	1.884	-0.0312	0.4946	0.4733	-0.0008
1303058-1	0.0842	15.6259	0.0067	0.5594	0.3168	-0.016	0.4911	0.4594	0.5165	0.0436
1303058-1D	0.0888	11.5585	0.003	0.5569	0.2955	-0.0239	0.4513	0.4517	0.5178	0.045
1303058-1L 5X	0.0134	3.2604	0.0022	0.113	0.0623	0.0008	0.0714	0.0929	0.1055	0.0084
CCV	0.9755	4.8643	1.0384	0.5066	0.4937	0.513	4.8624	0.4854	0.956	0.973
CCB	0.0047	-0.0077	-0.0045	-0.001	-0.0026	-0.0012	-0.0375	-0.0007	0.0001	0.0001
1303058-1MS	1.7576	11.1195	0.5129	1.0554	0.6319	1.892	0.4727	0.9636	0.9725	0.0414
1303058-1MSD	1.7124	10.5433	0.4948	1.0491	0.6277	1.8418	0.473	0.9443	0.9478	0.0395
1303058-2	0.0837	14.6511	0.0042	0.3549	0.211	-0.0138	0.6669	0.6114	0.2692	0.0262
1303058-3	0.0823	9.8142	0.0038	0.3884	0.259	-0.0191	0.4708	0.4736	0.2673	0.0288
1303058-4	0.1746	10.1605	0.0084	0.5653	0.2598	-0.0224	1.0236	1.0717	0.3814	0.0416
1303058-5	0.2733	7.2418	0.0031	0.2913	0.236	-0.0161	1.0398	0.9125	0.3152	0.0352
1303058-6	0.2969	6.4192	0.0066	0.3294	0.2733	-0.0223	2.9203	1.7965	0.3209	0.0212
1303058-7	0.1216	8.2047	0.0035	0.3971	0.1913	-0.0108	1.2482	0.9349	0.2687	0.0291
1303058-8	0.1536	9.2352	0.0059	0.302	0.2085	-0.0191	0.7919	0.7419	0.2588	0.0259
1303058-9	0.2103	11.4127	0.006	0.5338	0.1444	-0.0211	23.1208	0.9066	0.3844	0.0338
CCV	0.9412	4.7266	1.0149	0.4985	0.4752	0.4982	4.7693	0.4746	0.9209	0.9538
CCB	0.0027	-0.0067	0.001	-0.0009	-0.0026	-0.0041	-0.0213	-0.0002	0.0002	0.0002
1303058-10	0.2587	7.8896	0.0082	0.5477	0.0931	-0.0118	23.8374	0.8947	0.2678	0.0409
1303058-11	0.118	10.9338	0.0035	0.2525	0.2312	-0.0148	0.4069	0.411	0.2058	0.0236
1303058-12	0.0323	4.2977	-0.0008	0.209	0.1488	-0.014	0.0884	0.1053	0.206	0.0141
1303058-13	0.0087	10.5872	0.0046	0.4522	0.2266	-0.0177	0.1113	0.1042	0.2615	0.0252

Sample Id1	Se II	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
1303058-14	0.0114	11.0729	0.0002	0.2138	0.3724	-0.0181	0.1332	0.1492	0.2617	0.0361
1303059-1	0.4123	11.9472	0.0022	0.3678	0.1062	0.0105	1.4367	1.2227	0.1069	0.0228
1303059-1D	0.3745	9.5358	0.0018	0.378	0.1089	0.0098	1.2948	1.0715	0.106	0.0263
1303059-1L 5X	0.0872	2.4278	-0.0008	0.0729	0.0196	-0.0062	0.2562	0.2504	0.0218	0.0041
1303059-1MS	2.002	12.143	0.4989	0.8622	0.4292	1.9157	1.3156	1.896	0.5669	0.0387
1303059-1MSD	2.0179	12.7748	0.4938	0.9166	0.3892	1.8994	1.32	1.878	0.5502	0.0402
CCV	0.9508	4.7295	1.0337	0.5026	0.4716	0.5191	4.7667	0.4768	0.9211	0.9608
CCB	-0.0039	-0.01	-0.0019	-0.0014	-0.003	-0.0001	-0.0045	0.0004	-0.0012	0.0005
CCV	0.9504	4.6503	1.0182	0.4898	0.4684	0.5141	4.7726	0.4786	0.9368	0.9655
CCB	0.0025	-0.0041	-0.0006	-0.0015	-0.0027	-0.0043	-0.0341	-0.0001	-0.0006	0.0003
1303059-2	0.0253	8.0112	0.0009	0.0662	0.1411	-0.0051	0.1347	0.118	0.0774	0.0103
ZZZ	0.5891	7.6421	0.0126	0.2088	0.2374	-0.0056	42.9439	4.2376	0.0886	0.0541
ZZZ	0.5205	5.6788	0.0066	0.1972	0.2104	-0.0133	34.1676	3.4301	0.0969	0.0504
CCV	0.9346	4.6379	1.0116	0.4911	0.4672	0.5053	4.7647	0.4782	0.9341	0.9653
CCB	0.0004	-0.0042	-0.0023	-0.0014	-0.0026	-0.0061	-0.0255	-0.0003	-0.0004	0.0004
1303059-3	0.5936	7.7468	0.0159	0.2113	0.2402	0.004	43.4318	4.2866	0.0906	0.0551
1303059-4	0.5303	5.7986	0.0083	0.2009	0.2131	-0.0033	34.7305	3.4918	0.0985	0.0515
1303059-5	0.2221	5.5402	0.0014	0.0954	0.1628	-0.0105	0.465	0.7193	0.0855	0.0173
1303059-6	0.4517	8.7979	0.0043	0.1541	0.1307	-0.006	3.1338	1.0201	0.1302	0.0295
1303059-7	0.3138	9.7009	0.0005	0.1092	0.1656	-0.0104	0.9692	0.7322	0.1208	0.025
1303059-8	0.3577	10.377	0.0112	0.1231	0.1725	-0.0099	42.0181	1.5464	0.1229	0.025
1303059-9	0.1038	8.7352	0.0006	0.0972	0.1852	-0.0104	0.4399	0.5109	0.0878	0.0109
1303059-10	0.1323	7.8233	-0.0014	0.1053	0.2196	-0.0083	0.3758	0.446	0.0921	0.0088
1303059-11	0.2348	8.4034	0.0021	0.0825	0.3158	-0.0105	0.4248	0.7018	0.0918	0.0203
CCV	0.9682	4.7978	1.031	0.4997	0.4787	0.5148	4.8742	0.4927	0.962	0.9977
CCB	0.0037	0.0008	0.001	-0.0013	-0.0026	-0.0026	-0.0253	-0.0001	0.0007	0.0004
1303059-12	0.0044	11.5615	0.0007	0.0706	0.2509	-0.0124	0.0155	0.0647	0.1159	0.0188
1303059-13	0.0126	14.1532	0.0062	0.431	0.2252	-0.0149	0.135	0.1365	0.3714	0.0315
1303059-14	0.0047	5.8136	-0.0023	0.0191	0.1873	-0.0147	-0.0207	0.0277	0.0397	0.0092
1303059-15	0.0063	5.6928	-0.0007	0.0189	0.2015	-0.0075	-0.0119	0.0254	0.0403	0.0073
1303060-1	0.0281	17.7113	0.0034	0.5592	0.2669	-0.0193	0.2382	0.1816	0.39	0.0331
1303060-1D	0.024	15.7885	0.0047	0.5548	0.2695	-0.0203	0.2553	0.1836	0.3889	0.0344
1303060-1L 5X	0.0084	3.863	0	0.1157	0.0543	-0.0114	0.0156	0.0371	0.0852	0.0061
1303060-1MS	1.6611	18.1113	0.5044	1.0655	0.667	1.8924	0.2449	0.6913	0.869	0.0319
1303060-1MSD	1.6466	17.7337	0.496	1.0543	0.6508	1.8457	0.2395	0.6815	0.8932	0.0322
1303060-2	0.85	21.2067	0.0066	0.388	0.2205	-0.0232	6.1264	3.037	0.2372	0.0607
CCV	0.9547	4.7992	1.0291	0.4994	0.4809	0.5172	4.8983	0.4958	0.9695	0.9992
CCB	0.0001	0.0004	-0.0004	-0.0012	-0.0025	-0.007	-0.0196	0.0005	0.0008	0.0007

Sample Id1	Se II	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
1303060-3	0.3185	16.6738	0.0044	0.3874	0.2116	-0.0163	0.6134	1.2013	0.2874	0.0433
1303060-4	0.4316	15.7391	0.0037	0.5572	0.1994	-0.0128	1.4601	1.5509	0.2465	0.034
1303060-5	0.8169	16.1133	0.0052	0.4017	0.1908	-0.0189	3.3911	2.7584	0.3005	0.0554
1303060-6	0.1555	15.8462	0.0072	0.6365	0.2239	-0.0197	1.0543	0.8279	0.3941	0.0457
1303060-7	0.4679	16.9196	0.0016	0.4033	0.2477	-0.0149	2.1594	1.5566	0.2868	0.0342
1303060-8	0.4597	18.5685	0.0031	0.3623	0.2704	-0.0234	2.9874	1.8534	0.3633	0.0381
1303060-9	0.5198	14.4066	0.0036	0.3227	0.1717	-0.0193	1.3502	0.8642	0.2783	0.0254
1303060-10	0.3509	19.8821	0.006	0.5995	0.2714	-0.0196	1.3266	1.6493	0.4309	0.0411
1303060-11	0.244	18.5563	0.0064	0.7188	0.2414	-0.0158	1.3582	0.6591	0.4526	0.0466
1303060-12	0.0036	15.4	-0.0009	0.4963	0.2182	-0.0108	0.0805	0.0872	0.2058	0.0151
CCV	0.9662	4.8312	1.0472	0.502	0.4796	0.5173	4.905	0.4978	0.9791	1.0065
CCB	0.0023	0.0044	0.0003	-0.0011	-0.0027	-0.0006	-0.0052	0.001	0.0002	0.001
ZZZ	0.0331	5.2962	0.0042	0.3988	0.0686	-0.0066	0.1609	0.1421	0.0485	0.005
ZZZ	0.0372	4.2439	0.0006	0.0757	0.0724	-0.0696	0.2012	0.1772	0.0506	0.0066
ZZZ	0.0353	4.8708	0.0028	0.2645	0.0702	-0.0735	0.1927	0.1573	0.0494	0.0062
1303057-1 5X	0.0328	5.3953	0.0002	0.4033	0.0677	-0.0077	0.1553	0.1402	0.0464	0.0055
1303057-1D 5X	0.0408	4.2566	0.0013	0.0727	0.0697	-0.0063	0.2102	0.17	0.0461	0.0068
1303057-1L 25X	0.0085	1.0937	-0.0021	0.078	0.0116	-0.0068	0.0005	0.028	0.0081	0.0002
1303057-1MS 5X	0.4077	3.2488	0.1044	0.1507	0.1431	0.3952	0.1674	0.2926	0.1405	0.0082
1303057-1MSD 5X	0.3916	3.1761	0.1068	0.1536	0.1458	0.4058	0.1633	0.2806	0.1487	0.0082
ZZZ	0.9259	4.6725	1.0352	0.4967	0.458	0.5295	4.6872	0.4763	0.9152	0.961
CCV	1.0053	5.01	1.034	0.4955	0.5105	0.5103	4.9125	0.4912	1.0123	0.9763
CCB	0.0034	0.013	-0.0001	-0.003	-0.0022	0.0076	-0.0226	0.0004	0.0004	0.001
1303058-1 5X	0.014	3.3253	0.0017	0.1094	0.0639	0.0034	0.0996	0.0936	0.1102	0.0094
1303058-1D 5X	0.0167	2.468	-0.0009	0.1087	0.06	-0.0007	0.0756	0.0923	0.1122	0.0092
1303058-1L 25X	0.007	0.6697	-0.0027	0.0184	0.0106	-0.0004	-0.0205	0.0173	0.0315	0.001
1303058-1MS 5X	0.3801	2.3985	0.1016	0.2075	0.1321	0.378	0.063	0.1984	0.2193	0.008
1303058-1MSD 5X	0.3797	2.3162	0.102	0.2082	0.133	0.3829	0.066	0.1967	0.2167	0.008
CCV	0.9876	5.0019	1.0386	0.4953	0.51	0.5173	4.8918	0.4902	1.0104	0.9743
CCB	0.0016	0.0143	0.003	-0.0029	-0.002	0.0036	-0.0126	0.0006	0.0002	0.0012
1303058-1A	1.7781	16.4679	0.4911	0.9932	0.7796	1.7881	0.4674	0.9007	0.9792	0.0414
1303058-1A 5X	1.8035	4.9642	0.4888	0.5829	0.5479	1.8167	0.0754	0.5683	0.5974	0.0083
1303059-1A	2.0533	12.9234	0.463	0.7802	0.5601	1.7337	1.3542	1.6193	0.5522	0.0207
1303060-1A	1.5256	18.4215	0.4402	0.9407	0.6952	1.5935	0.2343	0.588	0.8008	0.0302
1303058-2 5X	0.0207	3.1132	-0.0005	0.0678	0.0428	0.0011	0.1112	0.1251	0.0582	0.0047
1303058-3 5X	0.0181	2.1029	0.0017	0.0744	0.0531	-0.0029	0.0596	0.0976	0.0829	0.0055
1303058-4 5X	0.0381	2.2124	0.0017	0.1113	0.0544	0.0004	0.1798	0.2243	0.0873	0.0086
1303058-5 5X	0.059	1.5527	-0.0022	0.0549	0.0484	0.0009	0.1915	0.1885	0.0693	0.0066

Sample Id1	Se II	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
1303058-6 5X	0.068	1.4231	0.0004	0.0639	0.0579	-0.0036	0.5923	0.381	0.0717	0.004
1303058-7 5X	0.0267	1.7958	-0.0025	0.0772	0.0393	-0.0033	0.2253	0.1956	0.0593	0.0052
CCV	1.0028	4.9946	1.0307	0.4953	0.5078	0.5058	4.8999	0.4897	1.0058	0.9736
CCB	0.0052	0.0139	-0.0041	-0.0029	-0.002	0.008	-0.0207	0.0007	-0.0002	0.0009
1303058-8 5X	0.035	1.9838	-0.0029	0.0568	0.0427	0.0004	0.1389	0.1534	0.0563	0.0049
1303058-9 5X	0.0483	2.5087	-0.0001	0.105	0.0301	-0.0001	4.8719	0.1935	0.0883	0.0068
1303058-10 5X	0.0561	1.8051	0.0045	0.1115	0.0195	0.0027	5.2078	0.1989	0.0642	0.0091
1303058-11 5X	0.0258	2.4178	0.0015	0.0483	0.0491	0.0013	0.0605	0.0868	0.0458	0.0045
1303058-12 5X	0.0057	0.939	-0.0036	0.0385	0.0303	-0.0019	-0.0003	0.0209	0.0456	0.0027
1303058-13 5X	0.0007	2.2982	0.0019	0.0869	0.0472	-0.0011	0.0062	0.0204	0.0584	0.0048
1303058-14 5X	0.0023	2.4322	0.0038	0.0399	0.0796	0.0053	0.0161	0.0306	0.0574	0.0075
1303059-5 5X	0.0496	1.1854	-0.002	0.0154	0.0329	0.0041	0.0735	0.1456	0.0175	0.003
1303059-7 5X	0.0668	2.0763	0.0021	0.0183	0.0332	0.0065	0.1884	0.1485	0.0247	0.0048
1303059-9 5X	0.0241	1.865	-0.0021	0.0157	0.0375	0.0013	0.0628	0.1028	0.0169	0.0017
CCV	0.9638	4.8664	1.0042	0.4779	0.4979	0.5038	4.78	0.4782	0.9845	0.9507
CCB	0.0022	0.004	0.001	-0.004	-0.0029	0.0006	-0.0236	-0.0003	-0.0022	-0.0001
1303059-11 5X	0.0514	1.7717	0.0008	0.0126	0.0648	0.001	0.0728	0.1396	0.0178	0.0038
1303059-12 5X	0.0018	2.5379	0.0019	0.0108	0.0537	0.0003	-0.012	0.013	0.0244	0.0035
1303059-13 5X	0.002	3.1566	0.001	0.0868	0.0484	-0.0038	0.0041	0.0274	0.0817	0.006
1303059-14 5X	0.0017	1.3225	-0.001	0.0002	0.0398	-0.0044	-0.0166	0.0053	0.0066	0.0015
1303060-9 5X	0.1212	3.3032	0.0012	0.0645	0.0369	-0.005	0.2524	0.1833	0.0623	0.0048
1303060-10 5X	0.0858	4.6217	0.0002	0.1251	0.0611	-0.003	0.2572	0.3586	0.1009	0.0083
1303060-1 5X	0.0091	4.704	-0.0029	0.1126	0.061	-0.0025	0.0255	0.0372	0.0868	0.0065
1303060-1D 5X	0.0041	3.5211	-0.0022	0.1107	0.0582	0.0015	0.0247	0.037	0.0865	0.0069
1303060-1L 25X	0.0058	0.8097	-0.0036	0.0189	0.0092	0.002	-0.0356	0.0064	0.0157	0.0001
1303060-1MS 5X	0.3861	4.0914	0.1075	0.2184	0.1486	0.3945	0.0189	0.1443	0.1962	0.0063
CCV	0.9897	4.9558	1.0285	0.485	0.5047	0.5084	4.8423	0.4863	1.006	0.9666
CCB	0.0034	0.0065	-0.0026	-0.004	-0.0026	-0.0006	-0.0248	-0.0002	-0.0013	-0.0002
1303060-1MSD 5X	0.3854	4.0879	0.1042	0.2211	0.1472	0.3996	0.0336	0.1455	0.2058	0.0068
1303060-2 5X	0.1896	4.7418	0.0022	0.0771	0.0467	0.0037	1.2819	0.6354	0.0511	0.0125
1303060-3 5X	0.0721	3.7035	-0.0012	0.0765	0.0449	-0.0009	0.0951	0.2483	0.0627	0.0084
1303060-4 5X	0.0991	3.4121	0.0006	0.1088	0.0412	-0.0027	0.2818	0.3144	0.0521	0.006
1303060-5 5X	0.1817	3.4843	-0.0025	0.0773	0.0393	-0.0019	0.6674	0.5571	0.0633	0.0104
1303060-6 5X	0.0374	3.5359	0.0008	0.1283	0.0482	0.0004	0.1912	0.1712	0.0862	0.0088
1303060-7 5X	0.1061	3.8135	-0.0003	0.0809	0.0543	-0.0039	0.4351	0.3283	0.0632	0.0065
1303060-8 5X	0.1084	4.2298	0.0022	0.0731	0.0598	-0.0032	0.6272	0.3943	0.0823	0.0077
1303060-11 5X	0.0569	4.2212	0.0024	0.148	0.0527	-0.0029	0.2564	0.1372	0.1018	0.0092
1303060-12 5X	-0.0034	3.5462	0.0024	0.1023	0.0481	0.0012	0.0167	0.0184	0.0467	0.0033

Sample Id1	Se II	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
CCV	0.9954	4.9525	1.0329	0.4872	0.5036	0.5021	4.853	0.4869	1.0064	0.9683
CCB	0.0011	0.0102	-0.0006	-0.004	-0.0028	0.0008	-0.0236	-0.0001	-0.002	0
1303057-2 5X	0.0908	3.659	-0.0009	0.0354	0.0342	-0.0031	0.3835	0.2645	0.0481	0.0058
1303057-3 5X	0.08	3.4528	-0.004	0.0467	0.0324	-0.0026	0.3291	0.2139	0.0366	0.0037
1303057-4 5X	0.0808	2.7865	-0.0012	0.0385	0.0205	-0.0018	0.1866	0.2411	0.0254	0.0048
1303057-5 5X	0.1459	2.7694	0.0026	0.061	0.018	0.0002	0.4456	0.4098	0.0218	0.0069
1303057-6 5X	0.077	2.5642	0.0008	0.0311	0.027	-0.0037	1.4045	0.6215	0.015	0.013
1303057-7 5X	0.1369	2.8037	-0.0005	0.0377	0.0307	0.002	1.2124	0.5915	0.0207	0.0112
1303057-8 5X	0.1378	3.9908	-0.0012	0.0554	0.0337	-0.0009	0.6579	0.4218	0.0557	0.0088
1303057-10 5X	0.2723	2.2005	0.0004	0.0283	0.023	-0.0047	1.528	0.7269	0.0142	0.0073
1303057-11 5X	0.2584	2.0768	0.0039	0.0322	0.0206	-0.0023	1.1871	0.7039	0.0106	0.0073
1303057-12 5X	0.0003	4.0976	0.0026	0.0535	0.0578	0.0049	0.0446	0.045	0.0813	0.0091
CCV	0.9976	4.9514	1.0276	0.4874	0.5026	0.508	4.8647	0.4845	1.0021	0.9681
CCB	-0.0005	0.0086	0.0001	-0.004	-0.0027	-0.0001	-0.0248	-0.0008	-0.0021	-0.0003
1303057-13 5X	0.0028	3.8875	-0.0001	0.0925	0.0466	-0.0003	0.0143	0.0426	0.0988	0.0082
1303057-14 5X	0.0068	4.6227	0.0022	0.1206	0.0621	-0.0031	0.0052	0.0384	0.0696	0.0072
1303057-15 5X	0.0029	5.127	-0.0044	0.0453	0.0916	-0.0002	-0.011	0.0352	0.0826	0.0068
CRI	0.0122	0.1139	0.1018	0.0174	0.0189	0.0239	0.1814	0.1033	0.0407	0.0516
ICSA	-0.0016	0.0084	0.0041	-0.002	-0.0013	-0.0001	0.1058	-0.0032	-0.0014	0.0021
ICSAB	0.0477	1.002	1.0252	0.9714	0.9951	0.1019	9.6899	0.4845	0.9792	0.4848
CCV	1.0014	4.9732	1.0373	0.487	0.5068	0.5109	4.8627	0.4894	1.0188	0.9719
CCB	-0.0017	0.0155	0.0023	-0.0039	-0.0026	0.0094	0.0143	0.0012	-0.001	0.001

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36
SampleId1 : BLANK **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 11:53:43
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	163.000	196.600	163.000	104.000	31.700	458.800	190.100	63.900	158.400
#2	162.100	196.600	166.200	104.200	31.600	457.200	191.500	63.900	156.000
Mean	**162.550**	**196.600**	**164.600**	**104.100**	**31.650**	**458.000**	**190.800**	**63.900**	**157.200**
%RSD	0.392	0.000	1.375	0.136	0.223	0.247	0.519	0.000	1.080

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	140.600	286.700	87.600	66.700	1024.100	162.600	163.600	16.500	78.800
#2	140.400	285.600	87.200	65.800	1016.800	161.700	163.700	16.400	77.200
Mean	**140.500**	**286.150**	**87.400**	**66.250**	**1020.450**	**162.150**	**163.650**	**16.450**	**78.000**
%RSD	0.101	0.272	0.324	0.961	0.506	0.392	0.043	0.430	1.450

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	187.900	291.500	77.200	2753.500	820.200	8.100	203.700	392.600	265.500
#2	187.600	289.300	77.200	2751.400	814.200	8.300	201.900	390.400	261.600
Mean	**187.750**	**290.400**	**77.200**	**2752.450**	**817.200**	**8.200**	**202.800**	**391.500**	**263.550**
%RSD	0.113	0.536	0.000	0.054	0.519	1.725	0.628	0.397	1.046

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	383.100	62.100	51.000	310.200	203.100	243.700	201.500	23.900	383.700
#2	382.800	61.900	50.800	307.600	201.500	240.900	198.700	23.600	381.800
Mean	**382.950**	**62.000**	**50.900**	**308.900**	**202.300**	**242.300**	**200.100**	**23.750**	**382.750**
%RSD	0.055	0.228	0.278	0.595	0.559	0.817	0.989	0.893	0.351

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36
SampleId1 : RL **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 11:55:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	172.700	235.300	169.900	217.700	40.800	601.500	198.300	246.600	173.200
#2	172.800	236.600	172.100	217.300	41.000	598.500	198.100	246.300	171.800
Mean	**172.750**	**235.950**	**171.000**	**217.500**	**40.900**	**600.000**	**198.200**	**246.450**	**172.500**
%RSD	0.041	0.390	0.910	0.130	0.346	0.354	0.071	0.086	0.574

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	149.500	309.000	92.200	147.800	1334.100	655.100	258.800	21.500	102.100
#2	149.400	309.900	92.800	147.300	1332.200	651.400	260.400	21.500	102.200
Mean	**149.450**	**309.450**	**92.500**	**147.550**	**1333.150**	**653.250**	**259.600**	**21.500**	**102.150**
%RSD	0.047	0.206	0.459	0.240	0.101	0.401	0.436	0.000	0.069

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	1663.200	336.300	107.000	2836.600	853.900	9.800	214.000	400.300	274.200
#2	1650.200	335.600	105.600	2846.900	847.700	9.700	216.900	394.100	273.800
Mean	**1656.700**	**335.950**	**106.300**	**2841.750**	**850.800**	**9.750**	**215.450**	**397.200**	**274.000**
%RSD	0.555	0.147	0.931	0.256	0.515	0.725	0.952	1.104	0.103

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	464.900	66.200	244.600	490.700	207.500	269.000	213.600	28.500	454.300
#2	463.100	65.800	243.400	492.100	210.900	269.100	215.300	28.600	455.100
Mean	**464.000**	**66.000**	**244.000**	**491.400**	**209.200**	**269.050**	**214.450**	**28.550**	**454.700**
%RSD	0.274	0.429	0.348	0.201	1.149	0.026	0.561	0.248	0.124

	Pb	Se
	Reading	Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36
SampleId1 : RL2 SampleId2 : [STD]
Analysis commenced : 3/11/2013 11:57:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	184.600	305.700	183.700	432.400	56.500	865.400	209.400	576.500	196.400
#2	183.900	307.100	182.100	434.500	56.500	867.100	210.900	578.300	195.000
Mean	**184.250**	**306.400**	**182.900**	**433.450**	**56.500**	**866.250**	**210.150**	**577.400**	**195.700**
%RSD	0.269	0.323	0.619	0.343	0.000	0.139	0.505	0.220	0.506

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	162.600	338.200	98.900	303.000	1888.200	1593.000	441.200	30.300	144.500
#2	162.200	338.700	98.600	302.900	1889.000	1599.000	440.000	30.400	142.200
Mean	**162.400**	**338.450**	**98.750**	**302.950**	**1888.600**	**1596.000**	**440.600**	**30.350**	**143.350**
%RSD	0.174	0.104	0.215	0.023	0.030	0.266	0.193	0.233	1.135

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	4440.900	405.500	160.100	2904.800	881.600	13.200	230.500	412.400	287.800
#2	4472.200	401.300	157.100	2884.200	872.300	13.000	229.600	408.000	287.600
Mean	**4456.550**	**403.400**	**158.600**	**2894.500**	**876.950**	**13.100**	**230.050**	**410.200**	**287.700**
%RSD	0.497	0.736	1.338	0.503	0.750	1.080	0.277	0.758	0.049

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	605.000	72.900	549.400	814.200	222.100	310.400	232.600	37.200	582.700
#2	607.100	72.800	551.700	818.400	221.500	309.000	233.100	36.700	582.000
Mean	**606.050**	**72.850**	**550.550**	**816.300**	**221.800**	**309.700**	**232.850**	**36.950**	**582.350**
%RSD	0.245	0.097	0.295	0.364	0.191	0.320	0.152	0.957	0.085

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36
SampleId1 : B3 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 11:59:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE4

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	212.600	199.000	215.200	299.700	353.100	1429.400	192.800	71.400	580.400
#2	212.400	199.500	212.300	299.100	353.000	1429.300	193.800	71.200	580.600
Mean	**212.500**	**199.250**	**213.750**	**299.400**	**353.050**	**1429.350**	**193.300**	**71.300**	**580.500**
%RSD	0.067	0.177	0.959	0.142	0.020	0.005	0.366	0.198	0.024

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	259.700	832.200	207.700	70.300	1041.900	166.300	167.700	192.200	257.400
#2	260.000	829.400	207.800	70.200	1038.400	166.000	167.300	191.800	257.900
Mean	**259.850**	**830.800**	**207.750**	**70.250**	**1040.150**	**166.150**	**167.500**	**192.000**	**257.650**
%RSD	0.082	0.238	0.034	0.101	0.238	0.128	0.169	0.147	0.137

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading

#1	205.200	858.500	305.000	3471.800	1198.100	8.100	223.700	432.400	321.200
#2	203.700	860.300	306.300	3464.500	1209.100	8.200	221.600	430.000	328.900
Mean	**204.450**	**859.400**	**305.650**	**3468.150**	**1203.600**	**8.150**	**222.650**	**431.200**	**325.050**
%RSD	0.519	0.148	0.301	0.149	0.646	0.868	0.667	0.394	1.675

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	948.600	91.700	1309.400	1704.700	253.100	249.000	387.700	89.700	400.000
#2	945.200	91.100	1309.500	1704.200	251.700	248.600	387.600	89.200	397.100
Mean	**946.900**	**91.400**	**1309.450**	**1704.450**	**252.400**	**248.800**	**387.650**	**89.450**	**398.550**
%RSD	0.254	0.464	0.005	0.021	0.392	0.114	0.018	0.395	0.515

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36
SampleId1 : B2 SampleId2 : [STD]
Analysis commenced : 3/11/2013 12:01:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	618.700	204.900	636.100	1990.200	3166.900	9987.000	198.900	68.700	4254.300
#2	616.700	205.300	634.400	1987.300	3156.400	9973.300	198.200	69.200	4259.200
Mean	**617.700**	**205.100**	**635.250**	**1988.750**	**3161.650**	**9980.150**	**198.550**	**68.950**	**4256.750**
%RSD	0.229	0.138	0.189	0.103	0.235	0.097	0.249	0.513	0.081

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	1277.500	5568.900	1261.000	72.400	1024.200	163.100	164.900	1726.200	1823.500
#2	1272.900	5550.600	1255.900	72.100	1027.800	163.100	165.400	1723.900	1816.400
Mean	**1275.200**	**5559.750**	**1258.450**	**72.250**	**1026.000**	**163.100**	**165.150**	**1725.050**	**1819.950**
%RSD	0.255	0.233	0.287	0.294	0.248	0.000	0.214	0.094	0.276

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	208.900	5824.900	2299.900	9288.200	4457.500	8.400	385.900	763.000	839.700
#2	209.200	5823.600	2286.900	9303.200	4470.900	8.200	386.600	761.800	851.600
Mean	**209.050**	**5824.250**	**2293.400**	**9295.700**	**4464.200**	**8.300**	**386.250**	**762.400**	**845.650**
%RSD	0.101	0.016	0.401	0.114	0.212	1.704	0.128	0.111	0.995

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	5861.100	343.900	12419.400	13941.900	682.900	245.600	1999.000	661.000	396.200

#2	5835.700	345.000	12381.800	13905.600	675.100	245.300	1998.500	661.400	395.500
Mean	**5848.400**	**344.450**	**12400.600**	**13923.750**	**679.000**	**245.450**	**1998.750**	**661.200**	**395.850**
%RSD	0.307	0.226	0.214	0.184	0.812	0.086	0.018	0.043	0.125

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:36

SampleId1 : B1 SampleId2 : [STD]

Analysis commenced : 3/11/2013 12:02:50

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	4701.800	291.400	4887.200	18851.100	30483.900	95162.700	266.600	96.400	40136.600
#2	4704.400	289.900	4902.000	18873.600	30550.700	94685.200	259.700	95.000	40080.400
Mean	**4703.100**	**290.650**	**4894.600**	**18862.350**	**30517.300**	**94923.950**	**263.150**	**95.700**	**40108.500**
%RSD	0.039	0.365	0.214	0.084	0.155	0.356	1.854	1.034	0.099

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	11486.100	53054.000	11908.300	109.900	1044.400	175.900	184.200	16538.300	17330.100
#2	11438.200	52877.800	11947.700	108.900	1031.000	173.500	181.500	16484.700	17290.000
Mean	**11462.150**	**52965.900**	**11928.000**	**109.400**	**1037.700**	**174.700**	**182.850**	**16511.500**	**17310.050**
%RSD	0.295	0.235	0.234	0.646	0.913	0.971	1.044	0.230	0.164

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	329.300	55517.800	21000.600	68456.500	37386.400	11.200	2053.400	4097.600	5980.700
#2	325.600	55338.300	20916.000	68203.800	37569.800	11.200	2048.900	4104.300	6043.800
Mean	**327.450**	**55428.050**	**20958.300**	**68330.150**	**37478.100**	**11.200**	**2051.150**	**4100.950**	**6012.250**
%RSD	0.799	0.229	0.285	0.262	0.346	0.000	0.155	0.116	0.742

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	53563.200	2884.500	117721.300	137962.700	5042.500	269.400	18230.500	6305.200	464.800
#2	53716.300	2874.400	117839.500	137840.800	5042.600	265.000	18193.200	6257.100	458.200
Mean	**53639.750**	**2879.450**	**117780.400**	**137901.750**	**5042.550**	**267.200**	**18211.850**	**6281.150**	**461.500**
%RSD	0.202	0.248	0.071	0.063	0.001	1.164	0.145	0.541	1.011

	Pb Reading	**Se** Reading
#1		
#2		

Mean	0.000	0.000ser: STEVE WORKMAN
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37
SampleId1 : A5 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 12:04:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	164.900	1593.800	168.500	139.800	38.300	485.900	191.800	3437.800	166.500
#2	163.300	1603.700	171.600	133.100	36.100	478.800	192.200	3447.500	162.600
Mean	**164.100**	**1598.750**	**170.050**	**136.450**	**37.200**	**482.350**	**192.000**	**3442.650**	**164.550**
%RSD	0.689	0.438	1.289	3.472	4.182	1.041	0.147	0.199	1.676

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	143.700	302.700	90.200	2664.900	2166.100	3997.300	1915.300	20.600	91.200
#2	142.900	297.900	88.500	2673.300	2167.100	4009.600	1923.500	19.600	88.500
Mean	**143.300**	**300.300**	**89.350**	**2669.100**	**2166.600**	**4003.450**	**1919.400**	**20.100**	**89.850**
%RSD	0.395	1.130	1.345	0.223	0.033	0.217	0.302	3.518	2.125

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	3728.000	303.900	81.700	2828.700	848.800	8.400	206.400	397.600	270.700
#2	3749.700	298.700	83.400	2816.400	848.700	8.100	206.300	398.700	273.400
Mean	**3738.850**	**301.300**	**82.550**	**2822.550**	**848.750**	**8.250**	**206.350**	**398.150**	**272.050**
%RSD	0.410	1.220	1.456	0.308	0.008	2.571	0.034	0.195	0.702

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	430.800	64.100	111.400	351.100	204.200	249.600	207.800	25.900	385.600
#2	417.300	63.700	103.500	342.600	203.100	247.000	205.700	25.500	383.000
Mean	**424.050**	**63.900**	**107.450**	**346.850**	**203.650**	**248.300**	**206.750**	**25.700**	**384.300**
%RSD	2.251	0.443	5.199	1.733	0.382	0.740	0.718	1.101	0.478

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37
SampleId1 : A4 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 12:06:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Raw intensities 13:05:38 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	166.900	13588.200	186.300	125.000	32.400	478.400	191.300	32719.500	162.100
#2	165.600	13623.400	189.700	124.600	32.200	478.400	191.300	32740.600	161.700
Mean	**166.250**	**13605.800**	**188.000**	**124.800**	**32.300**	**478.400**	**191.300**	**32730.050**	**161.900**
%RSD	0.553	0.183	1.279	0.227	0.438	0.000	0.000	0.046	0.175

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	143.100	318.600	88.600	24900.100	11005.200	37862.200	17193.000	22.400	96.200
#2	142.600	317.700	88.400	24931.400	11037.300	37940.500	17210.400	22.400	95.700
Mean	**142.850**	**318.150**	**88.500**	**24915.750**	**11021.250**	**37901.350**	**17201.700**	**22.400**	**95.950**
%RSD	0.247	0.200	0.160	0.089	0.206	0.146	0.072	0.000	0.368

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	32007.400	295.800	87.300	3190.800	942.800	9.200	242.000	453.000	307.300
#2	32089.300	296.500	85.300	3179.900	948.800	9.100	241.000	451.400	307.600
Mean	**32048.350**	**296.150**	**86.300**	**3185.350**	**945.800**	**9.150**	**241.500**	**452.200**	**307.450**
%RSD	0.181	0.167	1.639	0.242	0.449	0.773	0.293	0.250	0.069

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	434.400	70.900	59.200	353.400	231.400	285.100	224.300	28.800	398.400
#2	432.100	71.400	58.600	351.100	227.900	284.500	223.800	28.400	398.100
Mean	**433.250**	**71.150**	**58.900**	**352.250**	**229.650**	**284.800**	**224.050**	**28.600**	**398.250**
%RSD	0.375	0.497	0.720	0.462	1.078	0.149	0.158	0.989	0.053

	Pb	Se
	Reading	Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37
SampleId1 : A3 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 12:08:18
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	169.600	26427.300	206.600	127.300	32.300	488.700	197.100	63137.600	168.300
#2	167.200	26475.400	207.200	126.900	32.200	486.700	197.600	63197.200	167.900
Mean	**168.400**	**26451.350**	**206.900**	**127.100**	**32.250**	**487.700**	**197.350**	**63167.400**	**168.100**
%RSD	1.008	0.129	0.205	0.223	0.219	0.290	0.179	0.067	0.168

ted: 3/12/2013 13:05:38 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	145.800	332.800	89.000	47542.400	21866.000	79274.900	33522.000	27.700	109.500
#2	146.100	332.500	88.700	47607.000	21897.400	79391.700	33560.000	27.700	109.700
Mean	**145.950**	**332.650**	**88.850**	**47574.700**	**21881.700**	**79333.300**	**33541.000**	**27.700**	**109.600**
%RSD	0.145	0.064	0.239	0.096	0.101	0.104	0.080	0.000	0.129

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	62997.400	299.300	91.300	3607.300	1082.500	9.800	279.500	505.900	351.400
#2	63042.600	300.800	93.100	3597.900	1081.800	10.000	279.900	512.200	349.100
Mean	**63020.000**	**300.050**	**92.200**	**3602.600**	**1082.150**	**9.900**	**279.700**	**509.050**	**350.250**
%RSD	0.051	0.353	1.380	0.185	0.046	1.428	0.101	0.875	0.464

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	452.700	79.000	63.500	375.900	257.500	308.500	235.500	33.700	408.900
#2	452.600	78.800	63.100	375.500	254.800	309.200	237.400	33.400	407.900
Mean	**452.650**	**78.900**	**63.300**	**375.700**	**256.150**	**308.850**	**236.450**	**33.550**	**408.400**
%RSD	0.016	0.179	0.447	0.075	0.745	0.160	0.568	0.632	0.173

	Pb	Se
	Reading	Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37
SampleId1 : A2 SampleId2 : [STD]
Analysis commenced : 3/11/2013 12:10:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	168.800	50315.700	249.800	139.100	32.700	500.200	199.600	118858.300	176.200
#2	167.400	50242.800	243.500	139.200	32.700	500.400	196.100	118343.000	177.200
Mean	**168.100**	**50279.250**	**246.650**	**139.150**	**32.700**	**500.300**	**197.850**	**118600.650**	**176.700**
%RSD	0.589	0.103	1.806	0.051	0.000	0.028	1.251	0.307	0.400

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	150.900	349.400	90.100	87700.100	42222.900	162051.400	64278.000	37.500	138.200
#2	149.800	347.500	89.700	87544.800	42164.500	161736.700	64151.500	37.400	136.500
Mean	**150.350**	**348.450**	**89.900**	**87622.450**	**42193.700**	**161894.050**	**64214.750**	**37.450**	**137.350**
%RSD	0.517	0.386	0.315	0.125	0.098	0.137	0.139	0.189	0.875

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	115647.900	309.800	104.200	4404.400	1334.900	11.500	352.300	619.100	433.500
#2	115472.600	307.400	103.300	4384.400	1335.700	11.700	353.900	622.600	429.500
Mean	**115560.250**	**308.600**	**103.750**	**4394.400**	**1335.300**	**11.600**	**353.100**	**620.850**	**431.500**
%RSD	0.107	0.550	0.613	0.322	0.042	1.219	0.320	0.399	0.655

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	477.200	93.300	72.400	407.900	305.200	345.800	253.700	42.100	415.200
#2	476.000	92.900	72.300	406.300	306.000	347.000	252.800	42.200	413.800
Mean	**476.600**	**93.100**	**72.350**	**407.100**	**305.600**	**346.400**	**253.250**	**42.150**	**414.500**
%RSD	0.178	0.304	0.098	0.278	0.185	0.245	0.251	0.168	0.239

	Pb	Se
	Reading	Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37
SampleId1 : A1 SampleId2 : [STD]
Analysis commenced : 3/11/2013 12:11:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Raw intensities

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	174.800	113499.800	367.300	179.300	35.700	547.900	218.900	266763.200	207.400
#2	173.400	113755.400	365.600	178.000	35.600	548.700	222.200	266981.400	205.600
Mean	**174.100**	**113627.600**	**366.450**	**178.650**	**35.650**	**548.300**	**220.550**	**266872.300**	**206.500**
%RSD	0.569	0.159	0.328	0.515	0.198	0.103	1.058	0.058	0.616

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	172.600	401.600	95.900	185147.100	93310.400	393215.000	152104.000	66.300	224.300
#2	173.100	400.500	95.700	185570.000	93373.300	393903.000	152537.700	66.500	224.000
Mean	**172.850**	**401.050**	**95.800**	**185358.550**	**93341.850**	**393559.000**	**152320.850**	**66.400**	**224.150**
%RSD	0.205	0.194	0.148	0.161	0.048	0.124	0.201	0.213	0.095

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	222393.300	350.300	131.900	6861.200	2060.400	16.400	581.000	956.300	652.700
#2	222289.900	351.300	132.500	6884.000	2080.800	17.000	585.000	948.500	663.700
Mean	**222341.600**	**350.800**	**132.200**	**6872.600**	**2070.600**	**16.700**	**583.000**	**952.400**	**658.200**
%RSD	0.033	0.202	0.321	0.235	0.697	2.541	0.485	0.579	1.182

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
#1	539.700	139.100	97.700	504.000	463.500	450.100	310.200	68.900	451.500
#2	539.600	139.600	97.600	502.300	469.100	450.600	308.300	69.300	449.700
Mean	**539.650**	**139.350**	**97.650**	**503.150**	**466.300**	**450.350**	**309.250**	**69.100**	**450.600**
%RSD	0.013	0.254	0.072	0.239	0.849	0.079	0.434	0.409	0.282

	Pb Reading	Se Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:37

SampleId1 : C3 **SampleId2 :** **[STD]**

Analysis commenced : 3/11/2013 12:13:47

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Raw intensities

	Ag Reading	Al Reading	As Reading	B Reading	Ba Reading	Be Reading	Bi Reading	Ca Reading	Cd Reading
#1	167.300	201.300	164.200	109.000	31.800	464.500	226.800	74.000	157.300
#2	165.700	200.100	162.800	109.500	31.700	464.200	224.700	72.600	155.700
Mean	**166.500**	**200.700**	**163.500**	**109.250**	**31.750**	**464.350**	**225.750**	**73.300**	**156.500**
%RSD	0.680	0.423	0.605	0.324	0.223	0.046	0.658	1.351	0.723

	Co Reading	Cr Reading	Cu Reading	Fe Reading	K Reading	Li Reading	Mg Reading	Mn Reading	Mo Reading
#1	141.500	293.100	87.900	72.800	1026.200	163.900	170.900	17.000	79.100
#2	141.000	291.300	87.800	70.900	1021.200	162.500	170.000	16.800	79.000
Mean	**141.250**	**292.200**	**87.850**	**71.850**	**1023.700**	**163.200**	**170.450**	**16.900**	**79.050**
%RSD	0.250	0.436	0.080	1.870	0.345	0.607	0.373	0.837	0.089

	Na Reading	Ni Reading	P Reading	Pb I Reading	Pb II Reading	S Reading	Sb Reading	Se I Reading	Se II Reading
#1	203.000	288.800	76.200	2765.200	820.100	22.100	202.800	393.500	267.400
#2	200.400	293.500	76.600	2751.500	817.900	22.200	202.600	391.700	265.700
Mean	**201.700**	**291.150**	**76.400**	**2758.350**	**819.000**	**22.150**	**202.700**	**392.600**	**266.550**
%RSD	0.911	1.141	0.370	0.351	0.190	0.319	0.070	0.324	0.451

	Si Reading	Sn Reading	Sr Reading	Ti Reading	Tl Reading	U Reading	V Reading	Zn Reading	Zr Reading
#1	390.300	62.800	51.700	316.200	197.300	328.800	202.700	23.900	880.400
#2	391.300	62.600	51.400	312.900	198.400	328.600	202.400	23.800	890.000
Mean	**390.800**	**62.700**	**51.550**	**314.550**	**197.850**	**328.700**	**202.550**	**23.850**	**885.200**
%RSD	0.181	0.226	0.412	0.742	0.393	0.043	0.105	0.296	0.767

Pb	Se
Reading	Reading

			ser: STEVE WORKMAN
#1			
#2			
Mean	**0.000**	**0.000**	
%RSD	0.000	0.000	

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:38
SampleId1 : C2 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 12:15:37
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Raw intensities

	Ag Reading	**Al** Reading	**As** Reading	**B** Reading	**Ba** Reading	**Be** Reading	**Bi** Reading	**Ca** Reading	**Cd** Reading
#1	195.600	220.500	169.200	118.100	32.600	506.700	535.000	77.300	162.400
#2	195.200	219.800	168.200	116.000	32.500	503.500	532.400	76.700	162.000
Mean	**195.400**	**220.150**	**168.700**	**117.050**	**32.550**	**505.100**	**533.700**	**77.000**	**162.200**
%RSD	0.145	0.225	0.419	1.269	0.217	0.448	0.344	0.551	0.174

	Co Reading	**Cr** Reading	**Cu** Reading	**Fe** Reading	**K** Reading	**Li** Reading	**Mg** Reading	**Mn** Reading	**Mo** Reading
#1	147.600	356.600	98.600	76.000	1040.900	169.800	218.700	19.100	81.700
#2	147.100	356.000	98.300	75.200	1039.700	169.300	218.500	19.100	80.200
Mean	**147.350**	**356.300**	**98.450**	**75.600**	**1040.300**	**169.550**	**218.600**	**19.100**	**80.950**
%RSD	0.240	0.119	0.215	0.748	0.082	0.209	0.065	0.000	1.310

	Na Reading	**Ni** Reading	**P** Reading	**Pb I** Reading	**Pb II** Reading	**S** Reading	**Sb** Reading	**Se I** Reading	**Se II** Reading
#1	217.200	304.500	76.300	2871.900	858.700	145.000	206.700	393.600	268.200
#2	216.000	304.000	77.200	2876.300	856.300	144.900	208.600	400.100	270.800
Mean	**216.600**	**304.250**	**76.750**	**2874.100**	**857.500**	**144.950**	**207.650**	**396.850**	**269.500**
%RSD	0.392	0.116	0.829	0.108	0.198	0.049	0.647	1.158	0.682

	Si Reading	**Sn** Reading	**Sr** Reading	**Ti** Reading	**Tl** Reading	**U** Reading	**V** Reading	**Zn** Reading	**Zr** Reading
#1	440.600	64.300	54.900	351.900	205.800	1061.200	225.900	24.600	5608.100
#2	440.800	64.500	54.800	353.500	201.100	1061.900	225.600	24.600	5626.000
Mean	**440.700**	**64.400**	**54.850**	**352.700**	**203.450**	**1061.550**	**225.750**	**24.600**	**5617.050**
%RSD	0.032	0.220	0.129	0.321	1.634	0.047	0.094	0.000	0.225

	Pb Reading	**Se** Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:38
SampleId1 : C1 **SampleId2 :** **[STD]**
Analysis commenced : 3/11/2013 12:17:27

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Raw intensities

	Ag Reading	Al Reading	As Reading	B Reading	Ba Reading	Be Reading	Bi Reading	Ca Reading	Cd Reading
#1	448.600	407.300	181.700	189.400	34.000	869.100	3543.300	162.900	185.700
#2	450.000	408.000	183.800	187.400	34.200	866.300	3530.200	162.500	188.500
Mean	**449.300**	**407.650**	**182.750**	**188.400**	**34.100**	**867.700**	**3536.750**	**162.700**	**187.100**
%RSD	0.220	0.121	0.813	0.751	0.415	0.228	0.262	0.174	1.058

	Co Reading	Cr Reading	Cu Reading	Fe Reading	K Reading	Li Reading	Mg Reading	Mn Reading	Mo Reading
#1	182.700	921.200	188.300	149.000	1025.300	223.800	678.500	38.400	87.700
#2	183.100	916.800	188.300	149.100	1033.200	224.600	675.600	38.400	87.700
Mean	**182.900**	**919.000**	**188.300**	**149.050**	**1029.250**	**224.200**	**677.050**	**38.400**	**87.700**
%RSD	0.155	0.339	0.000	0.047	0.543	0.252	0.303	0.000	0.000

	Na Reading	Ni Reading	P Reading	Pb I Reading	Pb II Reading	S Reading	Sb Reading	Se I Reading	Se II Reading
#1	252.700	374.000	96.100	3581.800	1123.600	1356.000	224.500	437.600	291.100
#2	253.800	371.500	99.100	3593.600	1129.700	1344.800	227.300	442.200	295.600
Mean	**253.250**	**372.750**	**97.600**	**3587.700**	**1126.650**	**1350.400**	**225.900**	**439.900**	**293.350**
%RSD	0.307	0.474	2.173	0.233	0.383	0.586	0.876	0.739	1.085

	Si Reading	Sn Reading	Sr Reading	Ti Reading	Tl Reading	U Reading	V Reading	Zn Reading	Zr Reading
#1	888.600	73.800	77.800	679.500	234.100	8366.200	416.600	27.200	52525.400
#2	883.000	73.600	78.100	676.200	227.800	8301.100	415.600	26.500	52172.400
Mean	**885.800**	**73.700**	**77.950**	**677.850**	**230.950**	**8333.650**	**416.100**	**26.850**	**52348.900**
%RSD	0.447	0.192	0.272	0.344	1.929	0.552	0.170	1.843	0.477

	Pb Reading	Se Reading
#1		
#2		
Mean	**0.000**	**0.000**
%RSD	0.000	0.000

Method report Paragon2

Line calibration information

Analyte	Reporting name	C0	C1	C2	C3	Correlation coefficient	Low limit	High limit	Date of last regression
Ag 328.068	Ag	0.0002121	0.0004654	0.0	0	1.0000	-1.450	4288.250	3/11/2013 12:29:30
Al 308.215	Al	-0.0714972	0.0037336	0.0	0	0.99999	11.600	109379.500	3/11/2013 12:29:31
As 189.042/2	As	0.0038377	0.0011656	0.0	0	1.0000	-3.850	4299.600	3/11/2013 12:29:31
B 249.678/2	B	-0.0107024	0.0006133	0.0	0	1.0000	2.150	16355.650	3/11/2013 12:29:31
Ba 493.409	Ba	-0.0012	0.0003648	0.0	0	1.0000	0.000	26700.450	3/11/2013 12:29:31
Be 313.042	Be	-0.0053437	0.0000106	0.0	0	1.0000	458.000	94923.950	3/11/2013 12:29:31
Bi 223.061	Bi	0.0011107	0.0017508	0.0000000	0	1.0000	-3.000	2794.600	3/11/2013 12:29:31
Ca 317.933	Ca	-0.1077042	0.0015617	0.0	0	1.0000	4.750	255303.500	3/11/2013 12:29:32
Cd 226.502/2	Cd	-0.0009275	0.0001452	0.0	0	1.0000	0.200	33510.950	3/11/2013 12:29:32
Co 228.616	Co	-0.000389	0.000452	0.0	0	1.0000	-1.950	11041.850	3/11/2013 12:29:32
Cr 267.716	Cr	-0.0010632	0.0001931	0.0	0	1.0000	-0.650	51763.050	3/11/2013 12:29:32
Cu 324.753	Cu	-0.0153569	0.0009417	0.0	0	1.0000	14.800	10803.800	3/11/2013 12:29:32
Fe 259.94	Fe	-0.0119624	0.0007787	0.0	0	1.0000	1.000	181945.300	3/11/2013 12:29:32
K 766.491	K	-2.4920714	0.0023428	0.0	0	0.99998	1020.450	93341.850	3/11/2013 12:29:33
Li 670.784	Li	-0.0070261	0.0000261	0.0	0	0.99999	162.150	393559.000	3/11/2013 12:29:33
Mg 279.078	Mg	-0.0417495	0.0030674	0.0	0	1.0000	-1.200	147587.100	3/11/2013 12:29:33
Mn 257.610	Mn	-0.0011684	0.000593	0.0	0	1.0000	0.000	16227.650	3/11/2013 12:29:33
Mo 202.030/2	Mo	-0.0024069	0.0006285	0.0	0	1.0000	-0.600	15759.950	3/11/2013 12:29:33
Na 588.995	Na	-0.0761644	0.0004086	0.0	0	0.99998	187.750	222341.600	3/11/2013 12:29:34
Ni 231.604	Ni	-0.0028689	0.0002192	0.0	0	1.0000	1.350	45631.300	3/11/2013 12:29:34
P 178.287/2	P	-0.0017327	0.0022831	0.0	0	1.0000	-5.100	20515.700	3/11/2013 12:29:34
Pb 220.351	Pb I	0.0004775	0.0001576	0.0	0	1.0000	-17.900	63331.050	3/11/2013 12:29:34
Pb 220.352/2	Pb II	-0.0042496	0.0002905	0.0	0	1.0000	10.200	34732.050	3/11/2013 12:29:34
S 182.04/2	S	-0.0625666	0.0372993	0.0000005	0	1.0000	1.350	1318.400	3/11/2013 12:29:34
Sb 206.838/2	Sb	-0.0024073	0.0013187	0.0	0	1.0000	0.700	1506.400	3/11/2013 12:29:34
Se 196.021	Se I	0.0006193	0.0013741	0.0	0	1.0000	-3.250	3603.050	3/11/2013 12:29:35
Se 196.021/2	Se II	0.0000044	0.0008807	0.0	0	1.0000	-1.400	5554.000	3/11/2013 12:29:35
Si 288.158	Si	-0.1192407	0.0009331	0.0	0	1.0000	107.150	56968.550	3/11/2013 12:29:35
Sn 189.989	Sn	0.0001004	0.0036583	0.0	0	1.0000	-0.850	9709.750	3/11/2013 12:29:35
Sr 421.552	Sr	-0.004448	0.0000939	0.0	0	1.0000	-0.150	170730.050	3/11/2013 12:29:35

Method report Paragon2

Ti 334.941	Ti	-0.0022797	0.0000764	0.0	0	1.0000	-10.100	132882.950	3/11/2013 12:29:35
Tl 190.864/2	Tl	0.0027512	0.0011926	0.0	0	1.0000	-0.350	4230.000	3/11/2013 12:29:36
U 385.958	U	-0.0222583	0.0064664	0.0	0	1.0000	-1.950	7709.600	3/11/2013 12:29:36
V 292.402	V	-0.0005748	0.0002865	0.0	0	1.0000	-1.100	17487.950	3/11/2013 12:29:36
Zn 206.2	Zn	-0.0024721	0.0017146	0.0	0	1.0000	0.100	5717.050	3/11/2013 12:29:36
Zr 339.198	Zr	-0.0009584	0.0000991	0.0	0	1.0000	2.600	50187.400	3/11/2013 12:29:38

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:53
SampleId1 : MIXAHIGH SampleId2 : [CV]
Analysis commenced : 3/11/2013 12:30:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00170	499.79366	0.00780	-0.00764	-0.00054	0.00051	0.02532	495.96131	0.00041
#2	0.00068	500.25877	0.00174	-0.00991	-0.00058	0.00051	0.02199	496.94795	0.00031
Mean	**0.00119**	**500.02622**	**0.00477**	**-0.00877**	**-0.00056**	**0.00051**	**0.02365**	**496.45463**	**0.00036**
%RSD	60.22046	0.06577	89.84528	18.29499	4.59205	1.06403	9.96320	0.14053	20.28981

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00146	0.00084	-0.00778	197.28604	249.39979	9.80509	494.96295	0.00642	-0.00153
#2	0.00110	0.00034	-0.00899	197.77723	249.62236	9.79968	496.23218	0.00589	-0.00241
Mean	**0.00128**	**0.00059**	**-0.00838**	**197.53163**	**249.51107**	**9.80238**	**495.59756**	**0.00616**	**-0.00197**
%RSD	19.96967	59.25035	10.24855	0.17583	0.06308	0.03898	0.18109	6.13130	31.63399

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	150.83681	0.00219	0.00535	0.03936	-0.03139	0.11648	0.01973	0.02421	-0.01058
#2	150.67185	0.00018	0.00192	0.03232	-0.02878	0.12021	0.01617	0.02929	-0.00363
Mean	**150.75433**	**0.00119**	**0.00363**	**0.03584**	**-0.03009**	**0.11835**	**0.01795**	**0.02675**	**-0.00710**
%RSD	0.07737	120.24339	66.66263	13.89444	6.14727	2.22888	14.01909	13.41884	69.13084

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.02004	0.00486	-0.00163	0.00013	-0.01306	0.24275	-0.00125	-0.00470	0.00443
#2	-0.02311	-0.00063	-0.00165	0.00033	-0.02928	0.23360	-0.00293	-0.00419	0.00401
Mean	**-0.02158**	**0.00211**	**-0.00164**	**0.00023**	**-0.02117**	**0.23817**	**-0.00209**	**-0.00444**	**0.00422**
%RSD	10.05850	183.71093	0.81037	60.09994	54.15822	2.71418	56.92553	8.18457	6.96708

	Pb	Se
	calc	calc
#1	-0.00783	0.00101
#2	-0.00843	0.00733
Mean	**-0.00813**	**0.00417**
%RSD	5.22217	107.22355

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54
SampleId1 : MIXBHIGH SampleId2 : [CV]
Analysis commenced : 3/11/2013 12:31:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.98749	0.24132	4.98899	9.92651	9.88497	0.98424	0.00789	0.06988	4.97806
#2	2.00134	0.20581	5.00626	9.98142	9.94114	0.98636	0.00310	0.03286	4.98901
Mean	**1.99441**	**0.22356**	**4.99762**	**9.95396**	**9.91306**	**0.98530**	**0.00549**	**0.05137**	**4.98353**
%RSD	0.49111	11.23194	0.24422	0.39010	0.40067	0.15194	61.70704	50.95632	0.15533

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.94760	9.88089	9.93904	0.04037	0.02739	-0.00034	0.03862	9.83307	9.93980
#2	4.96020	9.91483	10.01416	0.02332	-0.00576	-0.00105	0.00212	9.87147	9.97773
Mean	**4.95390**	**9.89786**	**9.97660**	**0.03185**	**0.01081**	**-0.00069**	**0.02037**	**9.85227**	**9.95877**
%RSD	0.17977	0.24247	0.53243	37.87611	216.79859	72.31434	126.73355	0.27561	0.26934

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09188	10.07707	49.26078	9.90145	9.65158	-0.00662	1.89494	4.94620	4.78046
#2	0.08074	10.07439	49.40361	9.93785	9.82196	0.01949	1.90173	4.98483	4.93545
Mean	**0.08631**	**10.07573**	**49.33219**	**9.91965**	**9.73677**	**0.00644**	**1.89833**	**4.96552**	**4.85796**
%RSD	9.12575	0.01877	0.20473	0.25946	1.23735	286.74751	0.25302	0.55017	2.25593

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.06957	9.93732	9.94946	9.75050	4.94597	-0.08370	4.92800	9.82597	-0.01754
#2	49.60011	9.95382	9.99379	9.79711	4.98528	-0.11279	4.94465	9.85326	-0.01789
Mean	**49.33484**	**9.94557**	**9.97163**	**9.77380**	**4.96562**	**-0.09824**	**4.93633**	**9.83962**	**-0.01771**
%RSD	0.76042	0.11736	0.31432	0.33717	0.55979	20.94130	0.23854	0.19610	1.38677

	Pb	Se
	calc	calc
#1	9.73479	4.83565
#2	9.86055	4.95190
Mean	**9.79767**	**4.89377**
%RSD	0.90766	1.67958

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54

SampleId1 : MIXCHIGH SampleId2 : [CV]

Analysis commenced : 3/11/2013 12:33:46

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00417	0.37842	0.00174	0.02168	-0.00102	0.01624	5.00704	-0.05601	-0.00124
#2	-0.00466	0.37521	-0.00409	0.02076	-0.00091	0.01637	5.05340	-0.05788	-0.00147
Mean	**-0.00442**	**0.37681**	**-0.00117**	**0.02122**	**-0.00096**	**0.01631**	**5.03022**	**-0.05695**	**-0.00136**
%RSD	7.88819	0.60222	350.93216	3.06554	8.03574	0.54420	0.65165	2.32712	11.55723

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00534	-0.01273	-0.01105	-0.01079	-0.08358	-0.00108	-0.21628	0.00405	0.00375
#2	0.00480	-0.01474	-0.01203	-0.01212	-0.09180	-0.00110	-0.24020	0.00381	0.00231
Mean	**0.00507**	**-0.01373**	**-0.01154**	**-0.01146**	**-0.08769**	**-0.00109**	**-0.22824**	**0.00393**	**0.00303**
%RSD	7.56136	10.37468	6.02081	8.17075	6.63443	1.18136	7.41179	4.26635	33.73736

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02810	-0.00239	0.02886	-0.02245	0.01510	49.42045	0.00308	-0.00769	0.00850
#2	0.02716	-0.00144	0.02201	-0.02409	0.01144	50.08890	0.00311	-0.00293	0.00911
Mean	**0.02763**	**-0.00192**	**0.02544**	**-0.02327**	**0.01327**	**49.75467**	**0.00310**	**-0.00531**	**0.00880**
%RSD	2.40852	34.78972	19.04119	4.98353	19.50392	0.94999	0.52152	63.31393	4.88593

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00695	0.02314	-0.00208	0.00586	-0.01047	49.65109	-0.00652	-0.00041	4.97370
#2	-0.01755	0.01509	-0.00197	0.00565	0.00451	50.17711	-0.00709	-0.00110	5.00589
Mean	**-0.01225**	**0.01912**	**-0.00202**	**0.00576**	**-0.00298**	**49.91410**	**-0.00681**	**-0.00076**	**4.98980**
%RSD	61.17449	29.76863	3.93720	2.62727	355.48723	0.74519	5.93051	64.01614	0.45620

	Pb	**Se**
	calc	calc
#1	0.00260	0.00311
#2	-0.00039	0.00510
Mean	**0.00110**	**0.00410**
%RSD	191.60668	34.29176

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54
SampleId1 : ICV SampleId2 : [CV]
Analysis commenced : 3/11/2013 12:35:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD5

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09876	25.81154	0.26046	0.51153	0.52114	0.25458	0.26236	25.68656	0.25864
#2	0.09987	25.78631	0.26325	0.51257	0.52231	0.25550	0.25886	25.74396	0.25754
Mean	**0.09931**	**25.79893**	**0.26185**	**0.51205**	**0.52172**	**0.25504**	**0.26061**	**25.71526**	**0.25809**
%RSD	0.78891	0.06915	0.75516	0.14395	0.15866	0.25556	0.95086	0.15783	0.30056

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.24935	0.50488	0.51296	10.30434	23.73437	0.24720	25.22850	0.50172	0.49778
#2	0.25061	0.50731	0.51370	10.32527	23.72418	0.24781	25.25922	0.50320	0.49847
Mean	**0.24998**	**0.50609**	**0.51333**	**10.31480**	**23.72927**	**0.24751**	**25.24386**	**0.50246**	**0.49812**
%RSD	0.35786	0.33959	0.10300	0.14347	0.03039	0.17340	0.08605	0.20949	0.09824

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	23.38221	0.50441	2.50957	0.50320	0.49637	2.62189	0.24938	0.51787	0.50561
#2	23.34448	0.50546	2.52038	0.50423	0.50122	2.60694	0.25027	0.51856	0.51597
Mean	**23.36334**	**0.50494**	**2.51498**	**0.50371**	**0.49880**	**2.61441**	**0.24982**	**0.51821**	**0.51079**
%RSD	0.11419	0.14733	0.30388	0.14433	0.68653	0.40432	0.25235	0.09452	1.43347

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.53559	0.51643	0.25195	0.25819	0.25273	2.52924	0.24984	0.49304	0.50120
#2	2.52847	0.52046	0.25252	0.25925	0.25012	2.53377	0.25007	0.49665	0.50276
Mean	**2.53203**	**0.51844**	**0.25223**	**0.25872**	**0.25143**	**2.53151**	**0.24995**	**0.49484**	**0.50198**
%RSD	0.19874	0.54885	0.15837	0.29210	0.73475	0.12637	0.06515	0.51558	0.21959

	Pb	**Se**
	calc	calc
#1	0.49865	0.50969
#2	0.50222	0.51683
Mean	**0.50043**	**0.51326**
%RSD	0.50480	0.98330

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54
SampleId1 : ICB SampleId2 : [CB]
Analysis commenced : 3/11/2013 12:37:47
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00051	0.04700	-0.00549	-0.00236	0.00092	0.00004	-0.00118	-0.04258	-0.00019
#2	0.00022	0.04292	-0.00211	-0.00046	0.00106	0.00002	-0.00328	-0.04289	0.00042
Mean	**-0.00014**	**0.04496**	**-0.00380**	**-0.00141**	**0.00099**	**0.00003**	**-0.00223**	**-0.04273**	**0.00012**
%RSD	363.95072	6.42280	62.95119	95.27928	10.43644	35.80993	66.50861	0.51685	378.22332

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00034	-0.00038	-0.00054	0.01015	-0.11696	-0.00265	0.00426	-0.00022	-0.00077
#2	-0.00052	-0.00010	-0.00046	0.01039	-0.11132	-0.00263	0.00334	-0.00010	-0.00052
Mean	**-0.00043**	**-0.00024**	**-0.00050**	**0.01027**	**-0.11414**	**-0.00264**	**0.00380**	**-0.00016**	**-0.00065**
%RSD	29.88504	81.59485	11.39835	1.60851	3.49511	0.41986	17.11320	52.32503	27.47698

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04598	-0.00068	-0.00196	-0.00014	-0.00123	-0.00662	-0.00056	0.00649	0.00450
#2	0.04562	-0.00164	-0.00539	-0.00181	-0.00147	0.00084	-0.00162	-0.00448	0.00194
Mean	**0.04580**	**-0.00116**	**-0.00367**	**-0.00097**	**-0.00135**	**-0.00289**	**-0.00109**	**0.00100**	**0.00322**
%RSD	0.56871	58.81616	65.92400	121.59221	12.70439	182.75204	68.71759	772.52089	56.07418

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01197	-0.00026	-0.00111	-0.00259	-0.00131	-0.03519	0.00023	-0.00179	0.00057

#2	-0.01161	0.00010	-0.00109	-0.00256	-0.00190	-0.02097	0.00017	-0.00179	0.00052
Mean	**-0.01179**	**-0.00008**	**-0.00110**	**-0.00258**	**-0.00160**	**-0.02808**	**0.00020**	**-0.00179**	**0.00055**
%RSD	2.11596	325.38537	1.20344	0.83828	25.90717	35.82377	20.25686	0.00000	6.43491

	Pb calc	**Se** calc
#1	-0.00087	0.00516
#2	-0.00159	-0.00020
Mean	**-0.00123**	**0.00248**
%RSD	41.49190	152.63450

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54
SampleId1 : CRI SampleId2 : [CV]
Analysis commenced : 3/11/2013 12:39:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.02186	0.45063	0.01713	0.41213	0.42455	0.01187	0.06090	5.21440	0.01181
#2	0.01994	0.43999	0.00675	0.41287	0.42725	0.01193	0.05125	5.23877	0.01136
Mean	**0.02090**	**0.44531**	**0.01194**	**0.41250**	**0.42590**	**0.01190**	**0.05607**	**5.22659**	**0.01158**
%RSD	6.48995	1.68945	61.44195	0.12614	0.44921	0.32770	12.16907	0.32971	2.75832

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.10371	0.02225	0.05344	0.20886	3.83315	0.01487	5.22376	0.03198	0.02299
#2	0.10250	0.02130	0.05255	0.20824	3.85371	0.01499	5.22592	0.03193	0.02035
Mean	**0.10310**	**0.02177**	**0.05300**	**0.20855**	**3.84343**	**0.01493**	**5.22484**	**0.03196**	**0.02167**
%RSD	0.83410	3.09540	1.19491	0.21149	0.37833	0.54394	0.02913	0.13126	8.61578

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	4.01878	0.08539	0.19901	0.01791	0.00258	0.27690	0.12509	0.01238	0.00981
#2	4.04500	0.08283	0.19513	0.00437	0.00770	0.27317	0.12615	0.01467	0.01765
Mean	**4.03189**	**0.08411**	**0.19707**	**0.01114**	**0.00514**	**0.27503**	**0.12562**	**0.01352**	**0.01373**
%RSD	0.45988	2.15582	1.39345	85.95079	70.42404	0.95920	0.59433	11.98334	40.37584

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	0.10307	0.10654	0.01860	0.01973	0.01850	0.22472	0.10566	0.03937	0.05384
#2	0.09809	0.10507	0.01858	0.01955	0.02086	0.17752	0.10498	0.03954	0.05293
Mean	**0.10058**	**0.10581**	**0.01859**	**0.01964**	**0.01968**	**0.20112**	**0.10532**	**0.03945**	**0.05338**
%RSD	3.50058	0.97787	0.07149	0.66016	8.47958	16.59680	0.46090	0.30735	1.20659

	Pb calc	**Se** calc
#1	0.00768	0.01066
#2	0.00659	0.01666

Mean	**0.00714**	**0.01366ser: STEVE WORKMAN**
%RSD	10.85628	31.01764

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:54
SampleId1 : ICSA **SampleId2 :** [ICSAB]
Analysis commenced : 3/11/2013 12:41:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00011	272.39214	-0.00479	0.00107	-0.00029	0.00029	0.00532	269.04128	0.00075
#2	-0.00061	273.26146	0.00151	0.00070	-0.00040	0.00029	0.00900	269.22769	-0.00010
Mean	**-0.00036**	**272.82680**	**-0.00164**	**0.00089**	**-0.00034**	**0.00029**	**0.00716**	**269.13449**	**0.00033**
%RSD	98.69928	0.22531	271.29376	29.27247	22.57086	0.15911	36.27477	0.04898	182.90418

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00260	-0.00139	-0.00624	110.10582	-0.21756	-0.00274	270.00817	0.00358	-0.00184
#2	0.00233	-0.00219	-0.00660	110.33474	-0.22085	-0.00276	270.42033	0.00340	-0.00109
Mean	**0.00246**	**-0.00179**	**-0.00642**	**110.22028**	**-0.21920**	**-0.00275**	**270.21425**	**0.00349**	**-0.00146**
%RSD	7.79542	31.65558	4.00846	0.14686	1.06143	0.40311	0.10786	3.60791	36.42716

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.07394	0.00156	0.01630	0.01358	-0.01274	0.02322	0.00341	0.01378	-0.00397
#2	0.07341	-0.00125	0.01402	0.00963	-0.01028	0.04934	0.00224	0.01404	0.00012
Mean	**0.07368**	**0.00016**	**0.01516**	**0.01160**	**-0.01151**	**0.03628**	**0.00282**	**0.01391**	**-0.00192**
%RSD	0.51085	1274.46285	10.64768	24.04995	15.06324	50.89168	29.33608	1.33429	150.27697

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	-0.00893	0.00449	-0.00181	-0.00181	-0.01379	0.11431	-0.00215	-0.00316	0.00213
#2	-0.00975	0.00266	-0.00184	-0.00178	-0.01046	0.10134	-0.00343	-0.00419	0.00200
Mean	**-0.00934**	**0.00358**	**-0.00182**	**-0.00179**	**-0.01212**	**0.10782**	**-0.00279**	**-0.00367**	**0.00206**
%RSD	6.18759	36.15041	1.09338	0.90304	19.45119	8.50857	32.25173	19.80834	4.41491

	Pb calc	Se calc
#1	-0.00397	0.00194
#2	-0.00365	0.00476
Mean	**-0.00381**	**0.00335**
%RSD	5.95632	59.37216

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:55
SampleId1 : ICSAB **SampleId2 :** [ICSAB]
Analysis commenced : 3/11/2013 12:43:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations6:26 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19879	262.06505	0.10465	0.99724	0.50958	0.49413	0.54133	259.30142	1.00533
#2	0.19788	261.41951	0.10337	0.99196	0.50760	0.49260	0.53868	258.14109	0.99861
Mean	**0.19834**	**261.74228**	**0.10401**	**0.99460**	**0.50859**	**0.49337**	**0.54000**	**258.72125**	**1.00197**
%RSD	0.32281	0.17439	0.87152	0.37483	0.27463	0.21997	0.34782	0.31713	0.47410

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47770	0.48027	0.53434	106.35849	-0.18935	1.05445	261.71790	0.48713	0.96129
#2	0.47418	0.47755	0.53230	105.96378	-0.19264	1.05197	260.41827	0.48624	0.95815
Mean	**0.47594**	**0.47891**	**0.53332**	**106.16114**	**-0.19100**	**1.05321**	**261.06809**	**0.48668**	**0.95972**
%RSD	0.52370	0.40186	0.27021	0.26290	1.21822	0.16640	0.35201	0.12975	0.23199

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03272	0.95806	0.98780	0.06421	0.03449	1.05687	0.59666	0.06811	0.04383
#2	0.03272	0.95164	0.98711	0.05582	0.04197	1.07180	0.58781	0.04526	0.05557
Mean	**0.03272**	**0.95485**	**0.98746**	**0.06002**	**0.03823**	**1.06434**	**0.59223**	**0.05669**	**0.04970**
%RSD	0.00000	0.47557	0.04919	9.88470	13.82787	0.99203	1.05708	28.49539	16.70844

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.96606	1.02360	0.98844	0.97974	0.08032	9.72791	0.48208	0.92725	0.48346
#2	0.96292	1.01299	0.98330	0.97762	0.08011	9.69691	0.47998	0.92416	0.48240
Mean	**0.96449**	**1.01829**	**0.98587**	**0.97868**	**0.08021**	**9.71241**	**0.48103**	**0.92570**	**0.48293**
%RSD	0.23023	0.73698	0.36909	0.15301	0.18376	0.22575	0.30966	0.23666	0.15533

	Pb	Se
	calc	calc
#1	0.04439	0.05191
#2	0.04658	0.05214
Mean	**0.04549**	**0.05202**
%RSD	3.40904	0.30669

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:55
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 12:44:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19233	49.61615	0.50709	0.99319	1.01196	0.48618	0.51786	49.98584	0.50468
#2	0.19270	49.70428	0.51175	0.99282	1.01405	0.48659	0.52137	50.04655	0.50481
Mean	**0.19251**	**49.66021**	**0.50942**	**0.99301**	**1.01300**	**0.48638**	**0.51961**	**50.01620**	**0.50475**
%RSD	0.13497	0.12549	0.64675	0.02619	0.14594	0.06016	0.47875	0.08582	0.01804

ted: 3/12/2013 13:06:26 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47984	0.96799	0.99218	20.05814	48.85844	0.51198	49.07378	0.95937	0.96621
#2	0.48070	0.97008	0.99172	20.08157	48.93014	0.51226	49.12741	0.96165	0.97080
Mean	**0.48027**	**0.96904**	**0.99195**	**20.06986**	**48.89429**	**0.51212**	**49.10059**	**0.96051**	**0.96851**
%RSD	0.12653	0.15231	0.03332	0.08255	0.10370	0.03840	0.07723	0.16719	0.33563

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.71247	0.98031	4.89166	0.97023	0.95115	5.04204	0.48523	0.99760	0.96012
#2	47.77106	0.97893	4.87615	0.97478	0.96627	5.03829	0.48482	0.99925	0.99042
Mean	**47.74177**	**0.97962**	**4.88390**	**0.97251**	**0.95871**	**5.04017**	**0.48503**	**0.99843**	**0.97527**
%RSD	0.08678	0.09967	0.22457	0.33038	1.11529	0.05252	0.05882	0.11711	2.19681

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.82468	1.02563	0.49741	0.49409	0.51245	4.83973	0.48167	0.94584	0.96198
#2	4.83305	1.02270	0.49810	0.49532	0.51329	4.83778	0.48133	0.94739	0.96361
Mean	**4.82887**	**1.02416**	**0.49776**	**0.49470**	**0.51287**	**4.83875**	**0.48150**	**0.94662**	**0.96279**
%RSD	0.12254	0.20229	0.09785	0.17555	0.11587	0.02843	0.05017	0.11572	0.12023

	Pb	Se
	calc	calc
#1	0.95751	0.97260
#2	0.96910	0.99336
Mean	**0.96330**	**0.98298**
%RSD	0.85142	1.49338

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:55
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 12:51:33
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00027	0.02133	-0.00122	-0.00653	-0.00011	0.00003	-0.00030	-0.06522	0.00008
#2	-0.00064	0.02718	0.00087	-0.00623	-0.00011	0.00005	-0.00294	-0.06070	-0.00018
Mean	**-0.00018**	**0.02426**	**-0.00017**	**-0.00638**	**-0.00011**	**0.00004**	**-0.00162**	**-0.06296**	**-0.00005**
%RSD	352.20796	17.07877	851.36152	3.39935	0.00000	20.42912	114.95354	5.08674	387.71854

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00088	-0.00066	-0.00131	0.00205	-0.07958	-0.00270	-0.01322	-0.00058	-0.00146
#2	-0.00065	-0.00049	-0.00194	0.00392	-0.09016	-0.00272	-0.01261	-0.00069	-0.00090
Mean	**-0.00077**	**-0.00058**	**-0.00162**	**0.00299**	**-0.08487**	**-0.00271**	**-0.01292**	**-0.00063**	**-0.00118**
%RSD	20.83398	21.51858	27.41957	44.21202	8.81353	0.40854	3.35883	13.21352	33.86199

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02331	-0.00199	-0.01703	0.00037	-0.00270	-0.01035	0.00195	0.01036	0.00282
#2	0.02425	-0.00175	-0.00379	-0.00098	0.00049	-0.01035	-0.00095	-0.00176	0.00159
Mean	**0.02378**	**-0.00187**	**-0.01041**	**-0.00031**	**-0.00110**	**-0.01035**	**0.00050**	**0.00430**	**0.00221**
%RSD	2.79786	9.10812	89.95978	311.41365	204.71882	0.00000	413.48618	199.48533	39.47803

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01479	0.00010	-0.00306	-0.00267	-0.00333	-0.01903	-0.00034	-0.00059	-0.00005
#2	-0.01717	0.00084	-0.00302	-0.00276	-0.00633	-0.05006	-0.00077	-0.00161	-0.00001
Mean	**-0.01598**	**0.00047**	**-0.00304**	**-0.00272**	**-0.00483**	**-0.03454**	**-0.00056**	**-0.00110**	**-0.00003**
%RSD	10.51738	110.23073	0.87427	2.38747	43.88238	63.53406	54.32228	66.10215	84.00690

	Pb	Se
	calc	calc
#1	-0.00168	0.00533
#2	0.00000	0.00047
Mean	**-0.00084**	**0.00290**
%RSD	141.92923	118.34313

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:55
SampleId1 : F130301-1MB SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 12:53:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE60

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00019	-0.00307	-0.00122	-0.00690	-0.00113	-0.00025	0.00039	-0.10193	-0.00043
#2	-0.00032	-0.00273	-0.00146	-0.00770	-0.00127	-0.00024	0.00231	-0.10146	-0.00076
Mean	**-0.00006**	**-0.00290**	**-0.00134**	**-0.00730**	**-0.00120**	**-0.00024**	**0.00135**	**-0.10169**	**-0.00059**
%RSD	585.89075	8.21041	12.30287	7.72429	8.59741	2.64695	100.62999	0.32578	39.73783

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00124	-0.00108	-0.00195	-0.01173	-0.13553	-0.00300	-0.04635	-0.00117	-0.00228
#2	-0.00079	-0.00154	-0.00232	-0.01157	-0.13788	-0.00299	-0.04635	-0.00111	-0.00260
Mean	**-0.00102**	**-0.00131**	**-0.00214**	**-0.01165**	**-0.13670**	**-0.00300**	**-0.04635**	**-0.00114**	**-0.00244**
%RSD	31.41088	25.00864	12.42330	0.94520	1.21586	0.12325	0.00000	3.68230	9.11364

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00365	-0.00278	-0.02114	-0.00073	-0.00260	-0.01781	0.00432	-0.00519	-0.00176
#2	-0.00360	-0.00278	-0.01360	-0.00088	-0.00298	-0.01408	0.00420	-0.00230	0.00344
Mean	**-0.00362**	**-0.00278**	**-0.01737**	**-0.00080**	**-0.00279**	**-0.01594**	**0.00426**	**-0.00374**	**0.00084**
%RSD	0.79790	0.00000	30.66665	13.85719	9.56352	16.54489	2.10101	54.46177	437.52589

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.01776	0.00047	-0.00446	-0.00283	-0.00525	-0.03713	-0.00089	-0.00196	-0.00055
#2	-0.01813	-0.00099	-0.00447	-0.00292	-0.00514	-0.03842	-0.00075	-0.00316	-0.00073
Mean	**-0.01794**	**-0.00026**	**-0.00446**	**-0.00288**	**-0.00520**	**-0.03778**	**-0.00082**	**-0.00256**	**-0.00064**
%RSD	1.46817	394.81280	0.14886	2.25428	1.61295	2.42089	12.41825	33.17887	19.76591

	Pb calc	**Se** calc
#1	-0.00197	-0.00290
#2	-0.00228	0.00153
Mean	**-0.00213**	**-0.00069**
%RSD	10.10458	455.63548

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:55
SampleId1 : IP130307-2MB SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 12:55:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE1

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00010	0.00892	-0.00344	-0.00635	-0.00120	-0.00019	-0.00591	-0.08787	-0.00103
#2	0.00004	0.00923	0.00274	-0.00708	-0.00109	-0.00020	0.00477	-0.08662	-0.00018
Mean	**0.00007**	**0.00908**	**-0.00035**	**-0.00672**	**-0.00115**	**-0.00019**	**-0.00057**	**-0.08725**	**-0.00061**
%RSD	54.59314	2.35451	1251.28595	7.74867	6.75610	3.36103	1320.78824	1.01261	100.19577

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	-0.00169	-0.00139	-0.00242	0.01810	-0.17737	-0.00307	-0.04022	-0.00093	-0.00310
#2	-0.00093	-0.00147	-0.00177	0.01825	-0.16044	-0.00306	-0.04114	-0.00087	-0.00322
Mean	**-0.00131**	**-0.00143**	**-0.00210**	**0.01818**	**-0.16890**	**-0.00306**	**-0.04068**	**-0.00090**	**-0.00316**
%RSD	41.46604	4.18894	21.86740	0.60599	7.08487	0.24124	1.59972	4.65116	2.81190

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.00229	-0.00184	-0.00539	-0.00076	0.00007	-0.01035	-0.00438	-0.00230	0.00150
#2	0.00274	-0.00118	0.00535	-0.00349	-0.00298	-0.01408	0.00234	-0.00463	0.00001
Mean	**0.00251**	**-0.00151**	**-0.00002**	**-0.00213**	**-0.00146**	**-0.01221**	**-0.00102**	**-0.00346**	**0.00076**
%RSD	12.67219	30.78919	37388.66010	90.73385	148.57044	21.59858	466.98782	47.48402	139.99994

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	-0.01421	-0.00319	-0.00442	-0.00316	-0.00381	-0.03584	-0.00117	-0.00230	-0.00066
#2	-0.01069	0.00413	-0.00440	-0.00317	-0.00177	-0.02485	-0.00077	-0.00144	-0.00027
Mean	**-0.01245**	**0.00047**	**-0.00441**	**-0.00316**	**-0.00279**	**-0.03034**	**-0.00097**	**-0.00187**	**-0.00047**
%RSD	20.04432	1100.91935	0.30120	0.17084	51.53715	25.61606	29.22891	32.38161	58.61333

	Pb calc	**Se** calc

#1	-0.00020	0.00024
#2	-0.00315	-0.00154
Mean	**-0.00168**	**-0.00065**
%RSD	124.17484	193.25519

ser: **STEVE WORKMAN**

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:56
SampleId1 : IP130307-2LCS SampleId2 : **[SAMPLE]**
Analysis commenced : 3/11/2013 12:56:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08979	1.90728	0.97134	0.88964	0.99791	0.04766	0.00287	37.86220	0.04983
#2	0.08965	1.91551	0.96284	0.88682	0.99336	0.04757	-0.00274	37.80627	0.04877
Mean	**0.08972**	**1.91139**	**0.96709**	**0.88823**	**0.99564**	**0.04762**	**0.00007**	**37.83423**	**0.04930**
%RSD	0.10782	0.30442	0.62140	0.22451	0.32300	0.12196	6010.44708	0.10454	1.52141

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.46871	0.19068	0.25238	0.99024	36.10866	0.47263	37.35120	0.47522	0.96293
#2	0.46793	0.19103	0.25050	0.98984	36.19428	0.47310	37.27664	0.47475	0.96111
Mean	**0.46832**	**0.19086**	**0.25144**	**0.99004**	**36.15147**	**0.47286**	**37.31392**	**0.47498**	**0.96202**
%RSD	0.11691	0.12896	0.52904	0.02797	0.16747	0.06921	0.14130	0.07090	0.13423

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	35.02863	0.49027	0.00215	0.47023	0.45680	-0.01408	0.46537	1.73886	1.66535
#2	35.10848	0.48528	0.00831	0.46750	0.46786	-0.02900	0.46522	1.73401	1.70290
Mean	**35.06856**	**0.48777**	**0.00523**	**0.46887**	**0.46233**	**-0.02154**	**0.46530**	**1.73643**	**1.68413**
%RSD	0.16101	0.72443	83.33130	0.41180	1.69170	48.98656	0.02248	0.19721	1.57661

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.06858	0.49421	0.48501	0.48869	1.86948	-0.02890	0.48635	0.46984	-0.00003
#2	1.06727	0.49823	0.48319	0.48834	1.85705	-0.02955	0.48570	0.47070	-0.00064
Mean	**1.06793**	**0.49622**	**0.48410**	**0.48852**	**1.86327**	**-0.02923**	**0.48602**	**0.47027**	**-0.00034**
%RSD	0.08701	0.57366	0.26597	0.04969	0.47181	1.56427	0.09590	0.12916	128.97165

	Pb	**Se**
	calc	calc
#1	0.46127	1.68983
#2	0.46774	1.71326
Mean	**0.46450**	**1.70155**
%RSD	0.98466	0.97382

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:56
SampleId1 : IP130307-3MB SampleId2 : **[SAMPLE]**
Analysis commenced : 3/11/2013 12:58:38

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE21

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00000	0.01426	0.00297	-0.00592	-0.00076	-0.00015	-0.00118	-0.07522	-0.00050
#2	-0.00038	0.02022	-0.00390	-0.00598	-0.00102	-0.00017	-0.00258	-0.07803	-0.00032
Mean	**-0.00019**	**0.01724**	**-0.00047**	**-0.00595**	**-0.00089**	**-0.00016**	**-0.00188**	**-0.07663**	**-0.00041**
%RSD	143.36868	24.46519	1044.27139	0.72893	20.28706	11.47475	52.55838	2.59417	30.76279

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00088	-0.00096	-0.00177	0.01015	-0.12401	-0.00290	-0.02917	-0.00075	-0.00128
#2	-0.00115	-0.00074	-0.00253	0.00976	-0.13882	-0.00295	-0.03009	-0.00075	-0.00128
Mean	**-0.00102**	**-0.00085**	**-0.00215**	**0.00996**	**-0.13141**	**-0.00292**	**-0.02963**	**-0.00075**	**-0.00128**
%RSD	18.82802	18.48370	25.19812	2.76470	7.96828	1.19958	2.19587	0.00000	0.00000

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02123	-0.00133	0.00215	-0.00163	-0.00269	-0.00289	0.00063	-0.00436	0.00371
#2	0.01808	-0.00206	0.00694	-0.00340	-0.00188	-0.02154	-0.00227	-0.00682	0.00538
Mean	**0.01965**	**-0.00170**	**0.00455**	**-0.00251**	**-0.00229**	**-0.01221**	**-0.00082**	**-0.00559**	**0.00454**
%RSD	11.33576	30.14866	74.57870	49.78859	24.88300	107.99317	250.79382	31.14438	26.04780

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00889	-0.00319	-0.00426	-0.00274	-0.00286	-0.03131	0.00006	-0.00144	-0.00035
#2	-0.00994	0.00047	-0.00433	-0.00310	-0.00213	-0.01838	-0.00014	-0.00093	-0.00026
Mean	**-0.00942**	**-0.00136**	**-0.00429**	**-0.00292**	**-0.00250**	**-0.02485**	**-0.00004**	**-0.00119**	**-0.00031**
%RSD	7.85162	190.29911	1.08304	8.87563	20.53503	36.80527	339.67694	30.66239	20.55785

	Pb	Se
	calc	calc
#1	-0.00234	0.00102
#2	-0.00239	0.00132
Mean	**-0.00236**	**0.00117**
%RSD	1.57719	17.93406

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:56
SampleId1 : IP130307-3LCS SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:00:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE22

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09123	1.93931	0.98764	0.90166	1.00459	0.04865	0.00359	38.70200	0.05036
#2	0.09068	1.93889	0.98205	0.90068	1.00426	0.04863	0.00289	38.75767	0.05011

Mean	0.09095	1.93910	0.98484	0.90117	1.00442	0.04864	0.00324	38.72984	0.05023
%RSD	0.42550	0.01499	0.40121	0.07697	0.02324	0.03529	15.40377	0.10163	0.35525

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47783	0.19496	0.25468	1.00073	36.79487	0.47406	38.04238	0.48379	0.97445
#2	0.47828	0.19449	0.25394	1.00065	36.89094	0.47513	38.09388	0.48481	0.98112
Mean	**0.47806**	**0.19472**	**0.25431**	**1.00069**	**36.84290**	**0.47459**	**38.06813**	**0.48430**	**0.97779**
%RSD	0.06683	0.17186	0.20544	0.00553	0.18438	0.15882	0.09565	0.14777	0.48274

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	35.41686	0.49778	0.00671	0.48423	0.47054	-0.02900	0.47496	1.74330	1.69235
#2	35.48323	0.49805	0.00945	0.48086	0.47587	-0.01781	0.47580	1.75629	1.71319
Mean	**35.45004**	**0.49791**	**0.00808**	**0.48254**	**0.47320**	**-0.02340**	**0.47538**	**1.74979**	**1.70277**
%RSD	0.13238	0.03735	23.96259	0.49427	0.79563	33.81186	0.12479	0.52502	0.86522

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.08968	0.50371	0.49203	0.49651	1.90183	-0.01533	0.49603	0.48064	-0.00040
#2	1.08543	0.50664	0.49171	0.49644	1.88950	-0.02955	0.49537	0.48425	-0.00076
Mean	**1.08756**	**0.50518**	**0.49187**	**0.49647**	**1.89566**	**-0.02244**	**0.49570**	**0.48244**	**-0.00058**
%RSD	0.27627	0.40978	0.04612	0.00978	0.45962	44.82890	0.09388	0.52880	43.51694

	Pb	Se
	calc	calc
#1	0.47510	1.70932
#2	0.47753	1.72754
Mean	**0.47631**	**1.71843**
%RSD	0.36048	0.74986

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:56
SampleId1 : IP130307-4MB SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:02:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE42

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00069	0.00452	-0.00262	-0.00604	-0.00109	-0.00023	-0.00486	-0.06616	-0.00068
#2	-0.00014	0.00900	0.00484	-0.00635	-0.00109	-0.00026	-0.00171	-0.06663	-0.00035
Mean	**-0.00041**	**0.00676**	**0.00111**	**-0.00619**	**-0.00109**	**-0.00025**	**-0.00328**	**-0.06640**	**-0.00051**
%RSD	95.15096	46.86088	476.11952	3.50031	0.00000	8.51051	67.88763	0.49898	44.92379

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00160	-0.00118	-0.00180	0.01553	-0.15739	-0.00297	-0.03408	-0.00046	-0.00134
#2	-0.00183	-0.00081	-0.00095	0.01584	-0.15833	-0.00299	-0.03285	-0.00040	-0.00097
Mean	**-0.00172**	**-0.00099**	**-0.00138**	**0.01568**	**-0.15786**	**-0.00298**	**-0.03347**	**-0.00043**	**-0.00116**

%RSD	9.29895	26.13235	43.51429	1.40455	0.42116	0.43306	2.59239	9.81717	23.07810

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00597	-0.00084	-0.00036	-0.00246	0.00281	-0.00662	-0.00537	-0.01123	0.00300
#2	0.00494	-0.00055	-0.00539	-0.00245	-0.00035	-0.01035	-0.00353	-0.00188	0.00089
Mean	**0.00546**	**-0.00070**	**-0.00287**	**-0.00245**	**0.00123**	**-0.00848**	**-0.00445**	**-0.00656**	**0.00194**
%RSD	13.25403	28.93344	123.57016	0.44602	181.81152	31.09733	29.25612	100.76473	76.84754

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00435	-0.00465	-0.00231	-0.00319	-0.00674	-0.03261	-0.00048	-0.00044	-0.00051
#2	-0.00294	0.00157	-0.00229	-0.00327	-0.00269	-0.03261	-0.00046	-0.00061	-0.00045
Mean	**-0.00365**	**-0.00154**	**-0.00230**	**-0.00323**	**-0.00472**	**-0.03261**	**-0.00047**	**-0.00053**	**-0.00048**
%RSD	27.18698	285.18165	0.57816	1.83921	60.81783	0.00012	4.25052	22.91531	8.68571

	Pb	**Se**
	calc	calc
#1	0.00106	-0.00174
#2	-0.00105	-0.00004
Mean	**0.00000**	**-0.00089**
%RSD	33692.56522	135.77420

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:56
SampleId1 : IP130307-4LCS SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:03:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE43

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08998	1.92010	0.98368	0.89774	1.01148	0.04855	-0.00218	38.55483	0.05039
#2	0.09058	1.91462	0.97134	0.88909	1.00448	0.04843	-0.00569	38.38166	0.04975
Mean	**0.09028**	**1.91736**	**0.97751**	**0.89341**	**1.00798**	**0.04849**	**-0.00394**	**38.46825**	**0.05007**
%RSD	0.47172	0.20199	0.89267	0.68417	0.49146	0.17652	62.94159	0.31831	0.90686

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47458	0.19397	0.25508	1.00316	36.10570	0.48435	37.71128	0.48290	0.97684
#2	0.47277	0.19495	0.25526	0.99838	36.00529	0.48303	37.57117	0.48147	0.97426
Mean	**0.47368**	**0.19446**	**0.25517**	**1.00077**	**36.05549**	**0.48369**	**37.64122**	**0.48219**	**0.97555**
%RSD	0.27079	0.35738	0.05128	0.33759	0.19692	0.19345	0.26319	0.20953	0.18715

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	35.54794	0.49557	0.00671	0.47778	0.46687	-0.01035	0.46612	1.70648	1.63291
#2	35.46551	0.48943	0.00055	0.48028	0.47772	-0.01781	0.46622	1.69749	1.67474
Mean	**35.50673**	**0.49250**	**0.00363**	**0.47903**	**0.47229**	**-0.01408**	**0.46617**	**1.70199**	**1.65383**
%RSD	0.16415	0.88111	119.99242	0.36944	1.62483	37.47391	0.01559	0.37343	1.78847

ted: 3/12/2013 13:06:27 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.12242	0.49859	0.49466	0.49746	1.89198	-0.03279	0.49609	0.47342	-0.00092
#2	1.12240	0.50664	0.49094	0.49539	1.87601	-0.02955	0.49314	0.47325	-0.00076
Mean	**1.12241**	**0.50261**	**0.49280**	**0.49642**	**1.88400**	**-0.03117**	**0.49461**	**0.47334**	**-0.00084**
%RSD	0.00085	1.13296	0.53342	0.29556	0.59947	7.33684	0.42199	0.02566	13.31188

	Pb	Se
	calc	calc
#1	0.47050	1.65741
#2	0.47857	1.68232
Mean	**0.47454**	**1.66986**
%RSD	1.20283	1.05471

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:57
SampleId1 : 1303058-1 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:05:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE3

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00142	99.19145	0.08421	0.02916	0.97279	0.00861	0.01243	51.21333	0.00065
#2	-0.00253	99.35732	0.08619	0.02984	0.97224	0.00855	0.01487	51.06154	0.00075
Mean	**-0.00198**	**99.27438**	**0.08520**	**0.02950**	**0.97251**	**0.00858**	**0.01365**	**51.13743**	**0.00070**
%RSD	39.77239	0.11814	1.64434	1.61710	0.04000	0.48673	12.67689	0.20988	10.41970

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.07063	0.08109	0.09758	229.54026	37.57016	0.11061	28.03790	3.04772	0.00890
#2	0.06973	0.08073	0.09712	228.98868	37.58599	0.11024	28.01926	3.04444	0.00777
Mean	**0.07018**	**0.08091**	**0.09735**	**229.26447**	**37.57808**	**0.11042**	**28.02858**	**3.04608**	**0.00834**
%RSD	0.91080	0.31543	0.33556	0.17012	0.02977	0.23548	0.04703	0.07616	9.59764

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.62159	0.10303	3.73992	0.15326	0.14027	6.29681	0.00239	0.07970	0.08548
#2	0.60971	0.10316	3.73092	0.15170	0.14387	6.22186	0.00370	0.07708	0.08301
Mean	**0.61565**	**0.10309**	**3.73542**	**0.15248**	**0.14207**	**6.25934**	**0.00305**	**0.07839**	**0.08425**
%RSD	1.36486	0.09020	0.17036	0.72369	1.79400	0.84663	30.59616	2.36341	2.06949

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	15.60599	0.00302	0.55985	0.31698	-0.02035	0.49558	0.46044	0.51775	0.04352
#2	15.64574	0.01034	0.55887	0.31662	-0.01168	0.48663	0.45827	0.51534	0.04374
Mean	**15.62586**	**0.00668**	**0.55936**	**0.31680**	**-0.01602**	**0.49110**	**0.45936**	**0.51655**	**0.04363**
%RSD	0.17988	77.42279	0.12293	0.08177	38.26363	1.28920	0.33381	0.32930	0.35751

	Pb	Seser: STEVE WORKMAN
	calc	calc
#1	0.14460	0.08355
#2	0.14648	0.08104
Mean	**0.14554**	**0.08230**
%RSD	0.91560	2.16272

Method : Paragon2　　File : 130311A　　Printed : 3/12/2013 13:05:57
SampleId1 : 1303058-1D　　**SampleId2 :**　　**[SAMPLE]**
Analysis commenced : 3/11/2013 13:07:05
Dilution ratio : 1.00000 to 1.00000　　Tray :　　Position : TUBE4

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00350	99.45266	0.08817	0.02573	0.97833	0.00857	0.00765	50.64219	0.00047
#2	-0.00404	99.97184	0.08363	0.02554	0.98441	0.00862	0.00747	50.83109	-0.00003
Mean	**-0.00377**	**99.71225**	**0.08590**	**0.02564**	**0.98137**	**0.00859**	**0.00756**	**50.73664**	**0.00022**
%RSD	10.15943	0.36817	3.74159	0.50750	0.43865	0.39843	1.67634	0.26326	163.02812

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06757	0.07953	0.09817	228.90489	37.79638	0.11239	27.93196	3.03259	0.00664
#2	0.06794	0.08045	0.09782	229.98959	37.96329	0.11302	28.03914	3.04966	0.00714
Mean	**0.06775**	**0.07999**	**0.09800**	**229.44724**	**37.87983**	**0.11271**	**27.98555**	**3.04113**	**0.00689**
%RSD	0.38176	0.81832	0.25294	0.33428	0.31159	0.39431	0.27083	0.39696	5.16064

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.57498	0.10265	3.69146	0.14719	0.14972	6.87026	0.00134	0.07060	0.08529
#2	0.57774	0.10130	3.71500	0.14041	0.15185	6.90025	0.00067	0.06961	0.09234
Mean	**0.57636**	**0.10198**	**3.70323**	**0.14380**	**0.15079**	**6.88526**	**0.00101**	**0.07011**	**0.08881**
%RSD	0.33898	0.94226	0.44939	3.33464	0.99628	0.30801	47.05924	0.99598	5.60816

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.52555	0.00451	0.55523	0.29449	-0.02345	0.46465	0.45090	0.51758	0.04483
#2	11.59151	0.00158	0.55864	0.29654	-0.02436	0.43794	0.45248	0.51809	0.04527
Mean	**11.55853**	**0.00305**	**0.55693**	**0.29552**	**-0.02391**	**0.45130**	**0.45169**	**0.51784**	**0.04505**
%RSD	0.40358	67.92510	0.43271	0.49130	2.67244	4.18502	0.24794	0.07039	0.68075

	Pb	Se
	calc	calc
#1	0.14888	0.08040
#2	0.14804	0.08477
Mean	**0.14846**	**0.08258**
%RSD	0.40068	3.74127

Method : Paragon2　　File : 130311A　　Printed : 3/12/2013 13:05:57

SampleId1 : 1303058-1L 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 13:08:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE5

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00038	19.73472	0.01276	0.00046	0.19964	0.00168	0.00444	10.40670	-0.00022
#2	-0.00053	19.69727	0.01288	0.00083	0.19913	0.00166	0.00883	10.40527	-0.00012
Mean	**-0.00045**	**19.71599**	**0.01282**	**0.00064**	**0.19939**	**0.00167**	**0.00664**	**10.40599**	**-0.00017**
%RSD	23.38257	0.13429	0.64279	40.43066	0.18131	0.86073	46.70155	0.00968	43.03558

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01373	0.01564	0.01816	41.47078	6.26565	0.01669	5.75578	0.62944	0.00111
#2	0.01467	0.01634	0.01862	41.47779	6.25166	0.01668	5.76255	0.62914	0.00136
Mean	**0.01420**	**0.01599**	**0.01839**	**41.47428**	**6.25865**	**0.01669**	**5.75917**	**0.62929**	**0.00123**
%RSD	4.71876	3.12335	1.76428	0.01196	0.15809	0.04424	0.08308	0.03349	14.41886

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11298	0.02038	0.74587	0.02938	0.02801	1.29954	0.00163	0.01538	0.01384
#2	0.11285	0.02165	0.76647	0.03292	0.02745	1.29580	-0.00194	0.01966	0.01297
Mean	**0.11292**	**0.02101**	**0.75617**	**0.03115**	**0.02773**	**1.29767**	**-0.00015**	**0.01752**	**0.01341**
%RSD	0.07697	4.27777	1.92566	8.02053	1.43675	0.20345	1667.98677	17.24003	4.64101

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.25820	-0.00180	0.11306	0.06210	0.00023	0.06530	0.09273	0.10503	0.00819
#2	3.26258	0.00625	0.11285	0.06251	0.00143	0.07758	0.09307	0.10606	0.00852
Mean	**3.26039**	**0.00222**	**0.11295**	**0.06230**	**0.00083**	**0.07144**	**0.09290**	**0.10554**	**0.00835**
%RSD	0.09507	255.99677	0.12950	0.45945	102.17401	12.15986	0.26204	0.68955	2.84475

	Pb	Se
	calc	calc
#1	0.02847	0.01436
#2	0.02927	0.01519
Mean	**0.02887**	**0.01478**
%RSD	1.96123	3.99902

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:57
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 13:10:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.19567	49.96292	0.52382	1.00288	1.02487	0.48958	0.52705	50.64800	0.51415
#2	0.19493	50.08480	0.52289	1.00373	1.02685	0.48971	0.52125	50.63091	0.51301
Mean	**0.19530**	**50.02386**	**0.52335**	**1.00330**	**1.02586**	**0.48964**	**0.52415**	**50.63945**	**0.51358**
%RSD	0.26795	0.17227	0.12591	0.06049	0.13654	0.01939	0.78214	0.02387	0.15801

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48483	0.97576	1.00752	20.13986	49.22907	0.51699	49.43385	0.96463	0.98333
#2	0.48515	0.97640	1.01025	20.16745	49.34420	0.51808	49.46428	0.96637	0.98276
Mean	**0.48499**	**0.97608**	**1.00888**	**20.15365**	**49.28663**	**0.51754**	**49.44906**	**0.96550**	**0.98304**
%RSD	0.04629	0.04662	0.19142	0.09680	0.16518	0.14914	0.04351	0.12694	0.04077

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.28762	1.00498	4.91944	0.98541	0.95201	5.06450	0.49612	1.01680	0.96537
#2	48.34597	1.00564	4.93357	0.98136	0.96424	5.09071	0.49756	1.02273	0.98563
Mean	**48.31679**	**1.00531**	**4.92650**	**0.98338**	**0.95813**	**5.07760**	**0.49684**	**1.01976**	**0.97550**
%RSD	0.08540	0.04625	0.20271	0.29079	0.90234	0.36497	0.20543	0.41075	1.46863

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.86010	1.03478	0.50622	0.49328	0.51647	4.86689	0.48626	0.95493	0.97282
#2	4.86846	1.04210	0.50690	0.49413	0.50958	4.85783	0.48452	0.95700	0.97318
Mean	**4.86428**	**1.03844**	**0.50656**	**0.49370**	**0.51302**	**4.86236**	**0.48539**	**0.95597**	**0.97300**
%RSD	0.12151	0.49846	0.09484	0.12128	0.95021	0.13181	0.25382	0.15279	0.02587

	Pb	**Se**
	calc	calc
#1	0.96313	0.98250
#2	0.96994	0.99798
Mean	**0.96654**	**0.99024**
%RSD	0.49810	1.10585

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:57
SampleId1 : CCB **SampleId2 : [CB]**
Analysis commenced : 3/11/2013 13:12:27
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00098	0.05761	0.00018	-0.00708	-0.00014	0.00021	-0.00031	-0.06210	-0.00043
#2	-0.00069	0.05832	-0.00251	-0.00708	-0.00018	0.00020	-0.00521	-0.06163	-0.00030
Mean	**-0.00083**	**0.05797**	**-0.00116**	**-0.00708**	**-0.00016**	**0.00020**	**-0.00276**	**-0.06187**	**-0.00037**
%RSD	24.59451	0.86385	162.71584	0.00000	16.07614	2.42319	125.76733	0.53551	25.87950

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00066	-0.00068	-0.00105	0.00361	-0.11790	-0.00273	-0.01414	-0.00058	0.00029

#2	-0.00093	-0.00024	-0.00056	0.00369	-0.13200	-0.00275	-0.01046	-0.00063	-0.00116
Mean	**-0.00079**	**-0.00046**	**-0.00081**	**0.00365**	**-0.12495**	**-0.00274**	**-0.01230**	**-0.00061**	**-0.00043**
%RSD	24.19762	67.06530	42.49898	1.50820	7.98151	0.40426	21.15804	6.93054	236.25649

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02380	-0.00110	-0.01520	-0.00368	0.00189	-0.01408	0.00030	-0.00161	0.00432
#2	0.02327	-0.00082	-0.01566	-0.00204	0.00027	-0.00662	-0.00407	-0.00410	0.00511
Mean	**0.02354**	**-0.00096**	**-0.01543**	**-0.00286**	**0.00108**	**-0.01035**	**-0.00189**	**-0.00285**	**0.00472**
%RSD	1.59789	21.00118	2.09232	40.52278	105.87380	50.98373	163.69028	61.68430	11.88521

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00752	-0.00099	-0.00106	-0.00245	-0.00508	-0.03002	-0.00080	0.00059	0.00005
#2	-0.00787	-0.00794	-0.00103	-0.00278	0.00267	-0.04489	-0.00066	-0.00044	0.00007
Mean	**-0.00769**	**-0.00447**	**-0.00104**	**-0.00262**	**-0.00121**	**-0.03745**	**-0.00073**	**0.00007**	**0.00006**
%RSD	3.27522	109.96217	1.90931	9.08643	453.63356	28.07787	13.80556	1024.13289	22.04284

	Pb	**Se**
	calc	calc
#1	0.00003	0.00235
#2	-0.00050	0.00205
Mean	**-0.00023**	**0.00220**
%RSD	161.38959	9.63882

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:57
SampleId1 : 1303058-1MS SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:14:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE6

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09146	129.68632	1.07029	0.79155	1.99693	0.05723	0.02282	86.42517	0.05254
#2	0.09082	129.43268	1.06936	0.78401	1.99092	0.05706	0.00985	85.94336	0.05199
Mean	**0.09114**	**129.55950**	**1.06982**	**0.78778**	**1.99392**	**0.05714**	**0.01634**	**86.18427**	**0.05227**
%RSD	0.49891	0.13843	0.06155	0.67689	0.21316	0.20482	56.11750	0.39531	0.73850

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.54296	0.28251	0.35853	226.01594	81.95892	0.65917	68.54826	3.28447	0.87024
#2	0.54033	0.28064	0.35741	224.88883	81.85306	0.65813	68.25253	3.27498	0.86671
Mean	**0.54164**	**0.28157**	**0.35797**	**225.45238**	**81.90599**	**0.65865**	**68.40039**	**3.27972**	**0.86847**
%RSD	0.34324	0.46887	0.22113	0.35350	0.09139	0.11175	0.30572	0.20472	0.28707

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	40.54914	0.60728	3.59203	0.63608	0.59014	6.24809	0.30331	1.83329	1.73440
#2	40.49491	0.59613	3.57289	0.62478	0.60298	6.27807	0.28957	1.81917	1.78082

Mean	**40.52203**	**0.60171**	**3.58246**	**0.63043**	**0.59656**	**6.26308**	**0.29644**	**1.82623**	**1.75761**
%RSD	0.09463	1.31103	0.37788	1.26686	1.52218	0.33845	3.27704	0.54693	1.86747

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.12844	0.51490	1.05751	0.63233	1.89161	0.47746	0.96591	0.97748	0.04162
#2	11.11050	0.51087	1.05321	0.63151	1.89246	0.46797	0.96129	0.96750	0.04109
Mean	**11.11947**	**0.51289**	**1.05536**	**0.63192**	**1.89203**	**0.47272**	**0.96360**	**0.97249**	**0.04136**
%RSD	0.11407	0.55484	0.28782	0.09130	0.03186	1.42050	0.33939	0.72601	0.89241

	Pb	**Se**
	calc	calc
#1	0.60544	1.76733
#2	0.61024	1.79359
Mean	**0.60784**	**1.78046**
%RSD	0.55891	1.04281

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:58
SampleId1 : 1303058-1MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:16:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE7

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08873	126.65181	1.05097	0.76960	1.94881	0.05605	0.01317	86.45019	0.05061
#2	0.08761	125.65002	1.02780	0.76506	1.93923	0.05580	0.01946	86.07685	0.05052
Mean	**0.08817**	**126.15092**	**1.03938**	**0.76733**	**1.94402**	**0.05592**	**0.01631**	**86.26352**	**0.05057**
%RSD	0.89533	0.56153	1.57598	0.41809	0.34865	0.32156	27.26998	0.30603	0.12356

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.52933	0.27598	0.35318	220.50166	80.35575	0.64545	67.19516	3.27899	0.84468
#2	0.52602	0.27480	0.34932	219.67908	79.82314	0.64108	66.88791	3.26901	0.84700
Mean	**0.52768**	**0.27539**	**0.35125**	**220.09037**	**80.08944**	**0.64327**	**67.04153**	**3.27400**	**0.84584**
%RSD	0.44357	0.30264	0.77654	0.26428	0.47024	0.48003	0.32407	0.21559	0.19474

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	39.62871	0.59247	3.49978	0.61620	0.58443	6.40548	0.28873	1.77032	1.69581
#2	39.37696	0.58745	3.50162	0.61511	0.59645	6.36801	0.28387	1.75718	1.72902
Mean	**39.50284**	**0.58996**	**3.50070**	**0.61566**	**0.59044**	**6.38675**	**0.28630**	**1.76375**	**1.71242**
%RSD	0.45064	0.60158	0.03726	0.12494	1.43919	0.41491	1.20017	0.52695	1.37162

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.58129	0.49551	1.05219	0.62860	1.85778	0.47264	0.94702	0.94908	0.03969
#2	10.50534	0.49405	1.04597	0.62672	1.82575	0.47344	0.94150	0.94650	0.03932
Mean	**10.54331**	**0.49478**	**1.04908**	**0.62766**	**1.84177**	**0.47304**	**0.94426**	**0.94779**	**0.03951**

%RSD	0.50934	0.20888	0.41927	0.21133	1.22998	0.11891	0.41274	0.19263	0.64879

	Pb calc	Se calc
#1	0.59501	1.72062
#2	0.60267	1.73840
Mean	**0.59884**	**1.72951**
%RSD	0.90371	0.72688

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:58
SampleId1 : 1303058-2 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:17:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE8

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00171	55.54640	0.06626	0.01745	1.22325	0.00567	0.00829	89.61076	-0.00019
#2	-0.00207	55.21659	0.06346	0.01751	1.21928	0.00562	0.00618	89.25695	-0.00016
Mean	**-0.00189**	**55.38150**	**0.06486**	**0.01748**	**1.22127**	**0.00565**	**0.00724**	**89.43386**	**-0.00017**
%RSD	13.64933	0.42110	3.04937	0.24811	0.22963	0.65100	20.58072	0.27973	13.71444

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.03735	0.04213	0.04836	137.31995	15.89778	0.06113	18.04580	1.62608	0.00406
#2	0.03712	0.04175	0.04771	136.93790	15.82305	0.06089	17.98703	1.62115	0.00494
Mean	**0.03724**	**0.04194**	**0.04803**	**137.12892**	**15.86041**	**0.06101**	**18.01641**	**1.62362**	**0.00450**
%RSD	0.43839	0.63807	0.95361	0.19700	0.33316	0.27818	0.23064	0.21456	13.82305

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.24707	0.05910	2.17170	0.09581	0.09006	6.83652	0.00072	0.09183	0.08091
#2	0.24494	0.06018	2.18571	0.09825	0.09519	6.82528	0.00178	0.07876	0.08640
Mean	**0.24600**	**0.05964**	**2.17871**	**0.09703**	**0.09262**	**6.83090**	**0.00125**	**0.08529**	**0.08365**
%RSD	0.61350	1.27326	0.45484	1.78409	3.91966	0.11642	60.34167	10.83502	4.64180

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	14.68498	0.00498	0.35565	0.21113	-0.01046	0.67264	0.61275	0.27044	0.02609
#2	14.61725	0.00351	0.35409	0.21081	-0.01710	0.66107	0.61002	0.26787	0.02631
Mean	**14.65112**	**0.00424**	**0.35487**	**0.21097**	**-0.01378**	**0.66686**	**0.61139**	**0.26916**	**0.02620**
%RSD	0.32688	24.36900	0.31170	0.10748	34.06092	1.22699	0.31652	0.67643	0.59561

	Pb calc	Se calc
#1	0.09197	0.08454
#2	0.09621	0.08385
Mean	**0.09409**	**0.08420**
%RSD	3.18630	0.57886

ted: 3/12/2013 13:06:27 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:58
SampleId1 : 1303058-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:19:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE9

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00185	70.03940	0.06521	0.01910	2.11184	0.00564	0.00573	103.58580	-0.00011
#2	-0.00154	69.28343	0.06253	0.01874	2.09191	0.00561	0.01151	102.85479	-0.00019
Mean	**-0.00170**	**69.66141**	**0.06387**	**0.01892**	**2.10187**	**0.00562**	**0.00862**	**103.22030**	**-0.00015**
%RSD	13.16366	0.76735	2.96764	1.37527	0.67031	0.30493	47.39195	0.50077	38.65651

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03904	0.05521	0.05920	150.99499	18.36243	0.08728	25.63007	1.86146	0.00211
#2	0.03969	0.05466	0.05843	149.95829	18.18622	0.08644	25.42741	1.84882	0.00205
Mean	**0.03936**	**0.05494**	**0.05882**	**150.47664**	**18.27432**	**0.08686**	**25.52874**	**1.85514**	**0.00208**
%RSD	1.17564	0.70797	0.92160	0.48716	0.68184	0.68376	0.56132	0.48180	2.13523

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.28879	0.07212	2.72143	0.09531	0.08655	5.37903	0.00064	0.07637	0.08342
#2	0.28612	0.07212	2.70969	0.09352	0.08694	5.34158	0.00447	0.08010	0.08123
Mean	**0.28745**	**0.07212**	**2.71556**	**0.09441**	**0.08674**	**5.36030**	**0.00255**	**0.07823**	**0.08232**
%RSD	0.65669	0.00000	0.30556	1.33717	0.32023	0.49399	106.17371	3.36615	1.88122

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	9.85560	0.00602	0.39006	0.26001	-0.02248	0.46387	0.47535	0.26752	0.02874
#2	9.77280	0.00163	0.38666	0.25792	-0.01571	0.47764	0.47194	0.26701	0.02890
Mean	**9.81420**	**0.00382**	**0.38836**	**0.25896**	**-0.01909**	**0.47076**	**0.47365**	**0.26727**	**0.02882**
%RSD	0.59657	81.14536	0.61959	0.57113	25.07197	2.06802	0.50875	0.13624	0.40255

	Pb	Se
	calc	calc
#1	0.08946	0.08107
#2	0.08913	0.08085
Mean	**0.08930**	**0.08096**
%RSD	0.26329	0.19271

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:58
SampleId1 : 1303058-4 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:21:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE10

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00248	78.39235	0.07430	0.01996	0.91137	0.00808	0.01608	130.88497	0.00023
#2	-0.00179	77.74484	0.07267	0.01874	0.90309	0.00803	0.00995	130.24911	0.00052
Mean	**-0.00213**	**78.06859**	**0.07349**	**0.01935**	**0.90723**	**0.00805**	**0.01301**	**130.56704**	**0.00038**
%RSD	22.85392	0.58649	1.57002	4.48253	0.64575	0.40015	33.30668	0.34436	53.82232

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05444	0.06065	0.07627	208.47831	26.01313	0.10538	25.96776	2.16069	0.00488
#2	0.05506	0.06080	0.07550	207.55633	25.82417	0.10472	25.84950	2.14868	0.00412
Mean	**0.05475**	**0.06073**	**0.07588**	**208.01732**	**25.91865**	**0.10505**	**25.90863**	**2.15468**	**0.00450**
%RSD	0.80603	0.16913	0.71427	0.31341	0.51552	0.44942	0.32276	0.39403	11.84833

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.57510	0.08190	3.36329	0.13198	0.12123	12.62172	0.00611	0.16570	0.17462
#2	0.57081	0.08146	3.33586	0.13523	0.12195	12.58408	0.00505	0.17287	0.17465
Mean	**0.57296**	**0.08168**	**3.34957**	**0.13360**	**0.12159**	**12.60290**	**0.00558**	**0.16929**	**0.17463**
%RSD	0.52927	0.37948	0.57906	1.71758	0.41750	0.21121	13.46052	2.99203	0.01253

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.19682	0.01114	0.56779	0.26050	-0.02067	1.01676	1.07417	0.38204	0.04158
#2	10.12426	0.00565	0.56283	0.25910	-0.02410	1.03051	1.06924	0.38084	0.04155
Mean	**10.16054**	**0.00840**	**0.56531**	**0.25980**	**-0.02239**	**1.02363**	**1.07170**	**0.38144**	**0.04157**
%RSD	0.50492	46.20568	0.62001	0.38022	10.83290	0.94970	0.32533	0.22285	0.04447

	Pb	Se
	calc	calc
#1	0.12481	0.17165
#2	0.12637	0.17406
Mean	**0.12559**	**0.17285**
%RSD	0.87805	0.98423

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:58
SampleId1 : 1303058-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:23:04
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE11

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00112	64.88586	0.06218	0.01463	1.78840	0.00642	0.00708	81.66859	0.00036
#2	-0.00088	64.89268	0.06160	0.01536	1.79278	0.00643	0.01076	81.83875	0.00061
Mean	**-0.00100**	**64.88927**	**0.06189**	**0.01499**	**1.79059**	**0.00643**	**0.00892**	**81.75367**	**0.00049**
%RSD	17.05812	0.00744	0.66579	3.47054	0.17310	0.12361	29.14869	0.14718	36.52536

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04365	0.05312	0.06569	159.35215	17.28098	0.07793	21.63283	2.06907	0.00500
#2	0.04393	0.05327	0.06637	159.86811	17.26196	0.07796	21.69046	2.07510	0.00563
Mean	**0.04379**	**0.05319**	**0.06603**	**159.61013**	**17.27147**	**0.07794**	**21.66164**	**2.07208**	**0.00532**
%RSD	0.44540	0.19138	0.71932	0.22858	0.07786	0.03077	0.18810	0.20576	8.35668

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.28271	0.07022	3.36513	0.13001	0.11513	15.82145	0.00279	0.27589	0.27019
#2	0.28230	0.06998	3.39810	0.12784	0.11707	15.84409	0.00609	0.29693	0.27636
Mean	**0.28250**	**0.07010**	**3.38161**	**0.12892**	**0.11610**	**15.83277**	**0.00444**	**0.28641**	**0.27328**
%RSD	0.10279	0.24320	0.68931	1.19086	1.18403	0.10111	52.48491	5.19326	1.59699

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.23436	0.00422	0.29088	0.23560	-0.01227	1.04634	0.91224	0.31388	0.03518
#2	7.24924	0.00202	0.29164	0.23631	-0.02001	1.03331	0.91280	0.31645	0.03531
Mean	**7.24180**	**0.00312**	**0.29126**	**0.23595**	**-0.01614**	**1.03983**	**0.91252**	**0.31516**	**0.03525**
%RSD	0.14528	49.79005	0.18292	0.21277	33.91499	0.88594	0.04323	0.57779	0.25290

	Pb	**Se**
	calc	calc
#1	0.12008	0.27209
#2	0.12066	0.28321
Mean	**0.12037**	**0.27765**
%RSD	0.33700	2.83234

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:59
SampleId1 : 1303058-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:24:50
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE12

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00145	50.96225	0.07570	0.01101	0.60866	0.00758	0.01006	62.78617	0.00037
#2	-0.00111	51.17455	0.08130	0.00843	0.60910	0.00756	0.01146	62.79323	0.00027
Mean	**-0.00128**	**51.06840**	**0.07850**	**0.00972**	**0.60888**	**0.00757**	**0.01076**	**62.78970**	**0.00032**
%RSD	18.38237	0.29396	5.03924	18.73793	0.05100	0.14933	9.20278	0.00796	21.23264

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04314	0.04421	0.05172	181.96974	15.49276	0.06866	16.54004	1.73097	0.00601
#2	0.04323	0.04342	0.05201	182.10322	15.53118	0.06883	16.54900	1.73397	0.00664
Mean	**0.04319**	**0.04382**	**0.05187**	**182.03648**	**15.51197**	**0.06874**	**16.54452**	**1.73247**	**0.00632**
%RSD	0.14783	1.27016	0.39454	0.05185	0.17517	0.17711	0.03831	0.12272	7.02781

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.34286	0.05957	2.57650	0.16068	0.14595	15.47436	0.00623	0.31495	0.29650
#2	0.34368	0.05840	2.58455	0.15813	0.14983	15.44795	0.00427	0.30312	0.29723
Mean	**0.34327**	**0.05898**	**2.58052**	**0.15941**	**0.14789**	**15.46116**	**0.00525**	**0.30904**	**0.29686**
%RSD	0.16934	1.39255	0.22059	1.13123	1.85574	0.12076	26.42032	2.70874	0.17326

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	6.41038	0.00710	0.32926	0.27313	-0.02206	2.92384	1.79504	0.32126	0.02144
#2	6.42796	0.00600	0.32945	0.27348	-0.02249	2.91670	1.79787	0.32057	0.02087
Mean	**6.41917**	**0.00655**	**0.32935**	**0.27330**	**-0.02227**	**2.92027**	**1.79646**	**0.32091**	**0.02116**
%RSD	0.19368	11.85164	0.04046	0.08887	1.33947	0.17289	0.11142	0.15132	1.89893

	Pb calc	**Se** calc
#1	0.15086	0.30264
#2	0.15260	0.29919
Mean	**0.15173**	**0.30092**
%RSD	0.81073	0.81234

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:59
SampleId1 : 1303058-7 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:26:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE13

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00003	54.55774	0.07034	0.01720	0.75472	0.00631	0.01488	85.16913	0.00036
#2	-0.00105	54.92144	0.07151	0.01328	0.76105	0.00632	0.01138	85.58608	0.00046
Mean	**-0.00054**	**54.73959**	**0.07092**	**0.01524**	**0.75788**	**0.00631**	**0.01313**	**85.37760**	**0.00041**
%RSD	132.71962	0.46981	1.16199	18.21161	0.59123	0.10507	18.87441	0.34532	16.18390

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.04397	0.04191	0.04732	144.19703	13.26932	0.06910	18.36037	1.51251	0.00526
#2	0.04366	0.04069	0.04677	145.14756	13.36127	0.06967	18.43833	1.52320	0.00412
Mean	**0.04382**	**0.04130**	**0.04704**	**144.67229**	**13.31530**	**0.06939**	**18.39935**	**1.51786**	**0.00469**
%RSD	0.50064	2.10115	0.82991	0.46459	0.48831	0.58226	0.29959	0.49780	17.05794

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.36000	0.06217	2.06512	0.10846	0.08198	8.52075	0.00864	0.13238	0.11829
#2	0.36234	0.06233	2.05088	0.10012	0.08850	8.61458	0.00549	0.12550	0.12488
Mean	**0.36117**	**0.06225**	**2.05800**	**0.10429**	**0.08524**	**8.56766**	**0.00706**	**0.12894**	**0.12158**
%RSD	0.45881	0.17427	0.48924	5.65665	5.40954	0.77445	31.56502	3.77653	3.82949

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	8.17544	0.00134	0.39568	0.19063	-0.00959	1.25475	0.93199	0.26804	0.02924

#2	8.23400	0.00573	0.39849	0.19192	-0.01199	1.24164	0.93779	0.26941	0.02898
Mean	**8.20472**	**0.00354**	**0.39709**	**0.19127**	**-0.01079**	**1.24819**	**0.93489**	**0.26873**	**0.02911**
%RSD	0.50470	87.75181	0.50027	0.47703	15.74739	0.74252	0.43845	0.36134	0.62826

	Pb calc	**Se** calc
#1	0.09080	0.12298
#2	0.09237	0.12508
Mean	**0.09158**	**0.12403**
%RSD	1.21314	1.19652

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:59
SampleId1 : 1303058-8 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 13:28:21
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE14

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00077	54.39582	0.06241	0.01260	1.11036	0.00563	0.01059	96.09224	0.00017
#2	-0.00165	54.32232	0.06230	0.01260	1.11102	0.00561	0.01129	96.01433	0.00010
Mean	**-0.00121**	**54.35907**	**0.06236**	**0.01260**	**1.11069**	**0.00562**	**0.01094**	**96.05328**	**0.00013**
%RSD	51.26509	0.09561	0.13216	0.00000	0.04206	0.28361	4.52816	0.05735	37.91159

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.04127	0.04435	0.04748	128.60555	15.11388	0.06885	19.00235	1.60800	0.00224
#2	0.04050	0.04418	0.04796	128.63775	15.10836	0.06880	18.98656	1.60854	0.00117
Mean	**0.04088**	**0.04426**	**0.04772**	**128.62165**	**15.11112**	**0.06883**	**18.99446**	**1.60827**	**0.00170**
%RSD	1.33068	0.26654	0.71243	0.01770	0.02583	0.05360	0.05875	0.02377	44.33085

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.23566	0.06739	2.22730	0.09394	0.08074	6.48418	0.00489	0.15876	0.15331
#2	0.23505	0.06616	2.24224	0.09110	0.08396	6.53291	0.00397	0.14363	0.15385
Mean	**0.23535**	**0.06678**	**2.23477**	**0.09252**	**0.08235**	**6.50855**	**0.00443**	**0.15119**	**0.15358**
%RSD	0.18495	1.29969	0.47258	2.16814	2.76983	0.52933	14.79464	7.07796	0.24599

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	9.23964	0.01083	0.30195	0.20803	-0.01794	0.79709	0.74106	0.25894	0.02588
#2	9.23079	0.00095	0.30201	0.20896	-0.02033	0.78674	0.74282	0.25860	0.02584
Mean	**9.23521**	**0.00589**	**0.30198**	**0.20849**	**-0.01914**	**0.79192**	**0.74194**	**0.25877**	**0.02586**
%RSD	0.06774	118.51095	0.01323	0.31591	8.80682	0.92444	0.16708	0.09381	0.10396

	Pb calc	**Se** calc
#1	0.08513	0.15513
#2	0.08634	0.15044

Mean	0.08574	0.15278ser: STEVE WORKMAN
%RSD	0.99537	2.16747

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:05:59
SampleId1 : 1303058-9 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:30:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE15

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00132	24.94497	0.13176	0.00966	0.49250	0.01298	0.00402	333.20929	-0.00060
#2	-0.00297	24.85941	0.12780	0.00948	0.49195	0.01297	-0.00037	331.90696	-0.00058
Mean	**-0.00215**	**24.90219**	**0.12978**	**0.00957**	**0.49222**	**0.01297**	**0.00183**	**332.55813**	**-0.00059**
%RSD	54.45651	0.24295	2.15892	1.35987	0.07882	0.09205	169.66804	0.27691	1.51433

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.01862	0.01281	0.01755	69.40953	6.17506	0.02934	7.33816	5.43458	0.24630
#2	0.01767	0.01200	0.01673	69.26960	6.15134	0.02928	7.30000	5.42604	0.24592
Mean	**0.01814**	**0.01241**	**0.01714**	**69.33956**	**6.16320**	**0.02931**	**7.31908**	**5.43031**	**0.24611**
%RSD	3.69791	4.61856	3.37636	0.14270	0.27206	0.15112	0.36872	0.11119	0.10841

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.16093	0.02268	1.36396	0.21492	0.21338	18.85836	0.00384	0.21871	0.21086
#2	0.16043	0.02250	1.35731	0.21396	0.21602	18.72224	-0.00155	0.22033	0.20978
Mean	**0.16068**	**0.02259**	**1.36063**	**0.21444**	**0.21470**	**18.79030**	**0.00114**	**0.21952**	**0.21032**
%RSD	0.21650	0.54882	0.34543	0.31729	0.86673	0.51225	333.39307	0.52246	0.36321

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	11.42293	0.00944	0.53420	0.14464	-0.01637	23.13570	0.90754	0.38496	0.03411
#2	11.40248	0.00249	0.53347	0.14411	-0.02587	23.10588	0.90563	0.38393	0.03357
Mean	**11.41271**	**0.00597**	**0.53383**	**0.14437**	**-0.02112**	**23.12079**	**0.90658**	**0.38445**	**0.03384**
%RSD	0.12671	82.33823	0.09627	0.25807	31.81915	0.09118	0.14942	0.18952	1.13102

	Pb calc	**Se** calc
#1	0.21390	0.21347
#2	0.21533	0.21329
Mean	**0.21461**	**0.21338**
%RSD	0.47276	0.05980

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 13:32:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations6:27 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19167	48.94434	0.51962	0.98626	1.00517	0.47385	0.52800	49.29568	0.51072
#2	0.19119	49.05387	0.50867	0.98246	1.00932	0.47549	0.52979	49.34589	0.51098
Mean	**0.19143**	**48.99910**	**0.51415**	**0.98436**	**1.00725**	**0.47467**	**0.52890**	**49.32078**	**0.51085**
%RSD	0.17737	0.15807	1.50588	0.27304	0.29097	0.24319	0.23804	0.07199	0.03667

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47291	0.94911	0.99382	19.42418	48.81958	0.50938	48.06852	0.93607	0.96135
#2	0.47530	0.95195	0.99973	19.49582	48.87599	0.51043	48.15066	0.93876	0.96299
Mean	**0.47410**	**0.95053**	**0.99677**	**19.46000**	**48.84778**	**0.50991**	**48.10959**	**0.93741**	**0.96217**
%RSD	0.35760	0.21089	0.41910	0.26031	0.08165	0.14598	0.12072	0.20283	0.12033

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	47.99504	1.00049	4.74075	0.95784	0.91845	4.87732	0.48767	0.98553	0.92654
#2	48.04471	0.99545	4.78125	0.95408	0.93652	4.88480	0.48750	0.99450	0.95586
Mean	**48.01987**	**0.99797**	**4.76100**	**0.95596**	**0.92749**	**4.88106**	**0.48758**	**0.99002**	**0.94120**
%RSD	0.07315	0.35719	0.60150	0.27818	1.37801	0.10846	0.02418	0.64085	2.20281

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.71968	1.01431	0.49757	0.47414	0.49544	4.76608	0.47375	0.91930	0.95254
#2	4.73355	1.01540	0.49950	0.47624	0.50106	4.77253	0.47542	0.92240	0.95512
Mean	**4.72662**	**1.01485**	**0.49853**	**0.47519**	**0.49825**	**4.76931**	**0.47459**	**0.92085**	**0.95383**
%RSD	0.20758	0.07634	0.27302	0.31332	0.79810	0.09574	0.24904	0.23790	0.19122

	Pb	Se
	calc	calc
#1	0.93157	0.94618
#2	0.94237	0.96873
Mean	**0.93697**	**0.95745**
%RSD	0.81532	1.66499

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 13:34:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00047	0.08852	-0.00589	-0.00531	0.00011	0.00037	0.00145	-0.04055	-0.00015
#2	0.00004	0.08395	-0.00064	-0.00598	0.00011	0.00032	-0.00240	-0.04664	-0.00005
Mean	**-0.00022**	**0.08623**	**-0.00326**	**-0.00564**	**0.00011**	**0.00035**	**-0.00048**	**-0.04359**	**-0.00010**
%RSD	168.58951	3.74835	113.66253	8.45396	0.00000	11.62839	567.85976	9.88004	67.62229

ted: 3/12/2013 13:06:27 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00070	-0.00032	-0.00181	0.01381	-0.10332	-0.00256	-0.00095	-0.00016	-0.00002
#2	-0.00120	-0.00012	-0.00115	0.01171	-0.10873	-0.00260	0.00304	-0.00028	-0.00053
Mean	**-0.00095**	**-0.00022**	**-0.00148**	**0.01276**	**-0.10603**	**-0.00258**	**0.00104**	**-0.00022**	**-0.00028**
%RSD	37.07509	63.24745	31.59311	11.65000	3.60572	1.21548	270.69661	38.19361	129.03941

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03387	-0.00093	-0.01246	-0.00220	0.00275	-0.01408	-0.00116	0.01201	0.00450
#2	0.03064	-0.00077	-0.01246	-0.00015	0.00122	-0.01035	-0.00222	0.00073	0.00089
Mean	**0.03225**	**-0.00085**	**-0.01246**	**-0.00117**	**0.00199**	**-0.01221**	**-0.00169**	**0.00637**	**0.00269**
%RSD	7.08722	12.76669	0.00000	123.63908	54.77299	21.59858	44.35088	125.10496	94.82586

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00688	0.00157	-0.00091	-0.00262	-0.00173	-0.01967	-0.00029	0.00059	0.00040
#2	-0.00650	0.00047	-0.00092	-0.00259	-0.00638	-0.02291	-0.00017	-0.00010	0.00009
Mean	**-0.00669**	**0.00102**	**-0.00091**	**-0.00260**	**-0.00406**	**-0.02129**	**-0.00023**	**0.00024**	**0.00025**
%RSD	3.97389	76.23302	0.72819	1.03709	81.13163	10.73682	35.30153	199.99284	87.97894

	Pb	Se
	calc	calc
#1	0.00111	0.00700
#2	0.00076	0.00084
Mean	**0.00093**	**0.00392**
%RSD	25.99382	111.22240

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : 1303058-10 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:36:14
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE16

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00183	17.25715	0.13024	0.00972	0.30572	0.01235	0.00269	358.04006	-0.00085
#2	-0.00203	17.26847	0.13001	0.00831	0.30543	0.01238	0.00427	357.77370	-0.00051
Mean	-0.00193	**17.26281**	0.13013	**0.00902**	**0.30558**	**0.01237**	0.00348	**357.90688**	-0.00068
%RSD	7.02856	0.04636	0.12665	11.06404	0.06764	0.13095	32.05926	0.05262	34.95877

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01571	0.00504	0.00990	65.12904	4.11400	0.02087	5.02237	5.70277	0.33038
#2	0.01598	0.00496	0.00980	65.13482	4.12913	0.02082	5.02083	5.70649	0.32837
Mean	**0.01584**	**0.00500**	**0.00985**	**65.13193**	**4.12157**	**0.02084**	**5.02160**	**5.70463**	**0.32937**
%RSD	1.21458	1.18494	0.74387	0.00627	0.25963	0.17708	0.02165	0.04611	0.43208

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.15515	0.01466	1.21180	0.19983	0.19777	25.24064	0.00100	0.27204	0.25598
#2	0.15457	0.01347	1.22921	0.19775	0.20307	25.31281	0.00113	0.27879	0.26145
Mean	**0.15486**	**0.01406**	**1.22050**	**0.19879**	**0.20042**	**25.27673**	**0.00107**	**0.27542**	**0.25871**
%RSD	0.26205	5.95014	1.00881	0.73723	1.87255	0.20190	8.08711	1.73275	1.49596

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.87983	0.00694	0.54751	0.09341	-0.01385	23.83253	0.89513	0.26718	0.04108
#2	7.89938	0.00950	0.54786	0.09277	-0.00966	23.84226	0.89433	0.26838	0.04077
Mean	**7.88961**	**0.00822**	**0.54768**	**0.09309**	**-0.01175**	**23.83740**	**0.89473**	**0.26778**	**0.04093**
%RSD	0.17522	22.02636	0.04510	0.48733	25.18987	0.02886	0.06326	0.31728	0.53705

	Pb	Se
	calc	calc
#1	0.19845	0.26133
#2	0.20130	0.26723
Mean	**0.19988**	**0.26428**
%RSD	1.00823	1.57813

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : 1303058-11 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:37:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE17

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00086	62.64417	0.07698	0.01499	1.99162	0.00480	0.01787	77.10149	0.00036
#2	-0.00142	62.94305	0.08118	0.01181	2.00065	0.00480	0.01000	77.24810	0.00039
Mean	**-0.00114**	**62.79361**	**0.07908**	**0.01340**	**1.99614**	**0.00480**	**0.01394**	**77.17480**	**0.00038**
%RSD	34.61003	0.33656	3.75157	16.82862	0.32005	0.09496	39.96376	0.13433	5.53143

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03233	0.04490	0.04372	136.97109	11.98655	0.06781	17.94249	2.00668	0.00387
#2	0.03243	0.04494	0.04372	137.48156	12.02408	0.06805	17.99724	2.01210	0.00356
Mean	**0.03238**	**0.04492**	**0.04372**	**137.22633**	**12.00532**	**0.06793**	**17.96986**	**2.00939**	**0.00372**
%RSD	0.21799	0.05953	0.00189	0.26304	0.22104	0.24441	0.21541	0.19087	5.98068

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.18889	0.05531	2.07476	0.08475	0.07134	5.90340	0.00225	0.11522	0.11726
#2	0.18988	0.05492	2.09199	0.08226	0.07361	5.92962	-0.00065	0.10697	0.11875
Mean	**0.18938**	**0.05512**	**2.08338**	**0.08350**	**0.07248**	**5.91651**	**0.00080**	**0.11109**	**0.11800**
%RSD	0.36752	0.50614	0.58465	2.10809	2.22042	0.31341	255.62659	5.24918	0.89329

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.90354	0.00166	0.25192	0.23040	-0.01614	0.40627	0.41081	0.20522	0.02366
#2	10.96405	0.00532	0.25312	0.23192	-0.01350	0.40747	0.41114	0.20643	0.02346
Mean	**10.93379**	**0.00349**	**0.25252**	**0.23116**	**-0.01482**	**0.40687**	**0.41098**	**0.20582**	**0.02356**
%RSD	0.39127	74.08811	0.33746	0.46706	12.60976	0.20873	0.05644	0.41269	0.59894

	Pb calc	**Se** calc
#1	0.07580	0.11658
#2	0.07649	0.11483
Mean	**0.07615**	**0.11570**
%RSD	0.63980	1.07072

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : 1303058-12 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:39:43
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE18

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00177	35.14642	0.03864	0.00739	0.70172	0.00309	0.00535	61.83782	-0.00006
#2	-0.00209	35.22771	0.03864	0.00856	0.70289	0.00307	0.00203	61.89698	-0.00006
Mean	**-0.00193**	**35.18707**	**0.03864**	**0.00797**	**0.70231**	**0.00308**	**0.00369**	**61.86740**	**-0.00006**
%RSD	11.74585	0.16335	0.00000	10.33513	0.11798	0.48163	63.72638	0.06761	0.00000

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.03219	0.02354	0.03301	101.48339	7.00858	0.05215	17.15830	1.30846	0.00299
#2	0.03224	0.02279	0.03368	101.69677	7.00431	0.05226	17.18179	1.31140	0.00312
Mean	**0.03221**	**0.02316**	**0.03334**	**101.59008**	**7.00644**	**0.05220**	**17.17004**	**1.30993**	**0.00306**
%RSD	0.10010	2.28461	1.41243	0.14852	0.04313	0.14845	0.09677	0.15852	2.90894

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.12609	0.04122	2.45140	0.08011	0.06970	1.80367	0.00139	0.03053	0.03237
#2	0.12597	0.04192	2.45048	0.07828	0.07261	1.77379	0.00180	0.02791	0.03214
Mean	**0.12603**	**0.04157**	**2.45094**	**0.07920**	**0.07115**	**1.78873**	**0.00159**	**0.02922**	**0.03225**
%RSD	0.06897	1.19297	0.02653	1.63677	2.89331	1.18119	18.07987	6.33567	0.50540

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	4.29190	-0.00227	0.20900	0.14846	-0.01965	0.09195	0.10607	0.20608	0.01419
#2	4.30345	0.00066	0.20902	0.14905	-0.00833	0.08479	0.10456	0.20591	0.01411
Mean	**4.29767**	**-0.00080**	**0.20901**	**0.14876**	**-0.01399**	**0.08837**	**0.10532**	**0.20600**	**0.01415**
%RSD	0.18989	257.24776	0.00637	0.27950	57.22110	5.72262	1.01027	0.05891	0.40709

	Pb calc	**Se** calc

#1	0.07316	0.03176
#2	0.07450	0.03073
Mean	**0.07383**	**0.03124**
%RSD	1.27517	2.32105

ser: STEVE WORKMAN

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:00
SampleId1 : 1303058-13 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:41:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE19

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00085	54.91012	0.05787	0.01677	0.74472	0.00515	0.00325	120.43322	0.00029
#2	-0.00173	54.97770	0.05076	0.01549	0.74827	0.00517	0.00097	120.60163	-0.00013
Mean	**-0.00129**	**54.94391**	**0.05431**	**0.01613**	**0.74649**	**0.00516**	**0.00211**	**120.51742**	**0.00008**
%RSD	47.73814	0.08697	9.25571	5.64622	0.33654	0.30348	76.52780	0.09881	367.18416

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.04104	0.03922	0.04033	139.12998	14.58622	0.07113	19.97262	1.50171	0.00142
#2	0.04108	0.03918	0.03931	139.54400	14.58527	0.07113	20.00637	1.50663	0.00199
Mean	**0.04106**	**0.03920**	**0.03982**	**139.33699**	**14.58574**	**0.07113**	**19.98949**	**1.50417**	**0.00170**
%RSD	0.08209	0.08165	1.80664	0.21011	0.00465	0.00259	0.11936	0.23138	23.46928

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.29828	0.06031	2.00219	0.09681	0.08066	1.84476	0.00510	0.01791	0.00783
#2	0.29791	0.05952	2.02516	0.09116	0.08303	1.79994	0.00286	0.00168	0.00965
Mean	**0.29809**	**0.05992**	**2.01368**	**0.09399**	**0.08185**	**1.82235**	**0.00398**	**0.00979**	**0.00874**
%RSD	0.08769	0.93118	0.80636	4.24753	2.04091	1.73914	39.77437	117.19613	14.78067

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	10.56885	0.00569	0.45144	0.22601	-0.01593	0.12070	0.10455	0.26049	0.02519
#2	10.60558	0.00349	0.45304	0.22721	-0.01943	0.10187	0.10377	0.26255	0.02515
Mean	**10.58721**	**0.00459**	**0.45224**	**0.22661**	**-0.01768**	**0.11129**	**0.10416**	**0.26152**	**0.02517**
%RSD	0.24535	33.81657	0.25071	0.37163	13.99699	11.96301	0.52891	0.55693	0.10276

	Pb calc	Se calc
#1	0.08604	0.01118
#2	0.08574	0.00700
Mean	**0.08589**	**0.00909**
%RSD	0.25056	32.57116

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:01
SampleId1 : 1303058-14 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:43:13

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE20

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00063	43.18773	0.03631	0.01291	0.58337	0.00421	0.00802	14.94700	0.00139
#2	-0.00160	42.99207	0.03363	0.01211	0.58151	0.00419	0.00661	14.90419	0.00127
Mean	**-0.00112**	**43.08990**	**0.03497**	**0.01251**	**0.58244**	**0.00420**	**0.00732**	**14.92559**	**0.00133**
%RSD	61.06973	0.32107	5.42095	4.50620	0.22658	0.35119	13.59572	0.20280	6.74029

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.04403	0.05033	0.08286	114.71287	14.62293	0.04325	13.80141	2.33410	0.00438
#2	0.04271	0.05038	0.08241	114.41550	14.55360	0.04302	13.77486	2.32932	0.00368
Mean	**0.04337**	**0.05036**	**0.08263**	**114.56419**	**14.58826**	**0.04314**	**13.78813**	**2.33171**	**0.00403**
%RSD	2.14087	0.07070	0.38829	0.18354	0.33601	0.37643	0.13615	0.14475	12.13142

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.37715	0.06546	3.01884	0.10234	0.08927	3.03305	0.00283	0.00776	0.01102
#2	0.37641	0.06480	2.99120	0.10118	0.09250	3.03305	0.00296	0.01242	0.01177
Mean	**0.37678**	**0.06513**	**3.00502**	**0.10176**	**0.09088**	**3.03305**	**0.00290**	**0.01009**	**0.01140**
%RSD	0.13892	0.71383	0.65024	0.80589	2.51237	0.00000	3.10497	32.62775	4.62833

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	11.08856	0.00333	0.21418	0.37251	-0.02071	0.14193	0.14951	0.26066	0.03634
#2	11.05724	-0.00289	0.21347	0.37239	-0.01551	0.12452	0.14890	0.26272	0.03582
Mean	**11.07290**	**0.00022**	**0.21383**	**0.37245**	**-0.01811**	**0.13323**	**0.14921**	**0.26169**	**0.03608**
%RSD	0.20000	2036.44276	0.23343	0.02173	20.33564	9.23815	0.28528	0.55656	1.01810

	Pb calc	Se calc
#1	0.09362	0.00994
#2	0.09539	0.01199
Mean	**0.09450**	**0.01096**
%RSD	1.32257	13.21033

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:01
SampleId1 : 1303059-1 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:44:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE23

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00005	27.72241	0.91406	0.00911	0.43113	0.00485	0.01087	110.87212	0.00042
#2	-0.00198	27.81847	0.92815	0.00849	0.43131	0.00481	0.00508	110.58840	-0.00004

Mean	**-0.00102**	**27.77044**	**0.92110**	**0.00880**	**0.43122**	**0.00483**	**0.00798**	**110.73026**	**0.00019**
%RSD	133.83975	0.24458	1.08147	4.92778	0.02998	0.58334	51.31860	0.18118	169.97029

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01721	0.01248	0.02735	91.26777	10.42594	0.02530	9.09695	0.87173	1.35294
#2	0.01635	0.01129	0.02663	91.16156	10.46053	0.02541	9.06831	0.87161	1.35130
Mean	**0.01678**	**0.01188**	**0.02699**	**91.21467**	**10.44324**	**0.02535**	**9.08263**	**0.87167**	**1.35212**
%RSD	3.61932	7.10199	1.88575	0.08234	0.23418	0.29115	0.22303	0.00969	0.08569

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.79387	0.02016	2.05754	0.10791	0.09030	37.03838	0.00544	0.44182	0.40608
#2	0.79685	0.01891	2.07982	0.09975	0.09126	37.17245	0.00057	0.43779	0.41843
Mean	**0.79536**	**0.01953**	**2.06868**	**0.10383**	**0.09078**	**37.10541**	**0.00300**	**0.43981**	**0.41226**
%RSD	0.26478	4.52242	0.76149	5.55380	0.75055	0.25548	114.74556	0.64701	2.11964

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.93610	0.00400	0.36763	0.10612	0.01099	1.45382	1.22303	0.10777	0.02296
#2	11.95836	0.00034	0.36788	0.10635	0.01008	1.41956	1.22241	0.10606	0.02260
Mean	**11.94723**	**0.00217**	**0.36775**	**0.10623**	**0.01054**	**1.43669**	**1.22272**	**0.10691**	**0.02278**
%RSD	0.13169	119.11570	0.04712	0.15251	6.09845	1.68617	0.03587	1.13450	1.12048

	Pb	**Se**
	calc	calc
#1	0.09616	0.41798
#2	0.09409	0.42488
Mean	**0.09513**	**0.42143**
%RSD	1.54090	1.15818

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:01
SampleId1 : 1303059-1D SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:46:42
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE24

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00149	27.08734	0.86714	0.00721	0.41457	0.00456	0.00383	135.90896	-0.00033
#2	-0.00178	27.12701	0.86353	0.00782	0.41417	0.00453	0.01136	135.75291	0.00027
Mean	**-0.00163**	**27.10718**	**0.86533**	**0.00751**	**0.41437**	**0.00454**	**0.00759**	**135.83094**	**-0.00003**
%RSD	12.56441	0.10350	0.29495	5.77259	0.06863	0.47173	70.18053	0.08124	1452.59421

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01497	0.01155	0.02676	90.50765	10.63945	0.02510	9.00393	0.90775	1.27839
#2	0.01610	0.01160	0.02722	90.61925	10.65352	0.02515	9.01163	0.90978	1.28110
Mean	**0.01553**	**0.01157**	**0.02699**	**90.56345**	**10.64649**	**0.02513**	**9.00778**	**0.90877**	**1.27974**

%RSD	5.13146	0.28488	1.19050	0.08713	0.09349	0.15425	0.06045	0.15804	0.14971

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.79242	0.01854	2.07132	0.09706	0.09237	34.63126	-0.00393	0.38826	0.37441
#2	0.79313	0.02033	2.05731	0.09968	0.09045	34.74597	-0.00300	0.38566	0.37461
Mean	**0.79278**	**0.01943**	**2.06431**	**0.09837**	**0.09141**	**34.68861**	**-0.00347**	**0.38696**	**0.37451**
%RSD	0.06272	6.53895	0.47988	1.88240	1.49111	0.23384	19.12791	0.47490	0.03664

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	9.53208	0.00144	0.37760	0.10842	0.01387	1.28645	1.07083	0.10606	0.02646
#2	9.53951	0.00217	0.37848	0.10947	0.00570	1.30324	1.07208	0.10588	0.02622
Mean	**9.53580**	**0.00180**	**0.37804**	**0.10895**	**0.00978**	**1.29485**	**1.07146**	**0.10597**	**0.02634**
%RSD	0.05510	28.64920	0.16396	0.67908	59.04816	0.91719	0.08266	0.11446	0.64241

	Pb	Se
	calc	calc
#1	0.09393	0.37902
#2	0.09352	0.37829
Mean	**0.09373**	**0.37865**
%RSD	0.31212	0.13744

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:01
SampleId1 : 1303059-1L 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:48:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE25

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00148	5.73339	0.18711	-0.00610	0.08637	0.00110	-0.00280	22.16892	-0.00042
#2	-0.00109	5.69637	0.18478	-0.00641	0.08629	0.00107	0.00314	22.11385	-0.00032
Mean	**-0.00129**	**5.71488**	**0.18595**	**-0.00626**	**0.08633**	**0.00108**	**0.00017**	**22.14139**	**-0.00037**
%RSD	21.24284	0.45802	0.88627	3.46600	0.05978	2.29125	2428.56500	0.17586	19.62901

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00254	0.00119	0.00375	17.40054	1.65316	0.00199	1.86274	0.18054	0.27969
#2	0.00218	0.00103	0.00273	17.36563	1.64986	0.00201	1.85384	0.18019	0.27604
Mean	**0.00236**	**0.00111**	**0.00324**	**17.38309**	**1.65151**	**0.00200**	**1.85829**	**0.18036**	**0.27786**
%RSD	10.81090	10.14968	22.16439	0.14201	0.14125	1.01541	0.33879	0.13970	0.92821

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.13973	0.00287	0.41678	0.01870	0.01610	7.59398	-0.00107	0.09295	0.08908
#2	0.13912	0.00385	0.41221	0.01685	0.01930	7.53772	-0.00188	0.10118	0.08538
Mean	**0.13943**	**0.00336**	**0.41450**	**0.01777**	**0.01770**	**7.56585**	**-0.00147**	**0.09707**	**0.08723**
%RSD	0.31178	20.76615	0.77990	7.35882	12.81437	0.52582	38.89538	5.99349	3.00495

ted: 3/12/2013 13:06:27 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.43414	-0.00175	0.07311	0.01990	-0.00948	0.26688	0.25113	0.02133	0.00395
#2	2.42153	0.00008	0.07274	0.01929	-0.00295	0.24555	0.24969	0.02236	0.00419
Mean	**2.42784**	**-0.00084**	**0.07293**	**0.01959**	**-0.00622**	**0.25621**	**0.25041**	**0.02185**	**0.00407**
%RSD	0.36735	154.59981	0.35545	2.20569	74.33205	5.88771	0.40627	3.32995	4.17237

	Pb	Se
	calc	calc
#1	0.01696	0.09037
#2	0.01849	0.09064
Mean	**0.01772**	**0.09051**
%RSD	6.07805	0.20882

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:01
SampleId1 : 1303059-1MS SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:50:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE26

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09070	42.31980	1.87751	0.80571	1.45703	0.05336	0.01022	165.94760	0.05230
#2	0.09187	42.43254	1.89356	0.80792	1.45968	0.05351	0.00391	166.28530	0.05144
Mean	**0.09128**	**42.37617**	**1.88553**	**0.80681**	**1.45835**	**0.05344**	**0.00707**	**166.11645**	**0.05187**
%RSD	0.90698	0.18813	0.60182	0.19344	0.12836	0.19221	63.08517	0.14375	1.18020

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48408	0.20774	0.28998	95.52256	52.47338	0.54694	48.31776	1.33609	2.32388
#2	0.48458	0.20679	0.28924	95.79587	52.56328	0.54823	48.42530	1.34089	2.32489
Mean	**0.48433**	**0.20727**	**0.28961**	**95.65921**	**52.51833**	**0.54759**	**48.37153**	**1.33849**	**2.32439**
%RSD	0.07263	0.32152	0.18237	0.20203	0.12105	0.16709	0.15720	0.25335	0.03073

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	39.65083	0.52452	2.01528	0.57755	0.52433	36.45632	0.31591	2.11963	1.96923
#2	39.74362	0.52535	2.02079	0.57058	0.53705	36.55204	0.30760	2.11699	2.03481
Mean	**39.69722**	**0.52494**	**2.01804**	**0.57406**	**0.53069**	**36.50418**	**0.31176**	**2.11831**	**2.00202**
%RSD	0.16529	0.11219	0.19311	0.85964	1.69497	0.18541	1.88435	0.08806	2.31602

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.12367	0.49867	0.86161	0.42835	1.91770	1.31852	1.89405	0.56535	0.03913
#2	12.16224	0.49903	0.86272	0.43006	1.91368	1.31265	1.89788	0.56844	0.03837
Mean	**12.14295**	**0.49885**	**0.86217**	**0.42921**	**1.91569**	**1.31559**	**1.89596**	**0.56690**	**0.03875**
%RSD	0.22461	0.05159	0.09161	0.28283	0.14855	0.31552	0.14285	0.38587	1.38772

	Pb	Seser: STEVE WORKMAN
	calc	calc
#1	0.54206	2.01932
#2	0.54822	2.06217
Mean	**0.54514**	**2.04074**
%RSD	0.79914	1.48503

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02
SampleId1 : 1303059-1MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 13:51:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE27

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09041	42.43176	1.82704	0.79087	1.42111	0.05269	0.01136	287.50553	0.05138
#2	0.09023	42.38181	1.82902	0.79265	1.42081	0.05281	0.00944	287.93373	0.05134
Mean	**0.09032**	**42.40679**	**1.82803**	**0.79176**	**1.42096**	**0.05275**	**0.01040**	**287.71963**	**0.05136**
%RSD	0.14022	0.08329	0.07648	0.15879	0.01464	0.16536	13.11251	0.10524	0.05867

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47593	0.20165	0.28762	94.21180	54.23576	0.55760	47.79643	1.54709	2.27091
#2	0.47656	0.20312	0.28735	94.40669	54.23223	0.55783	47.87793	1.54944	2.27236
Mean	**0.47624**	**0.20239**	**0.28749**	**94.30925**	**54.23399**	**0.55772**	**47.83718**	**1.54827**	**2.27163**
%RSD	0.09378	0.51529	0.06693	0.14613	0.00461	0.02833	0.12047	0.10695	0.04520

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	40.61500	0.51343	2.13288	0.56294	0.52605	34.03106	0.29985	2.12283	1.99018
#2	40.58938	0.51039	2.16710	0.56295	0.53821	34.02724	0.29573	2.11519	2.04571
Mean	**40.60219**	**0.51191**	**2.14999**	**0.56295**	**0.53213**	**34.02915**	**0.29779**	**2.11901**	**2.01794**
%RSD	0.04463	0.42082	1.12574	0.00121	1.61609	0.00794	0.97640	0.25462	1.94577

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.77467	0.49615	0.91661	0.38895	1.90212	1.32523	1.87735	0.54696	0.04017
#2	12.77497	0.49140	0.91658	0.38941	1.89676	1.31485	1.87867	0.55349	0.04021
Mean	**12.77482**	**0.49377**	**0.91660**	**0.38918**	**1.89944**	**1.32004**	**1.87801**	**0.55023**	**0.04019**
%RSD	0.00169	0.68133	0.00219	0.08319	0.19950	0.55621	0.04983	0.83923	0.06963

	Pb	Se
	calc	calc
#1	0.53833	2.03435
#2	0.54645	2.06885
Mean	**0.54239**	**2.05160**
%RSD	1.05796	1.18896

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02

SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 13:54:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19335	48.86353	0.51659	0.98969	1.00752	0.47398	0.53558	49.45031	0.51721
#2	0.19463	49.36862	0.52510	1.00288	1.01970	0.47906	0.52807	49.96329	0.52124
Mean	**0.19399**	**49.11607**	**0.52085**	**0.99629**	**1.01361**	**0.47652**	**0.53182**	**49.70680**	**0.51923**
%RSD	0.46873	0.72716	1.15441	0.93549	0.84955	0.75402	0.99822	0.72974	0.54913

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47627	0.95206	1.00313	19.40108	48.89479	0.51058	48.15410	0.93350	0.96670
#2	0.48011	0.96113	1.01558	19.62330	49.33793	0.51603	48.63663	0.94366	0.97306
Mean	**0.47819**	**0.95660**	**1.00935**	**19.51219**	**49.11636**	**0.51330**	**48.39537**	**0.93858**	**0.96988**
%RSD	0.56879	0.67053	0.87200	0.80529	0.63797	0.75082	0.70502	0.76529	0.46371

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.04944	1.01430	4.74561	0.96221	0.91805	4.86609	0.49666	0.99062	0.93825
#2	48.45553	1.02585	4.79120	0.96520	0.92984	4.92598	0.48847	1.00390	0.96343
Mean	**48.25248**	**1.02007**	**4.76840**	**0.96370**	**0.92394**	**4.89603**	**0.49257**	**0.99726**	**0.95084**
%RSD	0.59509	0.80069	0.67608	0.21938	0.90209	0.86504	1.17433	0.94161	1.87192

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.70642	1.02456	0.49964	0.46831	0.51067	4.74732	0.47440	0.91621	0.95604
#2	4.75252	1.04286	0.50558	0.47480	0.52755	4.78610	0.47922	0.92602	0.96560
Mean	**4.72947**	**1.03371**	**0.50261**	**0.47155**	**0.51911**	**4.76671**	**0.47681**	**0.92111**	**0.96082**
%RSD	0.68932	1.25149	0.83635	0.97240	2.29987	0.57532	0.71403	0.75313	0.70392

	Pb	Se
	calc	calc
#1	0.93275	0.95569
#2	0.94161	0.97690
Mean	**0.93718**	**0.96630**
%RSD	0.66831	1.55220

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 15:21:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.00088	0.09267	0.00449	-0.00702	-0.00011	0.00057	0.00495	-0.06085	-0.00046
#2	0.00070	0.08682	-0.00064	-0.00739	-0.00014	0.00056	0.00180	-0.05960	-0.00026
Mean	**0.00079**	**0.08974**	**0.00192**	**-0.00721**	**-0.00012**	**0.00057**	**0.00337**	**-0.06023**	**-0.00036**
%RSD	16.74682	4.61305	188.50488	3.61057	20.80653	1.05448	66.06336	1.46692	41.16123

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	-0.00011	0.00049	-0.00212	0.00603	-0.17502	-0.00288	0.00027	-0.00043	-0.00109
#2	-0.00034	-0.00013	-0.00182	0.00649	-0.16420	-0.00284	-0.00371	-0.00031	-0.00006
Mean	**-0.00022**	**0.00018**	**-0.00197**	**0.00626**	**-0.16961**	**-0.00286**	**-0.00172**	**-0.00037**	**-0.00058**
%RSD	74.03238	243.18681	10.46411	5.27801	4.50762	0.77457	164.02751	23.33726	125.70827

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.01664	-0.00003	-0.01079	0.00436	-0.00281	-0.02154	0.00080	-0.00337	-0.00261
#2	0.01705	0.00002	-0.00847	0.00278	-0.00369	-0.01035	0.00002	0.00528	-0.00522
Mean	**0.01685**	**-0.00001**	**-0.00963**	**0.00357**	**-0.00325**	**-0.01594**	**0.00041**	**0.00096**	**-0.00391**
%RSD	1.71698	522.21445	17.05559	31.39749	19.21266	49.63470	133.53413	637.93559	47.20102

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	-0.01083	-0.00209	-0.00142	-0.00315	-0.00077	0.00010	0.00065	-0.00147	0.00030
#2	-0.00923	-0.00173	-0.00138	-0.00295	0.00066	-0.00911	0.00007	-0.00094	0.00064
Mean	**-0.01003**	**-0.00191**	**-0.00140**	**-0.00305**	**-0.00006**	**-0.00450**	**0.00036**	**-0.00121**	**0.00047**
%RSD	11.30917	13.54831	2.37118	4.68522	1832.71691	144.57445	114.65816	31.21709	51.77480

	Pb calc	**Se** calc
#1	-0.00042	-0.00286
#2	-0.00154	-0.00172
Mean	**-0.00098**	**-0.00229**
%RSD	80.62397	35.12627

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 15:23:27
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.19863	48.70862	0.51625	0.98136	0.98959	0.47717	0.54192	48.71502	0.51485
#2	0.19799	48.94090	0.51881	0.98344	0.99252	0.47909	0.52962	48.86375	0.51753
Mean	**0.19831**	**48.82476**	**0.51753**	**0.98240**	**0.99105**	**0.47813**	**0.53577**	**48.78938**	**0.51619**
%RSD	0.22896	0.33640	0.35014	0.15003	0.20935	0.28334	1.62310	0.21556	0.36781

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.48155	0.95597	1.00461	19.05060	49.14931	0.51321	47.46169	0.94904	0.95878

#2	0.48344	0.95952	1.00761	19.11738	49.35173	0.51540	47.61119	0.95299	0.96436
Mean	**0.48250**	**0.95774**	**1.00611**	**19.08399**	**49.25052**	**0.51431**	**47.53644**	**0.95101**	**0.96157**
%RSD	0.27742	0.26163	0.21067	0.24743	0.29062	0.30196	0.22238	0.29382	0.40988

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.39076	1.00516	4.80020	0.96770	0.90188	4.84363	0.49814	0.98498	0.93494
#2	48.55997	1.00568	4.80491	0.96502	0.93156	4.86983	0.48660	0.99050	0.96591
Mean	**48.47536**	**1.00542**	**4.80255**	**0.96636**	**0.91672**	**4.85673**	**0.49237**	**0.98774**	**0.95042**
%RSD	0.24683	0.03700	0.06932	0.19604	2.28929	0.38151	1.65763	0.39545	2.30458

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.64024	1.01797	0.48948	0.46698	0.51359	4.76935	0.47875	0.93455	0.96384
#2	4.66041	1.01834	0.49019	0.46985	0.51469	4.77591	0.47844	0.93900	0.96712
Mean	**4.65032**	**1.01816**	**0.48983**	**0.46841**	**0.51414**	**4.77263**	**0.47860**	**0.93678**	**0.96548**
%RSD	0.30674	0.02519	0.10351	0.43342	0.15125	0.09732	0.04607	0.33610	0.24012

	Pb	**Se**
	calc	calc
#1	0.92380	0.95160
#2	0.94270	0.97410
Mean	**0.93325**	**0.96285**
%RSD	1.43231	1.65241

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 15:25:18
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00010	0.07019	-0.00157	-0.00555	-0.00025	0.00056	-0.00311	-0.05679	-0.00029
#2	-0.00019	0.06882	-0.00297	-0.00807	-0.00022	0.00054	-0.00014	-0.05742	0.00002
Mean	**-0.00015**	**0.06950**	**-0.00227**	**-0.00681**	**-0.00023**	**0.00055**	**-0.00162**	**-0.05710**	**-0.00013**
%RSD	42.35165	1.39823	43.52547	26.11689	11.05115	3.05417	129.49827	0.77359	164.84102

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00075	-0.00067	-0.00237	0.00797	-0.15010	-0.00273	-0.01445	-0.00037	0.00045
#2	-0.00071	-0.00001	-0.00245	0.00797	-0.14798	-0.00273	-0.01077	-0.00025	-0.00032
Mean	**-0.00073**	**-0.00034**	**-0.00241**	**0.00797**	**-0.14904**	**-0.00273**	**-0.01261**	**-0.00031**	**0.00006**
%RSD	4.50757	136.35659	2.49833	0.00000	1.00366	0.00000	20.64330	27.94947	848.50131

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02258	-0.00066	-0.02055	-0.00115	-0.00030	-0.01035	-0.00010	-0.00243	0.00397
#2	0.02123	-0.00073	-0.00731	0.00051	0.00232	-0.01035	-0.00394	-0.00381	0.00100

Mean	0.02190	-0.00070	-0.01393	-0.00032	0.00101	-0.01035	-0.00202	-0.00312	0.00248
%RSD	4.35917	6.67695	67.22073	365.46910	183.04809	0.00000	134.56261	31.30866	84.64025

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	-0.00397	0.00157	-0.00147	-0.00264	-0.00210	-0.02949	-0.00011	-0.00041	0.00030
#2	-0.00415	-0.00282	-0.00144	-0.00278	-0.00651	-0.03870	-0.00014	-0.00076	0.00028
Mean	**-0.00406**	**-0.00063**	**-0.00146**	**-0.00271**	**-0.00431**	**-0.03410**	**-0.00012**	**-0.00058**	**0.00029**
%RSD	3.06214	494.20925	1.36767	3.65325	72.55754	19.09331	17.49628	42.91517	4.99117

	Pb calc	Se calc
#1	-0.00058	0.00184
#2	0.00172	-0.00061
Mean	**0.00057**	**0.00062**
%RSD	286.23349	280.32355

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:02
SampleId1 : 1303059-2 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:27:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE28

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.00199	17.17183	0.02337	0.00205	0.33583	0.00218	0.00232	19.96578	0.00028
#2	-0.00039	17.12526	0.02092	0.00126	0.33616	0.00216	0.00179	19.97523	-0.00024
Mean	**0.00080**	**17.14855**	**0.02215**	**0.00166**	**0.33600**	**0.00217**	**0.00206**	**19.97050**	**0.00002**
%RSD	211.25134	0.19201	7.81508	34.05392	0.06922	0.66840	18.20795	0.03345	2129.06676

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.01106	0.01317	0.01272	31.99070	4.21521	0.01104	6.10613	0.64012	0.02130
#2	0.00999	0.01228	0.01273	32.05790	4.19960	0.01105	6.09629	0.64123	0.02002
Mean	**0.01053**	**0.01272**	**0.01273**	**32.02430**	**4.20741**	**0.01105**	**6.10121**	**0.64068**	**0.02066**
%RSD	7.13990	4.96794	0.10322	0.14839	0.26231	0.06684	0.11408	0.12238	4.37846

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.08111	0.01729	1.28128	0.03626	0.02315	0.76200	0.00376	0.03044	0.02170
#2	0.08078	0.01562	1.27918	0.02852	0.02847	0.75080	0.00324	0.02121	0.02892
Mean	**0.08095**	**0.01645**	**1.28023**	**0.03239**	**0.02581**	**0.75640**	**0.00350**	**0.02583**	**0.02531**
%RSD	0.28617	7.15839	0.11589	16.91088	14.56227	1.04669	10.51772	25.25942	20.16184

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	8.00866	0.00542	0.06629	0.14095	-0.00280	0.14426	0.11844	0.07715	0.01059
#2	8.01367	-0.00372	0.06619	0.14128	-0.00743	0.12517	0.11761	0.07769	0.00992
Mean	**8.01117**	**0.00085**	**0.06624**	**0.14112**	**-0.00511**	**0.13472**	**0.11803**	**0.07742**	**0.01025**

%RSD	0.04423	760.09139	0.10034	0.16346	63.97242	10.01700	0.49796	0.48639	4.67746

	Pb calc	Se calc
#1	0.02752	0.02461
#2	0.02848	0.02636
Mean	**0.02800**	**0.02548**
%RSD	2.43933	4.83387

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:03
SampleId1 : ZZZ SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:28:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE29

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00259	27.01213	1.11278	0.02450	0.35020	0.02770	0.00500	49.40290	-0.00097
#2	-0.00539	26.88639	1.11697	0.02628	0.34954	0.02764	-0.00287	49.28739	-0.00123
Mean	**-0.00399**	**26.94926**	**1.11487**	**0.02539**	**0.34987**	**0.02767**	**0.00107**	**49.34515**	**-0.00110**
%RSD	49.67392	0.32991	0.26577	4.95321	0.13296	0.14682	522.46004	0.16553	16.78498

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.02035	0.00117	0.00572	67.25705	7.71710	0.02705	6.30424	0.72584	8.04386
#2	0.01993	-0.00088	0.00428	67.18528	7.68170	0.02700	6.24702	0.72479	8.01828
Mean	**0.02014**	**0.00015**	**0.00500**	**67.22116**	**7.69940**	**0.02703**	**6.27563**	**0.72531**	**8.03107**
%RSD	1.46601	969.30073	20.36973	0.07550	0.32517	0.12291	0.64473	0.10216	0.22521

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.34010	0.01203	1.65169	0.78869	0.74619	27.87168	-0.02649	0.61923	0.57698
#2	0.33957	0.01174	1.63255	0.78681	0.75895	27.79938	-0.02884	0.61870	0.60123
Mean	**0.33984**	**0.01188**	**1.64212**	**0.78775**	**0.75257**	**27.83553**	**-0.02767**	**0.61897**	**0.58910**
%RSD	0.11118	1.69530	0.82402	0.16926	1.19864	0.18368	6.01259	0.05985	2.91053

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	7.65020	0.01482	0.20906	0.23717	-0.00185	42.92963	4.24373	0.08852	0.05434
#2	7.63397	0.01043	0.20852	0.23754	-0.00935	42.95808	4.23143	0.08869	0.05378
Mean	**7.64208**	**0.01263**	**0.20879**	**0.23736**	**-0.00560**	**42.94386**	**4.23758**	**0.08860**	**0.05406**
%RSD	0.15021	24.58337	0.18168	0.10872	94.78028	0.04685	0.20531	0.14167	0.72348

	Pb calc	**Se** calc
#1	0.76035	0.59105
#2	0.76823	0.60705
Mean	**0.76429**	**0.59905**
%RSD	0.72915	1.88850

ted: 3/12/2013 13:06:28 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:03
SampleId1 : ZZZ SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:33:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE30

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00134	25.93505	0.99334	0.02094	0.35012	0.02154	0.00584	54.31031	-0.00034
#2	-0.00248	25.78290	0.98682	0.02002	0.34764	0.02133	-0.00088	53.95140	-0.00046
Mean	**-0.00191**	**25.85897**	**0.99008**	**0.02048**	**0.34888**	**0.02144**	**0.00248**	**54.13085**	**-0.00040**
%RSD	42.37599	0.41604	0.46560	3.17568	0.50370	0.68377	191.31064	0.46885	20.47369

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01749	0.00385	0.01235	72.34947	7.45171	0.02621	6.67590	0.81253	7.12637
#2	0.01666	0.00206	0.01002	71.77654	7.40325	0.02602	6.61621	0.80864	7.08580
Mean	**0.01707**	**0.00295**	**0.01119**	**72.06301**	**7.42748**	**0.02611**	**6.64606**	**0.81059**	**7.10609**
%RSD	3.44214	42.78573	14.75103	0.56217	0.46133	0.53001	0.63509	0.33897	0.40371

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.25865	0.01534	1.67409	0.60001	0.56210	25.40399	-0.02021	0.54685	0.51330
#2	0.25692	0.01481	1.64842	0.59244	0.57534	25.19506	-0.02080	0.54197	0.52760
Mean	**0.25779**	**0.01507**	**1.66126**	**0.59622**	**0.56872**	**25.29952**	**-0.02050**	**0.54441**	**0.52045**
%RSD	0.47296	2.46762	1.09272	0.89735	1.64565	0.58394	2.05330	0.63438	1.94250

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.70091	0.00790	0.19795	0.21134	-0.01293	34.27456	3.44202	0.09828	0.05086
#2	5.65676	0.00534	0.19638	0.20947	-0.01364	34.06063	3.41812	0.09562	0.04997
Mean	**5.67883**	**0.00662**	**0.19716**	**0.21040**	**-0.01329**	**34.16760**	**3.43007**	**0.09695**	**0.05042**
%RSD	0.54977	27.31517	0.56024	0.62894	3.76473	0.44273	0.49257	1.94224	1.23640

	Pb	Se
	calc	calc
#1	0.57472	0.52448
#2	0.58103	0.53239
Mean	0.57788	0.52843
%RSD	0.77194	1.05845

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:03
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 15:35:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19812	48.59974	0.50856	0.98068	0.99406	0.47685	0.53927	48.86441	0.51716
#2	0.19727	48.75427	0.50996	0.97737	0.99685	0.47803	0.53789	48.92686	0.51549
Mean	**0.19769**	**48.67701**	**0.50926**	**0.97903**	**0.99545**	**0.47744**	**0.53858**	**48.89563**	**0.51633**
%RSD	0.30479	0.22448	0.19409	0.23910	0.19800	0.17522	0.18193	0.09031	0.22938

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48110	0.95788	1.00435	19.09543	48.95772	0.51096	47.43443	0.94928	0.96865
#2	0.48091	0.95906	1.00722	19.14734	49.05828	0.51200	47.49680	0.95169	0.96641
Mean	**0.48100**	**0.95847**	**1.00579**	**19.12139**	**49.00800**	**0.51148**	**47.46561**	**0.95049**	**0.96753**
%RSD	0.02711	0.08668	0.20180	0.19193	0.14508	0.14373	0.09291	0.17914	0.16388

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.33132	1.00601	4.76654	0.96037	0.90284	4.82491	0.48704	0.98234	0.92005
#2	48.38324	1.00413	4.80962	0.96883	0.91960	4.84737	0.47933	0.98486	0.94921
Mean	**48.35728**	**1.00507**	**4.78808**	**0.96460**	**0.91122**	**4.83614**	**0.48319**	**0.98360**	**0.93463**
%RSD	0.07592	0.13261	0.63615	0.62054	1.30119	0.32839	1.12822	0.18128	2.20561

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.63234	1.00663	0.49062	0.46642	0.50455	4.74433	0.47748	0.93241	0.96441
#2	4.64352	1.01651	0.49158	0.46806	0.50602	4.78512	0.47897	0.93580	0.96612
Mean	**4.63793**	**1.01157**	**0.49110**	**0.46724**	**0.50529**	**4.76473**	**0.47822**	**0.93411**	**0.96527**
%RSD	0.17047	0.69074	0.13857	0.24896	0.20556	0.60534	0.22102	0.25616	0.12526

	Pb	Se
	calc	calc
#1	0.92199	0.94079
#2	0.93600	0.96108
Mean	**0.92900**	**0.95094**
%RSD	1.06585	1.50835

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:03
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 15:37:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00027	0.07286	-0.00087	-0.00610	-0.00011	0.00056	0.00617	-0.05304	-0.00038
#2	-0.00010	0.07259	0.00018	-0.00715	-0.00018	0.00056	-0.00241	-0.05351	-0.00013
Mean	**0.00008**	**0.07273**	**-0.00035**	**-0.00662**	**-0.00014**	**0.00056**	**0.00188**	**-0.05328**	**-0.00026**
%RSD	307.19671	0.26232	212.48596	11.12974	36.27598	0.44333	322.74821	0.62186	69.93852

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00061	-0.00011	-0.00210	0.00945	-0.12565	-0.00264	-0.00371	-0.00031	0.00166
#2	-0.00089	-0.00031	-0.00227	0.00945	-0.13600	-0.00266	-0.00371	-0.00031	0.00134
Mean	**-0.00075**	**-0.00021**	**-0.00218**	**0.00945**	**-0.13083**	**-0.00265**	**-0.00371**	**-0.00031**	**0.00150**
%RSD	26.01375	68.18984	5.35032	0.00000	5.59015	0.62700	0.00000	0.00000	15.04483

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02393	-0.00033	-0.00824	0.00074	-0.00075	-0.00662	-0.00023	-0.00448	-0.00080
#2	0.02331	-0.00106	-0.01126	-0.00280	0.00196	-0.02154	0.00254	-0.00038	0.00163
Mean	**0.02362**	**-0.00070**	**-0.00975**	**-0.00103**	**0.00060**	**-0.01408**	**0.00115**	**-0.00243**	**0.00041**
%RSD	1.83733	73.44642	21.90804	243.67177	317.54221	74.94791	169.79594	119.40284	417.90162

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00315	-0.00246	-0.00134	-0.00260	-0.00602	-0.01371	0.00036	-0.00058	0.00058
#2	-0.00526	-0.00209	-0.00141	-0.00268	-0.00627	-0.03739	-0.00095	-0.00023	0.00019
Mean	**-0.00421**	**-0.00227**	**-0.00137**	**-0.00264**	**-0.00615**	**-0.02555**	**-0.00030**	**-0.00041**	**0.00038**
%RSD	35.51072	11.37668	3.38781	2.28837	2.85886	65.52623	313.55156	61.61162	72.90934

	Pb	**Se**
	calc	calc
#1	-0.00025	-0.00203
#2	0.00038	0.00096
Mean	**0.00006**	**-0.00053**
%RSD	732.66537	395.60417

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:03
SampleId1 : 1303059-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:39:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE29

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00397	27.26272	1.13000	0.02573	0.35352	0.02867	0.00599	50.10725	-0.00043
#2	-0.00427	27.26478	1.13629	0.02702	0.35491	0.02871	0.00447	50.26452	-0.00130
Mean	**-0.00412**	**27.26375**	**1.13315**	**0.02637**	**0.35422**	**0.02869**	**0.00523**	**50.18589**	**-0.00087**
%RSD	5.07581	0.00533	0.39222	3.45335	0.27725	0.10694	20.54423	0.22158	70.84704

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02038	0.00176	0.00590	68.11180	7.77176	0.02727	6.49115	0.74694	8.28243
#2	0.02076	0.00081	0.00437	68.42644	7.79125	0.02736	6.49648	0.75027	8.30822
Mean	**0.02057**	**0.00129**	**0.00514**	**68.26912**	**7.78150**	**0.02732**	**6.49381**	**0.74861**	**8.29533**
%RSD	1.27572	52.24028	21.06398	0.32589	0.17709	0.22970	0.05806	0.31461	0.21986

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.34549	0.01369	1.67970	0.81772	0.77740	28.09242	-0.00558	0.62814	0.58371
#2	0.34450	0.01266	1.65916	0.81892	0.79580	28.26371	-0.00555	0.62545	0.60340
Mean	**0.34500**	**0.01318**	**1.66943**	**0.81832**	**0.78660**	**28.17807**	**-0.00556**	**0.62680**	**0.59356**
%RSD	0.20219	5.52768	0.86992	0.10374	1.65371	0.42984	0.34802	0.30303	2.34570

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.74353	0.01372	0.21089	0.23919	0.00360	43.32299	4.28301	0.08994	0.05517
#2	7.75017	0.01811	0.21161	0.24130	0.00446	43.54053	4.29010	0.09118	0.05511
Mean	**7.74685**	**0.01592**	**0.21125**	**0.24025**	**0.00403**	**43.43176**	**4.28656**	**0.09056**	**0.05514**
%RSD	0.06063	19.49082	0.23942	0.62161	15.07145	0.35418	0.11703	0.97032	0.07945

	Pb	**Se**
	calc	calc
#1	0.79083	0.59851
#2	0.80350	0.61075
Mean	**0.79716**	**0.60463**
%RSD	1.12387	1.43133

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-4 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:40:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE30

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00164	26.38932	1.01499	0.01904	0.35531	0.02260	0.00368	55.33869	-0.00107
#2	-0.00293	26.42002	1.02012	0.01959	0.35557	0.02261	0.00334	55.41995	-0.00087
Mean	**-0.00228**	**26.40467**	**1.01756**	**0.01932**	**0.35544**	**0.02260**	**0.00351**	**55.37932**	**-0.00097**
%RSD	39.97670	0.08221	0.35594	2.02034	0.05090	0.00928	6.73431	0.10376	14.37287

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01759	0.00449	0.01128	73.66070	7.53510	0.02667	6.93845	0.84143	7.38321
#2	0.01792	0.00385	0.01085	73.83611	7.55719	0.02675	6.93971	0.84294	7.39470
Mean	**0.01776**	**0.00417**	**0.01106**	**73.74841**	**7.54614**	**0.02671**	**6.93908**	**0.84218**	**7.38896**
%RSD	1.29707	10.90278	2.77265	0.16818	0.20704	0.20035	0.01279	0.12672	0.10995

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.26296	0.01586	1.68763	0.62580	0.59003	25.78014	-0.00196	0.56846	0.52635
#2	0.26333	0.01580	1.69393	0.62276	0.60119	25.95115	-0.00321	0.55764	0.53425
Mean	**0.26314**	**0.01583**	**1.69078**	**0.62428**	**0.59561**	**25.86564**	**-0.00258**	**0.56305**	**0.53030**
%RSD	0.09929	0.29372	0.26355	0.34437	1.32501	0.46750	34.03390	1.35913	1.05314

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.80017	0.01010	0.20081	0.21276	-0.00904	34.70108	3.48827	0.09881	0.05145

#2	5.79694	0.00644	0.20100	0.21350	0.00252	34.75985	3.49525	0.09810	0.05157
Mean	**5.79856**	**0.00827**	**0.20090**	**0.21313**	**-0.00326**	**34.73047**	**3.49176**	**0.09846**	**0.05151**
%RSD	0.03945	31.29970	0.06956	0.24475	250.45352	0.11965	0.14143	0.51000	0.15348

	Pb calc	**Se** calc
#1	0.60194	0.54037
#2	0.60838	0.54204
Mean	**0.60516**	**0.54121**
%RSD	0.75153	0.21743

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:42:55
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE31

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00138	17.07197	0.06556	0.00150	0.35484	0.00367	0.00282	62.77725	-0.00004
#2	-0.00234	16.98586	0.06148	0.00058	0.35381	0.00365	0.00211	62.77843	-0.00035
Mean	**-0.00186**	**17.02892**	**0.06352**	**0.00104**	**0.35433**	**0.00366**	**0.00246**	**62.77784**	**-0.00019**
%RSD	36.34245	0.35757	4.54084	62.41519	0.20423	0.35368	20.13840	0.00133	111.82828

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.01251	0.01198	0.01928	32.67521	3.98893	0.01143	6.17031	0.80999	0.05052
#2	0.01181	0.01212	0.01928	32.66872	3.96789	0.01141	6.15243	0.81068	0.04941
Mean	**0.01216**	**0.01205**	**0.01928**	**32.67197**	**3.97841**	**0.01142**	**6.16137**	**0.81033**	**0.04997**
%RSD	4.07845	0.84477	0.01673	0.01405	0.37397	0.11313	0.20514	0.06035	1.56752

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.11699	0.01751	1.19153	0.05945	0.05859	3.48921	0.01014	0.22555	0.22260
#2	0.11687	0.01759	1.20248	0.06422	0.05721	3.47425	0.01501	0.21840	0.22160
Mean	**0.11693**	**0.01755**	**1.19701**	**0.06183**	**0.05790**	**3.48173**	**0.01258**	**0.22198**	**0.22210**
%RSD	0.07433	0.35323	0.64714	5.46026	1.68291	0.30379	27.37955	2.27957	0.31633

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	5.55528	-0.00155	0.09548	0.16287	-0.00813	0.46738	0.71980	0.08564	0.01738
#2	5.52509	0.00430	0.09526	0.16268	-0.01279	0.46269	0.71876	0.08528	0.01715
Mean	**5.54019**	**0.00137**	**0.09537**	**0.16278**	**-0.01046**	**0.46504**	**0.71928**	**0.08546**	**0.01726**
%RSD	0.38533	301.15174	0.16033	0.07930	31.46473	0.71262	0.10245	0.30038	0.94835

	Pb calc	**Se** calc
#1	0.05887	0.22358
#2	0.05955	0.22054

Mean	**0.05921**	**0.22206ser: STEVE WORKMAN**
%RSD	0.80114	0.96984

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:44:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE32

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00094	24.75424	0.20494	0.00083	0.23065	0.00628	-0.00295	59.78679	-0.00001
#2	-0.00084	24.69141	0.20704	0.00193	0.23007	0.00628	0.00650	59.78981	-0.00005
Mean	**-0.00089**	**24.72283**	**0.20599**	**0.00138**	**0.23036**	**0.00628**	**0.00177**	**59.78830**	**-0.00003**
%RSD	7.32642	0.17970	0.72002	56.58457	0.17938	0.04377	376.70367	0.00357	104.20054

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02913	0.01197	0.04436	57.10359	4.84786	0.02966	9.82201	1.41620	2.19275
#2	0.02983	0.01233	0.04445	57.07337	4.83934	0.02964	9.80693	1.41595	2.19877
Mean	**0.02948**	**0.01215**	**0.04441**	**57.08848**	**4.84360**	**0.02965**	**9.81447**	**1.41608**	**2.19576**
%RSD	1.67749	2.09339	0.14471	0.03742	0.12440	0.03734	0.10863	0.01261	0.19380

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19025	0.02516	1.67993	0.09676	0.08729	9.98533	0.00409	0.47328	0.44861
#2	0.19045	0.02529	1.65846	0.09850	0.09001	9.98533	0.00596	0.46268	0.45484
Mean	**0.19035**	**0.02522**	**1.66919**	**0.09763**	**0.08865**	**9.98533**	**0.00503**	**0.46798**	**0.45172**
%RSD	0.07618	0.36869	0.90959	1.25620	2.16479	0.00000	26.37039	1.60115	0.97582

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.80167	0.00361	0.15426	0.13063	-0.00388	3.13210	1.02082	0.13030	0.02932
#2	8.79419	0.00507	0.15389	0.13083	-0.00806	3.13545	1.01932	0.13012	0.02971
Mean	**8.79793**	**0.00434**	**0.15408**	**0.13073**	**-0.00597**	**3.13377**	**1.02007**	**0.13021**	**0.02951**
%RSD	0.06013	23.84704	0.16836	0.10733	49.55852	0.07570	0.10348	0.09859	0.94209

	Pb	**Se**
	calc	calc
#1	0.09045	0.45682
#2	0.09283	0.45745
Mean	**0.09164**	**0.45714**
%RSD	1.84245	0.09733

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-7 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:46:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE33

Final concentrations6:28 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00094	23.67679	0.10507	0.00555	0.37728	0.00458	-0.00036	48.58634	-0.00044
#2	-0.00090	23.78885	0.10099	0.00524	0.37834	0.00458	0.00104	48.75327	0.00008
Mean	**-0.00092**	**23.73282**	**0.10303**	**0.00540**	**0.37781**	**0.00458**	**0.00034**	**48.66981**	**-0.00018**
%RSD	3.22500	0.33389	2.79944	4.01794	0.19840	0.00488	289.60580	0.24252	203.82119

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01698	0.01417	0.02529	48.20370	8.16851	0.02003	10.66052	1.20848	0.18580
#2	0.01665	0.01369	0.02528	48.38828	8.18920	0.02010	10.69257	1.21321	0.18828
Mean	**0.01681**	**0.01393**	**0.02528**	**48.29599**	**8.17886**	**0.02007**	**10.67654**	**1.21084**	**0.18704**
%RSD	1.37250	2.47504	0.01996	0.27026	0.17885	0.23913	0.21227	0.27617	0.93627

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.13519	0.02016	2.01524	0.10285	0.09694	8.46069	0.01034	0.32259	0.31296
#2	0.13560	0.02073	2.04584	0.10282	0.09926	8.56579	0.01498	0.32329	0.31471
Mean	**0.13539**	**0.02044**	**2.03054**	**0.10283**	**0.09810**	**8.51324**	**0.01266**	**0.32294**	**0.31384**
%RSD	0.21404	1.97107	1.06575	0.01865	1.67300	0.87290	25.89930	0.15215	0.39313

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	9.67887	-0.00009	0.10904	0.16533	-0.00426	0.96551	0.73030	0.12032	0.02490
#2	9.72295	0.00101	0.10934	0.16577	-0.01646	0.97284	0.73417	0.12122	0.02512
Mean	**9.70091**	**0.00046**	**0.10919**	**0.16555**	**-0.01036**	**0.96918**	**0.73224**	**0.12077**	**0.02501**
%RSD	0.32131	169.88058	0.19485	0.18983	83.26136	0.53506	0.37393	0.53147	0.61809

	Pb	Se
	calc	calc
#1	0.09891	0.31617
#2	0.10045	0.31756
Mean	**0.09968**	**0.31687**
%RSD	1.09185	0.31135

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-8 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:48:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE34

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00468	20.19415	0.19026	0.01788	0.31040	0.01977	-0.00014	28.00338	-0.00040
#2	-0.00486	20.46755	0.19294	0.01837	0.31329	0.01993	-0.00371	28.15552	-0.00100
Mean	**-0.00477**	**20.33085**	**0.19160**	**0.01812**	**0.31184**	**0.01985**	**-0.00192**	**28.07945**	**-0.00070**
%RSD	2.72035	0.95089	0.98914	1.91437	0.65455	0.57498	131.17167	0.38315	60.48504

ted: 3/12/2013 13:06:28   User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01864	0.00084	0.00558	44.78861	5.57986	0.01751	6.76027	0.82407	0.46540
#2	0.01916	0.00122	0.00651	45.08228	5.63365	0.01762	6.80733	0.82935	0.46957
Mean	**0.01890**	**0.00103**	**0.00604**	**44.93544**	**5.60676**	**0.01756**	**6.78380**	**0.82671**	**0.46748**
%RSD	1.92770	25.70257	10.88854	0.46212	0.67834	0.47284	0.49046	0.45177	0.63123

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.15240	0.01606	1.70934	0.16957	0.18931	8.92241	0.00751	0.35870	0.35525
#2	0.15424	0.01705	1.73081	0.16952	0.18839	8.95245	0.00779	0.36802	0.36008
Mean	**0.15332**	**0.01655**	**1.72008**	**0.16954**	**0.18885**	**8.93743**	**0.00765**	**0.36336**	**0.35767**
%RSD	0.85073	4.21327	0.88281	0.01949	0.34134	0.23764	2.60098	1.81385	0.95459

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	10.30956	0.00941	0.12255	0.17191	-0.01331	41.81887	1.54181	0.12231	0.02481
#2	10.44450	0.01307	0.12365	0.17307	-0.00639	42.21735	1.55093	0.12358	0.02515
Mean	**10.37703**	**0.01124**	**0.12310**	**0.17249**	**-0.00985**	**42.01811**	**1.54637**	**0.12295**	**0.02498**
%RSD	0.91949	23.00480	0.63204	0.47825	49.63310	0.67059	0.41705	0.73088	0.97972

	Pb	Se
	calc	calc
#1	0.18273	0.35640
#2	0.18211	0.36273
Mean	**0.18242**	**0.35956**
%RSD	0.24173	1.24374

Method : Paragon2   File : 130311A   Printed : 3/12/2013 13:06:04
SampleId1 : 1303059-9   SampleId2 :   [SAMPLE]
Analysis commenced : 3/11/2013 15:49:53
Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE35

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00014	16.04460	0.05589	0.00187	0.31785	0.00315	-0.00119	40.81100	-0.00026
#2	-0.00192	16.17955	0.05822	0.00144	0.32052	0.00314	0.00529	40.98778	0.00010
Mean	**-0.00103**	**16.11207**	**0.05705**	**0.00166**	**0.31919**	**0.00315**	**0.00205**	**40.89939**	**-0.00008**
%RSD	122.44277	0.59228	2.88897	18.33672	0.59095	0.09357	223.57511	0.30563	304.86902

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01167	0.01117	0.01497	34.39960	5.04979	0.01205	6.55482	0.76378	0.07515
#2	0.01078	0.01099	0.01422	34.62922	5.09904	0.01217	6.58775	0.76957	0.07274
Mean	**0.01123**	**0.01108**	**0.01459**	**34.51441**	**5.07442**	**0.01211**	**6.57129**	**0.76667**	**0.07394**
%RSD	5.59357	1.16364	3.65901	0.47042	0.68626	0.71621	0.35439	0.53331	2.30545

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09258	0.01564	1.46364	0.04829	0.04440	2.28558	0.00806	0.09174	0.10219
#2	0.09340	0.01540	1.47017	0.04731	0.04596	2.29679	0.00581	0.10673	0.10538
Mean	**0.09299**	**0.01552**	**1.46690**	**0.04780**	**0.04518**	**2.29118**	**0.00694**	**0.09924**	**0.10379**
%RSD	0.62290	1.09826	0.31483	1.44773	2.44419	0.34594	22.95892	10.67795	2.17423

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.69496	0.00208	0.09683	0.18418	-0.01106	0.43894	0.50868	0.08782	0.01113
#2	8.77543	-0.00085	0.09758	0.18631	-0.00965	0.44091	0.51309	0.08782	0.01074
Mean	**8.73519**	**0.00062**	**0.09721**	**0.18525**	**-0.01036**	**0.43993**	**0.51088**	**0.08782**	**0.01093**
%RSD	0.65140	335.90354	0.54714	0.81184	9.63714	0.31624	0.61127	0.00000	2.49773

	Pb	Se
	calc	calc
#1	0.04569	0.09871
#2	0.04641	0.10583
Mean	**0.04605**	**0.10227**
%RSD	1.09900	4.92191

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:05
SampleId1 : 1303059-10 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:51:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE36

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00229	17.87528	0.06218	0.00218	0.34387	0.00309	0.00169	58.22503	0.00033
#2	-0.00071	17.94050	0.06311	0.00095	0.34457	0.00312	0.00327	58.38490	-0.00030
Mean	**-0.00150**	**17.90789**	**0.06265**	**0.00156**	**0.34422**	**0.00311**	**0.00248**	**58.30497**	**0.00002**
%RSD	74.49094	0.25754	1.05239	55.47322	0.14264	0.51165	44.97124	0.19389	2828.93572

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01668	0.01389	0.02756	39.23802	5.68318	0.01341	10.39501	0.92150	0.06485
#2	0.01691	0.01453	0.02765	39.32219	5.70095	0.01343	10.44120	0.92364	0.06577
Mean	**0.01679**	**0.01421**	**0.02760**	**39.28011**	**5.69206**	**0.01342**	**10.41811**	**0.92257**	**0.06531**
%RSD	0.98014	3.18911	0.23122	0.15152	0.22079	0.09626	0.31348	0.16397	0.98763

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.24014	0.03164	1.43471	0.05152	0.04998	3.89315	0.00533	0.14145	0.13253
#2	0.24133	0.03276	1.45874	0.05262	0.04674	3.88193	0.00822	0.13664	0.13200
Mean	**0.24073**	**0.03220**	**1.44673**	**0.05207**	**0.04836**	**3.88754**	**0.00678**	**0.13904**	**0.13226**
%RSD	0.34962	2.45452	1.17422	1.49819	4.73368	0.20412	30.22958	2.44524	0.28218

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.80719	-0.00089	0.10521	0.21922	-0.00883	0.37378	0.44543	0.09181	0.00867
#2	7.83937	-0.00198	0.10539	0.22003	-0.00784	0.37778	0.44667	0.09236	0.00884
Mean	**7.82328**	**-0.00144**	**0.10530**	**0.21962**	**-0.00834**	**0.37578**	**0.44605**	**0.09209**	**0.00875**
%RSD	0.29087	54.10908	0.12628	0.26059	8.42703	0.75322	0.19577	0.41816	1.36722

	Pb	**Se**
	calc	calc
#1	0.05049	0.13550
#2	0.04870	0.13354
Mean	**0.04959**	**0.13452**
%RSD	2.55496	1.02670

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:05
SampleId1 : 1303059-11 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 15:53:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE37

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00069	15.49893	0.08514	0.00113	0.26977	0.00367	0.00676	46.04180	-0.00028
#2	-0.00046	15.39858	0.07966	0.00064	0.26824	0.00363	0.00256	45.92903	-0.00062
Mean	**-0.00057**	**15.44875**	**0.08240**	**0.00089**	**0.26900**	**0.00365**	**0.00466**	**45.98542**	**-0.00045**
%RSD	28.82513	0.45931	4.70044	39.02995	0.40331	0.90602	63.67133	0.17339	53.87672

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01165	0.00980	0.01763	36.57590	3.93928	0.01184	6.72608	0.80232	0.09124
#2	0.01235	0.01019	0.01884	36.48904	3.91919	0.01177	6.70538	0.79986	0.09261
Mean	**0.01200**	**0.00999**	**0.01823**	**36.53247**	**3.92923**	**0.01180**	**6.71573**	**0.80109**	**0.09193**
%RSD	4.13149	2.79809	4.70889	0.16814	0.36161	0.40659	0.21798	0.21642	1.05255

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.12154	0.01810	1.46270	0.07001	0.06663	4.05775	0.00488	0.23995	0.23070
#2	0.12088	0.01871	1.44894	0.07277	0.06604	4.02782	0.00686	0.24450	0.23899
Mean	**0.12121**	**0.01840**	**1.45582**	**0.07139**	**0.06633**	**4.04279**	**0.00587**	**0.24222**	**0.23485**
%RSD	0.38244	2.35778	0.66842	2.72949	0.63257	0.52348	23.85457	1.32778	2.49578

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	8.41920	0.00120	0.08273	0.31651	-0.01045	0.41980	0.70340	0.09163	0.02032
#2	8.38756	0.00303	0.08228	0.31514	-0.01047	0.42986	0.70029	0.09200	0.02031
Mean	**8.40338**	**0.00211**	**0.08250**	**0.31582**	**-0.01046**	**0.42483**	**0.70185**	**0.09181**	**0.02032**
%RSD	0.26619	61.32463	0.38674	0.30728	0.17220	1.67459	0.31331	0.27960	0.01533

	Pb	**Se**
	calc	calc

#1	0.06775	0.23378
#2	0.06828	0.24083
Mean	**0.06802**	**0.23730**
%RSD	0.54251	2.09877

ser: **STEVE WORKMAN**

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:05
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 15:55:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20022	49.23908	0.52533	0.99852	1.01071	0.49539	0.54414	49.64873	0.52586
#2	0.19730	49.08326	0.52452	0.99025	1.00847	0.49425	0.52634	49.39246	0.52304
Mean	**0.19876**	**49.16117**	**0.52492**	**0.99438**	**1.00959**	**0.49482**	**0.53524**	**49.52060**	**0.52445**
%RSD	1.03901	0.22412	0.10984	0.58852	0.15671	0.16284	2.35153	0.36593	0.37942

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49415	0.99049	1.02400	19.39066	49.33417	0.51873	49.08051	0.97922	0.99793
#2	0.49116	0.98667	1.01900	19.33094	49.29027	0.51842	48.83195	0.97663	0.99134
Mean	**0.49265**	**0.98858**	**1.02150**	**19.36080**	**49.31222**	**0.51857**	**48.95623**	**0.97792**	**0.99464**
%RSD	0.42942	0.27271	0.34601	0.21809	0.06295	0.04288	0.35900	0.18662	0.46865

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.77367	1.03508	4.82821	1.00817	0.94822	4.90726	0.50139	1.00801	0.95251
#2	48.66517	1.02466	4.81315	0.98437	0.97965	4.89229	0.49466	1.00270	0.98393
Mean	**48.71942**	**1.02987**	**4.82068**	**0.99627**	**0.96394**	**4.89978**	**0.49803**	**1.00536**	**0.96822**
%RSD	0.15748	0.71482	0.22099	1.68909	2.30548	0.21609	0.95569	0.37353	2.29436

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.81050	1.03077	0.50012	0.47895	0.51851	4.91036	0.49496	0.96545	0.99880
#2	4.78511	1.03114	0.49919	0.47837	0.51108	4.83800	0.49040	0.95853	0.99662
Mean	**4.79780**	**1.03096**	**0.49966**	**0.47866**	**0.51479**	**4.87418**	**0.49268**	**0.96199**	**0.99771**
%RSD	0.37428	0.02515	0.13087	0.08552	1.02176	1.04967	0.65406	0.50866	0.15416

	Pb	Se
	calc	calc
#1	0.96818	0.97099
#2	0.98122	0.99018
Mean	**0.97470**	**0.98059**
%RSD	0.94586	1.38351

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:05
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 15:57:29

Dilution ratio : 1.00000 to 1.00000   Tray :   Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00084	0.08369	0.00134	-0.00623	0.00004	0.00090	-0.00206	-0.04555	-0.00001
#2	0.00014	0.08419	0.00192	-0.00788	-0.00003	0.00087	0.00284	-0.04726	-0.00081
Mean	**-0.00035**	**0.08394**	**0.00163**	**-0.00705**	**0.00000**	**0.00088**	**0.00039**	**-0.04641**	**-0.00041**
%RSD	198.35503	0.42550	25.24478	16.60074	1393.09002	2.56171	880.85483	2.61785	138.92983

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00048	0.00009	-0.00238	0.01265	-0.10849	-0.00257	0.00110	-0.00017	-0.00017
#2	-0.00104	-0.00019	-0.00180	0.01257	-0.13012	-0.00260	-0.00078	-0.00017	0.00016
Mean	**-0.00076**	**-0.00005**	**-0.00209**	**0.01261**	**-0.11931**	**-0.00258**	**0.00016**	**-0.00017**	**-0.00001**
%RSD	52.29861	399.87766	19.83791	0.43681	12.81712	0.71462	839.76999	0.00000	3731.31533

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03097	-0.00086	-0.01404	0.00173	-0.00007	-0.00289	0.00610	-0.00091	0.00145
#2	0.03035	-0.00115	-0.01102	0.00067	0.00224	0.00084	0.00755	-0.00848	0.00604
Mean	**0.03066**	**-0.00100**	**-0.01253**	**0.00120**	**0.00109**	**-0.00102**	**0.00683**	**-0.00469**	**0.00374**
%RSD	1.41569	20.08352	17.03577	62.56303	149.96676	258.21599	15.09189	114.13939	86.74851

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00097	0.00193	-0.00130	-0.00251	0.00018	-0.01422	0.00002	0.00125	0.00058
#2	0.00062	0.00010	-0.00130	-0.00278	-0.00544	-0.03632	-0.00019	0.00016	0.00028
Mean	**0.00080**	**0.00102**	**-0.00130**	**-0.00264**	**-0.00263**	**-0.02527**	**-0.00008**	**0.00071**	**0.00043**
%RSD	30.79231	127.02217	0.00000	7.21715	151.11248	61.82537	180.63254	109.13578	49.36079

	Pb	Se
	calc	calc
#1	0.00053	0.00066
#2	0.00172	0.00120
Mean	**0.00113**	**0.00093**
%RSD	74.44156	40.91526

Method : Paragon2   File : 130311A   Printed : 3/12/2013 13:06:05
SampleId1 : 1303059-12   SampleId2 :   [SAMPLE]
Analysis commenced : 3/11/2013 15:59:21
Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE38

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00059	26.97089	0.01789	0.00377	0.44960	0.00309	-0.00009	11.34837	-0.00019
#2	-0.00127	27.04082	0.01778	0.00353	0.45084	0.00307	-0.00043	11.35439	0.00013

Mean	**-0.00093**	**27.00586**	**0.01783**	**0.00365**	**0.45022**	**0.00308**	**-0.00026**	**11.35138**	**-0.00003**
%RSD	51.71657	0.18310	0.46214	4.75417	0.19527	0.44384	94.04535	0.03750	685.41748

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01690	0.02254	0.03102	44.65341	6.40986	0.01653	7.76522	1.09358	0.00035
#2	0.01737	0.02291	0.03204	44.70032	6.43358	0.01653	7.75895	1.09477	0.00146
Mean	**0.01713**	**0.02273**	**0.03153**	**44.67687**	**6.42172**	**0.01653**	**7.76209**	**1.09418**	**0.00091**
%RSD	1.92714	1.16499	2.29775	0.07425	0.26120	0.01116	0.05718	0.07736	86.44810

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11367	0.02844	1.71377	0.04765	0.04538	0.79932	0.00523	0.00365	0.00154
#2	0.11355	0.02840	1.71681	0.04602	0.04456	0.80678	0.00496	-0.00884	0.00722
Mean	**0.11361**	**0.02842**	**1.71529**	**0.04684**	**0.04497**	**0.80305**	**0.00510**	**-0.00260**	**0.00438**
%RSD	0.07650	0.10906	0.12509	2.46224	1.30197	0.65728	3.65283	340.42568	91.64411

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	11.53118	0.00347	0.07053	0.25042	-0.00790	0.00984	0.06472	0.11596	0.01896
#2	11.59182	-0.00202	0.07070	0.25129	-0.01682	0.02122	0.06470	0.11578	0.01869
Mean	**11.56150**	**0.00072**	**0.07061**	**0.25085**	**-0.01236**	**0.01553**	**0.06471**	**0.11587**	**0.01882**
%RSD	0.37088	536.62555	0.17884	0.24379	51.02426	51.79394	0.02306	0.11079	1.01060

	Pb	**Se**
	calc	calc
#1	0.04614	0.00225
#2	0.04504	0.00187
Mean	**0.04559**	**0.00206**
%RSD	1.69890	12.72774

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06
SampleId1 : 1303059-13 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:01:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE39

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00250	59.88056	0.05799	0.01555	0.84056	0.00602	0.00528	175.72937	0.00042
#2	-0.00106	59.64995	0.04831	0.01665	0.83774	0.00602	0.00527	175.40987	0.00096
Mean	**-0.00178**	**59.76526**	**0.05315**	**0.01610**	**0.83915**	**0.00602**	**0.00528**	**175.56962**	**0.00069**
%RSD	56.94115	0.27284	12.87003	4.84883	0.23777	0.01115	0.05571	0.12868	55.84025

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04473	0.05799	0.07807	147.08126	19.15940	0.08182	61.04868	1.89753	0.00341
#2	0.04514	0.05775	0.07675	146.97229	19.15216	0.08177	60.96776	1.89607	0.00413
Mean	**0.04493**	**0.05787**	**0.07741**	**147.02677**	**19.15578**	**0.08179**	**61.00822**	**1.89680**	**0.00377**

%RSD	0.65847	0.29875	1.20815	0.05241	0.02673	0.04961	0.09379	0.05433	13.43264

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.59040	0.08159	4.55782	0.10707	0.09974	2.42009	0.00773	0.00487	0.01524
#2	0.59081	0.08096	4.59287	0.11044	0.09716	2.39767	0.00906	0.00267	0.01000
Mean	**0.59061**	**0.08127**	**4.57535**	**0.10875**	**0.09845**	**2.40888**	**0.00840**	**0.00377**	**0.01262**
%RSD	0.04938	0.55299	0.54173	2.19514	1.85608	0.65812	11.16994	41.15064	29.36149

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.16745	0.00533	0.43174	0.22568	-0.01247	0.13261	0.13629	0.37223	0.03112
#2	14.13903	0.00716	0.43024	0.22470	-0.01741	0.13732	0.13669	0.37060	0.03182
Mean	**14.15324**	**0.00624**	**0.43099**	**0.22519**	**-0.01494**	**0.13496**	**0.13649**	**0.37141**	**0.03147**
%RSD	0.14202	20.73894	0.24600	0.30897	23.38676	2.46628	0.20497	0.31135	1.56416

	Pb	**Se**
	calc	calc
#1	0.10218	0.01179
#2	0.10158	0.00756
Mean	**0.10188**	**0.00967**
%RSD	0.41603	30.89150

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06
SampleId1 : 1303059-14 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:02:51
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE40

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00149	8.33471	0.00752	-0.00770	0.23989	0.00127	-0.00362	2.55717	-0.00043
#2	-0.00067	8.31921	0.00624	-0.00665	0.23993	0.00126	-0.00572	2.55356	-0.00059
Mean	**-0.00108**	**8.32696**	**0.00688**	**-0.00718**	**0.23991**	**0.00127**	**-0.00467**	**2.55537**	**-0.00051**
%RSD	53.38743	0.13158	13.18218	10.27366	0.01077	0.20880	31.82785	0.09973	22.95145

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00460	0.00494	0.00261	21.23932	1.06475	0.00168	2.16321	0.35831	-0.00004
#2	0.00464	0.00498	0.00271	21.22385	1.06687	0.00171	2.16634	0.35824	0.00094
Mean	**0.00462**	**0.00496**	**0.00266**	**21.23159**	**1.06581**	**0.00170**	**2.16477**	**0.35827**	**0.00045**
%RSD	0.69925	0.58578	2.53739	0.05153	0.14059	1.19662	0.10225	0.01237	153.60206

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04615	0.00911	0.44179	0.01041	0.01399	0.13886	0.00273	-0.01067	0.00533
#2	0.04566	0.00900	0.44621	0.01510	0.01506	0.12767	0.00273	-0.00957	0.00398
Mean	**0.04590**	**0.00906**	**0.44400**	**0.01275**	**0.01452**	**0.13327**	**0.00273**	**-0.01012**	**0.00465**
%RSD	0.75659	0.85559	0.70382	26.03752	5.21031	5.93801	0.12558	7.67316	20.56124

ted: 3/12/2013 13:06:28 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.81291	-0.00304	0.01906	0.18704	-0.01557	-0.02007	0.02763	0.03990	0.00918
#2	5.81425	-0.00158	0.01911	0.18755	-0.01391	-0.02141	0.02778	0.03954	0.00927
Mean	**5.81358**	**-0.00231**	**0.01908**	**0.18730**	**-0.01474**	**-0.02074**	**0.02771**	**0.03972**	**0.00922**
%RSD	0.01639	44.72830	0.20887	0.19175	7.95968	4.55615	0.37186	0.64614	0.70951

	Pb	Se
	calc	calc
#1	0.01279	0.00000
#2	0.01507	-0.00053
Mean	**0.01393**	**-0.00026**
%RSD	11.55942	143.49448

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06
SampleId1 : 1303059-15 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:04:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE41

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00124	8.13870	0.00729	-0.00678	0.15995	0.00123	-0.00131	2.05182	-0.00018
#2	-0.00078	8.12270	0.00775	-0.00641	0.15922	0.00120	-0.00218	2.04806	-0.00044
Mean	**-0.00101**	**8.13070**	**0.00752**	**-0.00659**	**0.15959**	**0.00122**	**-0.00174**	**2.04994**	**-0.00031**
%RSD	32.62798	0.13915	4.38480	3.94641	0.32353	1.36885	35.30411	0.12964	60.17588

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00436	0.00573	0.00440	18.66660	1.57422	0.00194	1.81982	0.49053	0.00048
#2	0.00473	0.00594	0.00467	18.62916	1.58883	0.00194	1.81075	0.48997	0.00139
Mean	**0.00455**	**0.00583**	**0.00454**	**18.64788**	**1.58152**	**0.00194**	**1.81528**	**0.49025**	**0.00094**
%RSD	5.81015	2.51234	4.08945	0.14198	0.65316	0.09530	0.35357	0.08142	68.72150

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04513	0.00753	0.55136	0.00961	0.01407	0.10529	0.00259	0.00005	0.00817
#2	0.04549	0.00738	0.54810	0.01116	0.01329	0.11648	0.00523	-0.00392	0.00447
Mean	**0.04531**	**0.00746**	**0.54973**	**0.01039**	**0.01368**	**0.11089**	**0.00391**	**-0.00193**	**0.00632**
%RSD	0.57487	1.45483	0.41898	10.53220	4.02502	7.13650	47.78613	144.96964	41.39284

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.69785	0.00023	0.01895	0.20179	-0.01244	-0.02229	0.02550	0.03972	0.00724
#2	5.68776	-0.00160	0.01888	0.20129	-0.00266	-0.00152	0.02528	0.04081	0.00732
Mean	**5.69280**	**-0.00068**	**0.01891**	**0.20154**	**-0.00755**	**-0.01190**	**0.02539**	**0.04027**	**0.00728**
%RSD	0.12537	189.37831	0.28098	0.17540	91.56947	123.34889	0.60089	1.91221	0.81952

	Pb calc	Seser: STEVE WORKMAN calc
#1	0.01259	0.00546
#2	0.01258	0.00168
Mean	**0.01259**	**0.00357**
%RSD	0.02429	75.00503

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06

SampleId1 : 1303060-1 **SampleId2 :** **[SAMPLE]**

Analysis commenced : 3/11/2013 16:06:17

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE44

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00258	63.67635	0.05204	0.02597	0.77494	0.00652	0.00455	144.83513	0.00026
#2	-0.00191	64.02846	0.05857	0.02640	0.77728	0.00653	0.01139	145.20039	0.00094
Mean	**-0.00224**	**63.85240**	**0.05531**	**0.02619**	**0.77611**	**0.00652**	**0.00797**	**145.01776**	**0.00060**
%RSD	20.93732	0.38993	8.34483	1.15920	0.21361	0.10078	60.64827	0.17810	80.82593

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.05127	0.06146	0.09557	151.79201	20.01375	0.07830	40.42898	1.95324	0.01214
#2	0.05319	0.06240	0.09604	152.19730	20.10726	0.07865	40.59260	1.95882	0.01156
Mean	**0.05223**	**0.06193**	**0.09581**	**151.99466**	**20.06051**	**0.07848**	**40.51079**	**1.95603**	**0.01185**
%RSD	2.59034	1.07303	0.34168	0.18855	0.32962	0.31732	0.28559	0.20167	3.49854

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.59601	0.08915	3.65889	0.11048	0.10576	4.42070	0.00786	0.01211	0.03111
#2	0.59865	0.08992	3.68400	0.11502	0.10180	4.41695	0.01101	0.02201	0.02514
Mean	**0.59733**	**0.08954**	**3.67145**	**0.11275**	**0.10378**	**4.41882**	**0.00944**	**0.01706**	**0.02813**
%RSD	0.31252	0.60581	0.48361	2.84478	2.69726	0.05988	23.58657	41.04080	15.01077

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	17.66592	0.00345	0.55833	0.26575	-0.02230	0.23421	0.18120	0.39022	0.03280
#2	17.75671	0.00345	0.56009	0.26798	-0.01637	0.24218	0.18199	0.38986	0.03338
Mean	**17.71132**	**0.00345**	**0.55921**	**0.26686**	**-0.01934**	**0.23820**	**0.18160**	**0.39004**	**0.03309**
%RSD	0.36246	0.05318	0.22324	0.59075	21.68044	2.36378	0.30814	0.06589	1.24174

	Pb calc	**Se** calc
#1	0.10733	0.02479
#2	0.10620	0.02410
Mean	**0.10677**	**0.02444**
%RSD	0.74836	1.98311

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06

SampleId1 : 1303060-1D SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:08:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE45

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00292	63.04325	0.05449	0.02628	0.76600	0.00650	0.00175	144.33224	0.00085
#2	-0.00151	63.56477	0.05857	0.02610	0.76966	0.00654	0.01070	145.12762	0.00097
Mean	**-0.00221**	**63.30401**	**0.05653**	**0.02619**	**0.76783**	**0.00652**	**0.00622**	**144.72993**	**0.00091**
%RSD	45.13353	0.58254	5.10260	0.49680	0.33735	0.39934	101.62091	0.38860	9.14091

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05144	0.06068	0.09378	149.65366	19.80382	0.07751	39.86309	1.89100	0.01104
#2	0.05284	0.06208	0.09488	150.49796	19.94610	0.07795	40.15461	1.90234	0.01195
Mean	**0.05214**	**0.06138**	**0.09433**	**150.07581**	**19.87496**	**0.07773**	**40.00885**	**1.89667**	**0.01149**
%RSD	1.90023	1.61804	0.82150	0.39781	0.50622	0.40104	0.51523	0.42287	5.61185

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.59420	0.08779	3.72320	0.10883	0.10149	4.37205	0.00642	0.00084	0.02717
#2	0.59869	0.09040	3.70794	0.11718	0.09968	4.41321	0.01168	0.01627	0.02091
Mean	**0.59644**	**0.08910**	**3.71557**	**0.11301**	**0.10059**	**4.39263**	**0.00905**	**0.00856**	**0.02404**
%RSD	0.53305	2.06989	0.29033	5.22512	1.27006	0.66263	41.10391	127.45818	18.41834

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	15.72923	0.00345	0.55381	0.26833	-0.01911	0.23795	0.18305	0.38877	0.03384
#2	15.84770	0.00600	0.55581	0.27066	-0.02141	0.27262	0.18413	0.38913	0.03486
Mean	**15.78846**	**0.00473**	**0.55481**	**0.26949**	**-0.02026**	**0.25529**	**0.18359**	**0.38895**	**0.03435**
%RSD	0.53058	38.27725	0.25508	0.61205	8.03565	9.60311	0.41755	0.06607	2.09831

	Pb	Se
	calc	calc
#1	0.10393	0.01841
#2	0.10551	0.01937
Mean	**0.10472**	**0.01889**
%RSD	1.06395	3.59007

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:06
SampleId1 : 1303060-1L 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:09:47
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE46

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	-0.00121	13.36673	0.01113	-0.00242	0.16200	0.00143	0.00091	29.93306	-0.00035
#2	-0.00122	13.46103	0.01311	-0.00150	0.16266	0.00146	-0.00259	30.06157	-0.00020
Mean	**-0.00122**	**13.41388**	**0.01212**	**-0.00196**	**0.16233**	**0.00145**	**-0.00084**	**29.99732**	**-0.00028**
%RSD	0.49754	0.49712	11.55784	33.13904	0.28627	1.31581	294.18518	0.30293	37.29966

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01009	0.01242	0.01633	29.48193	3.29514	0.01150	8.64096	0.41986	0.00100
#2	0.01061	0.01230	0.01641	29.60905	3.31333	0.01159	8.67581	0.42186	0.00224
Mean	**0.01035**	**0.01236**	**0.01637**	**29.54549**	**3.30424**	**0.01155**	**8.65838**	**0.42086**	**0.00162**
%RSD	3.51337	0.73406	0.35890	0.30425	0.38920	0.54347	0.28459	0.33707	53.94464

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10503	0.01900	0.78736	0.02078	0.02422	0.92249	0.00446	0.01066	0.00528
#2	0.10556	0.01755	0.78294	0.02235	0.01810	0.94115	0.00460	0.01342	0.01151
Mean	**0.10530**	**0.01827**	**0.78515**	**0.02157**	**0.02116**	**0.93182**	**0.00453**	**0.01204**	**0.00840**
%RSD	0.35762	5.59763	0.39839	5.15380	20.43054	1.41625	2.19535	16.20496	52.51275

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.84834	0.00150	0.11548	0.05415	-0.01256	0.00991	0.03687	0.08474	0.00601
#2	3.87761	-0.00143	0.11599	0.05436	-0.01022	0.02127	0.03737	0.08564	0.00617
Mean	**3.86297**	**0.00004**	**0.11574**	**0.05425**	**-0.01139**	**0.01559**	**0.03712**	**0.08519**	**0.00609**
%RSD	0.53577	5545.88185	0.31024	0.27937	14.50303	51.53309	0.95402	0.75334	1.85323

	Pb	**Se**
	calc	calc
#1	0.02307	0.00707
#2	0.01952	0.01215
Mean	**0.02129**	**0.00961**
%RSD	11.80237	37.36411

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:07
SampleId1 : 1303060-1MS SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:11:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE47

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09375	87.62511	1.04468	0.84342	1.78895	0.05668	0.00812	181.61343	0.05282
#2	0.09255	87.05970	1.03967	0.83974	1.77970	0.05650	0.00636	180.88473	0.05297
Mean	**0.09315**	**87.34240**	**1.04218**	**0.84158**	**1.78433**	**0.05659**	**0.00724**	**181.24908**	**0.05289**
%RSD	0.91192	0.45774	0.33962	0.30908	0.36639	0.21570	17.16095	0.28428	0.20127

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.53352	0.27209	0.36121	157.54498	62.39651	0.62378	81.32670	2.36348	0.92412

#2	0.53169	0.27098	0.35979	157.05853	62.06271	0.62100	81.00190	2.35572	0.92190
Mean	**0.53261**	**0.27154**	**0.36050**	**157.30176**	**62.22961**	**0.62239**	**81.16430**	**2.35960**	**0.92301**
%RSD	0.24311	0.28816	0.27689	0.21867	0.37929	0.31596	0.28297	0.23243	0.16998

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	40.59479	0.60091	3.71005	0.62565	0.57187	4.83240	0.30866	1.74520	1.63493
#2	40.37997	0.59779	3.69198	0.62204	0.58548	4.80994	0.30417	1.73164	1.68719
Mean	**40.48738**	**0.59935**	**3.70102**	**0.62384**	**0.57867**	**4.82117**	**0.30642**	**1.73842**	**1.66106**
%RSD	0.37518	0.36719	0.34527	0.40906	1.66316	0.32941	1.03611	0.55146	2.22476

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	18.14587	0.50644	1.06840	0.66789	1.89596	0.24456	0.69338	0.86967	0.03194
#2	18.07676	0.50242	1.06264	0.66608	1.88874	0.24532	0.68915	0.86840	0.03182
Mean	**18.11131**	**0.50443**	**1.06552**	**0.66698**	**1.89235**	**0.24494**	**0.69126**	**0.86904**	**0.03188**
%RSD	0.26981	0.56398	0.38265	0.19158	0.26978	0.21873	0.43231	0.10369	0.26877

	Pb calc	**Se** calc
#1	0.58977	1.67165
#2	0.59765	1.70199
Mean	**0.59371**	**1.68682**
%RSD	0.93809	1.27200

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:07
SampleId1 : 1303060-1MSD SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:13:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE48

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.09235	88.18015	1.01313	0.82306	1.76287	0.05572	0.00579	181.28491	0.05088
#2	0.09332	88.25085	1.01686	0.82269	1.76446	0.05569	0.00002	181.01219	0.05177
Mean	**0.09284**	**88.21550**	**1.01499**	**0.82288**	**1.76366**	**0.05571**	**0.00290**	**181.14855**	**0.05133**
%RSD	0.74216	0.05667	0.25952	0.03161	0.06350	0.03107	140.68099	0.10645	1.22616

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.52390	0.26607	0.35387	157.97401	61.90834	0.61268	80.50070	2.36583	0.90239
#2	0.52357	0.26607	0.35416	157.89174	61.97813	0.61329	80.39905	2.36666	0.90323
Mean	**0.52374**	**0.26607**	**0.35401**	**157.93287**	**61.94323**	**0.61298**	**80.44988**	**2.36624**	**0.90281**
%RSD	0.04425	0.00235	0.05962	0.03684	0.07967	0.07040	0.08935	0.02470	0.06645

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	39.81463	0.59034	3.66922	0.59330	0.55326	4.38327	0.29819	1.68517	1.63016
#2	39.83839	0.58607	3.68799	0.59244	0.55862	4.39076	0.29502	1.69760	1.66311

Mean	**39.82651**	**0.58820**	**3.67860**	**0.59287**	**0.55594**	**4.38702**	**0.29661**	**1.69138**	**1.64663**
%RSD	0.04218	0.51379	0.36088	0.10287	0.68200	0.12063	0.75511	0.51980	1.41527

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	17.72117	0.49219	1.05402	0.65015	1.84119	0.24783	0.68220	0.89352	0.03245
#2	17.74632	0.49987	1.05455	0.65154	1.85026	0.23110	0.68087	0.89298	0.03200
Mean	**17.73375**	**0.49603**	**1.05428**	**0.65084**	**1.84573**	**0.23947**	**0.68154**	**0.89325**	**0.03223**
%RSD	0.10030	1.09525	0.03562	0.15070	0.34743	4.93915	0.13740	0.04324	0.98312

	Pb	**Se**
	calc	calc
#1	0.56659	1.64847
#2	0.56988	1.67460
Mean	**0.56824**	**1.66154**
%RSD	0.40931	1.11172

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:07
SampleId1 : 1303060-2 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:15:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE49

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00229	47.39541	0.23151	0.01775	0.97301	0.01145	0.01013	119.81962	0.00070
#2	-0.00285	47.35792	0.22091	0.01683	0.97352	0.01140	0.00592	119.55766	0.00055
Mean	**-0.00257**	**47.37667**	**0.22621**	**0.01729**	**0.97327**	**0.01142**	**0.00803**	**119.68864**	**0.00062**
%RSD	15.44084	0.05595	3.31467	3.76128	0.03730	0.28283	37.06088	0.15476	16.46646

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03623	0.03076	0.05942	122.23328	15.37989	0.06480	23.03516	1.85432	0.37509
#2	0.03568	0.03092	0.06048	122.10377	15.37317	0.06469	23.01210	1.85388	0.37301
Mean	**0.03596**	**0.03084**	**0.05995**	**122.16852**	**15.37653**	**0.06474**	**23.02363**	**1.85410**	**0.37405**
%RSD	1.09727	0.35481	1.24534	0.07496	0.03092	0.12822	0.07083	0.01691	0.39438

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.41803	0.04346	2.85042	0.30235	0.27967	34.72303	0.01406	0.86119	0.83582
#2	0.41659	0.04365	2.85909	0.29820	0.28286	34.81098	0.00890	0.88006	0.86420
Mean	**0.41731**	**0.04355**	**2.85475**	**0.30027**	**0.28127**	**34.76700**	**0.01148**	**0.87063**	**0.85001**
%RSD	0.24402	0.32024	0.21459	0.97728	0.80195	0.17888	31.76133	1.53256	2.36042

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	21.20613	0.00936	0.38799	0.22093	-0.01914	6.13682	3.03746	0.23762	0.06074
#2	21.20733	0.00387	0.38796	0.22009	-0.02721	6.11607	3.03663	0.23671	0.06068
Mean	**21.20673**	**0.00661**	**0.38798**	**0.22051**	**-0.02318**	**6.12645**	**3.03704**	**0.23716**	**0.06071**

%RSD	0.00397	58.67607	0.00515	0.26718	24.61088	0.23951	0.01925	0.27075	0.07230

	Pb calc	**Se** calc
#1	0.28722	0.84427
#2	0.28797	0.86948
Mean	**0.28760**	**0.85688**
%RSD	0.18336	2.08032

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:07
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 16:17:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.19996	49.00328	0.52685	0.99227	1.00730	0.49503	0.53039	49.63763	0.52377
#2	0.20122	49.37894	0.52487	0.99429	1.01236	0.49697	0.53922	49.77574	0.52688
Mean	**0.20059**	**49.19111**	**0.52586**	**0.99328**	**1.00983**	**0.49600**	**0.53481**	**49.70668**	**0.52533**
%RSD	0.44253	0.54000	0.26627	0.14402	0.35444	0.27769	1.16710	0.19647	0.41873

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.49316	0.99077	1.01633	19.32422	49.30733	0.51616	49.05814	0.97752	1.00492
#2	0.49531	0.99342	1.02277	19.40936	49.66009	0.51924	49.24058	0.98375	0.99963
Mean	**0.49424**	**0.99209**	**1.01955**	**19.36679**	**49.48371**	**0.51770**	**49.14936**	**0.98063**	**1.00227**
%RSD	0.30765	0.18891	0.44677	0.31085	0.50409	0.42137	0.26247	0.44937	0.37299

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	48.68359	1.02420	4.65946	1.00237	0.94985	4.79871	0.49799	0.98743	0.93988
#2	48.96844	1.03023	4.68299	1.00463	0.96574	4.80994	0.49341	1.00581	0.96950
Mean	**48.82602**	**1.02722**	**4.67123**	**1.00350**	**0.95780**	**4.80432**	**0.49570**	**0.99662**	**0.95469**
%RSD	0.41253	0.41491	0.35621	0.15882	1.17335	0.16528	0.65219	1.30416	2.19366

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	4.78155	1.02931	0.49798	0.47951	0.51787	4.88022	0.49459	0.96909	0.99700
#2	4.81691	1.02894	0.50080	0.48224	0.51660	4.91638	0.49698	0.96982	1.00136
Mean	**4.79923**	**1.02912**	**0.49939**	**0.48088**	**0.51724**	**4.89830**	**0.49578**	**0.96945**	**0.99918**
%RSD	0.52100	0.02537	0.39949	0.40228	0.17246	0.52211	0.34123	0.05313	0.30806

	Pb calc	**Se** calc
#1	0.96734	0.95571
#2	0.97869	0.98159
Mean	**0.97302**	**0.96865**
%RSD	0.82493	1.88891

ted: 3/12/2013 13:06:29 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:07
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 16:19:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00023	0.09422	-0.00099	-0.00457	0.00022	0.00042	0.00144	-0.03524	0.00020
#2	0.00036	0.08963	-0.00041	-0.00721	0.00019	0.00040	-0.00591	-0.03571	-0.00014
Mean	**0.00030**	**0.09193**	**-0.00070**	**-0.00589**	**0.00020**	**0.00041**	**-0.00223**	**-0.03547**	**0.00003**
%RSD	33.00286	3.52993	58.97471	31.67042	12.62350	2.63775	232.94747	0.93402	836.89683

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00057	-0.00020	-0.00228	0.01841	-0.09721	-0.00248	0.00798	0.00002	0.00120
#2	-0.00052	-0.00007	-0.00163	0.01771	-0.10896	-0.00251	0.00891	0.00002	0.00081
Mean	**-0.00055**	**-0.00013**	**-0.00195**	**0.01806**	**-0.10309**	**-0.00249**	**0.00845**	**0.00002**	**0.00100**
%RSD	6.03652	70.43620	23.51308	2.74459	8.06199	0.81448	7.85524	0.00000	27.54026

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03739	0.00034	-0.01056	0.00195	0.00135	-0.00662	0.00505	0.00087	-0.00071
#2	0.03600	-0.00117	-0.01730	-0.00182	0.00100	-0.02900	0.00334	0.00198	0.00100
Mean	**0.03669**	**-0.00041**	**-0.01393**	**0.00006**	**0.00118**	**-0.01781**	**0.00420**	**0.00143**	**0.00014**
%RSD	2.68129	259.92680	34.19991	4205.65514	20.63322	88.87229	28.96618	54.98172	848.47320

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00108	0.00010	-0.00125	-0.00245	-0.01056	-0.02427	0.00059	0.00089	0.00068
#2	-0.00036	-0.00099	-0.00125	-0.00247	-0.00340	-0.01490	0.00038	0.00071	0.00062
Mean	**0.00036**	**-0.00045**	**-0.00125**	**-0.00246**	**-0.00698**	**-0.01958**	**0.00049**	**0.00080**	**0.00065**
%RSD	282.51706	174.20678	0.00000	0.68514	72.57676	33.85175	30.40426	16.11645	6.70075

	Pb	Se
	calc	calc
#1	0.00155	-0.00019
#2	0.00006	0.00132
Mean	**0.00081**	**0.00057**
%RSD	130.32816	187.45722

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-3 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:20:59
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE50

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00106	50.54780	0.09598	0.02070	0.77384	0.00687	-0.00146	72.76023	0.00061
#2	-0.00144	51.16583	0.09027	0.01978	0.78179	0.00688	0.00029	73.34035	0.00120
Mean	**-0.00125**	**50.85682**	**0.09312**	**0.02024**	**0.77781**	**0.00688**	**-0.00059**	**73.05029**	**0.00090**
%RSD	21.14419	0.85930	4.33618	3.21417	0.72268	0.11938	210.79044	0.56154	46.25465

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03472	0.04330	0.07260	115.26841	14.16514	0.05490	24.47689	1.62051	0.04101
#2	0.03491	0.04319	0.07318	116.32772	14.31379	0.05540	24.67669	1.63607	0.03977
Mean	**0.03481**	**0.04325**	**0.07289**	**115.79806**	**14.23946**	**0.05515**	**24.57679**	**1.62829**	**0.04039**
%RSD	0.39610	0.18011	0.56267	0.64686	0.73816	0.64902	0.57486	0.67563	2.16735

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.40022	0.05514	3.02865	0.24812	0.22072	17.97002	0.00936	0.32722	0.31188
#2	0.40487	0.05400	3.05348	0.24591	0.22622	18.07584	0.00566	0.33986	0.32514
Mean	**0.40254**	**0.05457**	**3.04107**	**0.24701**	**0.22347**	**18.02293**	**0.00751**	**0.33354**	**0.31851**
%RSD	0.81656	1.47685	0.57741	0.63417	1.74003	0.41515	34.82319	2.68045	2.94404

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	16.57717	0.00644	0.38530	0.21095	-0.01575	0.62120	1.19519	0.28720	0.04325
#2	16.77033	0.00241	0.38949	0.21234	-0.01692	0.60561	1.20732	0.28757	0.04331
Mean	**16.67375**	**0.00443**	**0.38740**	**0.21165**	**-0.01634**	**0.61340**	**1.20126**	**0.28739**	**0.04328**
%RSD	0.81919	64.30003	0.76394	0.46396	5.07933	1.79769	0.71374	0.08939	0.09298

	Pb	Se
	calc	calc
#1	0.22984	0.31699
#2	0.23277	0.33004
Mean	**0.23131**	**0.32352**
%RSD	0.89574	2.85354

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-4 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:22:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE51

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00147	38.67643	0.17989	0.01751	0.68495	0.00741	0.00499	282.57444	0.00069
#2	-0.00103	38.55027	0.17802	0.01659	0.68213	0.00737	0.00411	281.68694	0.00073
Mean	**-0.00125**	**38.61335**	**0.17895**	**0.01705**	**0.68354**	**0.00739**	**0.00455**	**282.13069**	**0.00071**
%RSD	25.03384	0.23104	0.73673	3.81540	0.29165	0.37410	13.65938	0.22244	4.17888

Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03513	0.03191	0.05483	103.72895	14.81341	0.05675	26.50670	3.50970	0.48920
#2	0.03494	0.03170	0.05504	103.53243	14.77430	0.05658	26.42570	3.50208	0.49063
Mean	**0.03503**	**0.03181**	**0.05494**	**103.63069**	**14.79386**	**0.05666**	**26.46620**	**3.50589**	**0.48992**
%RSD	0.38383	0.46674	0.26330	0.13409	0.18693	0.20838	0.21641	0.15383	0.20706

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.51199	0.04915	2.66222	0.18582	0.16663	20.56100	0.00664	0.44183	0.42316
#2	0.51043	0.04872	2.67509	0.18187	0.16984	20.43607	0.00493	0.43727	0.43994
Mean	**0.51121**	**0.04894**	**2.66865**	**0.18384**	**0.16824**	**20.49854**	**0.00579**	**0.43955**	**0.43155**
%RSD	0.21656	0.63340	0.34106	1.51702	1.35102	0.43095	20.81156	0.73328	2.74986

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	15.74768	0.00499	0.55814	0.19957	-0.00738	1.46849	1.55335	0.24706	0.03390
#2	15.73047	0.00243	0.55621	0.19929	-0.01821	1.45178	1.54844	0.24597	0.03409
Mean	**15.73908**	**0.00371**	**0.55717**	**0.19943**	**-0.01280**	**1.46014**	**1.55089**	**0.24652**	**0.03400**
%RSD	0.07729	48.80609	0.24442	0.09848	59.84232	0.80916	0.22394	0.31259	0.39269

	Pb	**Se**
	calc	calc
#1	0.17302	0.42938
#2	0.17385	0.43905
Mean	**0.17343**	**0.43422**
%RSD	0.33864	1.57572

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-5 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:24:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE52

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00150	52.64498	0.21508	0.02150	1.10728	0.01088	0.00973	111.50883	0.00084
#2	-0.00151	52.62932	0.22370	0.02119	1.11058	0.01090	0.00798	111.55662	0.00087
Mean	**-0.00151**	**52.63715**	**0.21939**	**0.02134**	**1.10893**	**0.01089**	**0.00885**	**111.53272**	**0.00085**
%RSD	0.24208	0.02104	2.77922	1.01597	0.21061	0.12992	13.99268	0.03030	2.33005

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03933	0.03750	0.06991	129.04559	18.04306	0.06688	26.07452	1.90767	0.24622
#2	0.03939	0.03766	0.06915	129.24653	18.02016	0.06698	26.09604	1.91077	0.24257
Mean	**0.03936**	**0.03758**	**0.06953**	**129.14606**	**18.03161**	**0.06693**	**26.08528**	**1.90922**	**0.24439**
%RSD	0.09269	0.29429	0.77252	0.11001	0.08977	0.10750	0.05831	0.11501	1.05607

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.40993	0.05113	3.04365	0.28412	0.25733	32.82760	0.00835	0.84522	0.81408
#2	0.40985	0.05089	3.06731	0.28202	0.25961	32.94218	0.01097	0.84550	0.81973
Mean	**0.40989**	**0.05101**	**3.05548**	**0.28307**	**0.25847**	**32.88489**	**0.00966**	**0.84536**	**0.81691**
%RSD	0.01419	0.33422	0.54760	0.52493	0.62330	0.24636	19.13454	0.02359	0.48944

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	16.10241	0.00427	0.40127	0.19082	-0.01413	3.38772	2.75597	0.29919	0.05537
#2	16.12418	0.00610	0.40216	0.19069	-0.02370	3.39438	2.76088	0.30174	0.05550
Mean	**16.11330**	**0.00518**	**0.40172**	**0.19076**	**-0.01892**	**3.39105**	**2.75843**	**0.30047**	**0.05543**
%RSD	0.09553	24.95645	0.15599	0.04707	35.76660	0.13894	0.12582	0.59853	0.16585

	Pb calc	**Se** calc
#1	0.26625	0.82445
#2	0.26707	0.82831
Mean	**0.26666**	**0.82638**
%RSD	0.21742	0.33075

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-6 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:26:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE53

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00062	74.54324	0.12978	0.04413	1.12222	0.00843	0.00967	138.35420	0.00123
#2	-0.00189	73.95054	0.11906	0.04020	1.11414	0.00834	0.00562	137.70945	0.00121
Mean	**-0.00125**	**74.24689**	**0.12442**	**0.04216**	**1.11818**	**0.00839**	**0.00764**	**138.03183**	**0.00122**
%RSD	71.14314	0.56447	6.09355	6.58253	0.51060	0.75027	37.42232	0.33029	1.63632

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.05516	0.07091	0.12073	161.02741	26.10105	0.08996	33.43882	2.25385	0.07372
#2	0.05333	0.06963	0.11833	160.42846	25.94105	0.08952	33.27570	2.24565	0.07443
Mean	**0.05425**	**0.07027**	**0.11953**	**160.72794**	**26.02105**	**0.08974**	**33.35726**	**2.24975**	**0.07407**
%RSD	2.38920	1.28455	1.42160	0.26350	0.43480	0.34119	0.34577	0.25757	0.68420

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.92491	0.08821	3.68916	0.19300	0.15844	11.51917	0.01532	0.15435	0.14962
#2	0.91928	0.08580	3.70794	0.18580	0.16461	11.49284	0.00954	0.15004	0.16143
Mean	**0.92209**	**0.08701**	**3.69855**	**0.18940**	**0.16152**	**11.50600**	**0.01243**	**0.15220**	**0.15553**
%RSD	0.43217	1.95937	0.35896	2.68923	2.70202	0.16181	32.88693	2.00026	5.36897

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	15.89423	0.00899	0.63838	0.22387	-0.01273	1.07704	0.83179	0.39495	0.04610

#2	15.79824	0.00533	0.63467	0.22400	-0.02664	1.03160	0.82406	0.39331	0.04532
Mean	**15.84623**	**0.00716**	**0.63653**	**0.22393**	**-0.01968**	**1.05432**	**0.82792**	**0.39413**	**0.04571**
%RSD	0.42834	36.14759	0.41245	0.04009	49.98323	3.04712	0.65988	0.29343	1.21662

	Pb calc	**Se** calc
#1	0.16995	0.15120
#2	0.17167	0.15764
Mean	**0.17081**	**0.15442**
%RSD	0.71132	2.95032

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-7 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:28:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE54

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00158	45.28723	0.15367	0.02597	0.78366	0.00788	0.00396	178.62323	0.00094
#2	-0.00070	45.02279	0.15239	0.02419	0.78076	0.00784	-0.01005	178.09683	0.00090
Mean	**-0.00114**	**45.15501**	**0.15303**	**0.02508**	**0.78221**	**0.00786**	**-0.00304**	**178.36003**	**0.00092**
%RSD	54.15458	0.41410	0.59234	5.01377	0.26162	0.34788	325.41925	0.20869	2.66928

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.03680	0.04279	0.08955	116.79062	18.07053	0.05623	24.52368	1.99267	0.13432
#2	0.03675	0.04332	0.08928	116.51845	17.97559	0.05603	24.44370	1.98690	0.13269
Mean	**0.03677**	**0.04305**	**0.08942**	**116.65453**	**18.02306**	**0.05613**	**24.48369**	**1.98979**	**0.13350**
%RSD	0.09669	0.87057	0.21512	0.16497	0.37250	0.26296	0.23099	0.20505	0.86289

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.46537	0.06040	3.59037	0.21836	0.19574	19.50890	0.00488	0.48902	0.46336
#2	0.46331	0.05963	3.57301	0.21360	0.20184	19.39541	0.00895	0.48406	0.47236
Mean	**0.46434**	**0.06001**	**3.58169**	**0.21598**	**0.19879**	**19.45216**	**0.00691**	**0.48654**	**0.46786**
%RSD	0.31350	0.90382	0.34276	1.55831	2.17044	0.41254	41.64147	0.72178	1.36014

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	16.96375	0.00091	0.40435	0.24782	-0.01702	2.16473	1.55807	0.28648	0.03433
#2	16.87555	0.00237	0.40222	0.24760	-0.01287	2.15406	1.55504	0.28702	0.03400
Mean	**16.91965**	**0.00164**	**0.40328**	**0.24771**	**-0.01494**	**2.15939**	**1.55655**	**0.28675**	**0.03417**
%RSD	0.36862	63.04865	0.37359	0.06342	19.67511	0.34933	0.13743	0.13438	0.69163

	Pb calc	**Se** calc
#1	0.20327	0.47190
#2	0.20576	0.47625

Mean	**0.20451**	**0.47408ser: STEVE WORKMAN**
%RSD	0.85915	0.64864

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:08
SampleId1 : 1303060-8 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:29:46
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE55

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00202	48.17202	0.17394	0.02401	0.77560	0.00896	0.00594	153.56450	0.00103
#2	-0.00169	48.53316	0.17534	0.02370	0.77644	0.00899	0.00787	153.71008	0.00065
Mean	**-0.00185**	**48.35259**	**0.17464**	**0.02386**	**0.77602**	**0.00897**	**0.00691**	**153.63729**	**0.00084**
%RSD	12.61420	0.52813	0.56619	0.90889	0.07677	0.19389	19.79286	0.06700	32.63865

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03852	0.04268	0.07925	116.23597	18.26576	0.05789	24.80442	2.03542	0.12487
#2	0.03865	0.04302	0.07999	116.41126	18.41306	0.05822	24.86766	2.04068	0.12728
Mean	**0.03859**	**0.04285**	**0.07962**	**116.32361**	**18.33941**	**0.05805**	**24.83604**	**2.03805**	**0.12607**
%RSD	0.25083	0.55828	0.66424	0.10656	0.56794	0.40995	0.18004	0.18266	1.35231

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.44495	0.05604	3.52492	0.23786	0.21958	19.41433	0.00694	0.47686	0.45367
#2	0.44857	0.05733	3.53290	0.23834	0.22632	19.47486	0.01011	0.47659	0.46573
Mean	**0.44676**	**0.05668**	**3.52891**	**0.23810**	**0.22295**	**19.44459**	**0.00852**	**0.47672**	**0.45970**
%RSD	0.57333	1.61313	0.15982	0.14291	2.13755	0.22011	26.32892	0.04009	1.85393

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	18.51024	0.00345	0.36208	0.26937	-0.02593	2.98474	1.85338	0.36424	0.03788
#2	18.62685	0.00271	0.36252	0.27146	-0.02095	2.99007	1.85336	0.36242	0.03835
Mean	**18.56854**	**0.00308**	**0.36230**	**0.27041**	**-0.02344**	**2.98740**	**1.85337**	**0.36333**	**0.03811**
%RSD	0.44406	16.86246	0.08645	0.54772	15.01411	0.12610	0.00099	0.35363	0.85883

	Pb	**Se**
	calc	calc
#1	0.22567	0.46139
#2	0.23032	0.46934
Mean	**0.22799**	**0.46537**
%RSD	1.44390	1.20783

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:09
SampleId1 : 1303060-9 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:31:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE56

Final concentrations6:29 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00141	38.06696	0.04377	0.00432	2.05871	0.00500	0.00541	52.58455	0.00099
#2	-0.00068	38.06734	0.03945	0.00494	2.06070	0.00495	0.00558	52.63030	0.00098
Mean	**-0.00105**	**38.06715**	**0.04161**	**0.00463**	**2.05971**	**0.00497**	**0.00550**	**52.60742**	**0.00099**
%RSD	49.33171	0.00071	7.32827	9.36644	0.06839	0.69633	2.20851	0.06149	1.00422

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02674	0.03195	0.04553	107.86776	7.64890	0.04854	17.67063	1.65410	0.02622
#2	0.02637	0.03260	0.04507	108.01813	7.63987	0.04857	17.70467	1.65675	0.02713
Mean	**0.02656**	**0.03228**	**0.04530**	**107.94294**	**7.64439**	**0.04856**	**17.68765**	**1.65543**	**0.02667**
%RSD	0.99208	1.43066	0.71345	0.09850	0.08352	0.03800	0.13609	0.11348	2.41808

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.25873	0.02800	2.22999	0.12072	0.10744	7.35770	0.00391	0.52777	0.51677
#2	0.25881	0.02875	2.20475	0.12019	0.10698	7.30895	0.00958	0.54552	0.52276
Mean	**0.25877**	**0.02838**	**2.21737**	**0.12045**	**0.10721**	**7.33332**	**0.00674**	**0.53665**	**0.51977**
%RSD	0.02244	1.85689	0.80502	0.30885	0.29745	0.47008	59.41407	2.33881	0.81550

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	14.40312	0.00466	0.32252	0.17131	-0.01468	1.35723	0.86414	0.27794	0.02532
#2	14.41001	0.00246	0.32284	0.17216	-0.02392	1.34314	0.86423	0.27867	0.02552
Mean	**14.40656**	**0.00356**	**0.32268**	**0.17174**	**-0.01930**	**1.35018**	**0.86418**	**0.27830**	**0.02542**
%RSD	0.03382	43.63030	0.06813	0.34964	33.85937	0.73802	0.00719	0.18461	0.57005

	Pb	Se
	calc	calc
#1	0.11186	0.52043
#2	0.11138	0.53034
Mean	**0.11162**	**0.52539**
%RSD	0.30154	1.33363

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:09
SampleId1 : 1303060-10 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:33:17
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE57

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00069	49.22563	0.14085	0.02628	0.89678	0.00796	0.00927	159.85904	0.00190
#2	-0.00034	49.14265	0.13992	0.02340	0.89513	0.00793	0.00857	159.93373	0.00134
Mean	**-0.00051**	**49.18414**	**0.14038**	**0.02484**	**0.89596**	**0.00795**	**0.00892**	**159.89638**	**0.00162**
%RSD	47.67246	0.11929	0.46960	8.20602	0.13019	0.27024	5.56625	0.03303	24.47210

ted: 3/12/2013 13:06:29 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03275	0.04624	0.11248	123.35125	20.12708	0.06581	26.96237	2.11771	0.12774
#2	0.03270	0.04635	0.11250	123.50154	20.10799	0.06589	26.96110	2.11993	0.12741
Mean	**0.03273**	**0.04630**	**0.11249**	**123.42639**	**20.11753**	**0.06585**	**26.96173**	**2.11882**	**0.12757**
%RSD	0.10899	0.16669	0.00780	0.08610	0.06710	0.07564	0.00332	0.07413	0.18060

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.44808	0.04703	3.14158	0.21954	0.19184	22.29225	0.00980	0.37069	0.34259
#2	0.44767	0.04694	3.15025	0.21981	0.20073	22.30362	0.00623	0.35499	0.35914
Mean	**0.44787**	**0.04698**	**3.14592**	**0.21967**	**0.19629**	**22.29793**	**0.00802**	**0.36284**	**0.35086**
%RSD	0.06499	0.13194	0.19489	0.08977	3.20143	0.03606	31.43833	3.05951	3.33620

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	19.87871	0.00381	0.60008	0.27104	-0.01603	1.33300	1.65071	0.42875	0.04130
#2	19.88553	0.00820	0.59888	0.27172	-0.02323	1.32024	1.64780	0.43311	0.04094
Mean	**19.88212**	**0.00600**	**0.59948**	**0.27138**	**-0.01963**	**1.32662**	**1.64926**	**0.43093**	**0.04112**
%RSD	0.02426	51.69364	0.14148	0.17779	25.94374	0.67973	0.12489	0.71576	0.62282

	Pb	Se
	calc	calc
#1	0.20106	0.35194
#2	0.20708	0.35776
Mean	**0.20407**	**0.35485**
%RSD	2.08604	1.15849

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:09
SampleId1 : 1303060-11 **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 16:35:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE58

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00221	83.19023	0.11847	0.05357	1.04659	0.00836	0.00765	115.32455	0.00093
#2	-0.00097	83.20031	0.12267	0.05664	1.04773	0.00841	0.01046	115.65119	0.00150
Mean	**-0.00159**	**83.19527**	**0.12057**	**0.05510**	**1.04716**	**0.00838**	**0.00906**	**115.48787**	**0.00122**
%RSD	55.53305	0.00857	2.46050	3.93491	0.07680	0.34017	21.90139	0.19999	32.94056

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05343	0.07484	0.11387	170.80119	26.72044	0.09465	35.35995	2.07462	0.14507
#2	0.05362	0.07619	0.11463	171.42915	26.73629	0.09484	35.46763	2.08160	0.14383
Mean	**0.05353**	**0.07552**	**0.11425**	**171.11517**	**26.72836**	**0.09474**	**35.41379**	**2.07811**	**0.14445**
%RSD	0.24572	1.26381	0.46817	0.25949	0.04192	0.14016	0.21500	0.23748	0.60611

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.19579	0.09170	3.36286	0.18508	0.16241	27.76132	0.01038	0.23864	0.23640
#2	3.20216	0.09262	3.38842	0.18573	0.16389	27.82982	0.01207	0.24813	0.25166
Mean	**3.19897**	**0.09216**	**3.37564**	**0.18541**	**0.16315**	**27.79557**	**0.01122**	**0.24338**	**0.24403**
%RSD	0.14075	0.70631	0.53539	0.24874	0.64353	0.17425	10.62735	2.75630	4.42159

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	18.53367	0.00897	0.71809	0.24082	-0.01461	1.35991	0.65928	0.45183	0.04625
#2	18.57901	0.00384	0.71946	0.24195	-0.01691	1.35645	0.65892	0.45329	0.04690
Mean	**18.55634**	**0.00640**	**0.71878**	**0.24139**	**-0.01576**	**1.35818**	**0.65910**	**0.45256**	**0.04658**
%RSD	0.17278	56.56061	0.13486	0.33239	10.35449	0.18026	0.03816	0.22720	0.98902

	Pb	Se
	calc	calc
#1	0.16996	0.23714
#2	0.17116	0.25048
Mean	**0.17056**	**0.24381**
%RSD	0.50062	3.86803

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:09
SampleId1 : 1303060-12 SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:36:47
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE59

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00153	30.97926	0.03456	0.01334	0.76303	0.00374	-0.00080	181.03599	-0.00012
#2	-0.00135	31.03383	0.03223	0.01150	0.76340	0.00372	0.00306	181.29926	0.00006
Mean	**-0.00144**	**31.00655**	**0.03339**	**0.01242**	**0.76321**	**0.00373**	**0.00113**	**181.16763**	**-0.00003**
%RSD	8.73418	0.12444	4.93599	10.47596	0.03394	0.21655	241.79364	0.10276	404.53122

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03244	0.03167	0.04226	88.98420	8.40824	0.04584	37.41428	1.18811	0.00146
#2	0.03254	0.03240	0.04290	89.09421	8.41942	0.04589	37.49057	1.18962	0.00244
Mean	**0.03249**	**0.03203**	**0.04258**	**89.03921**	**8.41383**	**0.04586**	**37.45243**	**1.18887**	**0.00195**
%RSD	0.19970	1.61559	1.06531	0.08736	0.09395	0.08046	0.14405	0.08999	35.46742

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.43429	0.05411	2.39973	0.05733	0.05564	2.09130	0.00905	-0.00110	0.00240
#2	0.43495	0.05426	2.40581	0.06370	0.05572	2.07262	0.00904	0.00263	0.00485
Mean	**0.43462**	**0.05418**	**2.40277**	**0.06051**	**0.05568**	**2.08196**	**0.00905**	**0.00076**	**0.00362**
%RSD	0.10714	0.20021	0.17894	7.44061	0.10283	0.63440	0.04499	344.83044	47.77628

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	15.38804	0.00058	0.49647	0.21774	-0.01040	0.07147	0.08684	0.20456	0.01493
#2	15.41202	-0.00235	0.49618	0.21876	-0.01117	0.08953	0.08755	0.20711	0.01535
Mean	**15.40003**	**-0.00089**	**0.49633**	**0.21825**	**-0.01078**	**0.08050**	**0.08719**	**0.20584**	**0.01514**
%RSD	0.11011	233.90405	0.04033	0.33166	5.07275	15.86505	0.57145	0.87339	1.95298

	Pb	**Se**
	calc	calc
#1	0.05620	0.00123
#2	0.05838	0.00411
Mean	**0.05729**	**0.00267**
%RSD	2.68392	76.07263

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:09
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 16:39:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.20235	49.62597	0.52801	1.00956	1.01662	0.50042	0.54734	50.18389	0.53319
#2	0.20156	49.35913	0.52568	1.00380	1.01222	0.49855	0.54960	50.01885	0.53164
Mean	**0.20195**	**49.49255**	**0.52685**	**1.00668**	**1.01442**	**0.49949**	**0.54847**	**50.10137**	**0.53242**
%RSD	0.27679	0.38124	0.31267	0.40478	0.30682	0.26413	0.29194	0.23293	0.20552

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.50023	1.00251	1.03413	19.54480	49.82473	0.52338	49.74578	0.98853	1.01072
#2	0.49836	0.99991	1.02823	19.48418	49.56699	0.52039	49.53679	0.98589	1.01229
Mean	**0.49929**	**1.00121**	**1.03118**	**19.51449**	**49.69586**	**0.52188**	**49.64128**	**0.98721**	**1.01151**
%RSD	0.26497	0.18408	0.40470	0.21966	0.36673	0.40566	0.29770	0.18938	0.10951

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	49.17569	1.05276	4.71594	1.01222	0.95579	4.92973	0.50433	1.01477	0.95581
#2	48.99881	1.04415	4.70323	1.01187	0.96932	4.84737	0.50437	1.01794	0.97650
Mean	**49.08725**	**1.04846**	**4.70958**	**1.01204**	**0.96256**	**4.88855**	**0.50435**	**1.01635**	**0.96615**
%RSD	0.25479	0.58094	0.19080	0.02430	0.99419	1.19124	0.00684	0.21996	1.51481

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.84465	1.04651	0.50305	0.48049	0.52096	4.91100	0.49848	0.98348	1.00879
#2	4.81776	1.04798	0.50101	0.47863	0.51367	4.89895	0.49710	0.97473	1.00416
Mean	**4.83121**	**1.04724**	**0.50203**	**0.47956**	**0.51731**	**4.90497**	**0.49779**	**0.97910**	**1.00647**
%RSD	0.39356	0.09901	0.28841	0.27477	0.99631	0.17372	0.19555	0.63133	0.32554

	Pb	**Se**
	calc	calc

#1	0.97458	0.97544
#2	0.98349	0.99030
Mean	**0.97904**	**0.98287**
%RSD	0.64360	1.06894

ser: **STEVE WORKMAN**

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 16:40:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00026	0.10923	0.00064	-0.00672	0.00030	0.00052	0.00425	-0.02524	0.00019
#2	0.00074	0.11089	-0.00169	-0.00623	0.00033	0.00053	0.00250	-0.02290	0.00030
Mean	**0.00050**	**0.11006**	**-0.00052**	**-0.00647**	**0.00031**	**0.00052**	**0.00338**	**-0.02407**	**0.00025**
%RSD	67.17867	1.06301	314.61870	5.36163	8.22073	1.80715	36.54444	6.88228	33.92134

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00006	0.00029	-0.00220	0.02628	-0.12377	-0.00255	0.01361	0.00027	0.00139
#2	0.00036	0.00079	-0.00061	0.02667	-0.11602	-0.00251	0.02393	0.00033	0.00172
Mean	**0.00015**	**0.00054**	**-0.00140**	**0.02647**	**-0.11990**	**-0.00253**	**0.01877**	**0.00030**	**0.00156**
%RSD	192.85942	65.41479	80.33543	1.04030	4.57490	1.24056	38.88764	14.71284	14.78980

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03796	-0.00025	-0.00568	0.00058	0.00109	-0.01408	0.00703	0.00281	0.00199
#2	0.03821	0.00102	-0.01497	0.00436	-0.00246	-0.02154	0.00715	0.00282	0.00253
Mean	**0.03809**	**0.00039**	**-0.01033**	**0.00247**	**-0.00068**	**-0.01781**	**0.00709**	**0.00281**	**0.00226**
%RSD	0.45589	231.32582	63.61889	108.44206	368.30617	29.62403	1.25722	0.14359	16.90524

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00363	0.00047	-0.00116	-0.00268	-0.00100	-0.00820	0.00074	0.00071	0.00087
#2	0.00515	0.00010	-0.00110	-0.00273	-0.00029	-0.00217	0.00124	-0.00038	0.00117
Mean	**0.00439**	**0.00029**	**-0.00113**	**-0.00271**	**-0.00064**	**-0.00519**	**0.00099**	**0.00016**	**0.00102**
%RSD	24.42073	90.27948	4.12121	1.24375	78.80672	82.15376	36.02808	478.04764	21.41482

	Pb	**Se**
	calc	calc
#1	0.00092	0.00226
#2	-0.00019	0.00263
Mean	**0.00037**	**0.00244**
%RSD	212.95635	10.48199

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : ZZZ **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 16:42:43

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE61

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00069	12.65290	0.01300	-0.00389	0.19694	0.00148	0.00322	137.35873	-0.00030
#2	-0.00102	12.58687	0.01638	-0.00506	0.19515	0.00145	0.00200	136.63314	-0.00017
Mean	**-0.00086**	**12.61988**	**0.01469**	**-0.00448**	**0.19605**	**0.00147**	**0.00261**	**136.99594**	**-0.00024**
%RSD	27.52090	0.37000	16.27389	18.40256	0.64537	1.32164	33.15266	0.37451	40.82504

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00609	0.00824	0.00573	24.22675	3.09607	0.01139	5.57925	1.70604	0.00055
#2	0.00633	0.00856	0.00705	24.11257	3.07954	0.01133	5.55323	1.69921	0.00218
Mean	**0.00621**	**0.00840**	**0.00639**	**24.16966**	**3.08780**	**0.01136**	**5.56624**	**1.70262**	**0.00136**
%RSD	2.64344	2.73852	14.64223	0.33407	0.37850	0.35748	0.33057	0.28382	84.56099

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08815	0.00953	0.56369	0.02260	0.02336	1.85223	0.00360	0.03321	0.03165
#2	0.08738	0.01025	0.58649	0.02237	0.02251	1.82982	0.00361	0.03677	0.03461
Mean	**0.08777**	**0.00989**	**0.57509**	**0.02248**	**0.02294**	**1.84102**	**0.00360**	**0.03499**	**0.03313**
%RSD	0.62692	5.17132	2.80375	0.70862	2.63159	0.86076	0.08114	7.21085	6.30729

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.31180	0.00222	0.40038	0.06889	-0.00935	0.16354	0.14256	0.04843	0.00493
#2	5.28057	0.00624	0.39727	0.06836	-0.00392	0.15820	0.14162	0.04862	0.00515
Mean	**5.29619**	**0.00423**	**0.39882**	**0.06862**	**-0.00664**	**0.16087**	**0.14209**	**0.04852**	**0.00504**
%RSD	0.41690	67.31709	0.55158	0.54807	57.85706	2.34570	0.47012	0.26447	3.11796

	Pb	Se
	calc	calc
#1	0.02311	0.03217
#2	0.02246	0.03533
Mean	**0.02278**	**0.03375**
%RSD	1.99971	6.61923

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : ZZZ SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:45:58
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE62

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00024	13.94616	0.01649	-0.00383	0.21637	0.00151	0.00307	43.26577	-0.00027
#2	-0.00044	14.01865	0.01941	-0.00426	0.21809	0.00153	0.00325	43.45556	-0.00042

Mean	-0.00010	13.98241	0.01795	-0.00405	0.21723	0.00152	0.00316	43.36067	-0.00035
%RSD	484.18454	0.36659	11.47851	7.49890	0.55874	0.68529	3.96797	0.30950	30.78377

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00831	0.00928	0.00871	28.73473	3.03798	0.01073	5.46137	0.46864	0.00133
#2	0.00817	0.00926	0.00899	28.91957	3.03515	0.01076	5.49178	0.47153	0.00107
Mean	**0.00824**	**0.00927**	**0.00885**	**28.82715**	**3.03657**	**0.01075**	**5.47657**	**0.47008**	**0.00120**
%RSD	1.19170	0.16357	2.24233	0.45339	0.06598	0.13741	0.39264	0.43396	15.36752

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.13219	0.01314	0.59394	0.03260	0.02922	2.71159	0.00662	0.03461	0.03822
#2	0.13269	0.01406	0.60301	0.03281	0.02928	2.78634	0.00768	0.04946	0.03627
Mean	**0.13244**	**0.01360**	**0.59848**	**0.03271**	**0.02925**	**2.74896**	**0.00715**	**0.04204**	**0.03724**
%RSD	0.26255	4.78445	1.07225	0.45100	0.14716	1.92283	10.42076	24.97045	3.70820

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.22752	-0.00072	0.07548	0.07209	-0.08963	0.20022	0.17699	0.05007	0.00666
#2	4.26026	0.00185	0.07596	0.07264	-0.04955	0.20220	0.17732	0.05116	0.00662
Mean	**4.24389**	**0.00056**	**0.07572**	**0.07237**	**-0.06959**	**0.20121**	**0.17715**	**0.05061**	**0.00664**
%RSD	0.54542	320.41523	0.44769	0.53520	40.72043	0.69425	0.13304	1.52142	0.39428

	Pb	Se
	calc	calc
#1	0.03035	0.03702
#2	0.03046	0.04066
Mean	**0.03040**	**0.03884**
%RSD	0.25600	6.62822

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : ZZZ SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 16:49:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE62

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00034	13.15735	0.01649	-0.00439	0.20457	0.00169	0.00412	96.87858	0.00031
#2	-0.00104	13.30625	0.01626	-0.00463	0.20680	0.00171	0.00464	97.73120	0.00002
Mean	**-0.00069**	**13.23180**	**0.01638**	**-0.00451**	**0.20569**	**0.00170**	**0.00438**	**97.30489**	**0.00017**
%RSD	71.73576	0.79572	1.00651	3.84787	0.76581	0.75781	8.34863	0.61959	123.24268

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00722	0.00972	0.00823	25.97205	3.06490	0.01129	5.53943	1.18748	0.00276
#2	0.00708	0.00901	0.00769	26.19751	3.08922	0.01136	5.59492	1.19908	-0.00004
Mean	**0.00715**	**0.00936**	**0.00796**	**26.08478**	**3.07706**	**0.01132**	**5.56718**	**1.19328**	**0.00136**

%RSD	1.35972	5.32317	4.77455	0.61117	0.55887	0.48893	0.70483	0.68742	145.44478

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.12261	0.01273	0.60627	0.03156	0.02467	2.22206	0.00768	0.03531	0.03373
#2	0.12392	0.01231	0.59161	0.03119	0.02815	2.24074	0.00636	0.03954	0.03683
Mean	**0.12326**	**0.01252**	**0.59894**	**0.03138**	**0.02641**	**2.23140**	**0.00702**	**0.03742**	**0.03528**
%RSD	0.75218	2.35195	1.73075	0.85520	9.30989	0.59198	13.33517	7.99915	6.21183

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.84506	0.00624	0.26307	0.07007	-0.09427	0.20675	0.15706	0.04989	0.00616
#2	4.89653	-0.00071	0.26591	0.07034	-0.05263	0.17858	0.15749	0.04898	0.00625
Mean	**4.87079**	**0.00276**	**0.26449**	**0.07021**	**-0.07345**	**0.19267**	**0.15727**	**0.04943**	**0.00620**
%RSD	0.74720	177.92508	0.76025	0.27185	40.08368	10.33731	0.19389	1.29810	0.94873

	Pb	**Se**
	calc	calc
#1	0.02697	0.03425
#2	0.02916	0.03773
Mean	**0.02806**	**0.03599**
%RSD	5.52552	6.83068

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : 1303057-1 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:08:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE61

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00052	12.91752	0.00815	-0.00524	0.20030	0.00159	0.00497	140.28297	-0.00024
#2	-0.00029	12.86830	0.01176	-0.00518	0.20012	0.00159	-0.00046	140.11718	-0.00054
Mean	**-0.00041**	**12.89291**	**0.00996**	**-0.00521**	**0.20021**	**0.00159**	**0.00226**	**140.20008**	**-0.00039**
%RSD	40.41272	0.26991	25.66004	0.83183	0.06449	0.39476	169.94194	0.08362	54.10309

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00680	0.00818	0.00634	24.67968	3.11378	0.01153	5.58694	1.64615	-0.00102
#2	0.00698	0.00853	0.00634	24.67014	3.10929	0.01152	5.58325	1.64615	-0.00096
Mean	**0.00689**	**0.00835**	**0.00634**	**24.67491**	**3.11153**	**0.01153**	**5.58509**	**1.64615**	**-0.00099**
%RSD	1.84602	2.93892	0.00704	0.02733	0.10196	0.08006	0.04672	0.00000	4.47711

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06539	0.00993	0.57912	0.02211	0.02072	1.87090	0.00036	0.03402	0.03410
#2	0.06588	0.01017	0.56723	0.02394	0.01943	1.89705	0.00128	0.03334	0.03154
Mean	**0.06563**	**0.01005**	**0.57317**	**0.02302**	**0.02007**	**1.88398**	**0.00082**	**0.03368**	**0.03282**
%RSD	0.52930	1.69606	1.46706	5.59596	4.51578	0.98136	79.02138	1.44142	5.50683

ted: 3/12/2013 13:06:29 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.39942	-0.00181	0.40343	0.06752	-0.00354	0.15498	0.14062	0.04606	0.00547
#2	5.39125	0.00222	0.40317	0.06783	-0.01189	0.15563	0.13978	0.04674	0.00547
Mean	**5.39534**	**0.00020**	**0.40330**	**0.06767**	**-0.00772**	**0.15531**	**0.14020**	**0.04640**	**0.00547**
%RSD	0.10703	1390.47104	0.04628	0.32722	76.53707	0.29520	0.42012	1.04541	0.01949

	Pb	Se
	calc	calc
#1	0.02118	0.03407
#2	0.02093	0.03214
Mean	**0.02106**	**0.03311**
%RSD	0.83398	4.12971

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:10
SampleId1 : 1303057-1D 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:10:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE62

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00013	13.83327	0.01701	-0.00414	0.21557	0.00151	0.00902	42.87003	-0.00020
#2	-0.00084	13.88619	0.01514	-0.00475	0.21652	0.00149	-0.00726	42.95887	-0.00068
Mean	**-0.00036**	**13.85973**	**0.01608**	**-0.00445**	**0.21604**	**0.00150**	**0.00088**	**42.91445**	**-0.00044**
%RSD	192.97423	0.26998	8.20270	9.75235	0.31079	0.87639	1310.31140	0.14638	76.92110

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00795	0.00886	0.00732	28.47684	2.98651	0.01054	5.30556	0.43939	0.00080
#2	0.00786	0.00932	0.00742	28.57044	2.99053	0.01056	5.31970	0.44064	0.00092
Mean	**0.00790**	**0.00909**	**0.00737**	**28.52364**	**2.98852**	**0.01055**	**5.31263**	**0.44001**	**0.00086**
%RSD	0.79857	3.63655	0.95822	0.23204	0.09496	0.12248	0.18827	0.20084	10.31807

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.12777	0.01285	0.57386	0.03268	0.02388	2.68169	-0.00082	0.03586	0.04095
#2	0.12793	0.01175	0.57866	0.03453	0.02577	2.69290	-0.00241	0.03256	0.04062
Mean	**0.12785**	**0.01230**	**0.57626**	**0.03360**	**0.02482**	**2.68729**	**-0.00162**	**0.03421**	**0.04078**
%RSD	0.09065	6.30106	0.58930	3.88721	5.39582	0.29503	69.39893	6.82856	0.58526

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.24741	0.00258	0.07251	0.06970	-0.00576	0.21314	0.16974	0.04606	0.00673
#2	4.26589	0.00002	0.07287	0.06978	-0.00679	0.20731	0.17021	0.04623	0.00691
Mean	**4.25665**	**0.00130**	**0.07269**	**0.06974**	**-0.00627**	**0.21022**	**0.16998**	**0.04614**	**0.00682**
%RSD	0.30693	139.32667	0.34747	0.08518	11.61495	1.96327	0.19798	0.26281	1.81339

	Pb	Seser: STEVE WORKMAN
	calc	calc
#1	0.02681	0.03926
#2	0.02869	0.03793
Mean	**0.02775**	**0.03860**
%RSD	4.78743	2.42814

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:11
SampleId1 : 1303057-1L 25X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:11:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE63

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00104	2.69114	-0.00514	-0.00972	0.03962	0.00039	-0.00238	27.43658	-0.00062
#2	-0.00021	2.67486	-0.00001	-0.00905	0.03948	0.00038	0.00130	27.36129	-0.00104
Mean	**-0.00063**	**2.68300**	**-0.00257**	**-0.00938**	**0.03955**	**0.00038**	**-0.00054**	**27.39893**	**-0.00083**
%RSD	93.79913	0.42908	140.94307	5.08357	0.26093	0.45995	482.58332	0.19430	36.40004

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00064	0.00070	-0.00283	4.93458	0.42131	-0.00046	1.11560	0.33873	-0.00128
#2	0.00032	0.00044	-0.00321	4.92313	0.42672	-0.00044	1.11007	0.33778	-0.00153
Mean	**0.00048**	**0.00057**	**-0.00302**	**4.92885**	**0.42401**	**-0.00045**	**1.11284**	**0.33826**	**-0.00140**
%RSD	46.87599	31.82424	8.97720	0.16426	0.90230	2.86128	0.35102	0.19889	12.68704

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02953	-0.00085	0.10285	0.00281	0.00569	0.38883	-0.00229	0.00639	0.00519
#2	0.02957	-0.00013	0.10856	0.00441	0.00310	0.36271	-0.00031	0.00227	0.01188
Mean	**0.02955**	**-0.00049**	**0.10570**	**0.00361**	**0.00439**	**0.37577**	**-0.00130**	**0.00433**	**0.00853**
%RSD	0.09791	104.18030	3.81939	31.49339	41.70082	4.91474	107.47915	67.21246	55.46595

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.09748	0.00082	0.07821	0.01155	-0.01193	-0.00311	0.02797	0.00816	0.00009
#2	1.08999	-0.00503	0.07772	0.01169	-0.00168	0.00401	0.02805	0.00799	0.00038
Mean	**1.09373**	**-0.00211**	**0.07796**	**0.01162**	**-0.00681**	**0.00045**	**0.02801**	**0.00807**	**0.00024**
%RSD	0.48400	196.34128	0.44335	0.88324	106.53650	1112.19902	0.21213	1.50190	89.64104

	Pb	Se
	calc	calc
#1	0.00473	0.00559
#2	0.00354	0.00868
Mean	**0.00413**	**0.00713**
%RSD	20.41016	30.66479

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:11

SampleId1 : 1303057-1MS 5X, SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:13:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE64

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01891	18.40715	0.22457	0.16966	0.45508	0.01150	0.00177	25.20044	0.01059
#2	0.01850	18.50853	0.21932	0.16972	0.45607	0.01154	0.00772	25.27198	0.01039
Mean	**0.01870**	**18.45784**	**0.22194**	**0.16969**	**0.45558**	**0.01152**	**0.00474**	**25.23621**	**0.01049**
%RSD	1.55266	0.38840	1.67061	0.02555	0.15325	0.24991	88.73809	0.20047	1.32405

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10698	0.05068	0.06253	23.90118	10.63658	0.10597	13.12700	0.54972	0.18631
#2	0.10747	0.05096	0.06301	23.97361	10.69504	0.10649	13.15601	0.55263	0.18531
Mean	**0.10723**	**0.05082**	**0.06277**	**23.93739**	**10.66581**	**0.10623**	**13.14151**	**0.55118**	**0.18581**
%RSD	0.32821	0.38838	0.54446	0.21398	0.38754	0.34720	0.15609	0.37445	0.38285

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.05633	0.11923	0.42913	0.12494	0.11637	2.21459	0.06711	0.43427	0.40070
#2	7.08979	0.12022	0.42456	0.12675	0.11720	2.16602	0.06670	0.43591	0.41477
Mean	**7.07306**	**0.11973**	**0.42684**	**0.12585**	**0.11678**	**2.19030**	**0.06691**	**0.43509**	**0.40773**
%RSD	0.33452	0.58250	0.75737	1.01515	0.50161	1.56798	0.42882	0.26645	2.43935

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.24097	0.10200	0.15051	0.14287	0.39780	0.17388	0.29220	0.14125	0.00810
#2	3.25653	0.10676	0.15089	0.14329	0.39270	0.16093	0.29290	0.13971	0.00831
Mean	**3.24875**	**0.10438**	**0.15070**	**0.14308**	**0.39525**	**0.16741**	**0.29255**	**0.14048**	**0.00821**
%RSD	0.33867	3.22156	0.17655	0.20756	0.91153	5.46837	0.16946	0.77719	1.85366

	Pb	Se
	calc	calc
#1	0.11922	0.41188
#2	0.12038	0.42181
Mean	**0.11980**	**0.41684**
%RSD	0.68125	1.68410

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:11
SampleId1 : 1303057-1MSD 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:15:23
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE65

Final concentrations

Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.01855	19.69850	0.22585	0.17021	0.41343	0.01165	0.00649	21.81996	0.00999
#2	0.01873	19.76281	0.22993	0.16991	0.41464	0.01170	-0.00296	21.89716	0.01048
Mean	**0.01864**	**19.73066**	**0.22789**	**0.17006**	**0.41404**	**0.01168**	**0.00177**	**21.85856**	**0.01023**
%RSD	0.68547	0.23048	1.26547	0.12749	0.20605	0.30202	377.93294	0.24972	3.41976

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10727	0.05138	0.06160	28.85318	10.75636	0.10799	13.80233	0.54561	0.18606
#2	0.10795	0.05109	0.06235	28.98131	10.78858	0.10844	13.84432	0.54829	0.18757
Mean	**0.10761**	**0.05123**	**0.06198**	**28.91724**	**10.77247**	**0.10821**	**13.82333**	**0.54695**	**0.18682**
%RSD	0.44570	0.40702	0.85073	0.31332	0.21146	0.28971	0.21476	0.34653	0.57118

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.06767	0.12219	0.49108	0.12755	0.11697	2.55088	0.06973	0.40852	0.38354
#2	7.08786	0.12250	0.49520	0.13022	0.11682	2.55462	0.06698	0.42147	0.39964
Mean	**7.07777**	**0.12234**	**0.49314**	**0.12888**	**0.11689**	**2.55275**	**0.06836**	**0.41499**	**0.39159**
%RSD	0.20166	0.17734	0.59011	1.46008	0.08968	0.10352	2.85278	2.20571	2.90808

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.17011	0.10456	0.15320	0.14543	0.40634	0.15940	0.28010	0.14777	0.00815
#2	3.18209	0.10895	0.15391	0.14609	0.40533	0.16714	0.28115	0.14966	0.00818
Mean	**3.17610**	**0.10676**	**0.15355**	**0.14576**	**0.40584**	**0.16327**	**0.28063**	**0.14872**	**0.00817**
%RSD	0.26670	2.90739	0.32488	0.31859	0.17544	3.35066	0.26617	0.89733	0.23807

	Pb	**Se**
	calc	calc
#1	0.12049	0.39186
#2	0.12128	0.40691
Mean	**0.12089**	**0.39938**
%RSD	0.46054	2.66505

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:11
SampleId1 : ZZZ SampleId2 : [CV]
Analysis commenced : 3/11/2013 17:17:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19517	49.25424	0.53272	0.99871	1.01064	0.47293	0.54142	49.85201	0.53323
#2	0.19400	49.05296	0.52060	0.99644	1.00404	0.47067	0.54667	49.61839	0.52824
Mean	**0.19458**	**49.15360**	**0.52666**	**0.99757**	**1.00734**	**0.47180**	**0.54404**	**49.73520**	**0.53074**
%RSD	0.42441	0.28956	1.62648	0.16078	0.46345	0.33886	0.68234	0.33214	0.66442

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48140	0.95470	1.02667	19.36058	49.65256	0.52084	48.32716	0.93021	0.96350

#2	0.47882	0.94997	1.02079	19.26315	49.45132	0.51840	48.07887	0.92597	0.96243
Mean	**0.48011**	**0.95233**	**1.02373**	**19.31186**	**49.55194**	**0.51962**	**48.20301**	**0.92809**	**0.96296**
%RSD	0.38056	0.35098	0.40603	0.35676	0.28717	0.33174	0.36423	0.32320	0.07861

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.94733	1.04392	4.59430	0.96364	0.88531	4.87732	0.49799	1.01168	0.90717
#2	48.75601	1.03166	4.58157	0.95603	0.91558	4.87357	0.49581	0.99854	0.94472
Mean	**48.85167**	**1.03779**	**4.58793**	**0.95983**	**0.90045**	**4.87545**	**0.49690**	**1.00511**	**0.92594**
%RSD	0.27693	0.83481	0.19608	0.56036	2.37690	0.05429	0.31084	0.92440	2.86749

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.68122	1.04251	0.49841	0.45857	0.52981	4.70527	0.47757	0.91779	0.96320
#2	4.66383	1.02787	0.49491	0.45737	0.52928	4.66905	0.47512	0.91262	0.95872
Mean	**4.67252**	**1.03519**	**0.49666**	**0.45797**	**0.52955**	**4.68716**	**0.47635**	**0.91521**	**0.96096**
%RSD	0.26320	1.00008	0.49840	0.18494	0.07156	0.54638	0.36331	0.39893	0.32934

	Pb	**Se**
	calc	calc
#1	0.91139	0.94197
#2	0.92905	0.96264
Mean	**0.92022**	**0.95231**
%RSD	1.35669	1.53478

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:11
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 17:21:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19498	50.91719	0.51956	0.99160	1.01720	0.49952	0.51707	50.64485	0.50115
#2	0.19487	50.78897	0.52293	0.98700	1.01442	0.50026	0.51127	50.66244	0.50163
Mean	**0.19492**	**50.85308**	**0.52124**	**0.98930**	**1.01581**	**0.49989**	**0.51417**	**50.65364**	**0.50139**
%RSD	0.03761	0.17829	0.45825	0.32864	0.19406	0.10385	0.79799	0.02456	0.06677

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49048	0.99132	1.00911	20.20689	49.12323	0.52206	50.43783	0.98519	0.97868
#2	0.49160	0.99284	1.00816	20.21979	49.05953	0.52191	50.42277	0.98543	0.98038
Mean	**0.49104**	**0.99208**	**1.00863**	**20.21334**	**49.09138**	**0.52198**	**50.43030**	**0.98531**	**0.97953**
%RSD	0.16207	0.10823	0.06656	0.04509	0.09175	0.02077	0.02112	0.01716	0.12274

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.64828	0.97323	4.91064	0.99029	0.97424	5.24048	0.48692	1.03381	0.98830
#2	48.56263	0.97275	4.89305	0.99564	0.98765	5.25545	0.47950	1.01933	1.02234

Mean	**48.60545**	**0.97299**	**4.90185**	**0.99296**	**0.98094**	**5.24797**	**0.48321**	**1.02657**	**1.00532**
%RSD	0.12461	0.03504	0.25382	0.38120	0.96679	0.20181	1.08695	0.99710	2.39410

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.01673	1.03257	0.49600	0.51028	0.51122	4.90700	0.49081	1.01230	0.97597
#2	5.00331	1.03549	0.49494	0.51075	0.50932	4.91799	0.49155	1.01230	0.97671
Mean	**5.01002**	**1.03403**	**0.49547**	**0.51052**	**0.51027**	**4.91249**	**0.49118**	**1.01230**	**0.97634**
%RSD	0.18949	0.20022	0.15082	0.06445	0.26263	0.15830	0.10729	0.00000	0.05341

	Pb	**Se**
	calc	calc
#1	0.97958	1.00346
#2	0.99031	1.02134
Mean	**0.98495**	**1.01240**
%RSD	0.77020	1.24902

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 17:23:00
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00006	0.05646	-0.00292	-0.00494	0.00066	0.00017	-0.00188	0.00912	0.00004
#2	0.00032	0.05355	-0.00001	-0.00518	0.00062	0.00014	0.00670	0.00865	0.00005
Mean	**0.00013**	**0.05501**	**-0.00147**	**-0.00506**	**0.00064**	**0.00016**	**0.00241**	**0.00889**	**0.00004**
%RSD	205.42395	3.74383	140.58173	3.42813	4.01731	16.02167	251.34167	3.72898	15.63796

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00052	0.00042	-0.00056	0.04637	-0.10027	-0.00237	0.03279	0.00067	0.00036
#2	-0.00038	0.00046	0.00040	0.04629	-0.09909	-0.00237	0.03218	0.00067	-0.00190
Mean	**-0.00045**	**0.00044**	**-0.00008**	**0.04633**	**-0.09968**	**-0.00237**	**0.03248**	**0.00067**	**-0.00077**
%RSD	21.23110	7.41095	843.25785	0.11888	0.83377	0.00000	1.33549	0.00000	207.06265

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05053	-0.00068	-0.00493	0.00030	-0.00179	0.00084	-0.00254	0.00624	0.00618
#2	0.04995	-0.00096	-0.00927	0.00120	-0.00170	0.00084	0.00272	-0.00243	0.00054
Mean	**0.05024**	**-0.00082**	**-0.00710**	**0.00075**	**-0.00175**	**0.00084**	**0.00009**	**0.00190**	**0.00336**
%RSD	0.80652	24.57975	43.21424	85.02231	3.81050	0.00000	4268.62389	322.00174	118.66383

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01293	0.00193	-0.00299	-0.00226	0.00877	-0.01709	0.00044	0.00044	0.00102
#2	0.01312	-0.00209	-0.00295	-0.00223	0.00638	-0.02809	0.00038	0.00027	0.00097
Mean	**0.01302**	**-0.00008**	**-0.00297**	**-0.00225**	**0.00758**	**-0.02259**	**0.00041**	**0.00036**	**0.00100**

%RSD	1.05332	3562.54809	1.11878	0.96071	22.32308	34.40945	9.94889	33.96775	3.51878

	Pb calc	Se calc
#1	-0.00110	0.00620
#2	-0.00074	-0.00045
Mean	**-0.00092**	**0.00287**
%RSD	27.91101	163.50537

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : 1303058-1 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:24:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE66

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00026	20.01090	0.01689	-0.00003	0.19859	0.00133	0.00778	10.39657	-0.00016
#2	0.00126	19.82378	0.02062	0.00126	0.19643	0.00153	0.01059	10.37014	0.00009
Mean	**0.00076**	**19.91734**	**0.01876**	**0.00061**	**0.19751**	**0.00143**	**0.00919**	**10.38336**	**-0.00003**
%RSD	93.54270	0.66430	14.06066	148.58722	0.77134	10.02016	21.62937	0.17997	551.44531

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.01458	0.01620	0.01921	41.41478	6.19237	0.01687	5.87543	0.64053	0.00118
#2	0.01589	0.01792	0.01994	41.19282	6.15016	0.01685	5.86128	0.63731	0.00074
Mean	**0.01523**	**0.01706**	**0.01958**	**41.30380**	**6.17126**	**0.01686**	**5.86836**	**0.63892**	**0.00096**
%RSD	6.06780	7.13462	2.63447	0.37999	0.48364	0.07662	0.17048	0.35624	32.55088

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.09983	0.01887	0.75228	0.03364	0.02746	1.34061	0.00025	0.00798	0.01410
#2	0.11449	0.02034	0.74725	0.04078	0.01857	1.37048	0.00392	0.01584	0.01380
Mean	**0.10716**	**0.01961**	**0.74976**	**0.03721**	**0.02301**	**1.35554**	**0.00208**	**0.01191**	**0.01395**
%RSD	9.67719	5.29578	0.47473	13.57394	27.30564	1.55817	124.33708	46.63072	1.51838

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.33763	-0.00217	0.11000	0.06373	0.00270	0.08729	0.09332	0.11055	0.00879
#2	3.31296	0.00551	0.10890	0.06398	0.00415	0.11190	0.09396	0.10986	0.00992
Mean	**3.32529**	**0.00167**	**0.10945**	**0.06385**	**0.00342**	**0.09960**	**0.09364**	**0.11020**	**0.00935**
%RSD	0.52458	324.81039	0.71684	0.27913	29.91142	17.47405	0.48513	0.44027	8.57526

	Pb calc	**Se** calc
#1	0.02952	0.01206
#2	0.02597	0.01448
Mean	**0.02774**	**0.01327**
%RSD	9.04622	12.87361

ted: 3/12/2013 13:06:30 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : 1303058-1D 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:26:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE67

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00077	19.94822	0.01631	-0.00089	0.19888	0.00136	0.00585	10.38438	-0.00031
#2	-0.00164	19.90500	0.01666	-0.00187	0.19910	0.00136	-0.00099	10.35479	-0.00069
Mean	**-0.00120**	**19.92661**	**0.01648**	**-0.00138**	**0.19899**	**0.00136**	**0.00243**	**10.36959**	**-0.00050**
%RSD	51.25864	0.15336	1.49994	50.26891	0.07786	0.22865	198.80234	0.20179	53.41248

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01450	0.01647	0.01799	41.85293	6.22889	0.01725	5.90619	0.64416	0.00017
#2	0.01396	0.01641	0.01857	41.69516	6.20328	0.01723	5.87758	0.64220	0.00030
Mean	**0.01423**	**0.01644**	**0.01828**	**41.77405**	**6.21608**	**0.01724**	**5.89189**	**0.64318**	**0.00023**
%RSD	2.69154	0.28364	2.24852	0.26705	0.29134	0.07492	0.34330	0.21627	38.15805

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09782	0.01957	0.74267	0.02863	0.02805	1.44516	-0.00319	0.02145	0.01549
#2	0.10208	0.01911	0.75342	0.03163	0.02725	1.42275	-0.00437	0.01003	0.01784
Mean	**0.09995**	**0.01934**	**0.74805**	**0.03013**	**0.02765**	**1.43395**	**-0.00378**	**0.01574**	**0.01667**
%RSD	3.01373	1.68244	1.01652	7.03391	2.04813	1.10478	22.17307	51.31774	9.98479

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.46941	0.00186	0.10883	0.06010	-0.00100	0.08398	0.09237	0.11295	0.00924
#2	2.46653	-0.00363	0.10850	0.05984	-0.00037	0.06720	0.09217	0.11140	0.00907
Mean	**2.46797**	**-0.00088**	**0.10866**	**0.05997**	**-0.00068**	**0.07559**	**0.09227**	**0.11218**	**0.00915**
%RSD	0.08236	438.96097	0.21416	0.30621	64.70485	15.70139	0.15509	0.97319	1.29762

	Pb	Se
	calc	calc
#1	0.02824	0.01747
#2	0.02871	0.01524
Mean	**0.02848**	**0.01636**
%RSD	1.15157	9.65562

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : 1303058-1L 25X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:28:11
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE68

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00094	3.91825	0.00314	-0.00659	0.03838	-0.00015	-0.00465	2.02222	-0.00043
#2	-0.00057	3.91592	0.00442	-0.00684	0.03813	-0.00017	-0.00237	2.01376	-0.00049
Mean	**-0.00076**	**3.91708**	**0.00378**	**-0.00672**	**0.03825**	**-0.00016**	**-0.00351**	**2.01799**	**-0.00046**
%RSD	35.03508	0.04199	23.98789	2.58289	0.47208	7.71047	45.84403	0.29630	10.28908

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00136	0.00167	0.00086	7.93150	0.97811	0.00055	1.14322	0.12841	-0.00209
#2	0.00204	0.00241	0.00114	7.90969	0.98117	0.00057	1.13677	0.12776	-0.00297
Mean	**0.00170**	**0.00204**	**0.00100**	**7.92059**	**0.97964**	**0.00056**	**1.14000**	**0.12808**	**-0.00253**
%RSD	28.16871	25.48974	20.13374	0.19468	0.22091	2.30210	0.39977	0.36049	24.56822

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02532	0.00123	0.13482	0.00165	0.00592	0.25451	-0.00099	-0.00558	0.00601
#2	0.02667	0.00197	0.13985	0.00363	0.00360	0.25824	-0.00101	-0.00023	0.00794
Mean	**0.02599**	**0.00160**	**0.13734**	**0.00264**	**0.00476**	**0.25638**	**-0.00100**	**-0.00290**	**0.00698**
%RSD	3.67321	32.88788	2.58715	53.17914	34.46965	1.02897	1.14471	130.42602	19.60359

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.67136	-0.00394	0.01842	0.01036	-0.00183	-0.01917	0.01706	0.03182	0.00105
#2	0.66800	-0.00138	0.01829	0.01078	0.00101	-0.02175	0.01757	0.03114	0.00105
Mean	**0.66968**	**-0.00266**	**0.01835**	**0.01057**	**-0.00041**	**-0.02046**	**0.01732**	**0.03148**	**0.00105**
%RSD	0.35500	68.17365	0.50680	2.80981	492.37573	8.92649	2.08489	1.54079	0.04139

	Pb	Se
	calc	calc
#1	0.00450	0.00215
#2	0.00361	0.00522
Mean	**0.00406**	**0.00369**
%RSD	15.47310	58.95973

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : 1303058-1MS 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:29:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE69

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01759	25.76109	0.21886	0.15494	0.40312	0.01172	0.00174	17.52230	0.00974
#2	0.01787	25.69397	0.21245	0.15286	0.40005	0.01168	-0.00282	17.49421	0.00992
Mean	**0.01773**	**25.72753**	**0.21565**	**0.15390**	**0.40159**	**0.01170**	**-0.00054**	**17.50826**	**0.00983**
%RSD	1.14628	0.18448	2.10145	0.95800	0.54071	0.19923	596.43004	0.11347	1.25597

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11244	0.05946	0.06951	41.60470	14.25097	0.11365	14.31792	0.69860	0.17556
#2	0.11293	0.05877	0.06933	41.48888	14.21189	0.11338	14.29137	0.69663	0.17342
Mean	**0.11269**	**0.05911**	**0.06942**	**41.54679**	**14.23143**	**0.11352**	**14.30465**	**0.69762**	**0.17449**
%RSD	0.30941	0.82285	0.18092	0.19713	0.19417	0.16570	0.13126	0.19948	0.86629

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.03566	0.11930	0.72711	0.13288	0.12484	1.31820	0.05596	0.38573	0.37795
#2	7.00975	0.11950	0.73421	0.12710	0.12833	1.32941	0.05741	0.38475	0.38226
Mean	**7.02270**	**0.11940**	**0.73066**	**0.12999**	**0.12658**	**1.32381**	**0.05669**	**0.38524**	**0.38011**
%RSD	0.26089	0.11682	0.68639	3.14480	1.94987	0.59831	1.80844	0.17873	0.80214

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.40206	0.10238	0.20809	0.13214	0.37771	0.06850	0.19869	0.21933	0.00810
#2	2.39486	0.10092	0.20683	0.13206	0.37836	0.05753	0.19804	0.21933	0.00797
Mean	**2.39846**	**0.10165**	**0.20746**	**0.13210**	**0.37804**	**0.06302**	**0.19836**	**0.21933**	**0.00803**
%RSD	0.21215	1.01792	0.42664	0.04496	0.12177	12.31121	0.23235	0.00000	1.12236

	Pb	**Se**
	calc	calc
#1	0.12752	0.38054
#2	0.12792	0.38309
Mean	**0.12772**	**0.38182**
%RSD	0.22314	0.47258

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:12
SampleId1 : 1303058-1MSD 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:31:42
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE70

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01823	25.32781	0.21688	0.15390	0.39333	0.01164	0.00506	17.77937	0.01043
#2	0.01736	25.54067	0.21466	0.15133	0.39640	0.01172	0.00103	17.85810	0.00931
Mean	**0.01780**	**25.43424**	**0.21577**	**0.15261**	**0.39486**	**0.01168**	**0.00305**	**17.81874**	**0.00987**
%RSD	3.45007	0.59179	0.72556	1.19340	0.54990	0.44948	93.48603	0.31244	8.01034

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11188	0.05874	0.06827	41.08172	13.93263	0.11104	14.27284	0.70457	0.17525
#2	0.11306	0.05856	0.06848	41.33938	14.05199	0.11202	14.35220	0.70892	0.17481
Mean	**0.11247**	**0.05865**	**0.06838**	**41.21055**	**13.99231**	**0.11153**	**14.31252**	**0.70674**	**0.17503**
%RSD	0.74048	0.21497	0.21689	0.44211	0.60318	0.61839	0.39205	0.43561	0.17781

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	6.86112	0.12050	0.72505	0.13421	0.12298	1.36301	0.05756	0.38119	0.37195
#2	6.92938	0.11941	0.72483	0.13235	0.12815	1.39661	0.05914	0.38227	0.38754
Mean	**6.89525**	**0.11996**	**0.72494**	**0.13328**	**0.12556**	**1.37981**	**0.05835**	**0.38173**	**0.37974**
%RSD	0.69998	0.64598	0.02232	0.98586	2.90984	1.72213	1.91897	0.20007	2.90360

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.30475	0.10275	0.20750	0.13259	0.38543	0.07701	0.19627	0.21709	0.00803
#2	2.32760	0.10128	0.20893	0.13339	0.38042	0.05497	0.19712	0.21624	0.00788
Mean	**2.31618**	**0.10202**	**0.20822**	**0.13299**	**0.38293**	**0.06599**	**0.19670**	**0.21667**	**0.00795**
%RSD	0.69781	1.01499	0.48581	0.42635	0.92467	23.60882	0.30636	0.28004	1.27139

	Pb	**Se**
	calc	calc
#1	0.12672	0.37503
#2	0.12955	0.38579
Mean	**0.12814**	**0.38041**
%RSD	1.56045	2.00018

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:13
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 17:33:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19597	50.84617	0.51886	0.99319	1.01797	0.49968	0.51355	50.70526	0.50431
#2	0.19472	50.66727	0.52433	0.98007	1.01126	0.49904	0.50931	50.53863	0.49912
Mean	**0.19534**	**50.75672**	**0.52159**	**0.98663**	**1.01462**	**0.49936**	**0.51143**	**50.62195**	**0.50172**
%RSD	0.45180	0.24924	0.74219	0.94025	0.46781	0.09049	0.58561	0.23276	0.73196

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49116	0.99127	1.00894	20.21442	49.11194	0.52140	50.45289	0.98490	0.97918
#2	0.48988	0.98683	1.00349	20.17350	49.02743	0.52045	50.30101	0.98376	0.98258
Mean	**0.49052**	**0.98905**	**1.00621**	**20.19396**	**49.06969**	**0.52093**	**50.37695**	**0.98433**	**0.98088**
%RSD	0.18375	0.31770	0.38275	0.14328	0.12178	0.12806	0.21319	0.08159	0.24515

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.70612	0.97558	4.90231	0.99267	0.94976	5.24048	0.48640	1.03241	0.95970
#2	48.53961	0.96672	4.90347	0.98630	0.98395	5.16933	0.47881	1.03449	1.01558
Mean	**48.62286**	**0.97115**	**4.90289**	**0.98949**	**0.96686**	**5.20491**	**0.48260**	**1.03345**	**0.98764**
%RSD	0.24216	0.64473	0.01669	0.45536	2.50003	0.96649	1.11231	0.14173	4.00091

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.00785	1.04062	0.49716	0.51018	0.51978	4.89082	0.49038	1.01126	0.97562

#2	4.99594	1.03659	0.49353	0.50985	0.51489	4.89277	0.49009	1.00954	0.97295
Mean	**5.00190**	**1.03861**	**0.49534**	**0.51001**	**0.51733**	**4.89179**	**0.49023**	**1.01040**	**0.97428**
%RSD	0.16828	0.27412	0.51723	0.04548	0.66953	0.02817	0.04168	0.12050	0.19373

	Pb calc	**Se** calc
#1	0.96405	0.98391
#2	0.98473	1.02188
Mean	**0.97439**	**1.00289**
%RSD	1.50064	2.67665

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:13
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 17:36:13
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00096	0.06530	0.00057	-0.00580	0.00095	0.00021	-0.00117	0.01521	-0.00003
#2	0.00096	0.06319	-0.00444	-0.00641	0.00095	0.00019	0.00443	0.01474	0.00031
Mean	**0.00096**	**0.06425**	**-0.00193**	**-0.00610**	**0.00095**	**0.00020**	**0.00163**	**0.01498**	**0.00014**
%RSD	0.50493	2.32646	183.44614	7.10615	0.00000	9.79471	242.93728	2.21232	173.02695

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	-0.00011	0.00066	0.00066	0.05097	-0.09768	-0.00240	0.04230	0.00103	0.00061
#2	-0.00011	0.00092	-0.00027	0.05034	-0.09956	-0.00237	0.04383	0.00091	-0.00140
Mean	**-0.00011**	**0.00079**	**0.00019**	**0.05066**	**-0.09862**	**-0.00238**	**0.04307**	**0.00097**	**-0.00040**
%RSD	0.17219	23.02659	341.98090	0.86990	1.34834	0.69705	2.51829	8.67765	359.51997

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.05229	-0.00094	-0.00287	0.00014	-0.00212	-0.00289	-0.00057	0.00102	0.00142
#2	0.05221	0.00005	-0.00013	0.00480	-0.00168	0.00457	-0.00217	0.00624	0.00177
Mean	**0.05225**	**-0.00045**	**-0.00150**	**0.00247**	**-0.00190**	**0.00084**	**-0.00137**	**0.00363**	**0.00160**
%RSD	0.11080	155.99311	128.77809	133.62596	16.44091	625.32128	82.65946	101.53600	15.59218

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	0.01347	0.00632	-0.00285	-0.00209	0.00926	-0.00804	0.00058	0.00044	0.00123
#2	0.01507	-0.00026	-0.00286	-0.00196	-0.00196	-0.01709	0.00064	-0.00007	0.00109
Mean	**0.01427**	**0.00303**	**-0.00286**	**-0.00202**	**0.00365**	**-0.01257**	**0.00061**	**0.00019**	**0.00116**
%RSD	7.88775	153.70480	0.23259	4.53772	217.50024	50.93379	6.60624	196.10940	8.47738

	Pb calc	**Se** calc
#1	-0.00137	0.00129
#2	0.00048	0.00326

Mean	-0.00045	0.00227ser: STEVE WORKMAN
%RSD	293.49689	61.26989

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:13
SampleId1 : 1303058-1A SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:38:03
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE71

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00181	99.13951	1.04135	0.91993	1.88331	0.05459	0.01238	88.52830	0.04945
#2	-0.00176	98.47384	1.02890	0.92024	1.87358	0.05448	0.01324	88.16210	0.04916
Mean	**-0.00179**	**98.80668**	**1.03512**	**0.92008**	**1.87845**	**0.05454**	**0.01281**	**88.34520**	**0.04931**
%RSD	1.91211	0.47638	0.85088	0.02356	0.36624	0.14272	4.79652	0.29310	0.41948

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.52422	0.26164	0.34569	214.20050	77.64665	0.64126	66.97262	3.37983	0.93038
#2	0.52208	0.26125	0.34372	213.50833	77.15771	0.63741	66.74567	3.37015	0.92931
Mean	**0.52315**	**0.26144**	**0.34470**	**213.85441**	**77.40218**	**0.63934**	**66.85915**	**3.37499**	**0.92984**
%RSD	0.28893	0.10426	0.40498	0.22887	0.44668	0.42643	0.24002	0.20292	0.08140

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	41.14996	0.55802	3.55490	0.61134	0.57520	6.34552	0.45510	1.85321	1.75463
#2	40.87390	0.54949	3.55813	0.59633	0.59006	6.30805	0.45020	1.83148	1.80157
Mean	**41.01193**	**0.55376**	**3.55651**	**0.60384**	**0.58263**	**6.32679**	**0.45265**	**1.84235**	**1.77810**
%RSD	0.47597	1.08870	0.06420	1.75700	1.80301	0.41882	0.76499	0.83405	1.86682

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	16.49588	0.49460	0.99635	0.77987	1.80022	0.46796	0.90353	0.97941	0.04158
#2	16.43996	0.48765	0.99000	0.77937	1.77606	0.46679	0.89781	0.97907	0.04132
Mean	**16.46792**	**0.49112**	**0.99317**	**0.77962**	**1.78814**	**0.46738**	**0.90067**	**0.97924**	**0.04145**
%RSD	0.24010	1.00097	0.45210	0.04494	0.95538	0.17673	0.44880	0.02486	0.43878

	Pb calc	**Se** calc
#1	0.58724	1.78746
#2	0.59215	1.81153
Mean	**0.58969**	**1.79950**
%RSD	0.58910	0.94602

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:13
SampleId1 : 1303058-1A 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:39:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE72

Final concentrations6:30 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00038	22.06098	0.98047	0.90141	1.16428	0.04940	0.00531	10.48203	0.04830
#2	0.00027	22.04260	0.98780	0.90472	1.17390	0.04991	-0.00097	10.44595	0.04800
Mean	**-0.00006**	**22.05179**	**0.98413**	**0.90307**	**1.16909**	**0.04966**	**0.00217**	**10.46399**	**0.04815**
%RSD	775.95135	0.05894	0.52697	0.25922	0.58176	0.71882	204.61290	0.24384	0.43656

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48374	0.20695	0.26536	42.95573	6.27893	0.01740	5.93449	1.11893	0.93075
#2	0.48785	0.20859	0.26771	42.81691	6.26802	0.01734	5.88312	1.12281	0.94070
Mean	**0.48580**	**0.20777**	**0.26653**	**42.88632**	**6.27347**	**0.01737**	**5.90880**	**1.12087**	**0.93573**
%RSD	0.59853	0.55811	0.62336	0.22889	0.12297	0.25500	0.61471	0.24538	0.75184

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11548	0.49816	0.77539	0.50450	0.49330	1.34807	0.44972	1.84218	1.78581
#2	0.11748	0.50079	0.75892	0.50861	0.49676	1.32941	0.45584	1.85686	1.82114
Mean	**0.11648**	**0.49948**	**0.76715**	**0.50656**	**0.49503**	**1.33874**	**0.45278**	**1.84952**	**1.80348**
%RSD	1.21871	0.37234	1.51852	0.57471	0.49443	0.98606	0.95556	0.56101	1.38516

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.95945	0.48609	0.58049	0.54410	1.82461	0.07408	0.56600	0.59598	0.00823
#2	4.96904	0.49157	0.58530	0.55163	1.80887	0.07669	0.57050	0.59890	0.00841
Mean	**4.96424**	**0.48883**	**0.58290**	**0.54786**	**1.81674**	**0.07539**	**0.56825**	**0.59744**	**0.00832**
%RSD	0.13672	0.79274	0.58422	0.97164	0.61284	2.44972	0.55942	0.34585	1.58379

	Pb	Se
	calc	calc
#1	0.49703	1.80458
#2	0.50071	1.83304
Mean	**0.49887**	**1.81881**
%RSD	0.52157	1.10608

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:13
SampleId1 : 1303059-1A SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:41:34
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE73

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00072	28.61332	1.78568	0.86077	1.30185	0.04825	0.01143	146.00026	0.04713
#2	-0.00198	28.84013	1.79906	0.87364	1.32217	0.04903	0.00394	146.15983	0.04756
Mean	**-0.00135**	**28.72672**	**1.79237**	**0.86720**	**1.31201**	**0.04864**	**0.00768**	**146.08005**	**0.04735**
%RSD	66.36946	0.55828	0.52765	1.04979	1.09501	1.12194	68.94107	0.07724	0.64453

ted: 3/12/2013 13:06:30 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.44562	0.18562	0.25970	87.59898	50.46831	0.53999	47.88169	1.28323	2.15331
#2	0.45209	0.18870	0.26495	87.95291	50.63563	0.54144	47.90019	1.29630	2.17294
Mean	**0.44885**	**0.18716**	**0.26232**	**87.77594**	**50.55197**	**0.54071**	**47.89094**	**1.28977**	**2.16313**
%RSD	1.01978	1.16322	1.41588	0.28511	0.23404	0.18962	0.02731	0.71617	0.64171

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	39.61831	0.45091	2.01804	0.53408	0.51666	37.44827	0.43162	2.10663	2.02778
#2	39.71294	0.45808	2.03940	0.53761	0.52645	37.76246	0.43486	2.14087	2.07886
Mean	**39.66563**	**0.45449**	**2.02872**	**0.53585**	**0.52155**	**37.60536**	**0.43324**	**2.12375**	**2.05332**
%RSD	0.16869	1.11506	0.74439	0.46532	1.32724	0.59079	0.52856	1.14001	1.75928

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	12.86929	0.45497	0.77510	0.55520	1.72514	1.34583	1.61286	0.54888	0.02095
#2	12.97754	0.47106	0.78525	0.56495	1.74233	1.36258	1.62575	0.55559	0.02048
Mean	**12.92341**	**0.46302**	**0.78017**	**0.56007**	**1.73374**	**1.35420**	**1.61931**	**0.55223**	**0.02072**
%RSD	0.59231	2.45715	0.91997	1.23160	0.70098	0.87470	0.56261	0.85819	1.59173

	Pb	Se
	calc	calc
#1	0.52246	2.05404
#2	0.53016	2.09951
Mean	**0.52631**	**2.07677**
%RSD	1.03502	1.54840

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:14
SampleId1 : 1303060-1A SampleId2 : **[SAMPLE]**
Analysis commenced : 3/11/2013 17:43:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE74

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00119	64.24430	0.90700	0.81436	1.58963	0.04755	0.00471	176.21405	0.04397
#2	-0.00100	63.99870	0.91422	0.82784	1.59828	0.04829	0.00525	176.05686	0.04448
Mean	**-0.00109**	**64.12150**	**0.91061**	**0.82110**	**1.59395**	**0.04792**	**0.00498**	**176.13546**	**0.04422**
%RSD	12.34504	0.27083	0.56053	1.16155	0.38361	1.08781	7.72526	0.06311	0.82708

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.45387	0.22212	0.31365	149.50779	56.19316	0.54966	74.65419	2.25594	0.83606
#2	0.46056	0.22593	0.31648	149.11495	56.36190	0.55286	74.82038	2.25805	0.84985
Mean	**0.45721**	**0.22402**	**0.31506**	**149.31137**	**56.27753**	**0.55126**	**74.73729**	**2.25699**	**0.84295**
%RSD	1.03443	1.20244	0.63494	0.18604	0.21202	0.41061	0.15724	0.06621	1.15659

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	36.44875	0.48514	3.65824	0.51216	0.49543	4.53671	0.40357	1.55365	1.52251
#2	36.71822	0.49251	3.64094	0.51777	0.50373	4.49554	0.40504	1.56912	1.52869
Mean	**36.58349**	**0.48883**	**3.64959**	**0.51497**	**0.49958**	**4.51612**	**0.40431**	**1.56139**	**1.52560**
%RSD	0.52085	1.06528	0.33524	0.77102	1.17562	0.64456	0.25781	0.70095	0.28674

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	18.43495	0.43689	0.93920	0.69160	1.58439	0.23781	0.58618	0.79699	0.03016
#2	18.40800	0.44346	0.94213	0.69871	1.60253	0.23077	0.58982	0.80456	0.03022
Mean	**18.42148**	**0.44017**	**0.94066**	**0.69515**	**1.59346**	**0.23429**	**0.58800**	**0.80078**	**0.03019**
%RSD	0.10346	1.05677	0.22004	0.72356	0.80497	2.12543	0.43798	0.66839	0.15056

	Pb	Se
	calc	calc
#1	0.50100	1.53288
#2	0.50841	1.54216
Mean	**0.50470**	**1.53752**
%RSD	1.03815	0.42682

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:14
SampleId1 : 1303058-2 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:45:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE75

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00044	11.30605	0.01713	0.00095	0.24690	0.00075	0.00037	17.89771	-0.00013
#2	0.00007	11.32774	0.01398	-0.00095	0.24679	0.00063	0.00334	17.85251	-0.00037
Mean	**-0.00019**	**11.31690**	**0.01555**	**0.00000**	**0.24685**	**0.00069**	**0.00186**	**17.87511**	**-0.00025**
%RSD	192.70733	0.13549	14.30890	343420.74961	0.03139	11.45870	113.42193	0.17880	67.90148

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00750	0.00811	0.00855	25.44568	2.56074	0.00887	3.81530	0.34230	0.00067
#2	0.00737	0.00811	0.00807	25.49114	2.52441	0.00853	3.77812	0.34236	-0.00040
Mean	**0.00744**	**0.00811**	**0.00831**	**25.46841**	**2.54257**	**0.00870**	**3.79671**	**0.34233**	**0.00014**
%RSD	1.28240	0.02651	4.04277	0.12623	1.01050	2.73667	0.69248	0.01228	544.86396

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08123	0.00986	0.43301	0.01954	0.01574	1.44889	0.00248	0.01501	0.02180
#2	0.05622	0.01094	0.44239	0.01968	0.01641	1.41155	-0.00227	0.01735	0.01969
Mean	**0.06873**	**0.01040**	**0.43770**	**0.01961**	**0.01608**	**1.43022**	**0.00011**	**0.01618**	**0.02075**
%RSD	25.73851	7.30049	1.51414	0.53662	2.92468	1.84611	3160.94751	10.22573	7.18030

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.11082	-0.00288	0.06805	0.04299	0.00062	0.10893	0.12512	0.05892	0.00466
#2	3.11549	0.00188	0.06751	0.04258	0.00148	0.11345	0.12502	0.05755	0.00479
Mean	**3.11315**	**-0.00050**	**0.06778**	**0.04278**	**0.00105**	**0.11119**	**0.12507**	**0.05823**	**0.00473**
%RSD	0.10609	675.22494	0.55896	0.68174	57.97128	2.87333	0.05980	1.66603	2.06312

	Pb	**Se**
	calc	calc
#1	0.01701	0.01954
#2	0.01750	0.01892
Mean	**0.01725**	**0.01923**
%RSD	2.02083	2.30182

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:14
SampleId1 : 1303058-3 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:46:50
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE76

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00074	14.27001	0.01631	-0.00187	0.42641	0.00067	0.00056	20.78071	-0.00033
#2	-0.00022	14.19686	0.01654	-0.00071	0.42554	0.00063	0.00300	20.74609	-0.00065
Mean	**-0.00048**	**14.23344**	**0.01643**	**-0.00129**	**0.42597**	**0.00065**	**0.00178**	**20.76340**	**-0.00049**
%RSD	76.87999	0.36338	1.00351	63.95691	0.14566	4.19840	97.27531	0.11790	46.51451

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00837	0.01096	0.01057	28.20057	2.93104	0.01294	5.38674	0.39482	-0.00102
#2	0.00805	0.01093	0.01011	28.19106	2.90932	0.01292	5.37813	0.39476	-0.00014
Mean	**0.00821**	**0.01095**	**0.01034**	**28.19582**	**2.92018**	**0.01293**	**5.38243**	**0.39479**	**-0.00058**
%RSD	2.73477	0.20168	3.14669	0.02384	0.52589	0.08564	0.11312	0.01066	106.51717

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06379	0.01304	0.53773	0.01856	0.01794	1.14273	-0.00113	0.02074	0.01827
#2	0.06187	0.01381	0.53818	0.01913	0.01792	1.12033	0.00178	0.01606	0.01783
Mean	**0.06283**	**0.01343**	**0.53796**	**0.01885**	**0.01793**	**1.13153**	**0.00032**	**0.01840**	**0.01805**
%RSD	2.16552	4.03994	0.06011	2.14428	0.10352	1.39975	637.31877	17.99316	1.73030

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.10338	0.00040	0.07456	0.05316	-0.00416	0.06511	0.09758	0.08293	0.00566
#2	2.10237	0.00297	0.07433	0.05309	-0.00167	0.05412	0.09758	0.08293	0.00530
Mean	**2.10288**	**0.00168**	**0.07444**	**0.05312**	**-0.00291**	**0.05961**	**0.09758**	**0.08293**	**0.00548**
%RSD	0.03392	107.47567	0.22322	0.09151	60.50622	13.03711	0.00131	0.00000	4.60275

	Pb	**Se**
	calc	calc

#1	0.01815	0.01910
#2	0.01832	0.01724
Mean	**0.01824**	**0.01817**
%RSD	0.67017	7.21555

ser: **STEVE WORKMAN**

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:14
SampleId1 : 1303058-4 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:48:36
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE77

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00028	16.15772	0.01969	-0.00199	0.18602	0.00119	0.00060	26.62188	-0.00019
#2	-0.00068	16.06259	0.01386	-0.00285	0.18460	0.00115	0.00252	26.50503	-0.00066
Mean	**-0.00048**	**16.11015**	**0.01678**	**-0.00242**	**0.18531**	**0.00117**	**0.00156**	**26.56345**	**-0.00043**
%RSD	59.45630	0.41755	24.56481	25.05798	0.54339	2.41966	87.11509	0.31105	77.89591

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01164	0.01283	0.01384	39.26094	4.22349	0.01618	5.57987	0.46719	-0.00040
#2	0.01205	0.01279	0.01386	39.08995	4.21876	0.01611	5.54573	0.46564	-0.00153
Mean	**0.01185**	**0.01281**	**0.01385**	**39.17544**	**4.22112**	**0.01614**	**5.56280**	**0.46641**	**-0.00096**
%RSD	2.41590	0.25509	0.08663	0.30864	0.07923	0.28580	0.43392	0.23464	83.22271

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10396	0.01513	0.69211	0.03168	0.02499	2.71906	0.00161	0.03886	0.03693
#2	0.10470	0.01445	0.68799	0.02771	0.02488	2.69290	0.00187	0.04434	0.03919
Mean	**0.10433**	**0.01479**	**0.69005**	**0.02970**	**0.02494**	**2.70598**	**0.00174**	**0.04160**	**0.03806**
%RSD	0.49973	3.24937	0.42196	9.46264	0.30355	0.68366	10.47480	9.31522	4.20612

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.21928	0.00040	0.11175	0.05440	0.00173	0.18856	0.22439	0.08636	0.00874
#2	2.20545	0.00296	0.11083	0.05442	-0.00087	0.17113	0.22418	0.08825	0.00839
Mean	**2.21237**	**0.00168**	**0.11129**	**0.05441**	**0.00043**	**0.17984**	**0.22428**	**0.08730**	**0.00856**
%RSD	0.44179	107.56706	0.58549	0.02978	426.54717	6.85257	0.06461	1.52816	2.84258

	Pb	**Se**
	calc	calc
#1	0.02722	0.03757
#2	0.02582	0.04091
Mean	**0.02652**	**0.03924**
%RSD	3.71843	6.01003

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:14
SampleId1 : 1303058-5 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:50:21

Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE78

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00246	13.24441	0.01188	-0.00408	0.36281	0.00084	0.00583	16.58429	-0.00031
#2	-0.00074	13.23895	0.00967	-0.00463	0.36167	0.00083	0.00741	16.57521	-0.00031
Mean	**-0.00160**	**13.24168**	**0.01077**	**-0.00435**	**0.36224**	**0.00083**	**0.00662**	**16.57975**	**-0.00031**
%RSD	75.79370	0.02917	14.53599	8.96253	0.22118	0.42917	16.85938	0.03876	0.14713

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00842	0.00994	0.01120	29.93581	2.73442	0.01128	4.57475	0.44165	-0.00109
#2	0.00833	0.01030	0.01148	29.95669	2.73631	0.01127	4.58182	0.44147	0.00042
Mean	**0.00838**	**0.01012**	**0.01134**	**29.94625**	**2.73536**	**0.01127**	**4.57829**	**0.44156**	**-0.00033**
%RSD	0.77933	2.52854	1.71423	0.04930	0.04881	0.04911	0.10920	0.02859	320.57479

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05401	0.01239	0.69989	0.02179	0.02497	3.35085	0.00297	0.05975	0.05387
#2	0.05368	0.01210	0.68365	0.02658	0.02444	3.36207	0.00192	0.05935	0.06409
Mean	**0.05384**	**0.01224**	**0.69177**	**0.02419**	**0.02470**	**3.35646**	**0.00245**	**0.05955**	**0.05898**
%RSD	0.43006	1.64561	1.66026	14.00499	1.51398	0.23633	30.40664	0.48087	12.25731

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.55069	-0.00178	0.05497	0.04831	-0.00045	0.18766	0.18884	0.06921	0.00636
#2	1.55480	-0.00252	0.05479	0.04847	0.00231	0.19542	0.18810	0.06938	0.00687
Mean	**1.55274**	**-0.00215**	**0.05488**	**0.04839**	**0.00093**	**0.19154**	**0.18847**	**0.06929**	**0.00662**
%RSD	0.18704	24.06032	0.23007	0.24556	209.46932	2.86335	0.27807	0.17502	5.39379

	Pb	Se
	calc	calc
#1	0.02391	0.05583
#2	0.02515	0.06251
Mean	**0.02453**	**0.05917**
%RSD	3.58142	7.98830

Method : Paragon2   File : 130311A   Printed : 3/12/2013 13:06:15
SampleId1 : 1303058-6 5X   SampleId2 :   [SAMPLE]
Analysis commenced : 3/11/2013 17:52:07
Dilution ratio : 1.00000 to 1.00000   Tray :   Position : TUBE79

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00050	10.71910	0.01841	-0.00543	0.12615	0.00104	0.00070	13.13195	-0.00060
#2	-0.00087	10.64010	0.01514	-0.00543	0.12505	0.00100	0.00893	13.05494	0.00003

Mean	**-0.00068**	**10.67960**	**0.01678**	**-0.00543**	**0.12560**	**0.00102**	**0.00481**	**13.09345**	**-0.00029**
%RSD	38.40596	0.52305	13.75629	0.00000	0.61650	2.90840	120.78828	0.41588	155.67801

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00875	0.00889	0.01015	34.77482	2.56192	0.01010	3.58915	0.37882	0.00074
#2	0.00902	0.00858	0.00846	34.55668	2.54304	0.00999	3.56334	0.37674	-0.00008
Mean	**0.00888**	**0.00874**	**0.00930**	**34.66575**	**2.55248**	**0.01005**	**3.57625**	**0.37778**	**0.00033**
%RSD	2.14916	2.48747	12.86400	0.44496	0.52290	0.77145	0.51031	0.38968	176.56612

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.07890	0.00962	0.53201	0.03294	0.03164	3.36581	-0.00478	0.06701	0.06626
#2	0.07902	0.01046	0.53544	0.03667	0.03178	3.32468	0.00010	0.07374	0.06975
Mean	**0.07896**	**0.01004**	**0.53373**	**0.03481**	**0.03171**	**3.34524**	**-0.00234**	**0.07038**	**0.06800**
%RSD	0.11001	5.86552	0.45442	7.56758	0.32577	0.86943	147.33240	6.76453	3.62947

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.42744	-0.00143	0.06425	0.05799	-0.00517	0.59354	0.38283	0.07161	0.00398
#2	1.41884	0.00223	0.06349	0.05780	-0.00205	0.59099	0.37924	0.07178	0.00400
Mean	**1.42314**	**0.00040**	**0.06387**	**0.05790**	**-0.00361**	**0.59227**	**0.38103**	**0.07170**	**0.00399**
%RSD	0.42720	648.50734	0.84290	0.23322	61.08656	0.30412	0.66684	0.16916	0.37975

	Pb	**Se**
	calc	calc
#1	0.03207	0.06651
#2	0.03341	0.07108
Mean	**0.03274**	**0.06879**
%RSD	2.88952	4.69748

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:15
SampleId1 : 1303058-7 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:53:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE80

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00085	11.39203	0.00897	-0.00389	0.15583	0.00081	0.00284	17.46739	-0.00020
#2	-0.00150	11.42296	0.01468	-0.00610	0.15550	0.00078	-0.00451	17.44281	-0.00071
Mean	**-0.00118**	**11.40750**	**0.01182**	**-0.00500**	**0.15566**	**0.00079**	**-0.00084**	**17.45510**	**-0.00046**
%RSD	39.00027	0.19175	34.16108	31.23175	0.14926	2.86090	622.82363	0.09959	78.03037

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00856	0.00848	0.00862	27.67956	2.10551	0.00998	3.93177	0.32767	-0.00077
#2	0.00811	0.00786	0.00797	27.65181	2.10739	0.00997	3.92778	0.32732	-0.00190
Mean	**0.00833**	**0.00817**	**0.00829**	**27.66569**	**2.10645**	**0.00998**	**3.92977**	**0.32750**	**-0.00134**

%RSD	3.84067	5.32921	5.59211	0.07091	0.06332	0.07399	0.07188	0.07703	59.77284

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06870	0.01120	0.42593	0.01904	0.01738	1.85596	-0.00122	0.02296	0.02691
#2	0.06821	0.01142	0.42890	0.01895	0.01930	1.83729	-0.00399	0.02543	0.02655
Mean	**0.06846**	**0.01131**	**0.42741**	**0.01899**	**0.01834**	**1.84663**	**-0.00261**	**0.02419**	**0.02673**
%RSD	0.50747	1.37009	0.49163	0.31730	7.41091	0.71513	75.04996	7.22069	0.94351

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.79436	-0.00031	0.07720	0.03927	0.00239	0.22687	0.19605	0.05926	0.00535
#2	1.79726	-0.00470	0.07716	0.03937	-0.00908	0.22364	0.19525	0.05943	0.00512
Mean	**1.79581**	**-0.00251**	**0.07718**	**0.03932**	**-0.00335**	**0.22525**	**0.19565**	**0.05935**	**0.00523**
%RSD	0.11414	123.86676	0.03445	0.17858	242.20693	1.01341	0.29155	0.20434	3.08721

	Pb	Se
	calc	calc
#1	0.01793	0.02559
#2	0.01919	0.02618
Mean	**0.01856**	**0.02589**
%RSD	4.77724	1.59749

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:15
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 17:55:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19466	50.67068	0.51909	0.99227	1.01574	0.49811	0.52146	50.57365	0.50330
#2	0.19341	50.73325	0.52049	0.98583	1.01442	0.49816	0.51566	50.51805	0.49985
Mean	**0.19404**	**50.70197**	**0.51979**	**0.98905**	**1.01508**	**0.49813**	**0.51856**	**50.54585**	**0.50157**
%RSD	0.45640	0.08726	0.19015	0.46021	0.09199	0.00728	0.79165	0.07777	0.48731

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49012	0.98717	1.00968	20.16209	48.91535	0.51995	50.28344	0.98137	0.98050
#2	0.48867	0.98675	1.00893	20.14989	48.96199	0.52029	50.25551	0.98173	0.97987
Mean	**0.48940**	**0.98696**	**1.00930**	**20.15599**	**48.93867**	**0.52012**	**50.26948**	**0.98155**	**0.98019**
%RSD	0.20954	0.03026	0.05235	0.04278	0.06738	0.04699	0.03928	0.02584	0.04543

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.50154	0.97641	4.87314	0.98891	0.96619	5.21801	0.48528	1.00042	0.98661
#2	48.52146	0.97010	4.87360	0.98907	0.98096	5.30413	0.48515	1.00055	1.01895
Mean	**48.51150**	**0.97325**	**4.87337**	**0.98899**	**0.97358**	**5.26107**	**0.48521**	**1.00049**	**1.00278**
%RSD	0.02903	0.45862	0.00672	0.01149	1.07285	1.15752	0.01886	0.00949	2.28079

ted: 3/12/2013 13:06:31 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.99030	1.03110	0.49579	0.50744	0.50870	4.90183	0.49006	1.00420	0.97386
#2	4.99884	1.03037	0.49488	0.50817	0.50298	4.89795	0.48937	1.00747	0.97333
Mean	**4.99457**	**1.03074**	**0.49534**	**0.50780**	**0.50584**	**4.89989**	**0.48971**	**1.00584**	**0.97360**
%RSD	0.12090	0.05028	0.12931	0.10197	0.80007	0.05600	0.09951	0.22998	0.03835

	Pb	Se
	calc	calc
#1	0.97376	0.99121
#2	0.98366	1.01283
Mean	**0.97871**	**1.00202**
%RSD	0.71570	1.52560

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:15
SampleId1 : CCB **SampleId2 :** **[CB]**
Analysis commenced : 3/11/2013 17:57:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00059	0.06043	0.00279	-0.00561	0.00095	0.00018	0.00408	0.01552	0.00032
#2	-0.00060	0.06201	0.00022	-0.00733	0.00073	0.00015	-0.00381	0.01474	-0.00007
Mean	**-0.00001**	**0.06122**	**0.00151**	**-0.00647**	**0.00084**	**0.00016**	**0.00014**	**0.01513**	**0.00012**
%RSD	8643.11715	1.82453	120.35537	18.76570	18.36525	13.73211	4034.38729	3.64914	224.81681

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00007	0.00022	0.00009	0.05221	-0.05983	-0.00231	0.04138	0.00097	-0.00052
#2	-0.00074	0.00016	-0.00035	0.05198	-0.07276	-0.00232	0.03770	0.00085	0.00067
Mean	**-0.00041**	**0.00019**	**-0.00013**	**0.05210**	**-0.06630**	**-0.00232**	**0.03954**	**0.00091**	**0.00008**
%RSD	117.90010	23.14630	245.64179	0.31719	13.78986	0.47805	6.58311	9.24492	1113.82523

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05253	-0.00070	-0.00721	0.00236	-0.00026	-0.00289	-0.00149	0.00391	0.00556
#2	0.05225	-0.00179	-0.00128	-0.00268	0.00237	-0.01035	-0.00201	0.00856	0.00477
Mean	**0.05239**	**-0.00125**	**-0.00424**	**-0.00016**	**0.00106**	**-0.00662**	**-0.00175**	**0.00623**	**0.00517**
%RSD	0.38673	62.13787	98.90069	2229.17882	176.39422	79.72582	20.99978	52.73999	10.84727

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01478	-0.00538	-0.00287	-0.00179	0.00818	-0.00869	0.00115	-0.00024	0.00129
#2	0.01295	-0.00282	-0.00294	-0.00225	0.00781	-0.03261	0.00029	-0.00024	0.00052
Mean	**0.01386**	**-0.00410**	**-0.00290**	**-0.00202**	**0.00800**	**-0.02065**	**0.00072**	**-0.00024**	**0.00090**
%RSD	9.30813	44.12821	1.60177	16.04576	3.25423	81.92245	83.90426	0.00000	60.55867

	Pb calc	Seser: STEVE WORKMAN calc
#1	0.00061	0.00501
#2	0.00069	0.00603
Mean	**0.00065**	**0.00552**
%RSD	8.66056	13.06102

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16
SampleId1 : 1303058-8 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 17:59:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE81

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.00036	11.17740	0.01153	-0.00316	0.22367	0.00065	0.00791	19.48156	-0.00035
#2	-0.00082	11.18689	0.00920	-0.00414	0.22375	0.00062	-0.00506	19.45403	-0.00060
Mean	**-0.00023**	**11.18214**	**0.01036**	**-0.00365**	**0.22371**	**0.00063**	**0.00142**	**19.46780**	**-0.00048**
%RSD	363.13359	0.06001	15.90328	19.01261	0.02309	2.91330	644.03572	0.09997	36.48717

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00806	0.00941	0.00784	24.48522	2.44042	0.00972	4.03595	0.34427	-0.00046
#2	0.00788	0.00793	0.00788	24.46307	2.43688	0.00970	4.01352	0.34444	-0.00216
Mean	**0.00797**	**0.00867**	**0.00786**	**24.47414**	**2.43865**	**0.00971**	**4.02473**	**0.34435**	**-0.00131**
%RSD	1.61483	12.06074	0.35101	0.06398	0.10260	0.19010	0.39415	0.03663	91.81520

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.05720	0.01079	0.44239	0.01946	0.01642	1.34061	0.00246	0.03210	0.03240
#2	0.05646	0.01011	0.46205	0.01590	0.01729	1.31820	0.00036	0.03041	0.03759
Mean	**0.05683**	**0.01045**	**0.45222**	**0.01768**	**0.01686**	**1.32941**	**0.00141**	**0.03126**	**0.03499**
%RSD	0.91679	4.59929	3.07418	14.27348	3.65966	1.19158	105.27694	3.81656	10.49666

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	1.97999	-0.00214	0.05675	0.04242	0.00044	0.15890	0.15410	0.05686	0.00514
#2	1.98752	-0.00361	0.05677	0.04305	0.00029	0.11881	0.15272	0.05583	0.00470
Mean	**1.98375**	**-0.00288**	**0.05676**	**0.04274**	**0.00036**	**0.13886**	**0.15341**	**0.05635**	**0.00492**
%RSD	0.26857	35.99666	0.02342	1.03634	29.82618	20.41462	0.63493	1.29135	6.42886

	Pb calc	Se calc
#1	0.01743	0.03230
#2	0.01683	0.03520
Mean	**0.01713**	**0.03375**
%RSD	2.50400	6.08226

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16

SampleId1 : 1303058-9 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 18:01:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE82

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00018	5.25870	0.02866	-0.00475	0.10060	0.00217	-0.00227	64.88968	-0.00038
#2	-0.00144	5.28209	0.02913	-0.00506	0.10093	0.00218	0.00298	65.07856	-0.00084
Mean	**-0.00063**	**5.27039**	**0.02890**	**-0.00491**	**0.10076**	**0.00218**	**0.00036**	**64.98412**	**-0.00061**
%RSD	181.20963	0.31392	1.14082	4.41907	0.23051	0.35591	1044.06287	0.20552	52.56894

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00398	0.00226	0.00240	13.99144	0.93738	0.00283	1.57325	1.19081	0.04995
#2	0.00312	0.00159	0.00194	14.05483	0.93150	0.00282	1.56864	1.19710	0.04907
Mean	**0.00355**	**0.00192**	**0.00217**	**14.02314**	**0.93444**	**0.00282**	**1.57094**	**1.19396**	**0.04951**
%RSD	17.06405	24.62120	15.04666	0.31965	0.44535	0.39228	0.20726	0.37234	1.25681

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.04066	0.00357	0.27715	0.04806	0.04295	4.00912	0.00100	0.04303	0.04706
#2	0.04062	0.00176	0.28172	0.04400	0.04630	4.03531	0.00035	0.04206	0.04954
Mean	**0.04064**	**0.00267**	**0.27943**	**0.04603**	**0.04462**	**4.02221**	**0.00068**	**0.04255**	**0.04830**
%RSD	0.07120	48.26398	1.15642	6.22876	5.30369	0.46038	68.41918	1.61312	3.62663

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.50189	0.00007	0.10474	0.03025	-0.00415	4.87641	0.19301	0.08876	0.00694
#2	2.51556	-0.00030	0.10521	0.02985	0.00387	4.86734	0.19394	0.08790	0.00663
Mean	**2.50873**	**-0.00012**	**0.10497**	**0.03005**	**-0.00014**	**4.87188**	**0.19347**	**0.08833**	**0.00679**
%RSD	0.38535	219.98043	0.31668	0.93472	4131.36459	0.13165	0.33980	0.68653	3.22768

	Pb	Se
	calc	calc
#1	0.04465	0.04572
#2	0.04553	0.04705
Mean	**0.04509**	**0.04638**
%RSD	1.38359	2.02609

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16
SampleId1 : 1303058-10 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 18:02:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE83

Final concentrations

Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.00220	3.75718	0.02808	-0.00359	0.06469	0.00221	0.00971	72.26376	0.00023
#2	-0.00046	3.75368	0.02855	-0.00549	0.06392	0.00219	-0.00116	72.00985	-0.00045
Mean	**0.00087**	**3.75543**	**0.02831**	**-0.00454**	**0.06431**	**0.00220**	**0.00428**	**72.13681**	**-0.00011**
%RSD	215.97136	0.06585	1.16430	29.61951	0.84261	0.59931	179.76116	0.24889	432.56455

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00436	0.00261	0.00346	13.73438	0.60647	0.00147	1.13156	1.30229	0.07302
#2	0.00332	0.00094	0.00192	13.69414	0.60741	0.00147	1.10762	1.29845	0.07082
Mean	**0.00384**	**0.00177**	**0.00269**	**13.71426**	**0.60694**	**0.00147**	**1.11959**	**1.30037**	**0.07192**
%RSD	19.17266	66.88255	40.53172	0.20748	0.10965	0.12559	1.51193	0.20855	2.16311

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03207	0.00439	0.26778	0.05784	0.03602	5.62246	0.00627	0.08378	0.04948
#2	0.03227	0.00235	0.25087	0.04736	0.04240	5.61871	-0.00084	0.06696	0.06269
Mean	**0.03217**	**0.00337**	**0.25932**	**0.05260**	**0.03921**	**5.62059**	**0.00272**	**0.07537**	**0.05609**
%RSD	0.44970	42.81261	4.61026	14.08460	11.49891	0.04712	185.04692	15.78511	16.65648

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.80348	0.00483	0.11205	0.01933	0.00666	5.23753	0.20015	0.06441	0.00962
#2	1.80674	0.00410	0.11097	0.01969	-0.00126	5.17801	0.19765	0.06406	0.00865
Mean	**1.80511**	**0.00447**	**0.11151**	**0.01951**	**0.00270**	**5.20777**	**0.19890**	**0.06423**	**0.00913**
%RSD	0.12769	11.58670	0.68570	1.30117	207.46243	0.80823	0.88802	0.37760	7.52536

	Pb	**Se**
	calc	calc
#1	0.04329	0.06090
#2	0.04405	0.06411
Mean	**0.04367**	**0.06251**
%RSD	1.23672	3.63039

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16
SampleId1 : 1303058-11 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:04:38
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE84

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00059	13.21256	0.01713	-0.00573	0.41413	0.00051	-0.00121	16.05569	-0.00075
#2	-0.00041	13.19480	0.02051	-0.00500	0.41508	0.00051	0.00247	16.08804	-0.00039
Mean	**-0.00050**	**13.20368**	**0.01882**	**-0.00537**	**0.41460**	**0.00051**	**0.00063**	**16.07187**	**-0.00057**
%RSD	26.05563	0.09509	12.70300	9.69677	0.16212	0.46712	415.18395	0.14233	45.78294

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00596	0.00869	0.00784	26.72939	1.91053	0.00987	3.89182	0.43998	-0.00065

#2	0.00596	0.00898	0.00756	26.84154	1.91454	0.00991	3.89336	0.44183	-0.00222
Mean	**0.00596**	**0.00883**	**0.00770**	**26.78546**	**1.91253**	**0.00989**	**3.89259**	**0.44091**	**-0.00143**
%RSD	0.00214	2.30884	2.61065	0.29605	0.14816	0.29870	0.02791	0.29588	77.55465

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.04328	0.00903	0.44856	0.01391	0.01587	1.28834	0.00009	0.03036	0.03108
#2	0.04320	0.00940	0.44284	0.01560	0.01351	1.29207	-0.00098	0.02239	0.02052
Mean	**0.04324**	**0.00922**	**0.44570**	**0.01476**	**0.01469**	**1.29020**	**-0.00044**	**0.02637**	**0.02580**
%RSD	0.13385	2.85800	0.90671	8.06356	11.35620	0.20462	171.26517	21.36515	28.92062

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	2.41930	0.00224	0.04828	0.04879	0.00084	0.05956	0.08656	0.04537	0.00445
#2	2.41620	0.00077	0.04831	0.04951	0.00185	0.06148	0.08704	0.04623	0.00465
Mean	**2.41775**	**0.00151**	**0.04829**	**0.04915**	**0.00134**	**0.06052**	**0.08680**	**0.04580**	**0.00455**
%RSD	0.09059	68.71962	0.04128	1.03307	53.20300	2.24303	0.39083	1.32389	3.09054

	Pb calc	**Se** calc
#1	0.01522	0.03084
#2	0.01420	0.02115
Mean	**0.01471**	**0.02599**
%RSD	4.86929	26.36769

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16
SampleId1 : 1303058-12 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:06:24
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE85

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00006	7.32682	0.00710	-0.00592	0.14261	0.00018	-0.00355	12.75413	-0.00032
#2	-0.00045	7.30425	0.00582	-0.00629	0.14214	0.00017	0.00188	12.72302	-0.00024
Mean	**-0.00019**	**7.31553**	**0.00646**	**-0.00610**	**0.14238**	**0.00017**	**-0.00083**	**12.73857**	**-0.00028**
%RSD	187.19904	0.21815	14.03355	4.26369	0.23570	1.99683	461.55485	0.17267	20.41780

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00644	0.00423	0.00498	19.76070	1.06663	0.00698	3.65951	0.28327	-0.00153
#2	0.00616	0.00456	0.00564	19.72375	1.07276	0.00698	3.65306	0.28249	-0.00040
Mean	**0.00630**	**0.00439**	**0.00531**	**19.74222**	**1.06969**	**0.00698**	**3.65629**	**0.28288**	**-0.00096**
%RSD	3.06215	5.27768	8.76429	0.13233	0.40468	0.07933	0.12479	0.19315	83.22271

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.02822	0.00647	0.51166	0.01622	0.01188	0.37764	-0.00143	0.00323	0.00664
#2	0.02904	0.00754	0.50823	0.01670	0.01260	0.37017	0.00200	0.00488	0.00470

Mean	**0.02863**	**0.00700**	**0.50995**	**0.01646**	**0.01224**	**0.37390**	**0.00029**	**0.00405**	**0.00567**
%RSD	2.02106	10.84106	0.47557	2.06194	4.19209	1.41122	838.84101	28.76992	24.24550

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.93892	-0.00506	0.03856	0.03006	-0.00168	-0.00061	0.02101	0.04520	0.00261
#2	0.93901	-0.00213	0.03839	0.03052	-0.00218	0.00004	0.02069	0.04606	0.00269
Mean	**0.93896**	**-0.00359**	**0.03847**	**0.03029**	**-0.00193**	**-0.00029**	**0.02085**	**0.04563**	**0.00265**
%RSD	0.00728	57.58416	0.32814	1.08778	18.17587	160.70597	1.09433	1.32887	2.11293

	Pb	**Se**
	calc	calc
#1	0.01332	0.00550
#2	0.01397	0.00476
Mean	**0.01364**	**0.00513**
%RSD	3.33652	10.29453

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:16
SampleId1 : 1303058-13 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:08:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE86

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00056	11.35191	0.01736	-0.00512	0.15054	0.00060	0.00717	24.24144	-0.00016
#2	-0.00116	11.38227	0.01083	-0.00414	0.15090	0.00061	0.00087	24.25496	-0.00010
Mean	**-0.00086**	**11.36709**	**0.01409**	**-0.00463**	**0.15072**	**0.00061**	**0.00402**	**24.24820**	**-0.00013**
%RSD	49.29417	0.18888	32.74554	14.98379	0.17128	0.74180	110.90009	0.03943	32.00539

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00845	0.00808	0.00638	26.52717	2.28780	0.01000	4.24863	0.32286	-0.00197
#2	0.00854	0.00770	0.00686	26.54828	2.30809	0.01003	4.24555	0.32351	-0.00084
Mean	**0.00849**	**0.00789**	**0.00662**	**26.53773**	**2.29794**	**0.01002**	**4.24709**	**0.32319**	**-0.00140**
%RSD	0.75570	3.40146	5.12612	0.05623	0.62416	0.22110	0.05117	0.14310	57.09169

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05806	0.01019	0.41038	0.01761	0.01742	0.38137	0.00036	-0.00363	-0.00049
#2	0.05839	0.01107	0.41267	0.01920	0.01473	0.38883	0.00129	0.00117	0.00198
Mean	**0.05822**	**0.01063**	**0.41153**	**0.01840**	**0.01607**	**0.38510**	**0.00083**	**-0.00123**	**0.00075**
%RSD	0.39773	5.83059	0.39276	6.10547	11.84570	1.37021	80.03301	275.99326	233.01912

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.29326	0.00114	0.08694	0.04712	-0.00195	0.01109	0.02071	0.05823	0.00483
#2	2.30319	0.00261	0.08688	0.04720	-0.00028	0.00139	0.02012	0.05857	0.00486
Mean	**2.29823**	**0.00187**	**0.08691**	**0.04716**	**-0.00111**	**0.00624**	**0.02042**	**0.05840**	**0.00484**

%RSD	0.30569	55.19024	0.05354	0.11453	106.31969	109.90634	2.06797	0.41529	0.40719

	Pb calc	Se calc
#1	0.01748	-0.00153
#2	0.01622	0.00171
Mean	**0.01685**	**0.00009**
%RSD	5.31638	2542.23883

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:17
SampleId1 : 1303058-14 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:09:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE87

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.00173	8.92145	0.00978	-0.00408	0.11929	0.00042	0.00780	3.10800	0.00002
#2	-0.00120	8.99793	0.01060	-0.00567	0.11969	0.00041	-0.00238	3.11334	0.00037
Mean	**0.00026**	**8.95969**	**0.01019**	**-0.00488**	**0.11949**	**0.00041**	**0.00271**	**3.11067**	**0.00019**
%RSD	783.33886	0.60363	5.66165	23.12367	0.23761	1.99081	265.62250	0.12119	125.26718

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.01077	0.01171	0.01718	22.16696	2.37177	0.00538	2.97626	0.50618	0.00099
#2	0.00897	0.01044	0.01564	22.26651	2.37437	0.00540	2.96029	0.50821	-0.00178
Mean	**0.00987**	**0.01107**	**0.01641**	**22.21674**	**2.37307**	**0.00539**	**2.96827**	**0.50719**	**-0.00040**
%RSD	12.94641	8.13827	6.65685	0.31685	0.07732	0.27373	0.38051	0.28225	494.34106

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.06858	0.01353	0.62577	0.02943	0.01211	0.62764	0.00784	0.00987	0.00288
#2	0.06862	0.01188	0.61800	0.02217	0.01901	0.66496	-0.00376	0.00226	0.00166
Mean	**0.06860**	**0.01270**	**0.62189**	**0.02580**	**0.01556**	**0.64630**	**0.00204**	**0.00606**	**0.00227**
%RSD	0.04220	9.14991	0.88422	19.88177	31.36223	4.08295	402.88187	88.78948	37.88615

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	2.42632	0.00513	0.03982	0.07961	0.00816	0.04486	0.03107	0.05789	0.00803
#2	2.43809	0.00257	0.03990	0.07955	0.00246	-0.01271	0.03011	0.05686	0.00689
Mean	**2.43221**	**0.00385**	**0.03986**	**0.07958**	**0.00531**	**0.01608**	**0.03059**	**0.05737**	**0.00746**
%RSD	0.34222	47.04281	0.13336	0.06108	75.94731	253.19369	2.20343	1.26819	10.81943

	Pb calc	Se calc
#1	0.01787	0.00521
#2	0.02006	0.00186
Mean	**0.01897**	**0.00353**
%RSD	8.15252	66.97201

ted: 3/12/2013 13:06:31 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:17
SampleId1 : 1303059-5 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:11:42
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE88

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00078	3.52348	0.01305	-0.00678	0.07144	0.00009	-0.00038	12.77920	-0.00074
#2	-0.00079	3.54060	0.01258	-0.00770	0.07166	0.00008	0.00190	12.81730	-0.00058
Mean	**-0.00078**	**3.53204**	**0.01281**	**-0.00724**	**0.07155**	**0.00008**	**0.00076**	**12.79825**	**-0.00066**
%RSD	0.59515	0.34269	2.57302	8.98817	0.21638	7.33988	211.60860	0.21046	17.47239

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00159	0.00134	0.00284	6.68378	0.66271	-0.00031	1.26568	0.16552	0.00840
#2	0.00222	0.00147	0.00293	6.71216	0.66294	-0.00032	1.26691	0.16653	0.00790
Mean	**0.00190**	**0.00141**	**0.00289**	**6.69797**	**0.66283**	**-0.00031**	**1.26630**	**0.16602**	**0.00815**
%RSD	23.52422	6.48485	2.09068	0.29956	0.02510	3.52114	0.06856	0.42994	4.36132

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10573	0.00257	0.22848	0.01008	0.01018	0.73587	-0.00093	0.04315	0.04572
#2	0.10777	0.00167	0.23419	0.01330	0.00918	0.74707	-0.00173	0.04329	0.05347
Mean	**0.10675**	**0.00212**	**0.23134**	**0.01169**	**0.00968**	**0.74147**	**-0.00133**	**0.04322**	**0.04959**
%RSD	1.35675	30.01122	1.74582	19.48535	7.25918	1.06775	42.37590	0.23887	11.06082

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.18036	-0.00213	0.01539	0.03280	0.00252	0.06900	0.14533	0.01725	0.00296
#2	1.19034	-0.00177	0.01546	0.03298	0.00564	0.07805	0.14582	0.01776	0.00303
Mean	**1.18535**	**-0.00195**	**0.01543**	**0.03289**	**0.00408**	**0.07353**	**0.14558**	**0.01750**	**0.00300**
%RSD	0.59548	13.25863	0.30147	0.39413	54.05931	8.70143	0.23913	2.07814	1.59245

	Pb	Se
	calc	calc
#1	0.01014	0.04486
#2	0.01055	0.05008
Mean	**0.01035**	**0.04747**
%RSD	2.80188	7.77983

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:17
SampleId1 : 1303059-7 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:13:28
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE89

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00053	4.95353	0.01246	-0.00678	0.07651	0.00027	0.00018	9.99393	-0.00050
#2	0.00108	4.95230	0.02214	-0.00481	0.07618	0.00028	-0.00016	10.03268	0.00020
Mean	**0.00027**	**4.95291**	**0.01730**	**-0.00580**	**0.07635**	**0.00027**	**0.00001**	**10.01330**	**-0.00015**
%RSD	419.11845	0.01750	39.54129	23.94277	0.30418	3.01840	2593.46486	0.27366	325.46302

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00277	0.00197	0.00425	9.74455	1.30071	0.00117	2.22505	0.24862	0.03468
#2	0.00367	0.00348	0.00507	9.78021	1.32686	0.00122	2.23487	0.24963	0.03480
Mean	**0.00322**	**0.00272**	**0.00466**	**9.76238**	**1.31379**	**0.00120**	**2.22996**	**0.24912**	**0.03474**
%RSD	19.83882	39.23217	12.51053	0.25828	1.40715	3.08436	0.31158	0.28672	0.25588

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02855	0.00283	0.40810	0.02302	0.01764	1.80367	-0.00092	0.07253	0.06637
#2	0.02994	0.00368	0.40787	0.02819	0.01451	1.85596	0.00472	0.07131	0.06726
Mean	**0.02925**	**0.00326**	**0.40798**	**0.02561**	**0.01607**	**1.82982**	**0.00190**	**0.07192**	**0.06682**
%RSD	3.36373	18.55776	0.03962	14.29339	13.75466	2.02073	210.24127	1.19399	0.93812

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.07279	0.00518	0.01832	0.03309	0.00592	0.17644	0.14790	0.02411	0.00430
#2	2.07977	-0.00104	0.01832	0.03332	0.00714	0.20036	0.14916	0.02531	0.00523
Mean	**2.07628**	**0.00207**	**0.01832**	**0.03320**	**0.00653**	**0.18840**	**0.14853**	**0.02471**	**0.00476**
%RSD	0.23767	212.05611	0.00000	0.48802	13.21226	8.97768	0.60246	3.43555	13.65767

	Pb	Se
	calc	calc
#1	0.01943	0.06842
#2	0.01907	0.06861
Mean	**0.01925**	**0.06852**
%RSD	1.32932	0.19287

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:17
SampleId1 : 1303059-9 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:15:15
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE90

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00025	3.34749	0.01013	-0.00641	0.06411	-0.00001	-0.00633	8.41299	-0.00076
#2	-0.00077	3.32907	0.01118	-0.00647	0.06352	-0.00003	0.00208	8.37179	-0.00021
Mean	**-0.00051**	**3.33828**	**0.01066**	**-0.00644**	**0.06381**	**-0.00002**	**-0.00213**	**8.39239**	**-0.00048**
%RSD	71.77881	0.39017	6.96078	0.67339	0.64694	45.78645	279.70777	0.34713	81.54386

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00143	0.00069	0.00135	7.08110	0.80462	-0.00014	1.35346	0.15756	0.01262
#2	0.00165	0.00156	0.00153	7.04295	0.81874	-0.00013	1.34763	0.15691	0.01274
Mean	**0.00154**	**0.00113**	**0.00144**	**7.06203**	**0.81168**	**-0.00014**	**1.35055**	**0.15724**	**0.01268**
%RSD	10.32060	54.14890	8.73520	0.38199	1.23028	6.80031	0.30534	0.29373	0.70113

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02524	0.00094	0.28834	0.00479	0.00712	0.50077	0.00135	0.01606	0.02375
#2	0.02544	0.00116	0.30320	0.00892	0.00778	0.47838	-0.00078	0.02185	0.02445
Mean	**0.02534**	**0.00105**	**0.29577**	**0.00685**	**0.00745**	**0.48957**	**0.00028**	**0.01896**	**0.02410**
%RSD	0.57092	14.70022	3.55094	42.61334	6.26762	3.23366	528.68276	21.56968	2.04916

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.86733	-0.00324	0.01572	0.03747	-0.00196	0.05729	0.10330	0.01622	0.00153
#2	1.86264	-0.00104	0.01559	0.03750	0.00459	0.06829	0.10226	0.01759	0.00189
Mean	**1.86498**	**-0.00214**	**0.01566**	**0.03748**	**0.00132**	**0.06279**	**0.10278**	**0.01690**	**0.00171**
%RSD	0.17788	72.58873	0.59408	0.05764	351.25892	12.38730	0.71531	5.73844	14.81333

	Pb	**Se**
	calc	calc
#1	0.00634	0.02119
#2	0.00816	0.02359
Mean	**0.00725**	**0.02239**
%RSD	17.71126	7.55241

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:17
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 18:17:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19147	49.58179	0.51012	0.96284	0.98412	0.48772	0.49865	49.33545	0.49076
#2	0.19113	49.36744	0.49672	0.95616	0.97932	0.48720	0.49424	49.18399	0.48726
Mean	**0.19130**	**49.47461**	**0.50342**	**0.95950**	**0.98172**	**0.48746**	**0.49645**	**49.25972**	**0.48901**
%RSD	0.12708	0.30636	1.88158	0.49246	0.34604	0.07450	0.62866	0.21742	0.50622

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.47888	0.96893	0.98218	19.63460	48.21939	0.51040	49.15156	0.95961	0.95393
#2	0.47671	0.96663	0.97808	19.60829	48.00498	0.50868	49.02987	0.95848	0.95380
Mean	**0.47780**	**0.96778**	**0.98013**	**19.62145**	**48.11219**	**0.50954**	**49.09072**	**0.95905**	**0.95386**
%RSD	0.32207	0.16823	0.29642	0.09483	0.31511	0.23878	0.17528	0.08372	0.00934

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	47.76634	0.94928	4.76366	0.97135	0.93173	5.10568	0.47058	0.99066	0.94167
#2	47.59881	0.94103	4.75810	0.96059	0.95908	5.06450	0.46413	0.98898	0.98590
Mean	**47.68258**	**0.94515**	**4.76088**	**0.96597**	**0.94540**	**5.08509**	**0.46735**	**0.98982**	**0.96378**
%RSD	0.24843	0.61655	0.08249	0.78774	2.04586	0.57268	0.97616	0.11979	3.24546

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	4.87498	1.00988	0.47934	0.49809	0.50379	4.79127	0.47944	0.98630	0.95232
#2	4.85785	0.99854	0.47655	0.49776	0.50389	4.76863	0.47689	0.98268	0.94902
Mean	**4.86641**	**1.00421**	**0.47795**	**0.49793**	**0.50384**	**4.77995**	**0.47816**	**0.98449**	**0.95067**
%RSD	0.24893	0.79901	0.41315	0.04767	0.01410	0.33495	0.37726	0.25967	0.24574

	Pb calc	**Se** calc
#1	0.94492	0.95798
#2	0.95958	0.98693
Mean	**0.95225**	**0.97245**
%RSD	1.08868	2.10482

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 18:18:52
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00065	-0.00474	-0.00082	-0.00708	-0.00054	-0.00030	-0.00433	-0.06850	-0.00062
#2	-0.00052	-0.00327	-0.00013	-0.00788	-0.00065	-0.00036	-0.00240	-0.06882	-0.00064
Mean	**-0.00059**	**-0.00401**	**-0.00047**	**-0.00748**	**-0.00060**	**-0.00033**	**-0.00337**	**-0.06866**	**-0.00063**
%RSD	15.75479	26.05646	104.12268	7.53436	12.93605	13.12535	40.47898	0.32168	2.17985

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	-0.00079	-0.00039	-0.00111	0.00657	-0.12377	-0.00270	-0.02181	-0.00052	-0.00071
#2	-0.00056	-0.00068	-0.00131	0.00556	-0.12142	-0.00270	-0.02242	-0.00052	-0.00134
Mean	**-0.00068**	**-0.00054**	**-0.00121**	**0.00607**	**-0.12260**	**-0.00270**	**-0.02212**	**-0.00052**	**-0.00102**
%RSD	23.59849	39.40330	11.75211	11.80275	1.35576	0.13671	1.96134	0.00000	43.39725

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.01419	-0.00162	-0.01612	-0.00372	0.00013	-0.02154	-0.00175	0.00183	0.00256
#2	0.01288	-0.00182	-0.00927	-0.00212	-0.00267	-0.02527	0.00036	0.00445	0.00177
Mean	**0.01354**	**-0.00172**	**-0.01269**	**-0.00292**	**-0.00127**	**-0.02340**	**-0.00069**	**0.00314**	**0.00216**
%RSD	6.83920	8.11748	38.16010	38.81633	155.61701	11.27062	216.16323	59.08742	25.91921

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	0.00538	0.00340	-0.00403	-0.00281	-0.00342	-0.03002	-0.00054	-0.00264	-0.00016

#2	0.00256	-0.00136	-0.00402	-0.00295	0.00470	-0.01709	0.00000	-0.00179	-0.00012
Mean	**0.00397**	**0.00102**	**-0.00403**	**-0.00288**	**0.00064**	**-0.02355**	**-0.00027**	**-0.00221**	**-0.00014**
%RSD	50.21697	330.21368	0.33002	3.56454	894.85752	38.82769	141.47326	27.36830	20.80190

	Pb calc	**Se** calc
#1	-0.00115	0.00232
#2	-0.00249	0.00266
Mean	**-0.00182**	**0.00249**
%RSD	51.79556	9.79165

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : 1303059-11 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:20:43
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE91

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00033	3.16402	0.01689	-0.00531	0.05309	0.00003	0.00616	9.23017	-0.00065
#2	-0.00059	3.18498	0.01794	-0.00629	0.05341	0.00001	0.00248	9.25593	-0.00048
Mean	**-0.00013**	**3.17450**	**0.01742**	**-0.00580**	**0.05325**	**0.00002**	**0.00432**	**9.24305**	**-0.00057**
%RSD	489.66389	0.46686	4.25891	11.97138	0.43607	59.80545	60.21466	0.19705	20.81802

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00203	0.00176	0.00246	7.31284	0.56411	-0.00028	1.35838	0.16106	0.01683
#2	0.00136	0.00094	0.00247	7.34829	0.55729	-0.00030	1.36329	0.16207	0.01689
Mean	**0.00170**	**0.00135**	**0.00246**	**7.33057**	**0.56070**	**-0.00029**	**1.36083**	**0.16157**	**0.01686**
%RSD	28.27037	42.98752	0.39759	0.34193	0.86050	5.78591	0.25519	0.44178	0.26365

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.02511	0.00257	0.29657	0.01826	0.00936	0.84784	-0.00049	0.05113	0.05233
#2	0.02524	0.00165	0.28194	0.01215	0.01164	0.86650	-0.00206	0.04424	0.05049
Mean	**0.02518**	**0.00211**	**0.28926**	**0.01520**	**0.01050**	**0.85717**	**-0.00128**	**0.04769**	**0.05141**
%RSD	0.34478	30.90316	3.57496	28.43721	15.33551	1.53950	86.79784	10.20956	2.53684

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	1.76808	0.00149	0.01256	0.06468	0.00479	0.07988	0.13949	0.01810	0.00388
#2	1.77540	0.00002	0.01263	0.06494	-0.00272	0.06565	0.13970	0.01742	0.00378
Mean	**1.77174**	**0.00076**	**0.01259**	**0.06481**	**0.00103**	**0.07277**	**0.13960**	**0.01776**	**0.00383**
%RSD	0.29192	136.77076	0.42202	0.28333	513.93044	13.83077	0.10555	2.73073	1.85260

	Pb calc	**Se** calc
#1	0.01232	0.05193
#2	0.01181	0.04841

Mean	0.01207	0.05017ser: STEVE WORKMAN
%RSD	3.03118	4.96531

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : 1303059-12 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:22:30
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE92

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00007	5.72469	-0.00059	-0.00555	0.09429	0.00006	0.00525	2.36727	-0.00039
#2	-0.00026	5.74978	0.00454	-0.00543	0.09403	0.00007	-0.00263	2.37385	-0.00042
Mean	**-0.00017**	**5.73723**	**0.00197**	**-0.00549**	**0.09416**	**0.00006**	**0.00131**	**2.37056**	**-0.00040**
%RSD	78.30900	0.30922	183.82329	1.58002	0.19186	14.56494	425.07495	0.19627	6.15462

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00279	0.00412	0.00565	9.28913	1.04215	0.00077	1.65030	0.23091	-0.00222
#2	0.00261	0.00379	0.00566	9.30962	1.04168	0.00075	1.65705	0.23151	-0.00153
Mean	**0.00270**	**0.00396**	**0.00565**	**9.29938**	**1.04191**	**0.00076**	**1.65367**	**0.23121**	**-0.00187**
%RSD	4.74998	5.82861	0.03941	0.15581	0.03196	1.94721	0.28878	0.18170	26.10664

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05090	0.00443	0.34867	0.00854	0.00677	0.17990	0.00200	0.00253	0.00270
#2	0.05090	0.00338	0.35393	0.01116	0.00672	0.17244	-0.00023	-0.00022	0.00094
Mean	**0.05090**	**0.00390**	**0.35130**	**0.00985**	**0.00674**	**0.17617**	**0.00088**	**0.00116**	**0.00182**
%RSD	0.00000	19.05715	1.05804	18.86185	0.56704	2.99475	178.58431	168.06126	68.25108

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.53196	0.00077	0.01081	0.05362	0.00384	-0.01036	0.01314	0.02376	0.00358
#2	2.54385	0.00296	0.01080	0.05383	-0.00331	-0.01360	0.01291	0.02513	0.00346
Mean	**2.53790**	**0.00187**	**0.01080**	**0.05373**	**0.00027**	**-0.01198**	**0.01303**	**0.02445**	**0.00352**
%RSD	0.33131	83.11992	0.06149	0.27144	1895.99738	19.10901	1.22045	3.96765	2.43046

	Pb	Se
	calc	calc
#1	0.00736	0.00264
#2	0.00820	0.00056
Mean	**0.00778**	**0.00160**
%RSD	7.62610	92.29173

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : 1303059-13 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:24:16
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE93

Final concentrations6:31 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00006	12.88000	0.01153	-0.00420	0.17741	0.00072	0.00090	36.33068	-0.00070
#2	-0.00073	12.90097	0.01456	-0.00383	0.17744	0.00072	-0.00139	36.34880	-0.00050
Mean	**-0.00040**	**12.89049**	**0.01305**	**-0.00402**	**0.17743**	**0.00072**	**-0.00025**	**36.33974**	**-0.00060**
%RSD	120.04714	0.11504	16.42580	6.47669	0.01455	0.61428	656.80792	0.03526	23.11302

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00929	0.01177	0.01485	29.64146	3.12818	0.01229	13.10756	0.40839	-0.00140
#2	0.00920	0.01198	0.01488	29.68452	3.12062	0.01230	13.11003	0.40964	-0.00184
Mean	**0.00925**	**0.01187**	**0.01487**	**29.66299**	**3.12440**	**0.01230**	**13.10880**	**0.40901**	**-0.00162**
%RSD	0.69279	1.29535	0.16770	0.10265	0.17101	0.04503	0.01332	0.21601	19.18965

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11560	0.01484	0.99101	0.02167	0.01888	0.52316	0.00031	0.00682	0.00097
#2	0.11576	0.01539	0.98322	0.02045	0.01847	0.54555	-0.00273	0.00129	0.00301
Mean	**0.11568**	**0.01511**	**0.98711**	**0.02106**	**0.01867**	**0.53435**	**-0.00121**	**0.00406**	**0.00199**
%RSD	0.10017	2.56346	0.55764	4.11148	1.55019	2.96278	176.99126	96.36417	72.22827

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.15026	0.00151	0.08686	0.04834	-0.00671	0.02217	0.02782	0.08173	0.00609
#2	3.16295	0.00041	0.08679	0.04847	-0.00098	-0.01405	0.02697	0.08173	0.00591
Mean	**3.15661**	**0.00096**	**0.08682**	**0.04840**	**-0.00384**	**0.00406**	**0.02739**	**0.08173**	**0.00600**
%RSD	0.28434	80.95864	0.05360	0.18971	105.43531	630.66558	2.19783	0.00000	2.13147

	Pb	Se
	calc	calc
#1	0.01981	0.00292
#2	0.01913	0.00244
Mean	**0.01947**	**0.00268**
%RSD	2.47289	12.82423

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : 1303059-14 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:26:02
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE94

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00011	1.81666	0.00104	-0.00923	0.05082	-0.00028	-0.00145	0.49456	-0.00051
#2	-0.00071	1.81502	-0.00374	-0.00948	0.05068	-0.00031	-0.00040	0.49206	-0.00063
Mean	**-0.00041**	**1.81584**	**-0.00135**	**-0.00935**	**0.05075**	**-0.00029**	**-0.00092**	**0.49331**	**-0.00057**
%RSD	103.59130	0.06397	250.47247	1.85463	0.20335	7.70007	80.37658	0.35844	13.96262

ted: 3/12/2013 13:06:31 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00046	0.00014	-0.00056	4.60826	0.11885	-0.00193	0.45063	0.07624	-0.00253
#2	0.00041	-0.00016	-0.00084	4.60339	0.10498	-0.00194	0.45063	0.07606	-0.00165
Mean	**0.00043**	**-0.00001**	**-0.00070**	**4.60582**	**0.11192**	**-0.00193**	**0.45063**	**0.07615**	**-0.00209**
%RSD	7.36549	2386.88446	28.11866	0.07485	8.76547	0.66800	0.00000	0.16529	29.73369

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01619	-0.00039	0.09577	0.00109	0.00095	0.01949	-0.00058	-0.01327	0.00020
#2	0.01579	-0.00037	0.08960	-0.00175	0.00005	0.01203	-0.00083	-0.00187	0.00320
Mean	**0.01599**	**-0.00038**	**0.09269**	**-0.00033**	**0.00050**	**0.01576**	**-0.00070**	**-0.00757**	**0.00170**
%RSD	1.80921	4.06425	4.70409	609.51685	126.78251	33.46353	25.50166	106.45363	124.60914

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.31817	-0.00068	0.00019	0.03987	-0.00563	-0.01404	0.00533	0.00713	0.00150
#2	1.32678	-0.00141	0.00015	0.03979	-0.00313	-0.01921	0.00525	0.00610	0.00144
Mean	**1.32248**	**-0.00104**	**0.00017**	**0.03983**	**-0.00438**	**-0.01663**	**0.00529**	**0.00662**	**0.00147**
%RSD	0.46032	49.57854	19.65666	0.13562	40.37501	21.99870	1.15691	10.99666	2.93531

	Pb	Se
	calc	calc
#1	0.00100	-0.00428
#2	-0.00055	0.00151
Mean	**0.00022**	**-0.00139**
%RSD	489.19607	295.02015

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:18
SampleId1 : 1303060-9 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:27:49
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE95

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00091	8.31348	0.00908	-0.00776	0.44089	0.00052	0.00057	11.44201	-0.00068
#2	-0.00035	8.34430	0.00302	-0.00635	0.44170	0.00050	0.00564	11.44803	-0.00003
Mean	**-0.00063**	**8.32889**	**0.00605**	**-0.00705**	**0.44130**	**0.00051**	**0.00311**	**11.44502**	**-0.00036**
%RSD	62.46363	0.26167	70.81215	14.14137	0.12890	2.04305	115.48136	0.03720	128.32804

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00422	0.00595	0.00879	22.28817	1.25856	0.00666	3.92255	0.36020	0.00375
#2	0.00395	0.00632	0.00803	22.33098	1.25549	0.00667	3.92194	0.36062	0.00388
Mean	**0.00408**	**0.00613**	**0.00841**	**22.30958**	**1.25702**	**0.00666**	**3.92224**	**0.36041**	**0.00382**
%RSD	4.66785	4.24961	6.31270	0.13568	0.17223	0.08312	0.01108	0.08168	2.32961

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06481	0.00379	0.51303	0.02187	0.02319	1.73271	0.00201	0.11562	0.11780
#2	0.06457	0.00414	0.49451	0.02497	0.02310	1.70283	0.00068	0.12263	0.12459
Mean	**0.06469**	**0.00397**	**0.50377**	**0.02342**	**0.02315**	**1.71777**	**0.00134**	**0.11913**	**0.12119**
%RSD	0.26850	6.24715	2.59952	9.35302	0.25692	1.22992	69.63455	4.16018	3.96476

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.29958	-0.00141	0.06453	0.03698	-0.00452	0.25371	0.18289	0.06286	0.00481
#2	3.30689	0.00372	0.06453	0.03674	-0.00545	0.25111	0.18368	0.06166	0.00478
Mean	**3.30323**	**0.00116**	**0.06453**	**0.03686**	**-0.00498**	**0.25241**	**0.18328**	**0.06226**	**0.00479**
%RSD	0.15646	313.55830	0.00000	0.45427	13.26483	0.72679	0.30141	1.36344	0.45836

	Pb	Se
	calc	calc
#1	0.02275	0.11707
#2	0.02372	0.12394
Mean	**0.02324**	**0.12051**
%RSD	2.96807	4.02909

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:19
SampleId1 : 1303060-10 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:29:35
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE96

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00103	11.04952	0.02750	-0.00248	0.19486	0.00104	0.00556	34.59396	-0.00019
#2	-0.00069	10.97467	0.02668	-0.00371	0.19333	0.00101	-0.00198	34.34128	0.00011
Mean	**-0.00086**	**11.01210**	**0.02709**	**-0.00310**	**0.19409**	**0.00102**	**0.00179**	**34.46762**	**-0.00004**
%RSD	27.55778	0.48065	2.12957	28.00071	0.55874	2.50460	297.69842	0.51837	545.63811

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00667	0.00983	0.02224	26.19973	3.72821	0.00960	6.14335	0.47457	0.02575
#2	0.00662	0.00937	0.02159	26.02971	3.70363	0.00950	6.09352	0.47219	0.02550
Mean	**0.00665**	**0.00960**	**0.02192**	**26.11472**	**3.71592**	**0.00955**	**6.11843**	**0.47338**	**0.02563**
%RSD	0.51206	3.34109	2.07987	0.46038	0.46770	0.79230	0.57593	0.35569	0.69376

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.12261	0.00837	0.70492	0.04345	0.04330	5.32660	-0.00360	0.08594	0.08509
#2	0.12129	0.00816	0.71476	0.04223	0.04737	5.30788	-0.00096	0.08249	0.08648
Mean	**0.12195**	**0.00827**	**0.70984**	**0.04284**	**0.04534**	**5.31724**	**-0.00228**	**0.08422**	**0.08578**
%RSD	0.76026	1.87511	0.97996	2.01401	6.35785	0.24899	81.99743	2.89712	1.14048

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.63139	-0.00143	0.12574	0.06095	-0.00211	0.26464	0.35969	0.10077	0.00823
#2	4.61209	0.00186	0.12451	0.06132	-0.00388	0.24980	0.35753	0.10094	0.00839
Mean	**4.62174**	**0.00021**	**0.12513**	**0.06113**	**-0.00299**	**0.25722**	**0.35861**	**0.10085**	**0.00831**
%RSD	0.29524	1096.84617	0.69090	0.43290	41.58617	4.08025	0.42430	0.12026	1.37957

	Pb calc	**Se** calc
#1	0.04335	0.08537
#2	0.04566	0.08515
Mean	**0.04451**	**0.08526**
%RSD	3.67418	0.18756

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:19
SampleId1 : 1303060-1 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:31:21
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE97

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00039	13.90819	0.00920	-0.00163	0.16284	0.00087	0.00198	30.39518	-0.00038
#2	-0.00034	13.84488	0.01060	-0.00071	0.16240	0.00086	0.00128	30.33584	-0.00029
Mean	**-0.00037**	**13.87653**	**0.00990**	**-0.00117**	**0.16262**	**0.00087**	**0.00163**	**30.36551**	**-0.00033**
%RSD	8.82481	0.32259	9.99140	55.80549	0.19050	1.27357	30.47915	0.13818	19.46492

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.01069	0.01308	0.01918	30.72823	3.34687	0.01177	8.89428	0.42195	0.00048
#2	0.01065	0.01275	0.01776	30.74320	3.32538	0.01177	8.87764	0.42183	0.00042
Mean	**0.01067**	**0.01291**	**0.01847**	**30.73572**	**3.33612**	**0.01177**	**8.88596**	**0.42189**	**0.00045**
%RSD	0.30976	1.80039	5.40952	0.03443	0.45558	0.03136	0.13235	0.01995	9.81248

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.10446	0.01745	0.80834	0.02065	0.02105	1.01208	0.00043	-0.00348	0.01074
#2	0.10343	0.01624	0.80262	0.02408	0.01994	0.99714	0.00030	0.00573	0.00740
Mean	**0.10394**	**0.01685**	**0.80548**	**0.02237**	**0.02050**	**1.00461**	**0.00036**	**0.00112**	**0.00907**
%RSD	0.69666	5.05995	0.50223	10.84727	3.82677	1.05096	24.70007	578.97895	26.06683

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	4.71296	-0.00217	0.11281	0.06080	-0.00192	0.02521	0.03722	0.08670	0.00640
#2	4.69514	-0.00363	0.11235	0.06125	-0.00299	0.02585	0.03711	0.08687	0.00650
Mean	**4.70405**	**-0.00290**	**0.11258**	**0.06102**	**-0.00245**	**0.02553**	**0.03717**	**0.08679**	**0.00645**
%RSD	0.26788	35.72717	0.28941	0.51334	30.74143	1.78356	0.21175	0.13975	1.12227

	Pb calc	**Se** calc

#1	0.02092	0.00601
#2	0.02132	0.00684
Mean	**0.02112**	**0.00643**
%RSD	1.34797	9.19170

ser: STEVE WORKMAN

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:19
SampleId1 : 1303060-1D 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 18:33:07
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE98

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00049	13.55736	0.00920	-0.00040	0.15974	0.00082	0.00775	30.01668	0.00020
#2	-0.00117	13.60838	0.01153	-0.00261	0.15966	0.00083	-0.00276	30.08167	0.00018
Mean	**-0.00083**	**13.58287**	**0.01036**	**-0.00150**	**0.15970**	**0.00082**	**0.00250**	**30.04918**	**0.00019**
%RSD	58.13379	0.26559	15.90328	103.87437	0.03233	0.60031	297.45059	0.15293	5.86914

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01047	0.01317	0.01738	29.97079	3.28334	0.01151	8.65959	0.40517	0.00067
#2	0.01074	0.01221	0.01730	30.04972	3.29609	0.01151	8.68453	0.40642	0.00048
Mean	**0.01060**	**0.01269**	**0.01734**	**30.01025**	**3.28971**	**0.01151**	**8.67206**	**0.40580**	**0.00058**
%RSD	1.80125	5.30776	0.30689	0.18596	0.27414	0.01603	0.20341	0.21771	23.04231

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10077	0.01699	0.79942	0.02437	0.01909	0.97848	-0.00340	0.00835	0.00402
#2	0.10163	0.01589	0.81132	0.02493	0.01794	0.95982	-0.00180	0.00421	0.00421
Mean	**0.10120**	**0.01644**	**0.80537**	**0.02465**	**0.01852**	**0.96915**	**-0.00260**	**0.00628**	**0.00411**
%RSD	0.60104	4.71341	1.04479	1.60528	4.37622	1.36174	43.42370	46.64938	3.24601

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.51464	-0.00180	0.11063	0.05802	0.00129	0.03440	0.03713	0.08636	0.00689
#2	3.52750	-0.00253	0.11082	0.05847	0.00179	0.01498	0.03678	0.08670	0.00689
Mean	**3.52107**	**-0.00216**	**0.11073**	**0.05825**	**0.00154**	**0.02469**	**0.03695**	**0.08653**	**0.00689**
%RSD	0.25827	23.94348	0.12010	0.54709	23.22186	55.59774	0.68117	0.28032	0.02462

	Pb	**Se**
	calc	calc
#1	0.02085	0.00546
#2	0.02027	0.00421
Mean	**0.02056**	**0.00483**
%RSD	1.98817	18.32661

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:19
SampleId1 : 1303060-1L 25X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 18:34:54

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE99

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00177	2.71023	-0.00013	-0.00899	0.03149	-0.00024	-0.00395	6.03492	-0.00109
#2	-0.00176	2.70824	0.00162	-0.00819	0.03130	-0.00026	0.00094	5.99731	-0.00037
Mean	**-0.00176**	**2.70923**	**0.00075**	**-0.00859**	**0.03140**	**-0.00025**	**-0.00150**	**6.01611**	**-0.00073**
%RSD	0.54813	0.05209	165.07449	6.56570	0.41086	5.70809	230.20146	0.44211	69.24451

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00090	0.00102	0.00181	5.98378	0.49706	-0.00033	1.75529	0.08502	-0.00178
#2	0.00108	0.00080	0.00117	5.95777	0.47706	-0.00037	1.73472	0.08455	-0.00266
Mean	**0.00099**	**0.00091**	**0.00149**	**5.97078**	**0.48706**	**-0.00035**	**1.74500**	**0.08479**	**-0.00222**
%RSD	12.89106	17.03421	30.51578	0.30802	2.90318	8.47528	0.83348	0.39592	28.04876

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.02781	0.00147	0.14213	-0.00231	0.00333	0.19109	-0.00481	-0.00133	0.00799
#2	0.02655	0.00123	0.15081	-0.00311	0.00517	0.19109	-0.00507	-0.00533	0.00359
Mean	**0.02718**	**0.00135**	**0.14647**	**-0.00271**	**0.00425**	**0.19109**	**-0.00494**	**-0.00333**	**0.00579**
%RSD	3.30000	12.62654	4.19009	20.82907	30.66803	0.00000	3.79798	84.96400	53.83375

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	0.80923	-0.00613	0.01900	0.00923	0.00161	-0.02657	0.00654	0.01605	0.00027
#2	0.81018	-0.00101	0.01890	0.00913	0.00243	-0.04468	0.00617	0.01536	0.00000
Mean	**0.80971**	**-0.00357**	**0.01895**	**0.00918**	**0.00202**	**-0.03562**	**0.00635**	**0.01570**	**0.00013**
%RSD	0.08365	101.48702	0.38567	0.82386	28.43731	35.92867	4.19780	3.08852	140.46624

	Pb calc	Se calc
#1	0.00145	0.00489
#2	0.00241	0.00062
Mean	**0.00193**	**0.00275**
%RSD	35.26249	109.76572

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:19
SampleId1 : 1303060-1MS 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:36:40
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE100

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.01879	18.83711	0.22177	0.17034	0.37651	0.01166	0.00509	37.84699	0.01052
#2	0.01843	18.71700	0.21408	0.17120	0.37436	0.01162	0.00386	37.68770	0.01045

Mean	**0.01861**	**18.77705**	**0.21792**	**0.17077**	**0.37543**	**0.01164**	**0.00447**	**37.76735**	**0.01048**
%RSD	1.37488	0.45229	2.49544	0.35551	0.40619	0.23194	19.47386	0.29823	0.52634

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11341	0.05804	0.07209	31.92205	11.08813	0.11054	17.65612	0.51089	0.19097
#2	0.11259	0.05743	0.07126	31.82291	11.02176	0.11022	17.55160	0.50952	0.18858
Mean	**0.11300**	**0.05773**	**0.07167**	**31.87248**	**11.05495**	**0.11038**	**17.60386**	**0.51020**	**0.18977**
%RSD	0.51056	0.74470	0.82166	0.21996	0.42449	0.20549	0.41984	0.18982	0.89028

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.27523	0.12171	0.81841	0.12887	0.12459	1.12033	0.06122	0.39449	0.37784
#2	7.23028	0.12077	0.81040	0.13088	0.12538	1.09793	0.05765	0.39269	0.39426
Mean	**7.25276**	**0.12124**	**0.81441**	**0.12987**	**0.12499**	**1.10913**	**0.05943**	**0.39359**	**0.38605**
%RSD	0.43824	0.54967	0.69543	1.09647	0.44546	1.42799	4.24292	0.32395	3.00792

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.09955	0.10785	0.21894	0.14874	0.39272	0.02628	0.14462	0.19736	0.00630
#2	4.08334	0.10712	0.21786	0.14839	0.39623	0.01143	0.14406	0.19513	0.00625
Mean	**4.09144**	**0.10748**	**0.21840**	**0.14857**	**0.39447**	**0.01886**	**0.14434**	**0.19624**	**0.00628**
%RSD	0.28000	0.48110	0.34740	0.16355	0.63028	55.70222	0.27568	0.80380	0.63597

	Pb	**Se**
	calc	calc
#1	0.12602	0.38339
#2	0.12721	0.39374
Mean	**0.12661**	**0.38856**
%RSD	0.66782	1.88404

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20
SampleId1 : CCV **SampleId2 :** [CV]
Analysis commenced : 3/11/2013 18:38:26
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19369	50.39866	0.51711	0.98271	1.00096	0.49659	0.52037	50.31147	0.49892
#2	0.19256	50.08407	0.51047	0.97523	0.99468	0.49586	0.50522	50.20214	0.49629
Mean	**0.19313**	**50.24137**	**0.51379**	**0.97897**	**0.99782**	**0.49622**	**0.51279**	**50.25680**	**0.49761**
%RSD	0.41522	0.44276	0.91378	0.54023	0.44446	0.10446	2.08874	0.15382	0.37335

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48771	0.98438	1.00099	20.00853	48.71831	0.51798	50.07415	0.97653	0.97483
#2	0.48607	0.98092	0.99529	19.95244	48.39251	0.51499	49.91163	0.97473	0.97169
Mean	**0.48689**	**0.98265**	**0.99814**	**19.98048**	**48.55541**	**0.51649**	**49.99289**	**0.97563**	**0.97326**

%RSD	0.23738	0.24911	0.40415	0.19849	0.47445	0.41027	0.22988	0.12996	0.22876

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.29002	0.96606	4.87291	0.98540	0.96658	5.22924	0.47668	1.01969	0.97495
#2	47.97695	0.96129	4.85439	0.98520	0.97922	5.19554	0.47487	1.00532	1.00453
Mean	**48.13348**	**0.96368**	**4.86365**	**0.98530**	**0.97290**	**5.21239**	**0.47577**	**1.01250**	**0.98974**
%RSD	0.45991	0.35060	0.26924	0.01431	0.91854	0.45716	0.27018	1.00345	2.11332

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.96539	1.02964	0.48655	0.50517	0.50826	4.85332	0.48634	1.00558	0.96844
#2	4.94618	1.02745	0.48349	0.50426	0.50846	4.83133	0.48630	1.00644	0.96468
Mean	**4.95579**	**1.02855**	**0.48502**	**0.50471**	**0.50836**	**4.84233**	**0.48632**	**1.00601**	**0.96656**
%RSD	0.27409	0.15092	0.44566	0.12718	0.02782	0.32111	0.00514	0.06051	0.27509

	Pb	Se
	calc	calc
#1	0.97285	0.98984
#2	0.98121	1.00479
Mean	**0.97703**	**0.99732**
%RSD	0.60527	1.05963

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20
SampleId1 : CCB **SampleId2 :** [CB]
Analysis commenced : 3/11/2013 18:52:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00004	-0.00741	-0.00106	-0.00892	-0.00054	-0.00035	-0.00871	-0.07116	-0.00019
#2	0.00041	-0.00253	-0.00246	-0.00862	-0.00058	-0.00034	-0.00153	-0.07053	-0.00045
Mean	**0.00018**	**-0.00497**	**-0.00176**	**-0.00877**	**-0.00056**	**-0.00035**	**-0.00512**	**-0.07085**	**-0.00032**
%RSD	175.17872	69.33980	56.28844	2.47230	4.59205	2.66193	99.21023	0.62351	55.64683

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00115	-0.00085	-0.00158	0.00517	-0.12753	-0.00276	-0.02120	-0.00063	-0.00310
#2	-0.00057	-0.00020	-0.00112	0.00564	-0.12683	-0.00275	-0.01966	-0.00058	-0.00197
Mean	**-0.00086**	**-0.00052**	**-0.00135**	**0.00540**	**-0.12718**	**-0.00276**	**-0.02043**	**-0.00061**	**-0.00253**
%RSD	48.36317	87.15654	23.95544	6.11475	0.39207	0.26798	5.30825	6.93054	31.58772

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01051	-0.00147	-0.00698	-0.00092	-0.00153	-0.02154	-0.00769	-0.00628	0.00270
#2	0.01104	-0.00083	-0.01086	0.00143	-0.00404	-0.01408	0.00035	-0.00586	0.00410
Mean	**0.01077**	**-0.00115**	**-0.00892**	**0.00025**	**-0.00278**	**-0.01781**	**-0.00367**	**-0.00607**	**0.00340**
%RSD	3.49042	39.13511	30.75199	651.25741	63.75274	29.62403	155.07732	4.95872	29.30060

ted: 3/12/2013 13:06:31 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00491	-0.00758	-0.00403	-0.00265	-0.00151	-0.03196	-0.00020	-0.00110	-0.00028
#2	0.00807	0.00230	-0.00400	-0.00261	0.00041	-0.01773	-0.00029	-0.00144	-0.00004
Mean	**0.00649**	**-0.00264**	**-0.00401**	**-0.00263**	**-0.00055**	**-0.02485**	**-0.00024**	**-0.00127**	**-0.00016**
%RSD	34.39473	264.53484	0.49677	1.02805	244.96590	40.48668	25.14330	19.06381	106.97002

	Pb	Se
	calc	calc
#1	-0.00132	-0.00029
#2	-0.00222	0.00079
Mean	**-0.00177**	**0.00025**
%RSD	35.63172	310.18884

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20
SampleId1 : 1303060-1MSD 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:56:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE101

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01933	19.39235	0.22806	0.17169	0.37977	0.01181	0.00369	38.57120	0.01054
#2	0.01883	19.33521	0.22247	0.16948	0.37889	0.01177	0.00457	38.45466	0.01065
Mean	**0.01908**	**19.36378**	**0.22527**	**0.17058**	**0.37933**	**0.01179**	**0.00413**	**38.51293**	**0.01059**
%RSD	1.86666	0.20864	1.75570	0.91515	0.16354	0.23673	14.95753	0.21398	0.74052

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11477	0.05842	0.07292	32.67457	11.18339	0.11105	17.83177	0.52149	0.18933
#2	0.11373	0.05777	0.07293	32.61396	11.18220	0.11090	17.79621	0.52172	0.18719
Mean	**0.11425**	**0.05809**	**0.07293**	**32.64426**	**11.18279**	**0.11097**	**17.81399**	**0.52160**	**0.18826**
%RSD	0.64484	0.79032	0.01036	0.13130	0.00755	0.09638	0.14117	0.03229	0.80295

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	7.27815	0.12226	0.82596	0.12715	0.12112	1.01954	0.06226	0.38886	0.38022
#2	7.27177	0.12026	0.81750	0.12533	0.12423	1.02701	0.05909	0.38899	0.39055
Mean	**7.27496**	**0.12126**	**0.82173**	**0.12624**	**0.12268**	**1.02327**	**0.06067**	**0.38893**	**0.38538**
%RSD	0.06206	1.16305	0.72864	1.01639	1.79415	0.51590	3.69262	0.02313	1.89541

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.08696	0.10419	0.22137	0.14697	0.39704	0.03908	0.14569	0.20697	0.00686
#2	4.08875	0.10419	0.22088	0.14748	0.40224	0.02810	0.14533	0.20457	0.00671
Mean	**4.08786**	**0.10419**	**0.22112**	**0.14722**	**0.39964**	**0.03359**	**0.14551**	**0.20577**	**0.00679**
%RSD	0.03093	0.00040	0.15652	0.24574	0.92036	23.11793	0.17238	0.82560	1.55236

Seser: STEVE WORKMAN

	Pb calc	calc
#1	0.12313	0.38310
#2	0.12460	0.39003
Mean	**0.12386**	**0.38656**
%RSD	0.84028	1.26813

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20
SampleId1 : 1303060-2 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 18:57:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE102

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.00044	10.31389	0.05186	-0.00353	0.20596	0.00155	-0.00106	25.07702	-0.00047
#2	0.00029	10.22993	0.04696	-0.00328	0.20355	0.00154	0.00332	25.00565	0.00013
Mean	**0.00036**	**10.27191**	**0.04941**	**-0.00340**	**0.20476**	**0.00154**	**0.00113**	**25.04133**	**-0.00017**
%RSD	28.70566	0.57794	7.00538	5.09568	0.83234	0.47236	274.19444	0.20153	250.29986

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00753	0.00623	0.01137	24.61054	2.51591	0.00923	5.01314	0.39655	0.07654
#2	0.00870	0.00726	0.01258	24.55087	2.50978	0.00917	5.01038	0.39571	0.07547
Mean	**0.00812**	**0.00675**	**0.01197**	**24.58071**	**2.51284**	**0.00920**	**5.01176**	**0.39613**	**0.07601**
%RSD	10.20883	10.87325	7.18006	0.17166	0.17261	0.46136	0.03904	0.14867	0.99418

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.08664	0.00745	0.63447	0.06313	0.05575	7.96536	-0.00247	0.20198	0.18742
#2	0.08664	0.00855	0.62623	0.06780	0.05539	8.00663	0.00186	0.20047	0.19174
Mean	**0.08664**	**0.00800**	**0.63035**	**0.06547**	**0.05557**	**7.98600**	**-0.00030**	**0.20123**	**0.18958**
%RSD	0.00000	9.68370	0.92368	5.03653	0.45784	0.36543	1005.40380	0.52876	1.60875

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	4.75603	0.00041	0.07747	0.04668	0.00308	1.27767	0.63657	0.05086	0.01226
#2	4.72760	0.00407	0.07665	0.04671	0.00425	1.28609	0.63418	0.05137	0.01266
Mean	**4.74182**	**0.00224**	**0.07706**	**0.04669**	**0.00366**	**1.28188**	**0.63537**	**0.05111**	**0.01246**
%RSD	0.42403	115.42529	0.75048	0.04627	22.65139	0.46438	0.26593	0.71173	2.27947

	Pb calc	Se calc
#1	0.05821	0.19227
#2	0.05952	0.19465
Mean	**0.05887**	**0.19346**
%RSD	1.57692	0.86838

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20

SampleId1 : 1303060-3 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 18:59:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE103

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00011	10.89682	0.01922	-0.00255	0.16185	0.00086	-0.00750	15.39733	-0.00055
#2	-0.00016	10.97494	0.01957	-0.00445	0.16236	0.00082	-0.00260	15.41612	0.00006
Mean	**-0.00003**	**10.93588**	**0.01940**	**-0.00350**	**0.16211**	**0.00084**	**-0.00505**	**15.40673**	**-0.00025**
%RSD	706.49469	0.50511	1.27462	38.45241	0.22296	3.73948	68.60491	0.08624	173.87677

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00679	0.00885	0.01354	23.13708	2.33851	0.00758	5.29141	0.34498	0.00564
#2	0.00603	0.00819	0.01328	23.21961	2.34182	0.00759	5.30494	0.34623	0.00551
Mean	**0.00641**	**0.00852**	**0.01341**	**23.17834**	**2.34016**	**0.00758**	**5.29818**	**0.34560**	**0.00558**
%RSD	8.46979	5.50897	1.39630	0.25180	0.09978	0.14602	0.18057	0.25551	1.59428

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.07579	0.00930	0.65711	0.05096	0.04552	4.10265	-0.00053	0.07355	0.06845
#2	0.07534	0.00835	0.66260	0.04449	0.04879	4.11387	-0.00118	0.06240	0.07568
Mean	**0.07556**	**0.00882**	**0.65986**	**0.04772**	**0.04716**	**4.10826**	**-0.00086**	**0.06798**	**0.07206**
%RSD	0.42149	7.55228	0.58830	9.59176	4.90384	0.19319	53.52735	11.59845	7.10343

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.69133	-0.00105	0.07633	0.04491	0.00303	0.10418	0.24851	0.06252	0.00857
#2	3.71572	-0.00142	0.07666	0.04498	-0.00493	0.08606	0.24807	0.06286	0.00813
Mean	**3.70353**	**-0.00123**	**0.07649**	**0.04495**	**-0.00095**	**0.09512**	**0.24829**	**0.06269**	**0.00835**
%RSD	0.46559	20.99689	0.30414	0.10815	594.08526	13.47126	0.12574	0.38689	3.72990

	Pb	Se
	calc	calc
#1	0.04733	0.07015
#2	0.04736	0.07126
Mean	**0.04735**	**0.07070**
%RSD	0.03852	1.11572

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:20
SampleId1 : 1303060-4 5X **SampleId2 :** **[SAMPLE]**
Analysis commenced : 3/11/2013 19:01:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE104

Final concentrations

Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	-0.00070	8.14986	0.03461	-0.00451	0.13787	0.00082	0.00146	54.74140	-0.00006
#2	-0.00080	8.22528	0.03414	-0.00512	0.13871	0.00083	0.00147	55.01673	-0.00067
Mean	**-0.00075**	**8.18757**	**0.03437**	**-0.00481**	**0.13829**	**0.00082**	**0.00146**	**54.87906**	**-0.00036**
%RSD	9.03890	0.65139	0.95901	9.00701	0.42932	1.02370	0.17265	0.35476	117.80487

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00595	0.00572	0.00932	20.42147	2.28474	0.00727	5.56172	0.72789	0.09389
#2	0.00605	0.00630	0.01017	20.54595	2.30455	0.00732	5.61062	0.73188	0.09685
Mean	**0.00600**	**0.00601**	**0.00975**	**20.48371**	**2.29464**	**0.00729**	**5.58617**	**0.72989**	**0.09537**
%RSD	1.07534	6.78764	6.12113	0.42971	0.61052	0.43022	0.61897	0.38720	2.19068

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.08828	0.00780	0.55671	0.03426	0.03386	4.39450	0.00093	0.08472	0.09798
#2	0.08836	0.00719	0.56380	0.03782	0.03395	4.45812	-0.00130	0.09915	0.10020
Mean	**0.08832**	**0.00750**	**0.56025**	**0.03604**	**0.03391**	**4.42631**	**-0.00018**	**0.09194**	**0.09909**
%RSD	0.06558	5.78746	0.89473	6.98663	0.18350	1.01629	855.37789	11.10395	1.58645

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.39711	0.00261	0.10841	0.04114	0.00280	0.27991	0.31289	0.05206	0.00593
#2	3.42718	-0.00141	0.10911	0.04129	-0.00811	0.28377	0.31598	0.05206	0.00605
Mean	**3.41215**	**0.00060**	**0.10876**	**0.04122**	**-0.00265**	**0.28184**	**0.31443**	**0.05206**	**0.00599**
%RSD	0.62316	473.30172	0.45851	0.26209	290.84270	0.96779	0.69447	0.00000	1.33826

	Pb calc	**Se** calc
#1	0.03399	0.09356
#2	0.03524	0.09985
Mean	**0.03462**	**0.09671**
%RSD	2.54199	4.59936

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:21
SampleId1 : 1303060-5 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:03:20
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE105

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00155	11.08808	0.04521	-0.00273	0.22605	0.00130	0.00384	22.54549	-0.00019
#2	-0.00057	11.00983	0.04265	-0.00365	0.22459	0.00126	0.00384	22.45362	-0.00048
Mean	**-0.00106**	**11.04896**	**0.04393**	**-0.00319**	**0.22532**	**0.00128**	**0.00384**	**22.49955**	**-0.00034**
%RSD	65.06615	0.50076	4.12706	20.39482	0.45847	2.21872	0.00809	0.28872	60.61655

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00735	0.00706	0.01215	25.03577	2.93127	0.00933	5.47746	0.39506	0.04637

#2	0.00757	0.00639	0.01187	24.94601	2.92395	0.00930	5.43994	0.39393	0.04738
Mean	**0.00746**	**0.00672**	**0.01201**	**24.99089**	**2.92761**	**0.00931**	**5.45870**	**0.39450**	**0.04687**
%RSD	2.11763	7.10348	1.65989	0.25398	0.17675	0.19820	0.48600	0.20260	1.51725

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.07452	0.00897	0.64041	0.05390	0.05500	7.23770	-0.00186	0.17335	0.17541
#2	0.07419	0.00752	0.63858	0.05371	0.05567	7.21520	0.00053	0.18105	0.18801
Mean	**0.07435**	**0.00824**	**0.63950**	**0.05381**	**0.05534**	**7.22645**	**-0.00067**	**0.17720**	**0.18171**
%RSD	0.31152	12.40862	0.20233	0.24217	0.85016	0.22015	253.96380	3.07260	4.90311

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.49243	-0.00141	0.07759	0.03916	-0.00661	0.66773	0.55805	0.06355	0.01032
#2	3.47614	-0.00360	0.07710	0.03942	0.00277	0.66710	0.55617	0.06303	0.01042
Mean	**3.48429**	**-0.00251**	**0.07734**	**0.03929**	**-0.00192**	**0.66742**	**0.55711**	**0.06329**	**0.01037**
%RSD	0.33066	61.94101	0.44690	0.46738	345.96546	0.06680	0.23836	0.57483	0.62874

	Pb calc	**Se** calc
#1	0.05464	0.17473
#2	0.05502	0.18569
Mean	**0.05483**	**0.18021**
%RSD	0.49318	4.30374

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:21
SampleId1 : 1303060-6 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:05:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE106

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00158	15.96954	0.02179	0.00058	0.23386	0.00110	-0.00342	28.66521	-0.00012
#2	-0.00033	15.88966	0.02587	0.00034	0.23233	0.00109	0.00131	28.52995	-0.00026
Mean	**-0.00096**	**15.92960**	**0.02383**	**0.00046**	**0.23310**	**0.00110**	**-0.00105**	**28.59758**	**-0.00019**
%RSD	92.84367	0.35460	12.10632	37.74447	0.46535	0.78917	317.94786	0.33443	53.55924

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.01046	0.01366	0.02174	32.08244	4.41129	0.01376	7.24798	0.48153	0.01155
#2	0.01109	0.01401	0.02316	31.95150	4.39733	0.01371	7.20643	0.47998	0.01199
Mean	**0.01077**	**0.01383**	**0.02245**	**32.01697**	**4.40431**	**0.01373**	**7.22721**	**0.48076**	**0.01177**
%RSD	4.13459	1.78575	4.45599	0.28918	0.22407	0.26877	0.40652	0.22766	2.64404

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.16109	0.01506	0.80079	0.03231	0.03642	2.60694	-0.00176	0.03007	0.03743
#2	0.16125	0.01541	0.79736	0.03628	0.03395	2.60320	-0.00176	0.03144	0.03741

Mean	**0.16117**	**0.01523**	**0.79907**	**0.03430**	**0.03519**	**2.60507**	**-0.00176**	**0.03076**	**0.03742**
%RSD	0.07195	1.62763	0.30375	8.19896	4.96395	0.10144	0.11621	3.15399	0.03890

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.53993	-0.00032	0.12889	0.04801	-0.00431	0.19244	0.17121	0.08602	0.00852
#2	3.53188	0.00187	0.12778	0.04832	0.00516	0.18988	0.17124	0.08636	0.00917
Mean	**3.53590**	**0.00078**	**0.12833**	**0.04816**	**0.00043**	**0.19116**	**0.17122**	**0.08619**	**0.00884**
%RSD	0.16099	199.96247	0.61147	0.45978	1573.27877	0.94802	0.01301	0.28144	5.16206

	Pb calc	**Se** calc
#1	0.03505	0.03498
#2	0.03473	0.03542
Mean	**0.03489**	**0.03520**
%RSD	0.65532	0.89010

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:21
SampleId1 : 1303060-7 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:06:57
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE107

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00091	9.98307	0.02796	-0.00310	0.16565	0.00095	-0.00038	37.18941	-0.00016
#2	-0.00058	9.91355	0.03123	-0.00340	0.16434	0.00090	0.00067	36.97453	0.00002
Mean	**-0.00075**	**9.94831**	**0.02960**	**-0.00325**	**0.16499**	**0.00093**	**0.00015**	**37.08197**	**-0.00007**
%RSD	31.97922	0.49413	7.79703	6.67002	0.56330	4.28864	503.31603	0.40976	182.65750

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00723	0.00862	0.01726	23.95583	2.99832	0.00769	5.40796	0.43219	0.02613
#2	0.00718	0.00854	0.01653	23.81935	2.98581	0.00767	5.36491	0.42969	0.02544
Mean	**0.00721**	**0.00858**	**0.01689**	**23.88759**	**2.99206**	**0.00768**	**5.38643**	**0.43094**	**0.02578**
%RSD	0.45561	0.70263	3.08437	0.40400	0.29571	0.21623	0.56516	0.41011	1.89621

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.09082	0.01033	0.77562	0.04415	0.04195	4.46186	-0.00200	0.09821	0.10470
#2	0.09078	0.00973	0.78706	0.04319	0.04449	4.42444	-0.00345	0.11634	0.10750
Mean	**0.09080**	**0.01003**	**0.78134**	**0.04367**	**0.04322**	**4.44315**	**-0.00272**	**0.10727**	**0.10610**
%RSD	0.03190	4.17216	1.03542	1.54525	4.15117	0.59556	37.71821	11.95087	1.86573

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.82750	-0.00069	0.08126	0.05442	-0.00759	0.44353	0.32992	0.06252	0.00643
#2	3.79941	0.00004	0.08050	0.05413	-0.00014	0.42674	0.32672	0.06389	0.00654
Mean	**3.81346**	**-0.00033**	**0.08088**	**0.05428**	**-0.00387**	**0.43513**	**0.32832**	**0.06321**	**0.00648**

%RSD	0.52080	157.54435	0.66570	0.36820	136.14599	2.72826	0.69038	1.53496	1.24585

	Pb calc	Se calc
#1	0.04268	0.10254
#2	0.04406	0.11045
Mean	**0.04337**	**0.10649**
%RSD	2.24103	5.24862

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:21
SampleId1 : 1303060-8 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:08:45
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE108

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	0.00007	10.81667	0.03531	-0.00199	0.16591	0.00115	0.00161	32.47466	0.00011
#2	-0.00086	10.75559	0.03449	-0.00353	0.16499	0.00111	0.00756	32.24422	0.00026
Mean	**-0.00040**	**10.78613**	**0.03490**	**-0.00276**	**0.16545**	**0.00113**	**0.00458**	**32.35944**	**0.00018**
%RSD	165.14257	0.40042	1.65305	39.27816	0.39010	2.93793	91.83704	0.50355	57.93582

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00817	0.00900	0.01548	23.98541	3.13503	0.00833	5.51867	0.44475	0.02531
#2	0.00799	0.00883	0.01530	23.84997	3.10929	0.00824	5.47346	0.44219	0.02475
Mean	**0.00808**	**0.00891**	**0.01539**	**23.91769**	**3.12216**	**0.00829**	**5.49606**	**0.44347**	**0.02503**
%RSD	1.58382	1.33049	0.82490	0.40043	0.58292	0.69059	0.58161	0.40805	1.59820

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.10630	0.01015	0.77768	0.05115	0.04519	4.55168	0.00103	0.11791	0.10550
#2	0.10532	0.01000	0.78386	0.04910	0.04711	4.46186	-0.00254	0.10841	0.11138
Mean	**0.10581**	**0.01007**	**0.78077**	**0.05012**	**0.04615**	**4.50677**	**-0.00076**	**0.11316**	**0.10844**
%RSD	0.65703	1.07696	0.55954	2.88529	2.94480	1.40923	333.30712	5.93273	3.83741

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	4.24004	0.00442	0.07339	0.06004	-0.00265	0.63171	0.39486	0.08259	0.00783
#2	4.21962	0.00003	0.07276	0.05950	-0.00367	0.62268	0.39374	0.08207	0.00755
Mean	**4.22983**	**0.00223**	**0.07308**	**0.05977**	**-0.00316**	**0.62719**	**0.39430**	**0.08233**	**0.00769**
%RSD	0.34142	139.43846	0.60033	0.63253	22.91727	1.01797	0.19984	0.44194	2.51673

	Pb calc	Se calc
#1	0.04717	0.10963
#2	0.04778	0.11039
Mean	**0.04748**	**0.11001**
%RSD	0.89502	0.49093

ted: 3/12/2013 13:06:32 User: STEVE WORKMAN
Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:21
SampleId1 : 1303060-11 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:10:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE109

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00149	18.07869	0.02330	0.00580	0.22331	0.00121	-0.00234	24.52878	-0.00013
#2	-0.00103	17.94278	0.02610	0.00414	0.22236	0.00118	-0.00286	24.44587	-0.00035
Mean	**-0.00126**	**18.01074**	**0.02470**	**0.00497**	**0.22283**	**0.00119**	**-0.00260**	**24.48732**	**-0.00024**
%RSD	25.52688	0.53356	8.00768	23.57206	0.30132	2.16492	14.18370	0.23942	65.59323

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01075	0.01571	0.02244	34.50351	4.57216	0.01487	7.79189	0.45004	0.02789
#2	0.01102	0.01531	0.02196	34.41277	4.53218	0.01480	7.76757	0.44861	0.02858
Mean	**0.01089**	**0.01551**	**0.02220**	**34.45814**	**4.55217**	**0.01483**	**7.77973**	**0.44933**	**0.02824**
%RSD	1.75171	1.81081	1.54970	0.18620	0.62111	0.31104	0.22105	0.22479	1.73159

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.58817	0.01729	0.73764	0.03482	0.03228	6.43921	-0.00210	0.04950	0.05763
#2	0.58368	0.01662	0.73970	0.03721	0.03478	6.45420	-0.00380	0.05996	0.05612
Mean	**0.58593**	**0.01696**	**0.73867**	**0.03601**	**0.03353**	**6.44671**	**-0.00295**	**0.05473**	**0.05688**
%RSD	0.54254	2.83354	0.19712	4.69386	5.28918	0.16443	40.87055	13.51494	1.88029

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.23305	0.00040	0.14840	0.05266	-0.00522	0.24827	0.13770	0.10180	0.00926
#2	4.20931	0.00443	0.14760	0.05275	-0.00060	0.26445	0.13662	0.10180	0.00913
Mean	**4.22118**	**0.00242**	**0.14800**	**0.05271**	**-0.00291**	**0.25636**	**0.13716**	**0.10180**	**0.00920**
%RSD	0.39764	117.72448	0.38199	0.12297	112.25808	4.46372	0.55523	0.00000	1.03280

	Pb	Se
	calc	calc
#1	0.03312	0.05492
#2	0.03559	0.05740
Mean	**0.03436**	**0.05616**
%RSD	5.08139	3.11573

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : 1303060-12 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:12:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE110

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00056	6.93923	0.00990	-0.00389	0.16477	0.00036	0.00140	38.43502	-0.00053
#2	0.00047	6.89906	0.00605	-0.00469	0.16361	0.00032	0.00000	38.32029	-0.00004
Mean	**0.00051**	**6.91914**	**0.00798**	**-0.00429**	**0.16419**	**0.00034**	**0.00070**	**38.37765**	**-0.00029**
%RSD	13.04029	0.41050	34.10201	13.13080	0.50316	6.79217	140.55898	0.21138	121.83532

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00720	0.00721	0.00930	18.88289	1.36667	0.00605	8.38212	0.26193	-0.00184
#2	0.00679	0.00744	0.00911	18.82847	1.36337	0.00606	8.34763	0.26116	-0.00090
Mean	**0.00699**	**0.00733**	**0.00920**	**18.85568**	**1.36502**	**0.00606**	**8.36488**	**0.26154**	**-0.00137**
%RSD	4.12786	2.21560	1.47106	0.20406	0.17083	0.09139	0.29154	0.20887	48.66792

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.09737	0.01116	0.52675	0.02037	0.00518	0.46719	0.00631	0.00572	-0.00182
#2	0.09667	0.00986	0.53110	0.01378	0.00806	0.48211	0.00209	-0.00569	-0.00491
Mean	**0.09702**	**0.01051**	**0.52892**	**0.01708**	**0.00662**	**0.47465**	**0.00420**	**0.00001**	**-0.00336**
%RSD	0.50748	8.69874	0.58081	27.29016	30.67665	2.22354	71.05165	54008.85306	64.99086

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.55560	0.00517	0.10266	0.04818	0.00104	0.01506	0.01878	0.04657	0.00334
#2	3.53686	-0.00032	0.10195	0.04811	0.00138	0.01831	0.01808	0.04674	0.00317
Mean	**3.54623**	**0.00242**	**0.10230**	**0.04814**	**0.00121**	**0.01669**	**0.01843**	**0.04666**	**0.00325**
%RSD	0.37358	160.18339	0.49391	0.10097	19.51028	13.74351	2.68003	0.25991	3.58649

	Pb	Se
	calc	calc
#1	0.01024	0.00069
#2	0.00996	-0.00517
Mean	**0.01010**	**-0.00224**
%RSD	1.95255	185.09488

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : CCV SampleId2 : [CV]
Analysis commenced : 3/11/2013 19:14:05
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19450	50.08830	0.52107	0.97982	0.99468	0.49466	0.49959	50.20529	0.49677
#2	0.19386	50.40800	0.51618	0.98038	1.00103	0.49720	0.51158	50.40040	0.50034
Mean	**0.19418**	**50.24815**	**0.51862**	**0.98010**	**0.99786**	**0.49593**	**0.50558**	**50.30285**	**0.49856**
%RSD	0.23269	0.44990	0.66703	0.03981	0.44964	0.36166	1.67703	0.27427	0.50606

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48757	0.98196	0.99434	19.93023	48.38374	0.51511	49.88872	0.97181	0.97496
#2	0.48848	0.98549	1.00183	20.04094	48.61855	0.51762	50.10804	0.97838	0.97660
Mean	**0.48802**	**0.98373**	**0.99808**	**19.98559**	**48.50114**	**0.51637**	**49.99838**	**0.97509**	**0.97578**
%RSD	0.13127	0.25436	0.53050	0.39169	0.34233	0.34381	0.31017	0.47678	0.11865

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.02044	0.96639	4.74538	0.98289	0.96805	5.15810	0.47950	1.01788	0.97375
#2	48.23554	0.96758	4.77176	0.98787	0.98209	5.15810	0.47654	1.02756	1.01713
Mean	**48.12799**	**0.96698**	**4.75857**	**0.98538**	**0.97507**	**5.15810**	**0.47802**	**1.02272**	**0.99544**
%RSD	0.31603	0.08655	0.39203	0.35770	1.01858	0.00000	0.43751	0.66919	3.08154

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.93296	1.02782	0.48617	0.50193	0.51072	4.84169	0.48567	1.00369	0.96600
#2	4.97214	1.03806	0.48826	0.50533	0.49351	4.86432	0.48820	1.00920	0.97059
Mean	**4.95255**	**1.03294**	**0.48722**	**0.50363**	**0.50212**	**4.85301**	**0.48694**	**1.00644**	**0.96829**
%RSD	0.55943	0.70138	0.30262	0.47768	2.42377	0.32969	0.36846	0.38710	0.33525

	Pb	**Se**
	calc	calc
#1	0.97299	0.98845
#2	0.98402	1.02060
Mean	**0.97850**	**1.00452**
%RSD	0.79696	2.26367

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 19:15:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00023	0.00391	-0.00642	-0.00770	-0.00051	-0.00022	0.00757	-0.06460	-0.00024
#2	-0.00103	-0.00147	-0.00817	-0.00782	-0.00051	-0.00026	0.00075	-0.06710	-0.00025
Mean	**-0.00063**	**0.00122**	**-0.00729**	**-0.00776**	**-0.00051**	**-0.00024**	**0.00416**	**-0.06585**	**-0.00025**
%RSD	89.00447	311.35095	16.95039	1.11790	0.00000	9.60573	116.06647	2.68333	0.73241

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00070	-0.00070	-0.00121	0.00852	-0.11907	-0.00269	-0.01813	-0.00052	-0.00071
#2	-0.00120	-0.00064	-0.00159	0.00766	-0.11743	-0.00272	-0.02058	-0.00046	-0.00178
Mean	**-0.00095**	**-0.00067**	**-0.00140**	**0.00809**	**-0.11825**	**-0.00270**	**-0.01936**	**-0.00049**	**-0.00124**
%RSD	37.04437	5.55771	19.44421	7.48748	0.98394	0.61429	8.96427	8.62035	60.73015

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.01538	-0.00090	-0.00653	0.00107	-0.00179	-0.01408	-0.00121	-0.00188	0.00014
#2	0.01366	-0.00285	-0.01566	-0.00016	0.00056	0.00084	-0.00148	-0.00792	0.00199
Mean	**0.01452**	**-0.00187**	**-0.01109**	**0.00045**	**-0.00062**	**-0.00662**	**-0.00135**	**-0.00490**	**0.00107**
%RSD	8.36944	73.69300	58.21041	192.75199	268.71876	159.45201	14.18031	87.11861	122.56426

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01051	-0.00209	-0.00400	-0.00279	0.00589	-0.02743	0.00020	-0.00179	0.00005
#2	0.00994	0.00084	-0.00400	-0.00285	-0.00436	-0.01967	-0.00049	-0.00230	-0.00011
Mean	**0.01022**	**-0.00063**	**-0.00400**	**-0.00282**	**0.00076**	**-0.02355**	**-0.00014**	**-0.00204**	**-0.00003**
%RSD	3.98298	329.55951	0.00000	1.34173	952.40659	23.29638	340.88936	17.79878	390.51790

	Pb	**Se**
	calc	calc
#1	-0.00084	-0.00053
#2	0.00032	-0.00131
Mean	**-0.00026**	**-0.00092**
%RSD	312.44323	59.71792

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : 1303057-2 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:17:48
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE111

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00016	7.96628	0.01421	-0.00494	0.19742	0.00061	0.00025	18.39890	-0.00017
#2	-0.00031	7.89307	0.01433	-0.00402	0.19541	0.00059	0.00393	18.27186	-0.00047
Mean	**-0.00008**	**7.92968**	**0.01427**	**-0.00448**	**0.19641**	**0.00060**	**0.00209**	**18.33538**	**-0.00032**
%RSD	425.78143	0.65285	0.57758	14.52833	0.72305	2.47025	124.76053	0.48994	67.38514

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00343	0.00469	0.00810	16.42167	1.64208	0.00512	4.61133	0.41713	0.00055
#2	0.00411	0.00499	0.00894	16.29834	1.64185	0.00509	4.57783	0.41404	0.00092
Mean	**0.00377**	**0.00484**	**0.00852**	**16.36001**	**1.64196**	**0.00510**	**4.59458**	**0.41559**	**0.00074**
%RSD	12.66441	4.43839	6.97256	0.53304	0.01015	0.47019	0.51567	0.52645	36.24270

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06064	0.00439	0.57454	0.02832	0.03018	2.91717	-0.00485	0.08454	0.09197
#2	0.06015	0.00533	0.55739	0.03297	0.02806	2.87978	-0.00156	0.09829	0.08966
Mean	**0.06039**	**0.00486**	**0.56597**	**0.03064**	**0.02912**	**2.89847**	**-0.00320**	**0.09141**	**0.09082**
%RSD	0.57518	13.72083	2.14284	10.72957	5.16911	0.91192	72.72837	10.63859	1.79952

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.67105	-0.00104	0.03566	0.03416	-0.00268	0.37958	0.26583	0.04880	0.00567

#2	3.64696	-0.00067	0.03523	0.03424	-0.00345	0.38736	0.26325	0.04743	0.00600
Mean	**3.65900**	**-0.00085**	**0.03544**	**0.03420**	**-0.00306**	**0.38347**	**0.26454**	**0.04811**	**0.00584**
%RSD	0.46548	30.28565	0.86235	0.15795	17.71977	1.43505	0.68788	2.01632	4.01470

	Pb calc	**Se** calc
#1	0.02956	0.08950
#2	0.02969	0.09253
Mean	**0.02963**	**0.09102**
%RSD	0.30643	2.36051

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : 1303057-3 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:19:34
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE112

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	0.00001	6.57538	0.01351	-0.00432	0.26930	0.00036	0.00180	16.43728	0.00003
#2	-0.00026	6.55720	0.01270	-0.00580	0.26798	0.00034	0.00110	16.37686	-0.00048
Mean	**-0.00013**	**6.56629**	**0.01310**	**-0.00506**	**0.26864**	**0.00035**	**0.00145**	**16.40707**	**-0.00023**
%RSD	156.09685	0.19574	4.40266	20.56881	0.34617	3.48547	34.12044	0.26041	157.46417

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00349	0.00321	0.00541	16.84198	1.93599	0.00524	3.60605	0.36365	0.00268
#2	0.00317	0.00335	0.00636	16.80078	1.92750	0.00521	3.60513	0.36234	0.00281
Mean	**0.00333**	**0.00328**	**0.00589**	**16.82138**	**1.93175**	**0.00522**	**3.60559**	**0.36300**	**0.00275**
%RSD	6.75512	2.98688	11.37097	0.17320	0.31065	0.45938	0.01808	0.25489	3.23574

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.05204	0.00401	0.53956	0.02903	0.02615	4.36831	0.00006	0.07941	0.07767
#2	0.05184	0.00401	0.55282	0.02731	0.02607	4.32714	-0.00073	0.08504	0.08243
Mean	**0.05194**	**0.00401**	**0.54619**	**0.02817**	**0.02611**	**4.34772**	**-0.00033**	**0.08222**	**0.08005**
%RSD	0.27863	0.00000	1.71704	4.33343	0.22690	0.66945	168.61588	4.84250	4.19824

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	3.45680	-0.00469	0.04690	0.03242	-0.00592	0.33165	0.21478	0.03731	0.00361
#2	3.44876	-0.00323	0.04656	0.03243	0.00074	0.32648	0.21294	0.03594	0.00378
Mean	**3.45278**	**-0.00396**	**0.04673**	**0.03242**	**-0.00259**	**0.32906**	**0.21386**	**0.03662**	**0.00370**
%RSD	0.16479	26.11984	0.51194	0.01666	182.13611	1.11007	0.60882	2.64877	3.25097

	Pb calc	**Se** calc
#1	0.02711	0.07825
#2	0.02648	0.08329

Mean	0.02680	0.08077ser: STEVE WORKMAN
%RSD	1.66452	4.41663

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:22
SampleId1 : 1303057-4 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:21:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE113

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00068	5.88429	0.00815	-0.00807	0.40027	0.00027	-0.00142	15.70422	-0.00039
#2	-0.00013	5.86237	0.01316	-0.00721	0.39680	0.00025	-0.00212	15.62172	-0.00012
Mean	**-0.00040**	**5.87333**	**0.01066**	**-0.00764**	**0.39854**	**0.00026**	**-0.00177**	**15.66297**	**-0.00025**
%RSD	96.79433	0.26392	33.25709	7.95101	0.61619	7.55190	27.93190	0.37248	75.77795

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00207	0.00136	0.00368	12.39572	0.98258	0.00419	2.32638	0.40541	0.00061
#2	0.00288	0.00140	0.00376	12.33094	0.98258	0.00417	2.31563	0.40375	-0.00021
Mean	**0.00248**	**0.00138**	**0.00372**	**12.36333**	**0.98258**	**0.00418**	**2.32101**	**0.40458**	**0.00020**
%RSD	23.11389	1.68898	1.63480	0.37051	0.00000	0.39749	0.32744	0.29116	286.70640

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03702	0.00066	0.36444	0.02137	0.02381	1.87090	-0.00414	0.07940	0.08147
#2	0.03719	0.00105	0.37541	0.02320	0.02305	1.85223	-0.00507	0.08051	0.08023
Mean	**0.03710**	**0.00086**	**0.36993**	**0.02229**	**0.02343**	**1.86157**	**-0.00460**	**0.07996**	**0.08085**
%RSD	0.31197	32.55074	2.09701	5.80803	2.29943	0.70940	14.25754	0.97954	1.08819

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.78954	-0.00248	0.03866	0.02068	-0.00094	0.18243	0.24177	0.02548	0.00461
#2	2.78353	0.00008	0.03832	0.02036	-0.00263	0.19084	0.24044	0.02531	0.00505
Mean	**2.78653**	**-0.00120**	**0.03849**	**0.02052**	**-0.00179**	**0.18664**	**0.24110**	**0.02539**	**0.00483**
%RSD	0.15241	150.43717	0.62151	1.10581	67.04324	3.18943	0.39012	0.47754	6.40450

	Pb	Se
	calc	calc
#1	0.02300	0.08078
#2	0.02310	0.08032
Mean	**0.02305**	**0.08055**
%RSD	0.31107	0.40472

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:23
SampleId1 : 1303057-5 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:23:09
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE114

Final concentrations6:32 User: STEVE WORKMAN

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00046	6.31562	0.01036	-0.00684	0.28884	0.00050	-0.00012	16.36825	-0.00005
#2	0.00016	6.28112	0.00955	-0.00745	0.28694	0.00048	-0.00170	16.30800	-0.00083
Mean	**-0.00015**	**6.29837**	**0.00996**	**-0.00715**	**0.28789**	**0.00049**	**-0.00091**	**16.33812**	**-0.00044**
%RSD	289.73404	0.38726	5.79420	6.06926	0.46663	1.93998	122.12235	0.26079	124.05716

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00314	0.00178	0.00473	12.48527	0.73590	0.00493	2.22873	0.42291	0.00048
#2	0.00273	0.00192	0.00474	12.44861	0.74390	0.00491	2.21860	0.42124	0.00162
Mean	**0.00294**	**0.00185**	**0.00474**	**12.46694**	**0.73990**	**0.00492**	**2.22367**	**0.42207**	**0.00105**
%RSD	9.85353	5.42619	0.15023	0.20791	0.76472	0.22501	0.32223	0.27913	76.18687

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.06764	0.00140	0.33930	0.02575	0.02083	1.66175	-0.00138	0.15059	0.14619
#2	0.06743	0.00042	0.33747	0.02384	0.02272	1.62440	-0.00150	0.14055	0.14565
Mean	**0.06754**	**0.00091**	**0.33839**	**0.02480**	**0.02178**	**1.64308**	**-0.00144**	**0.14557**	**0.14592**
%RSD	0.21433	76.48663	0.38204	5.44343	6.15149	1.60720	6.26739	4.88015	0.25912

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.77275	0.00337	0.06117	0.01806	0.00180	0.45078	0.41051	0.02153	0.00689
#2	2.76613	0.00191	0.06078	0.01795	-0.00144	0.44044	0.40913	0.02205	0.00698
Mean	**2.76944**	**0.00264**	**0.06097**	**0.01800**	**0.00018**	**0.44561**	**0.40982**	**0.02179**	**0.00694**
%RSD	0.16915	39.18641	0.44690	0.42007	1241.49420	1.64083	0.23845	1.66933	0.92187

	Pb	Se
	calc	calc
#1	0.02247	0.14765
#2	0.02310	0.14395
Mean	**0.02278**	**0.14580**
%RSD	1.94862	1.79545

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:23
SampleId1 : 1303057-6 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:24:56
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE115

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00059	4.25691	0.01211	-0.00800	0.10002	0.00085	-0.00301	15.30960	-0.00060
#2	-0.00077	4.19446	0.00559	-0.00782	0.09845	0.00081	-0.00739	15.16744	-0.00053
Mean	**-0.00068**	**4.22569**	**0.00885**	**-0.00791**	**0.09923**	**0.00083**	**-0.00520**	**15.23852**	**-0.00057**
%RSD	18.81211	1.04512	52.15359	1.64436	1.11832	2.67167	59.50529	0.65968	9.19964

ted: 3/12/2013 13:06:32 User: STEVE WORKMAN

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00177	0.00027	0.00192	11.63385	0.72389	0.00222	1.58522	0.31055	0.00734
#2	0.00204	0.00016	0.00202	11.52122	0.72742	0.00220	1.56680	0.30823	0.00746
Mean	**0.00191**	**0.00021**	**0.00197**	**11.57753**	**0.72566**	**0.00221**	**1.57601**	**0.30939**	**0.00740**
%RSD	9.99193	36.73173	3.67672	0.68787	0.34399	0.58506	0.82638	0.52990	1.20149

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03379	-0.00030	0.38684	0.02876	0.03285	5.54381	0.00066	0.07342	0.07648
#2	0.03350	0.00101	0.37678	0.03224	0.03007	5.45018	0.00053	0.07767	0.07752
Mean	**0.03365**	**0.00035**	**0.38181**	**0.03050**	**0.03146**	**5.49699**	**0.00060**	**0.07554**	**0.07700**
%RSD	0.60203	263.48879	1.86249	8.08015	6.25933	1.20438	15.31058	3.98098	0.95496

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.58050	-0.00139	0.03133	0.02717	-0.00413	1.40872	0.62370	0.01570	0.01294
#2	2.54795	0.00300	0.03080	0.02689	-0.00323	1.40034	0.61938	0.01433	0.01307
Mean	**2.56423**	**0.00080**	**0.03106**	**0.02703**	**-0.00368**	**1.40453**	**0.62154**	**0.01502**	**0.01300**
%RSD	0.89762	387.73846	1.19775	0.71935	17.37884	0.42227	0.49113	6.45915	0.67955

	Pb	Se
	calc	calc
#1	0.03149	0.07546
#2	0.03079	0.07757
Mean	**0.03114**	**0.07652**
%RSD	1.58243	1.94979

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:23
SampleId1 : 1303057-7 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:26:44
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE116

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00131	5.36126	0.01596	-0.00561	0.23434	0.00091	0.00798	16.42070	-0.00048
#2	-0.00034	5.36409	0.01036	-0.00696	0.23379	0.00088	0.00097	16.41337	-0.00011
Mean	**0.00049**	**5.36268**	**0.01316**	**-0.00629**	**0.23407**	**0.00089**	**0.00447**	**16.41704**	**-0.00030**
%RSD	240.36559	0.03733	30.05602	15.17600	0.16551	1.90080	110.85325	0.03159	88.12828

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00372	0.00284	0.00341	13.41678	0.75355	0.00345	2.10130	0.37002	0.00312
#2	0.00249	0.00205	0.00325	13.41979	0.74884	0.00346	2.07950	0.37008	0.00017
Mean	**0.00311**	**0.00245**	**0.00333**	**13.41829**	**0.75119**	**0.00345**	**2.09040**	**0.37005**	**0.00165**
%RSD	27.81737	22.78851	3.30188	0.01588	0.44308	0.21370	0.73742	0.01137	126.81743

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.03592	0.00230	0.44353	0.03705	0.02550	4.73507	0.00179	0.15284	0.13407
#2	0.03612	0.00024	0.45199	0.03294	0.02822	4.71262	-0.00099	0.14882	0.13980
Mean	**0.03602**	**0.00127**	**0.44776**	**0.03499**	**0.02686**	**4.72385**	**0.00040**	**0.15083**	**0.13693**
%RSD	0.40169	114.39930	1.33577	8.30092	7.17420	0.33617	490.87134	1.88418	2.96022

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	2.80443	0.00080	0.03776	0.03050	0.00211	1.22925	0.59159	0.02068	0.01146
#2	2.80288	-0.00176	0.03758	0.03083	0.00185	1.19562	0.59131	0.02068	0.01097
Mean	**2.80365**	**-0.00048**	**0.03767**	**0.03066**	**0.00198**	**1.21244**	**0.59145**	**0.02068**	**0.01122**
%RSD	0.03916	374.18954	0.35278	0.75744	9.16529	1.96142	0.03405	0.00000	3.12236

	Pb	Se
	calc	calc
#1	0.02934	0.14032
#2	0.02979	0.14280
Mean	**0.02957**	**0.14156**
%RSD	1.07584	1.24137

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:23
SampleId1 : 1303057-8 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:28:31
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE117

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00111	9.18204	0.01106	-0.00623	0.28278	0.00086	-0.00178	15.74038	-0.00026
#2	-0.00010	9.20165	0.02051	-0.00641	0.28267	0.00086	0.00137	15.75520	0.00001
Mean	**-0.00061**	**9.19184**	**0.01578**	**-0.00632**	**0.28272**	**0.00086**	**-0.00021**	**15.74779**	**-0.00013**
%RSD	117.97169	0.15088	42.29278	2.05941	0.02741	0.51148	1082.19002	0.06652	148.87988

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00568	0.00423	0.00830	27.36224	1.61993	0.00628	4.02304	0.48451	0.00048
#2	0.00617	0.00498	0.00838	27.40622	1.62158	0.00629	4.03564	0.48522	-0.00014
Mean	**0.00592**	**0.00461**	**0.00834**	**27.38423**	**1.62076**	**0.00628**	**4.02934**	**0.48487**	**0.00017**
%RSD	5.92504	11.42174	0.68597	0.11355	0.07196	0.11753	0.22112	0.10419	261.29123

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05491	0.00629	0.48285	0.03372	0.03981	12.30554	0.00135	0.13525	0.14015
#2	0.05536	0.00620	0.48125	0.04187	0.03811	12.41469	-0.00051	0.13595	0.13540
Mean	**0.05513**	**0.00625**	**0.48205**	**0.03779**	**0.03896**	**12.36012**	**0.00042**	**0.13560**	**0.13777**
%RSD	0.57751	0.99208	0.23476	15.25061	3.07497	0.62443	310.34080	0.36518	2.44034

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr

	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.98865	0.00152	0.05533	0.03360	-0.00291	0.65115	0.42150	0.05635	0.00863
#2	3.99294	-0.00396	0.05538	0.03388	0.00117	0.66472	0.42208	0.05497	0.00894
Mean	**3.99080**	**-0.00122**	**0.05535**	**0.03374**	**-0.00087**	**0.65793**	**0.42179**	**0.05566**	**0.00878**
%RSD	0.07597	318.27058	0.06003	0.59228	331.58296	1.45871	0.09731	1.74302	2.54612

	Pb calc	**Se** calc
#1	0.03778	0.13852
#2	0.03936	0.13558
Mean	**0.03857**	**0.13705**
%RSD	2.90416	1.51600

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:23
SampleId1 : 1303057-10 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:30:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE118

Final concentrations

	Ag ppm	**Al** ppm	**As** ppm	**B** ppm	**Ba** ppm	**Be** ppm	**Bi** ppm	**Ca** ppm	**Cd** ppm
#1	-0.00052	3.42166	0.01817	-0.00782	0.13626	0.00094	-0.00124	15.43618	-0.00060
#2	-0.00088	3.40874	0.01538	-0.00776	0.13564	0.00091	-0.00457	15.41835	-0.00021
Mean	**-0.00070**	**3.41520**	**0.01678**	**-0.00779**	**0.13595**	**0.00093**	**-0.00290**	**15.42727**	**-0.00040**
%RSD	36.28031	0.26750	11.79111	0.55675	0.32278	1.79668	81.12122	0.08174	69.54821

	Co ppm	**Cr** ppm	**Cu** ppm	**Fe** ppm	**K** ppm	**Li** ppm	**Mg** ppm	**Mn** ppm	**Mo** ppm
#1	0.00220	0.00097	0.00236	11.66172	0.30793	0.00119	1.07355	0.32809	0.06919
#2	0.00228	0.00100	0.00247	11.67160	0.30981	0.00119	1.06803	0.32791	0.06963
Mean	**0.00224**	**0.00099**	**0.00241**	**11.66666**	**0.30887**	**0.00119**	**1.07079**	**0.32800**	**0.06941**
%RSD	2.74276	2.34734	3.33172	0.05984	0.43077	0.00000	0.36480	0.03845	0.44829

	Na ppm	**Ni** ppm	**P** ppm	**Pb I** ppm	**Pb II** ppm	**S** ppm	**Sb** ppm	**Se I** ppm	**Se II** ppm
#1	0.03710	0.00057	0.21592	0.02758	0.02336	3.17512	-0.00283	0.27526	0.26648
#2	0.03665	0.00046	0.21911	0.02618	0.02238	3.18633	-0.00124	0.27703	0.27805
Mean	**0.03688**	**0.00052**	**0.21751**	**0.02688**	**0.02287**	**3.18072**	**-0.00203**	**0.27614**	**0.27226**
%RSD	0.86315	14.97994	1.03974	3.66666	3.01063	0.24935	55.09634	0.45305	3.00418

	Si ppm	**Sn** ppm	**Sr** ppm	**Ti** ppm	**Tl** ppm	**U** ppm	**V** ppm	**Zn** ppm	**Zr** ppm
#1	2.20221	0.00337	0.02840	0.02233	-0.00251	1.53807	0.72730	0.01433	0.00740
#2	2.19887	-0.00249	0.02829	0.02360	-0.00681	1.51802	0.72650	0.01416	0.00723
Mean	**2.20054**	**0.00044**	**0.02834**	**0.02296**	**-0.00466**	**1.52805**	**0.72690**	**0.01425**	**0.00732**
%RSD	0.10721	941.87056	0.25785	3.92812	65.23569	0.92790	0.07781	0.85112	1.62204

	Pb calc	**Se** calc

#1	0.02476	0.26940	ser: STEVE WORKMAN
#2	0.02365	0.27771	
Mean	**0.02421**	**0.27356**	
%RSD	3.25322	2.14662	

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : 1303057-11 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:32:06
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE119

Final concentrations

	Ag ppm	Al ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca ppm	Cd ppm
#1	-0.00013	2.99930	0.01328	-0.00966	0.09845	0.00084	0.00357	18.66919	-0.00084
#2	-0.00065	2.99754	0.01386	-0.00880	0.09815	0.00080	-0.00256	18.64777	-0.00024
Mean	**-0.00039**	**2.99842**	**0.01357**	**-0.00923**	**0.09830**	**0.00082**	**0.00051**	**18.65848**	**-0.00054**
%RSD	93.72254	0.04143	3.03671	6.57747	0.21003	3.60720	857.62779	0.08118	79.17538

	Co ppm	Cr ppm	Cu ppm	Fe ppm	K ppm	Li ppm	Mg ppm	Mn ppm	Mo ppm
#1	0.00201	0.00024	0.00251	10.47488	0.30558	0.00081	0.94374	0.41047	0.02148
#2	0.00219	0.00038	0.00213	10.46293	0.29946	0.00081	0.94527	0.41023	0.02274
Mean	**0.00210**	**0.00031**	**0.00232**	**10.46891**	**0.30252**	**0.00081**	**0.94450**	**0.41035**	**0.02211**
%RSD	6.05632	30.21030	11.59080	0.08076	1.42937	0.00000	0.11487	0.04101	4.02110

	Na ppm	Ni ppm	P ppm	Pb I ppm	Pb II ppm	S ppm	Sb ppm	Se I ppm	Se II ppm
#1	0.03080	-0.00041	0.23876	0.02184	0.02412	3.16016	-0.00335	0.25938	0.25544
#2	0.03105	-0.00013	0.23579	0.02160	0.02301	3.11156	0.00009	0.26970	0.26135
Mean	**0.03092**	**-0.00027**	**0.23728**	**0.02172**	**0.02356**	**3.13586**	**-0.00163**	**0.26454**	**0.25840**
%RSD	0.56141	74.14285	0.88511	0.76459	3.31929	1.09595	149.06202	2.75856	1.61796

	Si ppm	Sn ppm	Sr ppm	Ti ppm	Tl ppm	U ppm	V ppm	Zn ppm	Zr ppm
#1	2.07534	0.00593	0.03219	0.02045	-0.00221	1.18516	0.70442	0.01142	0.00716
#2	2.07824	0.00191	0.03218	0.02066	-0.00245	1.18904	0.70344	0.00970	0.00751
Mean	**2.07679**	**0.00392**	**0.03219**	**0.02055**	**-0.00233**	**1.18710**	**0.70393**	**0.01056**	**0.00733**
%RSD	0.09869	72.63562	0.02064	0.73584	7.30656	0.23127	0.09804	11.48267	3.33993

	Pb calc	Se calc
#1	0.02336	0.25675
#2	0.02254	0.26413
Mean	**0.02295**	**0.26044**
%RSD	2.51419	2.00375

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : 1303057-12 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:33:54

Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE120

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00061	16.69770	0.01305	-0.00083	0.16156	0.00110	0.00899	5.24522	0.00057
#2	0.00154	16.77629	0.01211	-0.00107	0.16193	0.00107	0.01092	5.26000	0.00070
Mean	**0.00108**	**16.73699**	**0.01258**	**-0.00095**	**0.16174**	**0.00109**	**0.00995**	**5.25261**	**0.00063**
%RSD	60.73214	0.33201	5.24141	18.24041	0.15961	2.05233	13.71105	0.19897	15.27348

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01386	0.01647	0.02010	30.90949	5.20892	0.01070	5.65122	0.48528	0.00048
#2	0.01355	0.01702	0.02028	31.04358	5.23141	0.01074	5.66536	0.48725	-0.00102
Mean	**0.01370**	**0.01674**	**0.02019**	**30.97654**	**5.22017**	**0.01072**	**5.65829**	**0.48626**	**-0.00027**
%RSD	1.63603	2.34346	0.63305	0.30608	0.30475	0.24106	0.17680	0.28569	395.23490

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08910	0.01773	0.57935	0.03426	0.01709	0.90383	0.00460	0.01715	-0.00001
#2	0.08926	0.01822	0.58964	0.03635	0.01811	0.91502	0.00247	0.00231	0.00063
Mean	**0.08918**	**0.01797**	**0.58449**	**0.03531**	**0.01760**	**0.90943**	**0.00353**	**0.00973**	**0.00031**
%RSD	0.12989	1.89688	1.24502	4.17775	4.07338	0.87066	42.58054	107.81064	146.82382

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.08534	0.00003	0.05342	0.05749	-0.00089	0.04069	0.04519	0.08121	0.00898
#2	4.10987	0.00515	0.05353	0.05806	0.01064	0.04843	0.04476	0.08139	0.00926
Mean	**4.09760**	**0.00259**	**0.05348**	**0.05777**	**0.00487**	**0.04456**	**0.04497**	**0.08130**	**0.00912**
%RSD	0.42344	139.59200	0.14912	0.70115	167.16781	12.27465	0.68089	0.14918	2.11574

	Pb	Se
	calc	calc
#1	0.02281	0.00570
#2	0.02418	0.00119
Mean	**0.02350**	**0.00344**
%RSD	4.12561	92.67314

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 19:35:41
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19451	50.38181	0.51233	0.98136	1.00429	0.49518	0.52056	50.25025	0.50127
#2	0.19314	50.16758	0.51187	0.97823	0.99765	0.49303	0.50540	49.94554	0.49824

Mean	0.19383	50.27470	0.51210	0.97979	1.00097	0.49410	0.51298	50.09790	0.49976
%RSD	0.49941	0.30130	0.06434	0.22564	0.46897	0.30764	2.08863	0.43008	0.42940

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48668	0.98172	1.00567	19.98338	48.72282	0.51930	49.91319	0.97426	0.97931
#2	0.48464	0.97837	0.99798	19.89809	48.49926	0.51661	49.74190	0.97055	0.97294
Mean	**0.48566**	**0.98005**	**1.00183**	**19.94074**	**48.61104**	**0.51796**	**49.82755**	**0.97240**	**0.97613**
%RSD	0.29699	0.24189	0.54247	0.30241	0.32520	0.36759	0.24309	0.26947	0.46075

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.32342	0.97196	4.77315	0.97776	0.96555	5.19554	0.48191	1.00908	0.98682
#2	48.10916	0.96080	4.74445	0.97263	0.97692	5.16185	0.47637	1.01031	1.00831
Mean	**48.21629**	**0.96638**	**4.75880**	**0.97520**	**0.97123**	**5.17870**	**0.47914**	**1.00970**	**0.99756**
%RSD	0.31423	0.81631	0.42640	0.37190	0.82719	0.46012	0.81826	0.08614	1.52337

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.95910	1.02928	0.48896	0.50357	0.51124	4.87080	0.48562	1.00386	0.97053
#2	4.94371	1.02599	0.48579	0.50162	0.50477	4.85852	0.48343	1.00024	0.96557
Mean	**4.95141**	**1.02763**	**0.48737**	**0.50259**	**0.50801**	**4.86466**	**0.48453**	**1.00205**	**0.96805**
%RSD	0.21979	0.22654	0.45995	0.27475	0.90004	0.17848	0.31946	0.25514	0.36250

	Pb	**Se**
	calc	calc
#1	0.96962	0.99423
#2	0.97549	1.00898
Mean	**0.97255**	**1.00160**
%RSD	0.42681	1.04091

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 19:37:32
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00019	-0.00225	-0.00152	-0.00899	-0.00069	-0.00029	-0.00066	-0.06741	-0.00058
#2	-0.00126	-0.00395	0.00232	-0.00880	-0.00062	-0.00035	-0.00258	-0.06819	-0.00016
Mean	**-0.00072**	**-0.00310**	**0.00040**	**-0.00889**	**-0.00065**	**-0.00032**	**-0.00162**	**-0.06780**	**-0.00037**
%RSD	104.10183	38.79216	681.23527	1.46292	7.90129	12.14422	84.15542	0.81439	80.76787

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00138	-0.00132	-0.00187	0.00790	-0.11437	-0.00272	-0.02273	-0.00058	-0.00115
#2	-0.00084	-0.00079	-0.00139	0.00681	-0.11931	-0.00273	-0.02242	-0.00058	-0.00153
Mean	**-0.00111**	**-0.00106**	**-0.00163**	**0.00735**	**-0.11684**	**-0.00273**	**-0.02258**	**-0.00058**	**-0.00134**

%RSD	34.65392	35.26415	20.73485	10.48866	2.98746	0.47412	0.96068	0.00000	19.92428

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01415	-0.00223	-0.00972	-0.00440	0.00277	-0.02154	-0.00239	-0.00229	-0.00303
#2	0.01247	-0.00129	-0.01543	0.00045	0.00007	-0.01781	-0.00122	-0.00628	0.00199
Mean	**0.01331**	**-0.00176**	**-0.01258**	**-0.00197**	**0.00142**	**-0.01967**	**-0.00181**	**-0.00428**	**-0.00052**
%RSD	8.91082	37.81874	32.08870	173.96132	134.58817	13.40771	46.08886	65.89137	684.64371

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00751	-0.00099	-0.00403	-0.00262	0.00088	-0.02097	-0.00049	-0.00196	-0.00031
#2	0.00967	0.00120	-0.00400	-0.00275	-0.00115	-0.02873	-0.00106	-0.00230	-0.00020
Mean	**0.00859**	**0.00010**	**-0.00401**	**-0.00269**	**-0.00013**	**-0.02485**	**-0.00077**	**-0.00213**	**-0.00025**
%RSD	17.74718	1498.94816	0.49677	3.41589	1077.32856	22.08290	52.51599	11.38809	30.55343

	Pb	**Se**
	calc	calc
#1	0.00038	-0.00278
#2	0.00020	-0.00076
Mean	**0.00029**	**-0.00177**
%RSD	44.69831	80.54099

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : 1303057-13 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:39:22
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE121

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00020	19.24837	0.01491	-0.00193	0.20275	0.00111	0.00127	25.02643	-0.00009
#2	-0.00100	19.14400	0.01351	-0.00199	0.20136	0.00111	0.00530	24.92639	-0.00026
Mean	**-0.00060**	**19.19619**	**0.01421**	**-0.00196**	**0.20205**	**0.00111**	**0.00328**	**24.97641**	**-0.00018**
%RSD	95.21734	0.38443	6.95935	2.20927	0.48563	0.03785	86.79743	0.28321	72.31451

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01200	0.01726	0.02569	35.70120	4.29822	0.01494	8.64019	0.42481	-0.00102
#2	0.01164	0.01708	0.02502	35.59465	4.28072	0.01487	8.60538	0.42416	-0.00046
Mean	**0.01182**	**0.01717**	**0.02535**	**35.64792**	**4.28947**	**0.01490**	**8.62279**	**0.42448**	**-0.00074**
%RSD	2.17571	0.76795	1.88909	0.21135	0.28852	0.30957	0.28538	0.10904	53.96019

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.08299	0.02034	0.71705	0.02618	0.02358	2.76765	0.00207	0.00200	0.00127
#2	0.08267	0.01940	0.69989	0.02835	0.02333	2.74896	0.00115	0.00449	0.00443
Mean	**0.08283**	**0.01987**	**0.70847**	**0.02727**	**0.02345**	**2.75831**	**0.00161**	**0.00324**	**0.00285**
%RSD	0.27967	3.35380	1.71253	5.60908	0.75665	0.47908	40.25854	54.33928	78.27625

ted: 3/12/2013 13:06:32 User: STEVE WORKMAN

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.89478	-0.00105	0.09282	0.04659	-0.00041	0.00491	0.04259	0.09922	0.00811
#2	3.88013	0.00078	0.09214	0.04665	-0.00021	0.02368	0.04254	0.09837	0.00826
Mean	**3.88745**	**-0.00014**	**0.09248**	**0.04662**	**-0.00031**	**0.01429**	**0.04257**	**0.09880**	**0.00818**
%RSD	0.26637	945.98742	0.51759	0.08110	44.16453	92.85896	0.08152	0.61385	1.30779

	Pb	Se
	calc	calc
#1	0.02445	0.00151
#2	0.02500	0.00445
Mean	**0.02472**	**0.00298**
%RSD	1.58116	69.60361

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:24
SampleId1 : 1303057-14 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:41:08
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE122

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00083	14.35711	0.01386	0.00095	0.17153	0.00063	-0.00154	63.95312	-0.00009
#2	-0.00053	14.29904	0.00920	0.00070	0.17014	0.00066	0.00058	63.76565	0.00006
Mean	**-0.00068**	**14.32807**	**0.01153**	**0.00083**	**0.17083**	**0.00064**	**-0.00048**	**63.85939**	**-0.00002**
%RSD	31.72748	0.28660	28.59134	20.96121	0.57428	3.59556	310.92286	0.20758	553.90498

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00781	0.01065	0.01516	25.03710	2.73206	0.01296	12.85483	0.37930	-0.00134
#2	0.00867	0.01150	0.01645	24.94380	2.74032	0.01295	12.81071	0.37793	-0.00040
Mean	**0.00824**	**0.01107**	**0.01581**	**24.99045**	**2.73619**	**0.01295**	**12.83277**	**0.37861**	**-0.00087**
%RSD	7.34906	5.43651	5.78165	0.26399	0.21347	0.04275	0.24313	0.25551	76.89394

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.07386	0.01374	0.83443	0.02767	0.02381	0.83664	-0.00179	0.00954	0.00690
#2	0.07755	0.01388	0.82734	0.03070	0.02201	0.84037	-0.00153	0.01067	0.00671
Mean	**0.07571**	**0.01381**	**0.83088**	**0.02919**	**0.02291**	**0.83851**	**-0.00166**	**0.01010**	**0.00681**
%RSD	3.44206	0.67333	0.60377	7.34894	5.53380	0.31475	10.90912	7.86947	1.98669

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.62794	-0.00070	0.12118	0.06195	-0.00797	-0.00804	0.03818	0.07024	0.00696
#2	4.61740	0.00515	0.11996	0.06218	0.00178	0.01849	0.03862	0.06887	0.00744
Mean	**4.62267**	**0.00222**	**0.12057**	**0.06207**	**-0.00310**	**0.00523**	**0.03840**	**0.06955**	**0.00720**
%RSD	0.16122	186.15873	0.71146	0.26976	222.52387	358.71049	0.80879	1.39495	4.69072

	Pb	Seser: STEVE WORKMAN
	calc	calc
#1	0.02509	0.00778
#2	0.02491	0.00803
Mean	**0.02500**	**0.00790**
%RSD	0.52530	2.20859

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:25
SampleId1 : 1303057-15 5X SampleId2 : [SAMPLE]
Analysis commenced : 3/11/2013 19:42:53
Dilution ratio : 1.00000 to 1.00000 Tray : Position : TUBE123

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	-0.00111	12.64494	0.00652	-0.00169	0.16883	0.00068	-0.00024	5.29176	0.00006
#2	-0.00111	12.62710	0.00757	-0.00163	0.16813	0.00066	0.00046	5.27840	-0.00018
Mean	**-0.00111**	**12.63602**	**0.00704**	**-0.00166**	**0.16848**	**0.00067**	**0.00011**	**5.28508**	**-0.00006**
%RSD	0.10593	0.09988	10.53190	2.61830	0.29115	2.73489	446.80029	0.17882	278.68101

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01050	0.01200	0.02147	27.25234	3.86695	0.00793	4.87633	0.58224	-0.00159
#2	0.01055	0.01188	0.02119	27.19313	3.84662	0.00788	4.85696	0.58087	0.00086
Mean	**0.01052**	**0.01194**	**0.02133**	**27.22273**	**3.85678**	**0.00791**	**4.86664**	**0.58156**	**-0.00036**
%RSD	0.29446	0.68103	0.93226	0.15382	0.37270	0.44338	0.28142	0.16662	475.97898

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.13269	0.01567	0.86533	0.02293	0.02341	0.73960	-0.00207	0.00006	0.00250
#2	0.13174	0.01607	0.87540	0.02293	0.02286	0.73960	-0.00377	0.00610	0.00337
Mean	**0.13221**	**0.01587**	**0.87036**	**0.02293**	**0.02313**	**0.73960**	**-0.00292**	**0.00308**	**0.00293**
%RSD	0.50408	1.75775	0.81818	0.01854	1.68171	0.00000	41.10445	138.76221	21.02155

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	5.13032	-0.00403	0.04543	0.09151	0.00305	-0.01038	0.03494	0.08310	0.00694
#2	5.12367	-0.00476	0.04518	0.09170	-0.00354	-0.01166	0.03545	0.08207	0.00674
Mean	**5.12700**	**-0.00440**	**0.04531**	**0.09161**	**-0.00025**	**-0.01102**	**0.03520**	**0.08259**	**0.00684**
%RSD	0.09172	11.77222	0.39601	0.14738	1899.69310	8.23195	1.01319	0.88113	2.03680

	Pb	Se
	calc	calc
#1	0.02325	0.00168
#2	0.02288	0.00428
Mean	**0.02306**	**0.00298**
%RSD	1.13114	61.53923

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:25

SampleId1 : CRI **SampleId2 :** [CV]
Analysis commenced : 3/11/2013 19:44:39
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD6

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.02040	0.40146	0.01421	0.39251	0.41036	0.01157	0.05265	5.08423	0.01110
#2	0.02056	0.38838	0.00722	0.39098	0.41029	0.01147	0.05247	5.05955	0.01111
Mean	**0.02048**	**0.39492**	**0.01071**	**0.39174**	**0.41033**	**0.01152**	**0.05256**	**5.07189**	**0.01110**
%RSD	0.52160	2.34185	46.15284	0.27671	0.01260	0.59351	0.24359	0.34408	0.02760

	Co	Cr	Cu	Fe	K	Li	Mg	Mn	Mo
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.10152	0.02135	0.05207	0.19857	3.70812	0.01464	5.14259	0.03127	0.02104
#2	0.10098	0.02064	0.05114	0.19709	3.71285	0.01470	5.11123	0.03104	0.02035
Mean	**0.10125**	**0.02100**	**0.05160**	**0.19783**	**3.71048**	**0.01467**	**5.12691**	**0.03115**	**0.02069**
%RSD	0.37914	2.37436	1.27116	0.52947	0.09007	0.31447	0.43255	0.53851	2.36275

	Na	Ni	P	Pb I	Pb II	S	Sb	Se I	Se II
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	3.90894	0.08132	0.17548	0.01107	0.00185	0.20975	0.11691	0.01591	0.00818
#2	3.92619	0.07952	0.18325	0.00488	0.00615	0.20601	0.11533	0.01329	0.01620
Mean	**3.91756**	**0.08042**	**0.17936**	**0.00798**	**0.00400**	**0.20788**	**0.11612**	**0.01460**	**0.01219**
%RSD	0.31143	1.58030	3.06182	54.82969	76.18068	1.26899	0.96026	12.71108	46.48943

	Si	Sn	Sr	Ti	Tl	U	V	Zn	Zr
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.11516	0.10105	0.01744	0.01877	0.01911	0.18851	0.10392	0.04091	0.05184
#2	0.11256	0.10251	0.01741	0.01897	0.02865	0.17429	0.10260	0.04040	0.05146
Mean	**0.11386**	**0.10178**	**0.01743**	**0.01887**	**0.02388**	**0.18140**	**0.10326**	**0.04065**	**0.05165**
%RSD	1.61149	1.01651	0.11437	0.71565	28.23153	5.54544	0.90201	0.89484	0.52853

	Pb	Se
	calc	calc
#1	0.00492	0.01076
#2	0.00573	0.01523
Mean	**0.00532**	**0.01299**
%RSD	10.81079	24.33836

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:25
SampleId1 : ICSA **SampleId2 :** [ICSAB]
Analysis commenced : 3/11/2013 19:46:29
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD3

Final concentrations

	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm

#1	0.00086	265.99020	0.00465	-0.00212	-0.00036	0.00010	0.00883	261.83152	0.00062
#2	-0.00097	265.71607	-0.00420	-0.00457	-0.00073	0.00007	0.00059	260.70562	0.00022
Mean	**-0.00006**	**265.85314**	**0.00022**	**-0.00334**	**-0.00054**	**0.00008**	**0.00471**	**261.26857**	**0.00042**
%RSD	2298.48460	0.07291	2791.34419	51.89170	47.46160	25.81319	123.78857	0.30472	67.76467

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00373	-0.00039	-0.00418	105.60374	-0.20604	-0.00270	266.43916	0.00417	0.00099
#2	0.00251	-0.00195	-0.00668	105.40080	-0.22108	-0.00272	265.75783	0.00340	-0.00190
Mean	**0.00312**	**-0.00117**	**-0.00543**	**105.50227**	**-0.21356**	**-0.00271**	**266.09850**	**0.00378**	**-0.00046**
%RSD	27.70085	93.81569	32.58699	0.13601	4.98046	0.40854	0.18105	14.40897	445.95474

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.05028	0.00143	0.02612	0.03019	-0.02154	0.01949	0.01132	0.01352	-0.00753
#2	0.04983	-0.00085	0.00717	0.01202	-0.00811	0.00830	-0.00239	-0.00988	0.00423
Mean	**0.05006**	**0.00029**	**0.01665**	**0.02111**	**-0.01483**	**0.01390**	**0.00447**	**0.00182**	**-0.00165**
%RSD	0.63602	561.29057	80.49659	60.89474	64.08016	56.93076	217.04763	910.47958	504.51300

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01141	0.00705	-0.00193	-0.00129	0.00242	0.12612	-0.00165	-0.00196	0.00260
#2	0.00539	0.00120	-0.00205	-0.00139	-0.00259	0.08542	-0.00484	-0.00093	0.00169
Mean	**0.00840**	**0.00413**	**-0.00199**	**-0.00134**	**-0.00009**	**0.10577**	**-0.00325**	**-0.00144**	**0.00214**
%RSD	50.65404	100.30768	4.33572	5.64365	4140.49969	27.21134	69.45136	50.39771	30.06178

	Pb	**Se**
	calc	calc
#1	-0.00432	-0.00052
#2	-0.00141	-0.00047
Mean	**-0.00286**	**-0.00049**
%RSD	71.90585	8.21789

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:25
SampleId1 : ICSAB SampleId2 : [ICSAB]
Analysis commenced : 3/11/2013 19:48:19
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD4

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19864	264.60510	0.11095	0.98087	0.50457	0.50234	0.53308	259.80080	0.99226
#2	0.19931	264.25841	0.10792	0.98289	0.50307	0.50214	0.52571	259.36725	0.98586
Mean	**0.19897**	**264.43175**	**0.10943**	**0.98188**	**0.50382**	**0.50224**	**0.52939**	**259.58403**	**0.98906**
%RSD	0.23944	0.09271	1.95794	0.14569	0.21049	0.02942	0.98510	0.11810	0.45731

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.48332	0.48585	0.53590	105.34254	-0.19335	1.05634	266.25940	0.49308	0.96734

#2	0.48214	0.48564	0.53596	105.31063	-0.19076	1.05529	266.19469	0.49302	0.96400
Mean	**0.48273**	**0.48575**	**0.53593**	**105.32659**	**-0.19206**	**1.05582**	**266.22704**	**0.49305**	**0.96567**
%RSD	0.17293	0.03167	0.00775	0.02142	0.95190	0.07069	0.01719	0.00854	0.24439

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01787	0.94323	0.95483	0.06705	0.03153	1.05687	0.58468	0.05527	0.04486
#2	0.01763	0.94003	0.94911	0.06063	0.03715	1.06807	0.57261	0.05421	0.05049
Mean	**0.01775**	**0.94163**	**0.95197**	**0.06384**	**0.03434**	**1.06247**	**0.57865**	**0.05474**	**0.04768**
%RSD	0.97796	0.24030	0.42513	7.11182	11.55843	0.74533	1.47516	1.37589	8.35379

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	1.00436	1.02358	0.97252	0.99443	0.10096	9.67177	0.48560	0.97700	0.48490
#2	0.99962	1.02688	0.97023	0.99581	0.10276	9.70803	0.48334	0.98148	0.48473
Mean	**1.00199**	**1.02523**	**0.97138**	**0.99512**	**0.10186**	**9.68990**	**0.48447**	**0.97924**	**0.48482**
%RSD	0.33455	0.22711	0.16693	0.09851	1.24579	0.26464	0.33108	0.32322	0.02447

	Pb	**Se**
	calc	calc
#1	0.04336	0.04833
#2	0.04497	0.05173
Mean	**0.04416**	**0.05003**
%RSD	2.57166	4.80871

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:25
SampleId1 : CCV **SampleId2 :** **[CV]**
Analysis commenced : 3/11/2013 19:50:10
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD1

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.19595	50.28779	0.52119	0.98485	0.99894	0.49869	0.51281	50.63008	0.50173
#2	0.19400	50.41697	0.52049	0.98565	1.00011	0.49946	0.51087	50.59423	0.50123
Mean	**0.19498**	**50.35238**	**0.52084**	**0.98525**	**0.99952**	**0.49907**	**0.51184**	**50.61215**	**0.50148**
%RSD	0.70880	0.18140	0.09489	0.05720	0.08303	0.10982	0.26705	0.05009	0.06935

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.49078	0.98886	1.00051	20.09160	48.48623	0.51582	50.37727	0.97982	0.98176
#2	0.49078	0.98911	1.00070	20.10561	48.61704	0.51708	50.37601	0.98125	0.97641
Mean	**0.49078**	**0.98898**	**1.00061**	**20.09861**	**48.55163**	**0.51645**	**50.37664**	**0.98053**	**0.97908**
%RSD	0.00006	0.01811	0.01349	0.04928	0.19053	0.17294	0.00176	0.10345	0.38659

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	48.03790	0.97586	4.78055	0.99615	0.95668	5.20303	0.47917	1.01501	0.98017
#2	48.12688	0.97380	4.79976	0.99011	0.98630	5.19554	0.48337	1.01404	1.02265

Mean	**48.08239**	**0.97483**	**4.79016**	**0.99313**	**0.97149**	**5.19929**	**0.48127**	**1.01452**	**1.00141**
%RSD	0.13085	0.14945	0.28357	0.43010	2.15626	0.10185	0.61747	0.06752	2.99953

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	4.96869	1.03733	0.48715	0.50630	0.51746	4.86431	0.48993	1.01953	0.97177
#2	4.97777	1.03733	0.48693	0.50729	0.50437	4.86107	0.48881	1.01798	0.97205
Mean	**4.97323**	**1.03733**	**0.48704**	**0.50679**	**0.51091**	**4.86269**	**0.48937**	**1.01875**	**0.97191**
%RSD	0.12913	0.00008	0.03151	0.13730	1.81167	0.04708	0.16103	0.10756	0.02011

	Pb	**Se**
	calc	calc
#1	0.96982	0.99177
#2	0.98757	1.01978
Mean	**0.97869**	**1.00578**
%RSD	1.28230	1.96932

Method : Paragon2 File : 130311A Printed : 3/12/2013 13:06:26
SampleId1 : CCB SampleId2 : [CB]
Analysis commenced : 3/11/2013 19:52:01
Dilution ratio : 1.00000 to 1.00000 Tray : Position : STD2

Final concentrations

	Ag	**Al**	**As**	**B**	**Ba**	**Be**	**Bi**	**Ca**	**Cd**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00207	0.01641	0.00209	-0.00432	-0.00018	-0.00025	0.01267	-0.06413	0.00050
#2	0.00122	0.01761	-0.00013	-0.00567	-0.00025	-0.00025	0.00917	-0.06398	0.00005
Mean	**0.00164**	**0.01701**	**0.00098**	**-0.00500**	**-0.00022**	**-0.00025**	**0.01092**	**-0.06405**	**0.00027**
%RSD	36.57309	4.98386	159.45974	19.08607	23.97587	0.58377	22.65801	0.17241	117.21718

	Co	**Cr**	**Cu**	**Fe**	**K**	**Li**	**Mg**	**Mn**	**Mo**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.00102	0.00057	0.00055	0.01015	-0.09674	-0.00271	-0.00525	-0.00034	-0.00134
#2	0.00075	0.00070	0.00082	0.00930	-0.10544	-0.00271	-0.00279	-0.00040	-0.00046
Mean	**0.00088**	**0.00064**	**0.00068**	**0.00973**	**-0.10109**	**-0.00271**	**-0.00402**	**-0.00037**	**-0.00090**
%RSD	21.66543	13.81083	27.55044	6.22845	6.08380	0.13618	43.16830	11.39988	69.25722

	Na	**Ni**	**P**	**Pb I**	**Pb II**	**S**	**Sb**	**Se I**	**Se II**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01554	0.00022	-0.00721	0.00844	-0.00853	-0.01408	0.00259	0.01162	-0.00003
#2	0.01480	-0.00112	-0.00721	0.00669	-0.00761	-0.01035	0.00299	0.01273	-0.00329
Mean	**0.01517**	**-0.00045**	**-0.00721**	**0.00757**	**-0.00807**	**-0.01221**	**0.00279**	**0.01217**	**-0.00166**
%RSD	3.43218	211.45733	0.00000	16.37374	8.04889	21.59858	10.11509	6.47447	138.51969

	Si	**Sn**	**Sr**	**Ti**	**Tl**	**U**	**V**	**Zn**	**Zr**
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
#1	0.01643	0.00413	-0.00388	-0.00229	0.00972	0.00619	0.00137	-0.00110	0.00098
#2	0.01464	0.00047	-0.00388	-0.00285	0.00913	0.02236	0.00109	-0.00093	0.00093
Mean	**0.01554**	**0.00230**	**-0.00388**	**-0.00257**	**0.00943**	**0.01428**	**0.00123**	**-0.00101**	**0.00096**

%RSD	8.16332	112.52882	0.17120	15.36692	4.38596	80.07832	16.47149	11.94778	3.63792

	Pb calc	**Se** calc
#1	-0.00287	0.00385
#2	-0.00285	0.00204
Mean	**-0.00286**	**0.00294**
%RSD	0.71503	43.28997

Header Information for Analytical Sequence 13C08m01

Instrument: Agilent ICPMS Model 7700X; Serial No. JP09400112
Software Revision: B.01.01
Date of Analysis: 03/08/2013
Analyst: Ross Miller

Calibration Standards

High Calibration Standard: ST100324-6 (expires 2/28/2015)
This standard contains the following elements at the listed concentrations (ng/ml).

100000	50000	10000	5000	2000	1000	500	200	100	50	30	10	2
Na	Ca	Mg	Fe	Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	K		Al	Ti	Cu	Ni		Co	Be	Cd	U	
					Li	Sn		As		Y	Ag	
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

1/10,1/100, and 1/1000 dilutions of the High Calibration Standard are prepared daily to provide additional calibration standards.

ICV

The ICV is prepared by diluting 1ml of the 2nd Source intermediate (ST121126-2, expires 12/18/2013) to 5ml giving the following concentrations (ng/ml).

20000	10000	2000	1000	400	200	100	40	20	10	6	2	0.4
Na	Ca	Mg	Fe	Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	K		Al	Ti	Cu	Ni		Co	Be	Cd	U	
					Li	Sn		As		Y	Ag	
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

CRI1

The RL1 is prepared by diluting 0.05ml of the Reporting Limit Verification Spike Solution (ST100324-9 expires 2/28/2015) to 50ml giving the following concentrations (ng/ml).

100	50	10	5	2	1	0.5	0.2	0.1	0.05	0.03	0.02	0.01
Na	Ca	Mg	Al	Zn	B	Cr	Mn	V	Pb	Sb	Th	U
	K		Fe	Ti	Cu	Ni		Co	Be	Cd	Tl	Ag
					Li	Sn		As		Y		
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

CRI2

The RL2 is prepared by diluting 0.1ml of the Reporting Limit Verification Spike Solution (ST100324-9 expires 2/28/2015) to 50ml giving the following concentrations (ng/ml).

200	100	20	10	4	2	1	0.4	0.2	0.1	0.06	0.04	0.02
Na	Ca	Mg	Al	Zn	B	Cr	Mn	V	Pb	Sb	Th	U
	K		Fe	Ti	Cu	Ni		Co	Be	Cd	Tl	Ag
					Li	Sn		As		Y		
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

ICSA

The ICSA is prepared by diluting 0.5ml of ICSA intermediate (ST121206-1, expires 01/01/14) to a final volume of 50ml giving the following concentrations (ng/ml).

42.5 X 10^6	30000	25000	20000	10000	200
Cl	Ca	Fe	C	Al	Mo
		Na		K	Ti
				Mg	
				P	
				S	

ICSAB

The ICSAB is prepared by diluting 0.5ml of ICSA intermediate (ST121206-1, expires 01/01/14) and 5ml of High Calibration Standard: ST100324-6 (expires 2/28/2015) to a final volume of 50ml. The ICSAB contains the following elements at the listed concentrations (ng/ml).

42.5X10^6	35000	25500	20000	15000	11000	10500	10000	400	210
Cl	Ca	Fe	C	K	Mg	Al	P	Ti	Mo
	Na						S		

200	100	50	20	10	5	3	1	0.2
Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	Cu	Ni		Co	Be	Cd	U	
	Li	Sn		As		Y	Ag	
				Se		La		
				Ba		Ce		
				Sr		Pr		
						Nd		

CCV

The CCV is prepared by diluting 5ml of the High Calibration Standard: ST100324-6 (expires 2/28/2015) to a final volume of 50ml. The CCV contains the following elements at the listed concentrations (ng/ml).

10000	5000	1000	500	200	100	50	20	10	5	3	1	0.2
Na	Ca	Mg	Fe	Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	K		Al	Ti	Cu	Ni		Co	Be	Cd	U	
					Li	Sn		As		Y	Ag	
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

Linear Dynamic Range Standards

LDR-Ca,Na,K

The LDR-Ca,Na,K standard is prepared by diluting 1ml of the High Calibration Standard Intermediate Mix (ST100324-5, expires 2/28/2015) to a final volume of 10ml. The LDR-Ca,Na,K standard contains the following elements at the listed concentrations (ng/ml).

100000	50000	20000	10000	5000	2000	1000	500	300	100	20
Mg	Fe	Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	Al	Ti	Cu	Ni		Co	Be	Cd	U	
			Li	Sn		As		Y	Ag	
						Se		La		
						Mo		Ce		
						Ba		Pr		
						Sr		Nd		

1000 Na

The 1000 Na standard is prepared by diluting 1ml of the 10000mg/L Na stock solution (ST100301-26, expires 2/28/2015) to a final volume of 10ml. The 1000 Na standard contains Na at 1000000 ng/ml.

500 Ca

The 500 Ca standard is prepared by diluting 0.5ml of the 10000mg/L Ca stock solution (ST100301-9, expires 2/28/2015) to a final volume of 10ml. The 500 Ca standard contains Ca at 500000 ng/ml.

500 K

The 500 K standard is prepared by diluting 0.5ml of the 10000mg/L K stock solution (ST100301-22, expires 2/28/2015) to a final volume of 10ml. The 500 K standard contains K at 500000 ng/ml.

Linear Dynamic Range

The instrument Linear Dynamic Range (LDR) is determined at least every 6 months. The current LDR was determined on 09/13/2012. The instrument LDR is given below (ng/ml).

1000000	500000	100000	50000	20000	10000	5000	2000	1000	500	300	100	20
Na	Ca	Mg	Fe	Zn	B	Cr	Mn	V	Pb	Sb	Th	Tl
	K		Al	Ti	Cu	Ni		Co	Be	Cd	U	
					Li	Sn		As		Y	Ag	
								Se		La		
								Mo		Ce		
								Ba		Pr		
								Sr		Nd		

ICB/CCB and all diluent

1% HNO_3, 1%HCl in double deionized water

HNO_3 Lot No. K23022
HCl Lot No. K33031

Internal Standards

The internal standard intermediate contains 2 PPM each of Ga, Ge and Pt; 1 PPM each of In and Rh and 0.5 PPM of Bi. This intermediate is added to all standards and samples in the same proportion of 1 on top of 100. Most often this is done by adding 0.05ml of internal standard intermediate on top of 5ml of sample or standard. The final concentration of internal standard added to the standards or samples is about 20ppb each of Ga, Ge and Pt; 10ppb each of In and Rh; and 5ppb of Bi.

Pipet ID Numbers

1.0 to 5.0 ml -- M-66
0.1 to 1.0ml -- M-60
0.01 to 0.1ml -- M-56
0.5ml -- M-14

Dilutions

2X dilutions made by diluting 5ml of sample to 10ml final volume
5X dilutions made by diluting 1ml of sample to 5ml final volume
10X dilutions made by diluting 1ml of sample to 10ml final volume
50X dilutions made by diluting 0.1ml of sample to 5ml final volume
100X dilutions made by diluting 0.1ml of sample to 10ml final volume
200X dilutions made by diluting 0.05ml of sample to 10ml final volume
500X dilutions made by diluting 0.02ml of sample to 10ml final volume

Analytical Spikes

None needed in this sequence.

Daily Maintenance Items

1. Check / change pump tubing
2. Check / clean drain containers
3. Tune instrument per manufacturer's procedures
4. Perform resolution / mass calibration / stability test and print QC tune report

Monthly Maintenance Items

1. Check / clean torch and cones
2. Check / clean nebulizer and spray chamber
3. Check / fill water recirculating reservoir
4. Check / fill vacuum pump oil

Additional Comments

No additional comments.

QC Tune Report

Data File: C:\ICPMH\1\7500\QCTUNE.D
Date Acquired: 8 Mar 2013 11:49:06 am
Operator:
Misc Info:
Vial Number: 0
Current Method: C:\ICPMH\1\METHODS\2008TUNE.m

Minimum Response(CPS)

Element	Actual	Required	Flag

RSD (%)

Element	Actual	Required	Flag
9 Be	1.75	5.00	
24 Mg	0.61	5.00	
25 Mg	0.86	5.00	
26 Mg	0.63	5.00	
59 Co	0.81	5.00	
115 In	0.54	5.00	
206 Pb	0.77	5.00	
207 Pb	0.64	5.00	
208 Pb	0.62	5.00	

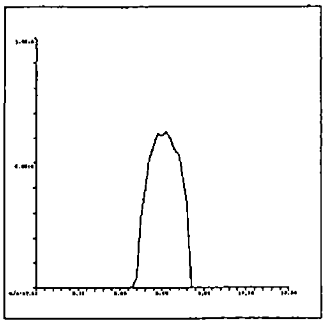
Ion Ratio

Element	Actual	Required	Flag

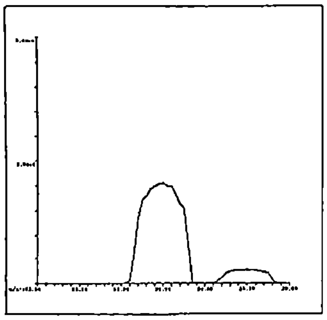
Maximum Bkg. Count(CPS)

Element	Actual	Required	Flag

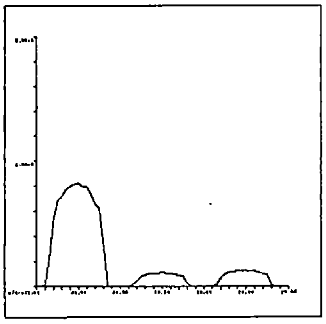
C:\ICPMH\1\7500\QCTUNE.D



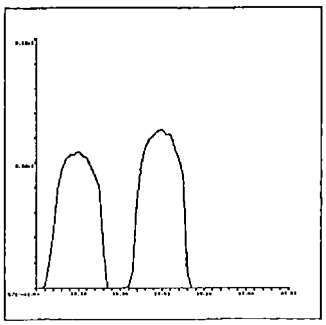
9 Be
Mass Calib.
Actual: 9.00
Required: 8.90-9.10
Flag:
Peak Width
Actual: 0.60
Required: 0.80
Flag:



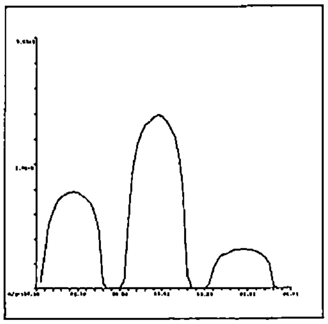
24 Mg
Mass Calib.
Actual: 24.00
Required: 23.90-24.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



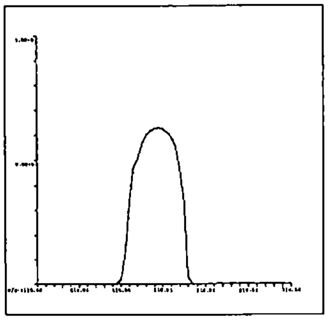
25 Mg
Mass Calib.
Actual: 25.00
Required: 24.90-25.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



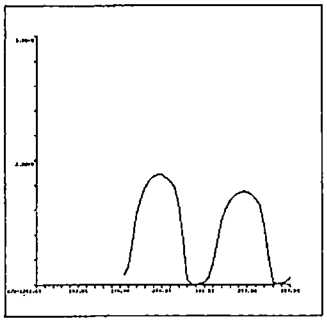
26 Mg
Mass Calib.
Actual: 26.00
Required: 25.90-26.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



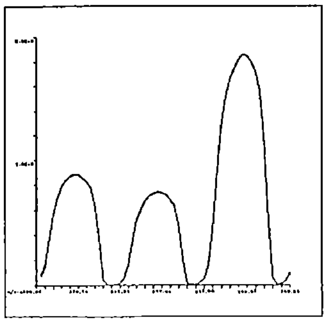
59 Co
Mass Calib.
Actual: 58.95
Required: 58.90-59.10
Flag:
Peak Width
Actual: 0.70
Required: 0.80
Flag:



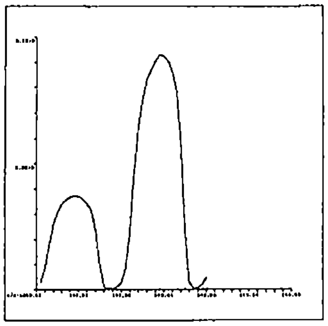
115 In
Mass Calib.
Actual: 114.95
Required: 114.90-115.10
Flag:
Peak Width
Actual: 0.70
Required: 0.80
Flag:



206 Pb
Mass Calib.
Actual: 205.95
Required: 205.90-206.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



207 Pb
Mass Calib.
Actual: 206.95
Required: 206.90-207.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:



208 Pb
Mass Calib.
Actual: 207.95
Required: 207.90-208.10
Flag:
Peak Width
Actual: 0.65
Required: 0.80
Flag:

QC Tune Result:Pass

Batch Summary Report

Batch Folder: C:¥ICPMH¥1¥DATA¥13C08m01.B¥
Analysis File: 13C08m01.batch.xml
Tune Step: #1 nogas.u
#2 hehe.u

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
1		3/8/2013 12:28:59 PM	001SMPL.D	blank	Sample		1.0000
2		3/8/2013 12:32:02 PM	002CALB.D	blank	CalBlk	1	1.0000
3		3/8/2013 12:35:05 PM	003CALB.D	blank	CalBlk	1	1.0000
4		3/8/2013 12:38:08 PM	004CALS.D	H/1000	CalStd	2	1.0000
5		3/8/2013 12:41:15 PM	005CALS.D	H/100	CalStd	3	1.0000
6		3/8/2013 12:44:19 PM	006CALS.D	H/10	CalStd	4	1.0000
7		3/8/2013 12:47:21 PM	007CALS.D	HIGH	CalStd	5	1.0000
8		3/8/2013 12:54:55 PM	008SMPL.D	ZZZZZZ	Sample		1.0000
9		3/8/2013 1:02:30 PM	009SMPL.D	ICV	6-ICV		1.0000
10		3/8/2013 1:18:37 PM	001SMPL_13C08n00.D	ICB	6-CCB		1.0000
11		3/8/2013 1:21:43 PM	002SMPL_13C08n00.D	CRI1	Sample		1.0000
12		3/8/2013 1:24:46 PM	003SMPL_13C08n00.D	ICSA	Sample		1.0000
13		3/8/2013 1:27:49 PM	004SMPL_13C08n00.D	ICSAB	Sample		1.0000
14		3/8/2013 1:39:37 PM	001SMPL_13C08n01.D	ZZZZZZ	Sample		1.0000
15		3/8/2013 1:42:39 PM	002SMPL_13C08n01.D	IP130307-1MB 10X	6-CCB		1.0000
16		3/8/2013 1:45:41 PM	003SMPL_13C08n01.D	1302343-1 10X	Sample		1.0000
17		3/8/2013 1:48:43 PM	004SMPL_13C08n01.D	1302347-1 10X	Sample		1.0000
18		3/8/2013 1:51:46 PM	005SMPL_13C08n01.D	1303056-2 10X	Sample		1.0000
19		3/8/2013 1:54:48 PM	006SMPL_13C08n01.D	1303056-2D 10X	Sample		1.0000
20		3/8/2013 2:00:19 PM	007SMPL_13C08n01.D	1303056-2L 50X	Sample		1.0000
21		3/8/2013 2:03:22 PM	008SMPL_13C08n01.D	CCV	6-CCV		1.0000
22		3/8/2013 2:16:46 PM	001SMPL_13C08o01.D	CCB	6-CCB		1.0000
23		3/8/2013 2:19:50 PM	002SMPL_13C08o01.D	F130301-1MB 10X	6-CCB		1.0000
24		3/8/2013 2:22:54 PM	003SMPL_13C08o01.D	1303056-2MS 10X	Sample		1.0000
25		3/8/2013 2:25:56 PM	004SMPL_13C08o01.D	1303056-2MSD 10X	Sample		1.0000
26		3/8/2013 2:29:01 PM	005SMPL_13C08o01.D	FM130301-1LCS 10X	6-LCS		1.0000
27		3/8/2013 2:32:06 PM	006SMPL_13C08o01.D	IP130307-1LCS 10X	6-LCS		1.0000

301 of 367

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
28		3/8/2013 2:41:26 PM	001SMPL_13C08o02.D	1303045-1 10X	Sample		1.0000
29		3/8/2013 2:44:27 PM	002SMPL_13C08o02.D	1303044-1 10X	Sample		1.0000
30		3/8/2013 2:47:30 PM	003SMPL_13C08o02.D	CCV	6-CCV		1.0000
31		3/8/2013 2:58:50 PM	001SMPL_13C08o03.D	CCB	6-CCB		1.0000
32		3/8/2013 3:01:54 PM	002SMPL_13C08o03.D	1303028-3 10X	Sample		1.0000
33		3/8/2013 3:04:56 PM	003SMPL_13C08o03.D	1303028-3L 50X	Sample		1.0000
34		3/8/2013 3:07:58 PM	004SMPL_13C08o03.D	1303028-3MS 10X	Sample		1.0000
35		3/8/2013 3:11:01 PM	005SMPL_13C08o03.D	1303028-1 10X	Sample		1.0000
36		3/8/2013 3:14:04 PM	006SMPL_13C08o03.D	1303028-2 10X	Sample		1.0000
37		3/8/2013 3:17:07 PM	007SMPL_13C08o03.D	1303046-1 10X	Sample		1.0000
38		3/8/2013 3:20:10 PM	008SMPL_13C08o03.D	1303029-1 10X	Sample		1.0000
39		3/8/2013 3:23:14 PM	009SMPL_13C08o03.D	1303029-2 10X	Sample		1.0000
40		3/8/2013 3:26:19 PM	010SMPL_13C08o03.D	1303030-1 10X	Sample		1.0000
41		3/8/2013 3:38:10 PM	001SMPL_13C08p00.D	1303028-3MSD 10X	Sample		1.0000
42		3/8/2013 3:41:12 PM	002SMPL_13C08p00.D	CCV	6-CCV		1.0000
43		3/8/2013 3:53:58 PM	001SMPL_13C08p01.D	CCB	6-CCB		1.0000
44		3/8/2013 4:10:22 PM	001SMPL_13C08q00.D	IP130307-2MB 10X	6-CCB		1.0000
45		3/8/2013 4:12:19 PM	002SMPL_13C08q00.D	IP130307-3MB 10X	6-CCB		1.0000
46		3/8/2013 4:14:18 PM	003SMPL_13C08q00.D	IP130307-4MB 10X	6-CCB		1.0000
47		3/8/2013 4:16:17 PM	004SMPL_13C08q00.D	IM130307-2LCS 10X	6-LCS		1.0000
48		3/8/2013 4:18:18 PM	005SMPL_13C08q00.D	IM130307-3LCS 10X	6-LCS		1.0000
49		3/8/2013 4:20:17 PM	006SMPL_13C08q00.D	IM130307-4LCS 10X	6-LCS		1.0000
50		3/8/2013 4:22:17 PM	007SMPL_13C08q00.D	1303058-1 100X	Sample		1.0000
51		3/8/2013 4:24:16 PM	008SMPL_13C08q00.D	1303058-1D 100X	Sample		1.0000
52		3/8/2013 4:26:16 PM	009SMPL_13C08q00.D	1303058-1L 500X	Sample		1.0000
53		3/8/2013 4:28:16 PM	010SMPL_13C08q00.D	1303058-1MS 100X	Sample		1.0000
54		3/8/2013 4:34:38 PM	011SMPL_13C08q00.D	CCV	6-CCV		1.0000
55		3/8/2013 4:36:36 PM	012SMPL_13C08q00.D	CCB	6-CCB		1.0000
56		3/8/2013 4:38:36 PM	013SMPL_13C08q00.D	1303058-1MSD 100X	Sample		1.0000
57		3/8/2013 4:40:36 PM	014SMPL_13C08q00.D	1303058-1A 100X	Sample		1.0000
58		3/8/2013 4:42:35 PM	015SMPL_13C08q00.D	1303058-2 100X	Sample		1.0000
59		3/8/2013 4:44:35 PM	016SMPL_13C08q00.D	1303058-3 100X	Sample		1.0000
60		3/8/2013 4:46:35 PM	017SMPL_13C08q00.D	1303058-4 100X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
61		3/8/2013 4:48:33 PM	018SMPL_13C08q00.D	1303058-5 100X	Sample		1.0000
62		3/8/2013 4:50:33 PM	019SMPL_13C08q00.D	1303058-6 100X	Sample		1.0000
63		3/8/2013 4:52:32 PM	020SMPL_13C08q00.D	1303058-7 100X	Sample		1.0000
64		3/8/2013 4:54:31 PM	021SMPL_13C08q00.D	1303058-8 100X	Sample		1.0000
65		3/8/2013 4:56:30 PM	022SMPL_13C08q00.D	1303058-9 100X	Sample		1.0000
66		3/8/2013 5:02:53 PM	023SMPL_13C08q00.D	CCV	6-CCV		1.0000
67		3/8/2013 5:04:52 PM	024SMPL_13C08q00.D	CCB	6-CCB		1.0000
68		3/8/2013 5:06:53 PM	025SMPL_13C08q00.D	1303058-10 100X	Sample		1.0000
69		3/8/2013 5:08:53 PM	026SMPL_13C08q00.D	1303058-11 100X	Sample		1.0000
70		3/8/2013 5:10:52 PM	027SMPL_13C08q00.D	1303058-12 100X	Sample		1.0000
71		3/8/2013 5:12:52 PM	028SMPL_13C08q00.D	1303058-13 100X	Sample		1.0000
72		3/8/2013 5:14:51 PM	029SMPL_13C08q00.D	1303058-14 100X	Sample		1.0000
73		3/8/2013 5:16:49 PM	030SMPL_13C08q00.D	1303059-1 100X	Sample		1.0000
74		3/8/2013 5:18:48 PM	031SMPL_13C08q00.D	1303059-1D 100X	Sample		1.0000
75		3/8/2013 5:20:48 PM	032SMPL_13C08q00.D	1303059-1L 500X	Sample		1.0000
76		3/8/2013 5:22:48 PM	033SMPL_13C08q00.D	1303059-1MS 100X	Sample		1.0000
77		3/8/2013 5:24:48 PM	034SMPL_13C08q00.D	1303059-1MSD 100X	Sample		1.0000
78		3/8/2013 5:31:10 PM	035SMPL_13C08q00.D	CCV	6-CCV		1.0000
79		3/8/2013 5:33:10 PM	036SMPL_13C08q00.D	CCB	6-CCB		1.0000
80		3/8/2013 5:35:09 PM	037SMPL_13C08q00.D	1303059-1A 100X	Sample		1.0000
81		3/8/2013 5:37:09 PM	038SMPL_13C08q00.D	1303059-2 100X	Sample		1.0000
82		3/8/2013 5:39:08 PM	039SMPL_13C08q00.D	1303059-3 100X	Sample		1.0000
83		3/8/2013 5:41:07 PM	040SMPL_13C08q00.D	1303059-4 100X	Sample		1.0000
84		3/8/2013 5:43:06 PM	041SMPL_13C08q00.D	1303059-5 100X	Sample		1.0000
85		3/8/2013 5:45:06 PM	042SMPL_13C08q00.D	1303059-6 100X	Sample		1.0000
86		3/8/2013 5:47:05 PM	043SMPL_13C08q00.D	1303059-7 100X	Sample		1.0000
87		3/8/2013 5:49:03 PM	044SMPL_13C08q00.D	1303059-8 100X	Sample		1.0000
88		3/8/2013 5:51:03 PM	045SMPL_13C08q00.D	1303059-9 100X	Sample		1.0000
89		3/8/2013 5:53:02 PM	046SMPL_13C08q00.D	1303059-10 100X	Sample		1.0000
90		3/8/2013 5:59:24 PM	047SMPL_13C08q00.D	CCV	6-CCV		1.0000
91		3/8/2013 6:01:24 PM	048SMPL_13C08q00.D	CCB	6-CCB		1.0000
92		3/8/2013 6:03:24 PM	049SMPL_13C08q00.D	1303059-11 100X	Sample		1.0000
93		3/8/2013 6:05:23 PM	050SMPL_13C08q00.D	1303059-12 100X	Sample		1.0000

	Rjct	Acq. Date-Time	Data File	Sample Name	Type	Level	Dilution
94		3/8/2013 6:07:22 PM	051SMPL_13C08q00.D	1303059-13 100X	Sample		1.0000
95		3/8/2013 6:09:21 PM	052SMPL_13C08q00.D	1303059-14 100X	Sample		1.0000
96		3/8/2013 6:11:21 PM	053SMPL_13C08q00.D	1303059-15 100X	Sample		1.0000
97		3/8/2013 6:13:20 PM	054SMPL_13C08q00.D	1303060-1 100X	Sample		1.0000
98		3/8/2013 6:15:19 PM	055SMPL_13C08q00.D	1303060-1D 100X	Sample		1.0000
99		3/8/2013 6:17:19 PM	056SMPL_13C08q00.D	1303060-1L 50X	Sample		1.0000
100		3/8/2013 6:19:18 PM	057SMPL_13C08q00.D	1303060-1MS 100X	Sample		1.0000
101		3/8/2013 6:21:19 PM	058SMPL_13C08q00.D	1303060-1MSD 100X	Sample		1.0000
102		3/8/2013 6:27:41 PM	059SMPL_13C08q00.D	CCV	6-CCV		1.0000
103		3/8/2013 6:29:41 PM	060SMPL_13C08q00.D	CCB	6-CCB		1.0000
104		3/8/2013 6:31:40 PM	061SMPL_13C08q00.D	1303060-1A 100X	Sample		1.0000
105		3/8/2013 6:33:39 PM	062SMPL_13C08q00.D	1303060-2 100X	Sample		1.0000
106		3/8/2013 6:35:38 PM	063SMPL_13C08q00.D	1303060-3 100X	Sample		1.0000
107		3/8/2013 6:37:37 PM	064SMPL_13C08q00.D	1303060-4 100X	Sample		1.0000
108		3/8/2013 6:39:35 PM	065SMPL_13C08q00.D	1303060-5 100X	Sample		1.0000
109		3/8/2013 6:41:35 PM	066SMPL_13C08q00.D	1303060-6 100X	Sample		1.0000
110		3/8/2013 6:43:36 PM	067SMPL_13C08q00.D	1303060-7 100X	Sample		1.0000
111		3/8/2013 6:45:35 PM	068SMPL_13C08q00.D	1303060-8 100X	Sample		1.0000
112		3/8/2013 6:47:34 PM	069SMPL_13C08q00.D	1303060-9 100X	Sample		1.0000
113		3/8/2013 6:49:34 PM	070SMPL_13C08q00.D	1303060-10 100X	Sample		1.0000
114		3/8/2013 6:55:57 PM	071SMPL_13C08q00.D	CCV	6-CCV		1.0000
115		3/8/2013 6:57:57 PM	072SMPL_13C08q00.D	CCB	6-CCB		1.0000
116		3/8/2013 6:59:56 PM	073SMPL_13C08q00.D	1303060-11 100X	Sample		1.0000
117		3/8/2013 7:01:55 PM	074SMPL_13C08q00.D	1303060-12 100X	Sample		1.0000
118		3/8/2013 7:08:18 PM	075SMPL_13C08q00.D	CCV	6-CCV		1.0000
119		3/8/2013 7:10:18 PM	076SMPL_13C08q00.D	CCB	6-CCB		1.0000

Analyte Table

		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]		27 Al [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		53.33		844.48		10623.84		13.33		80.00
2	blank	0.004	78.67	-0.301	852.26	-1.579	10570.36	0.297	13.33	-0.056	93.34
3	blank	0.000	52.00	-0.307	834.48	0.000	10877.35	0.000	0.00	0.000	100.01
4	H/1000	0.048	406.68	0.855	5263.09	97.046	38876.33	9.846	453.37	4.337	730.05
5	H/100	0.474	3727.11	10.504	44064.68	984.380	309591.82	94.543	4620.86	48.346	7532.00
6	H/10	4.740	37808.03	99.947	420271.19	9892.168	3038029.95	941.095	46525.34	476.342	74100.78
7	HIGH	50.026	398033.93	999.976	4744988.42	100010.942	30007005.39	10005.945	484965.82	5002.383	761893.22
8	ZZZZZZ	0.004	80.00	23.125	87664.13	-0.111	10914.03	0.373	16.67	0.017	103.34
9	ICV	9.895	82998.60	216.456	965834.65	20006.120	6307545.12	1940.500	98676.43	972.633	155518.95
10	ICB	0.001	62.00	4.286	18603.65	0.508	11531.11	0.791	36.67	-0.147	83.33
11	CRI1	0.045	437.34	4.357	21033.11	99.188	44189.75	12.297	633.37	7.278	1293.43
12	ICSA	0.000	58.67	2.713	14924.50	24581.001	8039187.79	8989.296	474309.47	8886.710	1473435.71
13	ICSAB	4.911	41854.10	107.600	490729.44	35094.335	11323733.58	10174.096	529875.49	9505.808	1555678.41
14	ZZZZZZ	-0.001	46.67	2.494	11984.33	3.786	12982.34	2.413	116.67	9.330	1526.81
15	IP130307-1MB ...	0.001	60.67	2.022	9985.26	-1.602	10777.19	1.017	46.67	0.856	226.68
16	1302343-1 10X	-0.001	51.33	7.818	36454.50	9165.016	3033886.52	113.698	6054.68	2.128	476.70
17	1302347-1 10X	-0.001	54.00	7.942	36859.96	7757.262	2533659.39	91.629	4810.92	1.706	400.02
18	1303056-2 10X	-0.001	52.67	9.479	46189.07	5851.868	1975145.13	2422.050	131215.22	2.985	630.04
19	1303056-2D 10X	-0.001	56.67	9.893	49078.10	6070.727	2108090.18	2464.419	137394.70	2.881	630.04
20	1303056-2L 50X	-0.002	46.67	2.972	15967.60	1108.962	397497.17	465.060	26004.48	1.726	430.03
21	CCV	4.675	42947.45	97.497	472688.78	9880.744	3384676.93	960.876	52977.95	475.908	82557.20
22	CCB	-0.002	40.67	1.507	8628.94	-2.093	11677.90	0.531	26.67	0.314	163.34
23	F130301-1MB ...	-0.003	34.67	1.357	7953.08	-2.670	11170.89	0.619	30.00	0.063	120.01
24	1303056-2MS 10X	4.816	42936.69	103.981	488678.35	7095.319	2372593.51	3367.903	180975.83	459.493	77720.42
25	1303056-2MSD ...	4.816	41882.16	112.612	518711.91	7084.697	2409815.69	3375.730	184518.10	459.444	79023.51
26	FM130301-1LC...	4.669	40353.16	106.888	481867.74	1010.147	347859.20	904.683	48444.51	442.088	74492.57
27	IP130307-1LCS...	4.460	38828.92	103.551	467421.06	975.466	337270.32	875.883	47030.49	425.206	71857.09
28	1303045-1 10X	-0.001	55.33	19.472	89461.27	5665.632	1881935.39	3241.554	172795.60	0.758	246.68
29	1303044-1 10X	-0.001	49.33	19.830	91742.17	7872.068	2634363.81	3436.628	184929.56	1.273	336.69
30	CCV	4.746	41882.75	101.087	471674.37	9932.055	3337990.68	945.117	51125.56	473.978	80684.35
31	CCB	-0.001	51.33	2.723	13211.92	-3.614	10927.38	0.610	30.00	-0.112	93.34

Analyte Table

		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]		27 Al [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	-0.004	26.00	27.150	125046.40	10167.130	3398031.82	431.829	23233.69	1.713	410.03
33	1303028-3L 50X	-0.001	52.00	8.263	39397.74	1942.986	659894.12	84.685	4554.16	1.058	300.02
34	1303028-3MS 10X	4.762	41908.31	124.799	579910.79	11676.563	3942061.92	3156.345	171608.26	481.501	82376.13
35	1303028-1 10X	-0.001	56.67	82.213	381375.71	47428.457	15648226.02	13433.904	715596.50	1.192	320.02
36	1303028-2 10X	-0.001	54.67	32.490	149779.64	11397.007	3765692.97	582.559	30989.47	1.192	320.02
37	1303046-1 10X	-0.002	46.00	30.386	139508.66	5858.215	1935238.36	4261.573	225973.75	0.967	280.02
38	1303029-1 10X	-0.002	44.00	26.187	121376.61	10786.232	3598042.45	6875.603	369323.82	0.429	193.34
39	1303029-2 10X	-0.002	43.33	32.597	149102.92	8239.536	2670156.11	3880.385	202250.49	0.864	260.01
40	1303030-1 10X	0.031	327.34	30.568	140474.89	68597.875	22300582.17	712.262	37392.69	37.217	6258.43
41	1303028-3MSD ...	4.764	41664.30	126.666	578146.00	12150.611	3972114.31	3264.956	171912.62	500.955	82994.94
42	CCV	4.713	40095.85	106.597	482493.75	10086.793	3247907.76	956.177	49560.94	481.034	78453.75
43	CCB	-0.003	33.33	3.383	16084.38	-2.609	11294.24	0.880	43.33	-0.074	100.01
44	IP130307-2MB ...										
45	IP130307-3MB ...										
46	IP130307-4MB ...										
47	IM130307-2LCS...										
48	IM130307-3LCS...										
49	IM130307-4LCS...										
50	1303058-1 100X										
51	1303058-1D 100X										
52	1303058-1L 500X										
53	1303058-1MS 1...										
54	CCV										
55	CCB										
56	1303058-1MSD ...										
57	1303058-1A 100X										
58	1303058-2 100X										
59	1303058-3 100X										
60	1303058-4 100X										
61	1303058-5 100X										
62	1303058-6 100X										

Analyte Table

		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]		27 Al [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X										
64	1303058-8 100X										
65	1303058-9 100X										
66	CCV										
67	CCB										
68	1303058-10 100X										
69	1303058-11 100X										
70	1303058-12 100X										
71	1303058-13 100X										
72	1303058-14 100X										
73	1303059-1 100X										
74	1303059-1D 100X										
75	1303059-1L 500X										
76	1303059-1MS 1...										
77	1303059-1MSD ...										
78	CCV										
79	CCB										
80	1303059-1A 100X										
81	1303059-2 100X										
82	1303059-3 100X										
83	1303059-4 100X										
84	1303059-5 100X										
85	1303059-6 100X										
86	1303059-7 100X										
87	1303059-8 100X										
88	1303059-9 100X										
89	1303059-10 100X										
90	CCV										
91	CCB										
92	1303059-11 100X										
93	1303059-12 100X										

307 of 367

Analyte Table

		9 Be [1]		11 B [1]		23 Na [2]		26 Mg [2]		27 Al [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X										
95	1303059-14 100X										
96	1303059-15 100X										
97	1303060-1 100X										
98	1303060-1D 100X										
99	1303060-1L 50X										
100	1303060-1MS 1...										
101	1303060-1MSD ...										
102	CCV										
103	CCB										
104	1303060-1A 100X										
105	1303060-2 100X										
106	1303060-3 100X										
107	1303060-4 100X										
108	1303060-5 100X										
109	1303060-6 100X										
110	1303060-7 100X										
111	1303060-8 100X										
112	1303060-9 100X										
113	1303060-10 100X										
114	CCV										
115	CCB										
116	1303060-11 100X										
117	1303060-12 100X										
118	CCV										
119	CCB										

Analyte Table

		39 K [2]		44 Ca [2]		52 Cr [2]		55 Mn [2]		56 Fe [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		4310.74		49.02		2760.27		55.56		2366.94
2	blank	-1.396	4584.16	2.331	32.05	0.024	2786.94	0.007	100.00	-0.020	2620.33
3	blank	0.000	4624.21	0.000	14.71	0.000	2652.48	0.000	80.00	0.000	2670.35
4	H/1000	34.902	7205.17	46.823	367.39	0.508	4920.80	0.200	636.69	5.935	27761.02
5	H/100	468.985	39628.19	467.773	3755.87	4.861	25038.05	1.965	5871.13	51.878	235048.96
6	H/10	4694.073	354995.63	4676.854	37862.22	47.968	223807.92	19.525	58243.49	495.182	2244758.51
7	HIGH	50030.918	3660925.78	50032.640	396977.17	500.205	2260848.52	200.048	584276.80	5000.462	22197683.00
8	ZZZZZZ	0.241	4667.53	4.168	45.09	-0.019	2589.13	0.000	80.00	0.008	2720.34
9	ICV	9896.444	763937.33	9730.807	81015.72	98.978	471781.04	39.482	121042.57	1002.601	4671637.85
10	ICB	3.539	5087.67	0.392	18.50	-0.026	2664.71	-0.004	72.22	-0.061	2533.63
11	CRI1	39.320	8405.87	63.654	553.17	0.422	5098.63	0.248	863.37	13.382	66174.20
12	ICSA	9671.079	774835.06	28654.680	247518.32	0.257	4413.99	1.952	6300.19	23409.867	1.13120E+08
13	ICSAB	15099.406	1191049.70	34734.420	296168.25	50.563	248396.29	22.312	70108.10	24259.803	1.15715E+08
14	ZZZZZZ	-1.989	4890.94	83.085	674.00	-0.080	2526.90	0.228	751.14	2.923	15865.07
15	IP130307-1MB ...	-6.361	4334.09	2.955	37.37	-0.023	2639.14	-0.007	64.44	0.245	3787.30
16	1302343-1 10X	266.928	26976.32	1759.202	15348.00	-0.098	2694.71	2.120	6901.54	4.560	25440.54
17	1302347-1 10X	216.845	22622.99	1113.080	9583.49	-0.102	2638.03	1.836	5900.03	16.762	83757.66
18	1303056-2 10X	503.730	46777.16	13918.315	123454.48	-0.113	2662.48	2.844	9381.67	1.363	10016.79
19	1303056-2D 10X	531.039	50434.23	14686.686	134056.42	-0.112	2744.72	3.039	10308.92	1.879	12943.80
20	1303056-2L 50X	90.444	13442.66	2640.747	24201.13	-0.167	2466.89	0.563	1997.93	0.337	5091.03
21	CCV	4795.305	404302.90	4763.382	43010.07	48.670	253208.41	19.504	64886.86	502.823	2542049.18
22	CCB	-5.889	4794.25	-0.709	10.78	-0.078	2640.25	-0.008	65.55	0.088	3430.52
23	F130301-1MB ...	-1.090	5010.97	1.877	31.38	-0.124	2353.54	0.003	97.78	0.090	3350.50
24	1303056-2MS 10X	1024.710	88590.08	15589.636	137153.34	49.000	248446.53	22.593	73237.10	517.708	2550938.35
25	1303056-2MSD ...	1021.969	89892.83	15272.008	136661.25	48.744	251419.42	22.448	74030.65	512.397	2568282.36
26	FM130301-1LC...	485.124	44737.89	1013.393	8900.85	47.139	238308.28	19.038	61525.29	497.181	2441308.61
27	IP130307-1LCS...	466.835	43377.66	959.111	8447.22	45.889	232697.83	18.424	59701.08	477.657	2351927.41
28	1303045-1 10X	401.166	37784.47	8515.282	74327.06	0.077	3562.66	0.290	1028.94	7.620	40401.03
29	1303044-1 10X	2252.843	188364.89	9196.025	81023.29	-0.033	3049.22	3.437	11239.50	5.198	28849.83
30	CCV	4745.069	392605.05	4749.295	42070.45	47.904	244577.21	19.182	62618.30	501.568	2488120.33
31	CCB	-0.744	5057.66	3.484	44.34	-0.133	2324.64	-0.003	80.00	0.056	3203.81

Analyte Table

		39 K [2]		44 Ca [2]		52 Cr [2]		55 Mn [2]		56 Fe [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	340.917	33250.89	1455.812	12839.33	-0.129	2568.02	-0.006	76.67	0.045	3457.24
33	1303028-3L 50X	65.863	10937.44	275.447	2443.01	-0.160	2411.32	0.014	141.11	0.012	3290.46
34	1303028-3MS 10X	2260.232	190919.16	3230.102	28766.78	48.295	247810.15	19.654	64484.27	511.532	2550324.81
35	1303028-1 10X	1488.473	125058.01	54990.615	479501.33	-0.146	2455.78	159.349	511549.39	0.220	4274.08
36	1303028-2 10X	306.722	30141.90	1768.135	15417.63	-0.141	2476.89	0.384	1325.64	0.181	4080.69
37	1303046-1 10X	225.007	23500.76	10550.823	91595.99	-0.117	2588.03	0.029	188.89	0.104	3690.59
38	1303029-1 10X	651.894	58383.52	18064.125	158839.63	-0.133	2538.01	0.008	121.11	0.070	3573.91
39	1303029-2 10X	494.144	44243.51	7262.231	61979.40	-0.100	2628.03	0.013	133.34	0.107	3637.26
40	1303030-1 10X	1938.815	158909.82	1875.182	16135.50	0.618	6154.57	13.711	43466.20	123.040	594783.70
41	1303028-3MSD ...	2287.718	187078.58	3360.390	28981.09	49.234	244595.80	20.000	63545.11	515.335	2488088.71
42	CCV	4795.381	380092.91	4738.074	40218.19	48.694	238159.63	19.593	61280.02	503.703	2393956.01
43	CCB	-5.047	4760.93	4.315	51.31	-0.093	2522.45	0.003	96.67	0.062	3247.15
44	IP130307-2MB ...										
45	IP130307-3MB ...										
46	IP130307-4MB ...										
47	IM130307-2LCS...										
48	IM130307-3LCS...										
49	IM130307-4LCS...										
50	1303058-1 100X										
51	1303058-1D 100X										
52	1303058-1L 500X										
53	1303058-1MS 1...										
54	CCV										
55	CCB										
56	1303058-1MSD ...										
57	1303058-1A 100X										
58	1303058-2 100X										
59	1303058-3 100X										
60	1303058-4 100X										
61	1303058-5 100X										
62	1303058-6 100X										

Analyte Table

		39 K [2]		44 Ca [2]		52 Cr [2]		55 Mn [2]		56 Fe [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X										
64	1303058-8 100X										
65	1303058-9 100X										
66	CCV										
67	CCB										
68	1303058-10 100X										
69	1303058-11 100X										
70	1303058-12 100X										
71	1303058-13 100X										
72	1303058-14 100X										
73	1303059-1 100X										
74	1303059-1D 100X										
75	1303059-1L 500X										
76	1303059-1MS 1...										
77	1303059-1MSD ...										
78	CCV										
79	CCB										
80	1303059-1A 100X										
81	1303059-2 100X										
82	1303059-3 100X										
83	1303059-4 100X										
84	1303059-5 100X										
85	1303059-6 100X										
86	1303059-7 100X										
87	1303059-8 100X										
88	1303059-9 100X										
89	1303059-10 100X										
90	CCV										
91	CCB										
92	1303059-11 100X										
93	1303059-12 100X										

Analyte Table

		39 K [2]		44 Ca [2]		52 Cr [2]		55 Mn [2]		56 Fe [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X										
95	1303059-14 100X										
96	1303059-15 100X										
97	1303060-1 100X										
98	1303060-1D 100X										
99	1303060-1L 50X										
100	1303060-1MS 1...										
101	1303060-1MSD ...										
102	CCV										
103	CCB										
104	1303060-1A 100X										
105	1303060-2 100X										
106	1303060-3 100X										
107	1303060-4 100X										
108	1303060-5 100X										
109	1303060-6 100X										
110	1303060-7 100X										
111	1303060-8 100X										
112	1303060-9 100X										
113	1303060-10 100X										
114	CCV										
115	CCB										
116	1303060-11 100X										
117	1303060-12 100X										
118	CCV										
119	CCB										

Analyte Table

		60 Ni [2]		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		501.13		1067.83		456.70		2.00		5.87
2	blank	-0.012	516.68	-0.001	1027.82	0.012	586.71	0.000	1.00	-0.062	6.13
3	blank	0.000	534.46	0.000	1020.05	0.000	566.70	0.000	1.00	0.000	9.07
4	H/1000	0.440	1482.31	1.090	7036.07	1.757	2483.63	0.106	44.33	0.116	15.20
5	H/100	4.934	11640.92	10.801	64084.61	21.134	24866.77	0.939	410.01	0.923	59.20
6	H/10	49.950	113789.95	102.977	608486.97	203.119	236396.91	9.691	4272.91	9.506	523.08
7	HIGH	500.006	1111548.43	999.694	5781987.27	1999.677	2276149.44	100.031	43231.95	100.050	5303.14
8	ZZZZZZ	-0.047	441.13	0.034	1206.73	-0.039	530.03	0.003	2.33	-0.075	5.47
9	ICV	100.832	235662.29	208.967	1268898.81	409.205	489177.19	19.616	8894.78	20.544	1150.57
10	ICB	-0.083	382.23	0.016	1158.95	-0.019	573.37	-0.001	0.67	-0.077	5.60
11	CRI1	0.434	1643.44	1.198	8539.00	14.851	18604.71	0.114	53.33	-0.009	10.00
12	ICSA	0.078	823.37	0.272	2926.97	21.987	27911.72	0.010	6.00	-0.067	6.93
13	ICSAB	50.987	122362.83	104.215	648795.37	236.586	289995.90	10.234	4754.04	10.505	607.88
14	ZZZZZZ	0.019	624.47	0.040	1341.19	0.105	736.72	0.000	1.00	-0.073	6.00
15	IP130307-1MB ...	0.044	644.47	-0.002	1042.27	-0.107	470.03	0.007	4.00	-0.043	7.20
16	1302343-1 10X	2.949	7839.75	0.111	1931.25	37.707	47821.29	0.004	3.33	-0.088	5.73
17	1302347-1 10X	0.032	707.80	0.059	1573.43	3.800	5354.51	0.003	2.33	-0.068	6.80
18	1303056-2 10X	0.039	747.81	0.046	1538.99	-0.028	656.71	0.133	65.33	0.585	45.60
19	1303056-2D 10X	0.107	944.48	0.145	2245.74	0.964	1973.55	0.139	70.33	0.611	48.53
20	1303056-2L 50X	-0.005	661.14	0.034	1512.32	-0.188	466.70	0.023	12.67	0.014	12.27
21	CCV	50.253	127675.84	103.923	684856.69	204.269	265100.84	9.837	4837.07	10.063	616.81
22	CCB	-0.053	484.46	0.016	1255.62	-0.017	623.38	-0.001	0.67	-0.063	6.80
23	F130301-1MB ...	-0.059	456.68	0.010	1182.28	-0.005	620.05	-0.001	0.67	-0.079	5.73
24	1303056-2MS 10X	50.160	124208.66	100.324	644426.96	206.263	260891.31	10.042	4812.73	10.380	619.88
25	1303056-2MSD ...	49.549	124823.16	100.034	653629.33	203.658	262064.29	10.022	4886.42	10.909	661.88
26	FM130301-1LC...	48.579	119906.05	98.285	629165.88	203.298	256285.68	9.452	4514.31	10.143	603.88
27	IP130307-1LCS...	47.318	117120.80	95.716	614403.36	194.717	246139.86	9.038	4328.92	9.825	586.81
28	1303045-1 10X	-0.011	613.36	0.122	2001.26	11.937	15621.42	0.208	100.00	-0.026	9.33
29	1303044-1 10X	0.090	870.04	0.229	2708.05	0.916	1840.20	0.106	52.00	0.054	14.13
30	CCV	49.244	122771.24	102.075	660022.87	202.326	257655.21	9.778	4717.70	9.991	600.94
31	CCB	-0.055	467.79	0.043	1378.97	-0.073	543.37	0.001	1.33	-0.068	6.40

Analyte Table

		60 Ni [2]		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	-0.026	582.24	0.038	1481.20	-0.171	470.03	0.784	377.34	0.042	13.47
33	1303028-3L 50X	-0.032	568.91	0.058	1606.77	0.008	696.72	0.149	72.67	-0.064	7.20
34	1303028-3MS 10X	50.074	125466.64	102.845	668395.87	204.887	262227.37	10.368	5027.80	10.047	607.34
35	1303028-1 10X	0.311	1401.20	0.264	2896.96	-0.101	553.37	0.157	76.00	-0.017	9.87
36	1303028-2 10X	-0.047	525.57	0.108	1906.81	-0.095	560.04	0.637	303.33	-0.063	7.20
37	1303046-1 10X	-0.034	556.68	0.098	1835.69	8.259	10960.86	0.055	27.33	0.312	28.93
38	1303029-1 10X	-0.030	572.24	0.080	1747.89	-0.044	630.04	0.034	17.33	0.021	12.13
39	1303029-2 10X	0.351	1464.53	0.086	1732.34	-0.266	340.02	0.258	121.00	-0.025	9.20
40	1303030-1 10X	0.256	1248.95	2.205	15016.07	0.687	1516.81	2.497	1170.05	0.186	21.33
41	1303028-3MSD ...	50.396	122284.41	104.519	657813.76	207.976	257778.94	10.619	4986.78	10.441	610.81
42	CCV	49.532	118316.05	103.208	639417.87	205.544	250775.09	9.651	4461.63	10.042	578.68
43	CCB	-0.064	448.90	0.049	1422.30	-0.032	593.38	0.000	1.33	-0.061	6.80
44	IP130307-2MB ...										
45	IP130307-3MB ...										
46	IP130307-4MB ...										
47	IM130307-2LCS...										
48	IM130307-3LCS...										
49	IM130307-4LCS...										
50	1303058-1 100X										
51	1303058-1D 100X										
52	1303058-1L 500X										
53	1303058-1MS 1...										
54	CCV										
55	CCB										
56	1303058-1MSD ...										
57	1303058-1A 100X										
58	1303058-2 100X										
59	1303058-3 100X										
60	1303058-4 100X										
61	1303058-5 100X										
62	1303058-6 100X										

Analyte Table

		60 Ni [2]		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X										
64	1303058-8 100X										
65	1303058-9 100X										
66	CCV										
67	CCB										
68	1303058-10 100X										
69	1303058-11 100X										
70	1303058-12 100X										
71	1303058-13 100X										
72	1303058-14 100X										
73	1303059-1 100X										
74	1303059-1D 100X										
75	1303059-1L 500X										
76	1303059-1MS 1...										
77	1303059-1MSD ...										
78	CCV										
79	CCB										
80	1303059-1A 100X										
81	1303059-2 100X										
82	1303059-3 100X										
83	1303059-4 100X										
84	1303059-5 100X										
85	1303059-6 100X										
86	1303059-7 100X										
87	1303059-8 100X										
88	1303059-9 100X										
89	1303059-10 100X										
90	CCV										
91	CCB										
92	1303059-11 100X										
93	1303059-12 100X										

Analyte Table

		60 Ni [2]		63 Cu [2]		66 Zn [2]		75 As [2]		78 Se [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X										
95	1303059-14 100X										
96	1303059-15 100X										
97	1303060-1 100X										
98	1303060-1D 100X										
99	1303060-1L 50X										
100	1303060-1MS 1...										
101	1303060-1MSD ...										
102	CCV										
103	CCB										
104	1303060-1A 100X										
105	1303060-2 100X										
106	1303060-3 100X										
107	1303060-4 100X										
108	1303060-5 100X										
109	1303060-6 100X										
110	1303060-7 100X										
111	1303060-8 100X										
112	1303060-9 100X										
113	1303060-10 100X										
114	CCV										
115	CCB										
116	1303060-11 100X										
117	1303060-12 100X										
118	CCV										
119	CCB										

Analyte Table

		88 Sr [2]		89 Y [2]		109 Ag [2]		111 Cd [2]		121 Sb [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		43.33		3.33		14.44		2.67		4.44
2	blank	-0.011	56.67	0.000	0.00	-0.001	6.67	0.000	0.66	0.000	4.44
3	blank	0.000	86.67	0.000	0.00	0.000	13.33	0.000	0.66	0.000	5.55
4	H/1000	0.113	413.36	0.029	193.35	0.011	116.67	0.030	50.51	0.027	148.89
5	H/100	1.015	3173.81	0.327	2296.94	0.107	1037.83	0.324	563.03	0.322	1762.35
6	H/10	9.242	28459.73	2.861	20574.14	1.047	10264.58	3.131	5559.11	2.979	16637.94
7	HIGH	100.076	301293.61	30.014	219735.99	9.995	99602.64	29.987	54224.01	30.002	170598.24
8	ZZZZZZ	-0.006	70.00	0.001	3.33	0.000	10.00	0.001	1.98	0.000	7.78
9	ICV	19.576	61907.69	5.773	42972.00	2.093	21218.90	6.295	11573.88	6.166	35655.01
10	ICB	-0.008	66.67	0.001	6.67	0.000	10.00	0.000	-0.01	0.000	6.67
11	CRI1	0.110	453.36	0.024	176.67	0.012	135.56	0.034	61.80	0.037	214.45
12	ICSA	0.187	716.72	0.010	80.00	0.011	130.01	-0.031	-59.86	0.069	432.23
13	ICSAB	10.177	33015.14	2.998	23324.57	1.051	11146.29	3.137	6025.42	3.197	19320.95
14	ZZZZZZ	0.107	416.69	0.003	23.33	0.000	14.45	0.003	6.64	0.003	21.11
15	IP130307-1MB ...	0.010	116.67	0.000	0.00	0.001	20.00	0.001	2.64	0.001	8.89
16	1302343-1 10X	37.404	123814.91	0.002	13.33	0.000	13.33	0.002	5.18	0.021	130.00
17	1302347-1 10X	27.375	89382.95	0.000	3.33	0.000	15.56	0.000	1.64	0.019	116.67
18	1303056-2 10X	146.679	493568.70	0.002	20.00	-0.001	10.00	0.003	5.97	0.031	198.89
19	1303056-2D 10X	151.422	524329.94	0.005	43.33	0.000	17.78	0.001	3.23	0.027	180.00
20	1303056-2L 50X	27.746	96472.55	0.001	10.00	0.000	15.55	0.000	1.19	0.006	47.78
21	CCV	9.387	32243.70	2.869	23100.87	1.032	11331.99	3.116	6196.77	3.012	18847.08
22	CCB	0.005	113.34	0.000	0.00	-0.001	6.67	0.000	1.32	-0.001	2.22
23	F130301-1MB ...	-0.003	86.67	0.000	0.00	0.000	13.33	0.000	1.32	0.002	17.78
24	1303056-2MS 10X	160.296	534951.76	2.920	23003.98	1.055	11324.17	3.118	6067.61	3.095	18951.65
25	1303056-2MSD ...	159.828	542610.60	2.925	23104.12	1.073	11549.91	3.185	6213.30	3.092	18971.66
26	FM130301-1LC...	9.357	31218.15	2.888	22139.45	1.059	11060.68	3.112	5892.53	3.003	17887.09
27	IP130307-1LCS...	9.109	30476.87	2.771	21184.95	1.017	10602.56	3.029	5720.82	2.951	17531.09
28	1303045-1 10X	106.730	353380.38	0.000	0.00	0.001	22.22	0.002	5.55	0.010	68.89
29	1303044-1 10X	110.070	367907.27	0.000	3.33	0.000	15.56	0.000	1.36	0.008	53.33
30	CCV	9.440	31816.04	2.873	22753.62	0.994	10726.01	3.125	6113.25	2.985	18362.01
31	CCB	0.002	103.34	0.000	0.00	0.000	14.45	0.000	0.66	0.001	11.11

Analyte Table

		88 Sr [2]		89 Y [2]		109 Ag [2]		111 Cd [2]		121 Sb [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	26.635	89094.08	0.001	6.67	0.001	32.22	0.000	0.53	0.011	73.33
33	1303028-3L 50X	5.123	17216.78	0.000	0.00	0.000	16.67	0.000	1.06	0.002	20.00
34	1303028-3MS 10X	34.996	118264.02	2.918	23020.85	1.029	11062.90	3.109	6058.74	3.082	18896.02
35	1303028-1 10X	4352.070	14396830.62	0.023	180.01	0.000	17.78	0.016	31.59	0.013	84.45
36	1303028-2 10X	37.625	124432.52	0.001	6.67	0.000	15.55	0.003	7.23	0.009	58.89
37	1303046-1 10X	54.645	180008.76	0.010	80.00	-0.001	8.89	0.003	7.15	0.010	68.89
38	1303029-1 10X	199.306	664870.77	0.009	66.67	0.000	15.55	0.000	0.62	0.010	67.78
39	1303029-2 10X	117.311	379778.23	0.002	13.33	0.000	14.44	0.008	16.27	0.011	74.44
40	1303030-1 10X	311.365	1015199.85	0.047	360.02	0.017	194.49	-0.093	-173.56	0.443	2620.26
41	1303028-3MSD ...	36.447	119274.44	2.990	22924.01	1.050	10970.60	3.156	5971.08	3.076	18314.19
42	CCV	9.733	31425.27	2.835	21565.52	1.028	10662.64	3.170	5961.11	3.032	17927.02
43	CCB	-0.002	90.00	0.001	10.00	-0.001	8.89	0.001	3.32	0.001	13.33
44	IP130307-2MB ...										
45	IP130307-3MB ...										
46	IP130307-4MB ...										
47	IM130307-2LCS...										
48	IM130307-3LCS...										
49	IM130307-4LCS...										
50	1303058-1 100X										
51	1303058-1D 100X										
52	1303058-1L 500X										
53	1303058-1MS 1...										
54	CCV										
55	CCB										
56	1303058-1MSD ...										
57	1303058-1A 100X										
58	1303058-2 100X										
59	1303058-3 100X										
60	1303058-4 100X										
61	1303058-5 100X										
62	1303058-6 100X										

Analyte Table

		88 Sr [2]		89 Y [2]		109 Ag [2]		111 Cd [2]		121 Sb [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X										
64	1303058-8 100X										
65	1303058-9 100X										
66	CCV										
67	CCB										
68	1303058-10 100X										
69	1303058-11 100X										
70	1303058-12 100X										
71	1303058-13 100X										
72	1303058-14 100X										
73	1303059-1 100X										
74	1303059-1D 100X										
75	1303059-1L 500X										
76	1303059-1MS 1...										
77	1303059-1MSD ...										
78	CCV										
79	CCB										
80	1303059-1A 100X										
81	1303059-2 100X										
82	1303059-3 100X										
83	1303059-4 100X										
84	1303059-5 100X										
85	1303059-6 100X										
86	1303059-7 100X										
87	1303059-8 100X										
88	1303059-9 100X										
89	1303059-10 100X										
90	CCV										
91	CCB										
92	1303059-11 100X										
93	1303059-12 100X										

Analyte Table

		88 Sr [2]		89 Y [2]		109 Ag [2]		111 Cd [2]		121 Sb [2]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X										
95	1303059-14 100X										
96	1303059-15 100X										
97	1303060-1 100X										
98	1303060-1D 100X										
99	1303060-1L 50X										
100	1303060-1MS 1...										
101	1303060-1MSD ...										
102	CCV										
103	CCB										
104	1303060-1A 100X										
105	1303060-2 100X										
106	1303060-3 100X										
107	1303060-4 100X										
108	1303060-5 100X										
109	1303060-6 100X										
110	1303060-7 100X										
111	1303060-8 100X										
112	1303060-9 100X										
113	1303060-10 100X										
114	CCV										
115	CCB										
116	1303060-11 100X										
117	1303060-12 100X										
118	CCV										
119	CCB										

320 of 367

Analyte Table

		137 Ba [1]		139 La [1]		140 Ce [1]		141 Pr [1]		146 Nd [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		53.33		626.71		926.75		100.01		46.67
2	blank	-0.005	60.00	0.000	553.37	0.000	1130.10	0.000	100.01	-0.003	36.67
3	blank	0.000	100.01	0.000	563.37	0.000	1113.45	0.000	120.01	0.000	80.00
4	H/1000	0.127	1116.76	0.029	2763.71	0.034	3663.93	0.031	2913.75	0.033	630.05
5	H/100	1.032	8762.94	0.308	24680.77	0.314	25518.77	0.301	29075.53	0.312	5587.96
6	H/10	9.904	86263.89	2.931	238419.33	2.978	240149.86	3.023	301313.15	3.071	56174.10
7	HIGH	100.009	897821.39	30.007	2513328.35	30.002	2485014.65	29.998	3084665.68	29.993	565400.98
8	ZZZZZZ	-0.004	66.67	0.003	760.06	0.004	1420.14	0.000	116.67	0.002	116.68
9	ICV	20.463	187149.69	6.045	516067.30	6.167	521110.68	6.190	648171.84	6.132	117783.22
10	ICB	-0.001	93.34	0.004	903.40	0.002	1316.78	0.000	170.01	0.000	83.34
11	CRI1	0.176	1706.87	0.040	4044.07	0.046	5107.80	0.030	3197.17	0.038	820.06
12	ICSA	0.401	4000.72	0.135	12886.05	0.130	13019.39	0.007	893.41	0.025	606.71
13	ICSAB	10.666	100708.11	3.155	278211.91	3.188	278600.86	3.137	338993.08	3.132	62117.04
14	ZZZZZZ	0.087	833.40	0.010	1370.13	0.015	2380.31	0.002	283.35	0.002	120.00
15	IP130307-1MB ...	0.008	170.01	0.032	3063.80	0.052	5094.41	0.005	606.71	0.017	380.03
16	1302343-1 10X	11.494	105532.45	0.013	1776.86	0.020	2980.45	0.001	246.68	0.004	163.34
17	1302347-1 10X	7.421	67940.15	0.012	1656.84	0.016	2670.38	0.002	320.02	0.006	210.01
18	1303056-2 10X	11.600	112538.73	0.008	1416.80	0.013	2577.00	0.001	283.35	0.003	163.34
19	1303056-2D 10X	12.135	120103.37	0.022	2757.06	0.033	4460.90	0.004	556.70	0.007	250.01
20	1303056-2L 50X	2.231	21485.78	0.009	1470.15	0.018	2997.12	0.002	363.36	0.001	120.01
21	CCV	9.945	99879.58	2.914	273372.90	2.965	275705.15	2.980	342553.07	2.937	61959.62
22	CCB	-0.001	103.34	0.010	1466.82	0.021	2977.12	0.002	383.36	0.003	143.34
23	F130301-1MB ...	0.000	116.67	0.011	1570.16	0.016	2600.37	0.001	230.01	0.003	140.01
24	1303056-2MS 10X	21.672	210767.34	3.042	276488.00	3.204	288621.60	3.051	339792.01	3.025	61842.18
25	1303056-2MSD ...	22.007	209662.72	2.959	263501.50	3.113	274686.78	3.065	334366.62	3.006	60182.93
26	FM130301-1LC...	9.757	91077.95	2.886	251627.10	3.027	261604.68	2.996	320074.20	2.952	57887.08
27	IP130307-1LCS...	9.556	89331.96	2.784	243129.73	2.928	253478.52	2.880	308162.03	2.905	57017.14
28	1303045-1 10X	2.525	23815.93	0.009	1493.47	0.017	2800.42	0.001	286.68	0.003	156.68
29	1303044-1 10X	2.869	27245.11	0.208	19054.28	0.108	10737.78	0.017	2013.58	0.048	1043.43
30	CCV	9.949	96148.54	2.946	265915.97	2.998	268278.30	2.985	330173.11	3.030	61514.10
31	CCB	-0.002	96.67	0.011	1480.15	0.018	2653.72	0.002	306.68	0.002	130.00

Analyte Table

		137 Ba [1]		139 La [1]		140 Ce [1]		141 Pr [1]		146 Nd [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	2.556	24330.17	0.012	1770.18	0.013	2473.66	0.002	383.36	0.003	160.01
33	1303028-3L 50X	0.462	4467.52	0.008	1426.82	0.011	2303.62	0.001	276.68	0.002	140.01
34	1303028-3MS 10X	12.447	119570.51	2.991	268448.27	3.105	276183.99	3.112	342264.47	3.059	61731.83
35	1303028-1 10X	7.785	74899.05	0.031	3507.25	0.034	4374.16	0.004	566.70	0.013	356.69
36	1303028-2 10X	2.460	23498.68	0.022	2667.03	0.033	4247.47	0.003	523.37	0.006	226.68
37	1303046-1 10X	7.033	66624.78	0.016	2110.25	0.022	3287.20	0.003	450.03	0.008	263.35
38	1303029-1 10X	7.925	75608.35	0.016	2076.91	0.015	2663.68	0.002	406.69	0.006	216.68
39	1303029-2 10X	1.718	16319.30	0.009	1516.82	0.014	2593.68	0.002	320.02	0.002	133.34
40	1303030-1 10X	21.542	204038.99	1.860	164922.09	3.974	348169.49	0.301	32837.00	0.871	17416.89
41	1303028-3MSD ...	12.829	121041.41	3.035	267540.26	3.104	271151.35	3.101	334897.17	3.080	61059.19
42	CCV	9.941	93166.91	2.936	257051.67	2.985	259036.09	2.973	318849.44	2.947	58003.77
43	CCB	0.000	113.34	0.006	1143.43	0.009	1966.90	0.001	216.68	0.001	100.00
44	IP130307-2MB ...										
45	IP130307-3MB ...										
46	IP130307-4MB ...										
47	IM130307-2LCS...										
48	IM130307-3LCS...										
49	IM130307-4LCS...										
50	1303058-1 100X										
51	1303058-1D 100X										
52	1303058-1L 500X										
53	1303058-1MS 1...										
54	CCV										
55	CCB										
56	1303058-1MSD ...										
57	1303058-1A 100X										
58	1303058-2 100X										
59	1303058-3 100X										
60	1303058-4 100X										
61	1303058-5 100X										
62	1303058-6 100X										

322 of 367

Analyte Table

		137 Ba [1]		139 La [1]		140 Ce [1]		141 Pr [1]		146 Nd [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X										
64	1303058-8 100X										
65	1303058-9 100X										
66	CCV										
67	CCB										
68	1303058-10 100X										
69	1303058-11 100X										
70	1303058-12 100X										
71	1303058-13 100X										
72	1303058-14 100X										
73	1303059-1 100X										
74	1303059-1D 100X										
75	1303059-1L 500X										
76	1303059-1MS 1...										
77	1303059-1MSD ...										
78	CCV										
79	CCB										
80	1303059-1A 100X										
81	1303059-2 100X										
82	1303059-3 100X										
83	1303059-4 100X										
84	1303059-5 100X										
85	1303059-6 100X										
86	1303059-7 100X										
87	1303059-8 100X										
88	1303059-9 100X										
89	1303059-10 100X										
90	CCV										
91	CCB										
92	1303059-11 100X										
93	1303059-12 100X										

Analyte Table

		137 Ba [1]		139 La [1]		140 Ce [1]		141 Pr [1]		146 Nd [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X										
95	1303059-14 100X										
96	1303059-15 100X										
97	1303060-1 100X										
98	1303060-1D 100X										
99	1303060-1L 50X										
100	1303060-1MS 1...										
101	1303060-1MSD ...										
102	CCV										
103	CCB										
104	1303060-1A 100X										
105	1303060-2 100X										
106	1303060-3 100X										
107	1303060-4 100X										
108	1303060-5 100X										
109	1303060-6 100X										
110	1303060-7 100X										
111	1303060-8 100X										
112	1303060-9 100X										
113	1303060-10 100X										
114	CCV										
115	CCB										
116	1303060-11 100X										
117	1303060-12 100X										
118	CCV										
119	CCB										

Analyte Table

		206 (Pb) [1]		207 (Pb) [1]		208 Pb [1]		232 Th [1]		238 U [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
1	blank		1093.44		966.75		4330.49		194.45		85.56
2	blank	0.002	986.75	0.006	943.42	0.002	4200.45	0.011	195.56	0.000	72.22
3	blank	0.000	936.74	0.000	816.73	0.000	4037.11	0.010	184.45	0.000	68.89
4	H/1000	0.060	2443.66	0.055	1963.56	0.056	9518.35	0.016	747.81	0.010	1224.51
5	H/100	0.540	14944.92	0.547	12739.40	0.530	58066.66	0.082	7895.65	0.097	11952.75
6	H/10	4.958	130851.51	5.033	111689.19	5.013	520128.82	1.002	110214.99	0.973	120863.72
7	HIGH	50.004	1298930.66	49.996	1091902.59	49.998	5102760.28	10.000	1198250.44	10.003	1230684.16
8	ZZZZZZ	0.013	1233.45	0.024	1280.12	0.017	5540.71	0.013	406.68	0.000	118.89
9	ICV	10.227	278048.83	10.319	235844.74	10.260	1096131.56	2.056	245833.48	1.997	256443.71
10	ICB	0.014	1293.45	0.008	990.09	0.007	4813.89	0.011	268.90	0.000	103.34
11	CRI1	0.136	4737.68	0.127	3807.34	0.123	17638.26	0.026	2005.73	0.011	1422.31
12	ICSA	0.100	3970.78	0.092	3183.85	0.096	15534.10	0.034	3110.38	0.002	350.01
13	ICSAB	5.266	146146.54	5.265	122879.51	5.244	572174.92	1.101	131060.45	1.037	135452.26
14	ZZZZZZ	0.023	1566.85	0.037	1646.84	0.024	6694.29	0.011	210.00	0.001	213.34
15	IP130307-1MB ...	0.007	1170.12	0.009	1060.10	0.007	4953.96	0.011	208.89	0.001	138.89
16	1302343-1 10X	0.066	2920.43	0.077	2757.05	0.070	12325.95	0.011	287.79	0.002	303.34
17	1302347-1 10X	0.012	1433.49	0.018	1390.15	0.011	5957.44	0.011	293.34	0.002	361.12
18	1303056-2 10X	0.006	1303.46	0.012	1256.79	0.006	5470.69	0.011	273.34	0.730	97934.59
19	1303056-2D 10X	0.013	1530.15	0.018	1443.47	0.014	6547.56	0.010	220.01	0.753	104033.20
20	1303056-2L 50X	0.011	1440.14	0.006	1133.44	0.005	5374.00	0.010	148.89	0.142	19090.40
21	CCV	5.056	147858.31	5.023	123552.80	5.042	579744.60	0.989	124112.22	0.975	134229.98
22	CCB	0.000	1046.76	0.010	1146.76	0.003	4893.89	0.011	238.90	0.001	188.89
23	F130301-1MB ...	0.004	1150.10	0.006	1040.09	0.002	4743.88	0.010	202.23	0.001	142.23
24	1303056-2MS 10X	5.118	148900.24	5.087	124473.18	5.116	585173.43	1.005	124417.14	1.735	237492.38
25	1303056-2MSD ...	5.233	147455.90	5.253	124496.96	5.239	580478.92	1.069	126823.20	1.789	237243.97
26	FM130301-1LC...	5.126	143894.10	5.079	119899.58	5.116	564603.11	1.026	122478.33	0.972	128436.62
27	IP130307-1LCS...	4.843	136881.95	4.882	116045.44	4.882	542492.45	0.995	118654.00	0.940	124977.95
28	1303045-1 10X	0.011	1410.14	0.011	1216.79	0.006	5474.03	0.014	596.69	0.394	52119.05
29	1303044-1 10X	0.025	1790.19	0.035	1773.53	0.026	7627.84	0.013	491.13	0.310	40807.99
30	CCV	4.916	141949.03	4.994	121253.63	4.978	565044.72	0.972	116855.14	0.967	131409.44
31	CCB	0.006	1170.11	0.002	940.08	-0.001	4340.48	0.013	452.24	0.001	141.11

Analyte Table

		206 (Pb) [1]		207 (Pb) [1]		208 Pb [1]		232 Th [1]		238 U [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
32	1303028-3 10X	-0.004	1020.10	-0.005	860.08	-0.006	4187.15	0.013	503.35	0.150	20217.48
33	1303028-3L 50X	0.004	1216.78	0.002	1020.09	0.000	4827.26	0.012	367.79	0.028	3863.91
34	1303028-3MS 10X	5.108	145883.35	5.081	122040.12	5.119	574827.04	0.996	120220.10	1.151	154693.82
35	1303028-1 10X	0.086	3447.28	0.102	3313.87	0.092	14616.97	0.030	2598.06	2.004	261496.54
36	1303028-2 10X	0.005	1253.45	0.005	1090.10	0.001	4910.57	0.016	890.04	0.150	20159.59
37	1303046-1 10X	-0.003	1023.42	0.002	1013.42	-0.004	4327.14	0.013	581.13	4.488	591123.40
38	1303029-1 10X	-0.005	973.41	-0.001	933.40	-0.006	4087.12	0.013	505.57	1.975	260404.17
39	1303029-2 10X	-0.001	1066.76	0.003	1026.76	-0.003	4330.47	0.012	347.79	0.808	105089.74
40	1303030-1 10X	3.546	98545.32	4.002	93414.33	3.786	413398.93	0.067	6996.42	15.704	2045786.45
41	1303028-3MSD ...	5.129	145765.15	5.074	121267.51	5.110	570907.57	0.995	119434.13	1.160	155155.19
42	CCV	5.023	141017.33	5.027	118669.06	5.042	556466.76	1.036	121381.74	0.978	129221.13
43	CCB	0.001	1060.09	0.006	1023.42	-0.001	4343.79	0.013	538.91	0.001	160.00
44	IP130307-2MB ...									0.001	151.11
45	IP130307-3MB ...									0.001	134.45
46	IP130307-4MB ...									0.002	267.78
47	IM130307-2LCS...									0.972	122390.45
48	IM130307-3LCS...									0.972	121588.87
49	IM130307-4LCS...									0.985	122209.99
50	1303058-1 100X									2.910	375545.84
51	1303058-1D 100X									3.118	412427.13
52	1303058-1L 500X									0.573	74106.80
53	1303058-1MS 1...									3.422	443879.28
54	CCV									0.988	126369.14
55	CCB									0.001	156.67
56	1303058-1MSD ...									3.780	497224.49
57	1303058-1A 100X									4.504	585130.49
58	1303058-2 100X									5.978	760484.33
59	1303058-3 100X									3.631	462649.19
60	1303058-4 100X									8.116	1042682.62
61	1303058-5 100X									9.812	1257454.03
62	1303058-6 100X									27.568	3627234.71

Analyte Table

		206 (Pb) [1]		207 (Pb) [1]		208 Pb [1]		232 Th [1]		238 U [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
63	1303058-7 100X									10.486	1377353.32
64	1303058-8 100X									6.699	897629.70
65	1303058-9 100X									214.196	28831313.45
66	CCV									0.986	127631.77
67	CCB									0.001	280.01
68	1303058-10 100X									217.726	29599641.81
69	1303058-11 100X									3.277	447832.07
70	1303058-12 100X									0.172	23336.46
71	1303058-13 100X									0.076	10313.77
72	1303058-14 100X									0.369	49229.21
73	1303059-1 100X									12.898	1760564.66
74	1303059-1D 100X									12.768	1729018.78
75	1303059-1L 500X									2.527	343431.02
76	1303059-1MS 1...									13.411	1792830.03
77	1303059-1MSD ...									12.376	1671648.62
78	CCV									0.982	131746.83
79	CCB									0.004	588.91
80	1303059-1A 100X									15.157	2045166.70
81	1303059-2 100X									1.060	144401.60
82	1303059-3 100X									393.852	53188313.31
83	1303059-4 100X									312.818	41800490.19
84	1303059-5 100X									5.520	745766.79
85	1303059-6 100X									27.357	3667715.88
86	1303059-7 100X									8.270	1121005.26
87	1303059-8 100X									376.213	50754810.65
88	1303059-9 100X									5.365	734982.86
89	1303059-10 100X									3.561	483660.10
90	CCV									0.985	129978.90
91	CCB									0.001	188.89
92	1303059-11 100X									3.776	458204.97
93	1303059-12 100X									0.066	8156.82

327 of 367

Analyte Table

		206 (Pb) [1]		207 (Pb) [1]		208 Pb [1]		232 Th [1]		238 U [1]	
	Sample Name	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS	Conc. [ppb]	CPS
94	1303059-13 100X									0.082	10288.21
95	1303059-14 100X									0.014	1763.47
96	1303059-15 100X									0.017	2110.19
97	1303060-1 100X									1.099	136007.13
98	1303060-1D 100X									1.249	153128.82
99	1303060-1L 50X									0.219	25808.45
100	1303060-1MS 1...									1.220	146960.75
101	1303060-1MSD ...									1.362	165281.35
102	CCV									0.984	121741.88
103	CCB									0.001	136.67
104	1303060-1A 100X									2.196	271379.82
105	1303060-2 100X									54.840	6756806.40
106	1303060-3 100X									5.140	630443.51
107	1303060-4 100X									13.295	1623697.47
108	1303060-5 100X									30.405	3749603.31
109	1303060-6 100X									8.619	1063664.98
110	1303060-7 100X									18.708	2291594.96
111	1303060-8 100X									25.773	3186311.43
112	1303060-9 100X									11.115	1359898.61
113	1303060-10 100X									11.308	1370151.39
114	CCV									0.980	121898.10
115	CCB									0.001	155.56
116	1303060-11 100X									11.137	1369712.14
117	1303060-12 100X									0.246	29931.80
118	CCV									0.974	121316.86
119	CCB									0.000	115.56

ISTD Table

		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]		103 Rh (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
1	blank	379948.15		29671.54		183264.42		12778.98		584572.07	
2	blank	388832.16	100.0	29561.13	100.0	183211.51	100.0	13062.51	100.0	598321.80	100.0
3	blank	386426.64	100.0	29771.86	100.0	180765.00	100.0	13109.28	100.0	596131.87	100.0
4	H/1000	397503.90	102.9	30904.00	103.8	185966.64	102.9	13256.02	101.1	607144.96	101.8
5	H/100	417408.18	108.0	32941.49	110.6	192908.08	106.7	14003.38	106.8	637707.93	107.0
6	H/10	432845.46	112.0	34180.31	114.8	199963.78	110.6	14767.33	112.6	655785.64	110.0
7	HIGH	462677.17	119.7	36929.67	124.0	221661.66	122.6	16412.31	125.2	654946.63	109.9
8	ZZZZZZ	388318.72	100.5	29998.89	100.8	191147.72	105.7	12602.09	96.1	597080.09	100.2
9	ICV	462937.61	119.8	34464.22	115.8	220724.99	122.1	15411.27	117.6	690066.73	115.8
10	ICB	404282.60	104.6	31455.04	105.7	200261.85	110.8	13576.27	103.6	624229.64	104.7
11	CRI1	454168.13	117.5	33809.92	113.6	218628.74	120.9	14734.06	112.4	694328.58	116.5
12	ICSA	478811.58	123.9	36298.51	121.9	239845.89	132.7	16375.54	124.9	710258.43	119.1
13	ICSAB	475894.97	123.2	36575.72	122.9	234705.62	129.8	16772.66	127.9	700726.89	117.5
14	ZZZZZZ	412592.73	106.8	31785.46	106.8	189865.41	105.0	14320.38	109.2	634749.07	106.5
15	IP130307-1MB ...	405091.91	104.8	30312.62	101.8	188161.47	104.1	12712.16	97.0	624913.64	104.8
16	1302343-1 10X	454740.07	117.7	34677.98	116.5	209419.89	115.9	15865.19	121.0	691666.81	116.0
17	1302347-1 10X	454387.81	117.6	35526.58	119.3	211233.07	116.9	15124.35	115.4	691134.73	115.9
18	1303056-2 10X	482954.50	125.0	37060.49	124.5	225888.24	125.0	16148.74	123.2	731433.43	122.7
19	1303056-2D 10X	488650.36	126.5	38219.49	128.4	233859.93	129.4	16462.37	125.6	747400.82	125.4
20	1303056-2L 50X	479582.68	124.1	37608.23	126.3	232865.58	128.8	16108.68	122.9	728489.36	122.2
21	CCV	500352.29	129.5	38082.69	127.9	248220.06	137.3	16615.88	126.7	755213.27	126.7
22	CCB	445906.06	115.4	33565.91	112.7	218466.18	120.9	14563.85	111.1	686307.57	115.1
23	F130301-1MB ...	445206.94	115.2	32400.12	108.8	216640.94	119.8	14493.71	110.6	681192.34	114.3
24	1303056-2MS 10X	491215.00	127.1	37357.71	125.5	235067.68	130.0	16205.37	123.6	732871.40	122.9
25	1303056-2MSD ...	479623.08	124.1	37140.30	124.7	229684.14	127.1	15437.95	117.8	714955.43	119.9
26	FM130301-1LC...	464267.52	120.1	35730.84	120.0	231097.59	127.8	15397.91	117.5	710512.80	119.2
27	IP130307-1LCS...	475810.23	123.1	35620.59	119.6	235761.94	130.4	15104.30	115.2	715695.67	120.1
28	1303045-1 10X	469079.56	121.4	35703.66	119.9	223232.73	123.5	15628.29	119.2	705019.44	118.3
29	1303044-1 10X	478959.17	123.9	35189.43	118.2	225943.51	125.0	15197.83	115.9	714678.37	119.9
30	CCV	485070.40	125.5	36408.53	122.3	241413.06	133.6	15801.69	120.5	725428.14	121.7
31	CCB	427920.75	110.7	32293.11	108.5	212683.26	117.7	13896.62	106.0	649392.13	108.9

ISTD Table

		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]		103 Rh (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
32	1303028-3 10X	470863.00	121.9	36285.02	121.9	227109.76	125.6	15951.94	121.7	716808.84	120.2
33	1303028-3L 50X	475325.80	123.0	35910.94	120.6	228761.34	126.6	15661.63	119.5	715295.64	120.0
34	1303028-3MS 10X	483342.13	125.1	37273.88	125.2	236395.47	130.8	15908.47	121.4	723404.31	121.3
35	1303028-1 10X	491721.67	127.2	37698.24	126.6	245188.66	135.6	15851.82	120.9	732262.31	122.8
36	1303028-2 10X	480239.07	124.3	35920.77	120.7	235286.64	130.2	15324.69	116.9	722332.62	121.2
37	1303046-1 10X	477787.90	123.6	35320.06	118.6	232907.21	128.8	15614.97	119.1	714742.83	119.9
38	1303029-1 10X	482037.88	124.7	36094.79	121.2	239538.69	132.5	15958.64	121.7	715824.29	120.1
39	1303029-2 10X	476017.51	123.2	35690.43	119.9	233142.24	129.0	15161.09	115.7	709464.31	119.0
40	1303030-1 10X	472899.12	122.4	34932.03	117.3	228598.19	126.5	15334.58	117.0	713378.27	119.7
41	1303028-3MSD ...	478326.91	123.8	36485.35	122.5	238812.83	132.1	15551.54	118.6	718913.19	120.6
42	CCV	468010.85	121.1	35546.77	119.4	240089.67	132.8	15221.14	116.1	699321.39	117.3
43	CCB	434149.92	112.3	33258.49	111.7	224421.40	124.2	14413.79	110.0	657608.58	110.3
44	IP130307-2MB ...									622126.19	104.4
45	IP130307-3MB ...									639960.55	107.4
46	IP130307-4MB ...									623166.85	104.5
47	IM130307-2LCS...									670912.85	112.5
48	IM130307-3LCS...									660695.38	110.8
49	IM130307-4LCS...									649937.52	109.0
50	1303058-1 100X									666561.81	111.8
51	1303058-1D 100X									669405.82	112.3
52	1303058-1L 500X									660853.67	110.9
53	1303058-1MS 1...									654389.58	109.8
54	CCV									657949.69	110.4
55	CCB									597725.64	100.3
56	1303058-1MSD ...									666845.85	111.9
57	1303058-1A 100X									668385.48	112.1
58	1303058-2 100X									642231.75	107.7
59	1303058-3 100X									641012.02	107.5
60	1303058-4 100X									642325.50	107.7
61	1303058-5 100X									649099.12	108.9
62	1303058-6 100X									674321.13	113.1

330 of 367

ISTD Table

		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]		103 Rh (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
63	1303058-7 100X									664323.77	111.4
64	1303058-8 100X									682071.68	114.4
65	1303058-9 100X									678373.82	113.8
66	CCV									654116.12	109.7
67	CCB									694033.30	116.4
68	1303058-10 100X									692964.29	116.2
69	1303058-11 100X									701067.98	117.6
70	1303058-12 100X									688321.92	115.5
71	1303058-13 100X									695847.57	116.7
72	1303058-14 100X									681208.27	114.3
73	1303059-1 100X									691726.81	116.0
74	1303059-1D 100X									681116.89	114.3
75	1303059-1L 500X									686752.23	115.2
76	1303059-1MS 1...									677238.19	113.6
77	1303059-1MSD ...									685127.44	114.9
78	CCV									691604.57	116.0
79	CCB									699729.42	117.4
80	1303059-1A 100X									689659.36	115.7
81	1303059-2 100X									701489.24	117.7
82	1303059-3 100X									689796.55	115.7
83	1303059-4 100X									681188.74	114.3
84	1303059-5 100X									692368.61	116.1
85	1303059-6 100X									685279.39	115.0
86	1303059-7 100X									696332.15	116.8
87	1303059-8 100X									696297.88	116.8
88	1303059-9 100X									702472.34	117.8
89	1303059-10 100X									695695.17	116.7
90	CCV									680100.61	114.1
91	CCB									592698.64	99.4
92	1303059-11 100X									630224.88	105.7
93	1303059-12 100X									634275.30	106.4

ISTD Table

		71 Ga (ISTD) [1]		71 Ga (ISTD) [2]		72 Ge (ISTD) [1]		72 Ge (ISTD) [2]		103 Rh (ISTD) [1]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
94	1303059-13 100X									642345.26	107.8
95	1303059-14 100X									607775.88	102.0
96	1303059-15 100X									605367.23	101.5
97	1303060-1 100X									626538.86	105.1
98	1303060-1D 100X									626461.23	105.1
99	1303060-1L 50X									596407.76	100.0
100	1303060-1MS 1...									609984.66	102.3
101	1303060-1MSD ...									615571.80	103.3
102	CCV									639755.00	107.3
103	CCB									578215.46	97.0
104	1303060-1A 100X									637172.24	106.9
105	1303060-2 100X									635031.89	106.5
106	1303060-3 100X									625961.32	105.0
107	1303060-4 100X									618572.40	103.8
108	1303060-5 100X									619863.05	104.0
109	1303060-6 100X									624249.21	104.7
110	1303060-7 100X									622794.16	104.5
111	1303060-8 100X									629652.87	105.6
112	1303060-9 100X									626622.45	105.1
113	1303060-10 100X									619867.40	104.0
114	CCV									642732.52	107.8
115	CCB									571272.96	95.8
116	1303060-11 100X									625781.62	105.0
117	1303060-12 100X									621213.79	104.2
118	CCV									645243.89	108.2
119	CCB									590580.57	99.1

ISTD Table

		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]		195 Pt (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
1	blank	198364.48		632949.00		100282.94		393173.30		97231.29	
2	blank	200853.10	100.0	637808.91	100.0	100478.23	100.0	393174.83	100.0	96322.08	100.0
3	blank	198436.57	100.0	639826.94	100.0	98516.02	100.0	397270.53	100.0	97835.68	100.0
4	H/1000	205380.30	103.5	656970.93	102.7	103749.75	105.3	407234.06	102.5	101583.95	103.8
5	H/100	218177.99	109.9	690992.64	108.0	108606.05	110.2	428664.11	107.9	106454.28	108.8
6	H/10	220763.36	111.3	716894.13	112.0	111267.70	112.9	437398.49	110.1	107632.07	110.0
7	HIGH	216437.75	109.1	739765.47	115.6	113287.76	115.0	434615.39	109.4	106418.86	108.8
8	ZZZZZZ	199642.72	100.6	640462.22	100.1	98940.97	100.4	393386.56	99.0	97587.03	99.7
9	ICV	227076.06	114.4	753252.77	117.7	115186.36	116.9	468574.75	117.9	111418.03	113.9
10	ICB	207683.45	104.7	668727.48	104.5	103314.20	104.9	409274.56	103.0	99838.21	102.0
11	CRI1	229877.38	115.8	745039.65	116.4	113432.18	115.1	455615.47	114.7	110758.28	113.2
12	ICSA	235640.09	118.7	796643.98	124.5	122142.56	124.0	481949.80	121.3	116178.32	118.7
13	ICSAB	232599.55	117.2	777187.35	121.5	120387.90	122.2	472385.84	118.9	114580.01	117.1
14	ZZZZZZ	216096.77	108.9	685922.85	107.2	107934.62	109.6	425579.49	107.1	104544.12	106.9
15	IP130307-1MB ...	204889.71	103.3	677189.21	105.8	104606.64	106.2	420366.35	105.8	99922.92	102.1
16	1302343-1 10X	237851.92	119.9	755846.47	118.1	118371.76	120.2	462580.31	116.4	113330.57	115.8
17	1302347-1 10X	234508.76	118.2	753198.08	117.7	117905.32	119.7	463964.03	116.8	113327.39	115.8
18	1303056-2 10X	241931.21	121.9	798777.33	124.8	123015.37	124.9	478938.62	120.6	115178.99	117.7
19	1303056-2D 10X	248966.26	125.5	814812.37	127.3	125522.30	127.4	486672.24	122.5	118255.86	120.9
20	1303056-2L 50X	249792.35	125.9	789179.79	123.3	126185.25	128.1	475325.42	119.6	117684.88	120.3
21	CCV	246210.79	124.1	826694.79	129.2	124628.90	126.5	498955.62	125.6	119797.88	122.4
22	CCB	224935.63	113.4	732895.57	114.5	111449.12	113.1	453597.18	114.2	109489.97	111.9
23	F130301-1MB ...	218536.42	110.1	729070.05	113.9	109170.38	110.8	447438.12	112.6	107488.56	109.9
24	1303056-2MS 10X	239969.54	120.9	801042.61	125.2	121962.62	123.8	492348.43	123.9	116642.69	119.2
25	1303056-2MSD ...	244107.09	123.0	784650.55	122.6	122218.80	124.1	471308.19	118.6	115874.54	118.4
26	FM130301-1LC...	239147.58	120.5	768262.99	120.1	118614.16	120.4	474534.98	119.4	116616.69	119.2
27	IP130307-1LCS...	239782.98	120.8	769446.76	120.3	118307.36	120.1	473953.09	119.3	114935.82	117.5
28	1303045-1 10X	238044.00	120.0	773300.64	120.9	121265.43	123.1	468153.14	117.8	116693.40	119.3
29	1303044-1 10X	240324.21	121.1	779116.25	121.8	122126.27	124.0	473758.50	119.3	113774.44	116.3
30	CCV	241571.96	121.7	795426.67	124.3	122532.09	124.4	478252.13	120.4	116505.74	119.1
31	CCB	219396.97	110.6	702962.89	109.9	108791.92	110.4	434566.72	109.4	105040.47	107.4

ISTD Table

		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]		195 Pt (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
32	1303028-3 10X	240269.93	121.1	780430.76	122.0	121617.11	123.4	472196.41	118.9	114119.79	116.6
33	1303028-3L 50X	240196.62	121.0	775526.20	121.2	121090.50	122.9	470657.87	118.5	117218.74	119.8
34	1303028-3MS 10X	242800.30	122.4	790870.68	123.6	122087.12	123.9	480016.39	120.8	115473.88	118.0
35	1303028-1 10X	237914.38	119.9	791537.09	123.7	122189.84	124.0	480493.07	120.9	114691.58	117.2
36	1303028-2 10X	237617.87	119.7	783194.44	122.4	118848.44	120.6	471117.65	118.6	115843.07	118.4
37	1303046-1 10X	236823.01	119.3	779316.01	121.8	119450.30	121.2	469996.89	118.3	113364.81	115.9
38	1303029-1 10X	239872.03	120.9	784931.53	122.7	119922.38	121.7	475154.60	119.6	115591.13	118.1
39	1303029-2 10X	232774.33	117.3	777141.65	121.5	120031.75	121.8	467936.01	117.8	113009.39	115.5
40	1303030-1 10X	234459.87	118.2	780104.17	121.9	117663.45	119.4	480405.37	120.9	113029.01	115.5
41	1303028-3MSD ...	235137.05	118.5	776779.79	121.4	118596.56	120.4	477555.02	120.2	114382.99	116.9
42	CCV	231458.94	116.6	771359.36	120.6	117794.41	119.6	465698.02	117.2	112740.51	115.2
43	CCB	220577.67	111.2	711486.04	111.2	111488.74	113.2	437488.32	110.1	106329.74	108.7
44	IP130307-2MB ...			683206.29	106.8			423613.80	106.6		
45	IP130307-3MB ...			702574.66	109.8			433760.41	109.2		
46	IP130307-4MB ...			679979.48	106.3			420052.15	105.7		
47	IM130307-2LCS...			734483.96	114.8			453746.67	114.2		
48	IM130307-3LCS...			731412.02	114.3			453014.29	114.0		
49	IM130307-4LCS...			721274.49	112.7			443554.26	111.7		
50	1303058-1 100X			728721.87	113.9			449665.03	113.2		
51	1303058-1D 100X			736477.83	115.1			459620.88	115.7		
52	1303058-1L 500X			730341.24	114.1			457858.55	115.3		
53	1303058-1MS 1...			727260.99	113.7			455757.57	114.7		
54	CCV			732914.30	114.5			455198.16	114.6		
55	CCB			653905.01	102.2			409746.70	103.1		
56	1303058-1MSD ...			736948.89	115.2			455191.84	114.6		
57	1303058-1A 100X			740363.45	115.7			467002.86	117.6		
58	1303058-2 100X			710647.09	111.1			441475.63	111.1		
59	1303058-3 100X			716312.79	112.0			440844.45	111.0		
60	1303058-4 100X			714747.57	111.7			440642.62	110.9		
61	1303058-5 100X			718287.79	112.3			448591.30	112.9		
62	1303058-6 100X			745429.90	116.5			466316.30	117.4		

ISTD Table

		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]		195 Pt (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
63	1303058-7 100X			737309.77	115.2			458165.76	115.3		
64	1303058-8 100X			753130.00	117.7			463213.48	116.6		
65	1303058-9 100X			755818.91	118.1			468108.13	117.8		
66	CCV			733361.37	114.6			452948.14	114.0		
67	CCB			765207.35	119.6			476525.03	119.9		
68	1303058-10 100X			772257.14	120.7			473068.48	119.1		
69	1303058-11 100X			774565.49	121.1			475495.81	119.7		
70	1303058-12 100X			758855.68	118.6			471377.31	118.7		
71	1303058-13 100X			768671.55	120.1			474146.91	119.4		
72	1303058-14 100X			749418.48	117.1			467011.19	117.6		
73	1303059-1 100X			775819.13	121.3			472059.60	118.8		
74	1303059-1D 100X			763864.47	119.4			471809.42	118.8		
75	1303059-1L 500X			768892.29	120.2			473726.74	119.2		
76	1303059-1MS 1...			758215.44	118.5			467302.30	117.6		
77	1303059-1MSD ...			761177.30	119.0			468551.86	117.9		
78	CCV			769475.46	120.3			476008.76	119.8		
79	CCB			762536.46	119.2			472620.12	119.0		
80	1303059-1A 100X			762286.66	119.1			474344.41	119.4		
81	1303059-2 100X			771641.61	120.6			476588.97	120.0		
82	1303059-3 100X			760096.85	118.8			474954.49	119.6		
83	1303059-4 100X			754460.74	117.9			468886.18	118.0		
84	1303059-5 100X			771560.91	120.6			470709.49	118.5		
85	1303059-6 100X			756617.64	118.3			465535.94	117.2		
86	1303059-7 100X			770894.56	120.5			471938.32	118.8		
87	1303059-8 100X			768572.05	120.1			475508.39	119.7		
88	1303059-9 100X			774267.61	121.0			478878.59	120.5		
89	1303059-10 100X			768993.35	120.2			473692.64	119.2		
90	CCV			761212.68	119.0			467791.45	117.8		
91	CCB			645773.51	100.9			402062.02	101.2		
92	1303059-11 100X			696653.72	108.9			423914.77	106.7		
93	1303059-12 100X			697108.21	109.0			429632.65	108.1		

ISTD Table

		103 Rh (ISTD) [2]		115 In (ISTD) [1]		115 In (ISTD) [2]		195 Pt (ISTD) [1]		195 Pt (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%	CPS	Recovery%
94	1303059-13 100X			706131.51	110.4			432095.85	108.8		
95	1303059-14 100X			672555.25	105.1			415151.27	104.5		
96	1303059-15 100X			668223.65	104.4			414653.73	104.4		
97	1303060-1 100X			693171.30	108.3			426305.73	107.3		
98	1303060-1D 100X			686771.88	107.3			432251.44	108.8		
99	1303060-1L 50X			658966.02	103.0			411900.52	103.7		
100	1303060-1MS 1...			680771.32	106.4			419049.51	105.5		
101	1303060-1MSD ...			676969.19	105.8			421987.52	106.2		
102	CCV			711803.68	111.2			440118.42	110.8		
103	CCB			639682.72	100.0			398580.01	100.3		
104	1303060-1A 100X			704154.52	110.1			437060.19	110.0		
105	1303060-2 100X			699913.82	109.4			429792.77	108.2		
106	1303060-3 100X			692803.90	108.3			430765.61	108.4		
107	1303060-4 100X			690542.22	107.9			424844.25	106.9		
108	1303060-5 100X			693370.29	108.4			428833.99	107.9		
109	1303060-6 100X			691131.15	108.0			425543.12	107.1		
110	1303060-7 100X			687985.99	107.5			427334.28	107.6		
111	1303060-8 100X			697788.17	109.1			426586.03	107.4		
112	1303060-9 100X			693014.87	108.3			428876.05	108.0		
113	1303060-10 100X			688058.40	107.5			425450.91	107.1		
114	CCV			711624.47	111.2			441698.39	111.2		
115	CCB			629271.80	98.4			390864.36	98.4		
116	1303060-11 100X			690413.38	107.9			426761.87	107.4		
117	1303060-12 100X			692774.69	108.3			423745.52	106.7		
118	CCV			716849.14	112.0			439707.99	110.7		
119	CCB			642420.30	100.4			403314.18	101.5		

ISTD Table

		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%
1	blank	354758.20		115112.05	
2	blank	360534.21	100.0	115532.85	100.0
3	blank	360196.53	100.0	114189.44	100.0
4	H/1000	372560.50	103.4	120793.57	105.8
5	H/100	393122.97	109.1	127877.12	112.0
6	H/10	399648.56	111.0	129531.78	113.4
7	HIGH	396167.39	110.0	125918.95	110.3
8	ZZZZZZ	356840.45	99.1	115371.72	101.0
9	ICV	413349.50	114.8	131592.59	115.2
10	ICB	368282.98	102.2	119050.39	104.3
11	CRI1	411698.12	114.3	132998.65	116.5
12	ICSA	433477.61	120.3	137582.03	120.5
13	ICSAB	420421.16	116.7	134487.05	117.8
14	ZZZZZZ	383813.85	106.6	125381.79	109.8
15	IP130307-1MB ...	382476.25	106.2	118978.98	104.2
16	1302343-1 10X	423089.41	117.5	137470.45	120.4
17	1302347-1 10X	427394.92	118.7	137239.22	120.2
18	1303056-2 10X	431766.78	119.9	137592.55	120.5
19	1303056-2D 10X	444420.71	123.4	140428.11	123.0
20	1303056-2L 50X	431839.83	119.9	138127.58	121.0
21	CCV	442903.17	123.0	140563.19	123.1
22	CCB	406570.25	112.9	127879.12	112.0
23	F130301-1MB ...	402450.94	111.7	124797.17	109.3
24	1303056-2MS 10X	440637.23	122.3	138278.68	121.1
25	1303056-2MSD ...	426892.20	118.5	137737.28	120.6
26	FM130301-1LC...	425160.76	118.0	136875.91	119.9
27	IP130307-1LCS...	427910.06	118.8	137627.67	120.5
28	1303045-1 10X	425195.36	118.0	137305.91	120.2
29	1303044-1 10X	423664.98	117.6	136208.01	119.3
30	CCV	437212.24	121.4	138726.66	121.5
31	CCB	392324.86	108.9	126864.91	111.1

ISTD Table

		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%
32	1303028-3 10X	431242.57	119.7	137075.19	120.0
33	1303028-3L 50X	429891.39	119.3	137968.16	120.8
34	1303028-3MS 10X	432574.33	120.1	137319.98	120.3
35	1303028-1 10X	420086.49	116.6	133768.33	117.1
36	1303028-2 10X	429930.38	119.4	137666.81	120.6
37	1303046-1 10X	424117.61	117.7	134511.90	117.8
38	1303029-1 10X	424395.24	117.8	133774.34	117.2
39	1303029-2 10X	418712.96	116.2	133010.91	116.5
40	1303030-1 10X	419479.34	116.5	132523.72	116.1
41	1303028-3MSD ...	430402.67	119.5	135166.97	118.4
42	CCV	425126.01	118.0	137592.83	120.5
43	CCB	395481.87	109.8	127950.39	112.1
44	IP130307-2MB ...	373795.22	103.8		
45	IP130307-3MB ...	387582.60	107.6		
46	IP130307-4MB ...	375047.64	104.1		
47	IM130307-2LCS...	405403.77	112.6		
48	IM130307-3LCS...	402491.52	111.7		
49	IM130307-4LCS...	399395.16	110.9		
50	1303058-1 100X	415506.22	115.4		
51	1303058-1D 100X	425841.28	118.2		
52	1303058-1L 500X	415767.55	115.4		
53	1303058-1MS 1...	417667.64	116.0		
54	CCV	411502.08	114.2		
55	CCB	369716.89	102.6		
56	1303058-1MSD ...	423455.75	117.6		
57	1303058-1A 100X	418261.74	116.1		
58	1303058-2 100X	409629.88	113.7		
59	1303058-3 100X	410253.93	113.9		
60	1303058-4 100X	413694.24	114.9		
61	1303058-5 100X	412652.46	114.6		
62	1303058-6 100X	423673.65	117.6		

ISTD Table

		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%
63	1303058-7 100X	422963.43	117.4		
64	1303058-8 100X	431423.12	119.8		
65	1303058-9 100X	433448.78	120.3		
66	CCV	416417.52	115.6		
67	CCB	432315.14	120.0		
68	1303058-10 100X	437779.66	121.5		
69	1303058-11 100X	439984.95	122.2		
70	1303058-12 100X	434345.34	120.6		
71	1303058-13 100X	434923.85	120.7		
72	1303058-14 100X	429308.32	119.2		
73	1303059-1 100X	439526.63	122.0		
74	1303059-1D 100X	436006.09	121.0		
75	1303059-1L 500X	437546.21	121.5		
76	1303059-1MS 1...	430491.91	119.5		
77	1303059-1MSD ...	434927.30	120.7		
78	CCV	431651.95	119.8		
79	CCB	426523.50	118.4		
80	1303059-1A 100X	434493.40	120.6		
81	1303059-2 100X	438301.24	121.7		
82	1303059-3 100X	434885.62	120.7		
83	1303059-4 100X	430297.49	119.5		
84	1303059-5 100X	434964.15	120.8		
85	1303059-6 100X	431708.90	119.9		
86	1303059-7 100X	436496.78	121.2		
87	1303059-8 100X	434453.73	120.6		
88	1303059-9 100X	441065.43	122.5		
89	1303059-10 100X	437231.32	121.4		
90	CCV	424517.58	117.9		
91	CCB	365751.78	101.5		
92	1303059-11 100X	390727.34	108.5		
93	1303059-12 100X	395215.02	109.7		

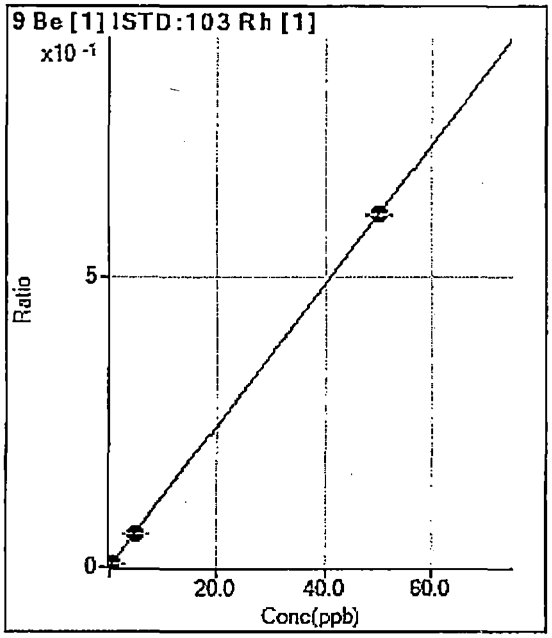
ISTD Table

		209 Bi (ISTD) [1]		209 Bi (ISTD) [2]	
	Sample Name	CPS	Recovery%	CPS	Recovery%
94	1303059-13 100X	399405.34	110.9		
95	1303059-14 100X	379466.54	105.3		
96	1303059-15 100X	379148.47	105.3		
97	1303060-1 100X	398330.87	110.6		
98	1303060-1D 100X	394465.63	109.5		
99	1303060-1L 50X	378606.68	105.1		
100	1303060-1MS 1...	387625.70	107.6		
101	1303060-1MSD ...	390454.67	108.4		
102	CCV	397961.69	110.5		
103	CCB	360636.35	100.1		
104	1303060-1A 100X	397835.03	110.4		
105	1303060-2 100X	396725.38	110.1		
106	1303060-3 100X	394908.00	109.6		
107	1303060-4 100X	393280.62	109.2		
108	1303060-5 100X	397156.99	110.3		
109	1303060-6 100X	397352.51	110.3		
110	1303060-7 100X	394418.59	109.5		
111	1303060-8 100X	398093.76	110.5		
112	1303060-9 100X	393978.52	109.4		
113	1303060-10 100X	390201.66	108.3		
114	CCV	400292.42	111.1		
115	CCB	357401.71	99.2		
116	1303060-11 100X	396041.94	110.0		
117	1303060-12 100X	390043.92	108.3		
118	CCV	400995.95	111.3		
119	CCB	363288.73	100.9		

Calibration for 001SMPL_13C08p00.D

Batch Folder: C:¥ICPMH¥1¥DATA¥13C08m01.B¥
Analysis File: 13C08m01.batch.xml
DA Date-Time: 3/11/2013 10:10:51 AM
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:
Tune Step: #1 nogas.u
#2 hehe.u

Level	Standard Data File	Sample Name	Acq. Date-Time
1	003CALB.D	blank	3/8/2013 12:35:05 PM
2	004CALS.D	H/1000	3/8/2013 12:38:08 PM
3	005CALS.D	H/100	3/8/2013 12:41:15 PM
4	006CALS.D	H/10	3/8/2013 12:44:19 PM
5	007CALS.D	HIGH	3/8/2013 12:47:21 PM
6			



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	52.00	0.0001	P	15.3
2	☐	0.050	0.048	406.68	0.0007	P	10.8
3	☐	0.500	0.474	3727.11	0.0058	P	2.2
4	☐	5.000	4.740	37808.03	0.0577	P	1.2
5	☐	50.000	50.026	398033.93	0.6077	P	0.6
6	☐	10.000					

y = 0.0121 * x + 8.7111E-005

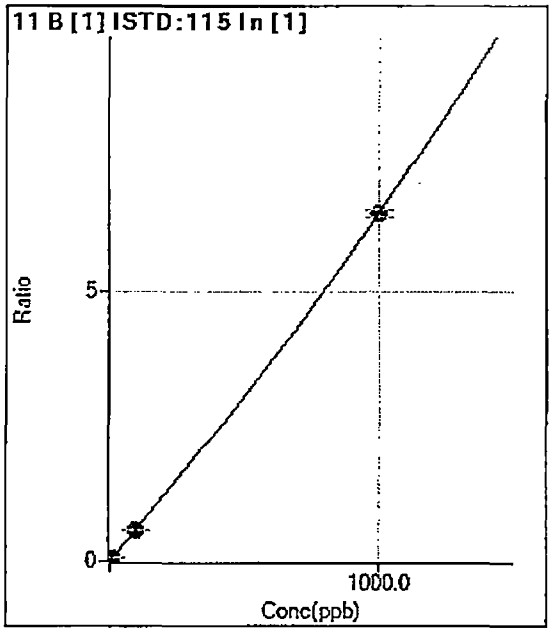
R = 1.0000

DL = 0.0033

BEC = 0.007172

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.307	834.48	0.0013	P	6.7
2	☐	1.000	0.855	5263.09	0.0080	P	1.2
3	☐	10.000	10.504	44064.68	0.0638	P	2.1
4	☐	100.000	99.947	420271.19	0.5862	P	1.2
5	☐	1000.000	1000.000	4744988.42	6.4137	A	2.2
6	☐	200.000					

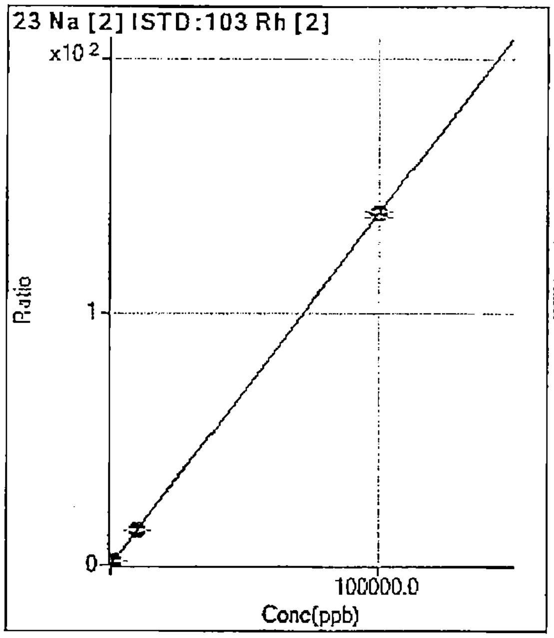
y = 6.3972E-007 * x ^ 2 + 0.0058 * x + 0.0031

DL = 0.04515

BEC = 0.533

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	10877.35	0.0548	P	3.6
2	☐	100.000	97.046	38876.33	0.1893	P	0.8
3	☐	1000.000	984.380	309591.82	1.4189	P	0.9
4	☐	10000.000	9892.168	3038029.95	13.7631	A	1.5
5	☐	100000.000	100010.942	30007005.39	138.6472	A	1.5
6	☐	20000.000					

y = 0.0014 * x + 0.0548

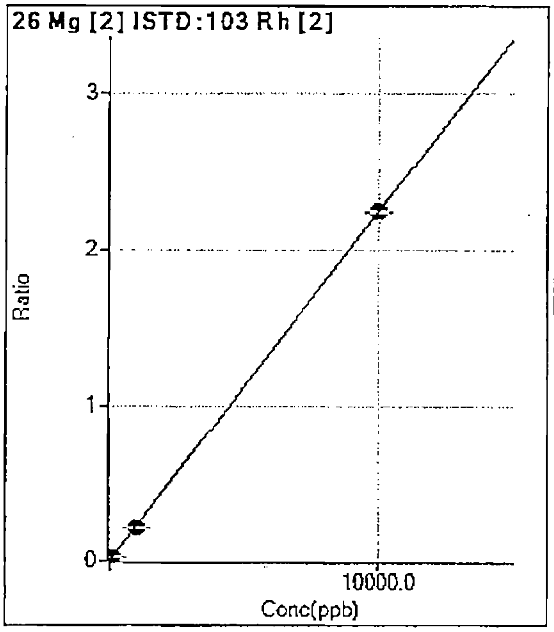
R = 1.0000

DL = 4.283

BEC = 39.56

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	0.00	0.0000	P	
2	☐	10.000	9.846	453.37	0.0022	P	15.1
3	☐	100.000	94.543	4620.86	0.0212	P	9.6
4	☐	1000.000	941.095	46525.34	0.2107	P	1.0
5	☐	10000.000	10005.945	484965.82	2.2407	P	0.5
6	☐	2000.000					

y = 2.2393E-004 * x + 0.0000E+000

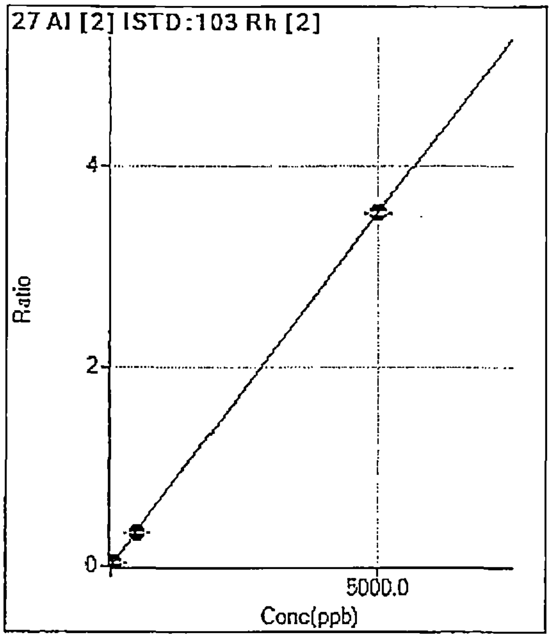
R = 1.0000

DL = 0

BEC = 0

Weight: None

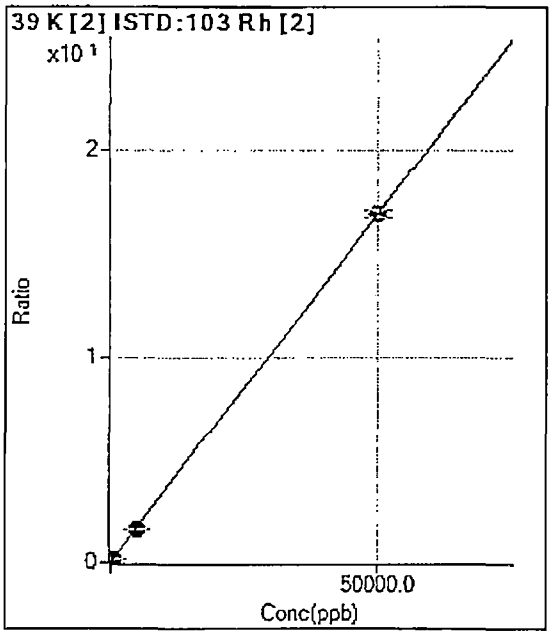
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	100.01	0.0005	P	30.5
2		5.000	4.337	730.05	0.0036	P	5.8
3		50.000	48.346	7532.00	0.0345	P	2.9
4		500.000	476.342	74100.78	0.3356	P	0.4
5		5000.000	5002.383	761893.22	3.5201	P	0.6
6		1000.000					

y = 7.0358E-004 * x + 5.0450E-004
R = 1.0000
DL = 0.6555
BEC = 0.717

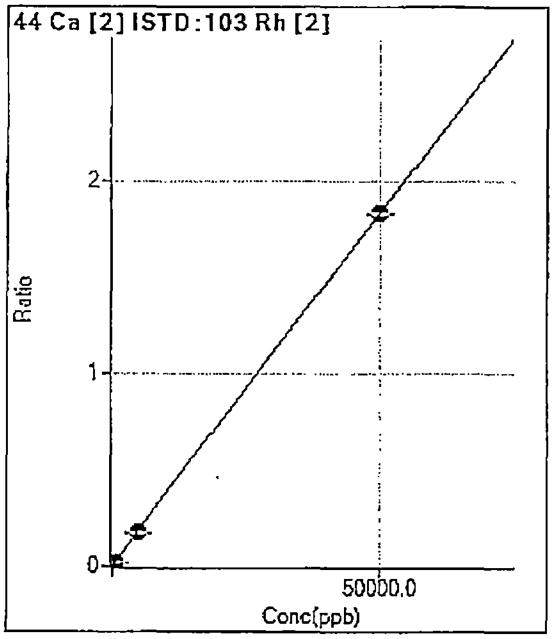
Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	4624.21	0.0233	P	4.4
2		50.000	34.902	7205.17	0.0351	P	0.7
3		500.000	468.985	39628.19	0.1816	P	2.1
4		5000.000	4694.073	354995.63	1.6080	P	1.1
5		50000.000	50030.918	3660925.78	16.9134	A	2.2
6		10000.000					

y = 3.3759E-004 * x + 0.0233
R = 1.0000
DL = 9.163
BEC = 69.02

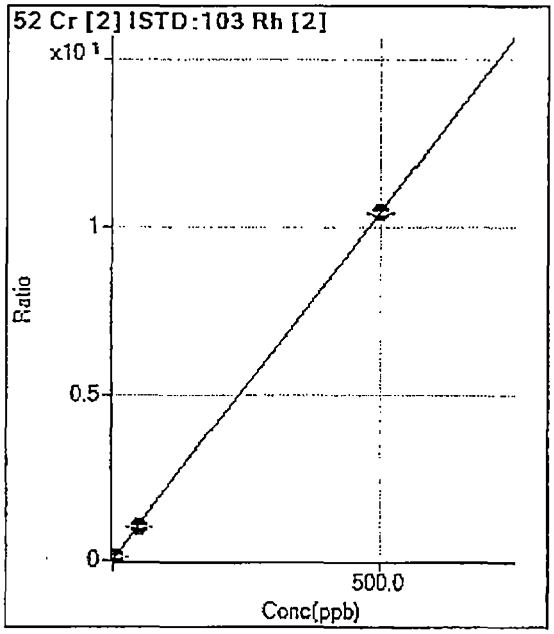
Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	14.71	0.0001	P	109.8
2	☐	50.000	46.823	367.39	0.0018	P	11.0
3	☐	500.000	467.773	3755.87	0.0172	P	10.1
4	☐	5000.000	4676.854	37862.22	0.1715	P	1.7
5	☐	50000.000	50032.640	396977.17	1.8341	P	0.3
6	☐	10000.000					

y = 3.6657E-005 * x + 7.4013E-005
R = 1.0000
DL = 6.65
BEC = 2.019

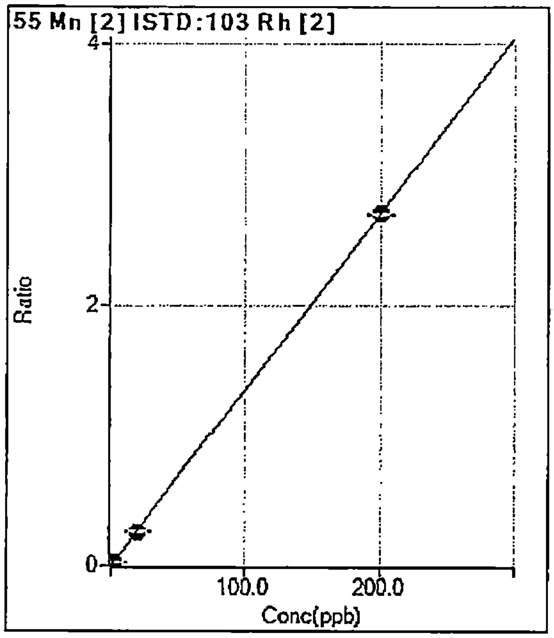
Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2652.48	0.0134	P	6.8
2	☐	0.500	0.508	4920.80	0.0240	P	5.1
3	☐	5.000	4.861	25038.05	0.1148	P	0.4
4	☐	50.000	47.968	223807.92	1.0138	P	0.7
5	☐	500.000	500.205	2260848.52	10.4461	A	0.8
6	☐	100.000					

y = 0.0209 * x + 0.0134
R = 1.0000
DL = 0.1301
BEC = 0.641

Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	80.00	0.0004	P	21.8
2	☐	0.200	0.200	636.69	0.0031	P	3.1
3	☐	2.000	1.965	5871.13	0.0269	P	1.5
4	☐	20.000	19.525	58243.49	0.2638	P	1.2
5	☐	200.000	200.048	584276.80	2.6996	P	0.4
6	☐	40.000					

y = 0.0135 * x + 4.0298E-004

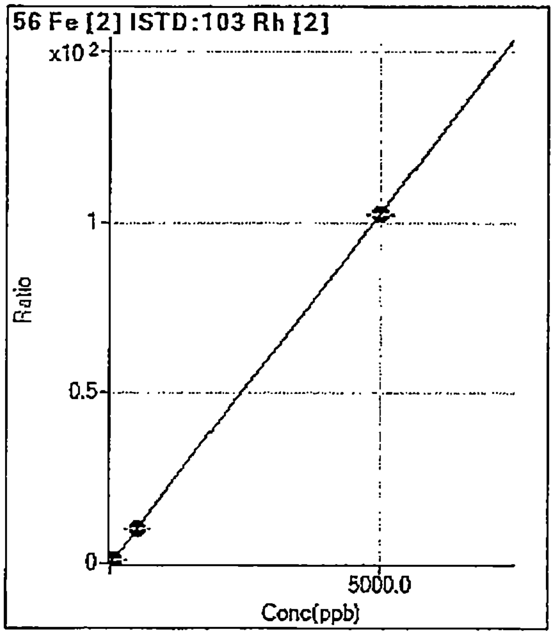
R = 1.0000

DL = 0.01953

BEC = 0.02987

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2670.35	0.0135	P	5.9
2	☐	5.000	5.935	27761.02	0.1352	P	4.4
3	☐	50.000	51.878	235048.96	1.0773	P	1.2
4	☐	500.000	495.182	2244758.51	10.1682	A	0.6
5	☐	5000.000	5000.462	22197683.00	102.5584	A	0.2
6	☐	1000.000					

y = 0.0205 * x + 0.0135

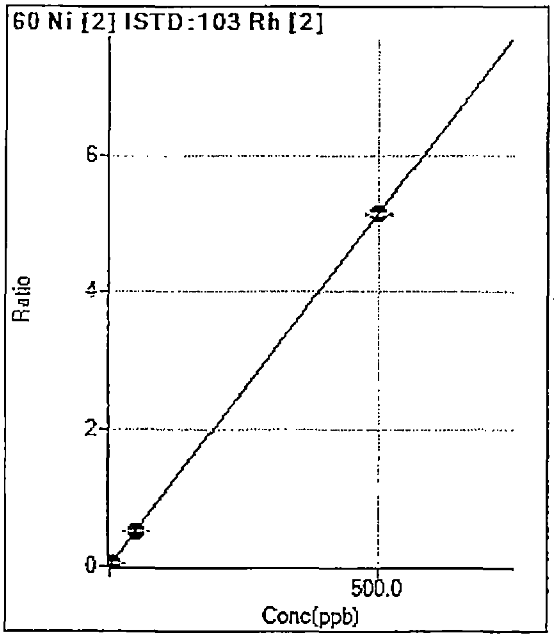
R = 1.0000

DL = 0.1164

BEC = 0.6563

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	534.46	0.0027	P	13.8
2	☐	0.500	0.440	1482.31	0.0072	P	3.7
3	☐	5.000	4.934	11640.92	0.0533	P	2.9
4	☐	50.000	49.950	113789.95	0.5155	P	1.1
5	☐	500.000	500.006	1111548.43	5.1357	P	0.8
6	☐	100.000					

y = 0.0103 * x + 0.0027

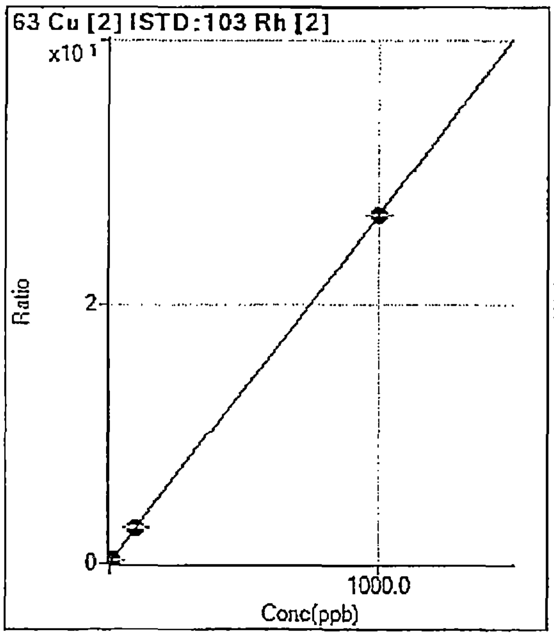
R = 1.0000

DL = 0.1089

BEC = 0.2625

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1020.05	0.0051	P	7.6
2	☐	1.000	1.090	7036.07	0.0343	P	1.8
3	☐	10.000	10.801	64084.61	0.2937	P	0.6
4	☐	100.000	102.977	608486.97	2.7564	P	0.5
5	☐	1000.000	999.694	5781987.27	26.7142	A	0.1
6	☐	200.000					

y = 0.0267 * x + 0.0051

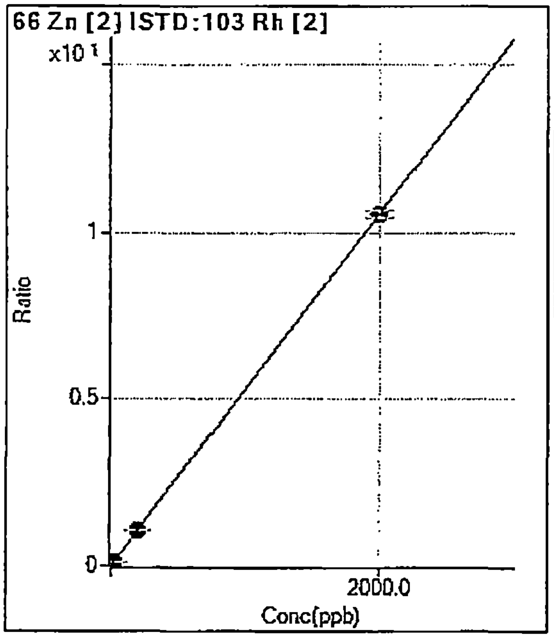
R = 1.0000

DL = 0.04372

BEC = 0.1925

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	566.70	0.0029	P	29.0
2		2.000	1.757	2483.63	0.0121	P	8.0
3		20.000	21.134	24866.77	0.1140	P	0.8
4		200.000	203.119	236396.91	1.0707	P	1.2
5		2000.000	1999.677	2276149.44	10.5160	A	2.1
6		400.000					

y = 0.0053 * x + 0.0029

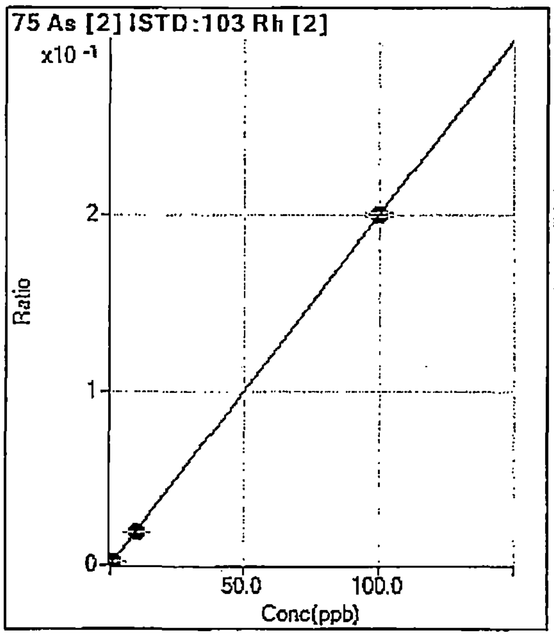
R = 1.0000

DL = 0.4732

BEC = 0.5437

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	1.00	0.0000	P	99.7
2		0.100	0.106	44.33	0.0002	P	22.4
3		1.000	0.939	410.01	0.0019	P	1.9
4		10.000	9.691	4272.91	0.0194	P	0.8
5		100.000	100.031	43231.95	0.1997	P	1.0
6		20.000					

y = 0.0020 * x + 5.0285E-006

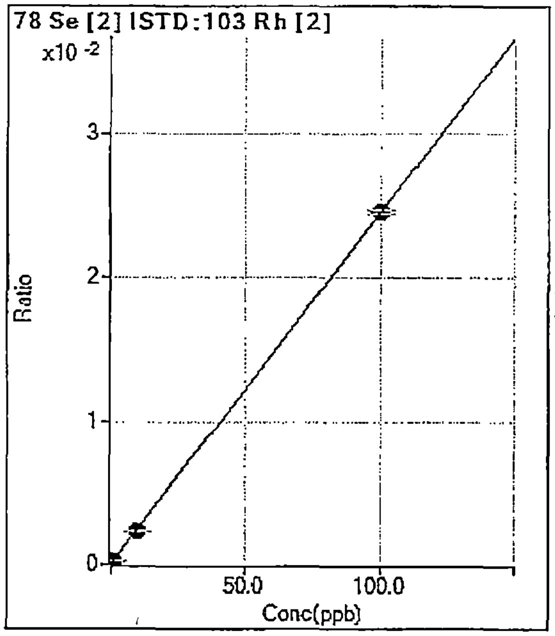
R = 1.0000

DL = 0.007529

BEC = 0.002518

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	9.07	0.0000	P	17.4
2		0.100	0.116	15.20	0.0001	P	24.5
3		1.000	0.923	59.20	0.0003	P	10.0
4		10.000	9.506	523.08	0.0024	P	1.8
5		100.000	100.050	5303.14	0.0245	P	1.1
6		20.000					

y = 2.4443E-004 * x + 4.5671E-005

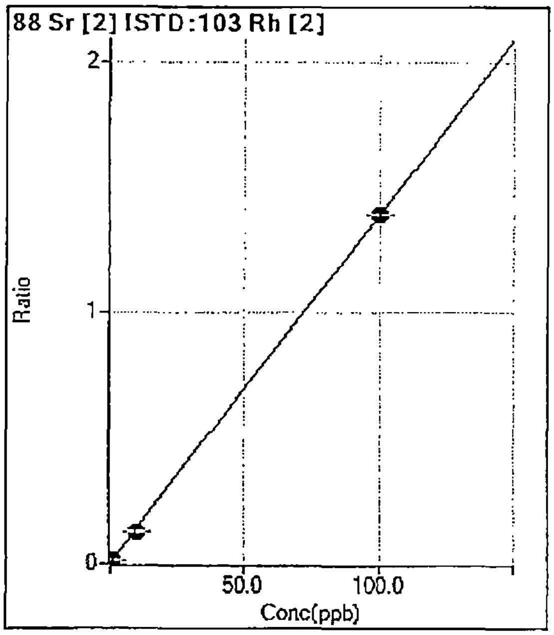
R = 1.0000

DL = 0.09759

BEC = 0.1868

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	86.67	0.0004	P	46.8
2		0.100	0.113	413.36	0.0020	P	11.6
3		1.000	1.015	3173.81	0.0146	P	7.4
4		10.000	9.242	28459.73	0.1290	P	4.7
5		100.000	100.076	301293.61	1.3921	P	0.1
6		20.000					

y = 0.0139 * x + 4.3713E-004

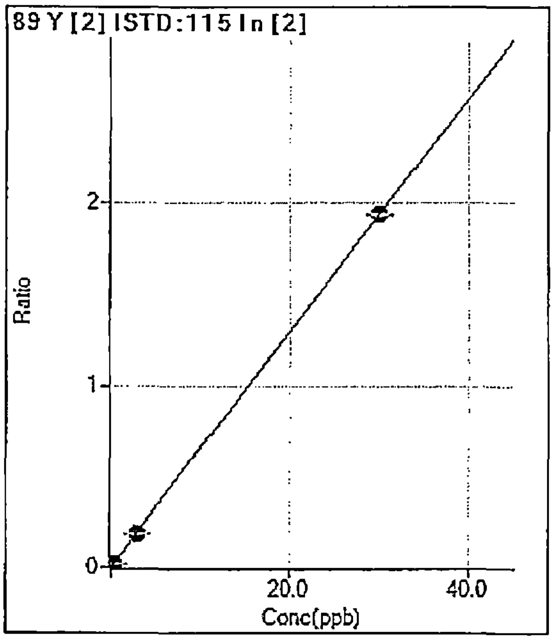
R = 1.0000

DL = 0.04412

BEC = 0.03144

Weight: None

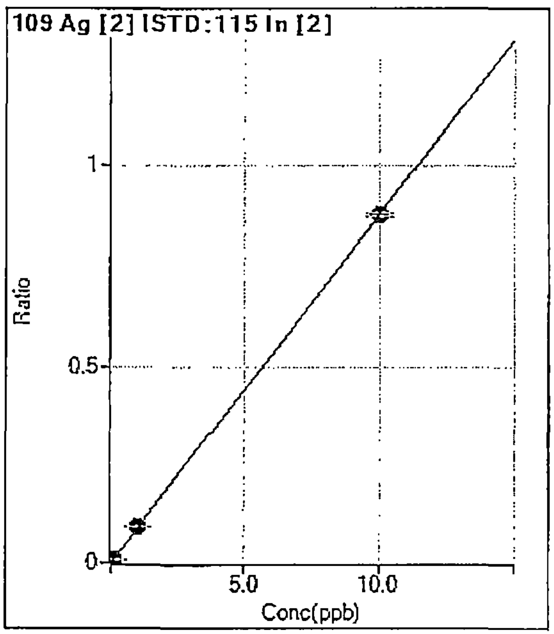
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	0.00	0.0000	P	
2	☐	0.030	0.029	193.35	0.0019	P	35.3
3	☐	0.300	0.327	2296.94	0.0211	P	4.0
4	☐	3.000	2.861	20574.14	0.1849	P	1.6
5	☐	30.000	30.014	219735.99	1.9396	P	0.4
6	☐	6.000					

y = 0.0646 * x + 0.0000E+000
R = 1.0000
DL = 0
BEC = 0

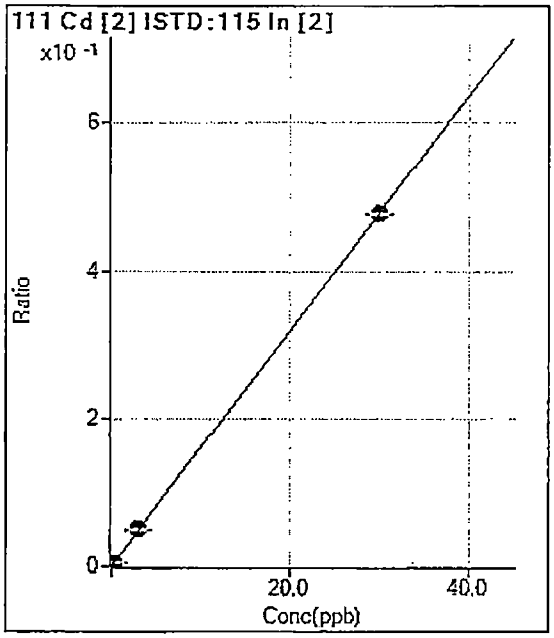
Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	13.33	0.0001	P	50.7
2	☐	0.010	0.011	116.67	0.0011	P	16.1
3	☐	0.100	0.107	1037.83	0.0096	P	7.0
4	☐	1.000	1.047	10264.58	0.0922	P	0.7
5	☐	10.000	9.995	99602.64	0.8793	P	0.9
6	☐	2.000					

y = 0.0880 * x + 1.3560E-004
R = 1.0000
DL = 0.002344
BEC = 0.001542

Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	0.66	0.0000	P	175.8
2	☐	0.030	0.030	50.51	0.0005	P	12.4
3	☐	0.300	0.324	563.03	0.0052	P	2.5
4	☐	3.000	3.131	5559.11	0.0500	P	3.8
5	☐	30.000	29.987	54224.01	0.4786	P	0.5
6	☐	6.000					

y = 0.0160 * x + 6.6929E-006

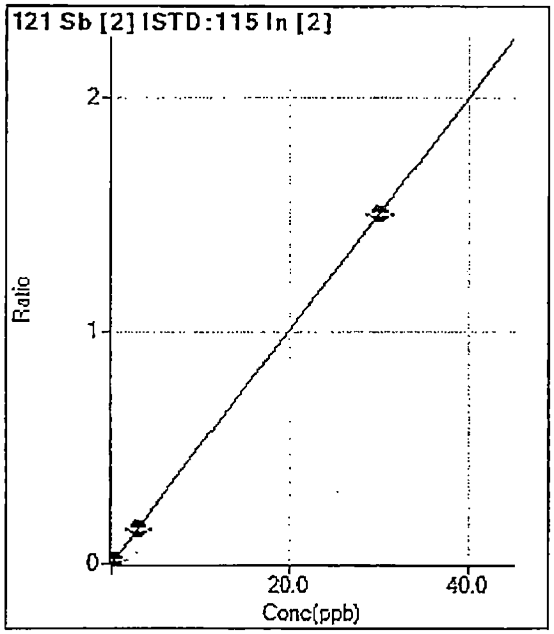
R = 1.0000

DL = 0.002212

BEC = 0.0004193

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5.55	0.0001	P	125.2
2	☐	0.030	0.027	148.89	0.0014	P	18.7
3	☐	0.300	0.322	1762.35	0.0162	P	3.6
4	☐	3.000	2.979	16637.94	0.1496	P	3.4
5	☐	30.000	30.002	170598.24	1.5059	P	0.6
6	☐	6.000					

y = 0.0502 * x + 5.6227E-005

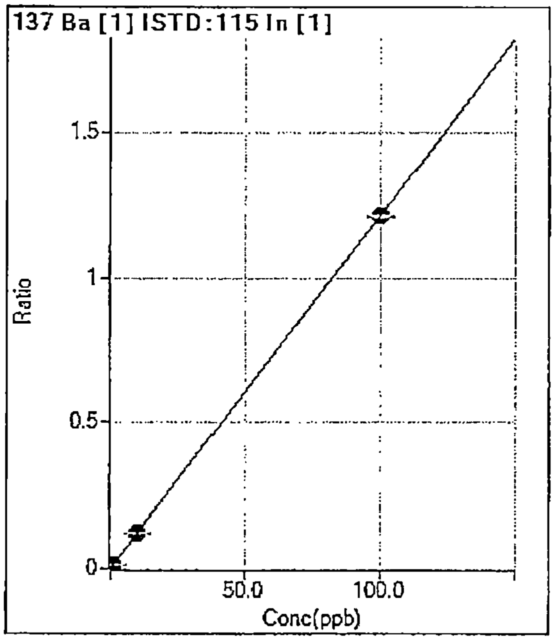
R = 1.0000

DL = 0.004208

BEC = 0.00112

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	100.01	0.0002	P	37.4
2	☐	0.100	0.127	1116.76	0.0017	P	12.2
3	☐	1.000	1.032	8762.94	0.0127	P	4.6
4	☐	10.000	9.904	86263.89	0.1203	P	0.9
5	☐	100.000	100.009	897821.39	1.2137	P	0.5
6	☐	20.000					

y = 0.0121 * x + 1.5677E-004

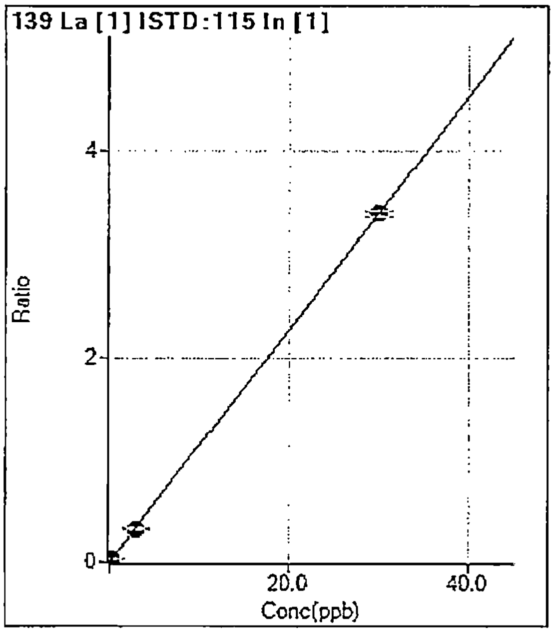
R = 1.0000

DL = 0.01451

BEC = 0.01292

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.37	0.0009	P	7.9
2	☐	0.030	0.029	2763.71	0.0042	P	8.5
3	☐	0.300	0.308	24680.77	0.0357	P	1.7
4	☐	3.000	2.931	238419.33	0.3326	P	1.2
5	☐	30.000	30.007	2513328.35	3.3973	A	1.6
6	☐	6.000					

y = 0.1132 * x + 8.8107E-004

R = 1.0000

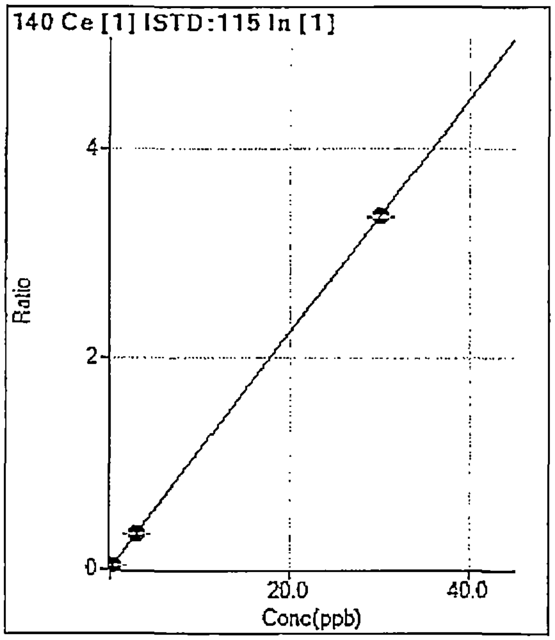
DL = 0.001839

BEC = 0.007784

Weight: None

Min Conc: <None>

Calibration for 001SMPL_13C08p00.D



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	1113.45	0.0017	P	19.2
2		0.030	0.034	3663.93	0.0056	P	5.6
3		0.300	0.314	25518.77	0.0369	P	1.0
4		3.000	2.978	240149.86	0.3350	P	0.8
5		30.000	30.002	2485014.65	3.3592	A	0.4
6		6.000					

y = 0.1119 * x + 0.0017

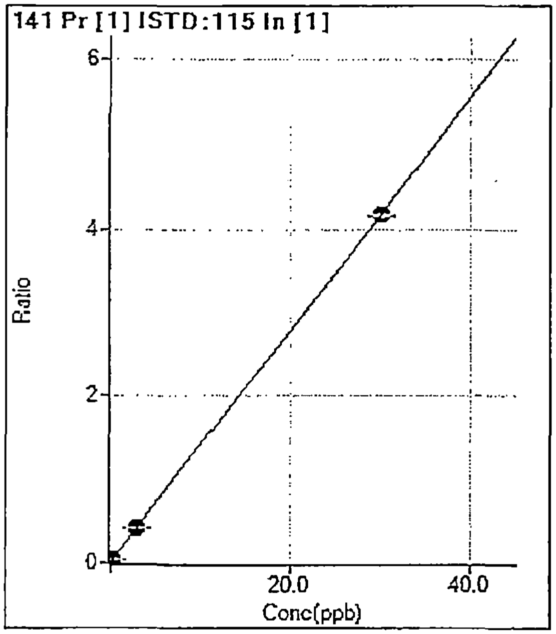
R = 1.0000

DL = 0.008965

BEC = 0.01555

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	120.01	0.0002	P	22.1
2		0.030	0.031	2913.75	0.0044	P	7.4
3		0.300	0.301	29075.53	0.0421	P	2.2
4		3.000	3.023	301313.15	0.4203	P	0.1
5		30.000	29.998	3084665.68	4.1697	A	0.8
6		6.000					

y = 0.1390 * x + 1.8760E-004

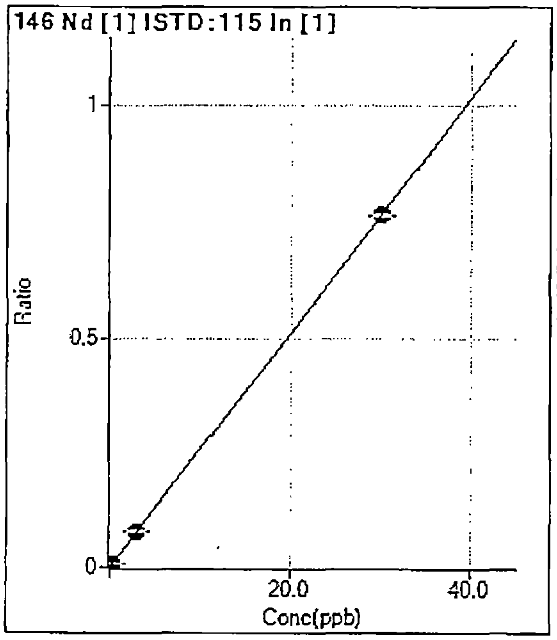
R = 1.0000

DL = 0.0008932

BEC = 0.00135

Weight: None

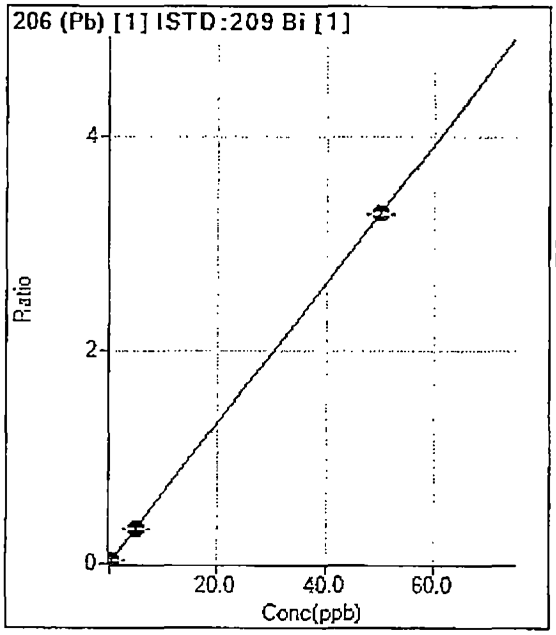
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	80.00	0.0001	P	46.4
2		0.030	0.033	630.05	0.0010	P	11.2
3		0.300	0.312	5587.96	0.0081	P	4.6
4		3.000	3.071	56174.10	0.0784	P	3.4
5		30.000	29.993	565400.98	0.7643	P	0.9
6		6.000					

y = 0.0255 * x + 1.2550E-004
R = 1.0000
DL = 0.006863
BEC = 0.004926

Weight: None
Min Conc: <None>

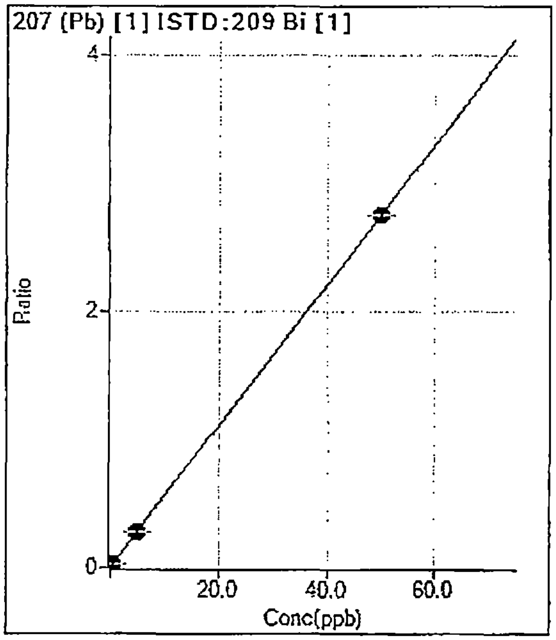


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	936.74	0.0026	P	6.6
2		0.050	0.060	2443.66	0.0066	P	6.8
3		0.500	0.540	14944.92	0.0380	P	5.0
4		5.000	4.958	130851.51	0.3274	P	1.9
5		50.000	50.004	1298930.66	3.2787	P	0.2
6		10.000					

y = 0.0655 * x + 0.0026
R = 1.0000
DL = 0.007907
BEC = 0.03969

Weight: None
Min Conc: <None>

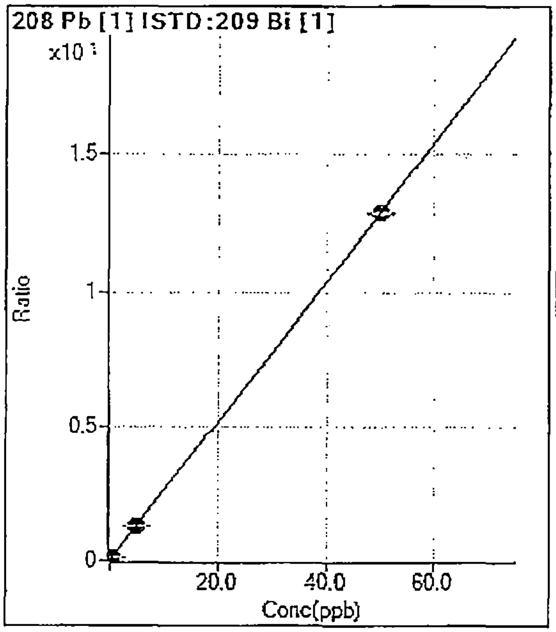
Calibration for 001SMPL_13C08p00.D



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	816.73	0.0023	P	10.9
2		0.050	0.055	1963.56	0.0053	P	4.2
3		0.500	0.547	12739.40	0.0324	P	2.0
4		5.000	5.033	111689.19	0.2795	P	1.6
5		50.000	49.996	1091902.59	2.7562	P	0.1
6		10.000					

y = 0.0551 * x + 0.0023
R = 1.0000
DL = 0.01344
BEC = 0.04116

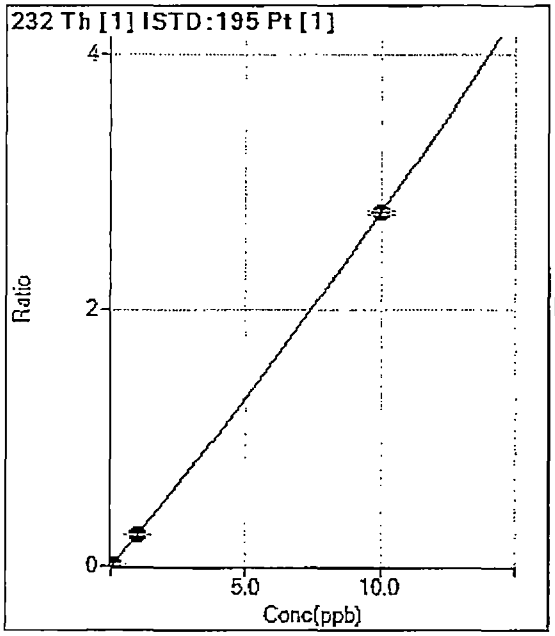
Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	4037.11	0.0112	P	6.8
2		0.050	0.056	9518.35	0.0255	P	4.4
3		0.500	0.530	58066.66	0.1477	P	1.1
4		5.000	5.013	520128.82	1.3015	P	1.5
5		50.000	49.998	5102760.28	12.8803	A	0.3
6		10.000					

y = 0.2574 * x + 0.0112
R = 1.0000
DL = 0.008873
BEC = 0.04354

Weight: None
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.010	184.45	0.0005	P	11.1
2		0.010	0.016	747.81	0.0018	P	15.8
3		0.100	0.082	7895.65	0.0184	P	3.9
4		1.000	1.002	110214.99	0.2520	P	1.5
5		10.000	10.000	1198250.44	2.7572	P	1.1
6		2.000					

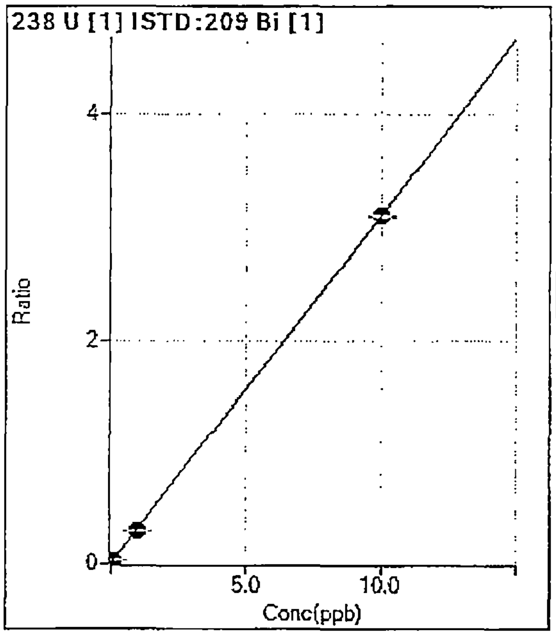
y = 0.0025 * x ^ 2 + 0.2512 * x - 0.0022

DL = 0.000614

BEC = -0.008566

Weight: None

Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1		0.000	0.000	68.89	0.0002	P	14.0
2		0.010	0.010	1224.51	0.0033	P	5.6
3		0.100	0.097	11952.75	0.0304	P	1.3
4		1.000	0.973	120863.72	0.3024	P	1.3
5		10.000	10.003	1230684.16	3.1065	P	0.6
6		2.000					

y = 0.3105 * x + 1.9124E-004

R = 1.0000

DL = 0.0002578

BEC = 0.0006158

Weight: None

Min Conc: <None>

Header Information for Analytical Run: Hg130311-1

Analyst: Sheri Lafferty

Standards:

Stock A: 10ppm (ST121005-2)
Stock B: 10ppm (ST121005-4)
Daily standards made by diluting stock solution 100X

Reagents:

See digestion log

Pipettes Used:

M-57 ----- 0.01mL to 0.1mL
M-61 ----- 0.1mL to 1.0mL
M-1010---1.0mL to 5.0mL

Method of Dilution:

2X-------Dilution made by diluting 5.0ml of sample to 10ml final volume.
5X-------Dilution made by diluting 2.0ml of sample to 10ml final volume
10X-----Dilution made by diluting 1.0ml of sample to 10ml final volume
20X-----Dilution made by diluting 0.5ml of sample to 10ml final volume
50X-----Dilution made by diluting 0.2ml of sample to 10ml final volume
100X---Dilution made by diluting 0.1ml of sample to 10ml final volume
500X---Dilution made by diluting a 5X dilution 100X
1000X-Dilution made by diluting a 10X dilution 100X

Daily Maintenance:

1. Check/ Change peristaltic pump tubing
2. Check gas liquid seperator for deposits, clean if necessary
3. Check/ Refill rinse water & stannous chloride reservoirs

Daily Maintenance done by: SL

Monthly Maintenance:

1. Check/ Clean sample and reference cells
2. Check/ Change Nafion cartridge

Monthly Maintenance done by: SL 03/05/2013

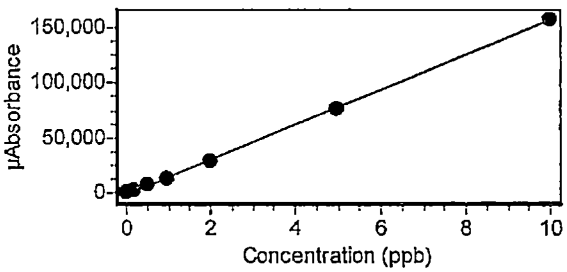
Report Generated By CETAC QuickTrace
Analyst: sheri.lafferty
Worksheet file: C:\Program Files\QuickTrace\Worksheets\HG130311-1.wsz
Date Started: 3/11/2013 1:04:24 PM
Comment:

Results

Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
Calibration Blank				STD	03/12/13 09:15:14 am	0.00000	5.67	
Replicates	45.1	51.1	49.9	50.6				
Standard #1 (0.20 ppb)				STD	03/12/13 09:17:22 am	0.20000	0.41	
Replicates	2757.2	2769.5	2777.1	2783.9				
Standard #2 (0.50 ppb)				STD	03/12/13 09:19:30 am	0.50000	0.27	
Replicates	6806.4	6828.9	6840.4	6849.8				
Standard #3 (1.0 ppb)				STD	03/12/13 09:21:39 am	1.00000	0.33	
Replicates	12824.6	12867.8	12898.0	12924.1				
Standard #4 (2.0 ppb)				STD	03/12/13 09:23:48 am	2.00000	0.20	
Replicates	27690.4	27756.6	27795.2	27817.3				
Standard #5 (5.0 ppb)				STD	03/12/13 09:25:58 am	5.00000	0.20	
Replicates	76207.1	76413.1	76516.9	76529.8				
Standard #6 (10.0 ppb)				STD	03/12/13 09:28:08 am	10.00000	0.18	
Replicates	156029.7	156410.6	156592.1	156650.1				

Calibration

Equation:	A = -1528.700 + 15713.060C
R2:	0.99943
SEE:	1509.3990
Flags:	



Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
ICV				ICV	03/12/13 09:30:19 am	0.98500	0.31	
Replicates	13890.2	13939.8	13974.3	13985.1				
% Recovery	98.49							

Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
ICB				ICB	03/12/13 09:35:03 am	0.09880	7.13	Z
Replicates	22.3	21.9	23.9	25.5				
CRA				UNK	03/12/13 09:40:07 am	0.28300	0.24	
Replicates	2905.9	2912.0	2919.1	2921.2				
HG130311-1MB				UNK	03/12/13 09:42:15 am	0.09910	8.94	
Replicates	31.8	29.2	27.7	25.7				
HG130311-1LCS				UNK	03/12/13 09:44:22 am	0.97100	0.26	
Replicates	13682.5	13723.9	13749.6	13762.7				
HG130311-2MB				UNK	03/12/13 09:46:30 am	0.09870	13.18	
Replicates	21.2	19.4	21.9	26.3				
HG130311-2LCS				UNK	03/12/13 09:48:38 am	0.98500	0.21	
Replicates	13902.5	13941.5	13962.4	13968.4				
1303058-1				UNK	03/12/13 09:50:46 am	0.22500	0.34	
Replicates	1997.6	2004.1	2011.3	2012.1				
1303058-2				UNK	03/12/13 09:52:55 am	0.17700	0.30	
Replicates	1251.2	1257.5	1259.2	1258.8				
1303058-3				UNK	03/12/13 09:55:04 am	0.19400	0.08	
Replicates	1516.7	1517.6	1519.5	1518.9				
1303058-4				UNK	03/12/13 09:57:14 am	0.20600	0.32	
Replicates	1705.4	1713.1	1716.1	1718.1				
1303058-5				UNK	03/12/13 09:59:24 am	0.19700	0.18	
Replicates	1562.8	1566.9	1568.6	1568.9				
CCV				UNK	03/12/13 10:01:34 am	1.94000	0.21	
Replicates	28914.6	28978.9	29019.5	29056.0				

Sample Name					Type	Date/Time	Conc (ppb)	%RSD	Flags
CCB					UNK	03/12/13 10:03:44 am	0.09910	8.27	
	Replicates	30.5	29.5	29.3	25.1				
1303058-6					UNK	03/12/13 10:05:50 am	0.16100	0.61	
	Replicates	998.4	1002.5	1010.7	1010.7				
1303058-7					UNK	03/12/13 10:07:57 am	0.18700	0.15	
	Replicates	1410.7	1409.5	1411.8	1414.4				
1303058-8					UNK	03/12/13 10:10:04 am	0.17100	0.22	
	Replicates	1147.4	1150.0	1151.0	1153.3				
1303058-9					UNK	03/12/13 10:12:12 am	0.28400	0.30	
	Replicates	2923.1	2931.9	2939.5	2943.2				
1303058-10					UNK	03/12/13 10:14:20 am	0.35000	0.21	
	Replicates	3965.5	3978.3	3981.1	3984.8				
1303058-11					UNK	03/12/13 10:16:28 am	0.19600	0.17	
	Replicates	1545.6	1549.1	1549.4	1551.9				
1303058-12					UNK	03/12/13 10:18:36 am	0.16800	0.09	
	Replicates	1116.7	1118.3	1118.3	1119.2				
1303058-13					UNK	03/12/13 10:20:45 am	0.15000	0.23	
	Replicates	829.5	832.1	834.3	832.3				
1303058-14					UNK	03/12/13 10:22:54 am	0.20000	0.14	
	Replicates	1616.5	1618.6	1619.1	1622.1				
1303058-14D					UNK	03/12/13 10:25:03 am	0.20200	0.37	
	Replicates	1638.6	1642.5	1650.0	1651.4				
CCV					UNK	03/12/13 10:27:12 am	1.96000	0.35	
	Replicates	29118.5	29217.5	29295.1	29352.3				

Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
CCB				UNK	03/12/13 10:29:22 am	0.09850	20.68	
Replicates	24.7	20.7	15.8	16.9				
1303058-14L 5X				UNK	03/12/13 10:31:29 am	0.11900	0.92	
Replicates	342.8	349.3	348.7	349.5				
1303058-14MS				UNK	03/12/13 10:33:36 am	2.39000	0.27	
Replicates	35973.3	36073.6	36149.1	36193.1				
1303058-14MSD				UNK	03/12/13 10:35:43 am	2.32000	0.23	
Replicates	34832.6	34918.6	34976.9	35020.5				
1303060-1				UNK	03/12/13 10:37:50 am	0.21300	0.24	
Replicates	1817.8	1823.0	1823.5	1828.5				
1303060-2				UNK	03/12/13 10:39:58 am	0.46100	0.22	
Replicates	5695.0	5705.7	5714.6	5724.2				
1303060-3				UNK	03/12/13 10:42:06 am	0.37500	0.18	
Replicates	4347.5	4356.7	4363.9	4364.2				
1303060-4				UNK	03/12/13 10:44:14 am	0.53000	0.20	
Replicates	6782.1	6793.3	6801.3	6815.0				
1303060-5				UNK	03/12/13 10:46:23 am	0.43900	0.38	
Replicates	5345.0	5368.3	5384.0	5390.6				
1303060-6				UNK	03/12/13 10:48:32 am	0.27300	0.27	
Replicates	2751.4	2755.0	2761.3	2768.3				
1303060-7				UNK	03/12/13 10:50:41 am	0.39500	0.23	
Replicates	4662.8	4674.2	4681.5	4687.4				
CCV				UNK	03/12/13 10:52:51 am	1.98000	0.26	
Replicates	29421.6	29504.2	29557.6	29601.5				

Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
CCB				UNK	03/12/13 10:55:00 am	0.09840	12.22	
Replicates	16.1	18.9	20.7	16.3				
1303060-8				UNK	03/12/13 10:57:08 am	0.40100	0.26	
Replicates	4753.9	4762.9	4774.6	4781.3				
1303060-9				UNK	03/12/13 10:59:15 am	0.20000	0.10	
Replicates	1609.8	1612.2	1612.0	1613.8				
1303060-10				UNK	03/12/13 11:01:22 am	0.29900	0.16	
Replicates	3171.3	3174.1	3179.4	3182.7				
1303060-11				UNK	03/12/13 11:03:29 am	0.23400	0.08	
Replicates	2139.9	2143.9	2142.8	2141.5				
1303060-12				UNK	03/12/13 11:05:37 am	0.17400	0.09	
Replicates	1198.6	1200.4	1197.8	1199.2				
1303060-12D				UNK	03/12/13 11:07:45 am	0.16800	0.17	
Replicates	1112.0	1112.8	1113.2	1116.2				
1303060-12L 5X				UNK	03/12/13 11:09:54 am	0.11500	0.86	
Replicates	277.2	276.6	275.1	272.0				
1303060-12MS				UNK	03/12/13 11:12:02 am	2.05000	0.24	
Replicates	30625.4	30715.1	30767.5	30795.5				
1303060-12MSD				UNK	03/12/13 11:14:11 am	2.08000	0.32	
Replicates	31109.1	31202.4	31281.8	31336.6				
CRA				UNK	03/12/13 11:16:20 am	0.28700	0.13	
Replicates	2980.5	2985.3	2988.3	2989.0				
CCV				UNK	03/12/13 11:18:30 am	1.99000	0.29	
Replicates	29556.2	29643.4	29703.1	29756.9				

Sample Name				Type	Date/Time	Conc (ppb)	%RSD	Flags
CCB				UNK	03/12/13 11:20:40 am	0.09790	26.50	
Replicates	8.0	8.4	7.7	12.9				

Miscellaneous

METALS DIGESTION WORKSHEET

ALS Laboratory Group

Digestion Date 3.7.13 HCl Lot No. 0000018301 Method: 3050 Beaker Lot No. MF06LKRG1 Initial Prep BMS Final Prep BMS

Digestion Batch IP130307-4 HNO_3 Lot No. 111120 SOP/Rev: 806R15 Avg. Beaker Wt. (g) 20.9 Prep Start Time 1520 Prep End Time 1800

Temp 95 °C Peroxide Lot No. 218704 Balance(s): 36 Pipet(s): M-70 Digestate Wt. (g) 105.11

Form 805r20.xls (02/10/11) Note: Each Page is copied as completed and included with the workorder/run documentation; reviewed subsequently

QC Grp	Lab Sample ID	Instrument	Init Vol/Wt (mL / g)	Final Vol. (mL)	Final Wt. (g)	pH	Comments, including metals list
	1303060-1	TRIMS	See	100.0	126.0	NA	-MS: 4
	-1D		Lims				-TR: 24 Target
	-1MS						
	-1MSD						
	-2						
	-3						
	-4						
	-5						
	-6						
	-7						
	-8						
	-9						
	-10						
	-11						
	-12						
	IP130307-4MB						
	& -4LCS						
	FM130307-4LCS						

BMS 3.7.13

QC Grp	Lab Sample ID	Init Vol/Wt. (mL / g)	Final Vol. (mL)	Final Wt. (g)

BMS 3.7.13

Spiking Information

QC	Amount	
ST121101-7	2mL	Z
ST121231-1	1mL	MS
ST121231-2	2mL	Cal
ST121231-3	1mL	C

305 of 367

431950

MERCURY DIGESTION - SOIL

Method 7471 SOP 812/Rev 15 Date Analyzed 3·12·13 File HG130311k*** Init. [illegible] (prep.) [illegible] ~~(analysis)~~

Digestion Date 3·11·13 Spike Witness N/A Time Start 1030 Time Finish 1100 Bath Temp 95°C

Tube #	Solution ID	Spike * Solution	Spike Volume (mL)	Sample **** Aliquot (g)	Final ** Volume (mL)	Comments
STD 1	0 ppb	-	-	-	100.0	
2	0.2 ppb	A	0.2	-	100.0	
3	0.5 ppb	A	0.5	-	100.0	
4	1.0 ppb	A	1.0	-	100.0	
5	2.0 ppb	A	2.0	-	100.0	
6	5.0 ppb	A	5.0	-	100.0	
7	10.0 ppb	A	10.0	-	100.0	
	ICV	B	1.0	-	100.0	
	ICB	-	-	-	100.0	
	CRA-0.2 ppb	A	0.2	-	100.0	
	SAMPLES -- **Prep. Batch ID(s)** HG130311-1/2 (see LIMs Prep. Batch report for sample info. (IDs, Aliquots, etc.)					
	CCVs	A	2.0	-	100.0	3 # prepared
	CCBs	-	-	-	100.0	3 # prepared

**** Automated balance entry into LIMS.

*** See run report for run log information.

** Laboratory DI water used to make-up to final volume.

*A: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST121005-2 ID

*B: 100 ppb Hg solution made from 100x dilution (1 mL/100 mL) of ST121005-4 ID (2nd source)

See run header for maintenance performed.

Digestion Cups: MH2-HK06-3030-RJ

Reagents: HNO_3 111120 HCl 0000018301 $SnCl_2$ RG130301-1 $KMnO_4$ RG130301-4 Hydroxylamine RG130301-2

Balance(s) Used: 29

Pipet(s) Used: M57 M61 M101D

Note: Each page is copied as completed and included with the workorder/run documentation; reviewed subsequently

Percent Moisture

Method SOP642 Revision 9

Lab Name: ALS Environmental -- FC

Balance ID: 31
Oven ID: 17
In Oven: 3/6/2013 16:10
Out of Oven: 3/7/2013 8:40

Date Extracted: 03/07/2013
Date Analyzed: 03/07/2013
Analyst: James A. Ceimet

Validated By: jac
Validation Date: 03/07/2013
Validation Time: 8:51:16 AM

Run ID	Prep Batch ID	QC Batch ID	Lab ID	QC Type	Dish Wt	Wet Wt	Dry Wt	Dry Wt-Dish Wt	Percent Moisture	Percent Solids	RPD
EX130306-2A	EX130306-2	EX130306-2-1	1303060-1	DUP	1.325	10.23	10.79	9.46	7.5	92.5	2
EX130306-2A	EX130306-2	EX130306-2-1	1303060-1	SMP	1.324	10.27	10.81	9.48	7.7	92.3	
EX130306-2A	EX130306-2	EX130306-2-2	EX130306-2	MB	1.323	1.323	1.323	0.00	100.0	0.0	
EX130306-2A	EX130306-2	EX130306-2-1	1303060-2	SMP	1.331	10.2	11.16	9.83	3.6	96.4	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-3	SMP	1.325	10.22	11.26	9.94	2.8	97.2	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-4	SMP	1.329	10.21	11.25	9.92	2.8	97.2	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-5	SMP	1.324	10.22	11.14	9.82	3.9	96.1	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-6	SMP	1.328	10.21	10.92	9.59	6.0	94.0	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-7	SMP	1.325	10.24	11.23	9.91	3.2	96.8	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-8	SMP	1.328	10.21	11.18	9.85	3.5	96.5	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-9	SMP	1.33	10.24	11.24	9.91	3.2	96.8	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-10	SMP	1.328	10.22	11.15	9.82	3.9	96.1	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-11	SMP	1.322	10.22	10.84	9.52	6.9	93.1	
EX130306-2A	EX130306-2	EX130306-2-2	1303060-12	DUP	1.318	10.23	11.2	9.88	3.4	96.6	3
EX130306-2A	EX130306-2	EX130306-2-2	1303060-12	SMP	1.328	10.34	11.30	9.98	3.5	96.5	

QC Types

CAR	Carrier reference sample
LCS	Laboratory Control Sample
MB	Method Blank
MSD	Laboratory Matrix Spike Duplicate
RVS	Reporting Level Verification Standard
SYS	Sample Yield Spike

DUP	Laboratory Duplicate
LCSD	Laboratory Control Sample Duplicate
MS	Laboratory Matrix Spike
REP	Sample replicate
SMP	Field Sample

Comments:

DUP = Sample Duplicate
Wet Wt = Sample Wet Wt - Dish Wt
Dry Wt = Sample Dry Wt + Dish Wt
Dry Wt - Dish Wt = Sample Dry Wt - Dish Wt
All weight values shown above are expressed in grams.

$$\text{RPD} = \frac{|\text{Sample Value - Duplicate Value}|}{(\text{Sample Value + Duplicate Value})/2} \times 100$$

$$\%\ \text{Solids} = \frac{\text{Dry Weight}}{\text{Wet Weight}} \times 100$$

$$\%\ \text{Moisture} = \frac{(\text{Wet Weight - Dry Weight})}{\text{Wet Weight}} \times 100$$

APPENDIX E

LABORATORY DATA VALIDATION PACKAGES

Review of Eberline Analytical Data Package 13-03012

The subject data package was reviewed and the data appear valid.
The data package contained analytical results for 13 soil samples including one lab duplicate and one field duplicate. The lab blanks and spikes for the data package were within tolerances, and MDA's for all results were acceptable. The data package indicated a minimum 21 day holding time to allow for the ingrowth of radon daughters, and analytical results were reported for daughters of U-238 (Ra-226), Th-232, and K-40.

The field duplicates nearly matched with analytical results for Ra-226 of 316 +/- 19 pCi/g and 356 +/- 20 pCi/g. This difference is likely due to inhomogeneity of the contaminant in the soil. Lab duplicates matched very well, with Ra-226 results of 11.4 and 12.1 pCi/g.

The data package contained 1 background and 12 site samples from the Section 30 Mine. The Ra-226 concentrations in the site samples were all elevated, ranging from 12.1 to 451 pCi/g. Th-232 ranged from 0.6 to 2.3 pCi/g, and K-40 ranged from 19 to 33 pCi/g. Ra-226 concentration in the background sample was1.3 pCi/g. Th-232 was 1.2 pCi/g, and K-40 was 23 pCi/g.

DATA QUALITY ASSURANCE REVIEW

SITE NAME Section 30 Mine

WORK ORDER NUMBER 20406.012.035.0785.01 TDD NUMBER TO-0035-12-11-04

PROJECT NUMBER ____________ SDG NUMBER 1303060

Weston Solutions, Inc. (WESTON®) has completed a QA review for Work Order Number 20406.012.035.0785.01; SDG No. 1303060; Section 30 Mine. Twelve samples were analyzed for metals by ALS Environmental. Sample numbers are listed below.

SAMPLE NUMBERS

S30-04-130228	S30-53-130228	S30-61-130228
S30-69-130228	S30-70-130228	S30-83-130228
S30-90-130228	S30-90-2-130228	S30-91-130228
S30-94-130228	S30-95-130228	S30-BKGD-N-130228

This data package was validated to determine if Quality Control (QC) specifications were achieved, following *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (June, 2008), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (Jan, 2010), *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (Sep, 2011), *Quality Assurance/Quality Control Guidance for Removal Activities* (April, 1990), and the Regional Protocol for Holding Times, Blanks, and VOA Preservation (April 13, 1989). Specific data qualifications are listed in the following discussion.

REVIEWER Gloria J. Switalski DATE March 26, 2013

Data Qualifiers

Data Qualifier Definitions were supplied by the Office of Solid Waste and Emergency Response (September 1989) and are included in the Functional Guidelines. Data qualifiers may be combined (UJ, QJ) with the corresponding combination of meanings. Additional qualifier may be added to provide additional, more specific information (JL, UB, QJK), modifying the meaning of the primary qualifier. Addition qualifiers utilized by WESTON are H, L, K, B, Q, and D.

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation or detection limit, which has been adjusted for sample weight/sample volume, extraction volume, percent solids, sample dilution or other analysis specific parameters.

An additional qualifier, "B", may be appended to indicate that while the analyte was detected in the sample, the presence of the analyte may be attributable to blank contamination and the analyte is therefore considered undetected with the sample detection or quantitation limit for the analyte being elevated.

J - The analyte was analyzed for, but the associated numerical value may not be consistent with the amount actually present in the environmental sample or may not be consistent with the sample detection or quantitation limit. The value is an estimated quantity. The data should be seriously considered for decision-making and are usable for many purposes.

An additional qualifier will be appended to the "J" qualifier that indicates the bias in the reported results:

L Low bias

H High bias

K Unknown bias

Q The reported concentration is less than the sample quantitation limit for the specific analyte in the sample.

The L and H qualifier will only be employed when a single qualification is required. When more than one quality control parameter affects the analytical result and a conflict results in assigning a bias, the result will be flagged JK.

R - Quality Control indicates that data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified. Resampling and reanalysis are necessary for verification to confirm or deny the presence of an analyte.

N - The analysis indicates the presence of analyte for which there is presumptive evidence to make a "tentative identification."

D - The concentration reported was determined in the re-analysis of the sample at a secondary dilution.

METALS DATA EVALUATION

1. Analytical Method:

Samples were prepared and analyzed for ICP metals using the procedures specified in **SW-846 Methods 6010B and 6020A.** Samples were prepared and analyzed for mercury using the procedures specified in **SW-846 Method 7471A.**

2. Holding Times:

All samples met established holding time criteria of 180 days for ICP metals and 28 days for mercury. Samples were maintained at 4°C±2°C. No qualifications are placed on the data.

3. Initial Calibration:

ICP initial calibration included a blank and one or more standards and initial calibration verification results fell within the control limits of 90 to 110 percent of the true values. Mercury initial calibration included a blank and six standards and the correlation coefficient was greater than 0.995. No qualifications are placed on the data.

4. Continuing Calibration:

All ICP results fell within the control limits of 90% to 110% of the true values. All mercury results fell within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

5. CRQL Standard:

The CRQL standards met acceptance criteria. No qualifications are placed on the data.

6. Blanks:

A. Laboratory Blanks:

No target analytes were detected in the calibration and preparation blanks. No qualifications are placed on the data.

B. Field Blanks:

No field blank samples were submitted with this analytical package. No qualifications are placed on the data.

7. ICP Interference Check:

All results for the Interference Check Sample were within the control limits of 80% to 120% of the true values. No qualifications are placed on the data.

8. Laboratory Control Sample (LCS):

The recoveries for the LCS were within the control limits provided. No qualifications are placed on the data.

9. Duplicate Sample Analysis:

A. Laboratory Duplicate Analysis:

Sample S30-04-130228 underwent laboratory duplicate analysis for the solid matrix for ICP metals. Sample S30-BKGD-N-130228 underwent laboratory duplicate analysis for the solid matrix for mercury. QC criteria are that the Relative Percent Difference (RPD) values for the duplicate sample analysis be less than 20% for aqueous samples and less than 35% for solid samples for concentrations greater than five times the reporting limit (RL). For sample concentrations less than five times the RL, the QC criteria are within ± the RL for the aqueous matrix or ± two times the RL for the solid matrix. All QC criteria were met. No qualifications are placed on the data.

B. Field Duplicate Analysis:

The following sample pair was submitted as field duplicates for the solid matrix: S30-90-130228/S30-90-2-130228. QC criteria are that the RPD values for the field duplicate sample analysis be less than 30% for aqueous samples and less than 50% for solid samples for concentrations greater than five times the RL. For sample concentrations less than five times the RL, the QC criteria is that the absolute difference between the samples is less than two times the RL for aqueous samples or less than 3.5 times the RL for the solid matrix. All QC criteria were met. No qualifications are placed on the data.

10. Spiked Sample Analysis:

Sample S30-04-130228 underwent spike and spike duplicate analysis for the solid matrix for ICP metals Sample S30-BKGD-N-130228 underwent spike and spike duplicate analysis for the solid matrix for mercury. The spike recoveries for the following analytes were outside of the 75%-125% QC recovery limits for analytes whose sample concentration did not exceed the spike concentration by a factor of 4 times or more:

ANALYTE	MATRIX	% RECOVERY	AFFECTED SAMPLES	QUALIFIER FLAG
Antimony	Solid	61/59	All	UJL

11. ICP Serial Dilution:

Sample S30-04-130228 underwent serial dilution for ICP metals. The Percent Difference (%D) values for the serial dilution analyses were within the QC limits of 10% for all analytes with concentrations greater than 50 times their method detection limit (MDL) with the following exception:

ANALYTE	MATRIX	%D	AFFECTED SAMPLES	QUALIFIER FLAG
Potassium	Solid	18	All	JK

12. Sample Quantitation and Reporting Limits:

Concentrations of all reported analytes were correctly calculated.

Some analytes in some samples were analyzed at a dilution due to the high concentration present in the samples and/or due to sample matrix. The RL in these samples are elevated as a result of the dilution performed.

13. Laboratory Contact

No laboratory contact was required

14. Overall Assessment:

The antimony results in all samples are estimated due to low MS/MSD recoveries.

The potassium results in all samples are estimated due to high serial dilution %D.

The analytical data is acceptable for use with the qualifications listed above.

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-04-130228	
1303060-1	

Sample Matrix: SOIL
% Moisture: 7.7
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	6800	21			
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	~~N~~	VJL
7440-38-2	ARSENIC	1	5.9	1.1			
7440-39-3	BARIUM	1	82	11			
7440-41-7	BERYLLIUM	1	0.69	0.53			
7440-43-9	CADMIUM	1	0.53	0.53	U		
7440-70-2	CALCIUM	1	15000	110			
7440-47-3	CHROMIUM	1	6.6	1.1			
7440-48-4	COBALT	1	5.6	1.1			
7440-50-8	COPPER	1	10	1.1			
7439-89-6	IRON	1	16000	11			
7439-92-1	LEAD	1	11	0.32			
7439-95-4	MAGNESIUM	1	4300	110			
7439-96-5	MANGANESE	1	210	1.1			
7439-98-7	MOLYBDENUM	1	1.3	1.1			
7440-02-0	NICKEL	1	9.5	2.1			
7440-09-7	POTASSIUM	1	2100	110		~~E~~	JK
7782-49-2	SELENIUM	1	2.6	0.53			
7440-22-4	SILVER	1	1.1	1.1	U		
7440-23-5	SODIUM	1	110	110	U		
7440-28-0	THALLIUM	5	5.3	5.3	U		
7440-31-5	TIN	1	5.3	5.3	U		
7440-62-2	VANADIUM	1	19	1.1			
7440-66-6	ZINC	1	41	2.1			

Data Package ID: *it1303060-1*

& 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-53-130228
1303060-2

Sample Matrix: SOIL
% Moisture: 3.6
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4800	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~	
7440-38-2	ARSENIC	1	23	1		
7440-39-3	BARIUM	1	99	10		
7440-41-7	BERYLLIUM	1	1.2	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	12000	100		
7440-47-3	CHROMIUM	1	3.1	1		
7440-48-4	COBALT	1	3.7	1		
7440-50-8	COPPER	1	6.1	1		
7439-89-6	IRON	1	12000	10		
7439-92-1	LEAD	1	29	0.31		
7439-95-4	MAGNESIUM	1	2300	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	38	1		
7440-02-0	NICKEL	1	4.4	2		
7440-09-7	POTASSIUM	1	1600	100		
7782-49-2	SELENIUM	1	87	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	310	1		
7440-66-6	ZINC	1	24	2		

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Data Package ID: *it1303060-1*

B 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-61-130228
1303060-3

Sample Matrix: SOIL
% Moisture: 2.8
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.037 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5000	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	9.2	0.99		
7440-39-3	BARIUM	1	77	9.9		
7440-41-7	BERYLLIUM	1	0.68	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	7200	99		
7440-47-3	CHROMIUM	1	4.3	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	7.2	0.99		
7439-89-6	IRON	1	11000	9.9		
7439-92-1	LEAD	1	23	0.3		
7439-95-4	MAGNESIUM	1	2400	99		
7439-96-5	MANGANESE	1	160	0.99		
7439-98-7	MOLYBDENUM	1	4	0.99		
7440-02-0	NICKEL	1	5.4	2		
7440-09-7	POTASSIUM	1	1400	99		
7782-49-2	SELENIUM	1	32	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	1	0.99	0.99	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	120	0.99		
7440-66-6	ZINC	1	28	2		

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Data Package ID: *it1303060-1*

& 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

[redacted] S30-69-130228
1303060-4

Sample Matrix: SOIL
% Moisture: 2.8
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.035 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3800	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~	
7440-38-2	ARSENIC	1	18	0.99		
7440-39-3	BARIUM	1	68	9.9		
7440-41-7	BERYLLIUM	1	0.74	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	28000	99		
7440-47-3	CHROMIUM	1	3.2	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	5.5	0.99		
7439-89-6	IRON	1	10000	9.9		
7439-92-1	LEAD	1	17	0.3		
7439-95-4	MAGNESIUM	1	2600	99		
7439-96-5	MANGANESE	1	350	0.99		
7439-98-7	MOLYBDENUM	1	49	0.99		
7440-02-0	NICKEL	1	4.9	2		
7440-09-7	POTASSIUM	1	1500	99		
7782-49-2	SELENIUM	1	43	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	5	5	5	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	150	0.99		
7440-66-6	ZINC	1	25	2		

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Data Package ID: *it1303060-1*

JS 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-70-130228
1303060-5

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.027 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5300	20		
7440-36-0	ANTIMONY	1	2	2	U	
7440-38-2	ARSENIC	1	22	1		
7440-39-3	BARIUM	1	110	10		
7440-41-7	BERYLLIUM	1	1.1	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	11000	100		
7440-47-3	CHROMIUM	1	3.8	1		
7440-48-4	COBALT	1	4	1		
7440-50-8	COPPER	1	7	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	27	0.3		
7439-95-4	MAGNESIUM	1	2600	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	25	1		
7440-02-0	NICKEL	1	5.2	2		
7440-09-7	POTASSIUM	1	1800	100		
7782-49-2	SELENIUM	1	84	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	280	1		
7440-66-6	ZINC	1	30	2		

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Data Package ID: *it1303060-1*

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Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-83-130228
1303060-6

Sample Matrix: SOIL
% Moisture: 6.0
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.002 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	7900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	120	11		
7440-41-7	BERYLLIUM	1	0.89	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	15000	110		
7440-47-3	CHROMIUM	1	7.5	1.1		
7440-48-4	COBALT	1	5.8	1.1		
7440-50-8	COPPER	1	13	1.1		
7439-89-6	IRON	1	17000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3500	110		
7439-96-5	MANGANESE	1	240	1.1		
7439-98-7	MOLYBDENUM	1	7.9	1.1		
7440-02-0	NICKEL	1	9.2	2.1		
7440-09-7	POTASSIUM	1	2800	110		
7782-49-2	SELENIUM	1	16	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	110	110	U	
7440-28-0	THALLIUM	1	1.1	1.1	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	88	1.1		
7440-66-6	ZINC	1	42	2.1		

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Data Package ID: *it1303060-1*

&3 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-90-130228
1303060-7

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	4600	21			
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~		UJL
7440-38-2	ARSENIC	1	16	1			
7440-39-3	BARIUM	1	80	10			
7440-41-7	BERYLLIUM	1	0.81	0.51			
7440-43-9	CADMIUM	1	0.51	0.51	U		
7440-70-2	CALCIUM	1	18000	100			
7440-47-3	CHROMIUM	1	4.4	1			
7440-48-4	COBALT	1	3.8	1			
7440-50-8	COPPER	1	9.2	1			
7439-89-6	IRON	1	12000	10			
7439-92-1	LEAD	1	21	0.31			
7439-95-4	MAGNESIUM	1	2500	100			
7439-96-5	MANGANESE	1	200	1			
7439-98-7	MOLYBDENUM	1	14	1			
7440-02-0	NICKEL	1	6.2	2.1			
7440-09-7	POTASSIUM	1	1900	100			JK
7782-49-2	SELENIUM	1	49	0.51			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	1	1	1	U		
7440-31-5	TIN	1	5.1	5.1	U		
7440-62-2	VANADIUM	1	160	1			
7440-66-6	ZINC	1	29	2.1			

Data Package ID: *it1303060-1*

8S 3/20/13

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-90-2-130228
1303060-8

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.035 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	4800	20			
7440-36-0	ANTIMONY	1	2	2	~~U~~		UJL
7440-38-2	ARSENIC	1	17	1			
7440-39-3	BARIUM	1	78	10			
7440-41-7	BERYLLIUM	1	0.9	0.5			
7440-43-9	CADMIUM	1	0.5	0.5	U		
7440-70-2	CALCIUM	1	15000	100			
7440-47-3	CHROMIUM	1	4.3	1			
7440-48-4	COBALT	1	3.9	1			
7440-50-8	COPPER	1	8	1			
7439-89-6	IRON	1	12000	10			
7439-92-1	LEAD	1	23	0.3			
7439-95-4	MAGNESIUM	1	2500	100			
7439-96-5	MANGANESE	1	200	1			
7439-98-7	MOLYBDENUM	1	13	1			
7440-02-0	NICKEL	1	5.7	2			
7440-09-7	POTASSIUM	1	1800	100			JK
7782-49-2	SELENIUM	1	47	0.5			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	1	1	1	U		
7440-31-5	TIN	1	5	5	U		
7440-62-2	VANADIUM	1	190	1			
7440-66-6	ZINC	1	36	2			

Data Package ID: *it1303060-1*

KS 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-91-130228	
1303060-9	

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	3900	20			
7440-36-0	ANTIMONY	1	2	2	~~U~~		UJL
7440-38-2	ARSENIC	1	4.2	1			
7440-39-3	BARIUM	1	210	10			
7440-41-7	BERYLLIUM	1	0.51	0.51	U		
7440-43-9	CADMIUM	1	0.51	0.51	U		
7440-70-2	CALCIUM	1	5300	100			
7440-47-3	CHROMIUM	1	3.3	1			
7440-48-4	COBALT	1	2.7	1			
7440-50-8	COPPER	1	4.6	1			
7439-89-6	IRON	1	11000	10			
7439-92-1	LEAD	1	11	0.3			
7439-95-4	MAGNESIUM	1	1800	100			
7439-96-5	MANGANESE	1	170	1			
7439-98-7	MOLYBDENUM	1	2.7	1			
7440-02-0	NICKEL	1	2.9	2			
7440-09-7	POTASSIUM	1	780	100			JK
7782-49-2	SELENIUM	1	53	0.51			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	5	5.1	5.1	U		
7440-31-5	TIN	1	5.1	5.1	U		
7440-62-2	VANADIUM	1	88	1			
7440-66-6	ZINC	1	28	2			

Data Package ID: *it1303060-1*

RS 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-94-130228
1303060-10

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.002 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5100	21		
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	
7440-38-2	ARSENIC	1	15	1		
7440-39-3	BARIUM	1	93	10		
7440-41-7	BERYLLIUM	1	0.83	0.52		
7440-43-9	CADMIUM	1	0.52	0.52	U	
7440-70-2	CALCIUM	1	17000	100		
7440-47-3	CHROMIUM	1	4.8	1		
7440-48-4	COBALT	1	3.4	1		
7440-50-8	COPPER	1	12	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	21	0.31		
7439-95-4	MAGNESIUM	1	2800	100		
7439-96-5	MANGANESE	1	220	1		
7439-98-7	MOLYBDENUM	1	13	1		
7440-02-0	NICKEL	1	4.9	2.1		
7440-09-7	POTASSIUM	1	2100	100		
7782-49-2	SELENIUM	1	37	0.52		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.2	5.2	U	
7440-31-5	TIN	1	5.2	5.2	U	
7440-62-2	VANADIUM	1	170	1		
7440-66-6	ZINC	1	45	2.1		

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JK

Data Package ID: *it1303060-1*

3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-95-130228	
1303060-11	

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	8900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	110	11		
7440-41-7	BERYLLIUM	1	0.9	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	12000	110		
7440-47-3	CHROMIUM	1	8.1	1.1		
7440-48-4	COBALT	1	5.7	1.1		
7440-50-8	COPPER	1	12	1.1		
7439-89-6	IRON	1	18000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3800	110		
7439-96-5	MANGANESE	1	220	1.1		
7439-98-7	MOLYBDENUM	1	15	1.1		
7440-02-0	NICKEL	1	9.8	2.1		
7440-09-7	POTASSIUM	1	2900	110		
7782-49-2	SELENIUM	1	26	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	340	110		
7440-28-0	THALLIUM	5	5.3	5.3	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	70	1.1		
7440-66-6	ZINC	1	48	2.1		

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Data Package ID: *it1303060-1*

& 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-BKGD-N-130228 1303060-12	**Sample Matrix:** SOIL **% Moisture:** 3.5 **Date Collected:** 28-Feb-13 **Date Extracted:** 07-Mar-13 **Date Analyzed:** 11-Mar-13 **Prep Method:** SW3050 Rev B	**Prep Batch:** IP130307-4 **QCBatchID:** IP130307-4-1 **Run ID:** IT130311-2A1 **Cleanup:** NONE **Basis:** Dry Weight **File Name:** 130311A.	**Analyst:** Mike Lundgreen **Sample Aliquot:** 1.007 G **Final Volume:** 100 ML **Result Units:** MG/KG **Clean DF:** 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3200	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	3.4	1		
7440-39-3	BARIUM	1	79	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	19000	100		
7440-47-3	CHROMIUM	1	3.3	1		
7440-48-4	COBALT	1	3.3	1		
7440-50-8	COPPER	1	4.4	1		
7439-89-6	IRON	1	9200	10		
7439-92-1	LEAD	1	5.9	0.31		
7439-95-4	MAGNESIUM	1	3900	100		
7439-96-5	MANGANESE	1	120	1		
7439-98-7	MOLYBDENUM	1	1	1	U	
7440-02-0	NICKEL	1	5.6	2.1		
7440-09-7	POTASSIUM	1	870	100		
7782-49-2	SELENIUM	1	0.51	0.51	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.1	5.1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	9	1		
7440-66-6	ZINC	1	21	2.1		

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Data Package ID: *it1303060-1*

3/20/13

Total URANIUM

Method SW6020 Revision A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: SW3050B
Analyst: Ross Miller

Final Volume: 100 ml
Matrix: SOIL
Result Units: UG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/07/2013	03/08/2013	7.7	100	12000	110		1.019 g
S30-53-130228	1303060-2	02/28/2013	03/07/2013	03/08/2013	3.6	100	560000	100		1.019 g
S30-61-130228	1303060-3	02/28/2013	03/07/2013	03/08/2013	2.8	100	51000	99		1.037 g
S30-69-130228	1303060-4	02/28/2013	03/07/2013	03/08/2013	2.8	100	130000	99		1.035 g
S30-70-130228	1303060-5	02/28/2013	03/07/2013	03/08/2013	3.9	100	310000	100		1.027 g
S30-83-130228	1303060-6	02/28/2013	03/07/2013	03/08/2013	6.0	100	92000	110		1.002 g
S30-90-130228	1303060-7	02/28/2013	03/07/2013	03/08/2013	3.2	100	190000	100		1.006 g
S30-90-2-130228	1303060-8	02/28/2013	03/07/2013	03/08/2013	3.5	100	260000	100		1.035 g
S30-91-130228	1303060-9	02/28/2013	03/07/2013	03/08/2013	3.2	100	110000	100		1.019 g
S30-94-130228	1303060-10	02/28/2013	03/07/2013	03/08/2013	3.9	100	120000	100		1.002 g
S30-95-130228	1303060-11	02/28/2013	03/07/2013	03/08/2013	6.9	100	120000	110		1.006 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/07/2013	03/08/2013	3.5	100	2500	100		1.007 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *im1303060-1*

8 3/20/13

Total MERCURY

Method SW7471 Revision A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: METHOD
Analyst: Sheri Lafferty

Final Volume: 100 g
Matrix: SOIL
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/11/2013	03/12/2013	7.7	1	0.038	0.035		0.611 g
S30-53-130228	1303060-2	02/28/2013	03/11/2013	03/12/2013	3.6	1	0.078	0.034		0.615 g
S30-61-130228	1303060-3	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.063	0.034		0.61 g
S30-69-130228	1303060-4	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.09	0.034		0.604 g
S30-70-130228	1303060-5	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.076	0.034		0.604 g
S30-83-130228	1303060-6	02/28/2013	03/11/2013	03/12/2013	6.0	1	0.048	0.035		0.611 g
S30-90-130228	1303060-7	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.067	0.034		0.613 g
S30-90-2-130228	1303060-8	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.068	0.034		0.611 g
S30-91-130228	1303060-9	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.034	0.034	U	0.616 g
S30-94-130228	1303060-10	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.051	0.034		0.61 g
S30-95-130228	1303060-11	02/28/2013	03/11/2013	03/12/2013	6.9	1	0.041	0.035		0.614 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.034	0.034	U	0.604 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *hg1303060-1*

& 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-04-130228	**Sample Matrix:** SOIL	**Prep Batch:** IP130307-4	**Analyst:** Mike Lundgreen
1303060-1	**% Moisture:** 7.7	**QCBatchID:** IP130307-4-1	**Sample Aliquot:** 1.019 G
	Date Collected: 28-Feb-13	**Run ID:** IT130311-2A1	**Final Volume:** 100 ML
	Date Extracted: 07-Mar-13	**Cleanup:** NONE	**Result Units:** MG/KG
	Date Analyzed: 11-Mar-13	**Basis:** Dry Weight	**Clean DF:** 1
	Prep Method: SW3050 Rev B	**File Name:** 130311A.	

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	6800	21			
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	~~N~~	VJL
7440-38-2	ARSENIC	1	5.9	1.1			
7440-39-3	BARIUM	1	82	11			
7440-41-7	BERYLLIUM	1	0.69	0.53			
7440-43-9	CADMIUM	1	0.53	0.53	U		
7440-70-2	CALCIUM	1	15000	110			
7440-47-3	CHROMIUM	1	6.6	1.1			
7440-48-4	COBALT	1	5.6	1.1			
7440-50-8	COPPER	1	10	1.1			
7439-89-6	IRON	1	16000	11			
7439-92-1	LEAD	1	11	0.32			
7439-95-4	MAGNESIUM	1	4300	110			
7439-96-5	MANGANESE	1	210	1.1			
7439-98-7	MOLYBDENUM	1	1.3	1.1			
7440-02-0	NICKEL	1	9.5	2.1			
7440-09-7	POTASSIUM	1	2100	110		~~E~~	JK
7782-49-2	SELENIUM	1	2.6	0.53			
7440-22-4	SILVER	1	1.1	1.1	U		
7440-23-5	SODIUM	1	110	110	U		
7440-28-0	THALLIUM	5	5.3	5.3	U		
7440-31-5	TIN	1	5.3	5.3	U		
7440-62-2	VANADIUM	1	19	1.1			
7440-66-6	ZINC	1	41	2.1			

Data Package ID: *it1303060-1*

3/26/13

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-53-130228 1303060-2	**Sample Matrix:** SOIL **% Moisture:** 3.6 **Date Collected:** 28-Feb-13 **Date Extracted:** 07-Mar-13 **Date Analyzed:** 11-Mar-13 **Prep Method:** SW3050 Rev B	**Prep Batch:** IP130307-4 **QCBatchID:** IP130307-4-1 **Run ID:** IT130311-2A1 **Cleanup:** NONE **Basis:** Dry Weight **File Name:** 130311A.	**Analyst:** Mike Lundgreen **Sample Aliquot:** 1.019 G **Final Volume:** 100 ML **Result Units:** MG/KG **Clean DF:** 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	4800	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~	
7440-38-2	ARSENIC	1	23	1		
7440-39-3	BARIUM	1	99	10		
7440-41-7	BERYLLIUM	1	1.2	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	12000	100		
7440-47-3	CHROMIUM	1	3.1	1		
7440-48-4	COBALT	1	3.7	1		
7440-50-8	COPPER	1	6.1	1		
7439-89-6	IRON	1	12000	10		
7439-92-1	LEAD	1	29	0.31		
7439-95-4	MAGNESIUM	1	2300	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	38	1		
7440-02-0	NICKEL	1	4.4	2		
7440-09-7	POTASSIUM	1	1600	100		
7782-49-2	SELENIUM	1	87	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	310	1		
7440-66-6	ZINC	1	24	2		

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Data Package ID: *it1303060-1*

&3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-61-130228
1303060-3

Sample Matrix: SOIL
% Moisture: 2.8
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.037 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5000	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~	
7440-38-2	ARSENIC	1	9.2	0.99		
7440-39-3	BARIUM	1	77	9.9		
7440-41-7	BERYLLIUM	1	0.68	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	7200	99		
7440-47-3	CHROMIUM	1	4.3	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	7.2	0.99		
7439-89-6	IRON	1	11000	9.9		
7439-92-1	LEAD	1	23	0.3		
7439-95-4	MAGNESIUM	1	2400	99		
7439-96-5	MANGANESE	1	160	0.99		
7439-98-7	MOLYBDENUM	1	4	0.99		
7440-02-0	NICKEL	1	5.4	2		
7440-09-7	POTASSIUM	1	1400	99		
7782-49-2	SELENIUM	1	32	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	1	0.99	0.99	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	120	0.99		
7440-66-6	ZINC	1	28	2		

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Data Package ID: *it1303060-1*

&3 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-69-130228 / 1303060-4	**Sample Matrix:** SOIL	**Prep Batch:** IP130307-4	**Analyst:** Mike Lundgreen
	% Moisture: 2.8	**QCBatchID:** IP130307-4-1	**Sample Aliquot:** 1.035 G
	Date Collected: 28-Feb-13	**Run ID:** IT130311-2A1	**Final Volume:** 100 ML
	Date Extracted: 07-Mar-13	**Cleanup:** NONE	**Result Units:** MG/KG
	Date Analyzed: 11-Mar-13	**Basis:** Dry Weight	**Clean DF:** 1
	Prep Method: SW3050 Rev B	**File Name:** 130311A.	

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	3800	20		
7440-36-0	ANTIMONY	1	2	2	U	UJL
7440-38-2	ARSENIC	1	18	0.99		
7440-39-3	BARIUM	1	68	9.9		
7440-41-7	BERYLLIUM	1	0.74	0.5		
7440-43-9	CADMIUM	1	0.5	0.5	U	
7440-70-2	CALCIUM	1	28000	99		
7440-47-3	CHROMIUM	1	3.2	0.99		
7440-48-4	COBALT	1	3.5	0.99		
7440-50-8	COPPER	1	5.5	0.99		
7439-89-6	IRON	1	10000	9.9		
7439-92-1	LEAD	1	17	0.3		
7439-95-4	MAGNESIUM	1	2600	99		
7439-96-5	MANGANESE	1	350	0.99		
7439-98-7	MOLYBDENUM	1	49	0.99		
7440-02-0	NICKEL	1	4.9	2		
7440-09-7	POTASSIUM	1	1500	99		JK
7782-49-2	SELENIUM	1	43	0.5		
7440-22-4	SILVER	1	0.99	0.99	U	
7440-23-5	SODIUM	1	99	99	U	
7440-28-0	THALLIUM	5	5	5	U	
7440-31-5	TIN	1	5	5	U	
7440-62-2	VANADIUM	1	150	0.99		
7440-66-6	ZINC	1	25	2		

Data Package ID: *it1303060-1*

KS 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-70-130228
1303060-5

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.027 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5300	20		
7440-36-0	ANTIMONY	1	2	2	~~U~~	UJL
7440-38-2	ARSENIC	1	22	1		
7440-39-3	BARIUM	1	110	10		
7440-41-7	BERYLLIUM	1	1.1	0.51		
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	11000	100		
7440-47-3	CHROMIUM	1	3.8	1		
7440-48-4	COBALT	1	4	1		
7440-50-8	COPPER	1	7	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	27	0.3		
7439-95-4	MAGNESIUM	1	2600	100		
7439-96-5	MANGANESE	1	190	1		
7439-98-7	MOLYBDENUM	1	25	1		
7440-02-0	NICKEL	1	5.2	2		
7440-09-7	POTASSIUM	1	1800	100		JK
7782-49-2	SELENIUM	1	84	0.51		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	1	1	1	U	
7440-31-5	TIN	1	5.1	5.1	U	
7440-62-2	VANADIUM	1	280	1		
7440-66-6	ZINC	1	30	2		

Data Package ID: *it1303060-1*

& 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-83-130228	**Sample Matrix:** SOIL	**Prep Batch:** IP130307-4	**Analyst:** Mike Lundgreen
1303060-6	**% Moisture:** 6.0	**QCBatchID:** IP130307-4-1	**Sample Aliquot:** 1.002 G
	Date Collected: 28-Feb-13	**Run ID:** IT130311-2A1	**Final Volume:** 100 ML
	Date Extracted: 07-Mar-13	**Cleanup:** NONE	**Result Units:** MG/KG
	Date Analyzed: 11-Mar-13	**Basis:** Dry Weight	**Clean DF:** 1
	Prep Method: SW3050 Rev B	**File Name:** 130311A.	

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	7900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	120	11		
7440-41-7	BERYLLIUM	1	0.89	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	15000	110		
7440-47-3	CHROMIUM	1	7.5	1.1		
7440-48-4	COBALT	1	5.8	1.1		
7440-50-8	COPPER	1	13	1.1		
7439-89-6	IRON	1	17000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3500	110		
7439-96-5	MANGANESE	1	240	1.1		
7439-98-7	MOLYBDENUM	1	7.9	1.1		
7440-02-0	NICKEL	1	9.2	2.1		
7440-09-7	POTASSIUM	1	2800	110		
7782-49-2	SELENIUM	1	16	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	110	110	U	
7440-28-0	THALLIUM	1	1.1	1.1	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	88	1.1		
7440-66-6	ZINC	1	42	2.1		

UJL

JK

Data Package ID: *it1303060-1*

JS 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-90-130228
1303060-7

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	4600	21			
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~		UJL
7440-38-2	ARSENIC	1	16	1			
7440-39-3	BARIUM	1	80	10			
7440-41-7	BERYLLIUM	1	0.81	0.51			
7440-43-9	CADMIUM	1	0.51	0.51	U		
7440-70-2	CALCIUM	1	18000	100			
7440-47-3	CHROMIUM	1	4.4	1			
7440-48-4	COBALT	1	3.8	1			
7440-50-8	COPPER	1	9.2	1			
7439-89-6	IRON	1	12000	10			
7439-92-1	LEAD	1	21	0.31			
7439-95-4	MAGNESIUM	1	2500	100			
7439-96-5	MANGANESE	1	200	1			
7439-98-7	MOLYBDENUM	1	14	1			
7440-02-0	NICKEL	1	6.2	2.1			
7440-09-7	POTASSIUM	1	1900	100			JK
7782-49-2	SELENIUM	1	49	0.51			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	1	1	1	U		
7440-31-5	TIN	1	5.1	5.1	U		
7440-62-2	VANADIUM	1	160	1			
7440-66-6	ZINC	1	29	2.1			

Data Package ID: *it1303060-1*

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-90-2-130228
1303060-8

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.035 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	4800	20			
7440-36-0	ANTIMONY	1	2	2	~~U~~		UJL
7440-38-2	ARSENIC	1	17	1			
7440-39-3	BARIUM	1	78	10			
7440-41-7	BERYLLIUM	1	0.9	0.5			
7440-43-9	CADMIUM	1	0.5	0.5	U		
7440-70-2	CALCIUM	1	15000	100			
7440-47-3	CHROMIUM	1	4.3	1			
7440-48-4	COBALT	1	3.9	1			
7440-50-8	COPPER	1	8	1			
7439-89-6	IRON	1	12000	10			
7439-92-1	LEAD	1	23	0.3			
7439-95-4	MAGNESIUM	1	2500	100			
7439-96-5	MANGANESE	1	200	1			
7439-98-7	MOLYBDENUM	1	13	1			
7440-02-0	NICKEL	1	5.7	2			
7440-09-7	POTASSIUM	1	1800	100			JK
7782-49-2	SELENIUM	1	47	0.5			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	1	1	1	U		
7440-31-5	TIN	1	5	5	U		
7440-62-2	VANADIUM	1	190	1			
7440-66-6	ZINC	1	36	2			

Data Package ID: *it1303060-1*

KS 3/20/13

Total ICP Metals

Method SW6010 Revision B
Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

[redacted] S30-91-130228
1303060-9

Sample Matrix: SOIL
% Moisture: 3.2
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.019 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	3900	20			
7440-36-0	ANTIMONY	1	2	2	~~U~~		WJL
7440-38-2	ARSENIC	1	4.2	1			
7440-39-3	BARIUM	1	210	10			
7440-41-7	BERYLLIUM	1	0.51	0.51	U		
7440-43-9	CADMIUM	1	0.51	0.51	U		
7440-70-2	CALCIUM	1	5300	100			
7440-47-3	CHROMIUM	1	3.3	1			
7440-48-4	COBALT	1	2.7	1			
7440-50-8	COPPER	1	4.6	1			
7439-89-6	IRON	1	11000	10			
7439-92-1	LEAD	1	11	0.3			
7439-95-4	MAGNESIUM	1	1800	100			
7439-96-5	MANGANESE	1	170	1			
7439-98-7	MOLYBDENUM	1	2.7	1			
7440-02-0	NICKEL	1	2.9	2			
7440-09-7	POTASSIUM	1	780	100			JK
7782-49-2	SELENIUM	1	53	0.51			
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	5	5.1	5.1	U		
7440-31-5	TIN	1	5.1	5.1	U		
7440-62-2	VANADIUM	1	88	1			
7440-66-6	ZINC	1	28	2			

Data Package ID: *it1303060-1*

83 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental – FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-94-130228
1303060-10

Sample Matrix: SOIL
% Moisture: 3.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.002 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	5100	21		
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~	
7440-38-2	ARSENIC	1	15	1		
7440-39-3	BARIUM	1	93	10		
7440-41-7	BERYLLIUM	1	0.83	0.52		
7440-43-9	CADMIUM	1	0.52	0.52	U	
7440-70-2	CALCIUM	1	17000	100		
7440-47-3	CHROMIUM	1	4.8	1		
7440-48-4	COBALT	1	3.4	1		
7440-50-8	COPPER	1	12	1		
7439-89-6	IRON	1	13000	10		
7439-92-1	LEAD	1	21	0.31		
7439-95-4	MAGNESIUM	1	2800	100		
7439-96-5	MANGANESE	1	220	1		
7439-98-7	MOLYBDENUM	1	13	1		
7440-02-0	NICKEL	1	4.9	2.1		
7440-09-7	POTASSIUM	1	2100	100		
7782-49-2	SELENIUM	1	37	0.52		
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	100	100	U	
7440-28-0	THALLIUM	5	5.2	5.2	U	
7440-31-5	TIN	1	5.2	5.2	U	
7440-62-2	VANADIUM	1	170	1		
7440-66-6	ZINC	1	45	2.1		

VJL

JK

Data Package ID: *it1303060-1*

& 3/20/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-95-130228
1303060-11

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.006 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	8900	21		
7440-36-0	ANTIMONY	1	2.1	2.1	U	
7440-38-2	ARSENIC	1	13	1.1		
7440-39-3	BARIUM	1	110	11		
7440-41-7	BERYLLIUM	1	0.9	0.53		
7440-43-9	CADMIUM	1	0.53	0.53	U	
7440-70-2	CALCIUM	1	12000	110		
7440-47-3	CHROMIUM	1	8.1	1.1		
7440-48-4	COBALT	1	5.7	1.1		
7440-50-8	COPPER	1	12	1.1		
7439-89-6	IRON	1	18000	11		
7439-92-1	LEAD	1	18	0.32		
7439-95-4	MAGNESIUM	1	3800	110		
7439-96-5	MANGANESE	1	220	1.1		
7439-98-7	MOLYBDENUM	1	15	1.1		
7440-02-0	NICKEL	1	9.8	2.1		
7440-09-7	POTASSIUM	1	2900	110		
7782-49-2	SELENIUM	1	26	0.53		
7440-22-4	SILVER	1	1.1	1.1	U	
7440-23-5	SODIUM	1	340	110		
7440-28-0	THALLIUM	5	5.3	5.3	U	
7440-31-5	TIN	1	5.3	5.3	U	
7440-62-2	VANADIUM	1	70	1.1		
7440-66-6	ZINC	1	48	2.1		

UJL

JK

Data Package ID: *it1303060-1*

JS 3/26/13

Total ICP Metals

Method SW6010 Revision B

Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1303060
Client Name: Weston Solutions, Inc.
ClientProject ID: Section 30 Mine DRS

S30-BKGD-N-130228
1303060-12

Sample Matrix: SOIL
% Moisture: 3.5
Date Collected: 28-Feb-13
Date Extracted: 07-Mar-13
Date Analyzed: 11-Mar-13
Prep Method: SW3050 Rev B

Prep Batch: IP130307-4
QCBatchID: IP130307-4-1
Run ID: IT130311-2A1
Cleanup: NONE
Basis: Dry Weight
File Name: 130311A.

Analyst: Mike Lundgreen
Sample Aliquot: 1.007 G
Final Volume: 100 ML
Result Units: MG/KG
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier	
7429-90-5	ALUMINUM	1	3200	21			
7440-36-0	ANTIMONY	1	2.1	2.1	~~U~~		UJL
7440-38-2	ARSENIC	1	3.4	1			
7440-39-3	BARIUM	1	79	10			
7440-41-7	BERYLLIUM	1	0.51	0.51	U		
7440-43-9	CADMIUM	1	0.51	0.51	U		
7440-70-2	CALCIUM	1	19000	100			
7440-47-3	CHROMIUM	1	3.3	1			
7440-48-4	COBALT	1	3.3	1			
7440-50-8	COPPER	1	4.4	1			
7439-89-6	IRON	1	9200	10			
7439-92-1	LEAD	1	5.9	0.31			
7439-95-4	MAGNESIUM	1	3900	100			
7439-96-5	MANGANESE	1	120	1			
7439-98-7	MOLYBDENUM	1	1	1	U		
7440-02-0	NICKEL	1	5.6	2.1			
7440-09-7	POTASSIUM	1	870	100			JK
7782-49-2	SELENIUM	1	0.51	0.51	U		
7440-22-4	SILVER	1	1	1	U		
7440-23-5	SODIUM	1	100	100	U		
7440-28-0	THALLIUM	5	5.1	5.1	U		
7440-31-5	TIN	1	5.1	5.1	U		
7440-62-2	VANADIUM	1	9	1			
7440-66-6	ZINC	1	21	2.1			

Data Package ID: *it1303060-1*

3/26/13

Total URANIUM

Method SW6020 Revision A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: SW3050B
Analyst: Ross Miller

Final Volume: 100 ml
Matrix: SOIL
Result Units: UG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/07/2013	03/08/2013	7.7	100	12000	110		1.019 g
S30-53-130228	1303060-2	02/28/2013	03/07/2013	03/08/2013	3.6	100	560000	100		1.019 g
S30-61-130228	1303060-3	02/28/2013	03/07/2013	03/08/2013	2.8	100	51000	99		1.037 g
S30-69-130228	1303060-4	02/28/2013	03/07/2013	03/08/2013	2.8	100	130000	99		1.035 g
S30-70-130228	1303060-5	02/28/2013	03/07/2013	03/08/2013	3.9	100	310000	100		1.027 g
S30-83-130228	1303060-6	02/28/2013	03/07/2013	03/08/2013	6.0	100	92000	110		1.002 g
S30-90-130228	1303060-7	02/28/2013	03/07/2013	03/08/2013	3.2	100	190000	100		1.006 g
S30-90-2-130228	1303060-8	02/28/2013	03/07/2013	03/08/2013	3.5	100	260000	100		1.035 g
S30-91-130228	1303060-9	02/28/2013	03/07/2013	03/08/2013	3.2	100	110000	100		1.019 g
S30-94-130228	1303060-10	02/28/2013	03/07/2013	03/08/2013	3.9	100	120000	100		1.002 g
S30-95-130228	1303060-11	02/28/2013	03/07/2013	03/08/2013	6.9	100	120000	110		1.006 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/07/2013	03/08/2013	3.5	100	2500	100		1.007 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *im1303060-1*

8 3/20/13

Total MERCURY

Method SW7471 Revision A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Weston Solutions, Inc.
Client Project ID: Section 30 Mine DRS
Work Order Number: 1303060
Reporting Basis: Dry Weight
Prep Method: METHOD
Analyst: Sheri Lafferty

Final Volume: 100 g
Matrix: SOIL
Result Units: MG/KG

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
S30-04-130228	1303060-1	02/28/2013	03/11/2013	03/12/2013	7.7	1	0.038	0.035		0.611 g
S30-53-130228	1303060-2	02/28/2013	03/11/2013	03/12/2013	3.6	1	0.078	0.034		0.615 g
S30-61-130228	1303060-3	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.063	0.034		0.61 g
S30-69-130228	1303060-4	02/28/2013	03/11/2013	03/12/2013	2.8	1	0.09	0.034		0.604 g
S30-70-130228	1303060-5	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.076	0.034		0.604 g
S30-83-130228	1303060-6	02/28/2013	03/11/2013	03/12/2013	6.0	1	0.048	0.035		0.611 g
S30-90-130228	1303060-7	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.067	0.034		0.613 g
S30-90-2-130228	1303060-8	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.068	0.034		0.611 g
S30-91-130228	1303060-9	02/28/2013	03/11/2013	03/12/2013	3.2	1	0.034	0.034	U	0.616 g
S30-94-130228	1303060-10	02/28/2013	03/11/2013	03/12/2013	3.9	1	0.051	0.034		0.61 g
S30-95-130228	1303060-11	02/28/2013	03/11/2013	03/12/2013	6.9	1	0.041	0.035		0.614 g
S30-BKGD-N-130228	1303060-12	02/28/2013	03/11/2013	03/12/2013	3.5	1	0.034	0.034	U	0.604 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *hg1303060-1*

& 3/26/13

APPENDIX F

REFERENCE DOCUMENTATION

SECTION 30

EPA United States of America
Environmental Protection Agency

A FAX FROM: Region 6 - Superfund Division

TO: Patrick Buster Weston	**FAX NO.:**
SUBJECT: Pre-CERCLIS Screens — Grants Mining Dist	
FROM: M. Purcell	**PHONE NO.:** 214-665-6707
OFFICE: R6 — Dallas	**FAX NO. FOR:** (214) 665-6660
COMMENTS: As Discussed Mark	
DATE and TIME: 11/29 3:30 PM	**NO. of PAGES:**

EPA Form 1315-18 (Rev. 5/97) (WebForms v1.0)

12

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive,
P. O. Box 5469 Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965
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SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Cabinet Secretary
Butch Tongate
Acting Deputy Secretary

NMNED607350

Memorandum

COPY

To: **LaDonna Turner, Site Assessment Manager**
Response and Prevention Branch
U.S. Environmental Protection Agency, Region 6

From: **Dana Bahar, Manager, Superfund Oversight Section, Ground Water Quality Bureau, New Mexico Environment Department**

Date: **October 31, 2011**

Subject: **Pre-CERCLIS Screening Assessment of the Section 30 Mine, New Mexico: No Further Action Under CERLCA Recommended**

Site name	Section 30	**Alias**	NA	**Street Address**	NA
City	NA	**State**	New Mexico	**Zip code**	NA
County	McKinley County				
Latitude	35° ~~25~~' 53.82" N 24 53.87	**Longitude**	107° 49' ~~28.26"~~ W 27.21		

Site physical description:
The Section 30 mine is located in Section 30, T14N, R9W, approximately 5.2 miles on State highway 509 north of the junction of State highways 509 and 605 in the Ambrosia Lake area. The Section 30 mine was an underground uranium mine in the Ambrosia Lake Mining Sub-District. The surface facilities and main shaft are located in Section 30 and the underground workings underlie parts of Sections 30, 29 and 28. The Section 30 mine had approximately 44 acres of disturbed surface. The Quivira Mining Company (QMC) started reclamation of the disturbed surface at the Section 30 mine site in 1994 under the Prior Reclamation Criteria of the New Mexico Mining Act Rules [19.10.5.511 NMAC] (Ref. 1). Additional surface reclamation work occurred at the Section 30 mine from 2003 through 2005 under an Existing Mine Permit through the New Mexico Mining Act Rules [19.10.5.500 NMAC] (Ref. 2).

Site identification:
The Section 30 mine is one of 97 legacy uranium sites identified within the Ambrosia Mining Sub-District of the Grants Mining District. It is one of 11 mines that are being addressed by Rio Algom Mining, LLC (RAML) under a discharge permit (DP-362) in accordance with the New Mexico Water Quality Control Commission (NMWQCC) Regulations [20.6.2.3000 NMAC].

Site summary:
The Section 30 mine commenced in 1957 with mine development. With subsequent completion of the mine shaft, the first ore production from the mine occurred in 1958. To date, the Section 30 mine has produced approximately 3.6 million tons of uranium ore. In 1984 the Section 30 mine shut down conventional mining activities due to the depressed condition of the uranium market. However, beginning in 1984, areas of the mine were available for old stope leaching methods (Ref. 1). Old stope leaching was discontinued in January 2000 and the Section 30 mine permanently suspended operations in December, 2002 (Ref. 2).

QMC began reclamation of the disturbed surface areas at the Section 30 mine site in 1994 under the Prior Reclamation Criteria of the New Mexico Mining Act Rules [19.10.5.511 NMAC]. From 1995 through 1998 several inspections by the New Mexico Energy Minerals and Natural Resources Department (NMEMNRD) found the reclamation measures did not satisfy the requirements of the New Mexico Mining Act (NMMA). Currently the Section 30 mine maintains an Existing Mine Permit (MK009RE) under the New Mexico Mining Act Rules [19.10.5 NMAC], with the NMEMNRD. MK009RE required QMC to develop an approved Closeout Plan (Ref. 3). In 2003 through 2005 RAML performed additional reclamation work under the Closeout Plan which included further demolition and disposal of surface facilities, contour work and revegetation of the surface along with the plugging of the main shaft, ventilation holes and injection holes (Ref. 2). To date the NMEMNRD has not released the Section 30 mine from its closure requirements under the Existing Mine Permit.

In 1983 the New Mexico Environment Department (NMED) determined that the old stope leaching process would require a discharge permit (DP) under the NMWQCC Regulations [20.6.2.3000 NMAC]. In 1985, DP-362 authorized QMC to conduct old stope leaching by recirculating mine water with some mine water fortified with sodium bicarbonate or sulfuric acid to be injected into 8 underground uranium mines in the Ambrosia Lake Mining Sub-District for the secondary recovery of uranium. These 8 mines included the Section 17, 19, 22, 24, 30, 30W, 33 and 35 mines. In 1999 a modification to DP-362 included four additional underground uranium mines; the Section 13, 15, 23 and 25 mines. NMED records are not conclusive that all mines listed in DP-362 were actually used for old stope leaching. QMC ceased all underground injections by 2000. To ensure an adequate Closure Plan is implemented in accordance with NMWQCC Regulations [20.6.2.3107 NMAC], and pursuant to Condition 6 of DP-362, RAML submitted a ground water flow and geochemical model to NMED for approval. NMED approved the ground water flow model but not the geochemical model. In 2008, NMED required RAML to submit an Abatement Plan to assess regional ground water conditions related to the RAML mines addressed in DP-362 with the exception of the Section 13 and 15 mines which RAML never owned or operated. In 2009, NMED allowed RAML to conduct abatement under NMWQCC Abatement Regulations [20.6.2.4000] rather than as a condition of DP-362 (Ref. 2).

Targets:
Wells that are registered with the New Mexico Office of the State Engineer (OSE) and located within a 4-mile radius are shown in Table 1. There is a ranch with several residences approximately 1.8 miles to the northeast of the Section 30 mine. During NMEDs ground water investigation of San Mateo Creek a domestic well was sampled at this residence. This well does not appear on the OSE database (Ref. 4). The analytical results from the sampled well show ground water concentrations below the Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCL) and the NMWQCC ground water standards (Ref 5).

Airborne Spectral Photometric Environmental Collection Technology (ASPECT) operated by EPA has developed exposure rate contour map of the Ambrosia Lake Mining Sub-District that includes the Section 30 (NM0012) mine (Figure 2). The EPA ASPECT exposure rate measurements were performed in part to evaluate if surface reclamation has been effective in the long-term elimination of such threats to human health and the environment. The map estimates radiation exposure rates on the ground and can be used to identify hazardous levels of radiation. Typical exposure rates in New Mexico range from 5 – 20 micro Roentgens per hour (μR/hr.). The ground surface exposure rates in and around the Section 30 mine are over one thousand times higher than the typical range, that is, ground surface radiological hazards were identified at most Ambrosia Lake uranium mine sites including the Section 30 mine (Ref. 6).

Site ownership and Potential Responsible Parties:
Kerr McGee Corporation owned and operated the Section 30 mine from 1959 until 1984. QMC, a subsidiary of Kerr McGee Corporation, took over mining operations in 1984. Rio Algom Mining Company (RAMC) acquired QMC in 1989 (Ref. 7). Billiton plc purchased RAMC in 2000. Broken Hill Proprietary Company Limited (BHP) merged with Billiton plc to form BHP Billiton Limited, which changed RAMC to RAML a wholly-owned subsidiary (Ref. 8).

File review:
Files that were reviewed for this assessment are listed below.

Site reconnaissance:
The last documented site reconnaissance occurred in 2004 by NMEMNRD personnel (Ref. 9). NMED has not conducted a site reconnaissance for this Pre-CERCLIS Screen.

Recommendation:
Data collected from the Ambrosia Lake Mining Sub-District has shown a release of CERCLA hazardous substances to both the ground surface, and ground water. In addition, an Aerial Radiological Survey conducted by EPA of the Ambrosia Lake Mining Sub-District measured radiological exposure rates above background in and around the eleven RAML mine sites.

On-going remedial activities at the Section 30 mine are being conducted by RAML under state oversight in accordance with NMWQCC regulations under DP-362 and a separate Abatement Plan. RAML is required to investigate and abate radiological and metal contamination for the regional impacts to the ground water system from legacy RAML uranium sites in the Ambrosia Lake area. In order to ensure that all reclamation work completed by RAML will meet applicable environmental standards which includes surface water, ground water and soils, NMED is also requiring RAML to submit all documentation and data related to completed surface reclamation for review for possible inclusion under NMWQCC abatement regulations because although RAML completed surface reclamation under a NMEMNRD Closeout Plan it did so without concurrence from NMED.

NMED recommends that no further action is required at the Section 30 mine at this time. SOS may revisit this recommendation should additional information become available that indicates that an imminent threat to human health or the environment exists such that further action under CERCLA is warranted. NMED SOS also proposes to periodically review new data as it becomes available and incorporate it into the ground water conceptual model for the Grants Mining

District. A generalized investigation of potential ground water impacts from former uranium mines within the Grants Mineral District is recommended as part of regional ground water quality characterization.

References:

1. New Mexico Energy, Minerals and Natural Resources Department, 2007, Abandoned and inactive uranium mines in New Mexico database, Mining and Minerals Division.
2. New Mexico Environment Department, DP-362 files.
3. Rio Algom Mining, LLC, 1999, Application for Existing Mine Permit to Mining and Minerals Division
4. New Mexico Office of the State Engineer, 2011, New Mexico water rights reporting system database, point of diversion by location, four mile radius of Section 19 Mine.
5. New Mexico Environment Department, 2010, Phase 1 Site Investigation Report San Mateo Creek Legacy Uranium Sites, CERCLIS ID# NMN00060684, McKinley and Cibola Counties, New Mexico.
6. EPA, 2011, Airborne Spectral Photometric Environmental Collection Technology Exposure Rate Contour Map of Ambrosia Lake Mining District.
7. Quivira Mining Company, 1994, Letter to the Mining and Minerals Division.
8. Rio Algom Mining, LLC, 2001, Letter to the Mining and Minerals Division.
9. Mining and Minerals Division, 2004, Annual Inspection Report of Rio Algom Mining, LLC in the Ambrosia Lake Mining District.

Table 1. Wells within a Four Mile Radius for Section 30 Mine, Office of the State Engineer[2].

OSE File Number	Well Use	Well Owner	Section	Town-ship	Range	Depth of Well (ft)	Depth of Water (ft)	Water Column (ft)
Wells (>1 and <2 miles)								
B 00366	Mining[1]	RIO ALGOM MINING LLC	24	14N	10W	760	*	*
B 00994	Mining[1]	RIO ALGOM MINING LLC	19	14N	09W	779	*	*
B 00372	Mining[1]	SABRE-PINON CORPORATION	23	14N	10W	796	*	*
B 00994	Mining[1]	RIO ALGOM MINING LLC	17	14N	09W	1094	*	*
B 00371	Mining[1]	SABRE-PINON CORPORATION	25	14N	10W	752	*	*
B 00364	Mining[1]	ANDERSON DEVELOPMENT CORP.	30	14N	09W	735	*	*
B 00994	Mining[1]	RIO ALGOM MINING LLC	30	14N	09W	810	*	*
B 00539	Highway[1]	NM State Highway Dept	31	14N	09W	*	*	*
B 00680	Construction	Star Lake Railroad	31	14N	09W	*	*	*
B 01145	Highway[1]	NM State Highway Dept	31	14N	09W	*	*	*
B 00363	Mining[1]	RIO ALGOM MINING LLC	22	14N	10W	745	*	*
Wells (>2 and <3 miles)								
B 00373	Mining[1]	RIO ALGOM MINING LLC	22	14N	10W	1003	*	*
B 00994	Mining[1]	RIO ALGOM MINING LLC	22	14N	10W	827	*	*
B 00365	Mining[1]	ANDERSON DEVELOPMENT CORP.	20	14N	09W	793	*	*
~~B 00994~~	~~Mining[1]~~	RIO ALGOM MINING LLC	~~30~~	~~14N~~	~~09W~~	~~750~~	~~*~~	~~*~~
B 00362	Mining[1]	RIO ALGOM MINING LLC	22	14N	10W	3093	*	*
B 00375	Industrial[1]	PHILLIPS PETROLEUM CO	28	14N	09W	*	*	*
B 00376	Industrial[1]	UNITED NUCLEAR CORP	28	14N	09W	*	*	*
B 01788	Monitoring[1]	US DOE	29	14N	09W	*	*	*

* = Value Unknown

[1] = Well may be used as a domestic well

[2] = Taken from Section 19 Well Data

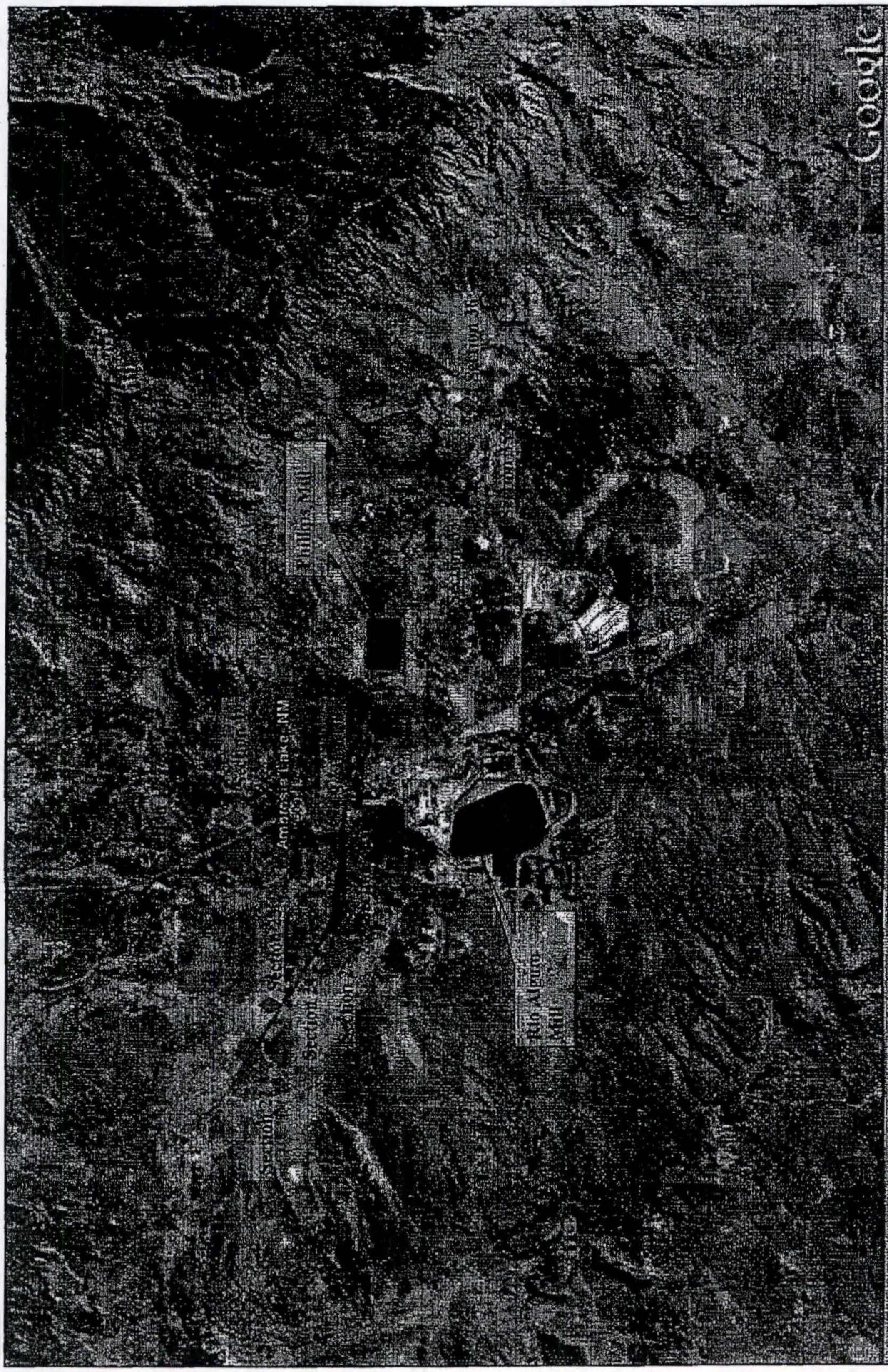


Figure 1. Ambrosia Lake Mining District, Rio Algom Mine Sites

Figure 2. U.S. EPA ASPECT Exposure Rate Contour Map of Ambrosia Lake Mining District.

APPENDIX G

TDD No. TO-0035-12-11-04

EPA

U.S. EPA
Washington, DC 20460

START3
Technical Direction Document

TDD #: TO-0035-12-11-04
Contract: EP-W-06-042

Assessment/Inspection Activities -
Enforcement Funds (0035)
Weston Solutions, Inc.

! = required field ☐ Moved To EAS

Note: Remaining Amount includes $0.00 in Reserve.

TDD Name:	Section 30 Mine	! Period:	Base Period
! Purpose:	Work Assignment Initiation		
! Priority:	High	! Start Date:	11/14/2012
Overtime:	Yes	! Completion Date:	10/31/2013
! Funding Category:	Enforcement Funds	Invoice Unit:	
! Project/Site Name:	Section 30 Mine	WorkArea:	ASSESSMENT/INSPECTIONS ACTIVITIES
Project Address:	Section 30,T14N,R10W; 5.2 miles on State Highway 509, north of the junction of State Hwys 509 and 605 in Ambrosia Lake Mining Sub-District	Activity:	Integrated Assessment (IA)
County:	McKinley	Work Area Code:	
City, State:	, NM	Activity Code:	IA
Zip:		EMERGENCY CODE:	☐ KAT ☐ RIT
! SSID:	A6FJ	FPN:	
CERCLIS:	NMN000607480	Performance Based:	No
Operable Unit:			

Authorized TDD Ceiling:	Cost/Fee	LOE (Hours)
Previous Action(s):	$0.00	0.0
This Action:	$30,000.00	0.0
New Total:	$30,000.00	0.0

Specific Elements Assess the potential for short or long term clean-up actions., Perform field screening and analysis of samples.

Description of Work:

All activities performed in support of this TDD shall be in accordance with the contract and TO PWS.

The Grants Mining District provided significant uranium extraction and production in New Mexico from the 1950s until late into the 20th century. There are three mining sub-districts within the Grants Mining District: Ambrosia Lake, Laguna, and Marquez. Land ownership within these sub-districts consists of public, tribal, tribal trust and private property. These mining sub-districts contain 97 former legacy uranium mines and five mill sites. EPA is currently assessing the mine sites for releases of hazardous substances that may have impacted soil, surface water, sediment and ground water. The Section 30 Mine, located in the Ambrosia Lake mining sub-districts has been previously reclaimed by Rio Algom under the direction of the New Mexico Energy, Minerals and Natural Resources Department's Mining and Minerals Division. Under this TDD, the contractor shall investigate mine water discharge locations, sample potentially-impacted soil for elevated concentrations and radioactivity of elemental uranium and radionuclides, sample any surface water and sediment present for metals and radionuclides, and sample any accessible groundwater wells in the immediate area of the Section 30 Mine site in the Ambrosia Lake sub-district. The contractor shall document mine site features (e.g., open and plugged mine portals, waste rock piles, protore stockpiles, mining-related structures, etc.), surface drainage features, ground water wells and all sample locations with photographs, descriptions, and geospatially. The contractor shall prepare and submit to EPA for review and approval a draft and final report for the site. Coordinate with SAM, Mark Purcell at purcell.mark@epa.gov or 214-665-6707 upon receipt of the TDD.

Accounting and Appropriation Information

SFO: 22

Line	DCN	IFMS	Budget / FY	Approp. Code	Budget Org Code	Program Element	Object Class	Site Project	Cost Org Code	Amount
1	ENC016	XXX	11	TD	06S	501EC7	2505	A6FJIA00	C001	$30,000.00

Funding Summary	Funding
Previous:	$0.00
This Action:	$30,000.00
Total:	$30,000.00

Funding Category

Enforcement Funds

Section

- Signed by Mark Purcell/R6/USEPA/US on 11/07/2012 09:53:32 AM, according to Jeff Criner/start6/rfw-

: Mark Purcell Date: 11/07/2012

Phone #:

Project Officer Section - Signed by Cora Stanley/R6/USEPA/US on 11/08/2012 02:27:22 PM, according to Jeff Cri

Project Officer: Linda Carter Date: 11/07/2012

Contracting Officer Section - Signed by Cora Stanley/R6/USEPA/US on 11/08/2012 02:27:22 PM, according to Je(

Contracting Officer: Cora Stanley Date: 11/08/2012

Contractor Section

Contractor Contact: Date:

January 31, 2023 Report Reference, (Ganus 1980), (Ganus, William J. December 1980. Hydrologic Assessment of Ambrosia Lake Area. Engineering Services Division, Kerr-McGee Corporation.), Rio Algom Mining LLC, Ambrosia Lake West site, License SUA-1473.

HYDROLOGIC ASSESSMENT
OF
AMBROSIA LAKE AREA

DECEMBER, 1980

William J. Ganus
Vice President, Hydrology
Engineering Services Division
Kerr-McGee Corporation

CONTENTS

CONTENTS

FIGURES

TABLES

SUMMARY

This is a hydrologic assessment of the Ambrosia Lake area. It focuses on Kerr-McGee's uranium milling operations. It has been prepared to provide information for purposes of mill re-licensing proceedings and compliance with New Mexico groundwater regulations. This study is based upon a review of more than 22 years of hydrologic records.

Prior to uranium mining and milling activity, very few of the groundwater resources of the area were utilized, and most sandstone aquifers in the area were nearly full of water to the outcrop. The large alluvial valley deposit along the Arroyo del Puerto in the Ambrosia Lake area was essentially devoid of groundwater during pre-mining time, an expression of a prolonged arid climate.

Mine dewatering and milling operations have now characterized the Ambrosia Lake area for more than 20 years. These activities have wrought at least two changes in the hydrologic characteristics of the area. First, mine dewatering has resulted in the creation of a groundwater depression in sandstone aquifers at and above the level of the mines down gradient from Kerr-McGee mill. Over the years the alluvial deposit has reached a virtually full condition due to infiltration of mine water discharges to the creek and the operation of unlined evaporation ponds at the mill. A large groundwater mound beneath the ponds and creek is presently moving fluid slowly down gradient in the subsurface. An estimated 8200 acre-feet of fluid is presently in subsurface storage. This fluid ranges from 1000 milligrams per liter (mg/l) total dissolved solids (TDS) near the alluvial deposit boundaries to over 9000 (mg/l) TDS near the ponds. This water is not presently being used, nor is there any evidence that the water will be used for domestic or agricultural purposes in the foreseeable future.

A water balance analysis has been performed for calendar year 1979. The water balance analysis showed an average of approximately 2200 gallons per minute (gpm) coming from the mines to the mill with 1400 gpm going

through the mill and discharged with the tailings. In unlined evaporation ponds, approximately two-thirds of the tailings solution has been lost by evaporation while one-third has seeped into the subsurface. Numerous geochemical processes occur to attenuate concentrations of heavy metals and radium contained in this seepage and to neutralize its acidic nature.

HYDROLOGIC ASSESSMENT FOR AMBROSIA LAKE AREA

I. INTRODUCTION

The uranium mining and milling operations which began in the Ambrosia Lake area in the 1950's have created significant changes in the groundwater system of the area. Initially, hydrologic testing of the aquifers and subsequent dewatering of mines and discharges of mill effluent have combined to alter the quality and pattern of movement of groundwater.

The primary purpose of this report is to review the hydrologic data which have been collected since 1957 and present an interpretation of the hydrologic responses. The report is provided at this time as an assessment of present and future conditions and as a technical basis for a discharge plan for Kerr-McGee mining and milling operations at Ambrosia Lake.

The report includes only that information particularly pertinent to the hydrogeologic problems at hand; detailed geologic data and descriptions can be found in references at the end of the report.

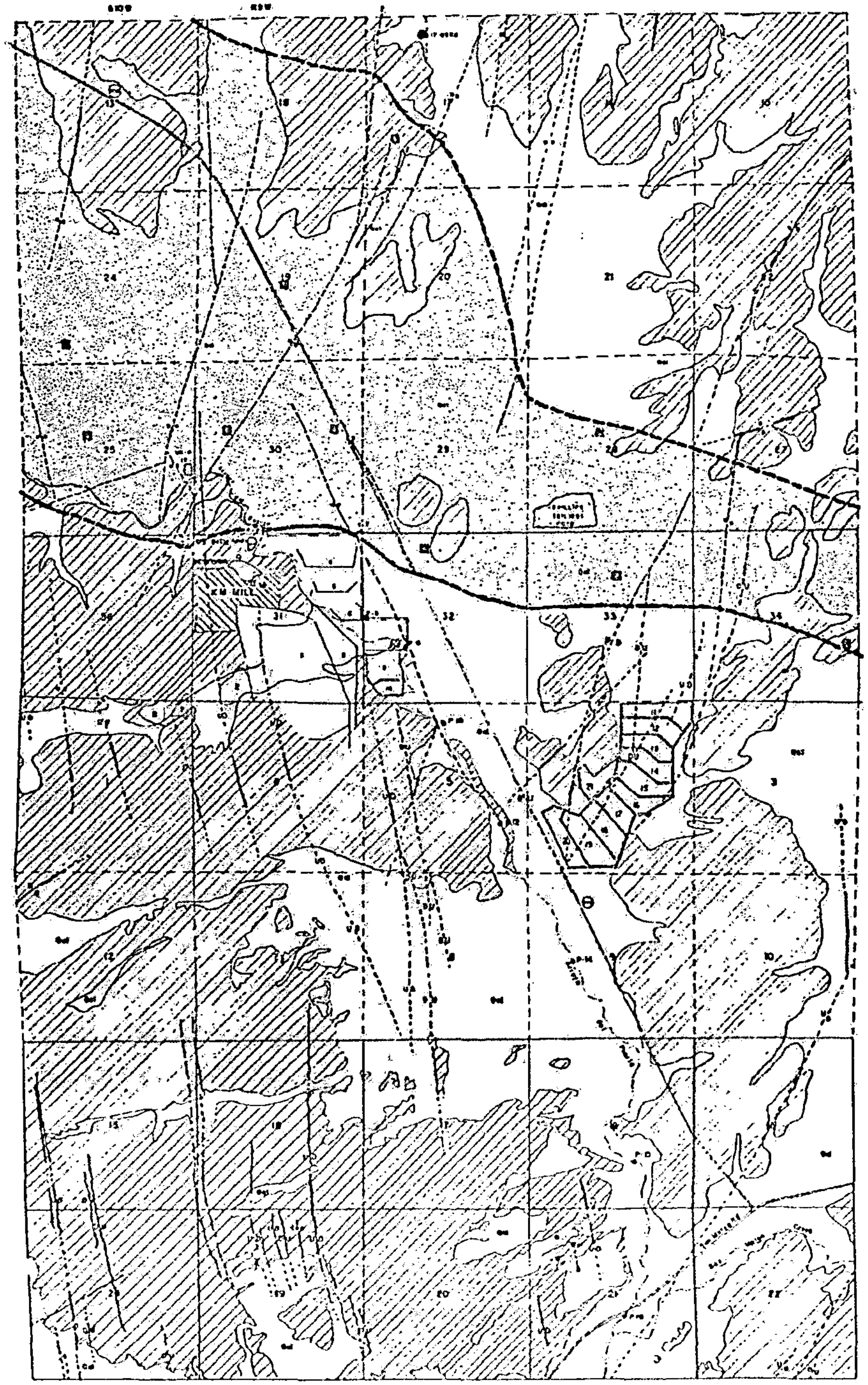
Location of Study Area

The Kerr-McGee mill site in Section 31, T14N, R9W (Figure 1) is the focal point of the present study. Kerr-McGee mines supplying ore to the mill are located to the east, north, and northwest of the mill. The dashed lines on Figure 1 indicate the approximate northern and southern extent of subsurface mining near the mill site.

Scope of Investigation

The study was undertaken in early 1977 with a visit to the Kerr-McGee Ambrosia Lake office to collect all hydrologic records. At that time, the scope of investigation was simply to organize, study, and interpret data which had been collected.

Based upon the historical data and data acquired during the period of study, the scope of this report was expanded to include a discussion of



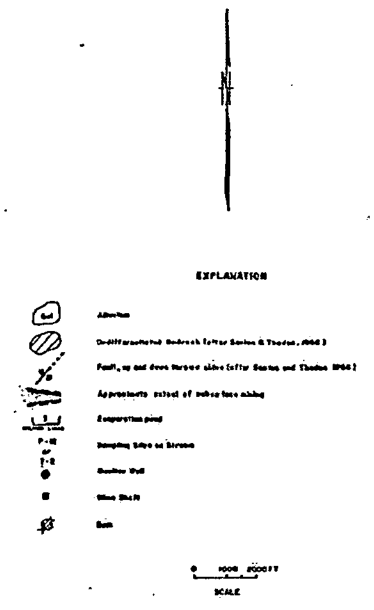
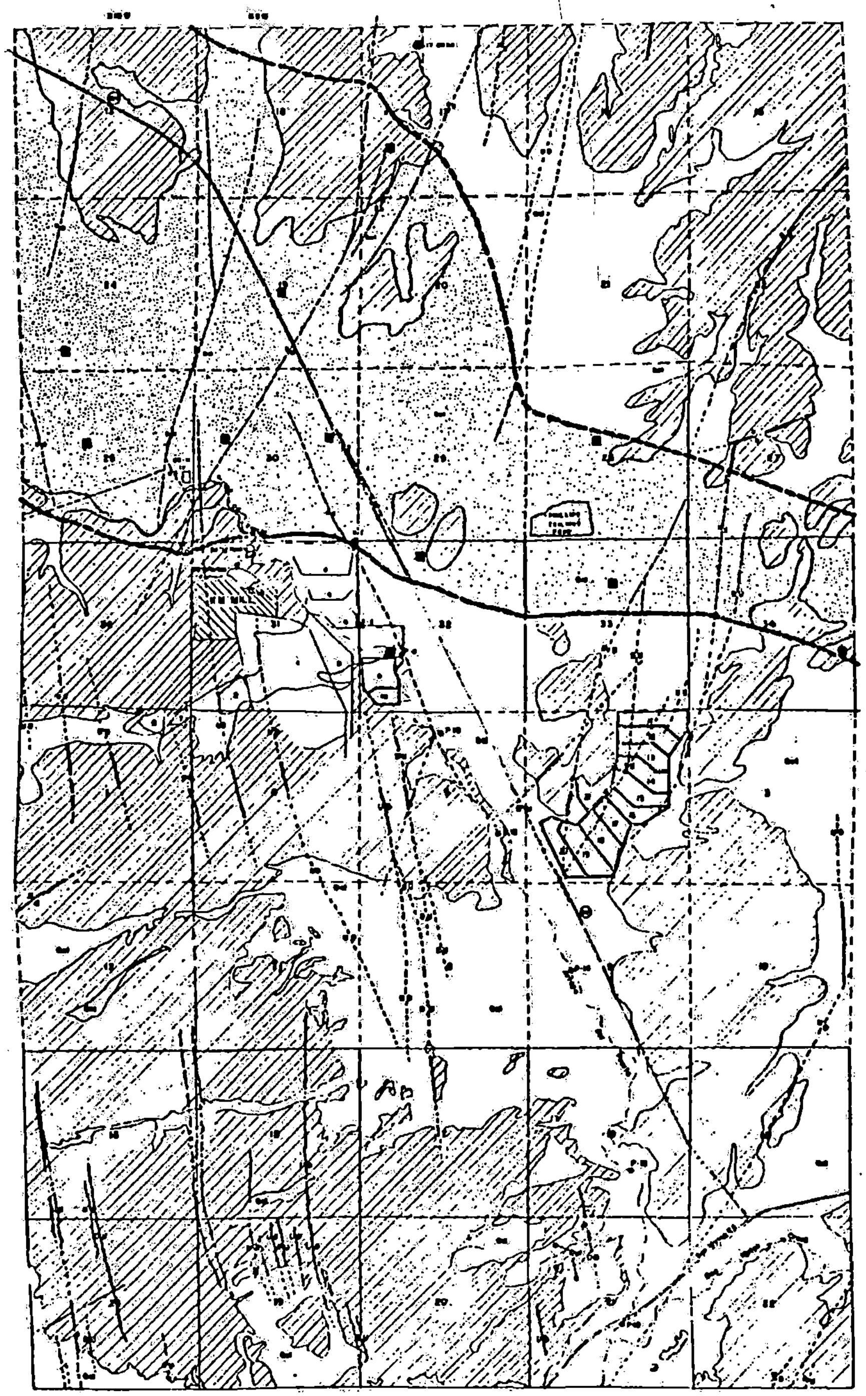


FIGURE I. LOCATION MAP FOR HYDROLOGIC ASSESSMENT, AMBROSIA LAKE AREA, NEW MEXICO

KERR-McGEE NUCLEAR CORPORATION

Dec. 1980



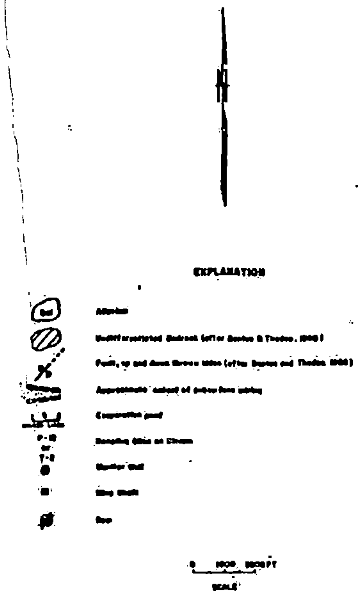


FIGURE I. LOCATION MAP FOR HYDROLOGIC ASSESSMENT, AMBROSIA LAKE AREA, NEW MEXICO

KERR-McGEE NUCLEAR CORPORATION

Dec. 1980

the natural hydrogeologic setting, the response of this system to over 20 years of mining and milling activity, a water balance for present-day operations and a projection of near-term conditions.

II. HYDROGEOLOGIC SETTING

The sedimentary units of interest in this study dip gently to the north (Figure 2), from the Zuni uplift to the south into the San Juan Basin to the north. Since time of deposition of these sedimentary units, the area has been subjected to several periods of tectonic activity. Faults and associated fractures are common with a predominant northerly trend (Figure 1). Large fault blocks are recognized in the area; the subject area is located on one of the upthrown blocks, a horst bounded by the Ambrosia fault (approximately 4 miles west of the mill) and by the San Mateo fault (approximately 4 miles east of the mill). In general, the older faults and fractures are partially healed and in some cases retard groundwater flow while younger faults and fractures frequently enhance the rate of groundwater movement. Some of the shaley sedimentary layers between aquifers contain significant bentonitic material; and, where these layers have been faulted or fractured, it is believed that they are generally closed and do not permit sustained interaquifer communication.

Figure 2 is a cross-section taken from Cooper and John (1968) through wells about 8 miles northwest of the Kerr-McGee operation. The mill site is shown on the section in its equivalent geologic position; that is, it is located on the Mancos shale with younger rock units exposed as cliffs to the northeast of the mill with the older units outcropping to the south of the mill site.

The principal drainage in the area is the Arroyo del Puerto which originates to the northwest and flows just north and east of the mill (Figure 1). Approximately 4 miles south of the mill, this creek joins the San Mateo Creek flowing from the east into the large alluvial valley where the United Nuclear-Homestake mill near Milan is located.

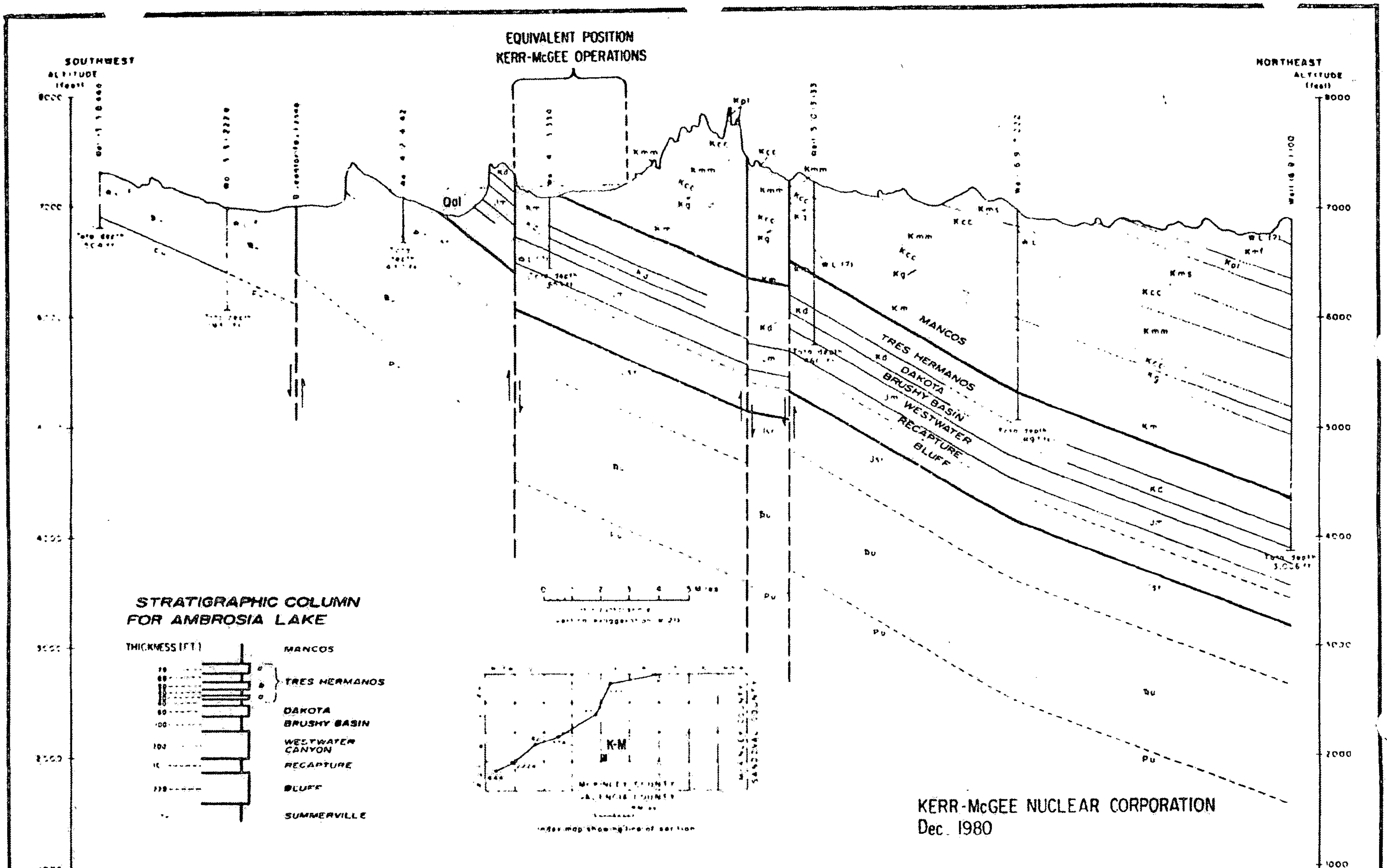


FIGURE 2. Cross-Section Showing Structural Relationships of Geological Formations, S.E. McKinley County, New Mexico

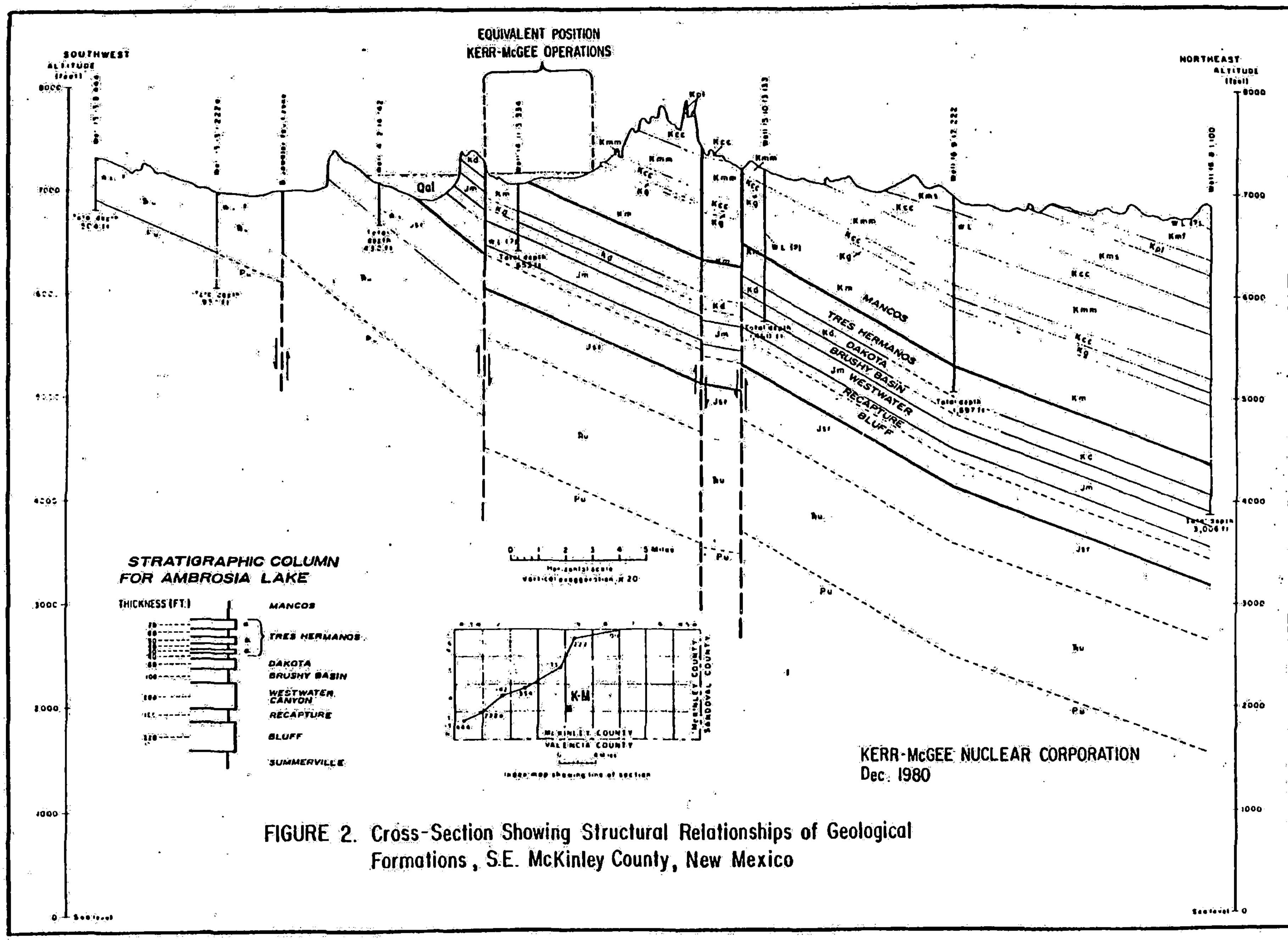


FIGURE 2. Cross-Section Showing Structural Relationships of Geological Formations, S.E. McKinley County, New Mexico

Formations

Formations of interest in this study have been highlighted in Figure 2. The Westwater formation is the ore zone and also an aquifer. Since mining activity ordinarily does not penetrate a significant distance beneath the Westwater, this study will be limited to the Westwater, the first aquifer beneath the Westwater, the Bluff sandstone, and the various aquifer units which are present from the ground surface to the ore body. The following discussion presents the formations of interest in order from the oldest to youngest.

Bluff

This sandstone is not widely used as an aquifer in the Ambrosia Lake area because of low yield and poor quality. In the area, the Bluff is reported to be about 220 feet thick and is underlain by the finely-bedded sandstone, siltstone, and shale of the Summerville formation. No pre-mining groundwater data in the subject area could be found for the Bluff.

Recapture

This unit is composed of intra-stratified siltstone, shale and fine sandstone. Overall, the unit is considered to be an aquitard. Leakage of groundwater between the Bluff and the Westwater appears to be negligible on account of the low permeability of the Recapture. In the Ambrosia Lake area, the formation is about 100 feet thick. Most shafts in the area commonly penetrate about 50 feet or more into this formation.

Westwater Canyon

This predominantly sandstone unit is the uranium ore body and a significant groundwater aquifer. The arkosic sand is fine to coarse grained and generally poorly sorted. The clay beds in the formation have fair lateral continuity which likely affects local groundwater movement and drainage from the aquifer.

Prior to mining in the area, several water supply wells were constructed into the Westwater. Early testing on the Westwater was done by most uranium mining companies to determine the difficulty of attempting to dewater the ore body. Early data indicate the Westwater natural potentiometric surface was between 6550 and 6600 elevation. Water quality was generally good where the aquifer was less than 1000 feet deep. Basinward or northward, the Westwater becomes more brackish in quality. The formation is approximately 200 feet thick in the subject area.

Brushy Basin

This unit conforms and intertongues with the upper Westwater. It consists of bentonitic mudstones and some thin sandstone lenses. It is generally less than 100 feet thick in the Ambrosia Lake area and acts as a good aquitard overlying the Westwater. It is documented that uncased wells left open in the unit will quickly seal off because of the expansive nature of the clay. For this reason, it is logical to conclude that faults and fractures do not remain open to permit interaquifer communication across this formation unless there is a significant difference in pressure between aquifers.

Dakota

This sandstone was deposited over an erosional surface developed on the Brushy Basin formation. The unit is predominantly a fine-grained, clean sandstone with fair to good permeability. Historical data indicated the potentiometric surface of the Dakota was close to or slightly above the Westwater formation, approximately 6600 feet. Water quality of the Dakota is variable. The formation is about 80 feet in thickness across the area.

Mancos and Tres Hermanos

The Dakota grades upward into Mancos shale, typically dark gray in color. The shale contains several sandstone lenses which in the Ambrosia Lake area are identified as the Tres Hermanos sands. These three sandstone lenses are referred to as the A, B, and C, (or 1, 2, and 3), from the lowest to the highest. The sands are fine-grained and do not yield much water to a well unless fractured. Very little data are available on the Tres Hermanos sands prior to mining activity in the area. These sandstones cap most of the low-lying hills around the Kerr-McGee mill site. Much of the rock has become deeply weathered and has been mapped as saprolite.

Alluvium

In the relatively recent geologic past, an erosional surface developed across the area, cutting down into the Mancos and Tres Hermanos to create a narrow canyon of nearly 100 feet in relief. Following the period of erosion, the canyon was filled by both wind and water transported material until the present-day alluvial valley deposit of 90 to 100 feet of sediment was created. The mill site is located on the slope southwest of this alluvial deposit. In wells, the alluvial material is commonly logged as very fine-grained sand and clay with occasional basal gravel layers. Layering or stratification in the material is commonly reported and is interpreted to be related to wind desposition and/or soil-horizon development. No records of water in the alluvium were made prior to mining activity. One well in the alluvial material three years after mining and milling began indicated only a very small amount of saturated material at the base of the alluvium. This water appears attributable to early mining and milling activity.

Summary Assessment of Natural Hydrologic Conditions

A review of early records and geologic setting leads to the following conclusions:

1) Sparse rainfall and runoff in the area were unable to develop an aquifer in the alluvial material. The small amounts of natural infiltration into the alluvium and then into the underlying Tres Hermanos sands occurred at rates much faster than natural recharge supplied water at the surface.

2) Tres Hermanos, Dakota, Westwater, and Bluff formations receive recharge along their outcrop areas and in areas where alluvial material covers these formations (approximately 6800 to 7100 feet elevation).

3) The original potentiometric surface in the Dakota, Westwater, and Bluff was near 6600 feet elevation, indicating that these aquifers were relatively full during premining time.

4) Groundwater movement in these formations was generally downdip to the north and northeast to areas of lower elevation and lower potentiometric head.

5) The gradient in these formations was not steep, implying very slow groundwater movement and discharge at some distant point which did not allow easy aquifer drainage.

6) Recharge waters are generally good in quality; however, as water moves through the formations, dissolved solids increase. Indications are that gypsum in the alluvial material may be the source of significant dissolved solids before the water reaches the underlying aquifers.

III. HYDROLOGIC EFFECTS RELATED TO MINING OPERATIONS

By 1957, several companies were sinking shafts and testing the Westwater aquifer to determine pumping requirements for mining uranium in the Ambrosia Lake area. Much of the early pumping discharge was put into the Arroyo del Puerto or its tributaries, creating a line source of recharge to the alluvium. A perennial stream condition across the alluvial valley was created. Within several months after continued pumping began, surface water in the Arroyo del Puerto had reached San Mateo Creek several miles to the south (Figure 1), indicating that discharge rates were high relative to infiltration capacity of the creek bed. This discharge was good quality water primarily from the Westwater formation. Where shaft sinking encountered significant amounts of water in the Tres Hermanos and Dakota formations, these aquifers were also pumped for a period of time.

Before mine development could proceed, ventilation holes had to be drilled near the shaft and subsequently throughout the mine area. Some 5 to 10 ventilation holes are needed for most mines. Typical construction on a ventilation hole in the Ambrosia Lake area involves installation of 30-to 60-inch diameter casing to the mine level. Three circumferential openings, 2 inches by 6 inches in size, are made every 20 feet to avoid recharged hydrostatic pressure buildup and possible casing collapse from external pressure. Any water-bearing zone from the surface to the mine level is permitted to drain into the ventilation holes. Across the area this has created a major sink or depression in all aquifers above the Westwater. Therefore, the entire mine area can be viewed as a groundwater depression or trough, not only in the Westwater because of the pumping, but also in the shallower aquifers because of drainage by ventilation holes.

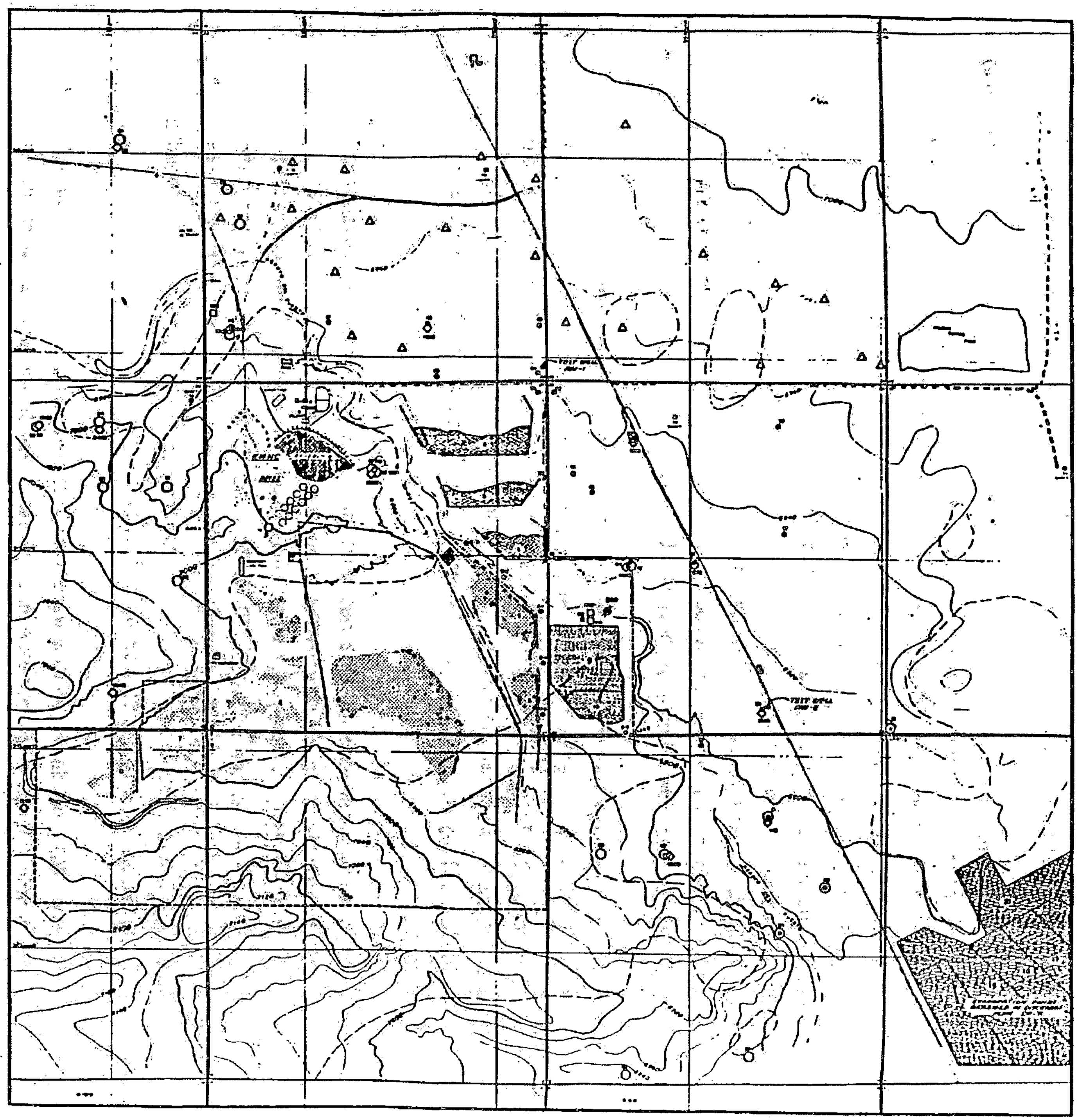
IV. HYDROLOGIC EFFECTS RELATED TO MILLING OPERATIONS

Mill operations which began in October 1958, required a water supply reservoir, tailings pile site, and several evaporation ponds for tailings solution. Figure 1 shows the location of these early impoundments - the mine water reservoir north of the mill site; pond #1, the tailings pile and pond; pond #3, the decant pond for pond #1; and ponds #2, #4, #5, and #6, which were constructed for evaporation of tailings solution. At the beginning of operations, the reservoir held mine waters of about 600 mg/l TDS, 200 mg/l sulfate, and 20 mg/l chloride with a pH of about 7. The tailings solution was on the order of 40,000 mg/l TDS, 26,000 mg/l sulfate, and 2,000 mg/l chloride with a pH between 1 and 2.

Pond construction was from local materials which were not abundant in clay; as a result, significant seepage losses occurred in all the ponds. Therefore, by late 1958, waters of different qualities from the reservoir and from the evaporation ponds were moving into the subsurface in the alluvial valley in addition to the water infiltrating along the stream course.

Kerr-McGee was concerned about movement of the fluid into the subsurface from the earliest days of operation, and monitor wells were installed as early as 1960. Additional wells have been constructed periodically; and, as of the summer of 1980, 70 monitor wells have been completed into various formations with 57 of these wells presently being monitored (see Appendix A and Figure 3). Due to some wells being dry, Appendix C lists water quality data for only 49 wells.

In early 1961, ponds #7 and #8 were constructed. From 1960 until early 1975, ponds #4, #5, and #6 were not in use. Ponds #9 and #10 were constructed in 1976 and were the first plastic lined ponds in the area. In late 1976 and early 1977, plastic-lined ponds #11 through #15 were constructed approximately 2 miles east of the mill, and lined ponds #16



EXPLANATION

MINE SHAFT

VENT HOLE

TOPOGRAPHIC CONTOUR

FIGURE 3

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Dec. 1980

through #21 were completed in early 1980 (Figure 1). Ponds #11 through #21 are currently covered by discharge plan DP-71 with the State of New Mexico and are not addressed further in this report.

In 1976, the stream course of the Arroyo del Puerto was realigned (Figure 1) near the mill site in order to divert flows around the ponds and away from the main tailings pile.

The entire mining and milling operation has been characterized by frequent changes. As mines develop, more of the Westwater Canyon aquifer is opened and aquifer drainage is altered. New ventilation holes are constructed and overlying aquifers continue to be drained. New evaporation ponds are constructed and old ponds are abandoned. Stream flow through the Ambrosia Lake area has been altered by stream realignment. Because of these numerous changes, it is difficult to fully document all hydrologic responses. For the purpose of this report, it is more constructive to present a brief historical analysis of the response of each aquifer and describe in detail the present-day conditions. With an understanding of the general hydrologic framework and present-day conditions, realistic projections of future trends can be made.

V. HYDROLOGIC SYSTEM RESPONSE TO THE MINING AND MILLING OPERATIONS

Figure 4 shows a generalized section of the formations in the Ambrosia Lake area. This figure shows the approximate potentiometric surfaces of the aquifers before any mining influences occurred. The aquifers were essentially full to the outcrop.

The hydrologic response of the various aquifers to mining and milling operations are presented in the following sections. Refer to Figure 3 for well locations.

Formations

Bluff

A well in the Bluff was constructed at the mill site in 1961 to a depth of 835 feet. After a short period of time, it was abandoned because of

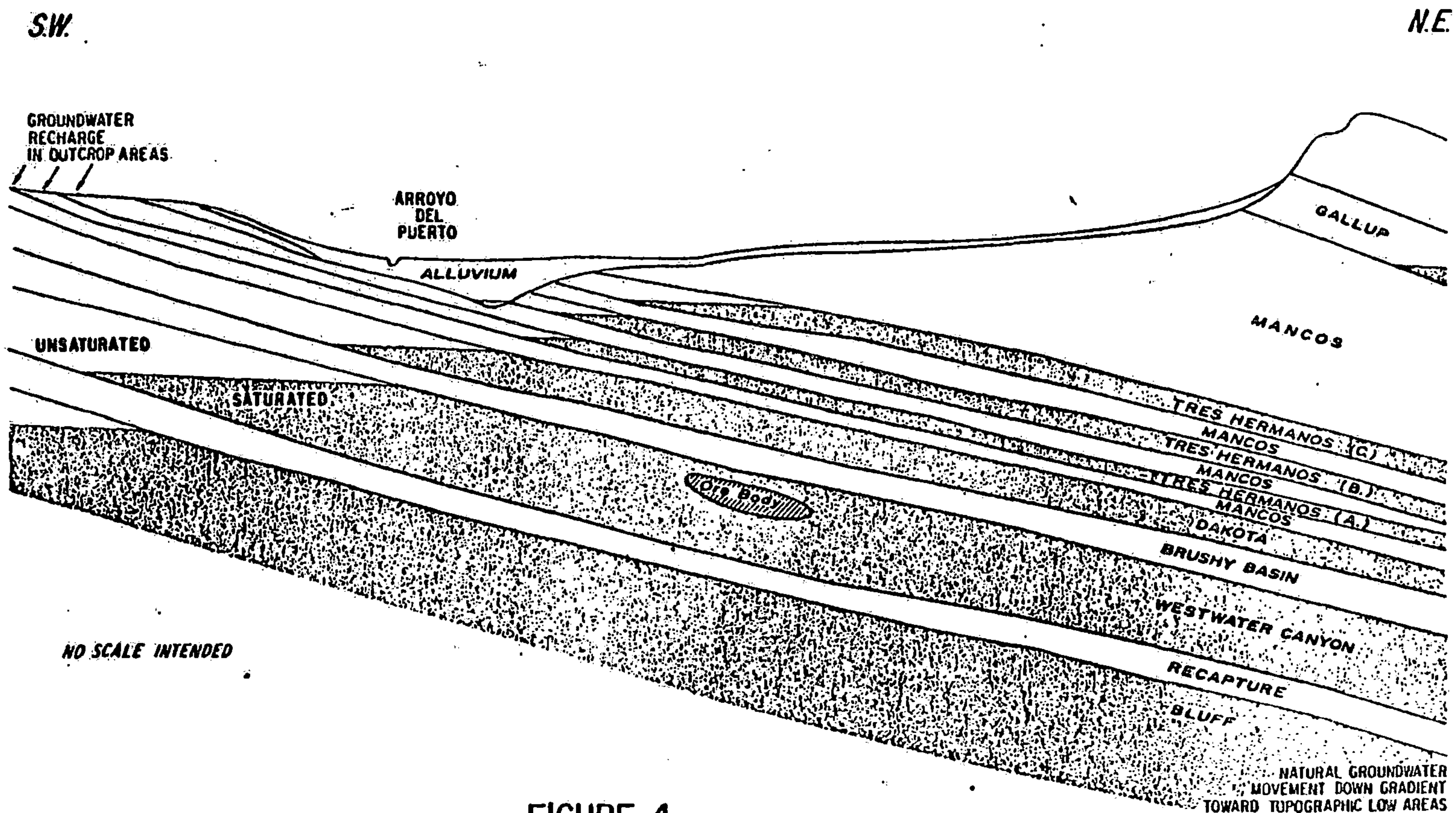

FIGURE 4.

NE-SW CROSS-SECTION THROUGH AMBROSIA LAKE AREA - GENERALIZED PRE-MINING CONDITIONS

KERR-McGEE NUCLEAR CORPORATION Dec. 1980

low yield and poor quality. The water level in January, 1961 was reported to be at a 465 foot depth (about 7540 feet elevation). In July, 1977, a water level was found at a 469 foot depth and a field specific conductivity of 2920 micromhos (umhos) measured (equivalent to approximately 2000 mg/l total dissolved solids). The water level for the Bluff aquifer has been virtually unaffected by the mining and milling operations during the past 19 years. No other monitor wells in the Bluff formation are known to be present in the subject area.

Westwater Canyon

In late 1957 and early 1958, J.B. Cooper and E.C. John (1968) surveyed the subject area for water well data. They reported on more than 30 Westwater wells in the Ambrosia Lake area. In general, the pre-mining potentiometric surface for the Westwater was found to be near 6550 feet in most wells and, characteristically, a good quality water was present. Most wells at the time of the survey were owned or drilled by the mining companies.

Kerr-McGee was reported to have one Westwater well in the northeast of Section 30, T14N, R9W, with a potentiometric surface of 6506 feet in 1957. No records on this well are now available; the well is reported to have been abandoned years ago because of complete dewatering by the nearby mining.

Two water supply wells located east of the mill near the Arroyo del Puerto were constructed by Berryhill (rancher) prior to mining activity and were later acquired by Kerr-McGee. These wells were referred to as the Berryhill well (B.H. #1) and the Windmill well (B.H. #2). Both were reported to be drilled and cased to the Westwater; however, it is likely that they were also open to the Dakota. The Berryhill well was monitored for quality from early 1960 to 1968 when it was cemented back to surface. Prior to early 1964, the water was of good quality, with sulfates of less than 200 mg/l and chlorides of less than 25 mg/l. By April, 1964, water quality rapidly rose to 3000 mg/l sulfates and 2000 mg/l chlorides, with pH going from 8.4 to 7.3. The Windmill well records began in 1968 when the Berryhill well was abandoned. The Windmill well records show sulfates from 3000 to 4000 mg/l, chlorides about 2000 mg/l and a pH near 7.0 until June, 1971, when the well was abandoned and plugged back to surface with cement. Evidence strongly suggests that both wells had developed leaks in the casing to account for the dramatic change in quality; a dilution or dispersion front associated with movement through an aquifer was not evident. Quality in both these wells at time of abandonment, was similar to that in the nearby alluvial monitoring well S-12 (discussed later).

In September, 1962, a Westwater water supply well was drilled north of the mill site at the Trailer Court. The water level at the time of well completion was reported to be 6475 feet elevation; the lower than expected potentiometric surface was probably due to effects of nearby mine dewatering. Water was of good quality until early 1967. In late 1966, sulfates were about 150 to 220 mg/l, chlorides less than 10 mg/l and pH near 8.0. In February, 1967, sulfates rose to 3600 mg/l, chlorides exceeded 250 mg/l and pH dropped to 7.7. The rapid quality change suggests a casing leak. The well is located very near a major north-south fault which also runs through pond #2. This pond is bounded in part by the middle Tres Hermanos sand. A short-circuit path from the pond to the well via fractures and a casing leak is a possible explanation for the rapid well contamination. The well was not monitored again until 1972 when it was probed for a water level. At a 190 foot depth, a casing collapse was found.

The earliest water quality records on the Berryhill and Trailer Court wells provide good background data for pre-mining water quality in the Westwater.

Typical analyses for these wells is given below.

TABLE 1. Water Quality for Westwater Wells

	Berryhill Well	Trailer Court Well
Date	4/12/63	3/7/63
SO_4 (mg/l)	133	145
Cl (mg/l)	3	3
TDS (mg/l)	427	529
pH	8.1	7.6

There are no existing Westwater monitoring wells in the study area. In order to determine present-day quality for the aquifer, underground water samples were taken from the nothern-most Kerr-McGee mine, Section 17, T14N, R9W. Analyses for two samples from the north side development drift are listed below.

TABLE 2. Water Quality for Westwater in Section 17 Mine

	0600 Drift	0800 Drift
Date	8/4/77	8/4/77
SO_4 (mg/l)	291	249
Cl (mg/l)	5	6
TDS (mg/l)	836	697
pH	8.5	8.6

It should be noted that the Section 17 water was obtained at an aquifer elevation of near 6200 feet, whereas the trailer court and Berryhill waters were from an approximate elevation of 6500 feet. A natural increase in dissolved solids downdip in the formation is expected.

Figure 5 is a drawing showing the general aquifer response to depressuring and dewatering due to mining. Note that the aquifer to the south of the mine is depleted quickly-leaving only a small amount of basal water-whereas the pressure surface from the north is above the level of the mine. Subsequently the mine drainage is heaviest and most prolonged from the northernmost drifts and longholes. This is further discussed in Section VII (Water Balance).

Dakota

The Dakota sandstone is the first aquifer above the ore body, separated from the Westwater by about 80 feet of clayey material of the Brushy Basin. Prior to mining, very little information about the water-bearing properties of the Dakota was recorded. At the Phillips Sandstone Mine in Section 28, T14N, R9W, about 3 miles NE of the Kerr-McGee mill, the Dakota potentiometric level was reported to be at 6678-feet elevation, approximately 100 feet higher than the potentiometric surface in the Westwater. This implies a natural gradient tending to move groundwater downward from the

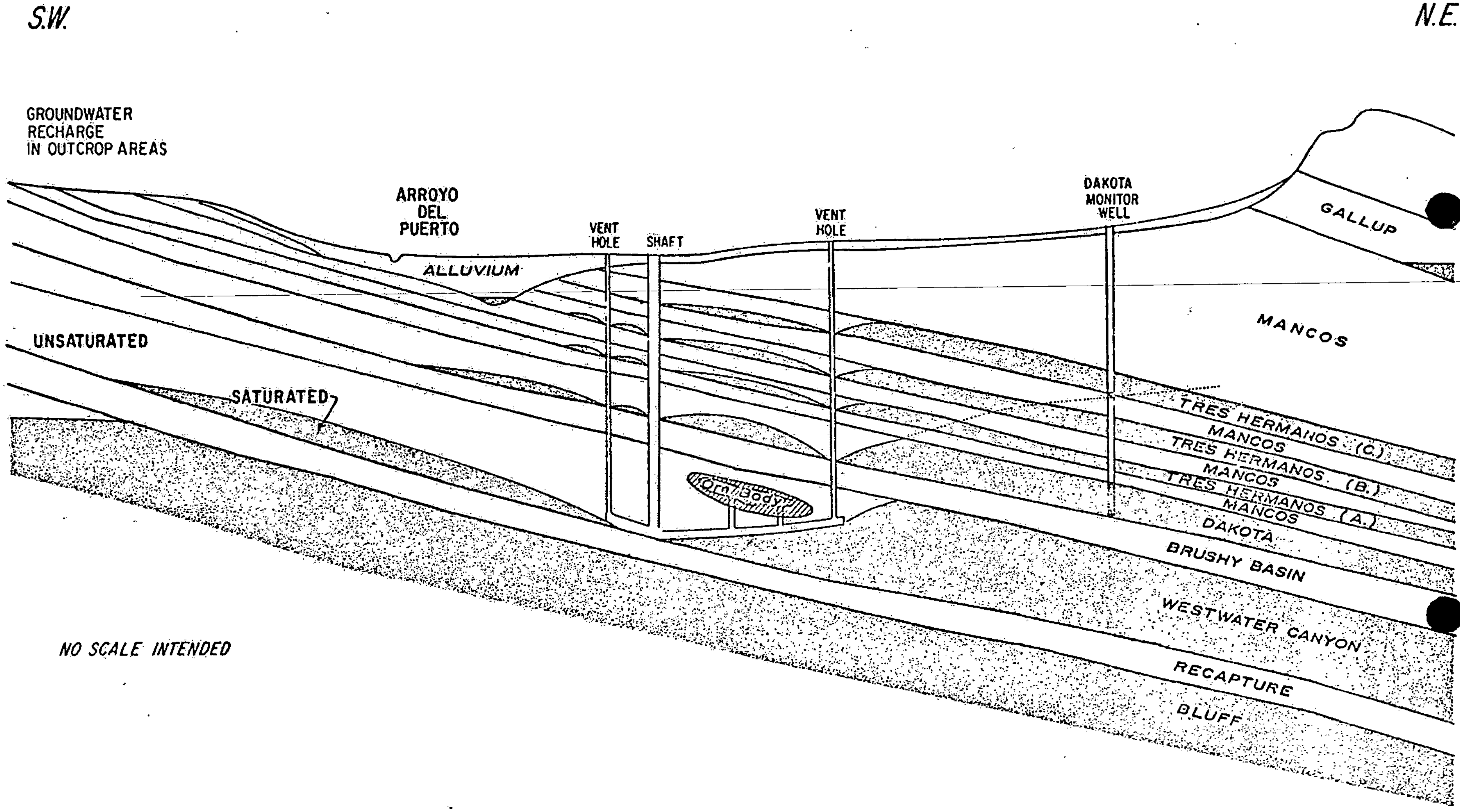

FIGURE 5.

NE-SW CROSS-SECTION THROUGH AMBROSIA LAKE AREA - GENERALIZED MINING CONDITIONS

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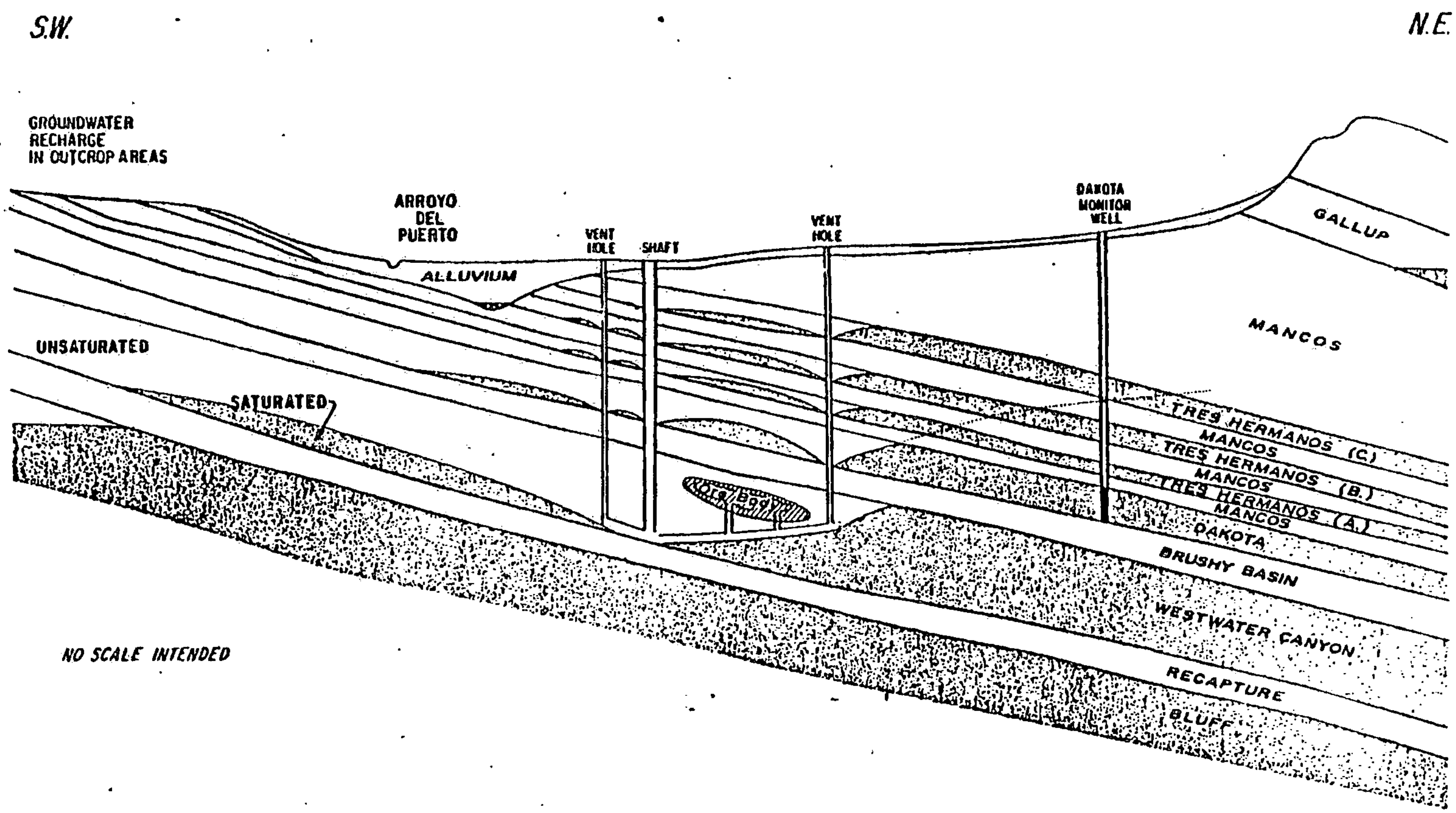


FIGURE 5.

NE-SW CROSS-SECTION THROUGH AMBROSIA LAKE AREA - GENERALIZED MINING CONDITIONS

KERR-McGEE NUCLEAR CORPORATION Dec. 1980

Dakota into the Westwater. This may be an indication of greater recharge capability of the Dakota; it does occupy more outcrop and more subcrop area than the Westwater in the Ambrosia Lake area.

As mine shafts were sunk and ventilation holes constructed, the Dakota was opened in numerous places and allowed to drain. Figure 3 shows ventilation holes as of 1979 around Kerr-McGee mines. Other mining companies have similar type ventilation holes around their mines.

In early 1972, Kerr-McGee installed the first monitor well into the Dakota east of the mill, near the Berryhill and Windmill wells. Additional Dakota wells were constructed in 1975 and 1977. Presently 12 wells are being monitored for Dakota response to mining and milling operations. One additional well in the Dakota was reported to be dry in the summer of 1980.

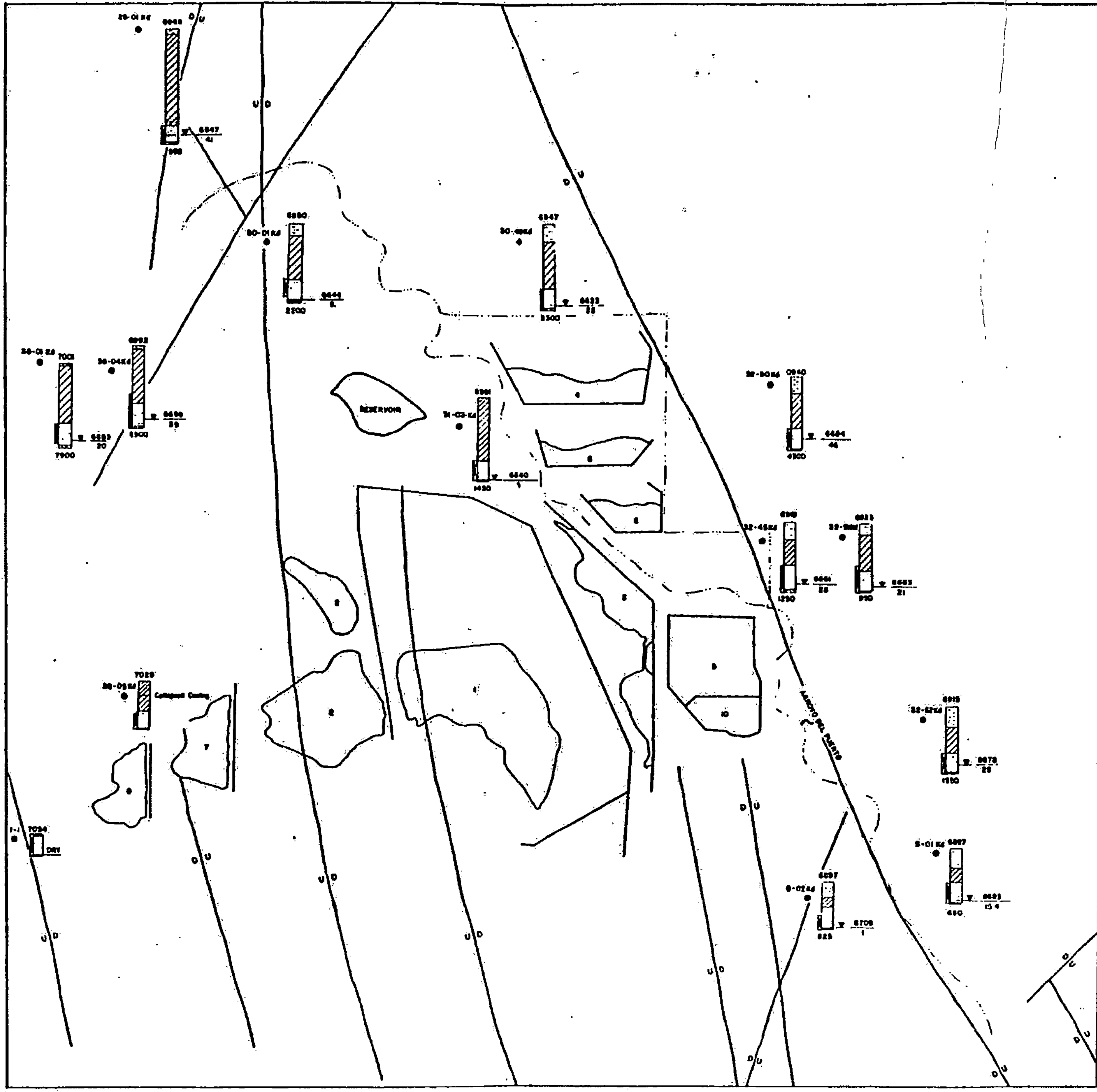
In general, these wells have only a few feet of saturation at the bottom of the Dakota-indicating that the drainage to mines has largely dewatered this aquifer in the immediate area. Water remaining in the aquifer is generally of good quality with specific conductivity from 600 to 1200 mhos (about 400 to 800 mg/l total dissolved solids).

Monitor wells in the Dakota are difficult to construct. The small amount of aquifer water can easily be contaminated by drilling mud and is difficult to clean out; air drilling results in the moist cuttings adhering to the wall of the hole and hanging up the bit or subsequently dropping back to plug the bottom of the hole.

Figure 6 shows the location of Dakota wells in relation to the mill and ponds and a general log of each Dakota well. The following items should be noted:

1) Groundwater in the basal Dakota appears to be slowly moving downdip; no steep gradients are present.

2) Wells on the northeast side, No. 32-50 and No. 30-48 indicate probable casing leakage from the alluvium because Dakota water quality closely resembles alluvial water. Other nearby wells show background-type water quality for the Dakota.



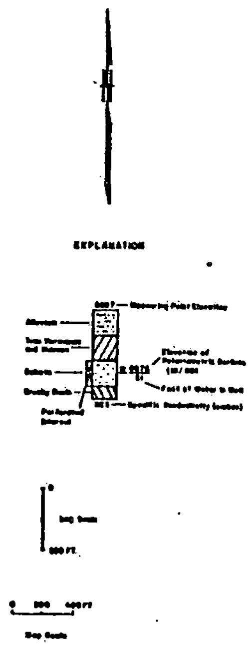


FIGURE 6. MAP SHOWING WELL LOGS AND WATER DATA FOR THE DAKOTA

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Dec. 1980

3) Two wells on the west side show poor quality characteristics, similar to tailings solution. Pond #8 is near the Dakota outcrop, and fluid movement through faults and fractures may account for the aforementioned quality characteristics.

Although some seepage may be occurring directly into the Dakota from tailings solution ponds, the depression trough in the Dakota in the mining area serves as the ultimate interception of such seepage.

In order to show that the Dakota aquifer has developed a gradient from the north towards the mining area, a monitor well was constructed in Section 17, T14N, R9W, just north of the Section 17 Kerr-McGee mine (Figure 1). The water level in that well is 6900 feet elevation (October, 1977), approximately 500 feet above the top of the Dakota in the nearest vent hole to the south where the Dakota is open and draining. This aquifer response to mine dewatering, therefore, would be as shown in Figure 5.

This new Dakota monitor well in Section 17 was perforated on October 31, 1977; chemical analyses of the water are given below.

TABLE 3. Water Quality for Dakota Well #17-01 Kd, 4/13/80.

SO_4 (mg/l)	621
Cl (mg/l)	28
TDS (mg/l)	1020
pH	9.7

For comparision, Cooper and John (1968) reported an analysis on the Dakota water from Section 17 mine as follows:

TABLE 4. Water Quality for Dakota in Section 17 Mine.

Date	8/8/62	4/30/63
SO_4 (mg/l)	772	850
Cl (mg/l)	14	17
TDS (mg/l)	1410	1525
pH	7.5	7.7

Tres Hermanos

The sandstone lenses within the Mancos shale constitute aquifers of marginal importance. . In the study area, no wells in these sandstones are known to have been constructed before or since mining began. As is typical of sandstones in the Mancos across the Grants Mineral Belt, only where these sandstones are fractured are there reports of water yields sufficient to sustain over a low capacity well.

Kerr-McGee began monitoring these zones in 1972. More wells were constructed in 1975 and 1977. Presently, 18 wells are completed entirely or in part in the Tres Hermanos sandstones. During the summer of 1980, three of these wells were found to be dry. Similar to the Dakota, very little fluid is found in most of these wells-indicating that substantial drainage by vent holes has probably occurred.

Several things complicate the analysis of Tres Hermanos aquifer response. The three sandstones making up the Tres Hermanos are not easily identified or distinguished; and, for most of the alluvial valley area, the alluvium lies, in part, on one of these sandstones. Therefore, construction of monitoring holes, in many cases, has combined the basal alluvium with an underlying Tres Hermanos sandstone.

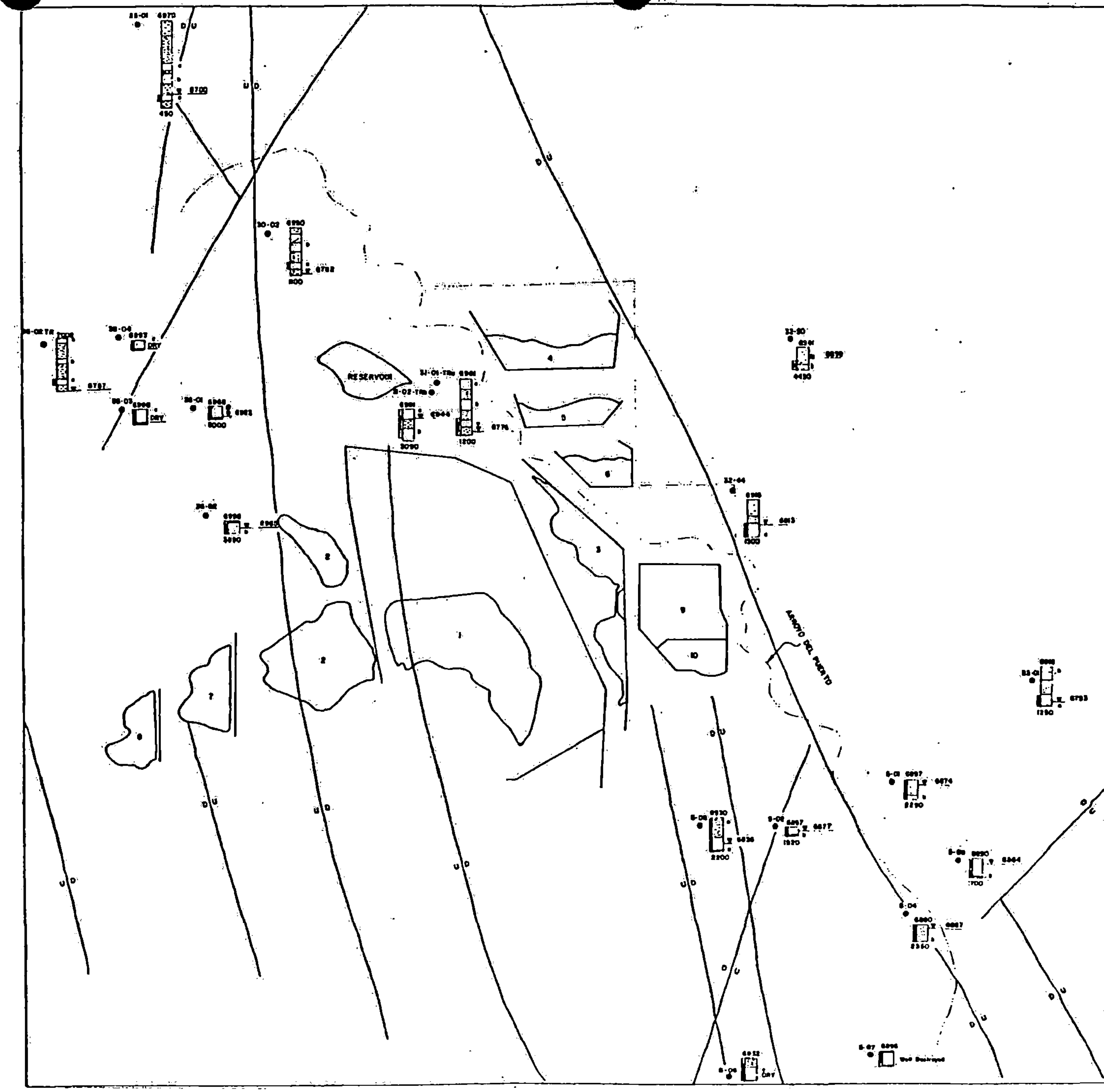
Figure 7 shows the location and general construction of the Tres Hermanos wells. The following items should be noted:

1) The Tres Hermanos Sandstones to the south are found to be dry, too high structurally to have any saturation.

2) On the west side, the highest sand(s) are dry with only the lowest sand having fluid.

3) Because of erosion on the Mancos surface before deposition of the alluvium, different Tres Hermanos sandstones are found in subcrop contact with the alluvium.

4) As with the Dakota, any present-day groundwater movement is probably largely controlled by the formation dip and faulting.



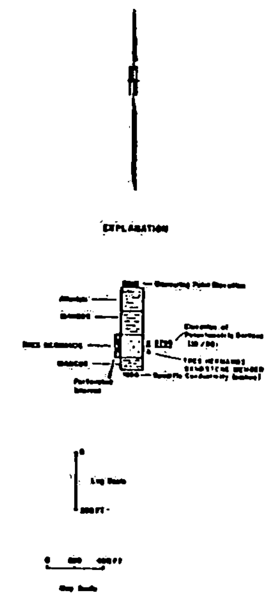


FIGURE 2 MAP SHOWING WELL LOGS AND WATER DATA FOR THE TRES HERMANOS

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Dec. 1980

5) Conductivity for two wells on the west side (middle sandstone) is high and believed to be due to seepage from the evaporation ponds, primarily along faults and fractures.

Similar to the Dakota, a large-scale depression trough in the mining area is believed to be present in the three Tres Hermanos sandstone aquifers. Therefore, any seepage from ponds or alluvium into these sandstones will ultimately end up entering the ventilation holes or shafts.

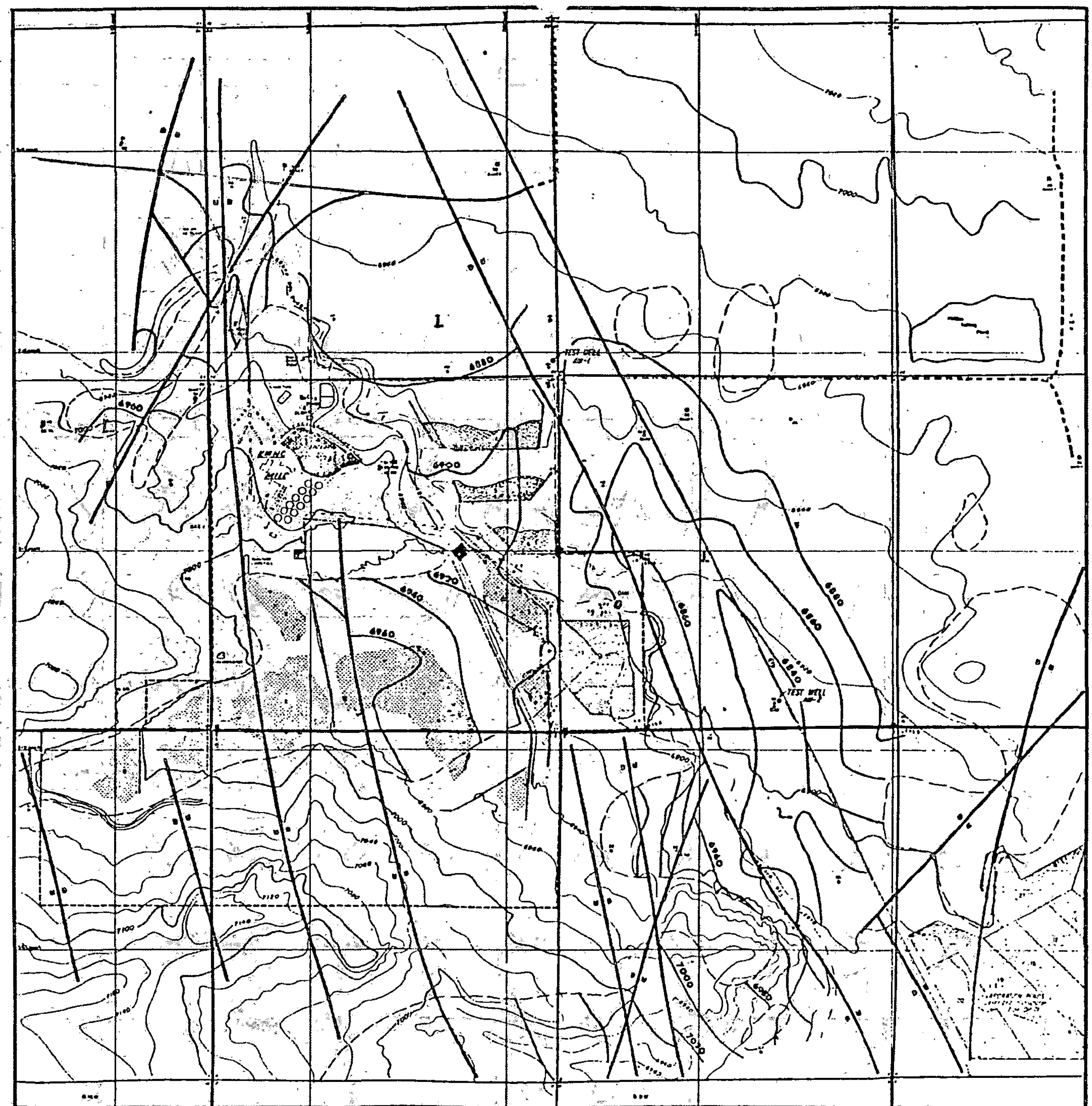
Alluvium

The greatest impact of the mining and milling operations has been on the alluvial valley deposit east of the mill site. Because of the important role this valley deposit has played during the past 20 years, a detailed analysis of this feature is presented here.

Unlike the previously-discussed formations, which dip uniformly to the northeast and are fairly consistent in thickness across the area, the alluvium has variable thickness and numerous and often indistinct layers within it related to soil-profile formation and changing patterns of deposition. Because of these variables, a general overall interpretation of alluvial conditions is presented rather than dwelling on isolated occurrences.

Figure 8 shows the areal extent of the alluvium and major faults as mapped by Santos and Thaden (1966). Superimposed on the map are structural contours on the base of the alluvium, developed by the Grants' office geological staff. It can be seen that the major axis of the alluvial basin follows the north-northwest trending fault east of the mill site. The deeply-weathered Mancos shales and Tres Hermanos sandstones are exposed on the surrounding low-lying hills. In the field, the lateral contact between the Mancos and the alluvium is often difficult to see. Air photos are especially helpful in determining alluvial boundaries at the surface.

The erosional valley developed on the Mancos and Tres Hermanos was subsequently filled with sediment by wind and water deposition to a maximum depth of almost 100 feet. Figure 9 is an isopach of the alluvium; the map was prepared by the Grants' geological staff of the Kerr-McGee Nuclear Corporation.



EXPLANATION

6800 STRUCTURAL CONTOUR ON BASE OF ALLUVIUM. REFERENCE IN FEET TO MEAN SEA LEVEL. CONTOUR INTERVAL: 20 FT

FAULT IN BEDROCK WITH UP AND DOWN THROWN SIDES INDICATED.

SEE FIG 3 FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS

FIGURE 8

STRUCTURAL MAP FOR THE BASE OF THE ALLUVIUM

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Dec. 1980

EXPLANATION

FIGURE 5

ISOPACH MAP OF ALLUVIUM

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Dec. 1980

The Mancos and Tres Hermanos subcrop and outcrop have been added to Figure 9. The outcrop detail is taken from the map by Santos and Thaden (1966).

The earliest hydrologic operations in the area after uranium ore was discovered was aquifer testing to determine the effect groundwater would have on mining. Pumping tests beginning in 1957 resulted in periodic flows in the Arroyo del Puerto; and, as the first shafts were sunk, more and more groundwater was pumped and put into the watercourse. Infiltration and percolation along the creek bed became a major source of recharge water to the alluvial sediments.

By late 1958, ponds to hold mine water and tailings solution were in operation, and seepage losses from these contributed a significant amount of fluid to the alluvium. Evaporation ponds for tailings solution were located on the alluvial material either in the valley proper (ponds #4, #5, and #6) or on an alluvial valley tributary (ponds #1, #2, and #3). The mine water reservoir was located on the weathered middle Tres Hermanos sandstone. All ponds were known to have some degree of seepage loss because ponds were constructed of local, relatively permeable soil.

Figure 10 is a cross-section depicting late 1950's conditions. The section is generally from tailings pond #1 in the southwest across the alluvial valley to the northeast. Note that only a very small amount of water, if any, was present initially in the basal alluvium. Along the Arroyo del Puerto, infiltration of good quality water, discharged from the mines, was recharging the alluvium. During this time ponds #1 through #6 were losing acidic and high TDS fluid to the alluvium by seepage. The two fluids mixed as they migrated toward the deepest part of the alluvium.

There were no wells in the alluvium prior to mining and milling operations; however, the earliest monitor well in the alluvium, well #25, drilled in early 1960 (Figure 3) indicates: (1) initial depth to water of 76 feet; and, (2) initial water quality of about 30 mg/l chlorides, 2000 mg/l sulfates, 3300 mg/l TDS, and a pH near 8.0. Depth of alluvium indicates that at the time this well was constructed, three years after flow was introduced into the creek, about 10 feet of saturation had developed. Therefore, virtually no groundwater could have been present in the alluvium

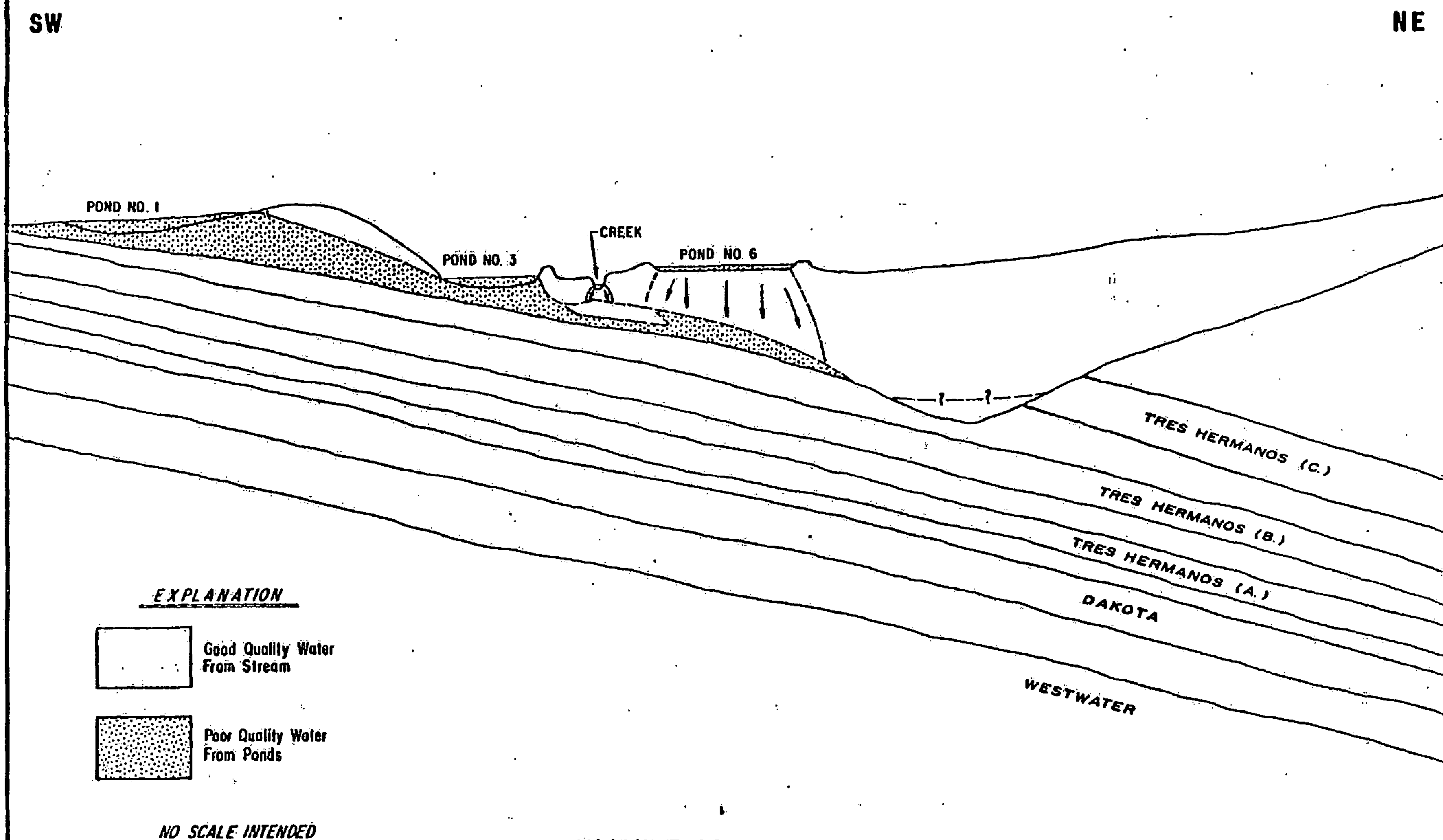

FIGURE 10.

NORTHEAST-SOUTHWEST CROSS-SECTION SHOWING SUBSURFACE HYDROLOGIC CONDITIONS FOR THE 1959-1960 PERIOD.

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Dec. 1980

prior to mining activity. The well was monitored for quality and water level until September, 1974. It was abandoned in 1976 because of stream realignment. By 1974, the chloride concentration had steadily risen to about 900 mg/l, sulfates had dropped to about 1000 mg/l, TDS was close to 3000 mg/l, and pH remained near 8.0. Depth to water was about 30 feet. Over a period of 14 years, this area of alluvial valley was filling with groundwater of a mixed composition.

Figure 11 is a graphical presentation of water levels and chloride concentrations for wells #25 and #41. These represent the earliest record for the alluvium. Numerous other wells were also drilled in the alluvium and monitored for water levels and water quality. Various patterns of chloride increase and water-level rise were apparent. In general, however, it was obvious that the alluvial-valley sediments were slowly filling with a mixed-composition fluid. The rate of increase in the chloride concentration suggests a dilution or dispersion front which would be expected from a mix of tailings solution with good water from infiltration along the stream.

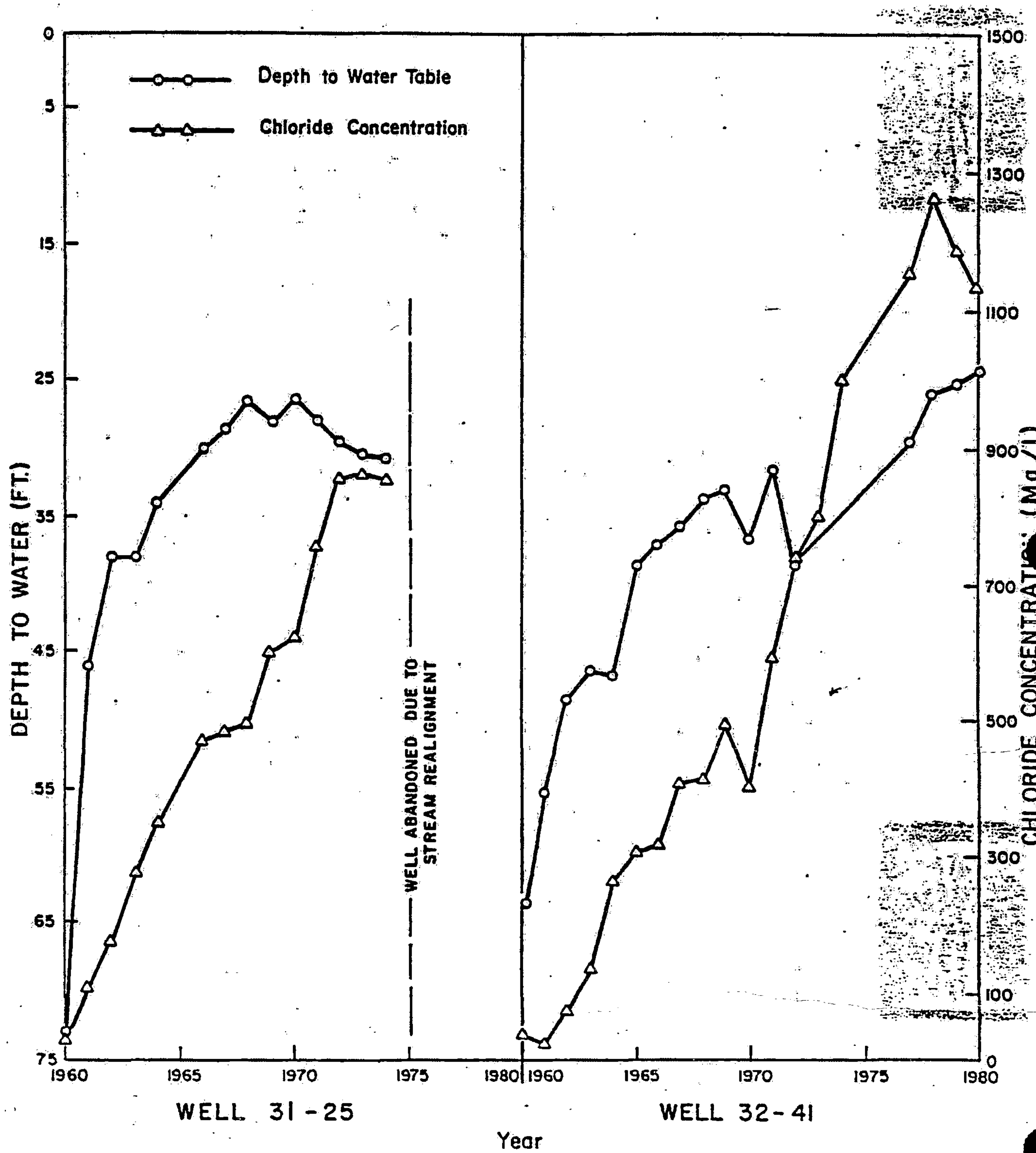
During the summer of 1980, a field conductivity analysis was run on the water from all alluvial wells; the data are presented in Figure 12. The general source of water-quality degradation, the evaporation ponds, is readily apparent in the pattern of conductivity values shown on this map.

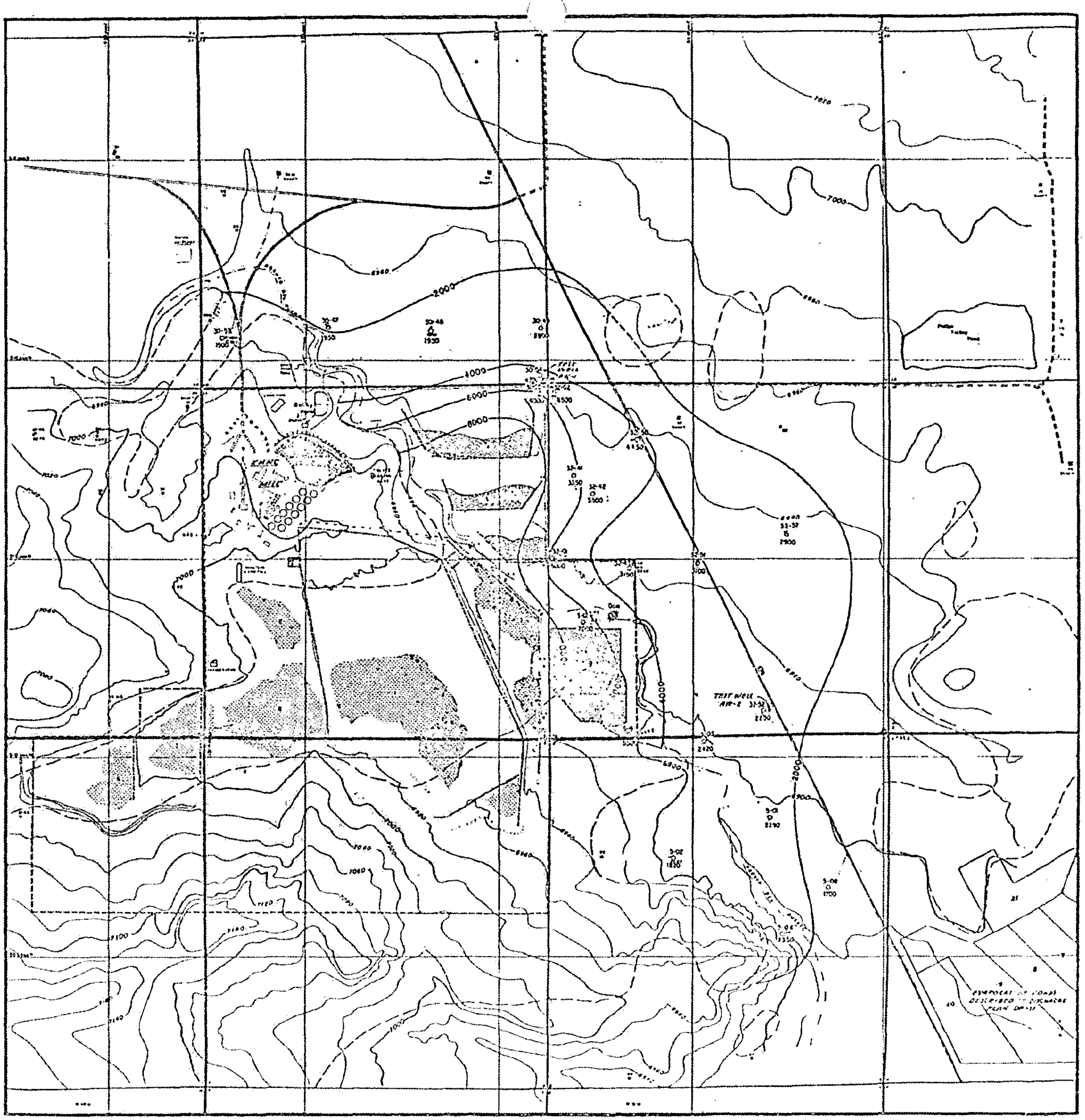
Water levels in all alluvial wells were also measured during the summer of 1980, and these data are presented as a water table map (Figure 13). The large groundwater mound closely resembles the water quality pattern in Figure 12.

The alluvial valley narrows to the south, and Figure 13 indicates that this is probably the only area where significant outflow of the groundwater can occur. The projected rate and quality of outflow are discussed in Section VII (Water Balance).

In the eastern portion of the basin, the water-table gradient (Figure 13) indicates that fluid is continuing to move to the east; however, the rate of movement is small because the gradient is relatively low.

FIGURE II. WATER LEVEL AND CHLORIDE CONCENTRATION CHANGES IN ALLUVIAL MONITOR WELLS 31-25 AND 32-41 FROM 1960-1980





EXPLANATION

CONTOUR SHOWING SPECIFIC CONDUCTIVITY (UMHOS) OF GROUNDWATER IN THE ALLUVIUM, 1980
CONTOUR INTERVAL: 2000 UMHOS

SEE FIG. 3 FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS.

SCALE

FIGURE 12

ISOSPECIFIC CONDUCTIVITY MAP FOR THE ALLUVIUM, 1980

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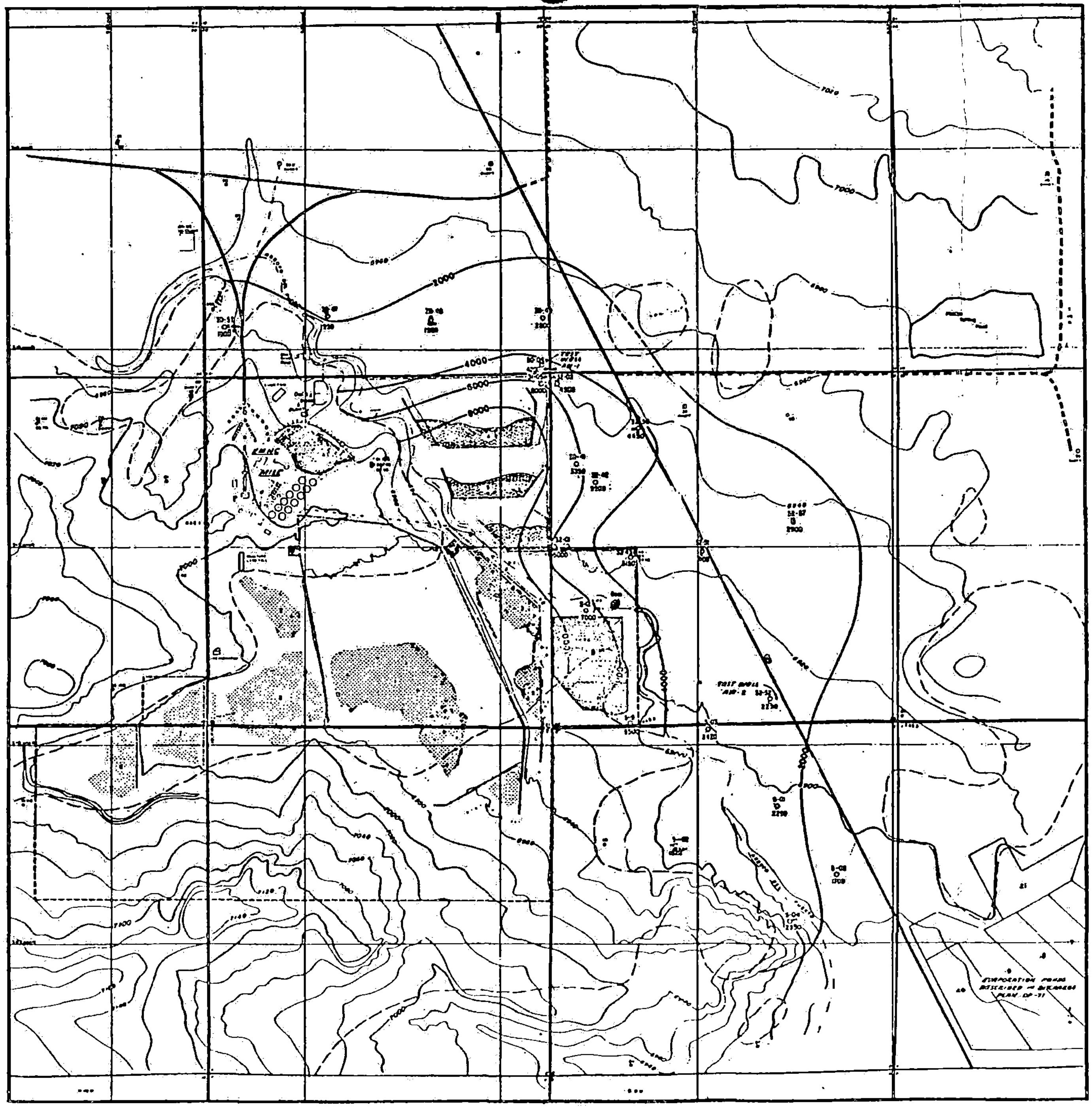
Dec 1980



EXPLANATION

CONTOUR SHOWING SPECIFIC CONDUCTIVITY (umhos) OF GROUNDWATER IN THE ALLUVIUM, 1900
CONTOUR INTERVAL = 2000 umhos

SEE FIG. 3 FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS.

SCALE

FIGURE 12

ISOSPECIFIC CONDUCTIVITY MAP FOR THE ALLUVIUM, 1980

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Dec. 1980

EXPLANATION

CONTOUR SHOWING WATER TABLE ELEVATION, 1980 REFERENCE IN FEET TO MEAN SEA LEVEL. CONTOUR INTERVAL = 5 FT.

FLOW PATH FOR GROUNDWATER MOVEMENT.

APPROXIMATE FLUID ELEV. IN POND, 1980.

SEE FIG. 3. FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS

SCALE

FIGURE 13

WATER TABLE MAP FOR ALLUVIUM 1980

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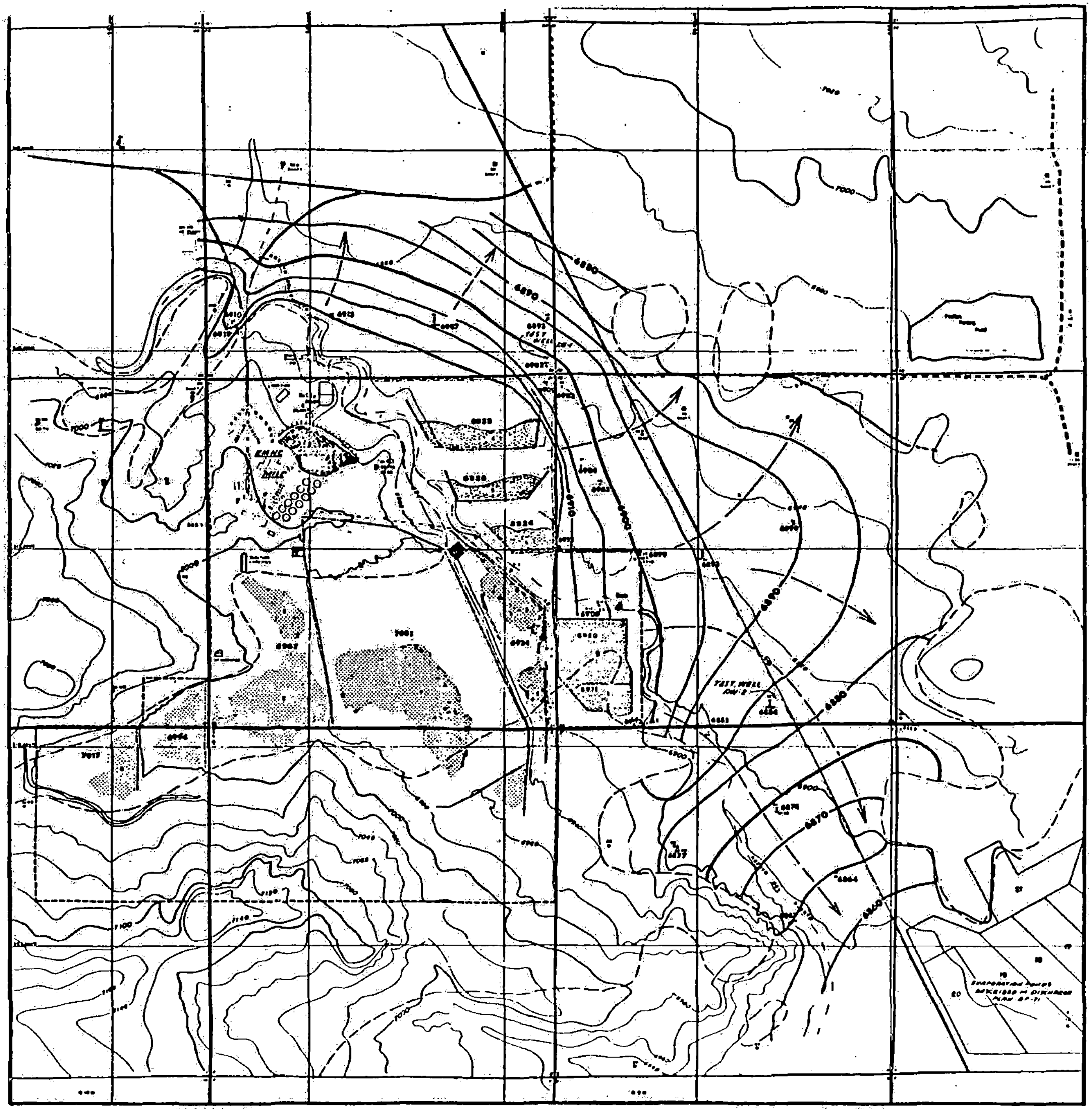
Dec. 1980



EXPLANATION

CONTOUR SHOWING WATER TABLE ELEVATION, 1980
REFERENCE IN FEET TO MEAN SEA LEVEL.
CONTOUR INTERVAL = 5 FT.

FLOW PATH FOR GROUNDWATER MOVEMENT.

APPROXIMATE FLUID ELEVATION IN POND, 1980

SEE FIG. 2 FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS

SCALE

FIGURE 13

WATER TABLE MAP
FOR ALLUVIUM
1980

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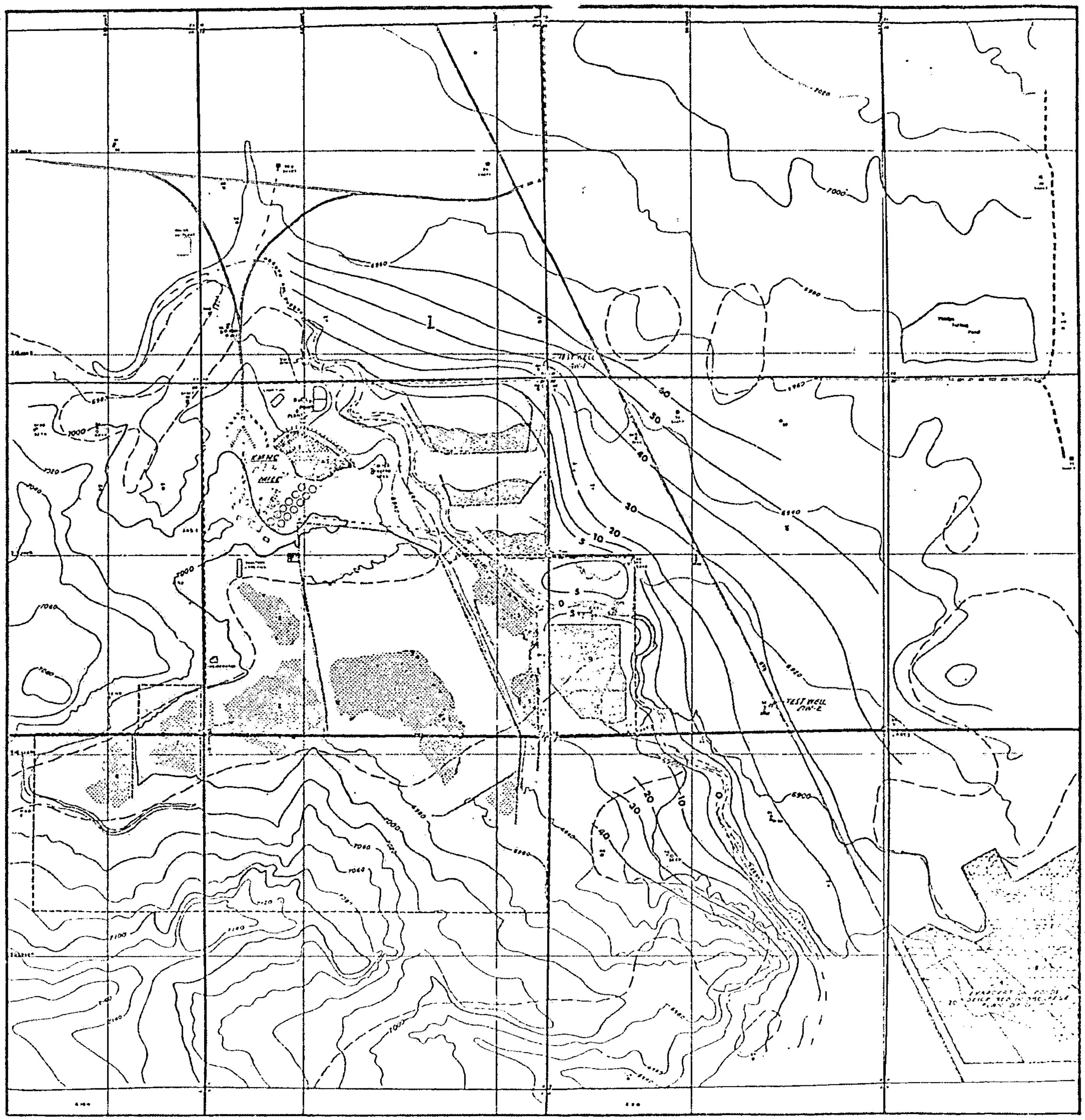
Dec. 1980

Figure 13 shows that along most of the Arroyo del Puerto's natural course, the groundwater table is at the stream bottom. The realignment of the stream in 1976 moved the creek flow to the north and east of ponds #4, #5, and #6. For most of this reach, the water table is presently well below the stream bottom, however, with infiltration along this new stream course, the water table will ultimately rise to the stream bottom.

To determine the areal extent over which the water table intersects the stream bottom, the differences in water table elevations and land surface elevations were contoured to produce a depth to water table map (Figure 14). It can be seen that virtually all of the old stream course opposite the mill is influenced by groundwater base flow. The new stream course is already showing a buildup of the water table to the stream bottom. This map does not show the extent to which groundwater flow enters the stream; such a determination must be made from gradients shown on the water table map (Figure 13) and a knowledge of the permeability of the shallow aquifer.

The water table map and structure map on the base of the alluvium were superimposed to give a saturated thickness of alluvium. This map was then planimetered and found to show that approximately 33,000 acre-feet of alluvial sediment is saturated. If sediments are assumed to have been dry initially, then a porosity factor of as high as 25% would apply and about 8200 acre-feet of fluid is calculated to be in storage within the alluvium. This represents a long-term average of 372 acre-feet per year (233 gpm) seepage loss from stream bed and unlined ponds.

As a comparision to the fluid conditions for the alluvium in the late 1950's (Figure 10), the cross-section was modified to show the present-day groundwater setting (Figure 15). Note that the new creek has been added and the water table is now at the creek bottom. A trench to intercept seepage was excavated in 1959 to the east of pond #3 and deepened in 1972. Fluid intercepted by this trench is returned to the evaporation ponds.



EXPLANATION

30 — CONTOUR SHOWING DEPTH (FT) TO THE WATER TABLE IN THE ALLUVIUM, 1980

CONTOUR INTERVAL = 5 & 10 FEET
SEE FIG. 3 FOR AN EXPLANATION OF ALL OTHER MAP SYMBOLS.

SCALE

FIGURE 14

MAP SHOWING DEPTH TO WATER TABLE IN THE ALLUVIUM, 1980

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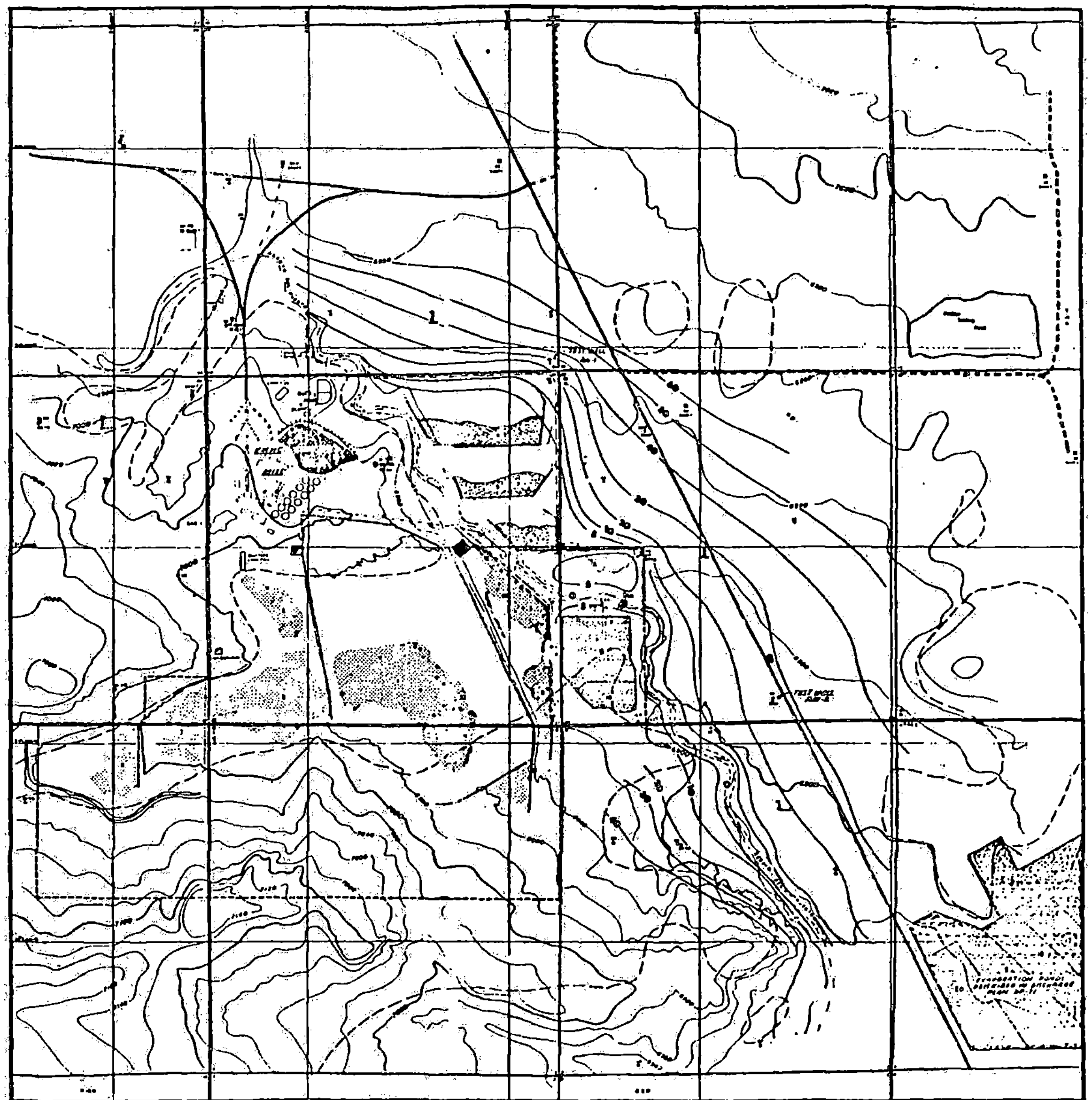
Dec. 1980



EXPLANATION

FIGURE 16

MAP SHOWING
DEPTH TO WATER TABLE
IN THE ALLUVIUM,
1980

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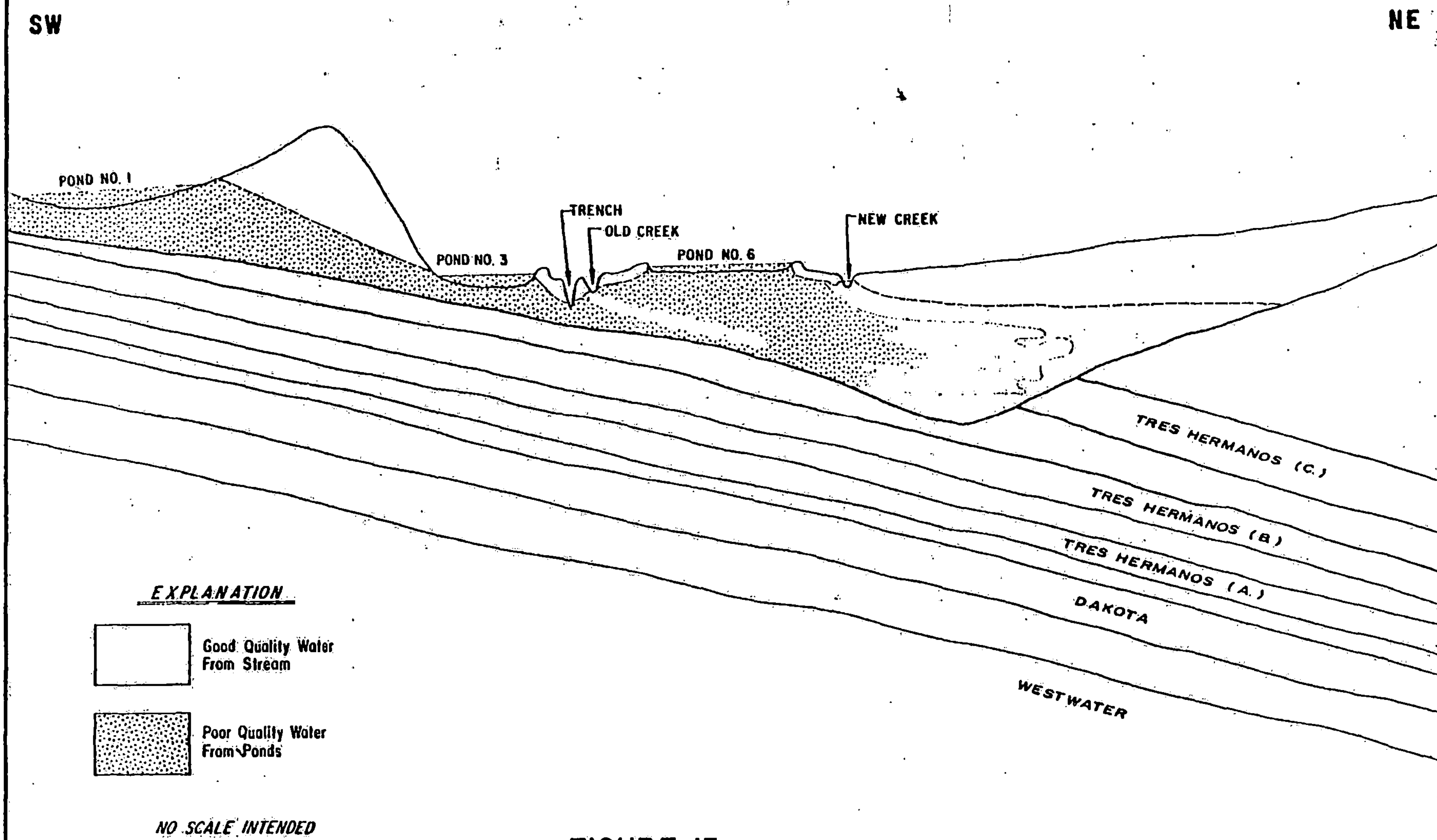


FIGURE 15.

NORTHEAST-SOUTHWEST CROSS-SECTION SHOWING SUBSURFACE HYDROLOGIC CONDITIONS FOR THE 1979-1980 PERIOD.

KERR-McGEE NUCLEAR CORPORATION
Dec. 1980

Figure 15 also shows the likelihood that some fluid in the basal part of the alluvium is moving into the Tres Hermanos sandstones. Downdip migration in these sandstones, believed to be small in quantity, is very likely intercepted by vent holes around the mines.

All indications are that the alluvial basin is approaching a near full condition. The quantity of fluid now entering the subsurface from the ponds and creek in one part of the basin is largely offset by outflow at the several discharge points described above. The continued buildup of subsurface storage as fluid moves to the east is a slow and decreasing process.

Summary Assessment of Present Day Conditions

A review of the hydrologic data for the past 20 years was made to assess the present-day conditions of the following aquifers.

1) Bluff
   a) Virtually unaffected in water level or quality at mill site well.
   b) No other wells present in area.

2) Westwater Canyon
   a) Presently no monitor wells in this unit.
      i) Three wells have been plugged and abandoned because of casing leaks.
      ii) One well abandoned after being dried up by mine dewatering.
   b) Aquifer to the south of mining area is largely drained; minor water in basal sandstone is still draining.
   c) Groundwater flow from north still strong as indicated in northern mines and northern drifts in these mines.
   d) Large depression trough exists throughout area due to mine dewatering.
   e) Background quality of water based on earlier wells and present-day mine drainage from the north indicates uncontaminated aquifer is of good quality.

3) Dakota

a) Presently 13 monitor wells are completed in the formation.

b) Aquifer to the south of mining area is largely dry due to drainage by ventilation holes.

c) Groundwater flow from north toward mining area indicated by piezometer in Section 17.

d) Large depression trough exists throughout area due to drainage in holes and/or roof collapse.

e) Some tailing solution has entered formation on the west side, probably along faults and fractures, originating where formation is exposed to tailings solution at the surface (pond #8).

f) Background quality of water is generally fair to good.

4) Tres Hermanos

a) Presently 18 monitor wells are completed in the formation.

b) Formation to the south of the mining area is drained, in part, where ventilation holes have permitted groundwater drainage.

c) Fairly large depression trough is believed to be present as for Dakota.

d) Some tailings solution may have entered the middle member of the formation on the west side, probably along faults and fractures, originating where the formation is in contact with tailing solution (pond #2).

e) Background quality of water is generally fair to good.

5) Alluvium

a) Presently 31 monitor wells are completed in the formation.

b) Basin sediments are nearly full of groundwater with very little additional subsurface storage possible; approximately 8200 acre-feet of water are estimated to be in storage.

c) Groundwater movement as base flow into the creek is indicated to have a minor impact on the stream flow.

d) Groundwater mound indicates the flow is moving:

   i) To north and intercepted by vent holes and shafts.

   ii) To east, very slowly because stream is preventing additional growth in height of the mound.

iii) To southeast toward narrows and into next alluvial basin.

e) Groundwater quality is becoming progressively degraded as movement from ponds continues outward.

VI. WATER BALANCE

An important aspect in the overall assessment of the hydrologic conditions for the Ambrosia Lake area is the water balance. From the source of the water in the mines to the eventual discharge to the creek or infiltration into the ground, the significant characteristics of each part of the system are described below.

Mine Water

Nature of Discharge

As water is removed from each mine, it first flows through a settling pond at the mine site before it is piped to the mill. Some of these mine ponds are lined with plastic and seepage there is negligible; at other mines, the unlined settling ponds probably have a small but constant seepage loss. Compared to the discharge for each mine, the seepage at these ponds is undoubtedly a very small percentage.

Quantity

Given in the following table is the discharge of each mine as of October, 1980; total discharge to the mill area at that time was 2110 gpm.

TABLE 5. Mine Discharge Rates, October, 1980.

Mine (Section)	17	19	22	24	30	30W	33
Discharge (gpm)	728	95	183	147	319	325	313

A review was made of monthly water reports to determine water use around the mill for 1979. During that period, minor fluctuations were noted in mine discharge with an average of 2209 gpm reaching the mill site from the mines.

In a letter to the State Engineer's office, September 1, 1977, E. Orrell, of the Grants office, stated that, "approximately 93,000 acre-feet of water has been pumped from the Cretaceous Dakota sandstone formation and/or from the Westwater Canyon member of the Jurassic Morrison formation since (Kerr-McGee) operations began in 1958". This information was developed in response to an inquiry from the State Engineer's office. It would be difficult to document historical changes in this discharge, however, an average discharge based on the above number would be 5000 acre-feet per year, or about 3000 gpm averaged over the 19 year history of the Kerr-McGee mining at Ambrosia Lake.

Quality

Water quality varies from mine to mine with some quality concentrations exceeding the New Mexico groundwater regulation standards at the mine site. The mixing of waters in some cases reduces these concentrations to an acceptable level. The analysis for each mine for February, 1980 is given below.

TABLE 6. Quality of Water at Kerr-McGee Ambrosia Lake Mines

Mine (Sec.)	17	19	22	24	30	30W	33	NM, EID Standards
SO_4 (mg/l)	645*	960*	565	575	1555*	1300*	1640*	600
Cl (mg/l)	8	27	19	15	113	121	28	250
TDS (mg/l)	1010*	1740*	1162*	1134*	2720*	2470*	2720*	1000
Se (mg/l)	0.081*	0.023	0.022	0.35*	0.14*	0.036	0.018	0.05
Mo (mg/l)	0.62	0.77	0.047	0.31	2.0*	1.2*	0.77	1.00
Ra**(pCi/l)	41*	63*	38.1*	300*	124*	56.7*	14.3	30

*Exceeding State Standards

**Ra-226 only; standard of 30 pCi/l include both Ra-226 and Ra-228.

Water at Mill

Nature of Uses

Section 17 mine water is of better quality and fairly large volume; because of this it is put through the IX plant at the mill separate of other mine waters and then after further treatment, is used for drinking water and sanitation at the mill, mine office and for the local area. Sanitation water from the mill and mine office, after septic treatment, is collected and sent to tailings pond #3 for final disposal. Water from the Section 17 mine in excess of that needed for the above uses is treated with barium chloride and discharged into the mill reservoir near the mill reservoir overflow point.

Water from the remaining mines (19, 22, 24, 30, 30W and 33) is treated in the IX plant then discharged into the mill reservoir near the intake point for mill makeup water. When the mill is not in operation and when otherwise needed, these mine waters are also treated with barium chloride prior to discharging into the mill reservoir.

Water from the mill reservoir that is not used in the mill operations is discharged to barium sulfate settling ponds for radium treatment and then released into the Arroyo del Puerto (Figure 3).

The water which is used by the mill is discharged with the tailings as a slurry to the No. 1 pond. The solution is decanted from this pond to Pond #3 and diverted to evaporation ponds for disposal.

A small diversion of runoff and other drainage waters from the mill area is collected in the unlined storm sewer pond located to the north of the mill reservoir and adjacent to the Arroyo del Puerto.

Quantity

For the year of 1979, approximately 2209 gpm were delivered to the mill site. Two hundred and thirty-seven (237) gpm from the Section 17 mine was removed for separate use and 1971 gpm were made available for mill operations and storage in the mill reservoir. An estimated 30 gpm was lost from the reservoir by evaporation and 203 gpm lost by seepage. During the year, approximately 283 gpm were released from the reservoir to the Arroyo del Puerto after barium chloride treatment.

In processing approximately 5875 tons of ore per day during the past year, the mill used 1381 gpm (about 4.25 tons per gallon of water per minute).

Assuming no water consumption loss by the mill, 1381 gpm was discharged as tailings solution to evaporation ponds for disposal. Discharge also included 100 gpm of ore moisture and 157 gpm derived from the recycle of tailings water within the mill. Discharge to evaporation ponds, totaled 1638 gpm (averaged through 1979).

Quality

The water in the mill reservoir is a combination of mine waters with some fluctuation in quality related to changes in storage and mine operations. In 1980, the reservoir water and that released to the creek through the barium chloride plant was of the following average composition:

TABLE 7. Average Water Quality for 1980. Mill Reservoir Final Discharge

Chemical Parameter	Range 1980	Average 1980	Number of Samples Averaged	Groundwater Standards
SO_4 (mg/l)	975-1230	1084	9	600 (mg/l)
Cl (mg/l)	N/A	82	1-only one value for 1980	250 (mg/l)
TDS (mg/l)	1820-2000	1928	9	1000 (mg/l)
Se (mg/l)	0.052-0.34	0.158	10	0.05 (mg/l)
Mo (mg/l)	0.74-0.94	0.826	10	1.0 (mg/l)
Ra-226 (total pCi/l)	0.40-4.8	1.85	10	30.0 (pCi/l)
V (mg/l)	0.002-0.10	0.052	10	N/A
Zn (mg/l)	0.002-0.11	0.023	9	10.0 (mg/l)
U (mg/l)	1.05-2.40	1.50	10	5.0 (mg/l)
pH	7.6-8.2	7.9	10	6-9

Arroyo del Puerto

Nature of Discharge

Prior to the mining activity in the area, the Arroyo del Puerto was a dry wash. Flow in the creek occurred only in response to significant rainfall events and periods of prolonged snow melt.

Under present-day conditions, the creek is dry until it reaches the United Nuclear-Homestake IX Plant in Section 25, northwest of the mill. At that point, a substantial discharge enters the creek. As the creek flows near the mill site, discharge from the Kerr-McGee mill reservoir is added.

In late 1976 the creek was realigned to flow north and east of ponds #4, #5, and #6 and away from ponds #1 and #3 (Figure 1). The new creek rejoins the original creek bed near the northeast corner of pond #9. Drainage from the reach of the abandoned creek is captured behind a small dam and is pumped back to pond #3. Stream flow in the Arroyo del Puerto continues about 4 miles downstream to empty into the San Mateo Creek, which carries periodic flows from precipitation events.

Quantity

Near the Section 25 - Section 30 boundary, the average flow during the year of study was 510 gpm. This flow has increased by the 283 gpm discharged from the mill reservoir (described previously). Flow leaving the Kerr-McGee property in Section 32 was measured at an average of 743 gpm for the year. This figure reflects evapotranspiration and infiltration occurring along the stream reach.

It has been assumed that local rainfall and runoff which would add to the Arroyo del Puerto outflow is offset by the evapotranspiration associated with the riparian vegetation along the creek bottom and in nearby still-water areas.

Quality

Water quality analyses for the Arroyo del Puerto date back to early 1960, the time of the first monitoring wells. Fluctuations in quality characteristics have been common with changes in mine and mill operations and with realignment of the creek.

The water course survey made in August, 1980 is given in the following table (in mg/l). The survey points are indicated on Figure 1.

TABLE 8. Water Quality Survey Along Arroyo del Puerto, 1980.

	P-1	T-1	T-2	P-8	P-10	P-12	P-14	P-15	P-16
SO_4 (mg/l)	950*	990*	960*	970*	1010*	940*	890*	940*	Dry
Cl (mg/l)	90	150	120	130	140	180	180	190	Dry
TDS (mg/l)	1710*	1750*	1730*	1730*	1710*	1710*	1760*	1830*	Dry
Se (mg/l)	0.074*	0.100*	0.050	0.066*	0.061*	0.061*	0.062*	0.050	Dry
Mo (mg/l)	0.71	0.75	0.71	0.63	0.48	0.52	0.640	0.550	Dry
Ra (pCi/l)	5	2	3	2	24**	3	7	9	Dry

*Exceeding State Standards (See Table 6)

**Probably Contaminated, Only Value (February 3)

A cursory examination of the above values indicates that the quality of the water in the Arroyo del Puerto is relatively constant.

Evaporation Ponds

Nature of Process

Although disposal of tailings solution is by evaporation ponds, a significant percentage of solution loss is by seepage through the pond bottom.

Evaporation potential is reduced by the presence of dissolved solids; the rule of thumb is that a one-percent increase in dissolved solids causes a one-percent decrease in evaporation rate. For the tailings solution of 45,000 ppm, an evaporation rate of 4.5% less than pure water would be expected if all other factors were held constant. However, in field studies with other solutions it has been found that this rule does not apply because the solution body will take on radiant energy, raise the temperature of the body; and, in the process, achieve an evaporation rate similar to fresh water at the lower temperature. Therefore, in lined ponds which buildup dissolved solids, the increased concentrations do not seriously retard evaporation until fairly high concentrations are reached.

Physical Characteristics

The physical characteristics of the Kerr-McGee ponds are summarized below:

TABLE 9. Evaporation Pond Characteristics, 1979
(Maximum Area and Volume Reported in 1979)

Pond	Area (Acres)	Volume (Acre-feet)	Date of Construction	Remarks
1	62	372	1958	Unlined
2	46	299	1958	Unlined; in contact with Tres Hermanos (outcrop)
3	27	53	1958	Unlined
4	13	26	1958	Unlined
5	11	16	1958	Unlined
6	8	16	1958	Unlined
7	12	13	1961	Unlined; in contact with Tres Hermanos (outcrop)
8	24	24	1961	Unlined; in contact with Dakota (outcrop)
9	24	73	1976	Plastic Lined
10	7	17	1976	Plastic Lined; needs remedial work
TOTALS (Approximately)	234 Acres	909 Acre-Feet		

At maximum capacity, the ponds total about 234 acres in area.

Ponds #2, #7, and #8 are located west of the tailings pond #1 and are in the narrow part of the canyon. The fluid in these ponds is in direct contact with the Tres Hermanos and/or Dakota. Leakage via fractures and faults is believed to be the mechanism by which tailings solution-type fluid has been found in wells to the north; however, as previously described, any northern movement of fluid in these formations will result in interception by ventilation holes. Leakage from ponds #2, #7, and #8 is considered to be small and of inconsequential potential impact to anyone. An intermediate positioned well, 36-05 (Figure 3), drilled in 1977 failed to find evidence of this seepage.

As indicated previously, the newest lined ponds, #11 through #21, in Section 4 are covered with the State under discharge plan DP-71.

Evaporation Potential and Rate

In the Ambrosia Lake area, evaporation rate for fresh water based on evaporation pan studies is estimated to be about 60 inches per year. The long-term average of rainfall for the area is near 12 inches per year. Therefore, net evaporation rates for fresh-water ponds is assumed to be 48 inches per year. For a pond of one acre, this amounts to 4 acre-feet or 1.3 million gallons per year. As a volumetric flow rate, this results in an evaporation rate of about 2.5 gallons per minute per acre of ponded water.

In 1979, approximately 438 acres of lined and unlined ponds were in operation, resulting in an estimated 1095 gpm evaporation loss. During this period, storage in newly constructed ponds and fluid retention in tailings occurred at the rate of 368 gpm. The unlined mill area evaporation ponds had a combined seepage rate of 203 gpm or approximately 1 gpm of seepage per acre of unlined pond.

During 1980, the pond system was essentially fully utilized, with mill operations resulting in 1638 gpm of tailings solution. In unlined ponds, approximately two-thirds of the solution was lost by evaporation while one-third went into subsurface storage.

Quality

In January, 1980, the tailings solution and seepage near pond #1 were analyzed. Results are shown in the following table.

TABLE 10. Quality of Tailings and Seepage Solution, 1980

	Tailings	Seepage
SO_4 (mg/l)	28,500	24,900
Cl (mg/l)	2,280	1,690
TDS (mg/l)	37,800	36,072
pH	1.08	1.45

These values are assumed to be typical of the past as well as present-day ponds and associated seepage.

Subsurface Water

Nature of Movement

A detailed description of present-day conditions of groundwater in the alluvium was given in Section VI. The principal avenues of fluid movement into the subsurface have been by infiltration along the creek bottom and from unlined ponds. A large groundwater mound in the alluvium near the evaporation ponds was noted to have formed and is slowly moving fluid to the north, east, and southeast. To the north, the fluid movement is largely intercepted by ventilation holes and/or fractures and faults in the bedrock. Fluid movement to the east appears to be very slow because the gradient has become very gentle, due to the Arroyo del Puerto creek bottom acting as a limiting factor in preventing additional buildup in mound height. To the southeast, fluid is moving through the subsurface narrows in Section 5 into the next alluvial basin to the south. The entire body of fluid in the alluvium has reached a near-steady state condition-that is, very little additional change in mound size or shape is occurring. Changes in quality of fluid; however, are occurring as the fluid migrates outward from the source.

Rate of Movement

The rate of groundwater movement is a function of the gradient, permeability and effective porosity. At any point of interest, the gradient can be obtained from information on the water table map. The permeability of the alluvium, determined from pumping tests, was found to be on the order of 10 gpd/ft^2 (Appendix B). The appropriate porosity value must be estimated because this parameter cannot be readily determined. Numerous references give total porosity values for alluvial sediments; however, it is generally agreed that some fraction of the total pore space is ineffective in transmitting fluid. Based on published values of alluvial porosity, it is estimated that total porosity for the Ambrosia Lake alluvium is on the order of 25% with an effective porosity of approximately 20%.

Using the above values, the rate of groundwater movement in the Ambrosia Lake area is found to be on the order of approximately 20.0 feet per year.

To the north, the steeper gradient toward the mines indicates a velocity of about 38.0 feet per year, whereas the gentle gradient to the east indicates a velocity of approximately 14.0 feet per year. To the southeast, a rate of movement of 18.0 feet per year was determined.

With a knowledge of the subsurface cross-sectional area and the groundwater velocity from above, a calculation of volumetric flow rates can be made. To the north, toward the mines, an estimated 30 gpm flow is calculated. Into the eastern portion of alluvial sediments, a 20 gpm flow is indicated; and, towards the subsurface narrows to the southeast, approximately 10 gpm flow is indicated. Based on changes in quality along the Arroyo del Puerto (Table 9), an estimated 8 gpm of groundwater is entering the creek as base flow.

This report has documented the localized impact on groundwater resources at Ambrosia Lake by the Kerr-McGee facility during the 22 years of operations. A major concern to all parties is the degree of impact which may occur due to the natural migration of industry-related waste fluids in the groundwater. Figure 16 summarizes the general hydrogeologic conditions downgradient from the mill area which will play the major role in the eventual movement of groundwater. The pre-existing canyon, cut into bedrock some 80 to 100 feet below the present alluvial stream bed, has been filled in with wind and water-transported sediments.

Those sediments, filled with groundwater from years of mine-water discharges to the Arroyo del Puerto, will be the principal pathway of groundwater as it leaves the Ambrosia Lake area.

The rate of groundwater movement from the mill area through this sedimentary deposit can be calculated in a manner similar to that described earlier. The porosity and permeability values are assumed to be the same as described above. Because the alluvial aquifer is full, the water-table gradient from the mill area to the confluence of the Arroyo del Puerto and the San Mateo Creek is assumed to be the same as the stream gradient. Using an average permeability of 10 gpd/ft^2, an effective porosity of 20% and a gradient of 140 foot drop in 20,000 foot distance, the rate of groundwater

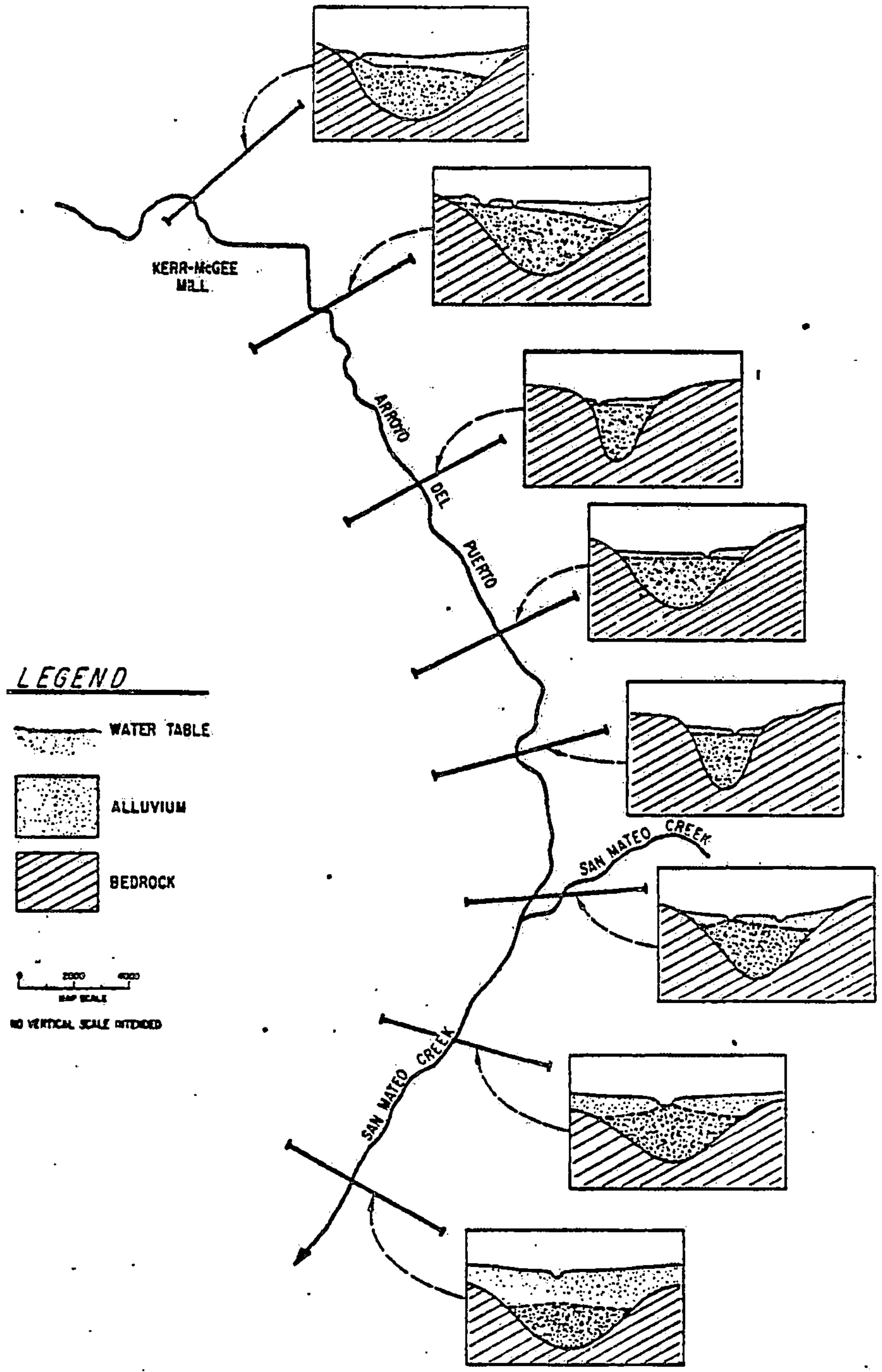


FIGURE 16

HYDROGEOLOGIC CROSS-SECTIONS OF ARROYO DEL PUERTO AND SAN MATEO CREEK NEAR AMBROSIA LAKE

KERR-McGEE NUCLEAR CORPORATION
Dec. 1980

movement is found to be 18 feet per year. Travel time for this 20,000 foot distance at this rate would take approximately 1100 years. The rate is likely to slow considerably when mining and milling activity cease in approximately 20 to 30 years because no further mine wastewater will be produced to sustain the groundwater mound against decay. The water in the alluvial sediments is not currently being employed for domestic or agricultural use and there is not evidence that it will be in the foreseeable future. The low permeability of these sediments and, therefore, the very low recovery capability by wells precludes the desirability of utilizing this material as a water supply aquifer.

Quality

Waters from different sources entering, mixing, and reacting with soil and rock of the subsurface has resulted in the present day distribution of chemical components. Seepage from the tailings pile and the unlined evaporation ponds and infiltration from the creek bottom for more than 20 years has allowed a variety of chemical constituents to enter the groundwater system. As these constituents move through the unsaturated zone and are transported by groundwater, attenuation or reduction of their concentration occurs as a result of both hydrodynamic and geochemical processes (Shepard & Cherry, 1980).

Hydrodynamic processes cause dilution of the chemical constituents, whereas geochemical processes remove certain constituents from the flow system by a mass transfer from the liquid to the solid phase. The evidence of these processes taking place in the alluvium is apparent in Table 11. This table shows several chemical constituents for tailings fluid in decant pond #3 and for wells located progressively farther away from the pond in a down-gradient flow direction (see Figure 3 for well locations). The dramatic decrease in most of the constituents and the increase in pH from 1.45 to 7.7 indicates the ability of the alluvium to greatly reduce the impact which tailings seepage has on the Ambrosia Lake area. The processes of attenuation have reduced both the concentrations and the rate of movement of the chemical constituents of most concern.

TABLE 11

CHANGE IN GROUNDWATER QUALITY AWAY FROM
MILL TAILINGS PONDS*

		pH	Se	Ra_{sol} (pCi/l)	Fe	Cl	SO_4	Ca	TDS
	Pond #3	1.45	2.79	1,013.00	2,280.00	2,130	24,700	460	34,400
Well No.	A-1	6.84	----	21.00	-----	4.270	7,010	---	18,840
	S-12	7.3	0.50	0.21	<.008	3,040	6,210	360	14,400
	5-03	7.9	0.072	0.37	<.008	278	2,050	360	3,750
	5-01	7.6	0.15	0.21	0.49	137	2,110	330	3,660
	5-08	7.7	0.12	5.5	<.008	109	1,600	240	2,540

*All values in mg/l unless otherwised noted.

Hydrodynamic Processes

Dilution of the chemical species in groundwater by physical means is due to both advection and dispersion processes.

Advection

Advection is the process whereby dissolved species are transported by the bulk motion of flowing groundwater. The previous section described the average linear groundwater velocity present in the alluvium for which a non-reactive (i.e., non-retarded) constituent would be transported by advection. This type of analysis allows one to approximate velocity and travel time for the 50%, incrementally increased, concentration value of a non-reactive chemical constituent.

Dispersion

Dispersion is the process whereby a zone of chemically different groundwater spreads and occupies a larger volume of flow than it would if advection were the only influence on its movement. Dispersion occurs both longitudinally (in the direction of flow), and transversely (at right angles to the flow). Dispersion causes the maximum concentrations in the zone of mixing to be attenuated, or spread out so that a single observation point shows a pattern of gradual increase until the maximum concentration is reached. The amount of dispersion, or spread in concentration, is related to the type of porous media. Dispersion can be described in quantitative terms and therefore predicted; however, dispersion cannot be precisely determined readily in the field and lab-derived dispersion values vary considerably from field-derived values. Additionally, there is some indication that dispersion is not constant when larger values of time and distance are considered.

Dispersion phenomena are evidenced at Ambrosia Lake by the reduction in chlorides, a non-reactive agent, as they move away from the unlined ponds (Table 11).

Geochemical Processes

Most of the constituents in seepage from uranium mill tailings undergo some degree of mass transfer attenuation of their concentration as they are transported in the groundwater zone. The main geochemical processes that control mass transfer are: adsorption, precipitation and co-precipitation.

Adsorption

Adsorption is defined as the surface of solids taking up, by physical or chemical forces, the molecules of dissolved substances. This process occurs in the Ambrosia Lake alluvium and affects the rate at which the individual constituents are transported. Radium removal from the seepage water is known to be largely accomplished by adsorption of the radium by subsurface clays. The attenuation of radium by the absorption process is indicated by the values in Table 11.

Precipitation

A second major geochemical process that causes mass transfer of contaminants from the liquid to the solid phase is precipitation. Through precipitation reactions, insoluble minerals or chemical compounds are formed from dissolved species, thereby removing them from solution. Very often precipitation is the result of neutralization of acid, i.e., solutions passing through basic geologic materials. The Ambrosia Lake alluvial material has been determined to have up to 2% $CaCO_3$ and is very effective in neutralizing the acidic seepage fluid. This is illustrated by the rapid rise in pH exhibited in a short distance between pond No. 3 and Well S-12 as shown in Table 11.

The neutralization of the tailings seepage and the resultant potential for precipitation of constituents is also illustrated by Table 11 in the rapid decrease in the concentration of dissolved iron. The iron precipitates as iron oxide in the immediate pond area.

Co-Precipitation

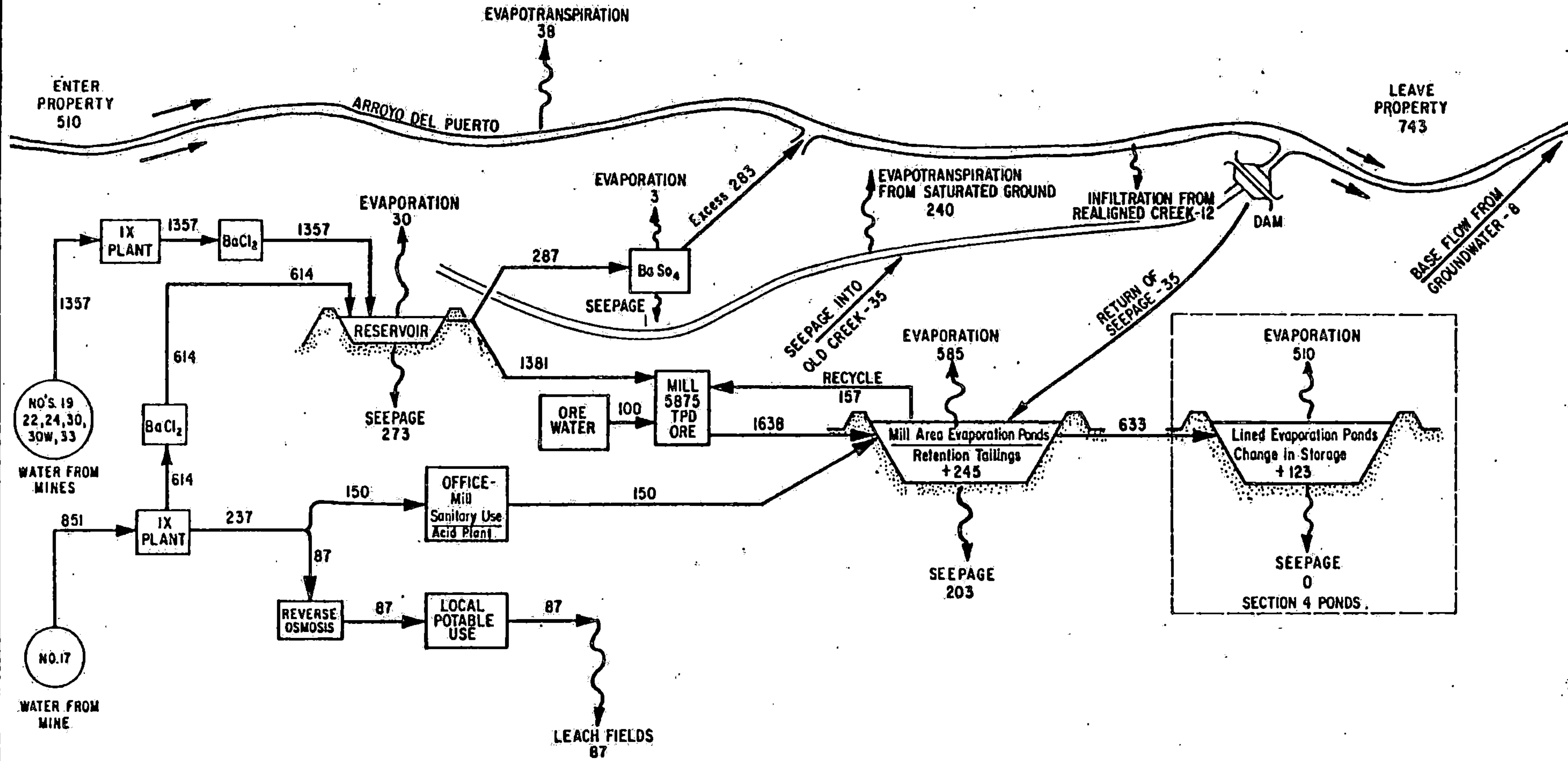
Co-precipitation refers to the incorporation of a constituent as an impurity or accessory within a mineral phase that precipitates. For example, the precipitation of gypsum ($CaSO_4 . 2H_2O$) with the co-precipitation of radium is a common process that occurs beneath tailings impoundments. This radium removal happens to a much less degree than adsorption of radium but still serves to reduce the radium concentration of tailings seepage.

The previous sections described basic processes that serve to reduce the concentrations of some constituents contained in tailings seepage. Most of the constituents of interest are affected to some degree by these hydrodynamic and geochemical processes even though these individual processes cannot be independently quantified. Of the changes occurring in the tailings seepage, the neutralization of the acidic wastes appears to be most important for reducing constituents concentrations. Although some exceptions may be found, a change in pH from 1-2 (acidic) range to 6-8 (neutral) range will generally result in very low mobility for most radionuclides and heavy metals.

Summary Statement on Water Balance

Volumetric flow rates for the various components described above have been summarized and are presented schematically in Figure 17. It should be noted that this summary is for average conditions existing for 1979.

WATER BALANCE
KERR-McGEE OPERATIONS–AMBROSIA LAKE
Average Values* for 1979



* VALUES ROUNDED IN GALLONS PER MINUTE (GPM)

KERR-McGEE NUCLEAR CORPORATION
Dec. 1980

FIGURE 17 Schematic Diagram of the Water Balance

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APPENDIX A

KERR-MCGEE - AMBROSIA LAKE - WELL INVENTORY

(Explanation at end of table)

Well Location T-R-Sec.	Well Number	Date Drilled	Total Depth (Ft)	Casing Depth (Ft)	Casing Diameter (in)	Casing Completion	Open Interval (Ft)	Open Formation	Meas. Point Elevation (Ft, MSL)	Remarks
13-9-5	01	9-71	83	83	4	C-C	S52B	Al-Trb	6897.0	WCO 6-80
	01Kd	2-75	226	140	6	C-B			6896.6	WCO 9-80
				226	4	C-C	S86B	D		
	02	12-71	40	40	4	C-C	S20B	Al-Trb	6896.8	WCO 6-80
	02Kd	2-75	191	136	6	C-B			6896.5	WCO 9-80
				191	4	C-C	S55B	D		
	03	12-71	53	53	4	C-C	S40B	Al	6901.1	WCO 11-80
	04	3-72	70	70	4	C-C	S40B	Al-Trb	6880.3	WCO 6-80
	05	5-72	150	150	4	C-C	S20B	Tra	6930.0	WCO 10-80
	06	6-72	108	108	4	C-C	S20B	Tra	6931.8	Dry Since Constructed
	07	8-72	70	70	4	C-C	S20B	Tra	6895.2	Dry Since Constructed (destroyed by road grader, 1980)
	08	7-74	85	85	4	C-C	-	Al-Trb	6890.1	WCO 6-80
13-10-1	01	6-72	90	90	4	C-C	S40B	D	7034.3	Dry Since Constructed
14-9-17	01	7-77	819	819	4	C-B	G718-800	D	7126.3	WCO 11-80
14-9-30	01	2-76	210	210	4	C-B	G160-185	Tra	6950.2	WCO 10-80
	02	2-76	319	319	4	C-B	G225-295	D	6950.4	WCO 10-80
	03	6-77	97	97	4	C-B	S20B	Al	6942.7	Casing Collapse @ 80' 6-80
	04	6-77	88	88	4	C-C	S20B	Al	6046.6	WCO 6-80
	46	3-72	40	40	4	C-C	S20B	Al	6949.3	Dry 6/80

Well Location T-R-Sec.	Well Number	Date Drilled	Total Depth (Ft)	Casing Depth (Ft)	Casing Diameter (in)	Casing Completion	Open Interval (Ft)	Open Formation	Meas. Point Elevation (Ft, MSL)	Remarks
14-9-30(cont.)	47	3-72	80	80	4	C-C	S40B	Al	6944.1	WCO 6-80
	48	3-72	88	88	4	C-C	S40B	Al	6947.0	WCO 6-80
	48Kd	2-75	351	260	6	C-B			6946.6	WCO 9-80
				351	4	C-C	S20B	D		
	49	3-72	69	69	4	C-C	S40B	Al	6951.4	WCO 6-80
	53	6-74	50	50	4	C-C	S15B	Al	6951.3	WCO 6-80
	54	7-74	75	-	-	-	-	Trc	6961	Dry in '75, well destroyed in '76
	55	7-74	80	-	-	-	-	Trc	6963	Dry in '75, well destroyed in '76
	908	9-62	638	638	6 5/8		S501-610	W	6980 E	Abd. 3/67,casing collapse at 190 ft. noted 12/72
	W	-	-	-	6	-	-	W	6984	Information from Cooper & John(1968), well abd. due to mine drainage
	AW-1	11-79	81	81	6	C-C	S51B	AL	6947	Gravel packed w/6-slot screen
14-9-31	A-1	1-59	21	20	4	C-C	OB	Al	6918.6	Gravel packed
	B-2	1-59	30	28	4	C-C	OB	Al	6918.9	Gravel packed
	C-3	1-59	15	12	4	C-C	OB	Al	6922.9	Gravel packed
	D-4	1-59	24	22	4	C-C	OB	Al	6924.9	Gravel packed
	E-5	1-59	18	17	4	C-C	OB		6921.2	
	01Tra	6-77	245	187	6	C-B			6980.6	
				245	4		S40B	Tra		
	02Trb	6-77	129	20	4	-	OH110B	Trb	6981.3	Trc dry; Trb artesian when drilled;WCO 10/80
	03Kd	6-77	345	257	6	C-B	OH88B	D	6981.1	WCO 10/80

Well Location T-R-Sec.	Well Number	Date Drilled	Total Depth (Ft)	Casing Depth (Ft)	Casing Diameter (in)	Casing Completion	Open Interval (Ft)	Open Formation	Meas. Point Elevation (Ft,MSL)	Remarks
14-9-31 (Cont.)	05	6-77	80	80	4	C-C	S10B	Al	6941.6	WCO 6/80
	25	2-60	>76	-	-	-		Al	6933 E	Well destroyed in '76 due to stream realignment
	B	12-60	850	338 850	10 6	C-B -	 S400B	 B	7005 E	Well abd. in mid-60's
14-9-32	01	6-77	58	58	4	C-C	S10B	Al	6920.5	WCO 11-80
	02	6-77	78	78	4	C-C	S10B	Al	6942.8	WCO 6-80
	40	3-60	>52	-	-	-	-	Al	6920 E	Well destroyed in '76 due to stream realignment
	41	3-60	-	-	4	-	-	Al	6933.2	Sounded depth 5-77 at 61 ft,WCO-6-80
	42	5-61	-	-	4	-	-	Al	6933.9	Sounded depth 5-77 at 38 ft,WCO 7-80
	43	10-71	80	-	4	C-C	S50B	Al	6919.1	Sounded depth 5-77 at 52 ft.,WCO 11-80
	44	1-72	165	106 165	8 4	C-B -	 S60B	 Tra	6917.7	WCO 11-80
	45	1-72	290	176 210	8 4	C-B -	 OH210-285	 D	6918.6	WCO 10-80
	50	3-72	95	95	4	C-C	S40B	Al-Trb	6940 5	WCO 6-80
	50Kd	2-75	300	215 300	6 4	C-B C-C	 S20B	 D	6940.5	WCO 9-80
	51	3-72	81	81	4	C-C	S51B	Al	6923.0	WCO 6-80
	51Kd	2-75	286	175 286	6 4	C-B C-C	 S20B	 D	6923.0	WCO 9-80
	52	3-72	88	88	4	C-C	S40B	Al	6915.0	WCO 6-80
	52kd	2-75	272	190 272	6 4	C-B C-C	 S20B	 D	6915.0	WCO 9-80

Well Location T-R-Sec.	Well Number	Date Drilled	Total Depth (Ft)	Casing Depth (Ft)	Casing Diameter (in)	Casing Completion	Open Interval (Ft)	Open Formation	Meas. Point Elevation (Ft,MSL)	Remarks
14-9-32(cont.)	56	8-74	60	-	4		-	Al	6932.6	WCO 6-80,dry 6-80
	57	8-74	60	-	4		-	Al	6932.5	WCO 6-80
	BH-1	pre-58	-	-	5	P&A(8-68)	-	W	6910	Information from Cooper & John(1968)
	BH-2	pre-58	-	-	5	P&A(6-71)	-	W	6910	Information from Cooper & John (1968)
	S-9	8-62	35	-	3	-	-	Al	6907.1	Sounded depth 5-77 at 25 ft.WCO6-80
	S-12	7-62	140	-	3	-	-	Al	6912.2	Sounded depth 5-77 at 27 ft. WCO 6/80
	AW-2	7-80	85	85	6	C-C	S60B	Al	6915.2	Gravel packed 10-slot screen
14-9-33	01	1-72	176	119	8	C-B			6918.0	WCO 9/80
				176	4	C-C	S60B	Tra		
14-10-25	01	2-76	390	388	4	C-B	G330-360	Tra	6969.8	WCO 11/80
	02	2-76	482	474	4	C-B	G400-475	D	6969.4	Well plugged at 383 ft 7-77
14-10-36	01	11-72	58	58	4	C-C	S20B	Trb	6965.8	WCO 10-80
	01Kd	2-76	350	340	4	C-B	G255-355	D	7001.0	WCO 9-80
	02	11-72	58	58	4	C-C	S20B	Trb	6997.5	WCO 10-80
	02Tr	2-76	240	238	4	C-B	G185-220	Tra	7001.7	WCO 11-80
	03	6-74	65	65	4	-	S20B	Trc	6996.4	WCO 11-80; dry,11-80
	04	6-74	40	40	4	-	S20B	Trc	6992.8	WCO 11-80;dry,11-80
	04Kd	2-75	341	200	6	C-B			6992.5	WCO 9-80
				341	4	C-C	S20B	D		
	05Kd	6-77	194	125	4	C-B	OH69B	D	7025.5	Casing Collapse @ 50' 11-80

Explanation for Well Inventory Table

Well Location

T - Township, all north
R - Range, all west

Casing Depth

Some deeper wells have dual casing with outside casing stopping at top of monitor zone.

Casing Completion

C-C - Cement around casing collar at surface
C-B - Cement placed at bottom through casing
P&A - Plugged with cement and abandoned

Open Interval

S - Preslotted casing
G - Gun-perforated casing
B - Bottom footage as indicated
OB - Casing bottom open
OH - Open hole

Open Formation

Al - Alluvium
Trc - Tres Hermanos (c)
Trb - Tres Hermanos (b)
Tra - Tres Hermanos (a)
D - Dakota
W - Westwater
B - Bluff

Measuring Point Elevation

Top of casing, referenced to mean sea level
E - Estimated

Remarks

WCO - Well cleaned out to total depth on date indicated

APPENDIX B

ALLUVIAL WELL TEST
KERR-McGEE NUCLEAR CORPORATION
AMBROSIA LAKE, NEW MEXICO

As part of the hydrologic assessment of Ambrosia Lake, Kerr-McGee began a program to accurately determine the water-transmitting characteristics of the alluvial sediments in the mill area.

Two recovery wells, AW-1 and AW-2, were constructed on sites representative of the alluvial material. The well locations are shown on Figure 3 of the text and well details are listed in Appendix A.

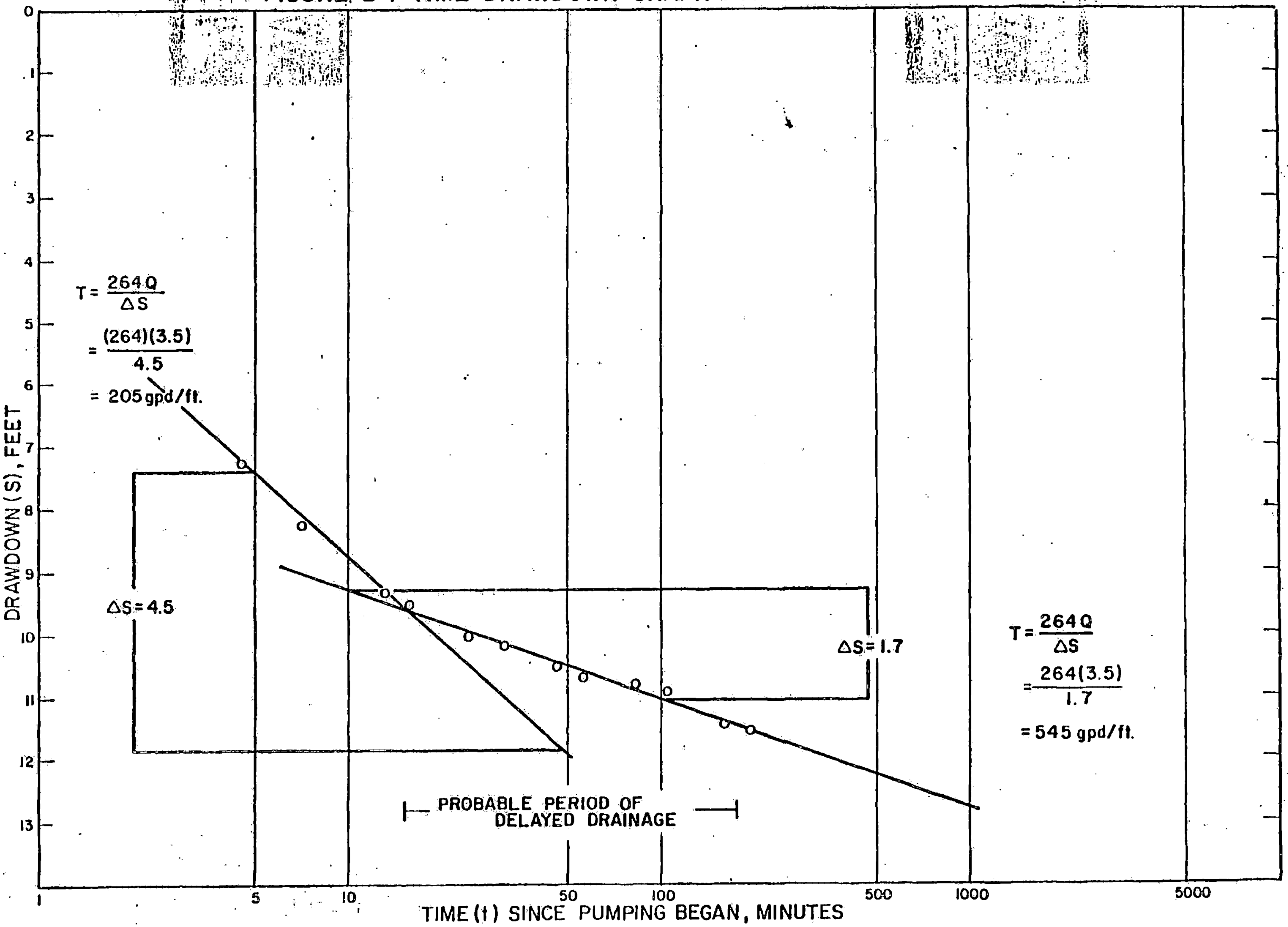
Since these wells were designed as recovery wells, construction was markedly different from the construction of nearby monitoring wells. The silt content of the alluvium required the use of manufactured well screens. Well AW-1 was constructed with 30-feet of 6-slot PVC screen, and well AW-2 was constructed with 25-feet of 10-slot PVC screen. The well screens and accompanying 6-inch PVC casing were placed in 12-inch holes drilled to bedrock. At each site the well screen was sand packed and the annulus was backfilled using pea gravel and a surface seal of cement.

Well AW-1 was equipped with a 1/3 h.p. Reda submersible pump and a pumping test was conducted during February, 1980. Discharge from the well was piped to pond #4.

Due to the fine-grained nature of the alluvial material, a high pumping rate was not expected from the wells and this was confirmed during the pumping tests. Pre-test attempts at setting a stable pumping rate for well AW-1 indicated that 4 gallons per minute was the maximum rate that could be sustained.

Figure B-1 shows a semi-log plot of time vs drawdown in well AW-1. The test was conducted for 3.25 hours with the well discharging 4 gpm and was cut short by the freezing of water in the discharge pipe. At the

FIGURE B-1 TIME-DRAWDOWN GRAPH FOR PUMPING WELL AW-1



end of the test the water level in the well had been drawn down 11.5 feet or 52% of the available drawdown.

The measurements collected from this well and a nearby observation well were analyzed and yielded an apparent transmissivity of 545 gpd/ft and a storage coefficient of 2×10^{-1}. However, the latter part of the test seems to have been affected by delayed drainage from the surrounding sediments. The transmissivity from the early part of the test, which is representative of the true aquifer conditions, is 205 gpd/ft. By dividing the saturated thickness into the transmissivity value, a hydraulic conductivity of approximately 5 gpd/ft^2 was determiend.

The pump was pulled from well AW-1 and placed in well AW-2 for a pumping test in September of 1980. The main purpose of this test was to confirm the low permeability and low yield results of the test on AW-1.

The well discharge during this test on well AW-2 averaged 6 gpm for a period of 4.25 hours. A semi-log plot of time vs drawdown is shown as Figure B-2. The results of this test show a case of delayed drainage from the stratified sediments surrounding the well and indicated the transmissivity to be approximately 250 gpd/ft with a hydraulic conductivity of about 5 gpd/ft^2.

The pumping tests conducted on these two wells are good indications that the stratified, fine-grained nature of the alluvium makes it difficult to complete a well and to maintain a useful pumping rate. The hydrogeologic characteristics calculated from the two pumping tests agreed remarkedly well and indicate that 5-10 gpd/ft^2 can be used as an average value of hydraulic conductivity for the alluvium. This seems to be a reasonable value when compared with a range of hydraulic conductivities, 0.2 gpd/ft^2 - 20 gpd/ft^2, listed for silty, fine sands in Fetter, 1980.

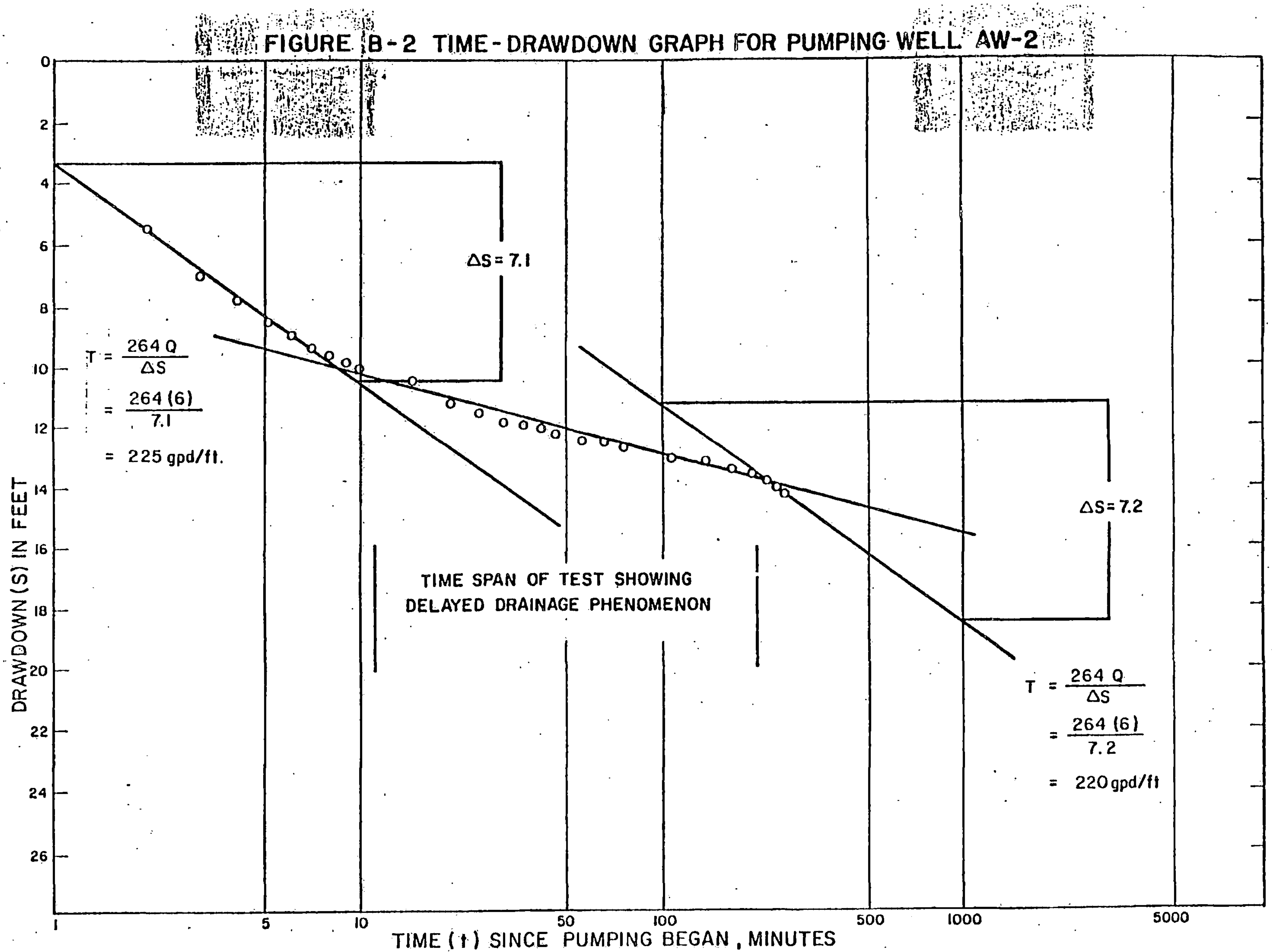


FIGURE B-2 TIME-DRAWDOWN GRAPH FOR PUMPING WELL AW-2
ΔS = 7.1
T = 264 Q / ΔS
= 264 (6) / 7.1
= 225 gpd/ft.
ΔS = 7.2
TIME SPAN OF TEST SHOWING DELAYED DRAINAGE PHENOMENON
T = 264 Q / ΔS
= 264 (6) / 7.2
= 220 gpd/ft
DRAWDOWN (S) IN FEET
0
2
4
6
8
10
12
14
16
18
20
22
24
26
1
5
10
50
100
500
1000
5000
TIME (t) SINCE PUMPING BEGAN, MINUTES

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

WELL NUMBER	5-01	5-01 Kd	5-02	5-03	5-04	5-05
SAMPLE DATE	6-20-80	9-22-80	6-20-80	6-20-80	6-20-80	11-03-80
CHEMICAL CONSTITUENT/PARAMETER						
Ag, *mg/l*	<.002	<.002	<.002	<.002	0.021	<.002
Al, *mg/l*	0.70	0.083	0.74	0.80	1.20	1.5
As, *mg/l*	0.044	0.001	0.032	0.072	0.038	0.022
B, *mg/l*	0.48	0.14	0.29	0.24	0.99	0.16
Ba, *mg/l*	0.030	0.065	0.004	0.003	<.001	0.096
Ca, *mg/l*	330.0	57.0	320.0	360.0	460.0	280.0
Cd, *mg/l*	<.008	<.008	<.008	<.008	<.008	<.008
Co, *mg/l*	<.006	<.006	<.006	<.006	<.006	<.006
Cr, *mg/l*	0.009	<.001	0.015	0.008	0.041	0.005
Cu, *mg/l*	<.001	0.002	<.001	<.001	0.017	0.010
Fe, *mg/l*	0.49	0.003	<.008	<.008	<.008	0.25
Hg, *mg/l*	<.001	<.001	<.001	<.001	<.001	<.001
K, *mg/l*	5.0	8.5	2.0	2.0	5.9	11.0
Mg, *mg/l*	150.0	40.0	180.0	180.0	310.0	220.0
Mn, *mg/l*	0.018	0.001	<.001	<.001	0.82	2.10
Mo, *mg/l*	0.096	0.004	0.13	<.002	<.002	0.037
Na, *mg/l*	500.0	110.0	280.0	410.0	200.0	190.0
Ni, *mg/l*	<.003	<.001	<.003	<.003	0.031	<.003
Pb, *mg/l*	0.003	<.001	<.001	0.006	0.005	0.002
Se, *mg/l*	0.15	0.033	0.28	0.072	0.17	0.007
U, *mg/l*	0.086	0.06	0.35	0.11	0.018	0.04
V, *mg/l*	<.003	0.004	<.003	<.003	<.003	<.003
Zn, *mg/l*	0.037	0.038	0.044	0.040	0.097	0.20
Cl, *mg/l*	137.0	26.0	524.0	278.0	98.0	610.0
HCO_3, *mg/l*	123.0	336.0	120.0	239.0	85.0	
F, *mg/l*	0.42	0.23	0.40	0.54	0.21	<.20
NO_3, as N, *mg/l*	22.0	1.6	3.6	2.4	4.9	1.7
pH	7.6	7.8	7.6	7.9	7.4	4.9
Sp. Cond., *umhos*	4080.0	1020.0	3670.0	4080.0	4160.0	3670.0
SO_4, *mg/l*	2110.0	236.0	1160.0	2050.0	2670.0	1235.0
TDS, *mg/l*	3660.0	670.0	2430.0	3750.0	4180.0	2650.0
TSS, *mg/l*	706.0	51.0	973.0	990.0	306.0	232.0
Ra-226 Total *pCi*	3.93	5.70	6.14	6.83	2.51	9.63

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

WELL NUMBER	5-08	17-01 Kd	30-01 Tra	30-02 Kd	30-04	30-47
SAMPLE DATE	6-20-80	11-03-80	10-14-80	10-20-80	6-25-80	6-25-80
Ag, mg/l	<.002	<.002	<.002	<.002	<.002	0.035
Al, mg/l	0.78	50.0	0.53	<.05	1.8	0.80
As, mg/l	0.033	0.058	0.030	0.033	0.091	0.041
B, mg/l	0.50	0.14	60.0	0.58	0.77	0.48
Ba, mg/l	0.003	0.004	0.018	0.017	<.001	0.005
Ca, mg/l	240.0	43.0	77.0	450.0	490.0	470.0
Cd, mg/l	<.008	<.008	<.008	<.008	<.008	<.008
Co, mg/l	<.006	<.006	<.006	<.006	<.006	<.006
Cr, mg/l	0.16	<.001	<.001	0.006	<.001	0.004
Cu, mg/l	<.001	0.018	0.32	0.011	<.001	0.030
Fe, mg/l	<.008	0.10	2.2	0.057	<.008	<.008
Hg, mg/l	<.001	<.001	<.001	<.001	<.001	<0.001
K, mg/l	5.8	29.0	27.0	19.0	13.0	7.4
Mg, mg/l	200.0	0.11	15.0	230.0	460.0	190.0
Mn, mg/l	0.74	0.027	0.15	0.74	0.54	0.49
Mo, mg/l	0.42	0.14	0.050	0.08	<.002	<.002
Na, mg/l	200.0	320.0	240.0	210.0	670.0	190.0
Ni, mg/l	<.003	0.10	0.027	0.050	<.003	<.003
Pb, mg/l	<.001	<.001	<.001	0.003	0.009	0.004
Se, mg/l	0.12	0.019	0.019	0.025	0.15	0.087
U, mg/l	0.10	0.23	0.05	0.06	0.044	0.024
V, mg/l	<.003	<.003	0.051	<.003	<.003	<.003
Zn, mg/l	0.15	0.022	1.3	0.21	0.14	0.049
Cl, mg/l	109.0	<10.0	50.0	375.0	1360	70.0
HCO_3, mg/l	67.0	108.0	11.0	279.0	252.0	101.0
F, mg/l	0.20	<.2	0.46	<.2	0.04	0.30
NO_3, as N, mg/l	0.7	20.0	20.0	2.8	28.0	0.90
pH	7.7	11.6	8.6	7.7	7.6	7.8
Sp. Cond., umhos	2800.0	1980.0	1650.0	4020.0	7340.0	3520.0
SO_4, mg/l	1600.0	500.0	590.0	1615.0	2610.0	2290.0
TDS, mg/l	2540.0	1190.0	1230.0	3280.0	6380.0	3560.0
TSS, mg/l	46.0	6040.0	248.0	124.0	372.0	136.0
Ra-226 Total pCi	18.0	1.25	7.13	3.07	4.32	9.58

CHEMICAL CONSTITUENT/PARAMETER

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

CHEMICAL CONSTITUENT/PARAMETER — WELL NUMBER / SAMPLE DATE	30-48 6-25-80	30-48 Kd 9-23-80	30-49 6-25-80	30-53 10-14-80	AW-1 4-16-80	A-1 11-12-80
Ag, mg/l	<.002	0.040	<.002	<.002	<.01	<.002
Al, mg/l	0.52	0.070	0.60	<.05	<.10	5.8
As, mg/l	0.040	0.005	0.052	0.031	<.005	<.001
B, mg/l	0.55	0.35	0.60	<.009	0.70	<.009
Ba, mg/l	<.001	0.040	<.001	0.008	<.10	0.002
Ca, mg/l	400.0	770.0	450.0	390.0	560.0	270.0
Cd, mg/l	<.008	0.036	<.008	<.008	0.007	0.11
Co, mg/l	<.006	<.006	<.006	<.006	<.02	0.051
Cr, mg/l	<.001	0.051	<.001	0.021	0.02	0.059
Cu, mg/l	<.001	0.002	<.001	<.001	0.01	0.048
Fe, mg/l	<.008	0.25	<.008	0.25	<.05	1100.0
Hg, mg/l	<.001	<.001	<.001	<.001	<.0004	<.001
K, mg/l	4.8	13.0	4.4	17.0	8.7	19.0
Mg, mg/l	140.0	360.0	200.0	540.0	880.0	1400.0
Mn, mg/l	0.090	3.8	0.38	0.041	<.02	7.9
Mo, mg/l	<.002	0.003	<.002	0.052	0.02	0.16
Na, mg/l	260.0	320.0	520.0	200.0	1500.0	2000.0
Ni, mg/l	0.008	0.016	<.003	0.026	0.01	0.046
Pb, mg/l	<.001	<.001	0.002	<.001	<.02	0.002
Se, mg/l	0.092	0.22	0.27	0.037	<.005	0.036
U, mg/l	0.34	0.14	0.060	0.16	0.18	0.19
V, mg/l	<.003	0.030	<.003	<.003	<.10	<.003
Zn, mg/l	0.056	0.11	0.066	0.21	0.02	0.64
Cl, mg/l	38.0	581.0	122.0	40.0	2410.0	4530.0
HCO_3, mg/l	183.0	423.0	155.0	354.0	1730.0	
F, mg/l	0.50	0.27	0.60	<.2	<.02	0.4
NO_3, as N, mg/l	2.4	19.0	15.0	17.0	56.0	42.0
pH	7.8	7.4	7.9	7.7	6.8	2.7
Sp. Cond., umhos	3260.0	5080.0	4670.0	4640.0	12,400.0	20,700.0
SO_4, mg/l	1960.0	2780.0	2750.0	3230.0	3650.0	6440.0
TDS, mg/l	3100.0	5000.0	4320.0	4790.0	9650.0	16,290.0
TSS, mg/l	17.0	60.0	28.0	2430.0	62.0	509.0
Ra-226 Total pCi	2.91	14.0	1.45	8.21	0.52	10.26

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

CHEMICAL CONSTITUENT/PARAMETER

WELL NUMBER	B-2	C-3	D-4	E-5	31-02 Trb	31-03 Kd
SAMPLE DATE	11-12-80	11-12-80	11-12-80	11-12-80	10-21-80	10-21-80
Ag, *mg/l*	<.002	<.002	<.002	<.002	<.002	<.002
Al, *mg/l*	5.8	5.8	2.3	<.05	0.89	0.30
As, *mg/l*	<.001	<.001	0.002	0.004	0.012	0.035
B, *mg/l*	<.009	<.009	<.009	<.009	0.44	0.078
Ba, *mg/l*	0.002	0.016	0.032	<.001	0.010	0.016
Ca, *mg/l*	220.0	350.0	1000.0	45.0	200.0	160.0
Cd, *mg/l*	0.12	0.099	<.008	<.008	<.008	<.008
Co, *mg/l*	0.040	0.031	<.006	<.006	<.006	<.006
Cr, *mg/l*	0.059	0.062	0.010	<.001	<.001	<.001
Cu, *mg/l*	0.023	0.086	0.032	<.001	0.009	<.001
Fe, *mg/l*	1120.0	990.0	44.0	0.34	0.18	0.15
Hg, *mg/l*	<.001	<.001	<.001	<.001	<.001	<.001
K, *mg/l*	2.3	12.0	8.6	22.0	6.4	12.0
Mg, *mg/l*	670.0	1300.0	340.0	760.0	92.0	42.0
Mn, *mg/l*	4.3	6.8	5.8	0.19	0.021	0.082
Mo, *mg/l*	0.13	0.12	0.031	0.049	0.035	0.090
Na, *mg/l*	1200.0	1400.0	190.0	1200.0	100.0	300.0
Ni, *mg/l*	0.047	0.041	<.003	<.003	0.038	<.003
Pb, *mg/l*	0.003	0.003	<.001	0.001	<.001	<.001
Se, *mg/l*	0.031	0.12	0.014	0.053	0.009	0.11
U, *mg/l*	0.013	0.04	0.07	0.06	0.027	0.11
V, *mg/l*	<.003	<.003	0.11	<.003	<.003	0.006
Zn, *mg/l*	0.43	0.52	0.18	0.23	0.17	0.026
Cl, *mg/l*	3690.0	3340.0	2560.0	2094.0	<10.0	80.0
HCO_3, *mg/l*				930.0	152.0	200.0
F, *mg/l*	<.2	<.2	<.2	<.2	0.26	0.38
NO_3,asN, *mg/l*	7.1	6.3	6.1	7.7	1.3	1.3
pH	3.3	3.0	3.5	7.9	7.8	7.8
Sp. Cond., *umhos*	13,800.0	13,200.0	8810.0	10,000.0	1860.0	2340.0
SO_4, *mg/l*	2890.0	3170.0	1070.0	2688.0	990.0	970.0
TDS, *mg/l*	9740.0	9090.0	5200.0	7780.0	1590.0	1800.0
TSS, *mg/l*	312.0	537.0	196.0	81.0	124.0	9830.0
Ra-226 Total *pCi*	4.45	14.32	33.62	4.31	2.45	15.48

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

CHEMICAL CONSTITUENT/PARAMETER						
WELL NUMBER	31-05	32-01	32-02	32-41	32-42	32-43
SAMPLE DATE	6-25-80	11-4-80	6-24-80	6-25-80	6-25-80	11-4-80
Ag, mg/l	<.002	<.002	<.002	<.002	<.002	<.002
Al, mg/l	2.8	<.05	2.7	2.3	1.6	<.4
As, mg/l	0.23	0.065	0.20	0.092	0.18	0.041
B, mg/l	0.37	<.009	0.31	0.39	0.38	0.27
Ba, mg/l	<.001	<.001	<.001	<.001	0.005	0.003
Ca, mg/l	440.0	10.0	360.0	380.0	550.0	420.0
Cd, mg/l	<.008	<.008	<.008	<.008	<.008	<.008
Co, mg/l	<.006	<.006	<.006	<.006	<.006	<.006
Cr, mg/l	0.034	0.029	0.028	<.001	<.001	0.017
Cu, mg/l	<.001	<.001	<.001	<.001	<.001	<.001
Fe, mg/l	<.008	0.15	<.001	<.008	<.008	<.2
Hg, mg/l	<.001	<.001	<.001	<.001	<.001	<.001
K, mg/l	14.0	1.3	14.0	14.0	6.50	11.0
Mg, mg/l	1000.0	810.0	750.0	750.0	400.0	530.0
Mn, mg/l	0.32	0.057	0.94	0.73	0.008	0.53
Mo, mg/l	0.002	0.066	0.002	0.002	0.088	0.045
Na, mg/l	1700.0	1300.0	1200.0	520.0	1000.0	650.0
Ni, mg/l	<.003	<.003	<.003	<.003	0.025	<.003
Pb, mg/l	0.024	<.001	0.032	0.025	0.007	<.001
Se, mg/l	0.27	0.085	0.31	0.19	0.50[illegible]	0.085
U, mg/l	0.010	0.05	0.11	0.066	1.98	0.15
V, mg/l	<.003	<.003	<.003	<.003	<.003	<.003
Zn, mg/l	0.21	0.26	0.15	0.13	0.100	0.19
Cl, mg/l	2250.0	2360.0	2010.0	1070.0	829.0	84.0
HCO_3, mg/l	484.0	638.0	551.0	349.0	326.0	402.0
F, mg/l	0.06	<.2	0.05	0.07	0.51	0.30
NO_3, as N, mg/l	42.0	7.6	30.0	29.0	50.0	210.0
pH	7.2	8.4	7.3	7.8	7.6	7.5
Sp. Cond., umhos	12,000.0	10,300.0	9590.0	6530.0	7750.0	6830.0
SO_4, mg/l	4470.0	2480.0	3310.0	3090.0	3750.0	3420.0
TDS, mg/l	10,700.0	7500.0	8770.0	6610.0	7400.0	6244.0
TSS, mg/l	1028.0	113.0	147.0	1400.0	16,830.0	150.0
Ra-226 Total pCi	3.29	2.68	1.62	174.99	121.24	1.83

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

CHEMICAL CONSTITUENT/PARAMETER						
WELL NUMBER	32-44	32-45 Kd	32-50	32-50 Kd	32-51	32-51 Kd
SAMPLE DATE	11-4-80	10-20-80	6-23-80	9-23-80	6-23-80	9-23-80
Ag, mg/l	<.002	<.002	0.009	<.002	<.002	<.002
Al, mg/l	0.72	0.33	1.6	0.089	1.1	0.090
As, mg/l	0.020	0.015	0.13	0.005	0.086	0.001
B, mg/l	0.27	0.97	1.0	0.63	0.94	0.20
Ba, mg/l	0.009	0.092	<.001	0.017	<.001	0.032
Ca, mg/l	98.0	120.0	670.0	480.0	460.0	107.0
Cd, mg/l	<.008	<.008	<.008	<.008	<.008	0.020
Co, mg/l	<.006	<.006	<.006	<.006	0.047	<.006
Cr, mg/l	<.001	<.001	0.037	0.027	0.025	<.001
Cu, mg/l	<.001	0.005	0.010	0.001	0.047	0.001
Fe, mg/l	0.30	0.093	<.001	0.025		0.24
Hg, mg/l	<.001	<.001	<.001	<.001	<.001	<.001
K, mg/l	8.0	13.0	7.8	9.1	4.1	9.3
Mg, mg/l	92.0	0.11	400.0	550.0	240.0	51.0
Mn, mg/l	0.44	<.002	0.51	0.73	0.66	0.003
Mo, mg/l	0.028	0.27	0.002	0.020	0.002	0.005
Na, mg/l	310.0	190.0	1100.0	810.0	610.0	140.0
Ni, mg/l	<.003	0.041	0.014	0.002	<.003	-0.001
Pb, mg/l	<.001	<.001	0.008	0.001	0.012	0.002
Se, mg/l	0.025	0.16	0.32	0.25	0.26	0.13
U, mg/l	0.06	0.05	0.31	0.11	0.24	0.08
V, mg/l	<.003	<.003	<.003	0.015	<.003	0.007
Zn, mg/l	0.079	0.059	0.096	0.16	0.063	0.091
Cl, mg/l	24.0	146.0	2120.0	1186.0	184.0	73.0
HCO_3, mg/l	232.0		293.0	451.0	230.0	168.0
F, mg/l	<.2	0.27	0.05	0.13	0.40	0.32
NO_3, as N, mg/l	1.1	4.6	50.0	46.0	18.0	2.7
pH	7.9	11.5	7.3	7.3	7.8	7.6
Sp. Cond., umhos	2320.0	1730.0	8770.0	7170.0	5200.0	1450.0
SO_4, mg/l	1080.0	400.0	2810.0	2740.0	3090.0	560.0
TDS, mg/l	1705.0	961.0	7510.0	6140.0	5050.0	1110.0
TSS, mg/l	89.0	3.0	33.0	33.0	10.0	56.0
Ra-226 Total pCi	1.95	1.097	0.50	6.05	0.91	7.75

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

WELL NUMBER	32-52	32-52 Kd	32-57	S-9	S-12	AW-12
SAMPLE DATE	6-24-80	9-22-80	6-25-80	6-25-80	6-25-80	9-2-80
CHEMICAL CONSTITUENT/PARAMETER						
Ag, mg/l	< .002	0.002	0.018	< .002	< .002	< .002
Al, mg/l	0.51	0.076	0.89	3.7	3.4	0.68
As, mg/l	0.040	0.007	0.18	0.20	0.25	< .001
B, mg/l	1.0	0.33	0.91	0.56	0.49	0.50
Ba, mg/l	< .001	0.13	< .001	< .001	< .001	0.008
Ca, mg/l	420.0	340.0	460.0	340.0	360.0	510.0
Cd, mg/l	< .008	0.011	< .008	< .008	< .008	< .008
Co, mg/l	< .006	< .006	< .006	< .006	< .006	< .006
Cr, mg/l	< .001	< .001	< .001	0.048	0.041	< .001
Cu, mg/l	< .001	0.002	0.015	< .001	< .001	< .001
Fe, mg/l	< .008	0.013	0.022	0.48	< .008	0.004
Hg, mg/l	< .001	< .001	< .001	< .001	< .001	< .001
K, mg/l	4.7	20.0	8.40	14.0	21.0	7.5
Mg, mg/l	140.0	91.0	240.0	990.0	1400.0	210.0
Mn, mg/l	0.12	1.1	0.012	0.89	3.6	0.001
Mo, mg/l	0.018	0.005	0.046	0.002	0.002	0.007
Na, mg/l	290.0	200.0	1200.0	1500.0	2800.0	360.0
Ni, mg/l	< .003	0.003	0.023	< .003	< .003	0.008
Pb, mg/l	0.005	< .001	0.010	0.033	0.032	0.001
Se, mg/l	0.26	0.11	0.95	0.20	0.50	0.18
U, mg/l	0.085	0.31	0.42	0.025	0.18	0.075
V, mg/l	< .003	0.015	< .003	< .003	< .003	0.018
Zn, mg/l	0.059	0.86	0.069	0.27	0.26	0.014
Cl, mg/l	44.0	95.0	184.0	2350.0	3040.0	111.0
HCO_3, mg/l	147.0	242.0	363.0	648.0	1190.0	282.0
F, mg/l	0.56	0.36	0.25	0.07	0.03	0.51
NO_3, as N, mg/l	42.0	1.0	10.0	4.7	6.4	32.0
pH	7.9	7.2	7.7	7.5	7.3	7.7
Sp. Cond., umhos	3570.0	2690.0	7140.0	12,100.0	15,400.0	4180.0
SO_4, mg/l	2040.0	1220.0	4290.0	4620.0	6210.0	2500.0
TDS, mg/l	3440.0	2226.0	6920.0	11,300.0	14,400.0	4070.0
TSS, mg/l	70.0	2180.0	81.0	478.0	165.0	15.0
Ra-226 Total pCi	1.42	874.73	2.65	3.52	0.78	0.46

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

WELL NUMBER	33-01	25-01 Tr	25-02 Kd	36-01 Tr	36-01 Kd	36-02 Trb
SAMPLE DATE	9-22-80	11-5-80	11-5-80	10-2-80	9-29-80	10-2-80
Ag, mg/l	<.002	<.002	<.002	<.002	<.002	<.002
Al, mg/l	0.097	<.050	<.05	0.088	0.080	0.093
As, mg/l	<.001	<.001	0.009	0.004	0.010	0.001
B, mg/l	0.47	7.2	0.27	0.38	0.77	0.33
Ba, mg/l	0.084	0.030	0.063	0.018	0.052	0.053
Ca, mg/l	200.0	29.0	100.0	420.0	480.0	480.0
Cd, mg/l	<.008	<.008	<.008	<.008	<.008	<.008
Co, mg/l	<.006	<.006	<.006	<.006	<.006	<.006
Cr, mg/l	<.001	<.001	0.005	0.061	0.090	0.039
Cu, mg/l	0.020	0.19	0.021	0.001	0.002	0.002
Fe, mg/l	0.004	0.053	0.19	0.11	67.0	0.010
Hg, mg/l	<.001	<.001	<.001	<.001	<.001	<.001
K, mg/l	10.0	11.0	20.0	15.0	40.0	17.0
Mg, mg/l	3.9	0.27	37.0	1400.0	1300.0	840.0
Mn, mg/l	0.19	0.004	0.071	2.0	58.0	3.8
Mo, mg/l	0.50	0.066	0.027	0.002	0.005	0.002
Na, mg/l	240.0	75.0	170.0	800.0	2000.0	430.0
Ni, mg/l	0.006	0.051	<.003	0.010	<.001	<.001
Pb, mg/l	0.006	<.001	<.001	0.002	0.007	<.001
Se, mg/l	0.18	0.013	0.011	0.68	0.47	0.22
U, mg/l	0.52	0.078	0.10	0.04	0.07	0.02
V, mg/l	0.016	<.003	<.003	0.028	0.017	0.010
Zn, mg/l	0.99	0.12	0.14	0.23	0.11	0.17
Cl, mg/l	72.0	<10.0	30.0	2398.0	2805.0	1264.0
HCO_3, mg/l	120.0	24.0	71.0	397.0	76.0	65.0
F, mg/l	0.22	<.2	<.2	0.10	1.6	0.07
NO_3, as N, mg/l	3.9	5.3	1.8	24.0	15.0	7.4
pH	7.5	9.9	7.8	7.0	5.5	6.6
Sp. Cond., umhos	1840.0	530.0	1530.0	12,400.0	17100.0	8000.0
SO_4, mg/l	750.0	170.0	760.0	4780.0	7560.0	3200.0
TDS, mg/l	1413.0	376.0	1130.0	10,710.0	14500.0	6560.0
TSS, mg/l	117.0	21.0	48.0	36.0	151.0	46.0
Ra-226 Total pCi	7.61	6.6	1.901	1.41	3.32	75.66

CHEMICAL CONSTITUENT/PARAMETER

*See Figure 3 for well locations

APPENDIX C

Water Quality Analyses
Ambrosia Lake Mill Area Monitoring Wells*
Kerr-McGee Nuclear Corporation

	WELL NUMBER	36-04 Kd				
	SAMPLE DATE	9-29-80				
CHEMICAL CONSTITUENT/PARAMETER	Ag, mg/l	<.002				
	Al, mg/l	0.073				
	As, mg/l	0.007				
	B, mg/l	0.41				
	Ba, mg/l	0.035				
	Ca, mg/l	540.0				
	Cd, mg/l	0.035				
	Co, mg/l	0.027				
	Cr, mg/l	0.034				
	Cu, mg/l	0.001				
	Fe, mg/l	260.0				
	Hg, mg/l	<.001				
	K, mg/l	39.0				
	Mg, mg/l	1100.0				
	Mn, mg/l	83.0				
	Mo, mg/l	0.003				
	Na, mg/l	1600.0				
	Ni, mg/l	0.001				
	Pb, mg/l	0.003				
	Se, mg/l	0.16				
	U, mg/l	0.09				
	V, mg/l	0.025				
	Zn, mg/l	0.40				
	Cl, mg/l	2259.0				
	HCO_3, mg/l	<6.0				
	F, mg/l	0.05				
	NO_3,asN, mg/l	6.2				
	pH	4.0				
	Sp. Cond., umhos	14,300.0				
	SO_4, mg/l	6160.0				
	TDS, mg/l	12,100.0				
	TSS, mg/l	86.0				
	Ra-226 Total pCi	7.18				

*See Figure 3 for well locations

EXPLANATION

- MINE SHAFT
- VENT HOLE
- EVAPORATION POND & NUMBER
- TOPOGRAPHIC CONTOUR REFERENCE IN FEET TO MEAN SEA LEVEL. CONTOUR INTERVAL=20 FT
- BEDROCK/ALLUVIUM BOUNDARY
- MONITOR WELL LOCATION & NUMBER (SEE APPENDIX A FOR DETAILS ON WELLS)
- ALLUVIUM
- TRES HERMANOS
- DAKOTA
- WESTWATER
- BLUFF

SCALE

FIGURE 3

MAP SHOWING LOCATION OF WELLS, PONDS, SHAFTS, AND VENT HOLES NEAR KERR-McGEE MILL-SITE

KERR-McGEE NUCLEAR CORPORATION

Dec. 1980