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The Chicago Dock & Canal Trust

REPORT

VOLUME I

Report for Characterization Investigation Gamma Radiation Survey

Lindsay Light II Site
316 E. Illinois St.
Chicago, Illinois

STS Consultants Ltd.
Consulting Engineers

The Chicago Dock & Canal Trust

VOLUME 1

Report for Characterization Investigation Gamma Radiation Survey

Lindsay Light II Site
316 E. Illinois St.
Chicago, Illinois

REPORT FOR CHARACTERIZATION INVESTIGATION
GAMMA RADIATION SURVEY

LINDSAY LIGHT II SITE
316 E. ILLINOIS ST.
CHICAGO, ILLINOIS

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27313-ZH

OCTOBER 27, 1995

(REV. 3)

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REPORT FOR CHARACTERIZATION INVESTIGATION
GAMMA RADIATION SURVEY
(REV. 3)

LINDSAY LIGHT II SITE
316 E. ILLINOIS STREET
CHICAGO, ILLINOIS

EXECUTIVE SUMMARY

This report presents the results of a site characterization investigation of the property located in downtown Chicago, Illinois, bounded by East Illinois Street on the south, East Grand Avenue on the north, North Columbus Drive on the west, and North McClurg Court on the east. This report is the result of the implementation of the Work Plan for Site Characterization Investigation, approved by USEPA May 13, 1994. The objectives of the investigation were to identify the location and distribution of contamination at the site, document the concentration and source of radioactive materials at this site, and determine whether the material exhibited characteristics of hazardous waste.

The areal distribution and location of the radiological contaminants were evaluated through an overland gamma radiation survey of the site using both a sodium iodide (NaI) detector and a tissue equivalent doserate instrument. These surveys were conducted site-wide on a 6 x 6 meter grid and on 1 x 1 meter grids for areas exhibiting elevated gamma readings.

The surface survey results show consistently low background readings with distinct and elevated gamma readings greater than the average background plus two standard deviations in a few discrete areas. These data suggest the surface surveys are capable of identifying the areas of gamma-emitting materials with an accuracy of about 1 to 2 meters for the contamination borders. The overland survey measured gamma radiation ranging from background levels of 2484 counts per minute (CPM) at 1 cm elevation to over 100 times area background level, maximum reading of 6.26×10^5 CPM. The largest area and the area exhibiting the highest readings was the previous location of the stable building which had housed the Lindsay Light operations. An additional eleven (11) smaller areas also exhibited elevated gamma readings. Recognizing that the

Lindsay Light operations occupied the building for more than 15 years (from 1916 to 1932) the walls and floors of the building may have become contaminated by the monazite sand which was stored and processed in the building incidental to Lindsay's gas mantle manufacturing operations. The smaller areas separate from or adjacent to the building footprint may represent monazite sand-contaminated debris from the building spread as a result of demolition and subsequent site grading. These areas may also have been contaminated due to the sand, the processing residues, the thorium nitrate, or gas mantle parts spilled or discarded during transportation or handling of these materials.

The surface radiation data were evaluated and eight locations selected for down-hole gamma surveys to explore the vertical extent of the radioactive materials. The down-hole gamma logs generally extended to as deep as 6.5 meters, and one which reached a maximum of 9.6 meters. Several profiles encountered obstructions which prevented deeper penetration. One complete profile was surveyed at an apparent background location; three complete profiles and two obstructed profiles were surveyed at transitional gamma radiation locations (one of the complete profiles may reflect background conditions); and two complete profiles and one obstructed profile were completed at locations showing elevated gamma radiation readings. Soil samples were collected from one background location, two transitional locations and two locations showing elevated gamma radiation. Laboratory analyses were conducted for waste characterization and radioactive evaluation.

The vertical profiles of gamma radiation that showed the elevated gamma levels are limited to the upper 2.5 meters, with the majority of elevated profiles occurring from 0.5 to 1.5 meters below the ground surface. Subsurface background levels were generally less than 50 counts per second (CPS) (less than 3000 CPM). Transitional levels were in the range of 800 to 1000 CPS (48,000 to 60,000 CPM). Elevated gamma locations measured 9000 to slightly more than 11,000 CPS (540,000 to more than 660,000 CPM). In several transitional and elevated gamma profiles, two maxima were noted, suggesting two layers of contamination at depths of approximately 1 meter and 2 meters.

These overland gamma and down-hole gamma surveys define in general terms the distribution and location, both horizontally and vertically, of the radioactive contamination.

Analysis of the soil samples consisted of three components: gamma spectroscopy (spec) analysis, isotopic thorium and isotopic uranium analysis, and RCRA hazardous waste characterization. The two samples tested for RCRA hazardous waste characterization did not exhibit results which would cause the material to be classified as hazardous waste.

The gamma spectral analyses measured concentrations above minimum detectable levels for eleven isotopes. K-40, Tl-208, Pb-210, Pb-212, Pb-214, Bi-212, Bi-214, Ra-224 (surrogate detection by Pb-212). Ra-226 (measured as Pb-214), Ra-228 (measured as Ac-228), and U-238 (measured as Th-234) were detected frequently enough to be confidently identified. These isotopes are either naturally occurring isotopes, can be readily identified as counting artifacts, or are present in the natural decay chains (radionuclide breakdown products) of uranium and thorium, present in the monazite sand suspected as the source of the contamination.

The three highest gamma spec measurements were subsequently analyzed for isotopic uranium and isotopic thorium. The elevated gamma radiation samples measured maximum concentrations of 71.5 pCi/gm U-234, 12.8 pCi/gm U-235, 52.3 pCi/gm U-238, 334 pCi/gm Th-228, 263 pCi/gm Th-230, and 342 pCi/gm Th-232. Reanalysis of the highest gamma spec uranium concentration sample by alpha spectroscopy measured 89.6 pCi/gm U-234, 10.4 pCi/gm U-235/236, and 82.8 pCi/gm U-238. Total uranium and total thorium background concentrations in soil in the Chicago area vary from less than 1 to about 3 pCi/gm (Myrick, et al., 1981; NCRP, 1975; NCRP, 1987). The measured concentration of uranium and thorium isotopes indicate these elements exhibit isotopic ratios which show no evidence of uranium enrichment and are considered reasonable for soils containing materials contaminated with monazite sand. On the basis of the gamma spec and isotopic uranium and isotopic thorium analyses, there is no indication of a radioactive contamination source other than the monazite sand containing naturally occurring thorium, uranium and their respective breakdown products.

A rudimentary risk assessment was performed based on the doserate data collected with the tissue equivalent instrument capable of responding to gamma ray energies from 17 KeV to 1.3 MeV. The only plausible exposure scenario for the site in its present use as a paved parking lot is from direct exposure of lot attendants or lot patrons. Under the most unlikely exposure conditions, the annual dose to an individual would not exceed 4 mrem/yr, whereas a more reasonable scenario associated with the most elevated location on site predicts a dose much less than 1 mrem/yr. That scenario has the individual parking at the exact location of the most elevated gamma reading 165 μ Rem/hr, 50 days a year (this assumes he/she is able to occupy this same parking location approximately 20% of the time), standing on the location for 5 minutes each day (165 μ Rem/hr x 50 days/yr x 5 min/day x 1 hr/60 min. = 687.5 μ Rem/yr or 0.7 mrem/yr). It should be noted that the footprint of this elevated location is about 6 inches in diameter and is located in a parking space where the car's engine or trunk would normally be located. These facts render the exposure scenario for this site unlikely. Therefore, based on this basic assessment, the site in its present condition poses no additional radiological risk to lot attendants or patrons in excess of that already present for general radiological (background) conditions associated with the downtown Chicago area.

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REPORT FOR CHARACTERIZATION INVESTIGATION
GAMMA RADIATION SURVEY
(REV. 3)

LINDSAY LIGHT II SITE
316 E. ILLINOIS STREET
CHICAGO, ILLINOIS

1.0 INTRODUCTION

1.1 Objective

This report presents the results of the investigation conducted at the 316 East Illinois Street site, herein referred to as the "Lindsay Light II Site" or "site", for the characterization of radioactive contamination. The objective of the investigation was to determine the type and relative quantities of radioactive materials present, the hazardous waste characteristics of those materials, and the distribution or location of these materials at the subject site.

1.2 Site Description and Site History

The Lindsay Light II site at 316 East Illinois Street in downtown Chicago, Illinois, extends from East Illinois Street on the south to East Grand Avenue on the north. It is bounded by Columbus Drive on the west and McClurg Court on the east. Figure 1-1 is a location map, indicating the location of the property within the State of Illinois and the City of Chicago. Figure 1-2 shows the general layout of the site. The dimensions of the site are 66 meters (208 feet) north to south, and 186 meters (591 feet) east to west which makes the site approximately 12,276 m^2 (2.7 acres).

The property is presently undeveloped and has been used as a parking lot in recent years. The parking lot is paved with asphalt and has guard rails that border it. The

property is situated in an urban area, surrounded by commercial and residential buildings. A shopping mall is located approximately 200 feet to the southeast. The Chicago River is located 1/4 mile south of the site, and Lake Michigan is about 1/4 mile east of the site.

The Chicago Dock & Canal Company was founded in 1857. The Chicago Dock & Canal Trust, the direct successor of The Chicago Dock & Canal Company, is a real estate investment trust formed in 1962. Both companies are included in the reference to "Chicago Dock". Chicago Dock records indicate that a portion of the property was leased to the Lindsay Light Company from about 1915 to 1932. These records also indicate that the property from 316 to 322 East Illinois was rented by Cooper's Stable prior to 1913. A two-story building on the property housed a stable for horses and wagons and a blacksmith shop (Figure 1-2).

In 1914, the Cooper Stable was divided in half, from east to west. The south half, fronting on Illinois at 316 East to 322 East, was leased by Lindsay Light. Chicago Dock's records indicate that Lindsay Light made rent and tax payments on this property until about 1932. The building was demolished around 1933, which is consistent with the cessation of rent payments by Lindsay Light.

Review of property records indicates that Lindsay Light probably performed its primary manufacturing operations in this area of Chicago at 161 East Grand Avenue, about one-quarter mile west of the property. The operations at 161 East Grand Avenue included the manufacturing of incandescent gas mantles. Some manufacturing and/or processing of thorium-bearing monazite sand reportedly took place at the 316 East Illinois site.

A principal ingredient in gas mantle manufacture is thorium as a nitrate. Small amounts of cerium, beryllium, and magnesium nitrates are also used. Thorium was extracted from the monazite sand using an acid bath. The gas mantles were then dipped into a solution containing the thorium nitrate to increase the mantle's incandescent strength.

Thorium occurs in nature principally as the parent radionuclide Thorium-232 in association with its daughter products in a decay sequence known as the Thorium

Decay Series. Several thorium isotopes are also found within the Uranium and Actinium Decay Series. It is believed that the principal source of contamination at this site is Thorium-232 and thorium decay series nuclides.

1.3 Previous Investigations

In June 1993, the USEPA and Illinois Department of Nuclear Safety (IDNS) measured gamma radiation levels on portions of the site. The USEPA and IDNS survey was conducted based on information USEPA and IDNS had in their files which indicated Lindsay Light formerly had operations at the site. Several areas of gamma radiation levels above the vicinity background levels were indicated (Figure 1-3). A similar reconnaissance survey was conducted by STS for Chicago Dock in June 1993 which also found several areas of elevated gamma measurements. The results of the surveys suggested the presence of a subsurface gamma radiation source. Subsequently, a Work Plan was developed to conduct a comprehensive investigation of the source of the contamination. The investigation, completed through implementation of the Work Plan, was conducted with the objectives of identifying the type and quantity of the radioactive material, and the location and extent of the contamination.

1.4 Administrative Order by Consent

On January 27, 1994, an Administrative Order by Consent (AOC) was agreed upon by USEPA and Chicago Dock. The AOC required preparation of a Work Plan for site investigations. That Work Plan was prepared and, following review and revision in response to review comments, was approved by USEPA on May 13, 1994. This report is the result of the implementation of the work conducted in accordance with the Work Plan.

2.0 SCOPE OF WORK

The work scope as defined in the Work Plan consisted of five principal tasks. These tasks were:

- Site grid lay-out
- Overland gamma survey
- Down-hole gamma logging
- Soil sampling
- Chemical analysis

The following sections, Section 2.1 through 2.5, describe the specifics of these work scopes. Sections 3.1 through 3.4 present the results of the survey, sampling and analysis tasks.

2.1 Site Survey

A site-wide 6 x 6 meter grid was surveyed on May 14, 1994. The purpose of this site-wide grid was to establish accurate location points for surface radiation measurements, locating down-hole survey stations, and positioning borings for soil sampling. The grid was laid out by Certified Surveys, land surveyors licensed in the State of Illinois. The approved Work Plan specified a 30 x 30 meter grid be surveyed. However, rather than surveying a grid on 30 meter centers from which a 6 x 6 meter grid could be located, the grid was laid out at a 6-meter spacing site-wide. Each 6-meter station was marked with an orange spray paint spot. Every 3 to 4 stations were labeled with the north and east grid coordinates to facilitate data collection during the survey. The 0-0 point is located approximately 2 meters south and 1 meter west of the southwest corner of the parking lot guard rail. Survey nails were placed in the sidewalk to mark the corners of the survey grid.

The approximate location of the former stable building was obtained from 1905 Sanborn fire insurance maps of the property as part of a 1992 environmental assessment (STS 1992). That location was surveyed and marked and is assumed to be

accurate within a few feet. A 1 meter grid was surveyed and marked using green spray paint within the footprint of the former stable building, an area of approximately 30 meters by 30 meters. The survey grid is shown on Figure 2-1.

During the course of the overland gamma survey, additional 1-meter survey grids were established around locations where elevated readings were noted. Those smaller grids were laid out from the 6 x 6 meter grid stations using a rope marked in 1 meter increments. Stations were marked by spray painting spots on the ground at each 1 meter interval.

An elevation survey was not conducted since a site survey with elevations to 0.1 feet was available from The Chicago Dock & Canal Trust. The site elevation survey is included as Figure 2-2.

2.2 Overland Gamma Radiation Survey

2.2.1 Survey Methods

Two types of overland radiation surveys were conducted. One survey, conducted May 14, 15 and 21, 1994, measured gamma radiation levels using a Ludlum 44-10 2x2 inch NaI detector coupled with an ESP-1 portable ratemeter/scaler. The NaI detector measured gamma radiation in counts per minute (CPM). The second survey was conducted May 21 and 22, 1994, and used a Bicron microRem LE tissue equivalent doserate meter, which measured the tissue equivalent radiation dose in microRem/hr. The ESP-1/NaI surveys included readings at 1 meter elevation and at ground surface (1 cm elevation), while all Bicron measurements were collected at 1 meter elevation only.

The 6 x 6 meter site-wide grid was surveyed using the Ludlum 2x2 inch NaI detector with 1 minute measurements taken at 1 meter and 1 cm from the ground surface. Once all grid measurements were completed for each north/south row, an inter-grid survey was performed for each square formed by the 6 meter grid points. Inter-grid surveys were performed at a traverse speed of approximately 3 feet per second ($\pm$1 m/sec.). The survey instrument was held as close to the surface as possible and the grid surveyed

in a "zig-zag" pattern. For all inter-grid surveys, the ESP-1 external speaker was activated to provide an auditory indication of any increase in count rate, since this method is more sensitive than observing the ratemeter liquid crystal display (LCD) for subtle count rate changes. Areas discovered in the inter-grid surveys which showed increased count rates were marked with an "X" or several "Xs" at the location(s) of the highest reading(s). Once the 6 meter and inter-grid surveys were complete, detailed one meter grids were laid out around the "Xs" using a rope marked at one meter intervals and the 6 meter markings for reference.

In addition to the 1 meter grid layout over the former stable building footprint, eleven (11) additional areas of above background readings were identified by the inter-grid surveys. All twelve of the 1 x 1 meter grid areas were surveyed using the NaI detector with all measurements taken at 1 cm (ground surface). Measurement times for the 1 meter grid areas varied from 1 minute to as low as 15 seconds in the high activity areas. All measurements were then normalized to CPM and background subtracted to give the net CPM for comparison to the range of area background based on statistical considerations.

The twelve 1 x 1 meter grid areas were also surveyed using the Bicron microRem LE meter. All measurements were made at 1 meter from the ground surface. To allow for proper instrument response on the lowest measurement range, the instrument was held at each location for approximately 15 seconds. This allowed the instrument to reach at least 90 percent of the final reading.

Details of the overland gamma and doserate surveys including instrument calibrations and field checks are described in detail in Attachment A.

2.2.2 Determination of Site Background

Background levels of gamma radiation were established by means of a survey of stations along three traverses, each consisting of 12 stations. The background surveys were conducted May 14, 1994. The three traverses include one along the west margin of the parking lot, one located immediately east of the site and one on the sidewalk east of McClurg Court, station 207E from 0 to 66N. The east side of McClurg Court is

referred to as the off-site traverse. The two on-site traverses are located along the eastern-most and western-most margins of the site, at 0E and 187E from 0 to 66N. Figure 2-1, the site survey grid, shows the location of the background survey traverses.

Attachment A presents calculation of background values as the mean of the three traverses plus 2 standard deviations. Further discussions of the background values are presented in the Results, Section 3.0 and Attachment A.

2.2.3 Data Management

All NaI scintillometer data were plotted on spreadsheets (Attachment A). Two- and three-dimensional illustrations of the measurements were also prepared. These data were used to select proposed locations for subsequent investigations (down-hole gamma logging and soil sampling). The scintillometer data were also provided to USEPA representatives for preliminary review prior to selection of proposed locations.

The Bicron doserate measurements were collected concurrent with the down-hole and soil sampling work and were not used in the selection of sampling locations. The NaI and Bicron data are presented and discussed in Section 3.1, Overland Gamma Survey Results.

2.3 Cone Penetrometer and Down-hole Gamma Logging

2.3.1 Methods

The Cone Penetrometer Test truck (CPT) was used in combination with down-hole geophysical logging of gamma radiation to provide vertical delineation of the extent of contamination. The down-hole survey was conducted May 21 and 22, 1994. The depth of the investigation extended below the surficial fill materials to the naturally occurring soils. The CPT holes extended a maximum of 9.6 meters (31 feet). Obstructions were encountered at several proposed locations. The obstructions ranged from shallow, less than 1 meter deep, possible floor slabs or pavements, to deep, on the order of 2.5 to 3 meters, possibly a basement floor slab. The following summarizes the locations where cone holes were attempted and the results (Table 1).

Table 1
Down-hole Gamma Survey Locations

Proposed Locations		Results
Background		
24E	12N	Obstructed. No log after 6 attempts.
156E	48N	Logged at 157E 49N
Alternate Location		
72E	60N	Anomalous log results. (Drilled through obstruction and logged).
71E	59N	Partial log. obstructed.
36E	12N	Obstructed. No log.
Transitional		
82E	25N	Logged
62E	25N	Partial log. obstructed
171E	64N	Logged
Alternate Location		
76E	21N	Obstructed. No log.
89E	16N	Logged
Elevated Gamma		
81E	5N	Logged at 81E 6N (access restricted by perimeter guardrail)
78E	4N	Obstructed. No log.
78E	18N	Logged
78E	9N	Partial. obstructed
Alternate Location		
82E	15N	Obstructed. No log.
78E	25N	Obstructed. No log.

The CPT casing was hydraulically pushed to the desired depth, and the hole was geophysically logged to record gamma radiation levels in counts per second (CPS) as a function of depth. Logging speed was held at 2 meters per minute, which gave excellent resolution of both background and elevated gamma locations.

The CPT down-hole gamma survey used a Colog MXG logger equipped with electronically controlled winch assembly, computer interface, and a Mount Sopris Model HLP-2375-I gamma radiation probe. The Mount Sopris probe was equipped

with a 0.5x1.5 inch NaI(TI) crystal which is capable of providing vertical resolution of approximately 1.5 inches.

2.3.2 Quality Assurance

2.3.2.1 Sensitivity Test Runs

In order to evaluate the impact of the stainless steel casing on the sensitivity of the Colog gamma logging unit, a series of five sensitivity runs were made. Standardized thorium-containing soils in fixed geometries prepared for the West Chicago thorium contamination project were used as the calibration sources. Specifications for the preparation of the "calibration soils" were provided and are included as Attachment B. The Work Plan specified that the casing would be used if it could be demonstrated that the use of the casing did not diminish the gamma reading by more than 50 percent when compared to readings obtained with no casing.

The following presents the results of those sensitivity test runs.

Table 2
Influence of CPT Casing Evaluation

Drum No.	Counts/second with Casing	Counts/second without Casing	Percent Difference (Range)
CD-1	13-16 CPS	20-25 CPS	20-48%
CD-2	180-210 CPS	280-288 CPS	25-38%
CD-3	399-420 CPS	550-600 CPS	24-34%
CD-7	104-115 CPS	150-165 CPS	23-37%
CD-8	58-70 CPS	88-100 CPS	23-42%

These data indicate the gamma readings using the casing were diminished 23 to 40 percent on average, sufficiently below the 50 percent threshold which would have precluded use of the casing. As a result, casing was used in all the down-hole logging at the site.

Data were available on the concentration of the gamma emitting radionuclides in the calibration drums. Correlation of the counts per second readings with the reported standardized soil concentrations allows for the derivation of a calibration curve to be applied to the gamma counts and soil (Th-232 + Ra 226) concentrations at the Lindsay Light site.

Analysis of the calibration drum materials indicated total gamma emitter and Th-232 plus Ra-226 concentrations as follows for the five drums:

Table 3

Calibration Drum Radionuclide Concentrations *

Drum No.	Total Gamma (pCi/gm)	Th-232 + Ra-226 (pCi/gm)
CD-1	2.7	1.7
CD-2	53.5	48.0
CD-3	104.6	97.1
CD-7	29.6	23.4
CD-8	17.5	12.9

*Analysis of drum contents are included in Attachment B.

Plotting the Th-232 + Ra-226 concentration vs. measured counts for each calibration drum yields Figure 2-3. Figure 2-3 plots the average reading of the CPT probe in counts per second (CPS) versus the soil concentration of Th-232 + Ra-226 in pCi/gm. Best fit linear regressions were then added to the plot and the equations for the probe response with and without the casing were determined.

2.3.2.2 Replicate Gamma Logs

Replicate gamma log readings were obtained in borings through logging both the probe entering the hole and the probe being withdrawn from the hole. Where both "in and out" logs were recorded, both logs are presented side-by-side on the gamma log figures.

Additionally, one background boring 157E 49N, was logged on the first day of the down-hole logging effort, and then again at the completion of the down-hole logging task. This replication of the log on two different days was to assess the reproducibility of the logging runs and to evaluate potential impacts to the equipment after logging the transitional and elevated gamma locations.

Observations of the two runs (up and down) show excellent replication on most borings. One exception was boring 71E 59N. That log was run in a drilled boring, due to the presence of obstructions at a depth of approximately 2.5 meters. Non-replicate logs were obtained in several runs and are attributed to faulty connections between the probe and the recording unit. After the anomalous results were noted, the soil cuttings from the boring were screened with the NaI scintillometer and the Bicron tissue equivalent doserate meter. No elevated readings above background were measured in these cuttings, which tends to confirm the background nature of this location.

Comparison of the two logs run in the background boring to check the reproducibility of the logging following the end of the survey showed excellent reproducibility. No significant difference was noted in the logs run on separate days. This indicates no significant impact to the equipment resulted from the logging of the locations of suspected elevated gamma material.

2.4 Soil Sampling

2.4.1 Selection of Samples

Based on the results of the overland gamma survey and the down-hole gamma survey, locations and depths were selected for the collection of soil samples. The objective was to collect samples at one background location removed from any surface indications of contamination, two transitional locations where gamma readings are above the background but not among the highest values measured, and two locations exhibiting significantly elevated gamma readings. Samples were to be analyzed to identify the radioactive material, measure the activity, determine the soil concentration and correlate these findings with the down-hole gamma data. The overland survey information indicated the horizontal locations to be sampled. The down-hole gamma information indicated the depth where the highest gamma readings were recorded and samples would be collected.

The selected soil sampling locations are listed below. The depth of sampling is based on the zones which consistently exhibited the highest reading in the down-hole boring gamma logging. The proposed sample depth was from 0.65 meters to 1.3 meters (2 to 4 feet).

The following locations were chosen for soil sample collection:

Background	156E	49N
Transitional	82E	25N
	89E	16N
Elevated Gamma	81E	5N
	78E	18N

Duplicate samples were also submitted to facilitate assessment of the reproducibility of the analyses. Duplicates were prepared by homogenizing the sample recovered in the barrel of the split spoon and then filling two sets of sample bottles a little at a time

until both sets of bottles were full. Duplicates were prepared for two of the elevated gamma measurements, at 81E 5N from 0.65 to 0.95 meters (2-3 ft), and at 78E 18N from 0.95 to 1.3 meters (3-4 ft). In order to prevent the laboratory from recognizing these split samples as duplicates, the duplicate samples were coded with a 9 at the end of the sample number and the label and Chain-of-Custody indicated the samples were from a depth 20 feet deeper than the actual sample depth.

2.4.2 Sampling Methods

Samples were collected using a truck-mounted drill rig. Samples could not be collected as initially proposed using the CPT rig due to pavements and obstructions at the sample locations.

Drilling was conducted using solid flight augers. The sample was recovered by driving a 2.5 inch diameter split spoon sampler using an SPT hammer.

Upon recovery of the sample to the ground surface, the borehole depth was measured using a weighted tape. The split spoon was opened and the sample screened using the Bicron meter. The sample was also screened using an HNu photo-ionization detector (PID). The sample was then described and logged. The recovered material was homogenized using a stainless steel spatula blade and subdivided into the individual sample bottles.

Cuttings from the borings were screened using the Bicron meter. The levels were not recorded, but did exhibit elevated readings in the transitional and elevated gamma sample locations. All cuttings from the transitional and elevated gamma borings were placed in a bucket, segregated from other cuttings and materials generated as part of the investigation. The buckets were stored, locked in the on-site trailer. The material was utilized in testing of the physical and chemical properties of the soil. No soil materials remain on site.

All borings were grouted closed with a neat cement grout upon completion of sampling.

2.5 Analyses

2.5.1 Analytical Parameters

A total of 12 samples were submitted for analysis. Two samples were submitted from each of the five sampling locations. Two duplicate samples were also submitted. The samples were initially analyzed by gamma spectroscopy. All gamma emitters identified were reported.

The three samples showing the highest gamma spec detections were subsequently analyzed for isotopic uranium and isotopic thorium. In addition, one of the samples from the background boring was analyzed for isotopic uranium and isotopic thorium.

Two of the samples from the elevated gamma radiation areas were also submitted for RCRA hazardous waste characterization. The purpose of that analysis was to evaluate potential constraints on the eventual disposal of the radioactive material present at the site. Those analyses included TCLP volatiles, TCLP semi-volatiles, TCLP metals, reactivity, corrosivity and ignitability.

2.5.2 Quality Assurance

2.5.2.1 Overland Gamma Survey

Quality Assurance measures were performed in accordance with Quality Assurance procedures in Appendix D of the Work Plan. Per Section 3.2.2 of the Work Plan, duplicate measurements were conducted for approximately 10 percent of the 6 meter grid stations. QA measurements were made randomly across the site at surveyor-established 6 meter grid points using the ESP-1/44-10 instrument set detector (S/N 112642) with the 2.5 inch lead shield at a distance of 1 cm above the surface. All 6 meter grid QA data are shown in Appendix E of Attachment A. The site was walked randomly from west to east and north to south to north in a "zig-zag" pattern similar to the inter-grid survey technique. A total of 100 QA measurements were made, where only 36 measurements were required by the Work Plan. The additional measurements

were made to provide for a random sampling across the entire site versus only a portion of the site.

All QA measurements were collected for 30 seconds. Appendix D-6 of Attachment A gives the raw data as CPM and the percent difference between the Corrected QA CPM and Corrected Initial CPM, using the initial CPM as the "true" or expected value for the percent difference calculation. The result of percent difference test range from -31.8% to 50.77% with an overall average of -1.56 ± 12.3% at one standard deviation. These QA data show that the average variation is excellent and that 95 percent of the data are within an error range of less than ±25 percent at 2 standard deviations. Given the fact that the QA measurements were made on a different day than the original measurements and that the majority of the QA data are in the range of site background, an error of only 25 percent at 2 sigma is considered to be acceptable.

Appendix G-4 of Attachment A presents a QA check to correlate ESP-1/44-10 readings with those of the Bicron microRem LE instruments at the most elevated reading measured on the site, near survey point 76E 4N. The highest Bicron contact reading was 650 μrem/hr at the surface. The average correction factor calculated for converting the ESP-1 countrate data to equivalent μrem/hr data was 487 CPM/μrem/hr at one meter above the surface.

2.5.2.2 Chemical Analytical QA/QC

Data validation was conducted for samples analyzed at the ITAS Laboratory. The laboratory reported results for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganic parameters specified in the toxicity characteristic leaching procedure (TCLP). The compounds were analyzed according to methods for hazardous waste characteristic determination as specified by EPA SW-846. The sample analyses were reviewed for accuracy and completeness. Precision was not analyzed as only two samples were analyzed (CD-S81E5N-2-3 and CD-S78E18N-2-3) from the elevated gamma reading areas, as specified in the Work Plan.

Volatile Organic Compound QA/QC

Specific VOC compounds specified in TCLP were analyzed on the zero headspace TCLP extract. The samples were analyzed according to EPA SW-846 Method 8240. The samples were analyzed within two weeks of sample collection. The GC/MS tuning was completed and the acceptance criteria associated with injection of 4-bromofluorobenzene (BFB) for the initial calibration and sample analyses were within acceptable ranges. Neither the QC blank nor the extraction blank contained analytes of interest.

A laboratory control sample spike was completed and all of the spiked compounds were within QC acceptable ranges. This would be considered a measure of accuracy for the method. However, a matrix spike, which would provide a measure of accuracy for the sample matrix, was not completed.

Semi-Volatile Organic Compound QA/QC

Semi-volatile compounds specified in TCLP were analyzed according to Method SW 846-8270. The samples were extracted within one week of sample collection and analyzed within two weeks of sample collection. The samples, extraction blank, method blank and method spike had acceptable surrogate recoveries. No analytes were detected in the method blank associated with these samples.

The GC/MS tuning was completed and the acceptance criteria associated with injection of decafluorotriphenylphosphine (DFTPP) for both the initial calibration and samples were within acceptable ranges.

A laboratory control sample spike was completed and all spiked compounds were within the QC acceptable range. This could be considered a measure of accuracy, although a matrix spike was not completed for these samples.

Inorganic Analyses QA/QC

Inorganic analyses were completed as applicable by methodology stated in EPA SW-846. The initial and continuing calibrations were acceptable for all metals analyzed. The blanks that were reported associated with the metals analyses did not contain any analytes above the detection limit. Sample CDS78E18N23 reported barium above the instrument detection limit but below the CRDL, the normal CLP detection reporting limit. Sample CDS81E5N23 also indicated detects of barium and cadmium in the range between the instrument detection and the CRDL.

A laboratory control sample spike was completed for each metal that was analyzed. The results for the spiked sample were within acceptable limits. This could be considered a measure of accuracy, although a matrix spike was not completed.

Radiological Sample Analysis

The entire data analysis package sent from the analytical laboratory was checked against the laboratory's Quality Assurance Management Plan and procedures shown in Appendices A through E of the Work Plan. The QA review consisted of 100 percent of all data sheets and all calibration sheets forwarded by the lab. No discrepancies were noted in any of the data or analyses reviewed. QA review forms are included as part of Attachment E. Additionally, a laboratory internal memorandum regarding the rationale for not conducting matrix spike analyses on gamma spec analyses is also included in Attachment E.

3.0 INVESTIGATION RESULTS

3.1 Overland Gamma Survey

The overland gamma survey consisted of two surveys, one performed using a Ludlum ESP-1 with a NaI detector, and a second using a Bicron tissue equivalent doserate meter. Background measurements established typical levels remote from contaminated locations. Details of the methods used in conducting the overland gamma surveys and the survey results are presented in Attachment A. The following sections present the NaI survey, the Bicron survey, and a summary of the survey results including descriptions of the zones exhibiting elevated radiation readings.

3.1.1 NaI Ludlum Survey

Background gamma radiation values were calculated from measurements taken at 1 meter and 1 cm above the ground surface along three traverses including both on- and off-site locations. These background values were calculated to facilitate identification of anomalous surface gamma levels. In accordance with the Work Plan, a threshold was set at the mean of the background traverse readings plus two standard deviations (m $+2\sigma$). Background values were measured and calculated for the 1 meter and 1 cm elevations as follows:

$m + 2\sigma$ (1 m) = 2818 CPM
$m + 2\sigma$ (1 cm) = 3114 CPM

The 6 x 6 m station to station site survey combined with inter-grid surveys identified 12 areas exhibiting gamma readings which exceeded the background thresholds. These areas are identified on Figure 3-1. A full description of the survey results including tabulated records of all readings is included as Attachment A. These elevated locations were surveyed at a 1 meter grid interval with the detector at 1 cm elevation.

The areas of elevated readings have been presented as two- and three-dimensional illustrations of the net gamma radiation readings after background subtraction on Figures 3-2 through 3-13. A brief summary of each area is provided below.

Area 1 is located toward the northwest corner of the site. That area showed only one data point above the background plus 2σ ($\bar{m} + 2\sigma$) threshold (29E 60N). That reading was 4.56×10^3 counts per minute (CPM). Figure 3-2 shows the $\bar{m} + 2\sigma$ exceedance area.

Area 2 also showed only one data point above the $\bar{m} + 2\sigma$ threshold shown on Figure 3-3. That point at 42E 28N, measured 7.10×10^3 CPM.

Area 3 exhibits a series of elevated readings extending along 51E from 13N to 20N, Figure 3-4. The elevated gamma readings extend to the limits and possibly beyond the surveyed area to the west. Maximum readings in Area 3 are noted at 50E 17N (2.26×10^4 CPM) and 51E 19N (1.29×10^4 CPM).

Area 4, Figure 3-5, similar to Areas 1 and 2, has one point which exceeds the $\bar{m} + 2\sigma$ threshold. The elevated gamma reading is at the eastern edge of the survey area indicating elevated levels may extend beyond the survey area and connect with Area 5 to the east. Station 62E 20N measured 3.92×10^3 CPM. This Area is near Area 5 which extends west from the northwest corner of the former stable area.

Area 5 extending west from the footprint of the former stable has numerous measurements above the $\bar{m} + 2\sigma$ threshold (Figure 3-6). Elevated gamma readings extend to the limits and possibly beyond the surveyed area to the west and north. The highest reading is 3.70×10^4 CPM at Station 69E 27N. Several other readings are in the 10^4 CPM range.

Area 6 exhibits the highest reading outside the stable building footprint. Station 68E 7N measured 5.35×10^4 CPM. Figure 3-7 displays the gamma readings and background as $\bar{m} + 2\sigma$.

Area 7 designates the entire footprint of the former stable building. Note that the *entire footprint does not display elevated gamma readings.* Figure 3-8 shows the plot of values with the $m + 2\sigma$ background. Figure 3-8a gives the 3 dimensional image of the gamma readings.

The highest values measured and the majority of values above background lay along the western third of the building area. The highest value measured on site was 6.26×10^5 CPM at 81E 5N. Farther west at 76E 4N, a maximum value of 4.94×10^5 CPM was measured.

The highest readings within the building footprint are generally located from 76E to about 85E. High readings extend nearly to the southern limit of the site, with the highest readings noted at 4 to 6 meters north of the southern boundary of the survey area. Note, however, that values tend to approach or fall below the $m + 2\sigma$ threshold at the southern margin of the survey. Elevated gamma readings extend to the limits of the surveyed area and may extend beyond the site boundary to the south.

Area 8 which extends off the northeast corner of the former stable footprint shows several values in the 10^4 CPM range (Figure 3-9). Elevated gamma readings extend to the limits of the surveyed area and possibly beyond the area boundary to the northwest. Two values at 106E 26N, and 27N approach the maximum values measured in Area 6. Station 106E 26N measures 5.22×10^4 CPM while 106E 27N measures 5.15×10^4 CPM. Several high values near the northeast end of Area 8 are located at 24N to 27N between 114E and 119E.

Area 9 shows several data points which exceed the $m + 2\sigma$ threshold (Figure 3-10). Elevated gamma readings extend to the limits of the surveyed area and may extend beyond the surveyed area to the east. The highest value measured was 1.77×10^4 CPM at 134E 33N. The elevated readings trend along an east-west orientation at about 33N running from 132E across to 137E. A similar east-west alignment of higher readings is noted from 135E to 138E at about 26N.

Area 10 shows several points which exceed the $m + 2\sigma$ threshold (Figure 3-11). The highest value measured in Area 10 is 1.08×10^4 CPM at station 134E 13N.

Area 11 showed one data point, 140E 14N, which exceeded the $\bar{m} + 2\sigma$ threshold (Figure 3-12). The highest measurement in Area 11 was 4.46×10^3 CPM.

Area 12 showed a number of elevated readings (Figure 3-13). One of the highest, 2.97×10^4 CPM, was measured along the northern margin of the site at station 170E 66N, indicating elevated readings may extend beyond the site boundary to the north. The highest value was measured near there at 171E 64N, where a value of 4.35×10^4 CPM was recorded.

The limits of the 1 meter gridded areas were set based upon several considerations. The inter-grid survey identified locations with elevated readings and the survey grid was laid out around those locations. In some areas where several elevated readings were sufficiently close, they were included in a single gridded area. In other areas, separate grids were surveyed around elevated gamma locations. Where different grid areas approach but do not overlap each other, i.e. areas 4 and 5, the gap between areas is sufficiently small to be insignificant. Where elevated readings extend to the edge of the 1 meter grids within the 6 meter grid, the absence of elevated readings detected in the inter-grid survey indicates the readings dropped to background levels. Additional survey points may have provided minor added detail to the margin of the elevated gamma area, but, in the opinion of the investigators, would not have documented additional contaminated areas. Inasmuch as the objective was to document the apparent limits of the gamma radiation source areas, these data are considered sufficient to make that demonstration.

In areas where the elevated readings extended beyond the limits of the 6 meter gridded area, specifically south of area 7 and north of area 12, the inter-grid survey does not provide documentation of background levels. These off-site areas were surveyed by MJW Corporation, but no data were recorded or provided for this report. These areas were described as exhibiting background values to the north of area 12, and somewhat elevated readings 1 to 2 meters to the south of area 7 before dropping to background levels. It was noted that both areas were concrete sidewalk paved rather than the asphalt paving which covered the majority of the site. The concrete pavement was anticipated to be a more effective cover, precluding direct comparison of gamma readings between the asphalt paved areas and the concrete sidewalks. It was further

noted that at the request of USEPA on-site personnel, the excavation spoil from utility trenching on East Grand Avenue to the north was screened for elevated gamma readings. All materials screened were at background levels.

3.1.2 Bicron Survey

Bicron instrument surveys were made over those areas showing elevated gamma readings and in the footprint of the former stable building. Background values were obtained as with the Ludlum NaI scintillometer at the three traverse locations. General area Bicron background readings were 4.5 μrem/hr. The background threshold was calculated as follows:

- background mean plus two standard deviations ($\bar{m} + 2\sigma$) equals 7.25 μrem/hr

The results of the Bicron survey are included as tables and three dimensional plots of readings in Appendix A. The plots of the site-wide Bicron survey data are included as Figure 3-14 viewed from south to north, and Figure 3-14a viewed from north to south. Figures 3-14 and 3-14a exhibit some linear features aligned east-west and north-south. These features are the result of the graphing software used to prepare the figures.

The Bicron doserate data for the 12 areas show similar intensities as the scintillometer data. The $\bar{m} + 2\sigma$ threshold for the Bicron data was exceeded in 10 of the 12 areas, excepting Areas 1 and 2. The highest net reading at a 1 meter elevation, the elevation at which typical whole body doserate measurements are made, was in Area 7 at station 76E 4N, near one of the highest scintillometer readings. At that location and elevation, a value of 165.5 μrem/hr was measured. At that location, a surface (1 cm elevation) reading was taken which measured 650 μrem/hr.

3.2 Down-hole Gamma Survey Results

Down-hole gamma logs were attempted and either partially run or completely logged at 10 locations. Numerous other locations were precluded from logging due to subsurface obstructions such as concrete pavement, basement floor slabs, or massive debris in the

fill soils. Three partial records appear usable from holes encountering obstructions at depths of 2.5 to 3 meters (9 to 10 feet) Seven complete logs were run. These included one with inconsistent signals on re-runs which does not appear usable (discussed below under background logs). A second anomalous log shows background level gamma measurements in a log run in what was anticipated to be a transitional gamma level area, based on surface gamma survey data.

The down-hole gamma radiation logs are presented in Figures 3-15 to 3-24.

For most of the logs, replicate runs were recorded to allow for evaluation of the reproducibility of the data. Gamma measurements were recorded on a run into the casing, labeled "Gamma Log Dwn" on the left side of the gamma log Figures. The record of the readings upon withdrawal of the probe is labeled "Gamma Log Up" and is shown on the right side of the Figures.

Replicate logs were also run on the one check boring which was logged on both days of the down-hole survey. Replication between the logs run on the two days was excellent.

The scales used to display the gamma levels on the various logs vary by a factor of 10 between the background, transitional and elevated gamma logs. The background logs are shown with a full scale value of 120 counts per second (CPS). (Note the units in the down-hole gamma survey is counts per second, CPS, as opposed to counts per minute, CPM, for the overland survey. The absence of the overburden shielding produces this significantly greater sensitivity). The transitional logs are shown at a full scale reading of 1200 CPS. The elevated gamma records are shown at 12,000 CPS full scale.

The vertical scale on the logs is 1.1 meter to the inch.

3.2.1 Background Logs

At station 157E 49N, a background boring was logged which yielded excellent records (Figures 3-15 and 3-15a). Replicate runs into and out of the boring matched well, as did logs run the next day upon completion of the logging effort.

These logs indicate a relatively low gamma level ranging from less than 6 CPS to perhaps 25 CPS (360 to 1500 CPM) in the fill materials. Below a depth of approximately 2.5 to 3 meters (9 to 10 feet), the gamma levels are lower and much more constant at around 6 to 8 CPS (360 to 480 CPM), to a total depth of 6.5 meters, about 22 feet.

The log for boring 171E 64N (Figures 3-16 and 3-16a) exhibits a similar profile, although that log was anticipated to be a transitional gamma radiation location. Gamma levels ranged from maxima of less than 40 CPS (2400 CPM) in the fill soils above approximately 3 meters (9 to 10 feet deep) to a consistent 5 to 9 CPS (300 to 540 CPM) in the natural soils to a depth of 6.5 meters (22 feet). Consistent values were measured on both the log down and log up runs in this boring.

Attempts at a background boring at 72E 60N encountered repeated obstructions at a depth of about 9 to 10 feet. This was interpreted as a basement floor slab. In an effort to obtain a background gamma log at this location, a boring was advanced at 71E 59N, using a drill rig. A CPT casing was then placed in the boring and a series of gamma logs run.

These records show, in one set (Figure 3-17), a profile with some slight variation above 3 meters and relatively constant values from 3 meters to the bottom at 6.2 meters. This profile is similar to the background logs previously described, except that the recorded gamma levels were from about 147 to 165 CPS (8820 to 9900 CPM). This suggests a scale shift of approximately 140 CPS (8400 CPM) occurred on this record.

A second run (Figure 3-17a), gave dramatically different records for the log down and log up runs. The inconsistencies between the several logs suggest these logs are not usable in the evaluation of site conditions.

In order to evaluate whether the anomalous readings at this location were the result of elevated gamma levels, the cuttings which had been brought to the surface during the drilling of the bore hole were screened. The materials were screened using the Ludlum NaI scintillometer and Bicron tissue equivalent doserate meter by the health physics technician. No levels above background were noted in these cuttings.

The absence of a consistent record indicating the presence of contamination and the lack of any elevated radiation upon screening the cuttings indicate there is no evidence of radioactive contamination at this location.

3.2.2 Transitional Logs

The transitional gamma logs were obtained in areas where overland gamma results indicated increasing gamma radiation around the highest gamma readings, or areas exhibiting levels above background, but removed from the highest reading areas.

One of the proposed transitional areas was located at 171E 64N, in Area 12. That location was discussed above under background locations, since the log (Figures 3-16 and 3-16a) appeared characteristic of background locations and did not show the elevated gamma levels anticipated.

A second location in an out-lying area was logged for transitional gamma levels at 62E 25N, from Area 5. At that location, a fairly good profile (Figure 3-18) was obtained of the upper 2.7 meters, but was terminated at an obstruction. At that location, a gamma radiation peak signal at a level of 660 CPS (39,600 CPM) was recorded at 2.2 meters. Gamma levels dropped to approximately 340 CPS (20,400 CPM) at 2.5 meters, then began to rise again when the record was interrupted by the obstruction at 2.7 meters. Note that the high reading at a depth of 2.2 meters is the deepest horizon identified exhibiting an elevated gamma radiation level. The data record was consistent for this boring between the log down and log up records.

A second obstructed record is included from location 82E 15N. This location lies within the stable building footprint. The record at this location (Figure 3-19) is only for about one meter depth. The record shows a gamma peak of about 840 CPS (50,400 CPM) at 0.8 meters. The record shows a fairly sharp rise in counts below a depth of about 0.3 meters, a peak at about 0.5 to 0.8 meters and a fairly sharp fall off in readings to the end of the record at about 1.0 meter depth.

At location 82E 25N, the deepest profile on site was recorded. Gamma log measurements were made to a depth of 9.6 meters (31 feet). This profile (Figure 3-20)

shows low gamma readings to a depth of 0.4 meters, a steady rise with some gentle fluctuations to a distinct peak of about 840 CPS (50,400 CPM) at a depth of 1.2 meters, followed by an abrupt drop down to background levels of less than 10 CPS (600 CPM) below 2 meters. A slight rise in gamma levels to perhaps 10 to 20 CPS (600 to 1200 CPM) below 9 meters may signify a change in strata from lake shore sand to glacial clay till soils. It does not appear to be an indication of contamination due to the broad (shallow) nature of the data signal.

At station 89E 16N, also within the building footprint, a transitional log extended to a depth of 6.4 meters. This profile (Figure 3-21), run both log down and log up, displays a double peak in gamma readings. Gamma levels rise below a depth of 0.3 meters to a peak reading of approximately 1050 CPS (63,000 CPM) at a depth of 0.62 meters. Below that, levels drop to approximately 680 CPS (40,800 CPM) at 1.0 meter depth, then rise in a second peak to 840 CPS (50,400 CPM) to 1.2 meters deep. Below the second peak gamma reading, levels decline until at about 2.2 meters, a fairly constant reading of 10 CPS (600 CPM) or less is detected. These readings are mirrored in both records for this boring.

3.2.3 Elevated Gamma Logs

Three records were run on borings from locations of elevated surface gamma measurements. All three are from the western portion of the building footprint.

At station 78E 9N, a partial log was obtained to a depth of 3.3 meters before encountering an obstruction. That record (Figure 3-22) shows a very strong peak rising from low levels at 0.4 meters deep to a peak value of approximately 11,000 CPS (660,000 CPM) at a depth of just below 1.0 meter. Below 1 meter, gamma levels drop to about 600 CPS (36,000 CPM) at 1.8 meters before increasing slightly to 1200 to 1300 CPS (72,000 to 78,000 CPM) at about 2.1 meters. This peak is similar to the maximum level measured at 62E 25N where a 660 CPS (39,600 CPM) peak was noted at 2.2 meters. Below 2.1 meters, the gamma levels in the log at 78E 9N drop to background values by 2.5 meters deep and remain at that level to the bottom of the boring at 3.3 meters.

At station 78E 18N, the gamma levels show a single pronounced peak (Figure 3-23). Beginning below a depth of 0.4 meters, the readings rise to approximately 11,200 CPS (672,000 CPM), just above 1.0 meter. Readings then drop sharply back to background levels, and below 1.7 or 1.8 meters, show consistently low levels to the total depth of the log at 6.5 meters.

At station 81E 6N, two maxima are apparent in the gamma log (Figure 3-24). Below 0.4 meters readings rise sharply to a high of 9,500 CPS (570,000 CPM) at approximately 0.8 meters deep. Readings drop to a low of 3,700 CPS (222,000 CPM) at 1.3 meters deep, then rise to just over 6,000 CPS (360,000 CPM) at about 1.6 meters. Below 1.6 meters, readings drop to background levels below about 2.2 meters and remain low to the total depth of the log at 6.5 meters.

The distinct maxima noted on both the transitional logs and elevated gamma logs likely represent relatively thin horizons of gamma-emitting materials. The rise in gamma counts approaching these horizons is likely an example of the penetrating power of the radiation rather than a broad band of contamination. This is likely particularly true where the slope of the log is equally steep above and below the maximum value.

Where double peaks are evident, i.e., 81E 6N, or 89E 16N, these represent two distinct gamma-emitting concentration horizons, possibly a layer of fill placed over a former floor during the period of operations. The low reading between the two peaks represents where the "halos" of the two horizons intersect.

These down-hole logs appear to fairly accurately define the vertical extent of the gamma-emitting contamination in the areas tested. The distinct signature evident in both the obstructed (incomplete) and the unobstructed (complete) down-hole logs suggests that the character of the material can confidently be distinguished using the methods employed in this survey.

The principal unexplained anomaly was the absence of an elevated, transitional gamma record from station 171E 64N. It is possible that the source was sufficiently small and relatively shallow so as to be evident from the ground surface and apparent over some area, but was otherwise shielded and not detected in the subsurface.

The inconsistent and anomalous records in the several logs at the 71E 59N records are attributed to electrical problems with faulty connections between the detection and data recording equipment. That location was unique in that the log was run down a drilled hole into which a casing had been placed. The difficulty is not attributed to the drilled boring, but rather the logging equipment was set up in a configuration and location outside the CPT truck for this one boring. This set-up may have resulted in incomplete electrical connections or other logistical problems.

3.2.4 Summary of the Down-hole Gamma Survey Results

Figure 3-25 plots all CPT gamma log data from logged transition and elevated gamma boreholes against the depth at which the peak gamma intensity was recorded. Review of this plot shows that no gamma peaks occurred in the first one half meter, while 11 of 14 plotted gamma peak locations occurred within a one meter zone from 0.5 to 1.5 meters below grade. One of the three peaks occurring outside this one meter zone from 0.5 to 1.5 meters was located at 1.6 meters and two were located between 2 and 2.5 meters. Based on this population of subsurface testing in areas tens of meters apart, it is likely that the subsurface contamination patterns in untested areas are similar to those of Figure 3-25.

3.3 Soil Sampling

Soil sampling locations were selected from overland gamma locations, using those readings to select one background, two transitional, and two elevated gamma locations. The selected locations were:

156E 49N	-	Background
82E 25N	-	Transitional
89E 16N	-	Transitional
78E 18N	-	Elevated gamma
81E 5N	-	Elevated gamma

The down-hole gamma logging data were used to select the interval from which to recover the sample. The horizon of interest, i.e., that horizon showing the elevated gamma radiation, was generally around 1 meter deep. As a result, since two samples

were to be recovered from each of the boring locations, the sample intervals were set at 0.65 to 0.95 meters and 0.95 to 1.3 meters (2 to 3 feet and 3 to 4 feet).

Sampling was originally intended to be conducted with the CPT rig. However, obstructions were noted at sufficient frequency that a truck-mounted drill rig was mobilized to conduct the soil sampling. A Mobile B-55 drill rig equipped with solid stem auger was used to complete the soil sampling.

The asphalt pavement was drilled rather than being cored. The bore hole extended to the top of the interval to be sampled at 2 feet. A 2.5 inch diameter split spoon was driven with a standard penetration test (SPT) hammer through the 1 foot interval. The split spoon was recovered and the sample was screened for radioactivity, logged for soil type, homogenized and placed in the sample containers.

The borings all encountered fill materials below the asphalt pavement and gravel base course. Boring logs are presented in Appendix C. The fill consisted of sandy and clayey soil, cinders, wood, brick, mortar, wire and fragments of gravel. In Boring 82E 25N, a concrete pavement was encountered from 3.0 to 3.5 ft. The second sample in that boring extended from 3.5 ft. to 4.5 ft. In Boring 78E 18N, a wire mesh screen was recovered with the sample in a fragment of cement.

Radiation screening of the samples showed the samples from the elevated gamma areas exhibited μrem levels of between 55 and 170 and scintillometer readings of about 6 x 10^3 CPM (see Appendix B-5 of Appendix A).

Chain-of-Custody records for the samples submitted are included in Appendix D.

3.4 Analyses

The analysis of the soil samples consisted of two general components: radioactivity and RCRA hazardous waste characteristics. The radioactivity analysis was to assess the concentration and chemistry of the radioactive contaminants indicated as being present at the site. The RCRA hazardous waste characterization was to assess whether the

material exhibited any of the characteristics specified by regulation to classify material as hazardous waste.

3.4.1 Radiological Analysis

The radiological analysis consisted of two separate analyses. Gamma spectroscopy analyses were conducted on all samples submitted. Isotopic uranium and isotopic thorium analyses were conducted on the three samples exhibiting the highest gamma spec readings. Additionally, one of the background samples was analyzed for isotopic uranium and isotopic thorium. The objective of the gamma spec analysis was to detect and measure the concentration of all gamma-emitting radionuclides in the samples. The isotopic uranium and isotopic thorium analyses indicate isotopic ratios which can characterize the breakdown products (daughter isotopes) in each of the radioactive decay series. The individual isotopic analyses also have a greater sensitivity (lower detection level) than the gamma spec analyses.

In the gamma spec analyses, eighteen (18) gamma emitters were initially reported. However, three of these had consistent less than (<) values reported due to interferences from other radionuclides constraining detection. These were Th-230, U-234, and U-235. Four radionuclides were measured in only one or two samples, and at low levels, only slightly above the minimum detection level. These consisted of I-129, Ce-139, Ce-141, and Pa-234. Three of these (I-129, Ce-139 and Ce-141) are known fission products, were found to be the result of interference from other gamma or x-ray emitters, and were subsequently rejected. Pa-234 is naturally occurring (from the uranium chain). Ra-223 was found to be reported in error as a result of interference from Ac-228. The remaining ten radionuclides were above the minimum detection limit and were detected in a sufficient number of samples to be confidently identified as present. These compounds consist of: K-40, Tl-208, Pb-210, Pb-212, Bi-212, Ra-224, Ra-226, Ra-228, Th-228, and Th-234. Many of these radionuclides, namely Th-228, Ra-228, Ra-224, Pb-212, Bi-212 and Tl-208, are in the natural radioactive decay series of thorium. These elements are present in the monazite sand which was reported to have been stored and processed at the Lindsay Light operations formerly on site. Monazite also contains uranium to a lesser extent, represented by the uranium decay products Th-234, Ra-226, and Pb-210 in the identified nuclides.

Potassium-40 (K-40) is not a part of a decay chain. It is a naturally occurring radioactive isotope of potassium, accounting for 0.1 percent of all potassium.

The results of the gamma spec analyses are summarized in Table 4. The laboratory report of the gamma spec analyses is included in Appendix E.

The gamma spec analyses suggest the thorium decay chain products may not be in equilibrium. A compilation of the reported activities for each sample with positive results is attached as equilibrium charts, Figures 3-26 through 3-35.

A review of the equilibrium charts indicates that the Th-228 results are higher than Ra-228 results. This apparent anomaly could be due to the low abundances (1.2% and 0.2%) for Th-228 (Thorium Chain Nuclide identification parameters used by the analytical laboratory are presented on Table 4a). For most of the analyses, the Ra-228 and Ra-224 are showing equilibrium. The daughter products of Ra-224 (Pb-212, Bi-212, and Tl-208) should be in equilibrium within 2 days, based on a half-life of 10.6 hrs. for Pb-212. It is unexplained why the gamma spectrum shows Bi-212, and occasionally Pb-212, slightly lower than Ra-224 and Tl-208. The Tl-208 consistently shows a concentration at equilibrium with Ra-224 when corrected for percent of decay.

Samples were dried and weighed into petri dishes on 6-1-94. The samples were counted on 6-5-94; sufficient time to re-establish equilibrium following sample drying.

The gamma spec analyses show the lowest or non-detect concentrations in the background samples. No thorium isotopes were detected in the gamma spec analyses of the background samples. Only trace levels, less than 2 pCi/gm of one radium isotope, Ra-226, were measured in the background samples. The highest results, particularly for Pb, Ra and Th isotopes are noted in the samples recovered from the locations which measured the highest readings in the overland gamma survey. The highest readings, in several isotopes on the order of 2000 pCi/gm for Ra-224, Ra-228, and Th-228, were noted in the sample from 78E 18N at a depth of two to three feet. The other sample with readings around 1000 pCi/gm for Ra-224, Ra-228 and Th-228 was in the sample from 81E 5N from a depth of three to four feet. The sample from

81E 5N, from two to three feet was the third sample exhibiting elevated gamma spec readings which was selected for isotopic thorium and isotopic uranium analyses.

The three samples with the highest gamma spec readings were selected for analyses for isotopic thorium and isotopic uranium. Additionally, one sample from the background boring was also analyzed. Quality assurance testing at the laboratory resulted in that background sample being analyzed as a laboratory duplicate. A total of two background samples, duplicates from a single sample, and three samples exhibiting elevated gamma spec readings were analyzed for isotopic uranium and isotopic thorium. The background sample exhibited uranium isotope concentrations at or below laboratory background values for U-235, 1.12 to 1.89 pCi/gm U-234, and 0.502 to 2.14 pCi/gm U-238 in the duplicate analyses. The isotopic thorium results from those two analyses were very consistent between samples, 0.533($\pm$0.135) and 0.556($\pm$0.174) pCi/gm for Th-228, 0.70($\pm$0.122) and -0.01($\pm$0.003) pCi/gm for Th-230, and 0.337($\pm$0.11) to 0.396($\pm$0.143) pCi/gm for Th-232 in the background samples.

The initial uranium analyses were measured by gamma spec. In order to reduce the uncertainties, the samples were subsequently analyzed by alpha spec for uranium.

Isotopic uranium concentrations by gamma spec were fairly consistent in the three samples from the three elevated gamma locations. U-234 measured 71.5, 64.4 and 61.4 pCi/gm in the three samples: 78E 18N from two to three feet, 81E 5N from three to four feet, and 81E 5N from two to three feet, respectively. U-235 was less than the laboratory background value for all three samples. U-238 measured 52.3, 53.8 and 50.0 pCi/gm for the same samples. The isotopic uranium concentrations measured by alpha spec were also consistent in the three samples from the elevated gamma locations. U-234 measured 30.0, 89.6 and 51.1 pCi/gm; U-235/-236 measured 3.25, 10.4 and 7.47 pCi/gm; and U-238 measured 32.0, 82.8 and 52.4 pCi/gm. The background sample measured 1.66 pCi/gm U-234, 0.08 pCi/gm U-235/-236, and 1.62 pCi/gm U-238. The apparent differences in uranium nuclide concentrations between the gamma spec and alpha spec analyses are likely the result of the influence of sample inhomogeneties owing to the small aliquot size. Aliquots ranged from 2.0 grams to 0.01 grams.

Isotopic thorium also showed relatively consistent values between the three elevated gamma samples. The sample from 78E 18N, two to three feet, however, showed the highest of all the three thorium isotopes. Maximum concentrations of 399 pCi/gm Th-228, 263 pCi/gm Th 230, and 342 pCi/gm Th-232 were measured in that sample. A complete tabulation of the isotopic uranium results by gamma spec is presented in Table 5. The results of uranium analysis by alpha spec are presented in Table 5a. Isotopic thorium results are presented in Table 6.

The relative ratios between the uranium and thorium isotopes, on the order of 1:5 or 1:6 uranium to thorium, are consistent with the U:Th ratios found in naturally occurring monazite sand. Monazite sand was the source material from which the thorium was reportedly extracted at the 316 E. Illinois building operated by the Lindsay Light Company. Dr. David Dooley, principal of MJW, the health physics consultant for this project, has concurred with the consistency of these findings and the indication of a monazite sand source. Additionally, the works of Eisenbud et al. 1964, 1973; Linsalata et al. 1985; Roser et al. 1964; and Wedow, 1967, support these nuclide ratios and relative concentrations as indicative of monazite sand materials.

There does not appear to be any indication of a radioactive contamination source other than the monazite sand and the associated uranium, thorium and their naturally occurring daughter (breakdown) products.

3.4.2 RCRA Hazardous Waste Characteristics

The classification of material as hazardous waste can be either a result of the material being specifically listed as a hazardous waste, or as a result of exhibiting a characteristic of hazardous waste. Four characteristics are designated for the determination of hazardous waste:

Reactivity
Corrosivity
Ignitability
Toxicity

The characteristic of toxicity (Toxicity Characteristic Leaching Procedure TCLP Test) has thresholds set and specific extraction methods proposed for three sets of parameters: Metals, Volatiles and Semi-volatiles. All three characteristics were analyzed on the samples submitted.

The determination of whether the material might be classified as a hazardous waste was of a concern for the subsequent management of the material, should off-site removal and disposal be proposed as a remedial measure in the future. Two samples from the elevated gamma locations were submitted for hazardous waste characteristic testing. These samples had to be selected before the radioactive analyses were conducted due to the volume of sample required for the analyses. The results of the waste characteristic testing are presented in Table 7.

None of the parameters tested for either sample submitted exhibited characteristics which would result in the classification of the sampled material as hazardous waste.

4.0 ELEMENTARY RADIOLOGICAL RISK ASSESSMENT

An elementary radiological risk assessment for the Lindsay Light II site shows that the only potential exposure pathway to members of the general public working at or using the site parking facilities is via direct exposure. The most concern would be for the parking lot attendants who man the cash booths. Both of the check-out booths on site are located in background areas and therefore, individuals working at these locations would incur no greater risk than anyone else in the downtown Chicago area with regard to direct radiation exposure. Further, these individuals are typically captive in the cashier booth due to the volume of business and they do not typically walk around the site during slow periods. Therefore, the most reasonable scenario for exposure becomes an individual member of the public who parks their car in the lot in the same location each day and which corresponds to the location of the highest Bicron reading of 165 μRem/hr at one meter from the surface. If we assume that this individual parks in this location 250 days per year and spends a minimum of 5 minutes per day outside the car directly over the highest measured location, the calculated annual dose would be 165 μRem/hr x 250 days/yr x 5 min/day x 1 hr/60 min. = 3,438 μRem/hr or 3.4 mrem/yr. This calculated dose would only apply to an individual who spent time outside the car without moving off the elevated location. This may be a reasonable scenario for summer months but seems more unlikely for winter months. Further, the likelihood of someone parking in the same location every day without a reserved parking space is very remote.

In a more realistic case where an individual only occasionally (say 20 percent of the time) parks in the location where he could be subjected to the maximum dose rate, the actual annual dose is likely much less than 1 mrem/yr (165 μRem/hr x (0.2 x 250 days/yr) x 5 min/day x 1 hr/60 min. = 687.6 μRem/hr or 0.69 μRem/yr). Such a dose satisfies all current as well as all proposed federal regulations concerning allowable doses to individual members of the general public from sources of residual radioactive material accessible by the general public in unrestricted areas. Under either the maximum exposure conditions or the realistic conditions, the site does not present a risk beyond that of the normal radiation environment in the downtown Chicago area.

5.0 CONCLUSIONS

The investigation of the 316 E. Illinois site had three principal objectives. These were to identify the apparent distribution or location of the contamination at the site, document the type and relative quantities of radioactive materials, and determine whether the material exhibited characteristics of hazardous waste.

The distribution and location of the radionuclide contamination is evident in the overland gamma survey results using a NaI scintillometer. These data identified eleven (11) relatively small areas and one (1) larger area with elevated gamma readings. The larger area appears to lie within the footprint of the former stable building. The western one-third of that building footprint exhibits the highest readings found on-site in the surface gamma survey. The remaining areas may be the results of tracking of radioactive material from the building during demolition of the structure and subsequent site grading. The more distant locations generally show lower levels of gamma radiation.

The overland survey of locations with elevated gamma radiation using a Bicron tissue equivalent meter showed similar elevated readings for most of the 12 identified areas. Background threshold values of $m + 2\sigma$ were exceeded in 10 of the 12 areas (except areas 1 and 2). The highest reading was near the southeast corner of the building at station 76E 4N, where a reading of 165.5 μrem/hr was measured at a one meter (typical whole body dose) elevation. At that location, a surface (1 cm elevation) reading measured 650 μrem/hr.

These overland gamma survey results show consistently low background readings with areas of elevated gamma readings greater than the average background plus 2 standard deviations. These data suggest the surface gamma surveys using the 2x2 inch NaI scintillometer equipment are capable of identifying the areal extent of gamma-emitting materials on site with an accuracy of about 1 to 2 meters for the contaminant borders. The down-hole survey results show distinctly different gamma readings in background, transitional and elevated gamma areas. The consistency of the natural soils at depth and the shallow depth of all the materials showing elevated gamma readings indicates this method and equipment is capable of distinguishing the depth of gamma-emitting

materials in the subsurface. These data indicate that the material exhibiting the highest gamma radiation is at a depth of 0.8 to about 1.4 meters. The consistently low readings in the upper 0.4 meters, even in areas where the highest subsurface reading are measured, indicates this surface blanket of asphalt, base course gravel and fill is not a zone of contamination, but rather an existing barrier, isolating the contamination present at greater depths.

These overland gamma and down-hole gamma surveys define in general terms the distribution and location, both horizontally and vertically of the radioactive contamination.

The samples which were submitted for chemical analyses showed no characteristics which could result in their classification as hazardous waste. The radioactive analysis found the gamma-emitting radionuclides present are characteristic of the thorium and uranium decay series. The isotopic uranium and isotopic thorium analyses indicate the relative ratios of these elements are typical of the ratios which would be found in monazite sands from which thorium was reportedly extracted on-site.

On the basis of the gamma spec and isotopic thorium and isotopic uranium analyses, there is no indication of a radioactive contamination source other than the monazite sand containing naturally occurring uranium, thorium and their respective breakdown products. An elementary radiological risk assessment for the Lindsay Light II site shows that the only potential exposure pathway to members of the general public working at or using the site parking facilities is via direct exposure. Under either the maximum exposure conditions or the realistic conditions (discussed in Section 4.0), the site does not present a risk beyond that of the normal radiation environment in the downtown Chicago area.

6.0 REFERENCES

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TABLES

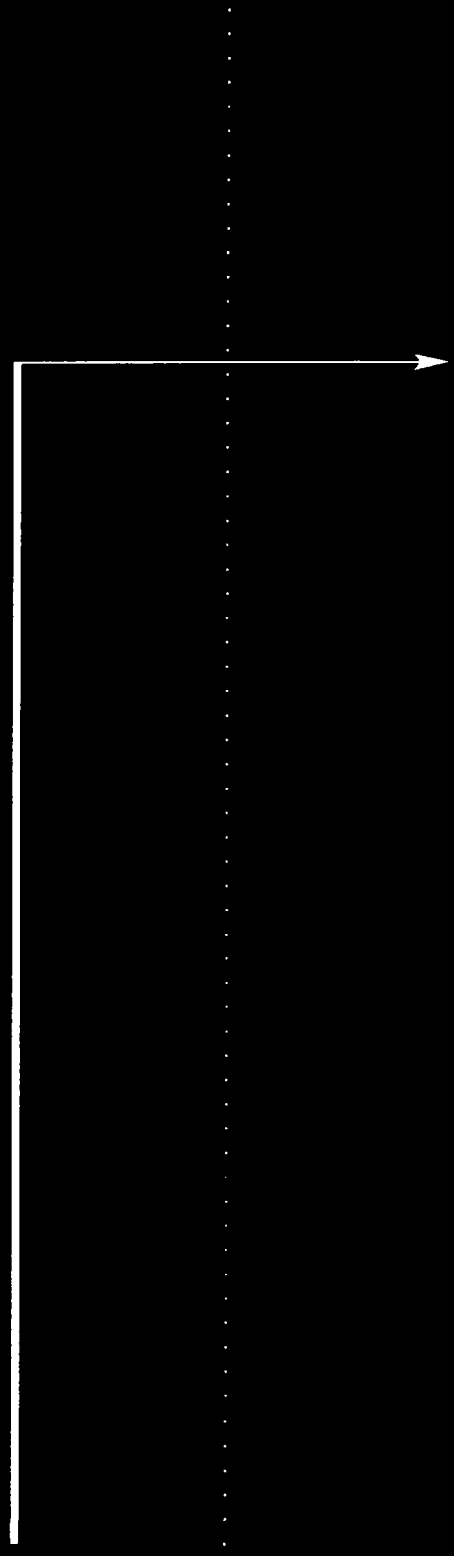

Table 4
GAMMA SPEC ANALYSIS*
(concentration in pCi/gm)

Sample Number	Lab Number	K-40	Co-57	Co-60	Y-88	Cd-109	Sn-113	I-129	Cs-137
CD-S156E49N-2-3	5179-001	13.9							
CD-S156E49N-2-3	5179-001Dp	7.53							
CD-S156E49N-3-4	5179-002	12							
CD-S82E25N-2-3	5179-003								
CD-S82E25N-3-4	5179-004								
CD-S78E18N-2-3	5179-005	149							
CD-S78E18N-3-4-9	5179-008	35.1							
CD-S78E18N-3-4	5179-009								
CD-S89E16N-2-3	5179-006								
CD-S89E16N-3-4	5179-007								
CD-S81E5N-2-3-9	5179-010	42.1							
CD-S81E5N-3-4	5179-011	85.1							
CD-S81E5N-2-3	5179-012								

Sample Number	Lab Number	Ce-139	Ce-141	Hg-203	Tl-208	Pb-210	Pb-212	Bi-212
CD-S156E49N-2-3	5179-001					1.56		
CD-S156E49N-2-3	5179-001DP							
CD-S156E49N-3-4	5179-002					1.84		
CD-S82E25N-2-3	5179-003				131	53	322	271
CD-S82E25N-3-4	5179-004				17.5		48.5	34.1
CD-S78E18N-2-3	5179-005				544		1250	1160
CD-S78E18N-3-4-9	5179-008				134	33.9	352	264
CD-S78E18N-3-4	5179-009				127	30.6	319	257
CD-S89E16N-2-3	5179-006				20.1	18.3	56.3	41.8
CD-S89E16N-3-4	5179-007				19.6		55.3	40.6
CD-S81E5N-2-3-9	5179-010				168		361	299
CD-S81E5N-3-4	5179-011				288	39.3	754	579
CD-S81E5N-2-3	5179-012				230	104	574	466

*Laboratory results in Attachment E.

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Table 4
GAMMA SPEC ANALYSIS (cont.)*
(concentration in pCi/gm)

Sample Number	Lab Number	Ra-223	Ra-224	Ra-226	Ra-228	Th-228	Th-230
CD-S156E49N-2-3 [1]	5179-001			1.24	<1.12	<6.49	<18.6
CD-S156E49N-2-3 [1]	5179-001Dp			<0.334	<1.62	<17.4	<82.9
CD-S156E49N-3-4 [1]	5179-002			1.78	<1.14	<5.70	<15.7
CD-S82E25N-2-3 [2]	5179-003	67.6	393	60.7	418	543	<149
CD-S82E25N-3-4 [2]	5179-004	13.3		9.78	53.9	10.6	<248
CD-S78E18N-2-3 [3]	5179-005		1660	162	1850	2040	<252
CD-S78E18N-3-4-9 [3]	5179-008		406	47.2	443	438	<142
CD-S78E18N-3-4 [3]	5179-009	80.3	384	41.4	412	528	<147
CD-S89E16N-2-3 [2]	5179-006	11.7	48.5	15.1	65.5	85.5	<65.6
CD-S89E16N-3-4 [2]	5179-007			13.9	59.6	<53.1	<269
CD-S81E5N-2-3-9 [3]	5179-010	75.8		92.6	475	760	<679
CD-S81E5N-3-4 [3]	5179-011		964	39.1	965	1160	<195
CD-S81E5N-2-3 [3]	5179-012	123	631	131	741	936	<194

Sample Number	Lab Number	Th-234	Pa-234	U-234	U-235	Am-241
CD-S156E49N-2-3	5179-001	<1.76		<57.2	<0.689	
CD-S156E49N-2-3	5179-001Dp	<3.61		<723	<1.18	
CD-S156E49N-3-4	5179-002	<1.92		<51.1	<0.614	
CD-S82E25N-2-3	5179-003	65.9		<392	<4.61	
CD-S82E25N-3-4	5179-004	35.9		<1850	<2.83	
CD-S78E18N-2-3	5179-005	159	579	<679	<7.96	
CD-S78E18N-3-4-9	5179-008	80.3		<361	<4.10	
CD-S78E18N-3-4	5179-009	73.8		<381	<4.53	
CD-S89E16N-2-3	5179-006	<3.59		<173	<1.93	
CD-S89E16N-3-4	5179-007	<7.20		<2040	<3.12	
CD-S81E5N-2-3-9	5179-010	<19.5		<5220	<8.14	
CD-S81E5N-3-4	5179-011	<12.5		<492	<5.75	
CD-S81E5N-2-3	5179-012	121		<514	<6.18	

[1] - Background sample
[2] - Transitional sample
[3] - High Gamma sample

*Labortory results in Attachment E.

Table 4a

Thorium Decay Chain Radionuclide Identification Parameters

Isotope	Energy (KeV)	Abundance (%)
Ra-228 (Ac-228)	338.32 911.07 969.11	11.4 27.7 16.6
Th-228	84.37 215.98	1.2 0.2
Ra-224	240.98	4.0
Pb-212	74.81 77.11 87.3 238.63 300.09	10.7 18.0 8.0 44.6 3.4
Bi-212	727.17 785.46 1620.62	11.8 2.0 2.8
Tl-208	277.35 510.84 583.14 860.37	6.8 21.6 84.2 12.5

Table 5

ISOTOPIC URANIUM*
(concentration in pCi/gm)

Sample	Lab No.	U-238	U-235 U-236	U-234
CD-S156E49N-2-3	5179-001	2.14 ±2.02	0.0517 ±1.22	1.12 ±1.74
CD-S156E49N-2-3	5179-001 Dup.	0.502 ±1.29	-0.0627** ±-0.911	1.89 ±1.95
CD-S78E18N-2-3	5179-005	52.3 ±30.2	12.8 ±18.7	71.5 ±32.7
CD-S81E5N-3-4	5179-011	53.8 ±30.8	-7.22 ±13	64.4 ±32.6
CD-S81E5N-2-3	5179-012	50.0 ±27.8	-3.28 ±10.7	61.4 ±29.6

*Laboratory results in Attachment E. (Errors reported at 2 standard deviations)

** (-)negative concentration results from background values above the measured concentration.

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Table 5a

ISOTOPIC URANIUM BY ALPHA SPECTROSCOPY*
(concentration in pCi/gm)

Sample	Lab No.	U-238	U-235 U-236	U-234
CD-S156E49N-2-3	9369-001	1.62 ±0.55	0.08 ±0.12	1.66 ±0.56
CD-S78E18N-2-3	9369-002	32.0 ±6.8	3.25 ±1.08	30.0 ±6.4
CD-S81E5N-3-4	9369-003	82.8 ±17.2	10.4 ±2.6	89.6 ±18.6
CD-S81E5N-2-3	9369-004	52.4 ±11.1	7.47 ±2.04	51.1 ±10.8

*Laboratory results are in Attachment E. (Errors reported at 2 standard deviations)

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Table 6

ISOTOPIC THORIUM*
(concentration in pCi/gm)

Sample	Lab No.	Th-232	Th-230	Th-228
CD-S156E49N-2-3	5179-001	0.337 ±0.11	0.700 ±0.122	0.533 ±0.135
CD-S156E49N-2-3	5179-001 Dup	0.396 ±0.143	-0.0105 ±0.003	0.556 ±0.174
CD-S78E18N-2-3	5179-005	342 ±52.9	8.83 ±1.51	399 ±58.8
CD-S81E5N-3-4	5179-011	297 ±44.3	-20.0 ±4.36	382 ±53
CD-S81E5N-2-3	5179-012	222 ±36.8	-34.8 ±8.18	254 ±40.3

*Laboratory results in Attachment E. (Errors reported at 2 standard deviations)

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Table 7

HAZARDOUS WASTE CHARACTERISTICS*

VOLATILES TCLP ANALYSIS
ug/L

	CD-S81E5N-2-3	CD-S78E18N-2-3
Vinyl Chloride	U	U
1,1-Dichloroethene	U	U
Chloroform	U	U
1,2-Dichloroethane	U	U
2-Butanone	U	U
Carbon Tetrachloride	U	U
Trichloroethene	290**	U
Benzene	U	U
Tetrachloroethene	U	U
Chlorobenzene	U	U

U = Not detected

*Laboratory results in Attachment E.

**TCLP hazardous waste level 500 ug/L

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Table 7 (cont.)

HAZARDOUS WASTE CHARACTERISTICS*

REACTIVITY, CORROSIVITY, IGNITABILITY

	CD-S81E5N-2-3	CD-S78E18N-2-3
Cyanide	<0.549 ug/g	<0.59 ug/g
Sulfides	<12.1 ug/g	<12.4 ug/g
Flash Pt	>60°C	>60°C
pH	7.26	8.47

*Laboratory results in Attachment E.

RGB:BBS:seb

Table 7 (cont.)

HAZARDOUS WASTE CHARACTERISTICS*

METALS (TCLP)
ug/L

	CD-S81E5N-2-3	CD-S78E18N-2-3
Arsenic	U	U
Barium [1]	78.7 B	477 B
Cadmium [2]	19.3 B	U
Chromium	U	U
Lead	U	U
Mercury	U	U
Selenium	U	U
Silver	U	U

U = Not detected

B = Above instrument detection limit. Below contract required detection limit.

[1] - TCLP hazardous waste level 100,000 ug/L
[2] - TCLP hazardous waste level 1,000 ug/L

*Laboratory results in Attachment E.

RGB:BI1:seb

Table 7 (cont.)

HAZARDOUS WASTE CHARACTERISTICS*

SEMI-VOLATILE TCLP ANALYSIS

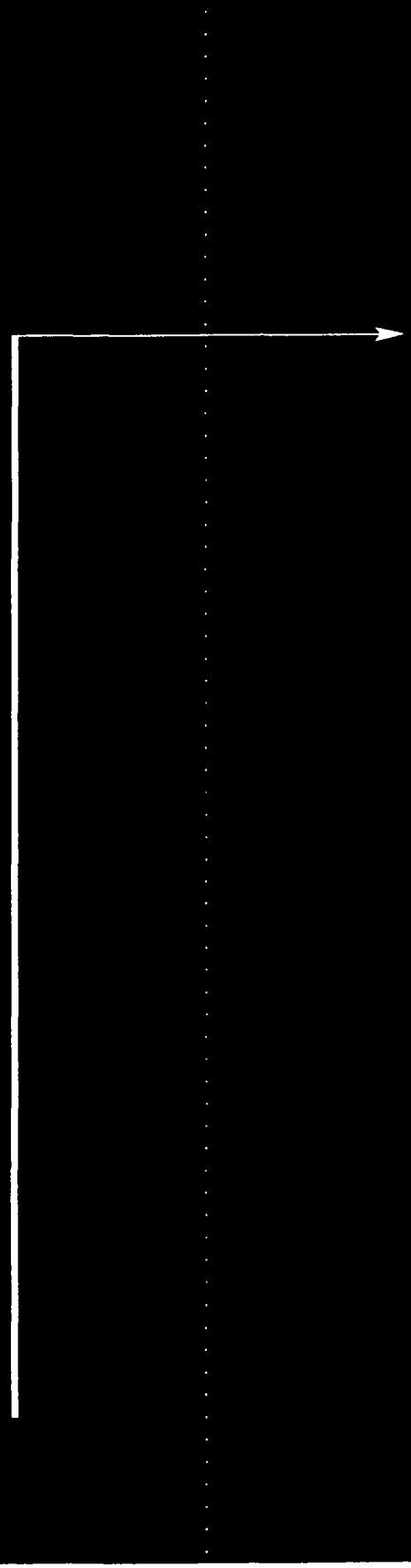
	CD-S81E5N-2-3	CD-S78E18N-2-3
Pyridine	U	U
1,4-Dichlorobenzene	U	U
2-Methylphenol	U	U
4-Methylphenol	U	U
Hexachloroethane	U	U
Nitrobenzene	U	U
Hexachlorobutadiene	U	U
2,4,6-Trichlorophenol	U	U
2,4,5-Trichlorophenol	U	U
2,4-Dinitrotoluene	U	U
Hexachlorobenzene	U	U
Pentachlorophenol	U	U

U = Not detected

*Laboratory results in Attachment E.

RGB:BI1:seb

FIGURES



STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT

316 E. ILLINOIS LOCATION MAP
CHICAGO DOCK & CANAL
316 E. ILLINOIS STREET
CHICAGO, ILLINOIS

DRAWN BY	KKB	2-22-94
CHECKED BY		
APPROVED BY	STN	2-22-94
SCALE: NTS	FIGURE NO.: 1-1	
STS DRAWING NO.: 27313-ZH		

LEGEND

● CATCH BASINS

GRS

RGB

RGB

J:\NBK94DWG\27313\27313ZH\
1:40

GAMMA RADIATION SURVEY
SITE LAYOUT

LINDSAY LIGHT II
316 E. ILLINIOS ST.
CHICAGO, ILLINOIS

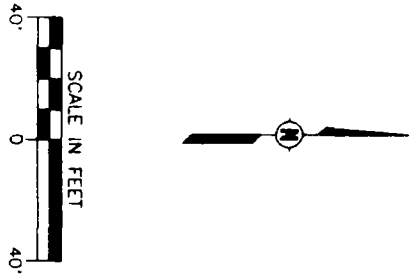
STS Consultants Ltd.

27313-ZH

27313ZH3

1" = 40'

FIGURE 1-2



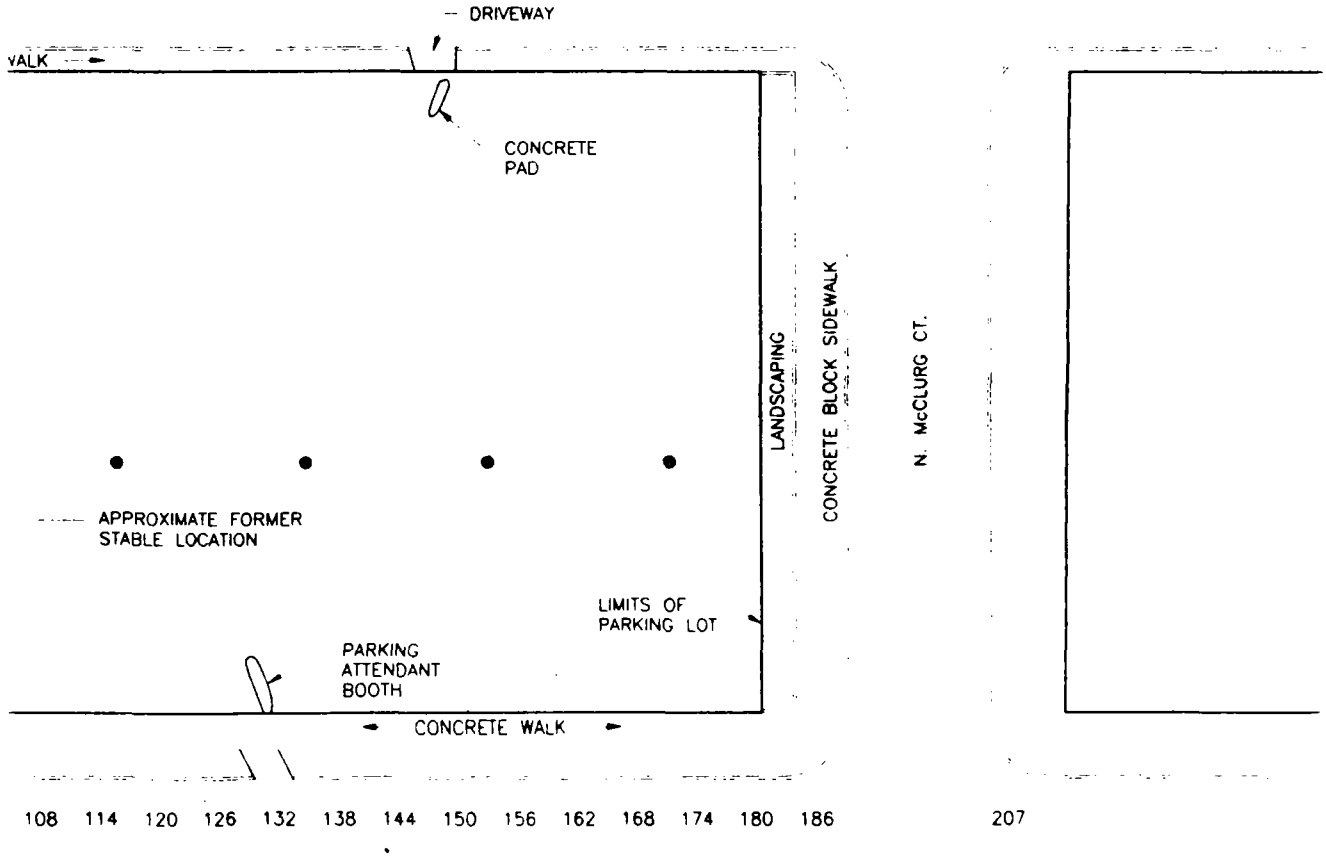
GAMMA RADIATION SURVEY
SITE LAYOUT

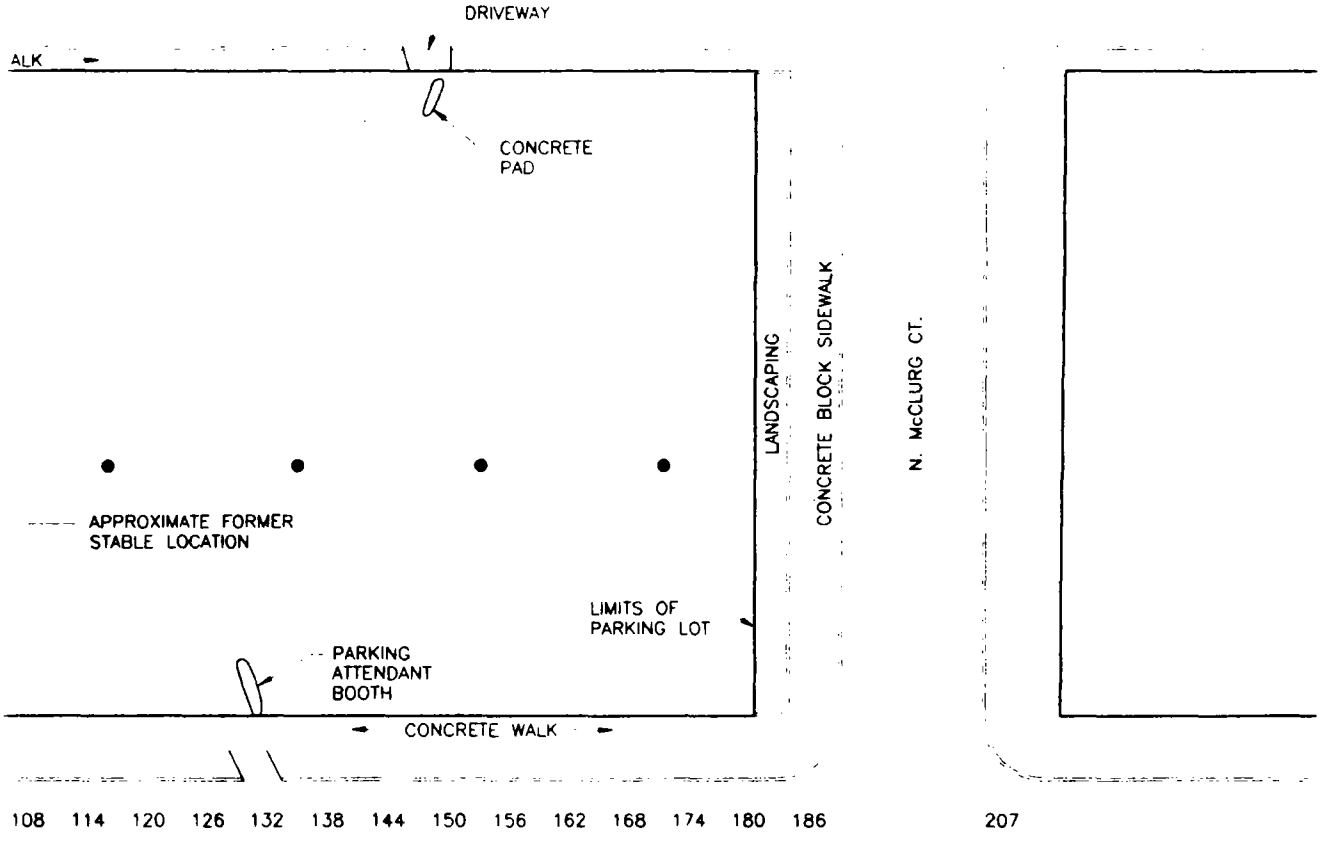
LINDSAY LIGHT II
316 E. ILLINIOS ST.
CHICAGO, ILLINOIS

DRAWN BY	GRS	7-15-94
CHECKED BY	RGB	7-15-94
APPROVED BY	RGB	7-15-94

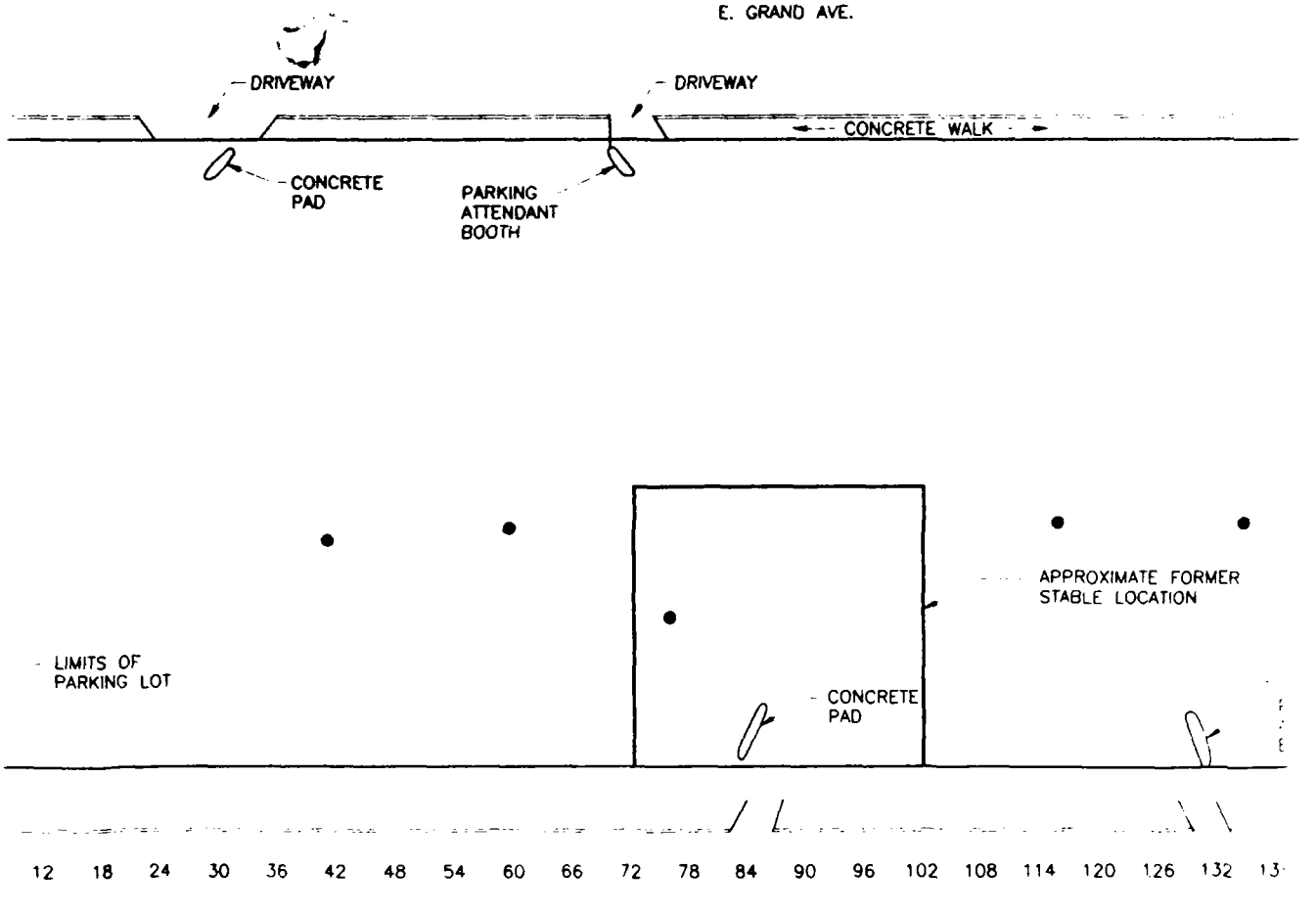
ADDLE
J:\NBK94DWG\27313\27313ZH\27313ZH3.DWG
1:40

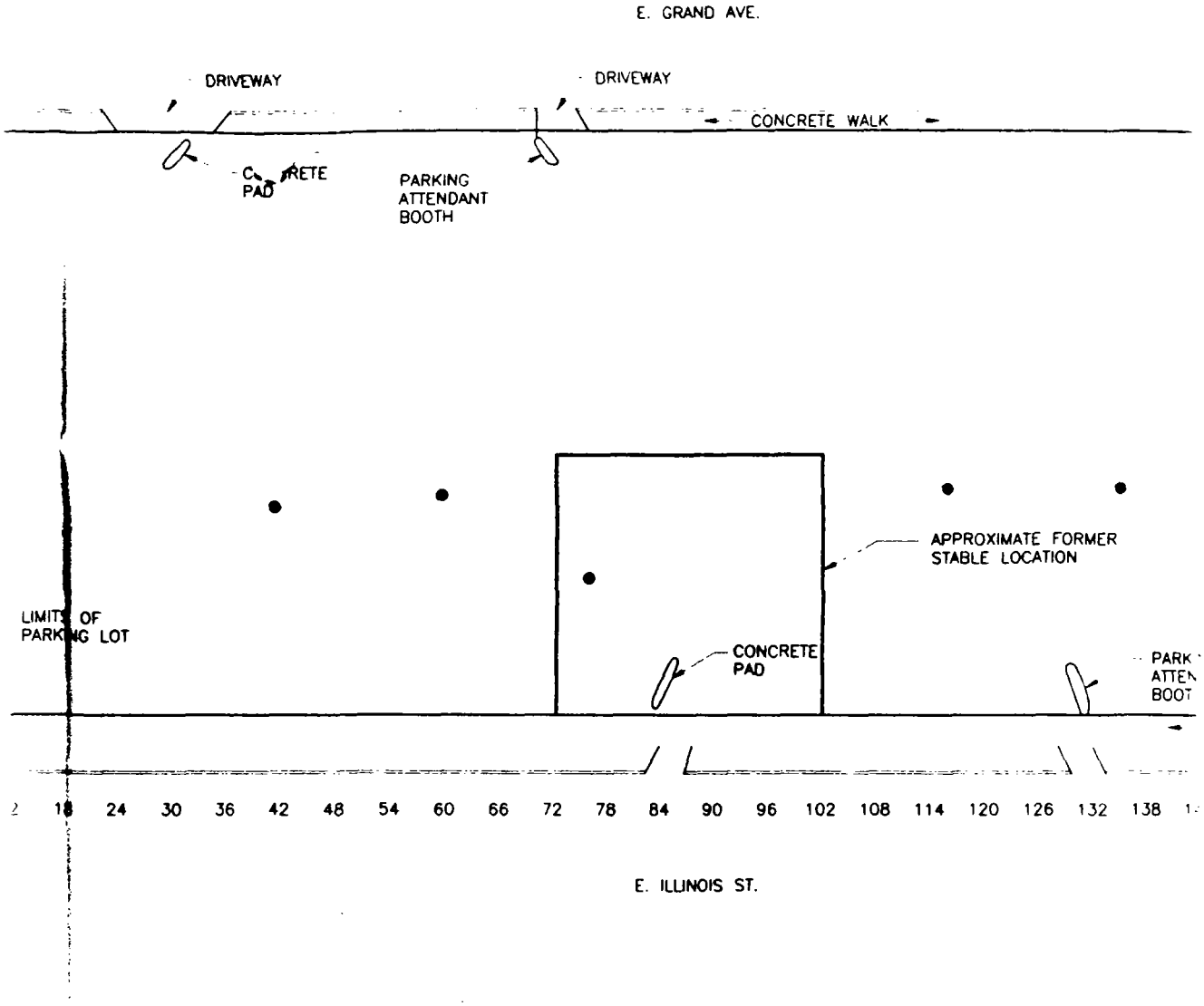
REVISION NO	DESCRIPTION	DATE	BY


DRIVEWAY
VALK
CONCRETE
PAD
LANDSCAPING
CONCRETE BLOCK SIDEWALK
N. McCLURG CT.
APPROXIMATE FORMER
STABLE LOCATION
LIMITS OF
PARKING LOT
PARKING
ATTENDANT
BOOTH
CONCRETE WALK
108 114 120 126 132 138 144 150 156 162 168 174 180 186
207


DRIVEWAY
ALK
CONCRETE PAD
LANDSCAPING
CONCRETE BLOCK SIDEWALK
N. McCLURG CT.
APPROXIMATE FORMER STABLE LOCATION
LIMITS OF PARKING LOT
PARKING ATTENDANT BOOTH
CONCRETE WALK
108 114 120 126 132 138 144 150 156 162 168 174 180 186
207

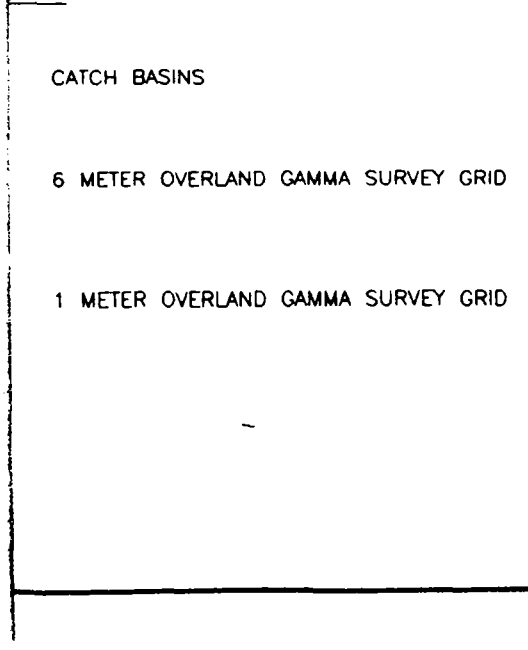
LEG


E. GRAND AVE.
DRIVEWAY
DRIVEWAY
CONCRETE WALK
CONCRETE PAD
PARKING ATTENDANT BOOTH
APPROXIMATE FORMER STABLE LOCATION
LIMITS OF PARKING LOT
CONCRETE PAD
12 18 24 30 36 42 48 54 60 66 72 78 84 90 96 102 108 114 120 126 132
E. ILLINOIS ST.


E. GRAND AVE.
DRIVEWAY
DRIVEWAY
CONCRETE WALK
CONCRETE PAD
PARKING ATTENDANT BOOTH
APPROXIMATE FORMER STABLE LOCATION
LIMITS OF PARKING LOT
CONCRETE PAD
2 18 24 30 36 42 48 54 60 66 72 78 84 90 96 102 108 114 120 126 132 138
E. ILLINOIS ST.

N. COLUMBUS DRIVE
66
60
54
48
42
36
30
24
18
12
6
0
CONCRETE WALK
LIMITS OF
PARKING LOT
0
6
12
18
24

66
60
54
48
42
36
30
24
18
12
6
0
N. COLUMBUS DRIVE
CONCRETE WALK
LIMITS OF
PARKING
0
6
12
18

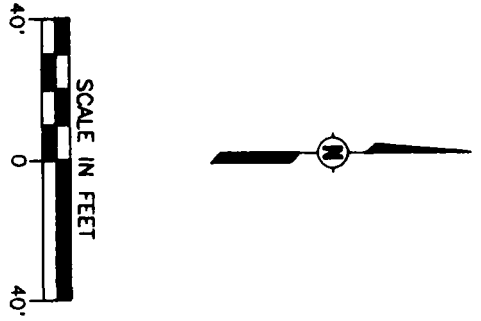


GAMMA RADIATION SURVEY
SITE GRID

LINDSAY LIGHT II
316 E. ILLINIOS ST.
CHICAGO, ILLINOIS

STS Consultants Ltd.
Consulting Engineers

STS PROJECT NUMBER	27313-ZH
STS PROJECT FILE	27313ZH4
SCALE	1" =40'
SHEET NUMBER	FIGURE 2-1



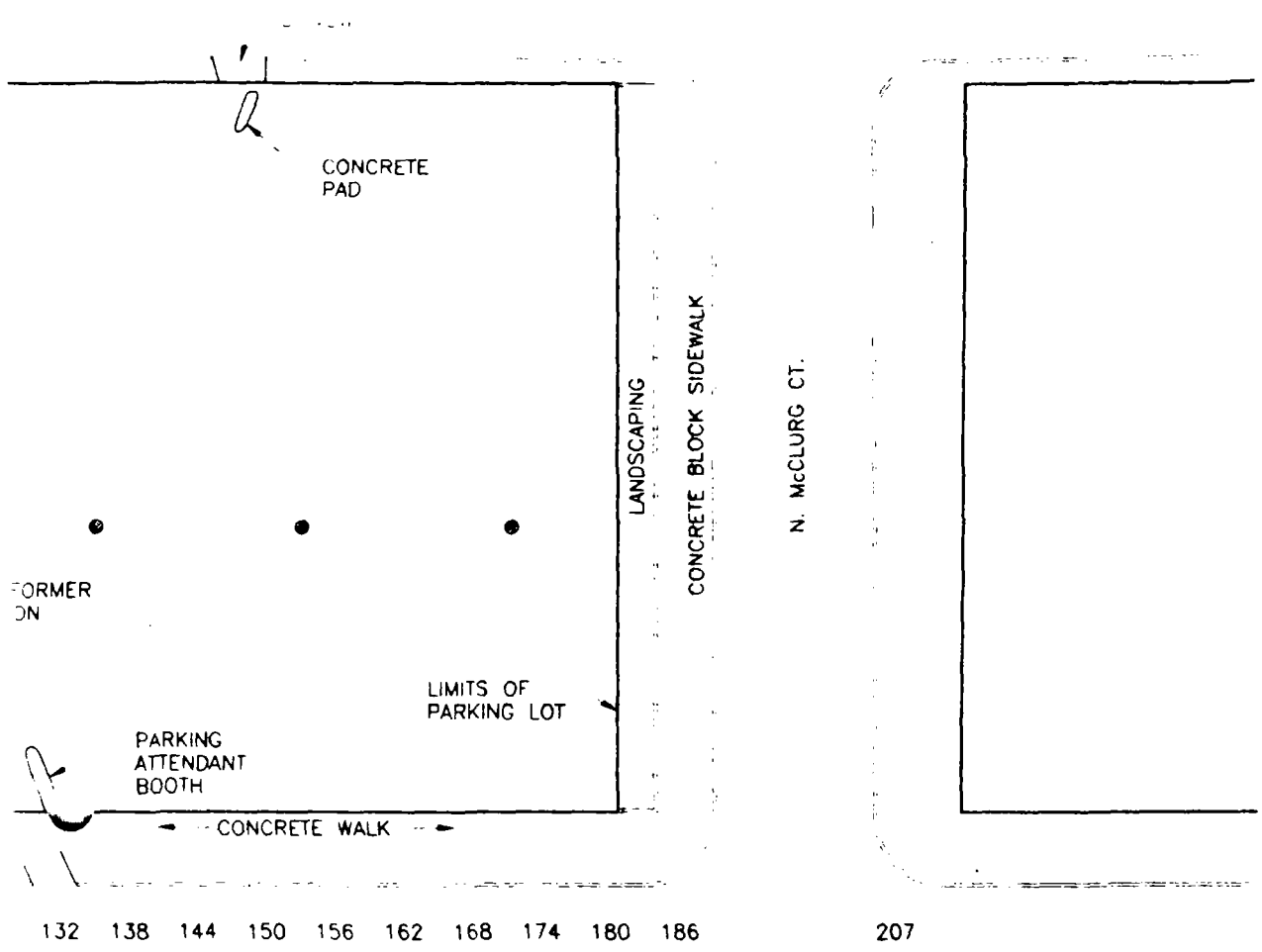
ON SURVEY
RID

GHT II
IIOS ST.
LINOIS

DRAWN BY	GRS	DATE	7-15-94
CHECKED BY	RGB	DATE	7-15-94
APPROVED BY	RGB	DATE	7-15-94

CADFILE
J:\NBK94DWG\27313\27313ZH\27313ZH4.DWG
1:40

REVISION NO	DESCRIPTION	DATE	BY

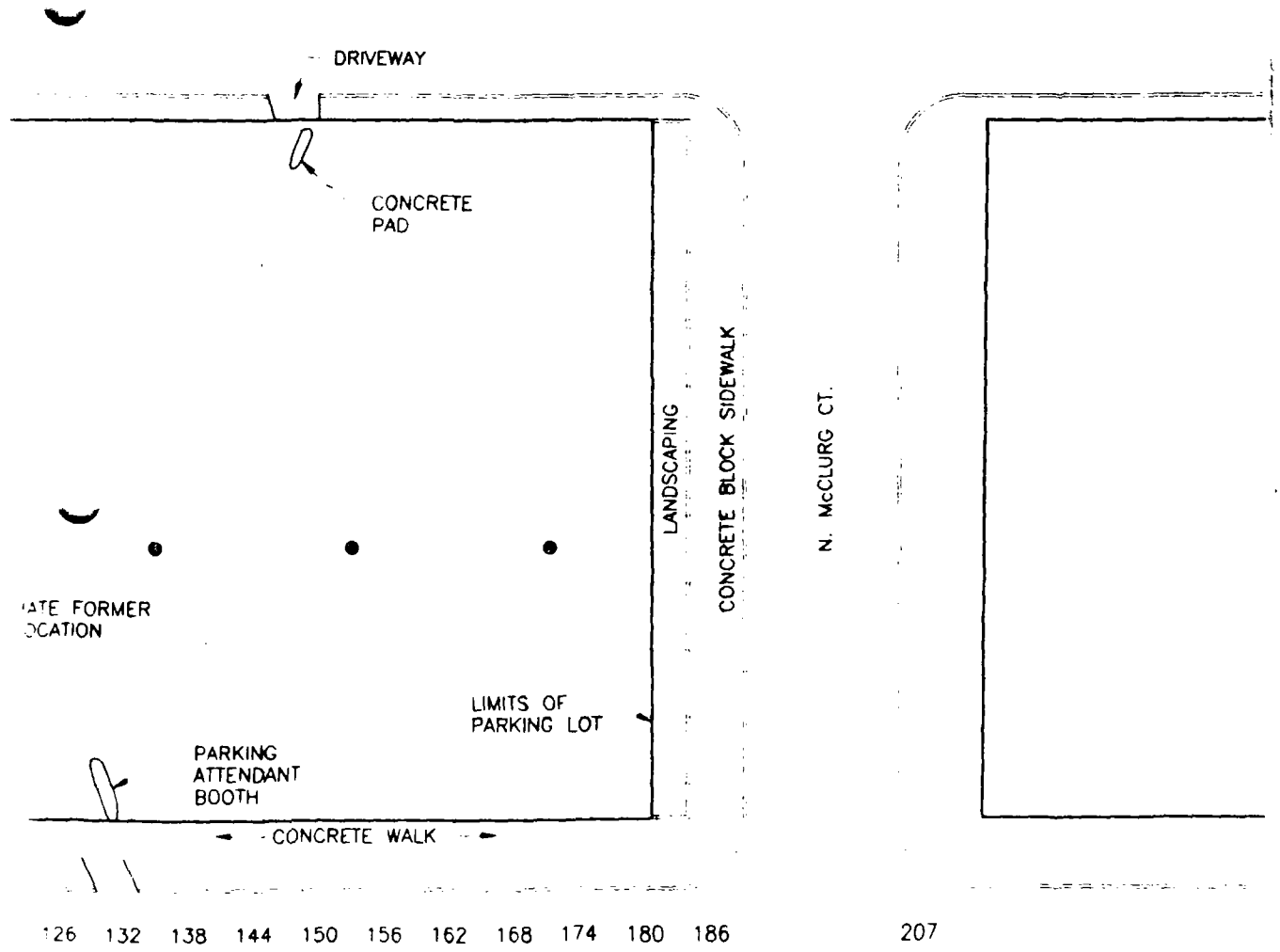


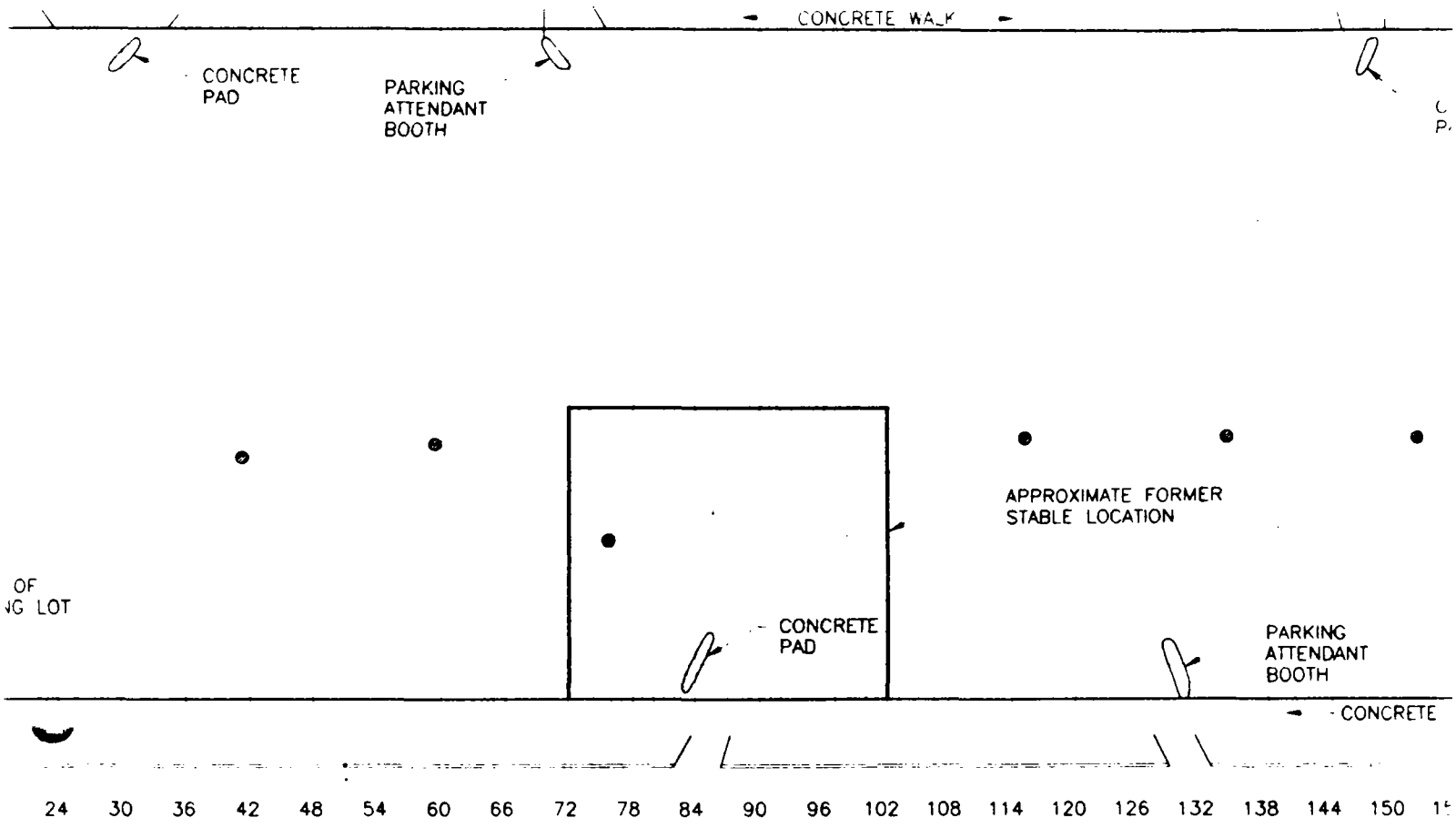
LEGEND

● CATCH BASINS

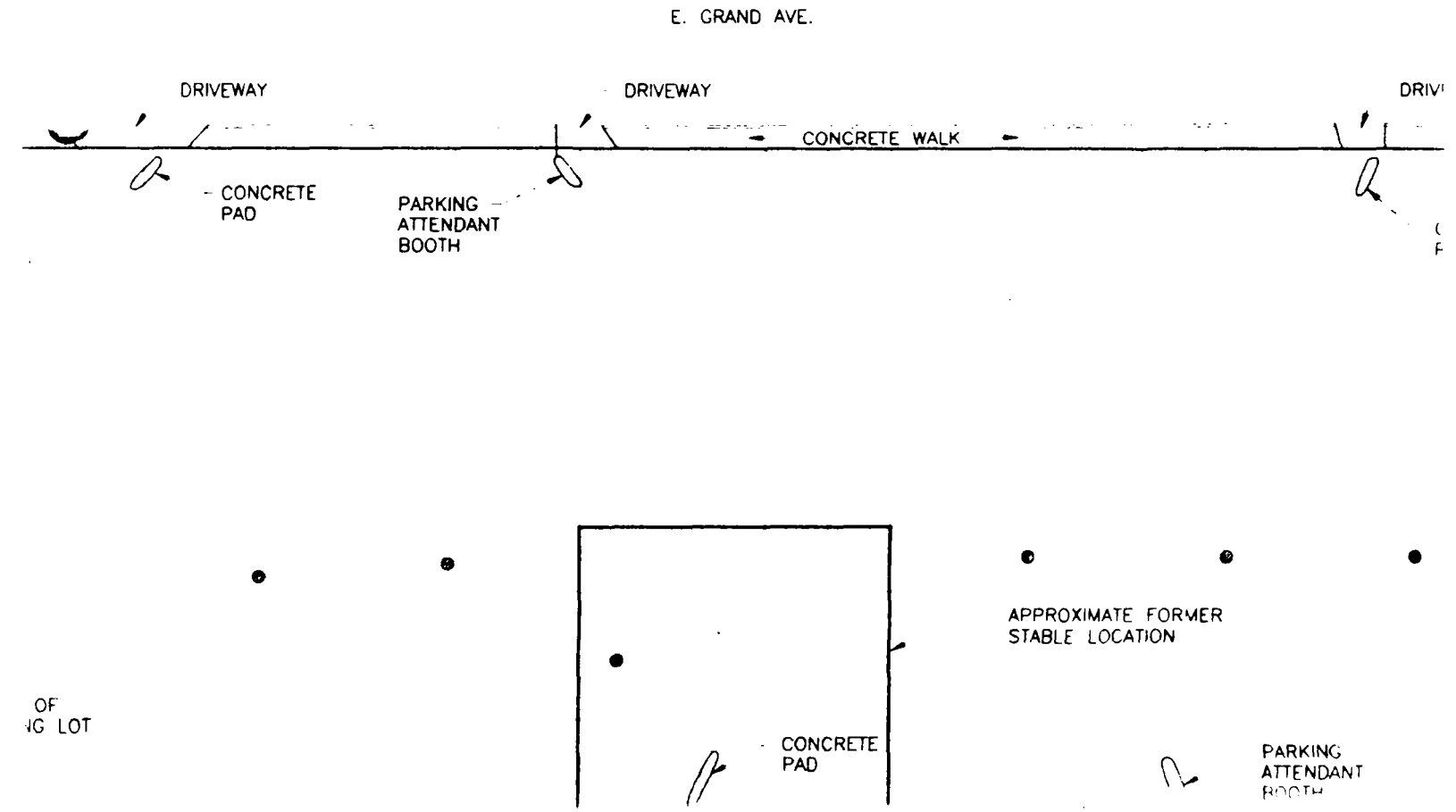
6 METER OVERLAND GAMMA

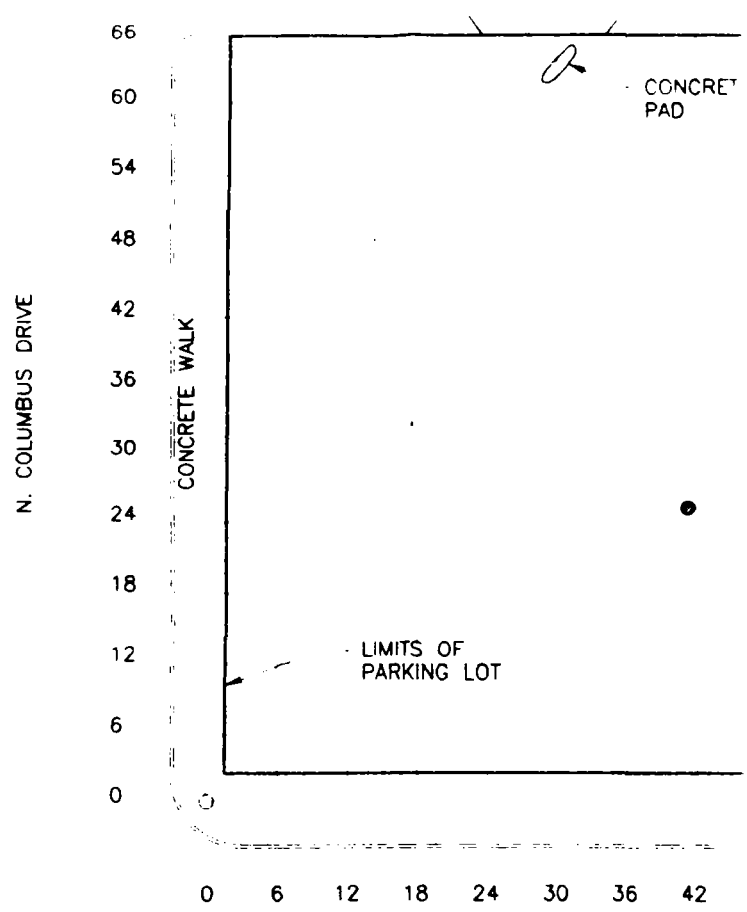
1 METER OVERLAND GAMMA

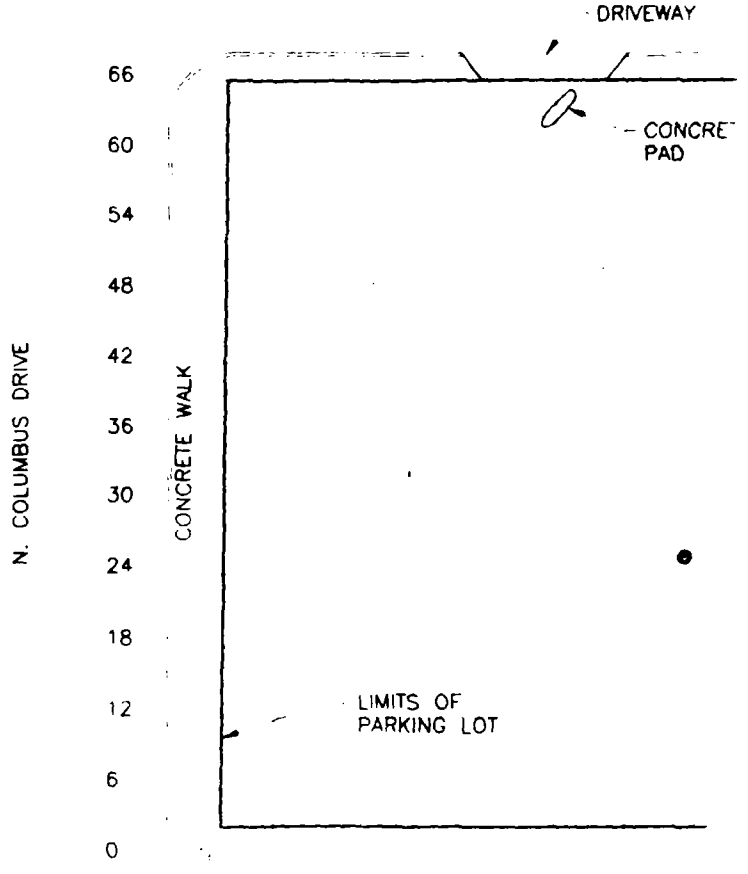

SCAL
40'
DRIVEWAY
CONCRETE
PAD
LANDSCAPING
CONCRETE BLOCK SIDEWALK
N. McCLURG CT.
ATE FORMER
OCATION
LIMITS OF
PARKING LOT
PARKING
ATTENDANT
BOOTH
CONCRETE WALK
126
132
138
144
150
156
162
168
174
180
186
207

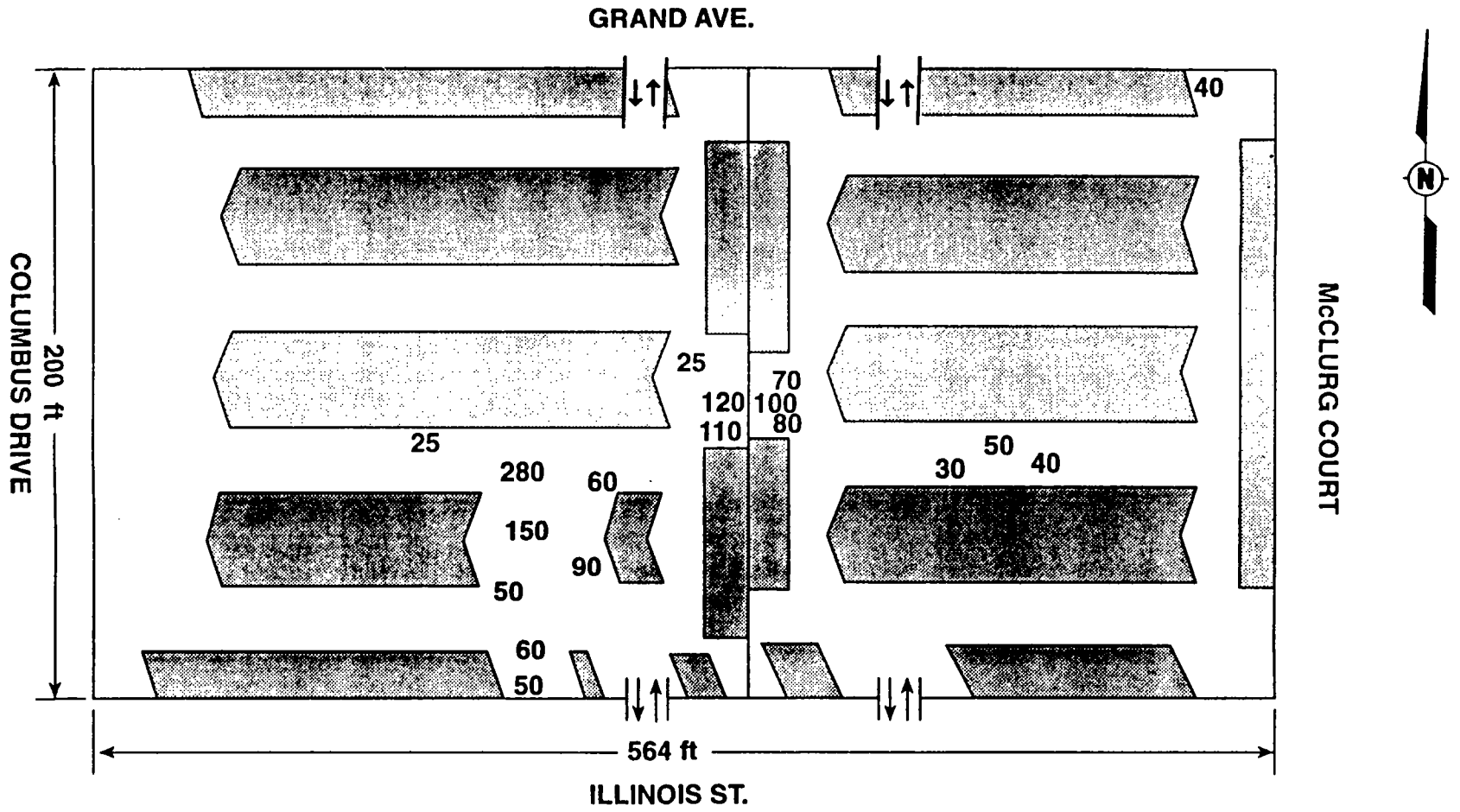


E. ILLINOIS ST.


E. GRAND AVE.
DRIVEWAY
DRIVEWAY
CONCRETE WALK
CONCRETE PAD
PARKING ATTENDANT BOOTH
APPROXIMATE FORMER STABLE LOCATION
CONCRETE PAD
PARKING ATTENDANT


66
60
54
48
42
36
30
24
18
12
6
0
N. COLUMBUS DRIVE
CONCRETE WALK
CONCRET
PAD
LIMITS OF
PARKING LOT
0
6
12
18
24
30
36
42


DRIVEWAY
CONCRETE PAD
66
60
54
48
42
36
30
24
18
12
6
0
N. COLUMBUS DRIVE
CONCRETE WALK
LIMITS OF PARKING LOT

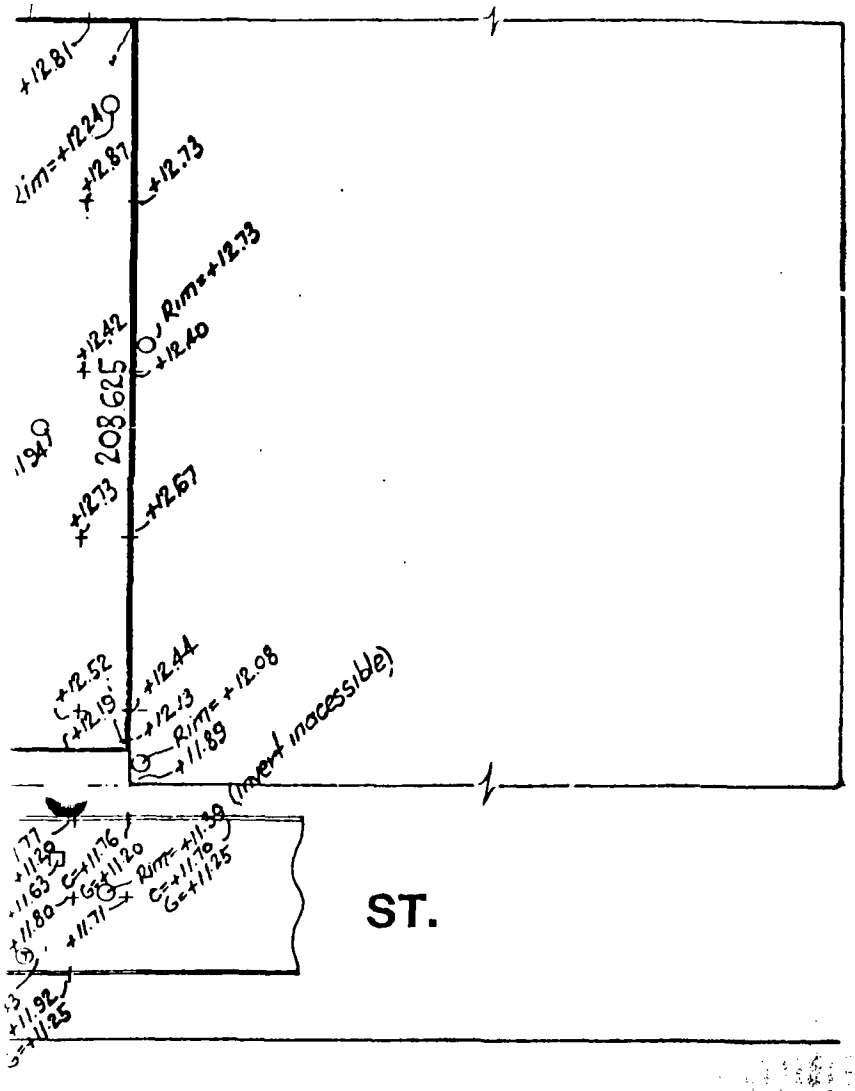


SHEET NO. FIGURE 1-3	SCALE NTS	STS PROJECT FILE	STS PROJECT NO. 27313-ZH

STS Consultants Ltd.
Consulting Engineers

USEPA RADIATION SURVEY RESULTS
LINDSAY LIGHT II SITE
316 E. ILLINOIS STREET
CHICAGO, ILLINOIS

DRAWN BY	KKB	DATE	2-22-94
CHECKED BY		DATE	
APPROVED BY	STN	DATE	2-22-94
CADFILE			



DRAWN BY

CHECKED BY

APPROVED BY

CADFILE

ELEVATION SURVEY
LINDSAY LIGHT II
316 E. ILLINOIS STREET
CHICAGO, ILLINOIS

STS Consultants Ltd.
Consulting Engineers

STS PROJECT NUMBER
27313-ZH

STS PROJECT FILE

SCALE
1"=40'

SHEET NUMBER
FIGURE 2-2

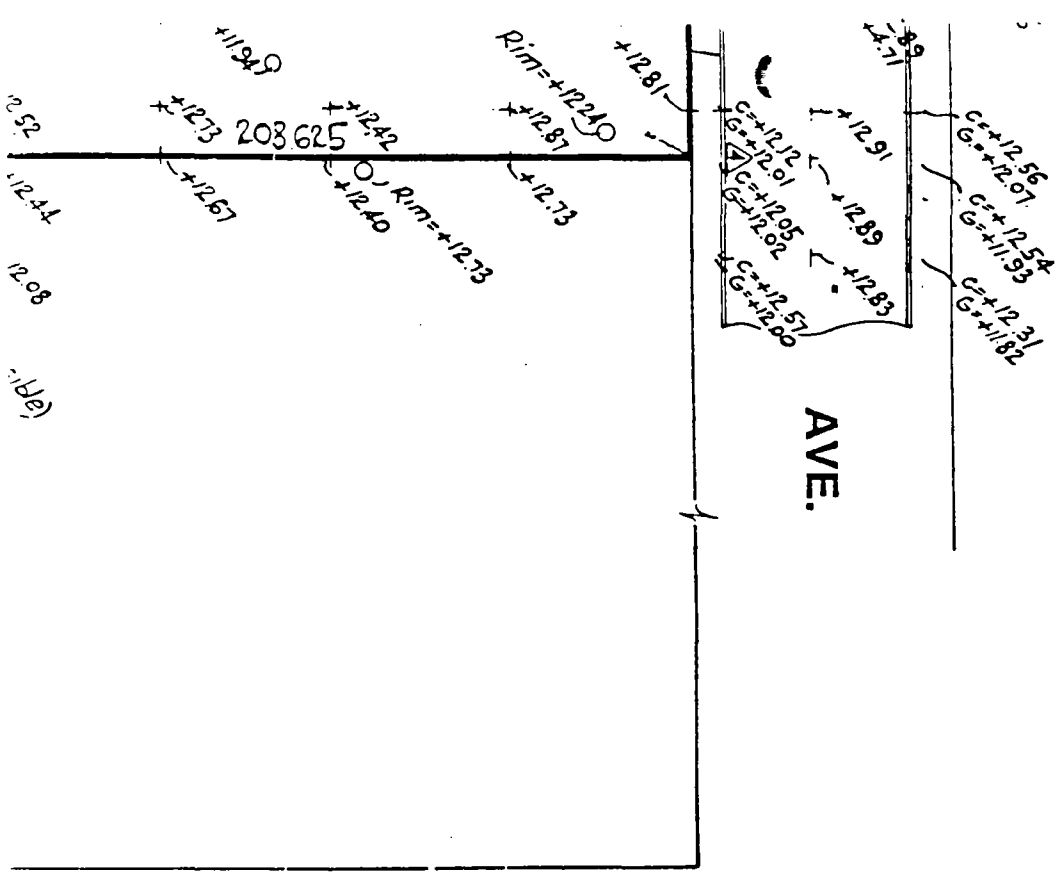
by

Chicago Guarantee Survey Company
123 W. Madison St. Chicago, Illinois 60602
Telephone: 312-726-6880 Fax: 312-236-1132
Date: AUGUST 13TH *, 1992*

by Robert J. Hannon
President

Attest: Ralph J. Van Doepe
Secretary

4th, 1992



ON SURVEY
Y LIGHT II
INOIS STREET
O, ILLINOIS

DRAWN BY	KKB	DATE	11-17-94
CHECKED BY		DATE	
APPROVED BY	RGB	DATE	11-17-94
CADFILE			

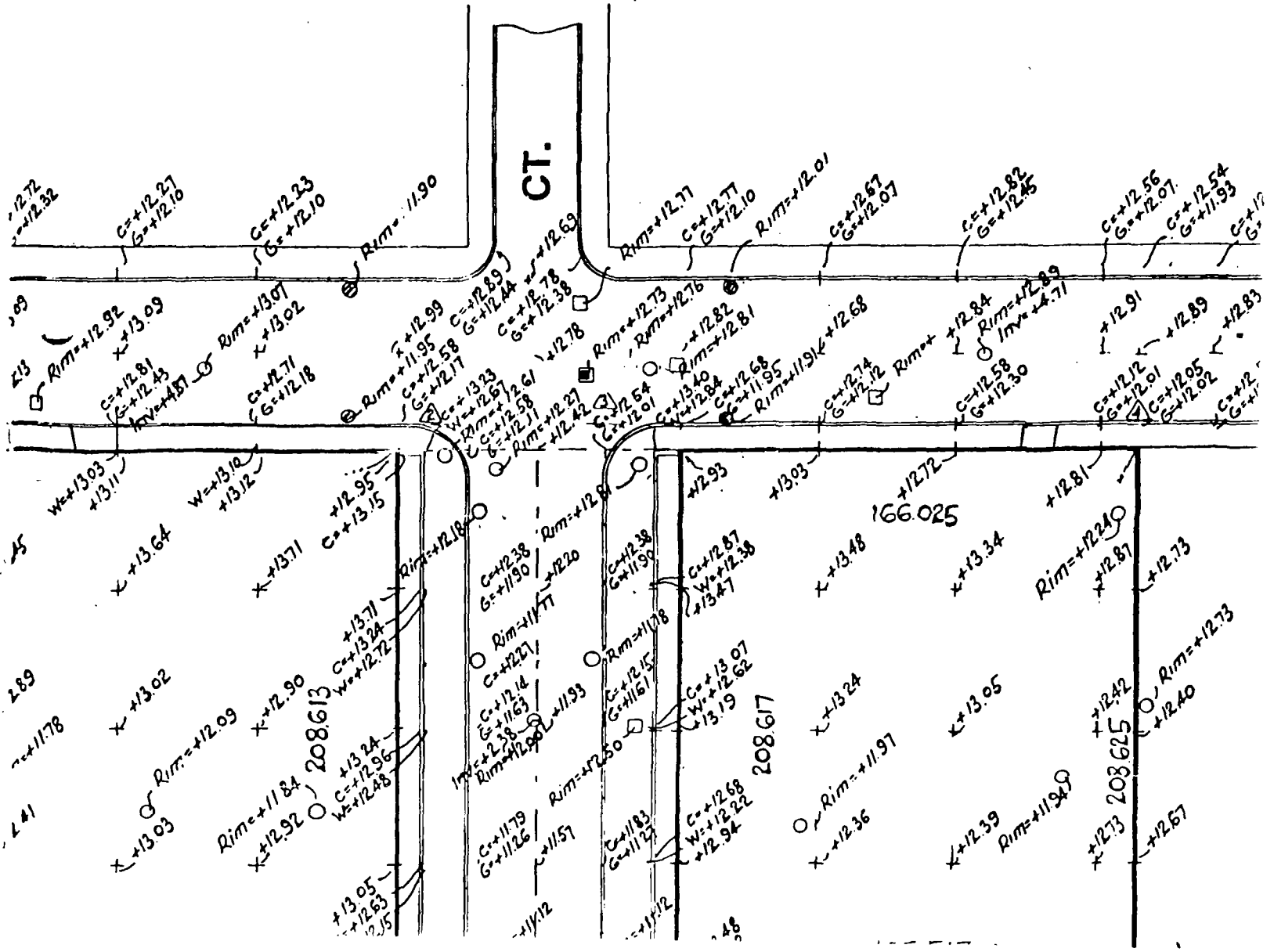
REVISION NO.	DESCRIPTION	DATE	BY

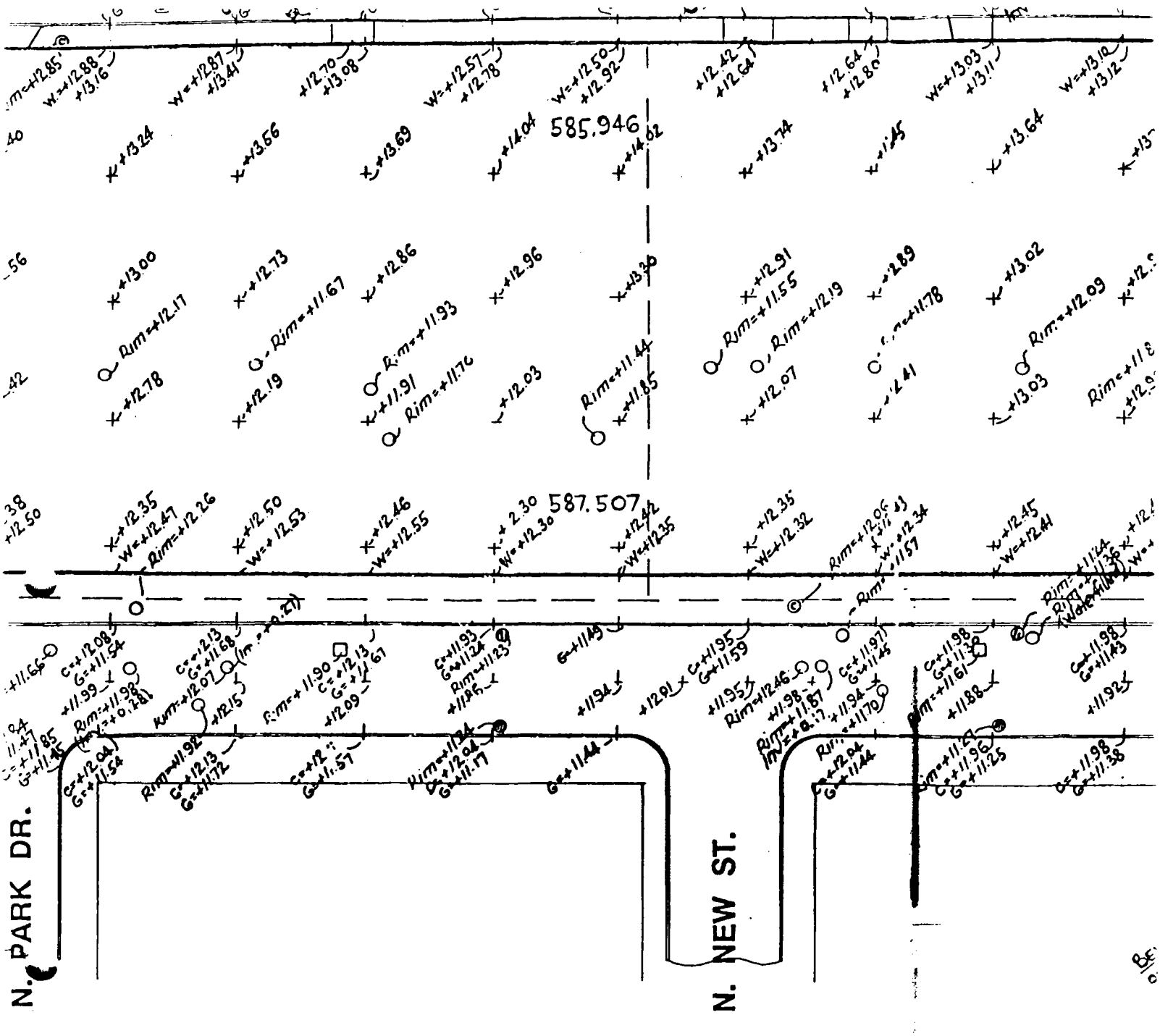
Chicago Guarante
123 W. Madison St.
Telephone: 312-726-6880
Date: AUGUST 13TH ,

by
Pres

Attest:
Secr

Revised August 24th, 1992


CT.
208.613
208.617
208.625
166.025

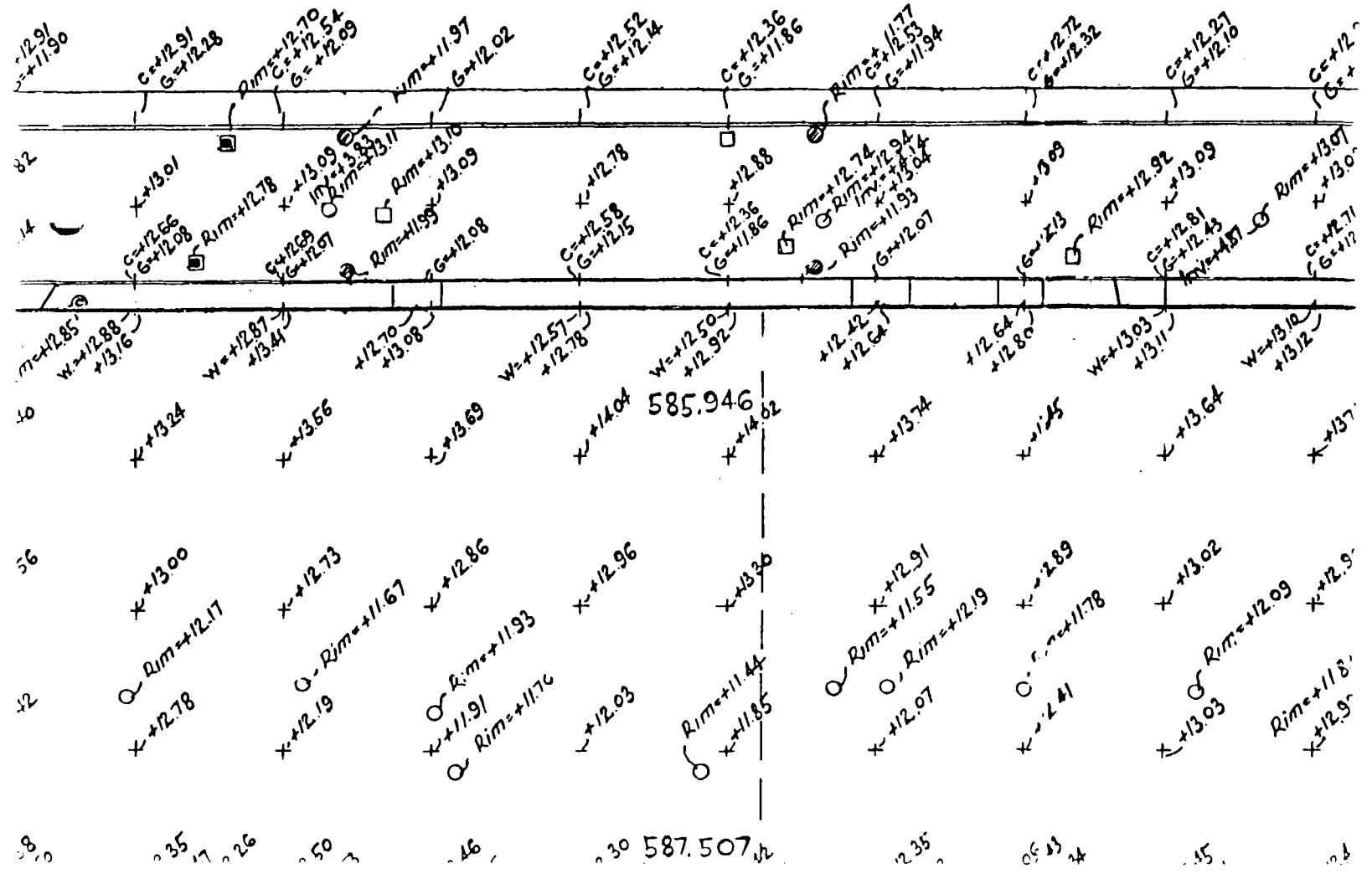


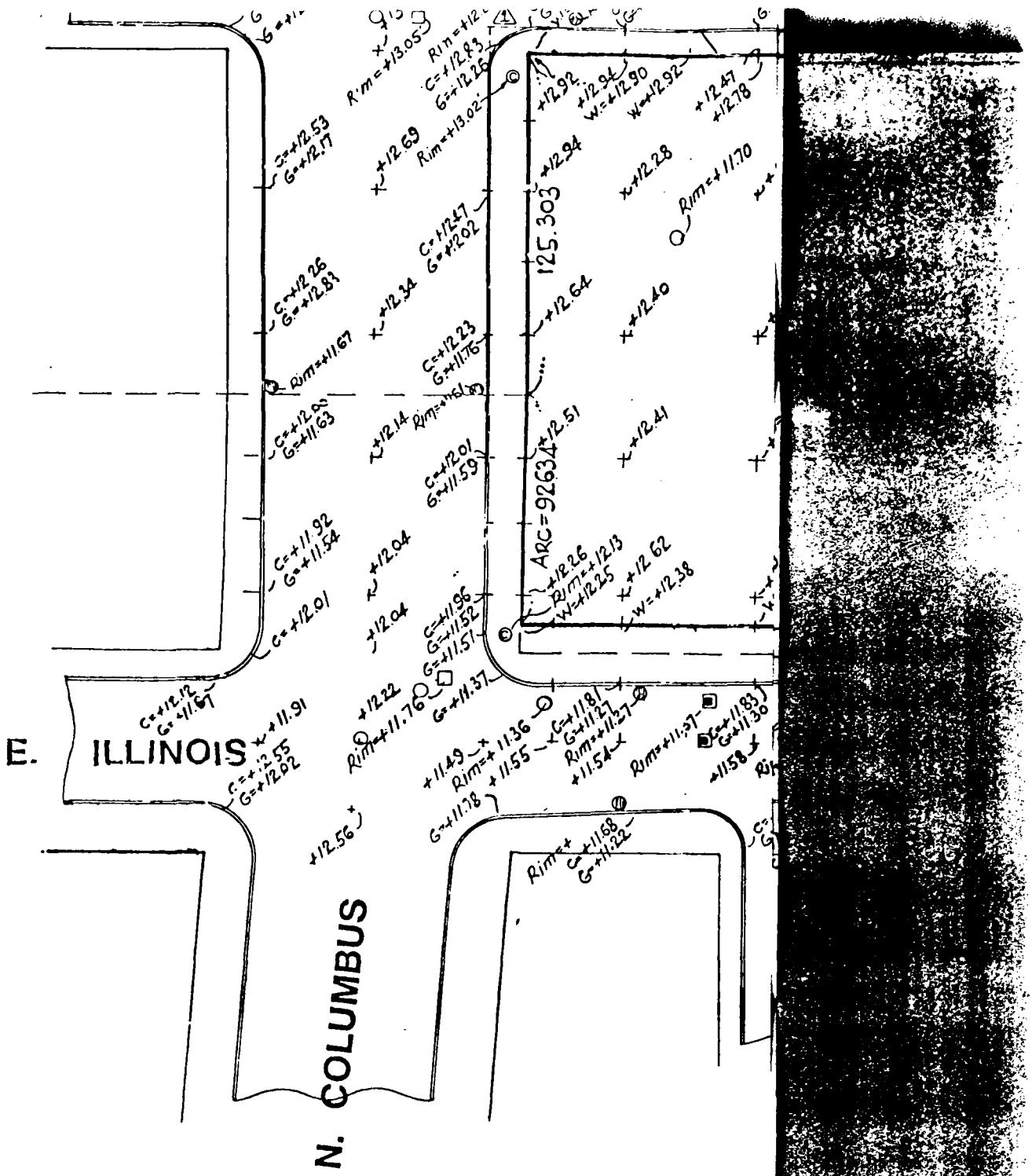
NOTE:

1. Established curb Grade = +13.00
2. Established curb Grade = +13.00
3. Established curb Grade = +13.00
4. Established curb Grade = +12.18

Elevations Indicated thus: +11.73

0.00 = CHICAGO CITY DATUM


585.946
587.507

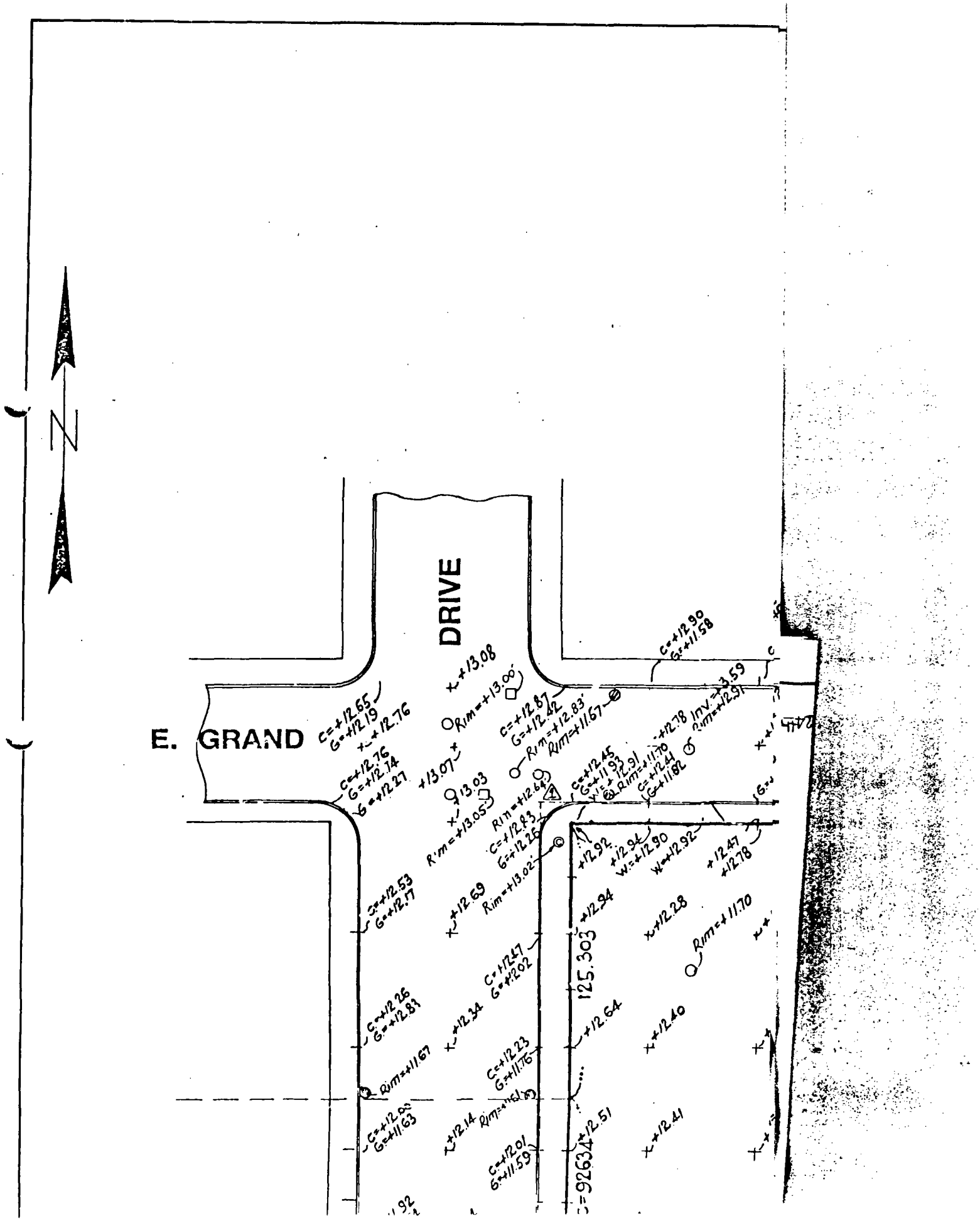


Distances are marked in feet and decimals.

Order No. 9206012

Ordered by CRSS CONSTRUCTORS, INC.

RRUNNG. 543603



N
E. GRAND
DRIVE
+13.08
Rim=+13.00
C=+12.65
G=+12.19
+12.76
C=+12.76
G=+12.74
G=+12.27
+13.07
+13.03
Rim=+13.05
C=+12.87
G=+12.42
Rim=+12.83
Rim=+11.67
C=+12.90
G=+11.58
Inv.=+13.59
Rim=+12.91
+12.78
C=+12.45
G=+11.93
W=+12.91
Rim=+11.70
C=+12.41
G=+11.82
Rim=+12.64
C=+12.83
G=+12.26
Rim=+13.02
+12.92
+12.94
W=+12.90
W=+12.92
+12.47
+12.78
C=+12.53
G=+12.17
+12.69
+12.94
+12.28
Rim=+11.70
125.303
C=+12.47
G=+12.02
C=+12.26
G=+12.83
+12.34
+12.64
+12.40
Rim=+11.67
C=+12.23
G=+11.76
C=+12.00
G=+11.63
+12.14
+12.51
+12.41
C=+12.01
G=+11.59
C=92634

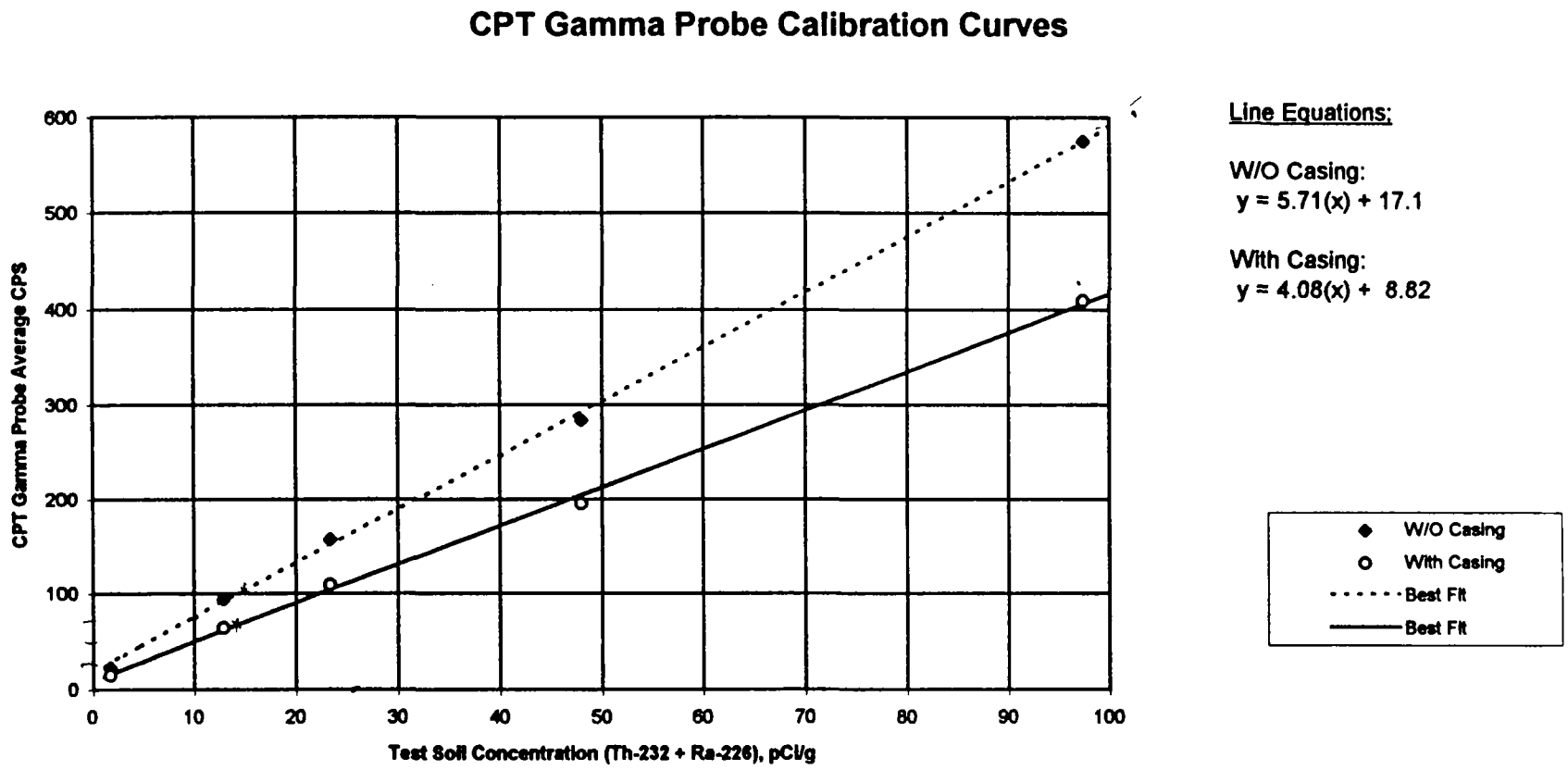
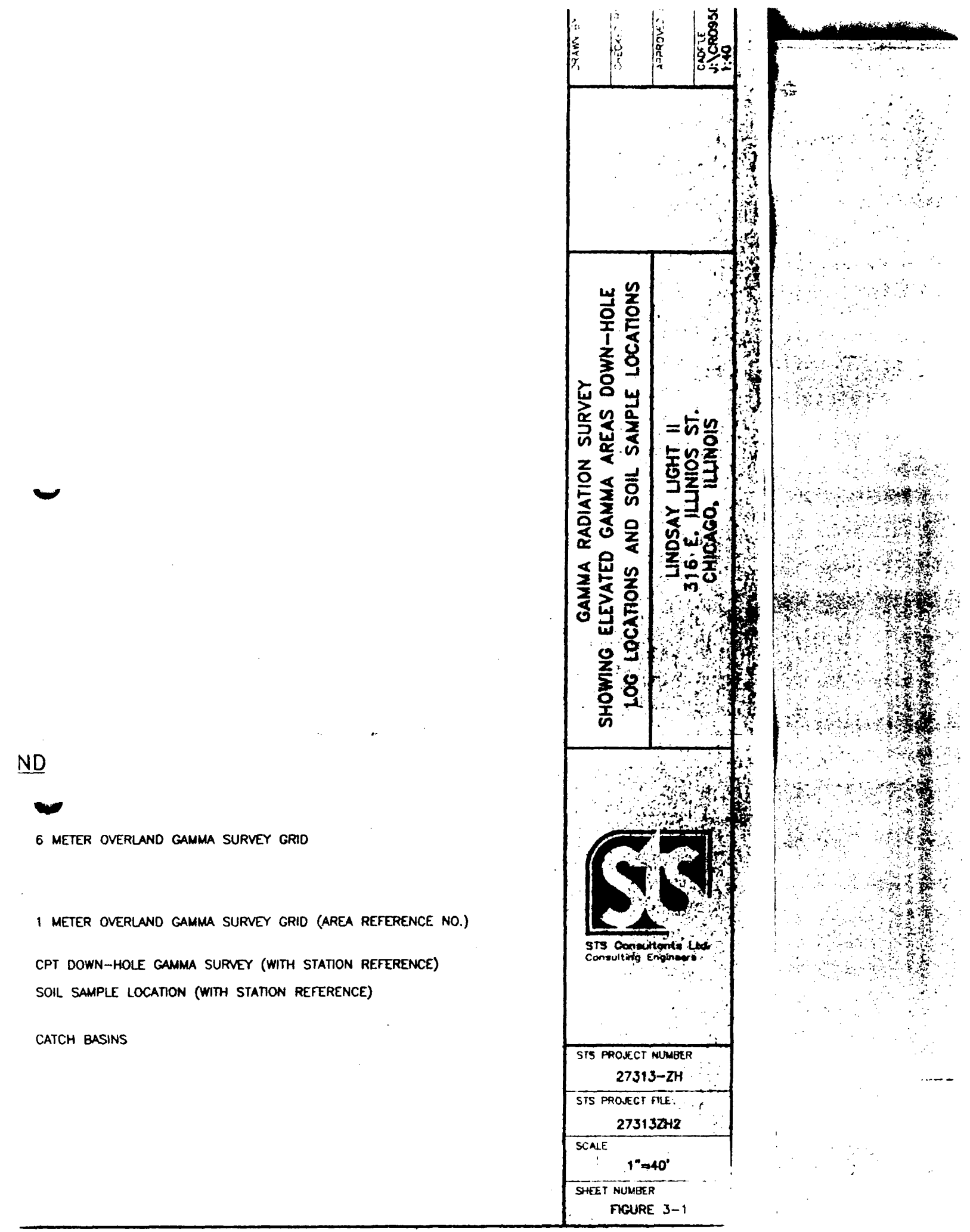
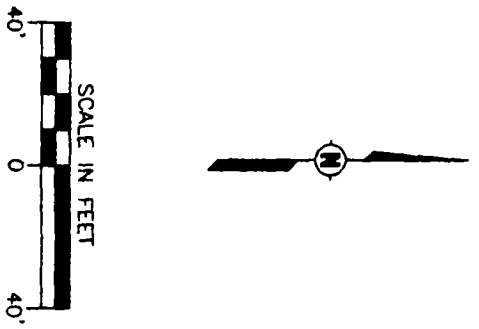


FIGURE 2-3

Figure 2-3. Plot of Th-232+Ra-226 Concentrations Versus CPT Gamma Log Output

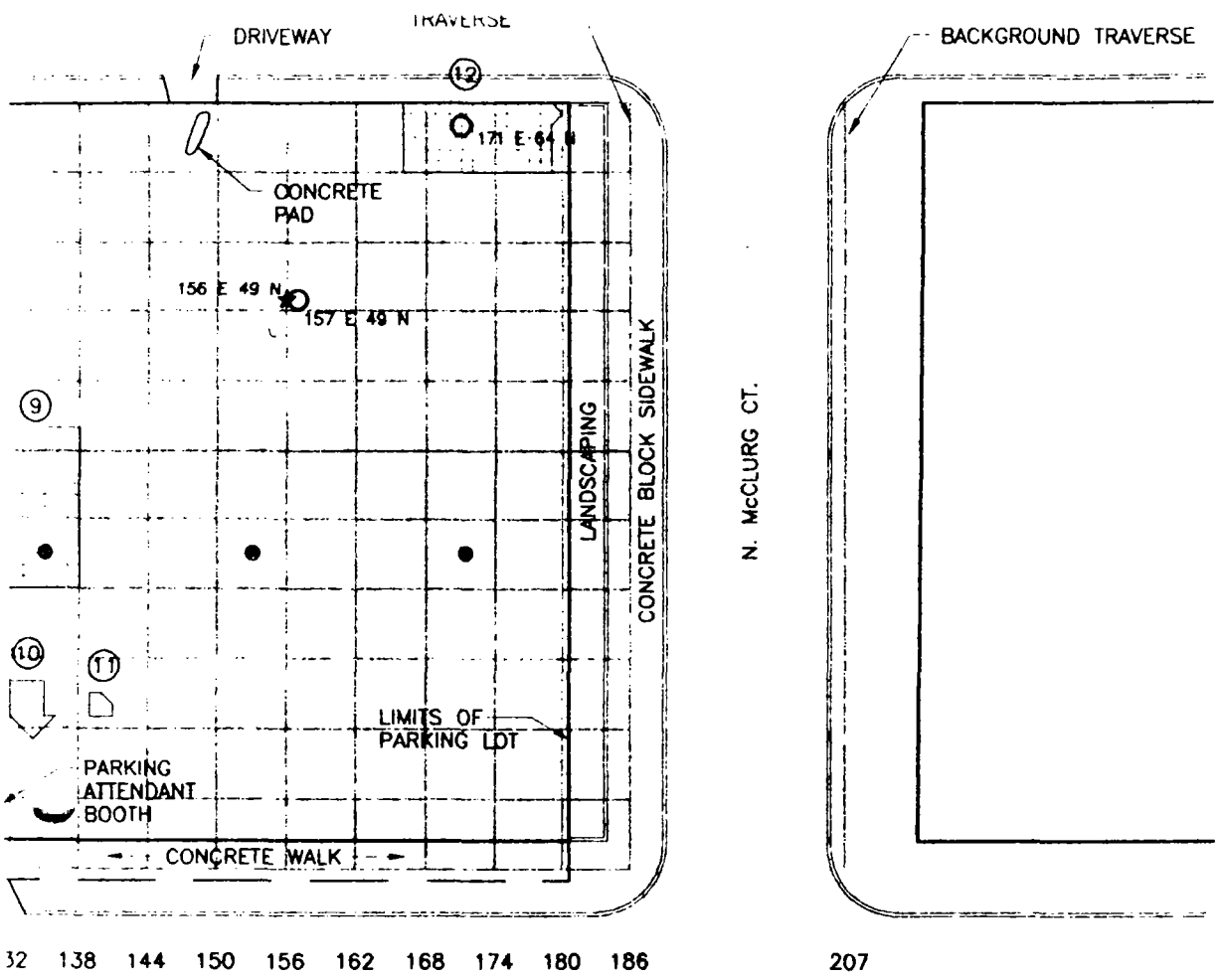

ND
6 METER OVERLAND GAMMA SURVEY GRID
1 METER OVERLAND GAMMA SURVEY GRID (AREA REFERENCE NO.)
CPT DOWN-HOLE GAMMA SURVEY (WITH STATION REFERENCE)
SOIL SAMPLE LOCATION (WITH STATION REFERENCE)
CATCH BASINS
DRAWN
CHECKED
APPROVED
CADFILE J:\CROSS\
1:40
GAMMA RADIATION SURVEY
SHOWING ELEVATED GAMMA AREAS DOWN-HOLE
LOG LOCATIONS AND SOIL SAMPLE LOCATIONS
LINDSAY LIGHT II
316 E. ILLINOIS ST.
CHICAGO, ILLINOIS
STS Consultants Ltd.
Consulting Engineers
STS PROJECT NUMBER
27313-ZH
STS PROJECT FILE:
27313ZH2
SCALE
1"=40'
SHEET NUMBER
FIGURE 3-1



WN-HOLE
OCATIONS

DRAWN BY: GRS	DATE: 7-15-94
CHECKED BY: RGB	DATE: 7-15-94
APPROVED BY: RGB	DATE: 7-15-94
CADFILE: J:\CROSSDWG\27313\27313ZH\27313ZH2.DWG	
1:40	

REVISION NO.	DESCRIPTION	DATE	BY
1	RESPONSE TO USEPA COMMENTS	7-14-95	RGB



LEGEND

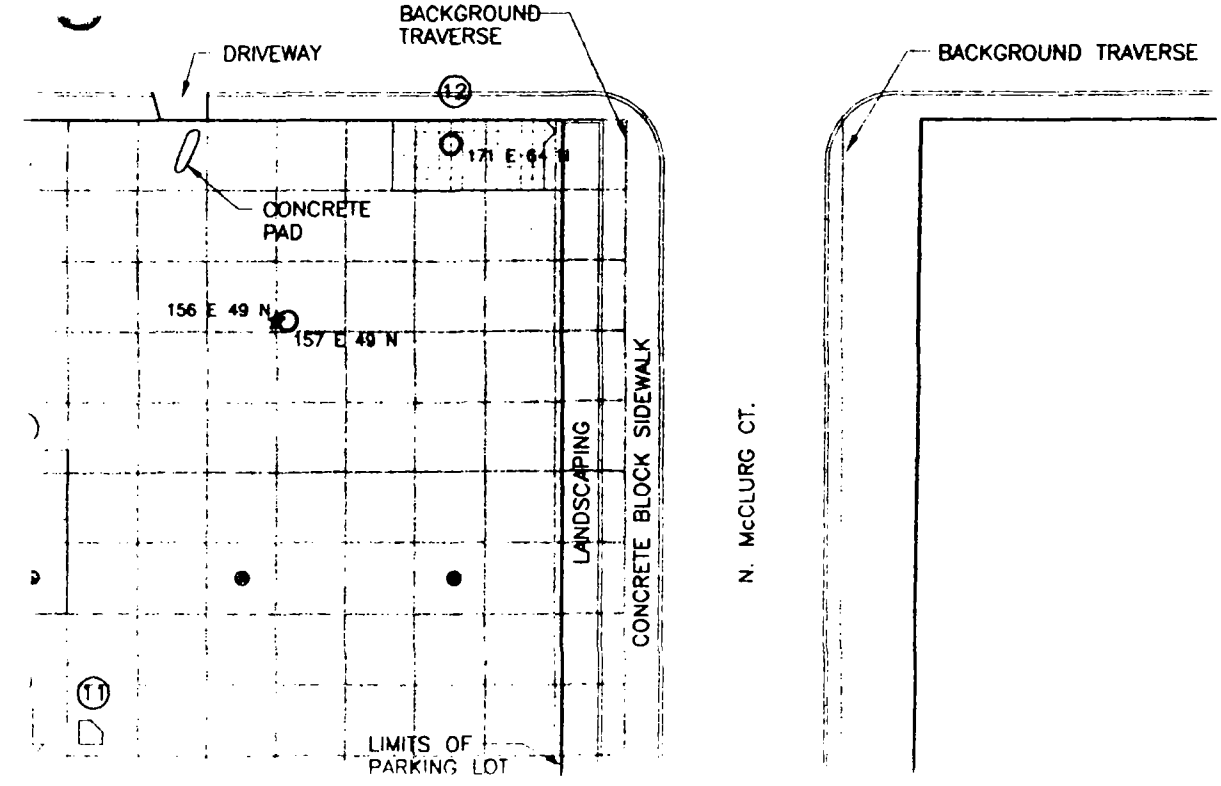
6 METER OVERLAND GAMMA

12 1 METER OVERLAND GAMMA

81 E 6 N CPT DOWN-HOLE GAMMA SU

81 E 5 N SOIL SAMPLE LOCATION (WITI

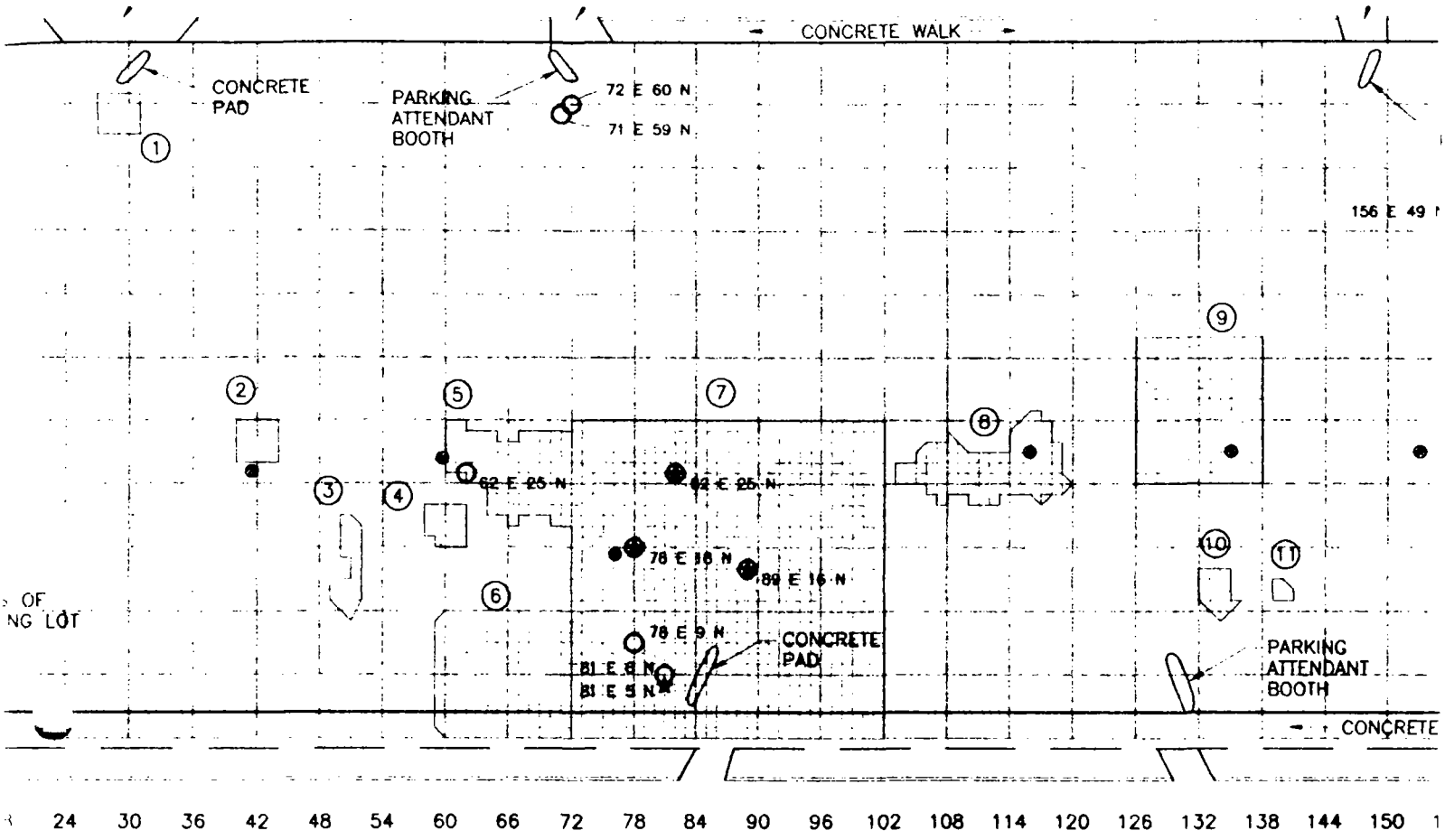
CATCH BASINS



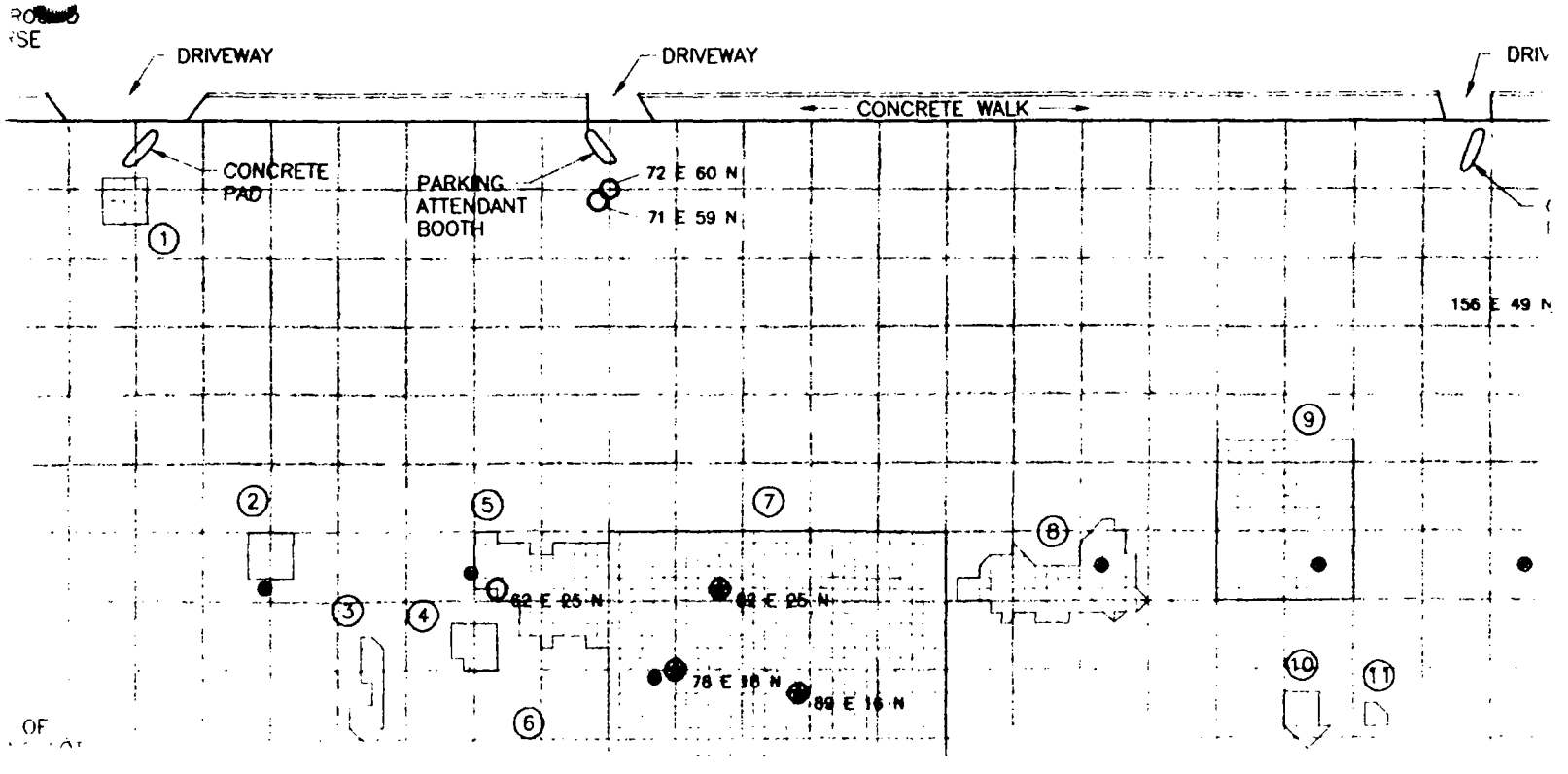
N

SCALE IN FEET

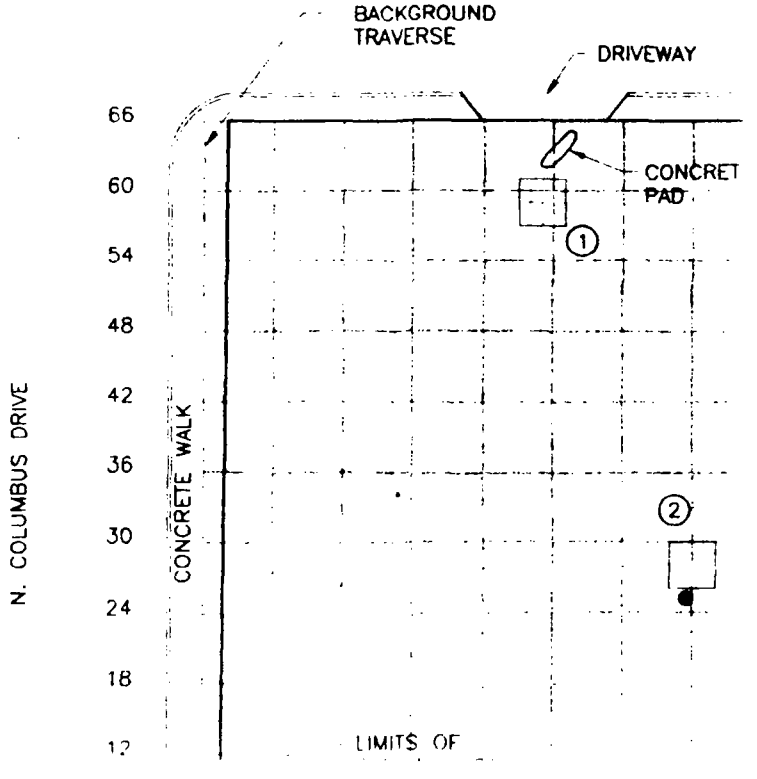
40' 0



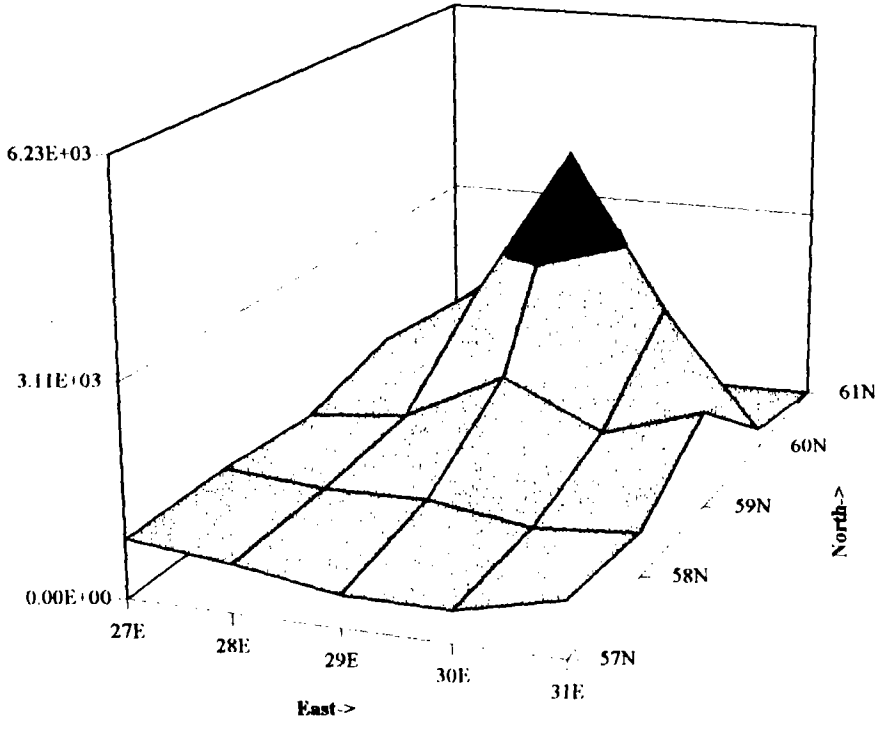
E. ILLINOIS ST.


E. GRAND AVE.
DRIVEWAY
DRIVEWAY
CONCRETE WALK
CONCRETE PAD
PARKING ATTENDANT BOOTH
72 E 60 N
71 E 59 N
156 E 49 N
82 E 25 N
82 E 25 N
78 E 16 N
89 E 16 N
1
2
3
4
5
6
7
8
9
10
11

N. COLUMBUS DRIVE
CONCRETE WALK
CONCRET
PAD
1
2
LIMITS OF
PARKING LOT
66
60
54
48
42
36
30
24
18
12
6
0
0
6
12
18
24
30
36
42


BACKGROUND
TRAVERSE
DRIVEWAY
CONCRET
PAD
1
2
66
60
54
48
42
36
30
24
18
12
N. COLUMBUS DRIVE
CONCRETE WALK
LIMITS OF

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 1
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Legend: Data Ranges (Net CPM)

▯ ≤ Bkg. + 2 Std. Dev.

▮ > (Bkg. + 2 Std. Dev.) to 10 x Bkg.

Legend: Data Ranges (Net CPM)

▯ ≤ Bkg. + 2 Std. Dev.

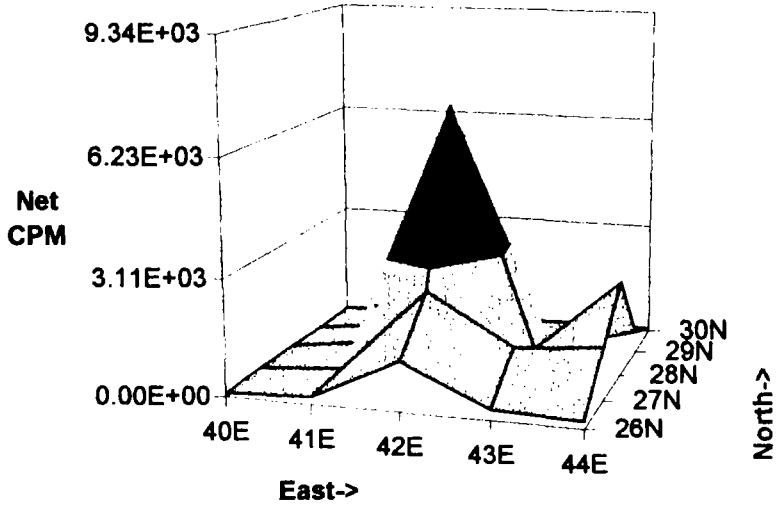
▮ > (Bkg. + 2 Std. Dev.) to 10 x Bkg.

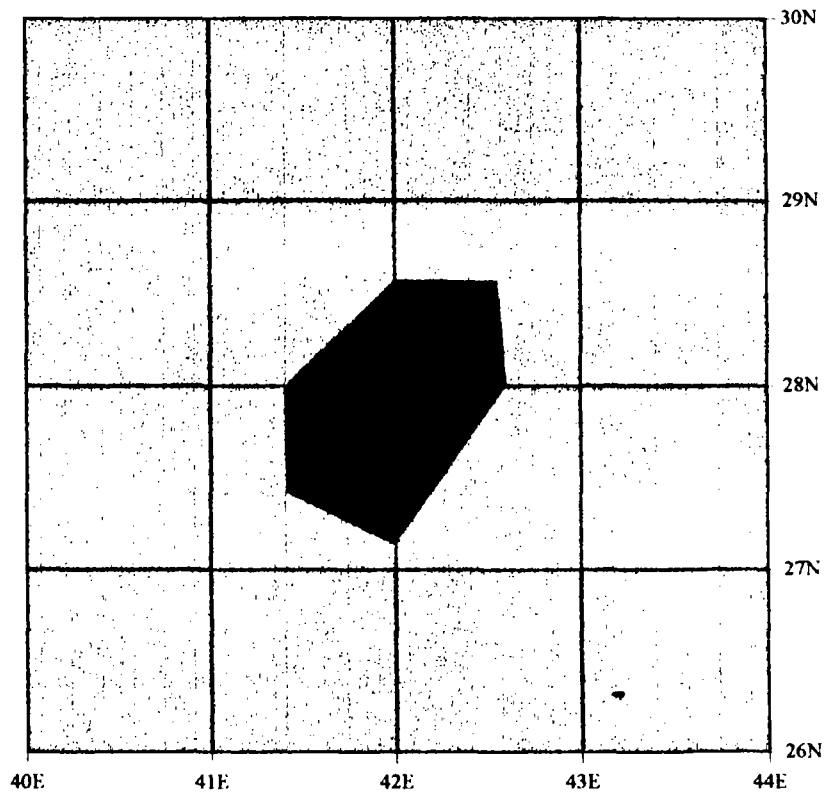
*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

8/19/94
Rev. 1 - 6/23/95

FIGURE 3-2 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 2
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

FIGURE 3-3 (REV.1)

8/19/94
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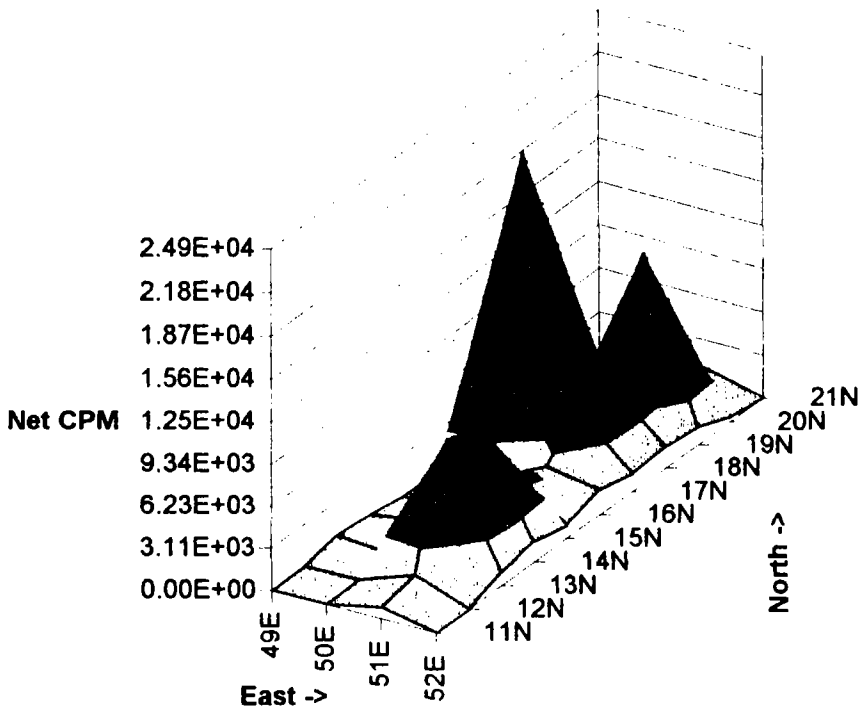
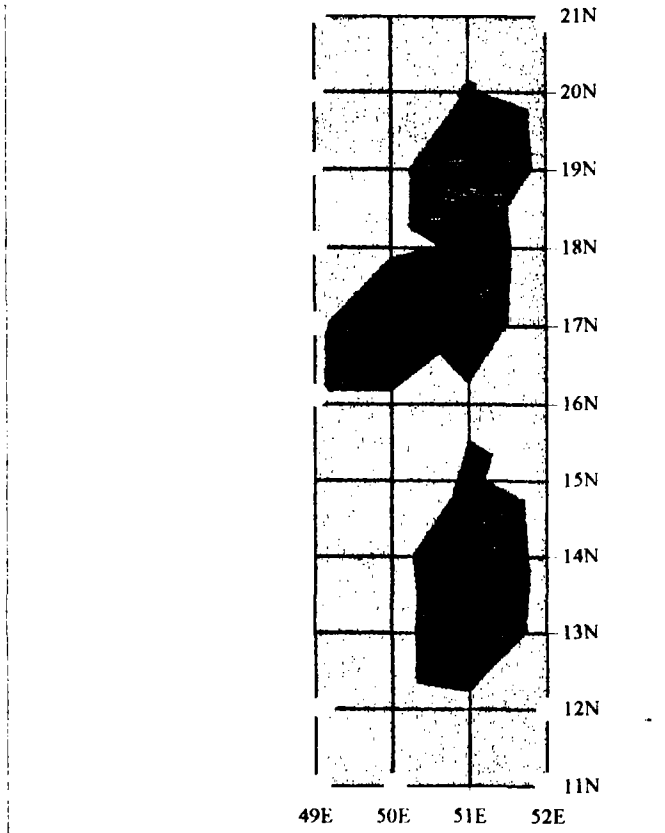
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 3
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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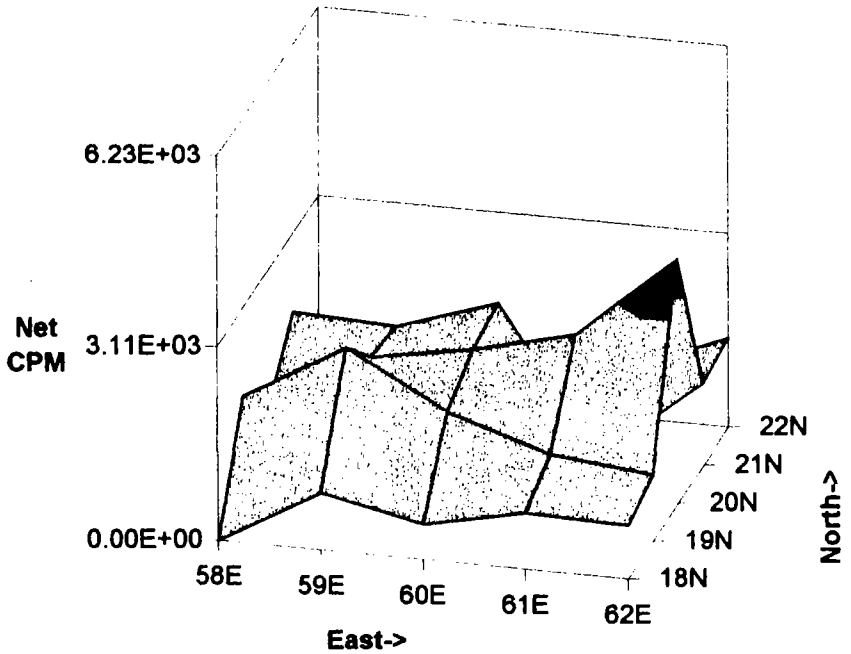
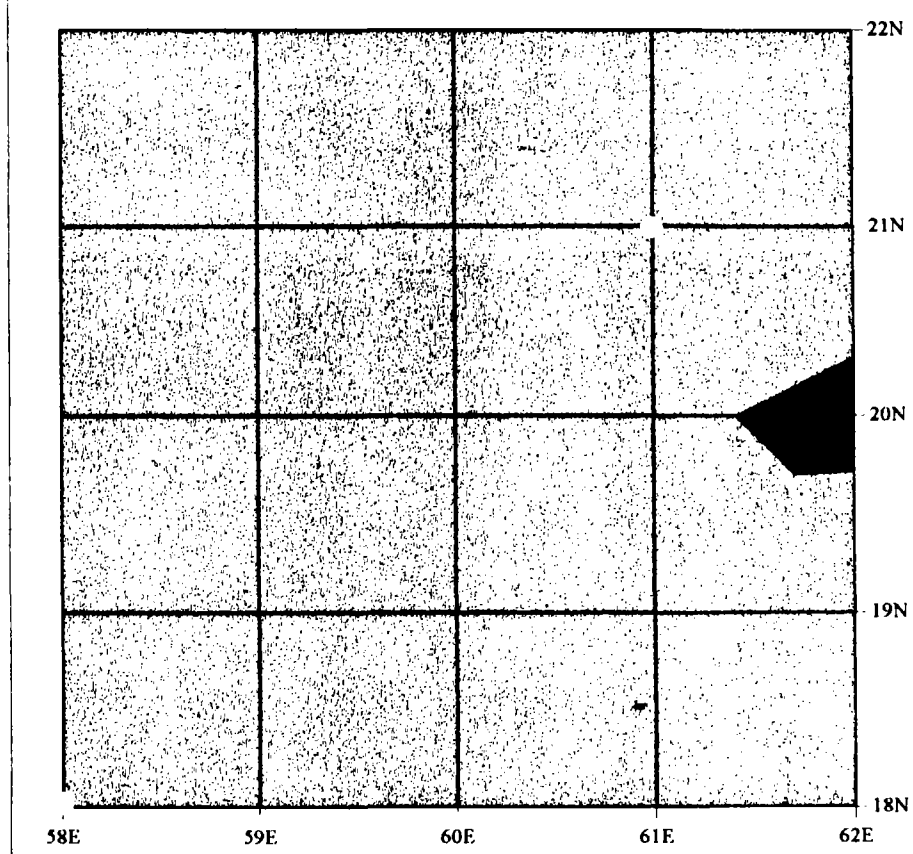
FIGURE 3-4 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 4
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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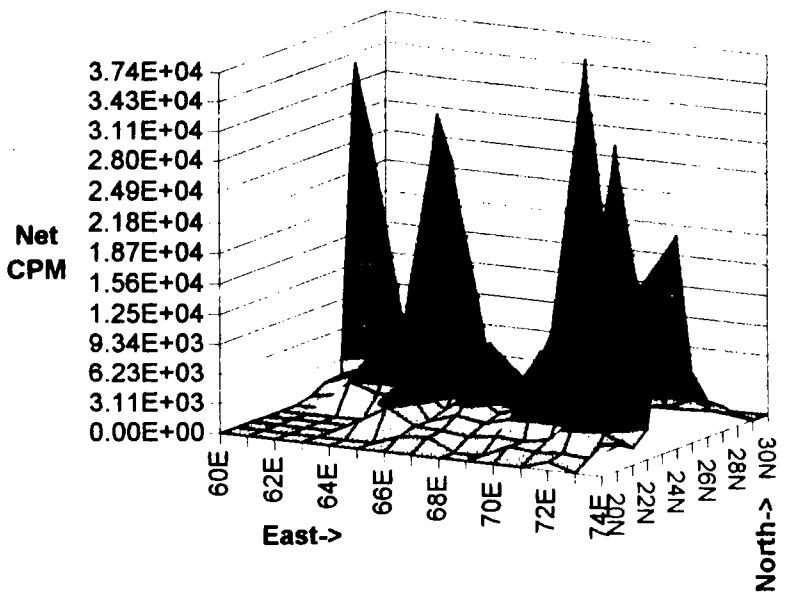
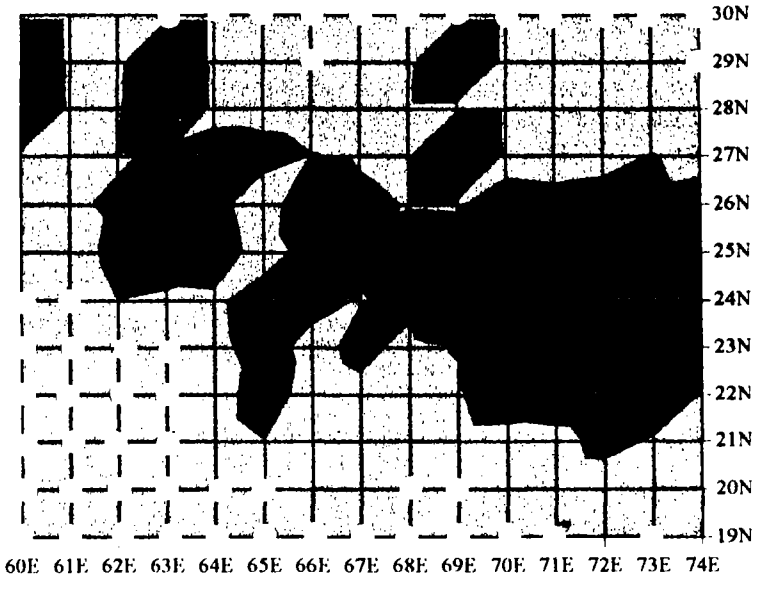
FIGURE 3-5 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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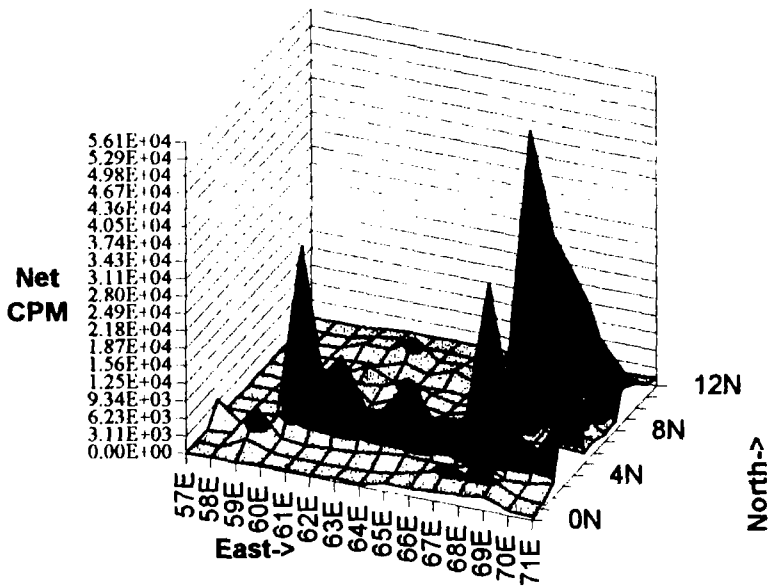
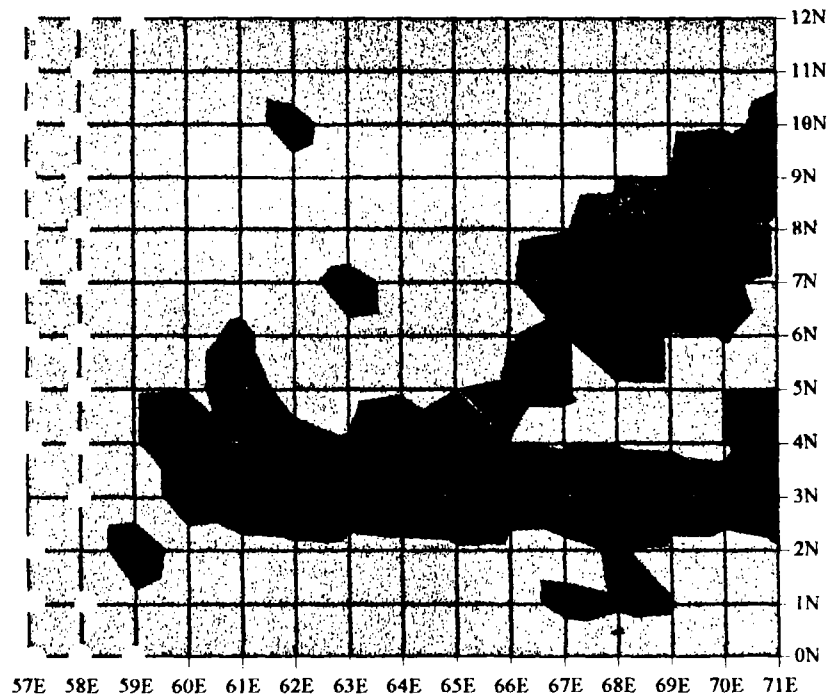
FIGURE 3-6 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Legend: Data Ranges (Net

- ≤ Bkg. + 2 Std. Dev.
- Bkg. + 2 Std. Dev. to 10 x Bkg.
- 10 x Bkg. to 20 x Bkg.
- > 20 x Bkg.



Legend: Data Ranges (Net CPM)

Grid points for which no value was measured. Plotting software assumes a background value, assigned to these locations.

- ≤ Bkg. + 2 Std. Dev.
- Bkg. + 2 Std. Dev. to 10 x Bkg.
- 10 x Bkg. to 20 x Bkg.
- > 20 x Bkg.

*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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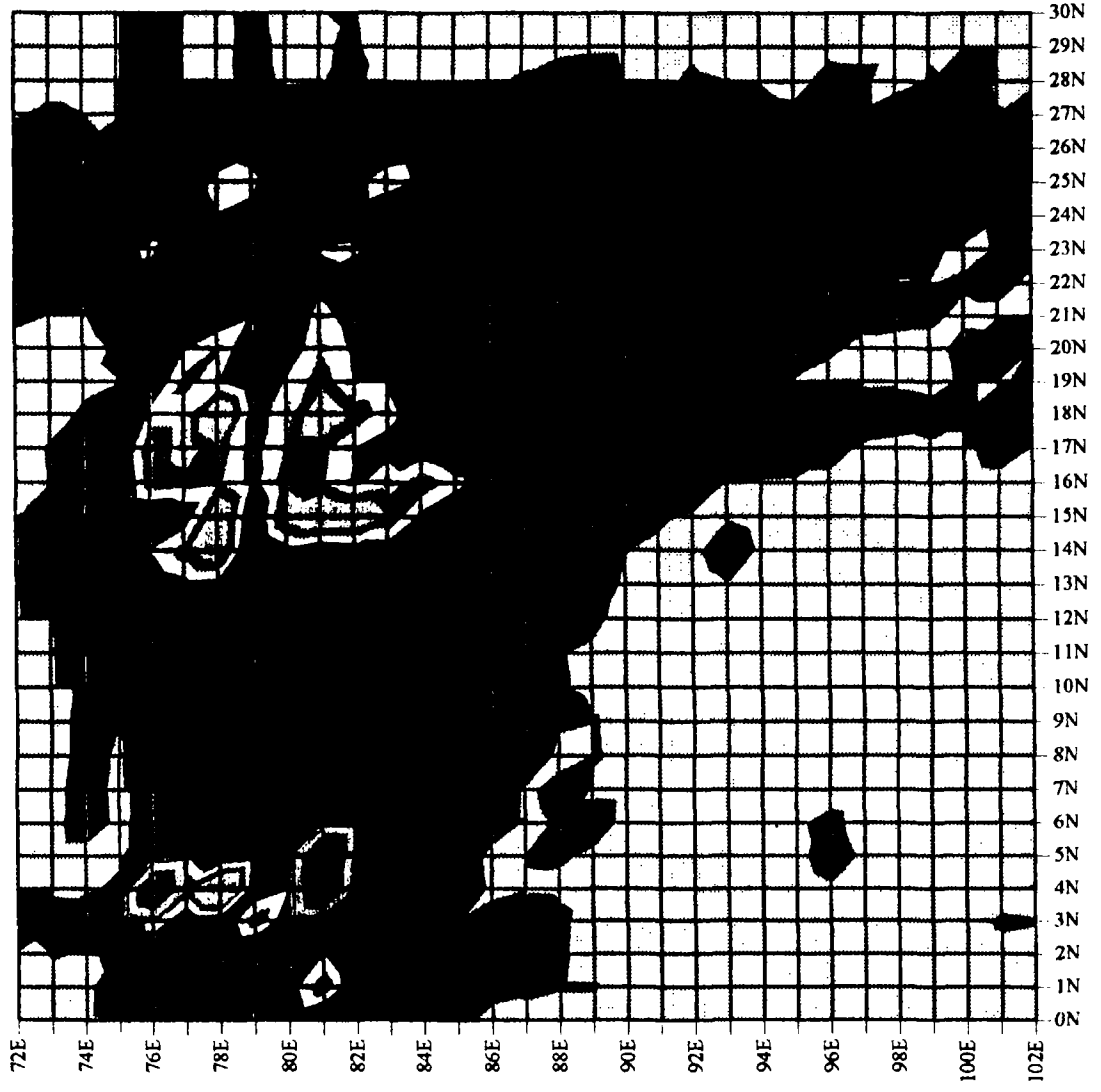
FIGURE 3-7 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey -Area 7
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Legend: Data Ranges (Net CPM)

- < Bkg. + 2 Std. Dev.
- Bkg. + 2 Std. Dev. to 10 x Bkg.
- 10 x Bkg. to 20 x Bkg.
- 20 x Bkg. to 30 x Bkg.
- 30 x Bkg. to 40 x Bkg.
- 40 x Bkg. to 50 x Bkg.
- 50 x Bkg. to 100 x Bkg.
- > 100 x Bkg.

*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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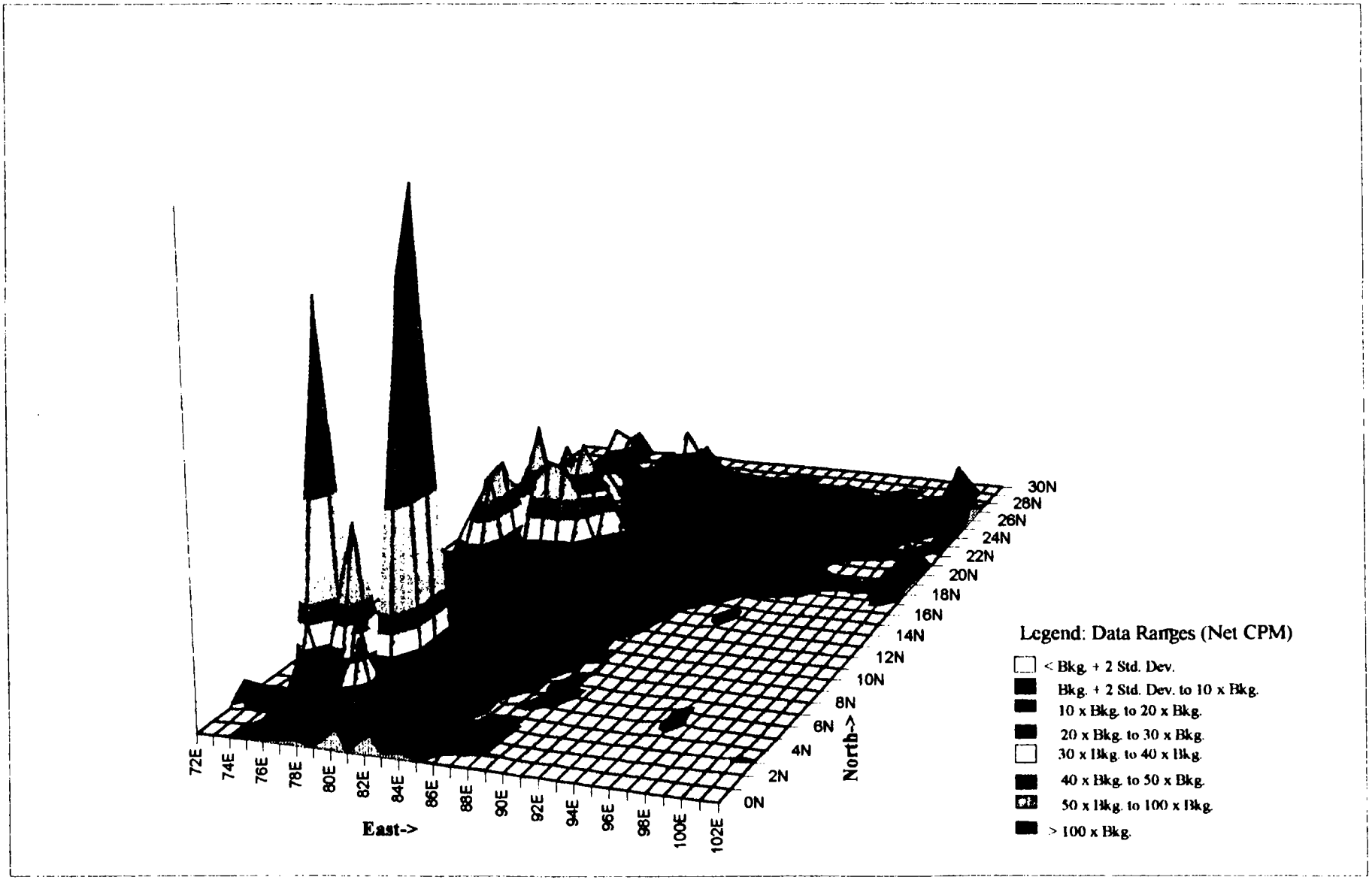
FIGURE 3-8 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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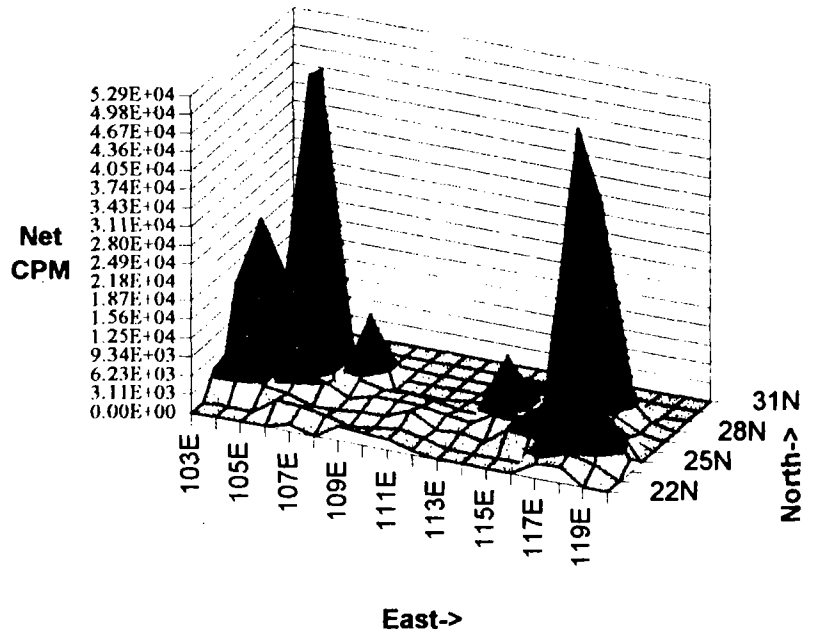
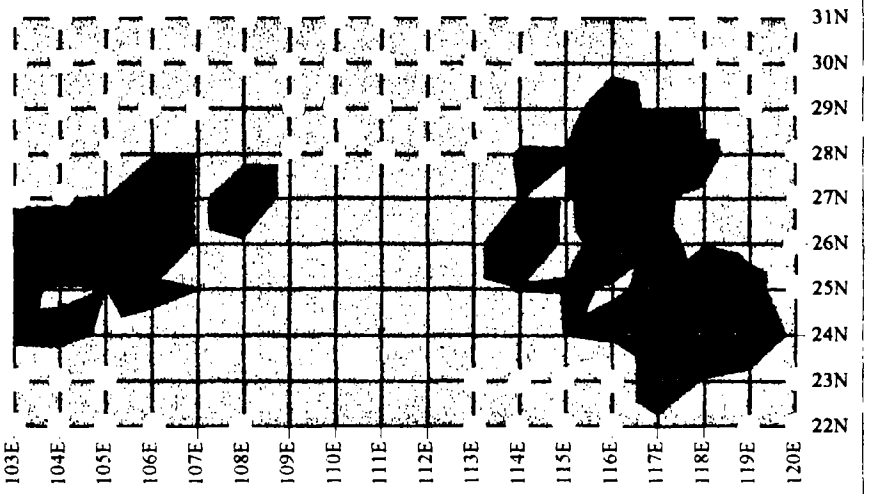
FIGURE 3-8A (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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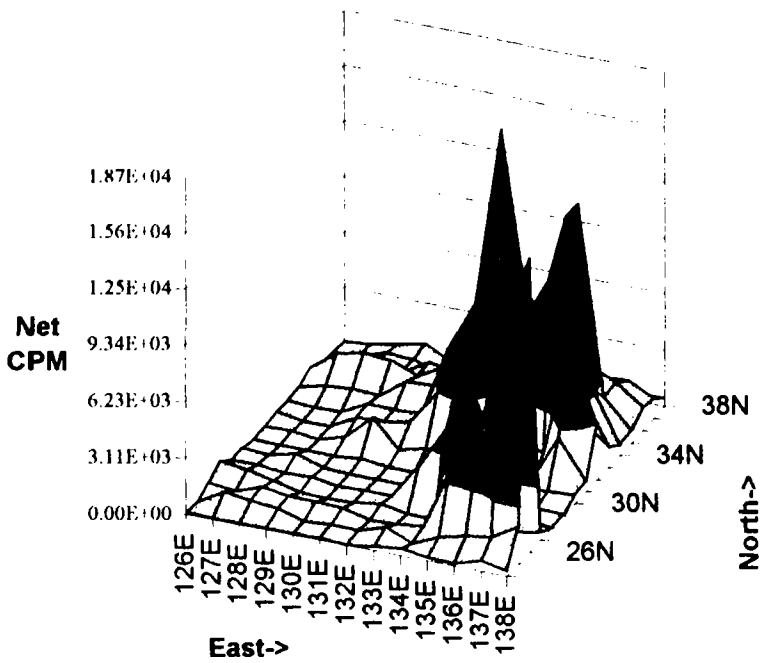
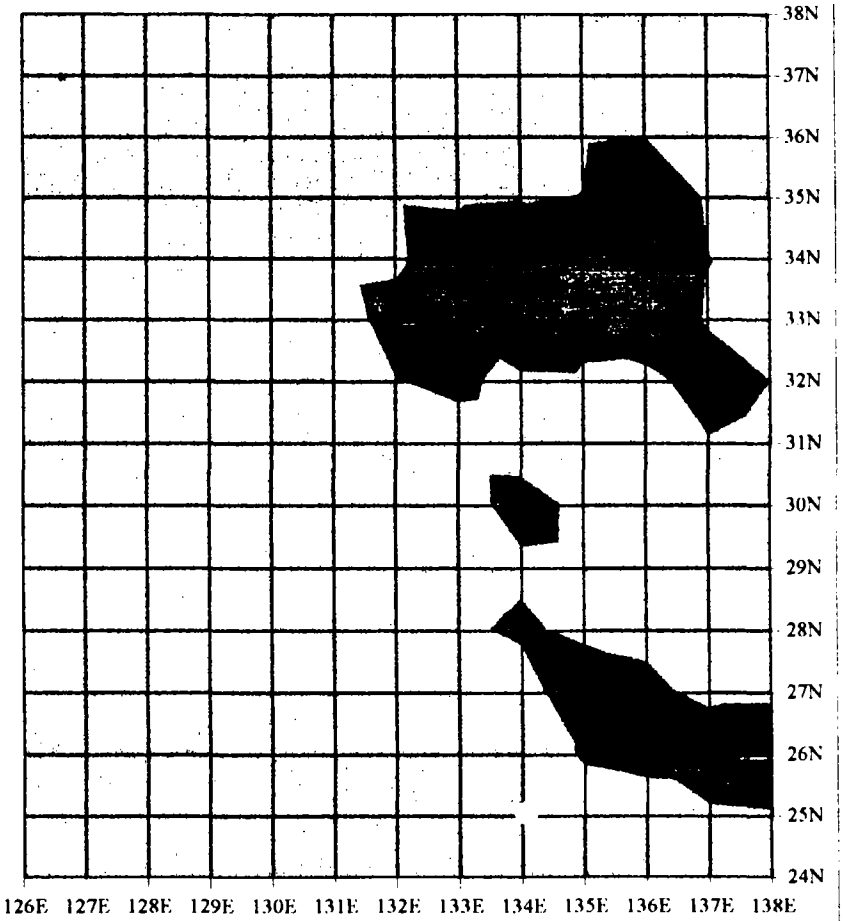
FIGURE 3-9 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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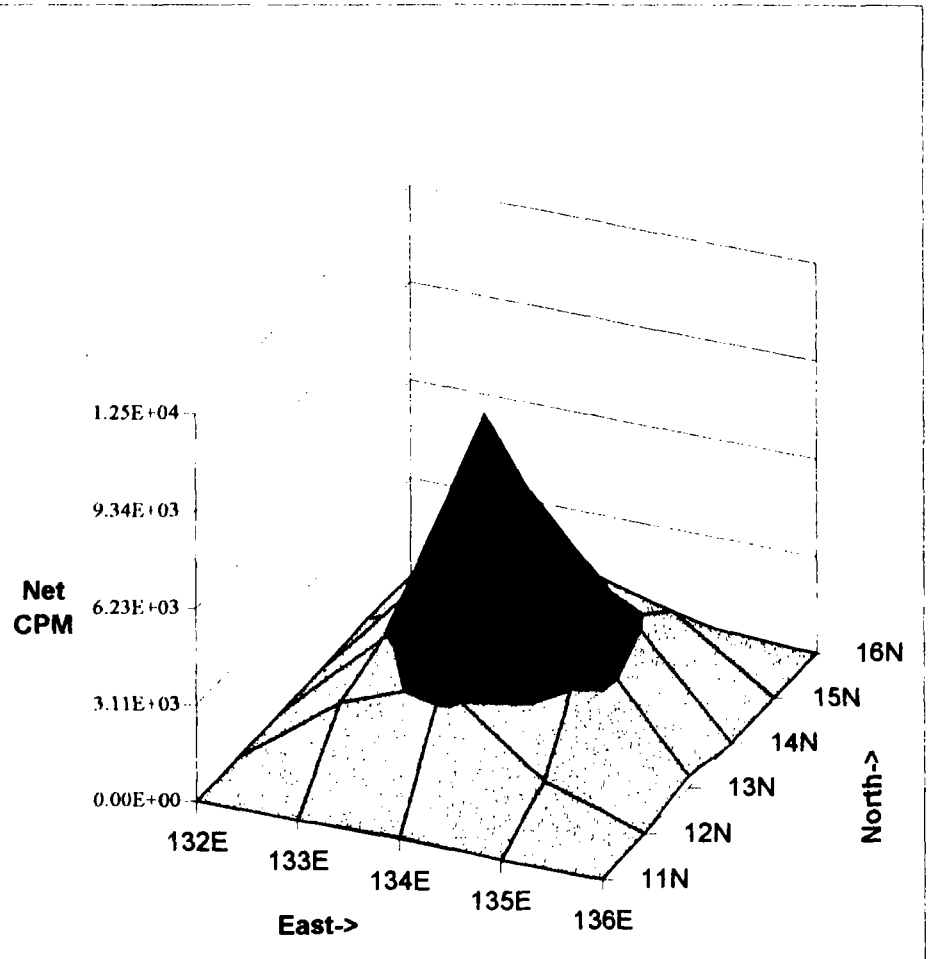
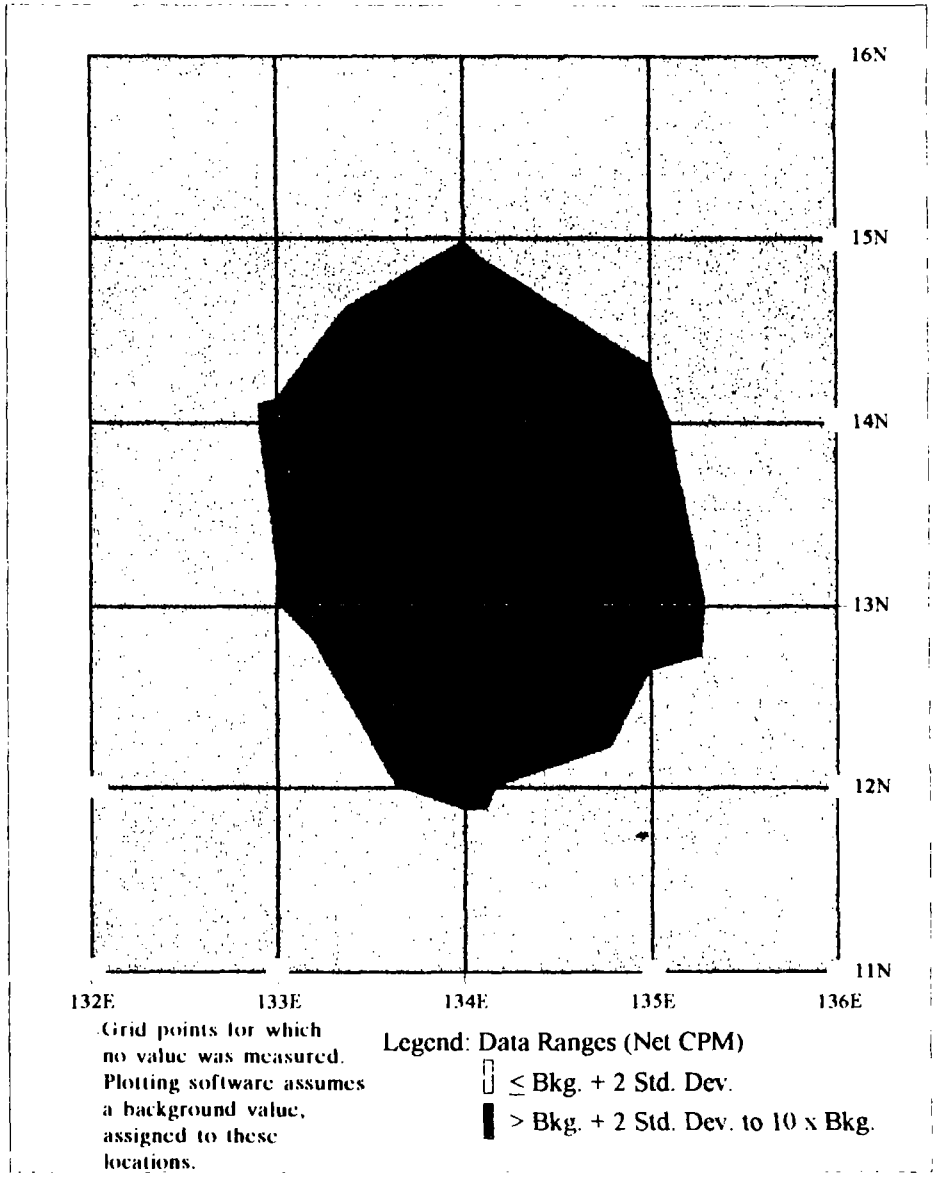
FIGURE 3-10 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 10
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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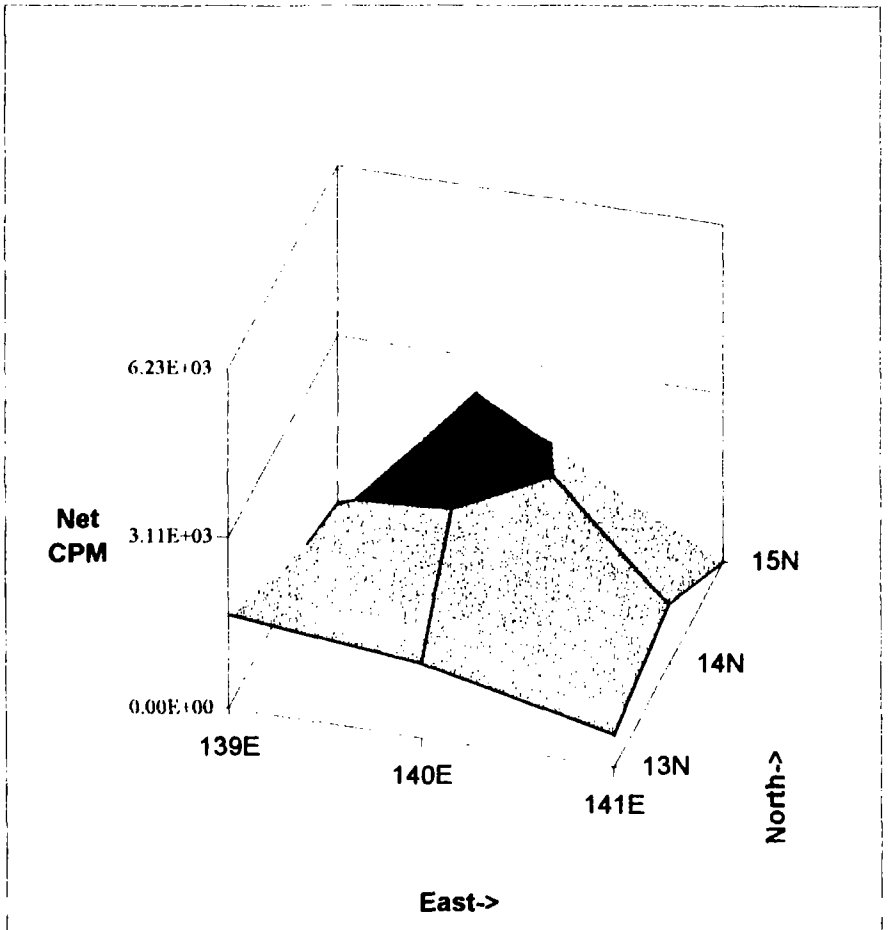
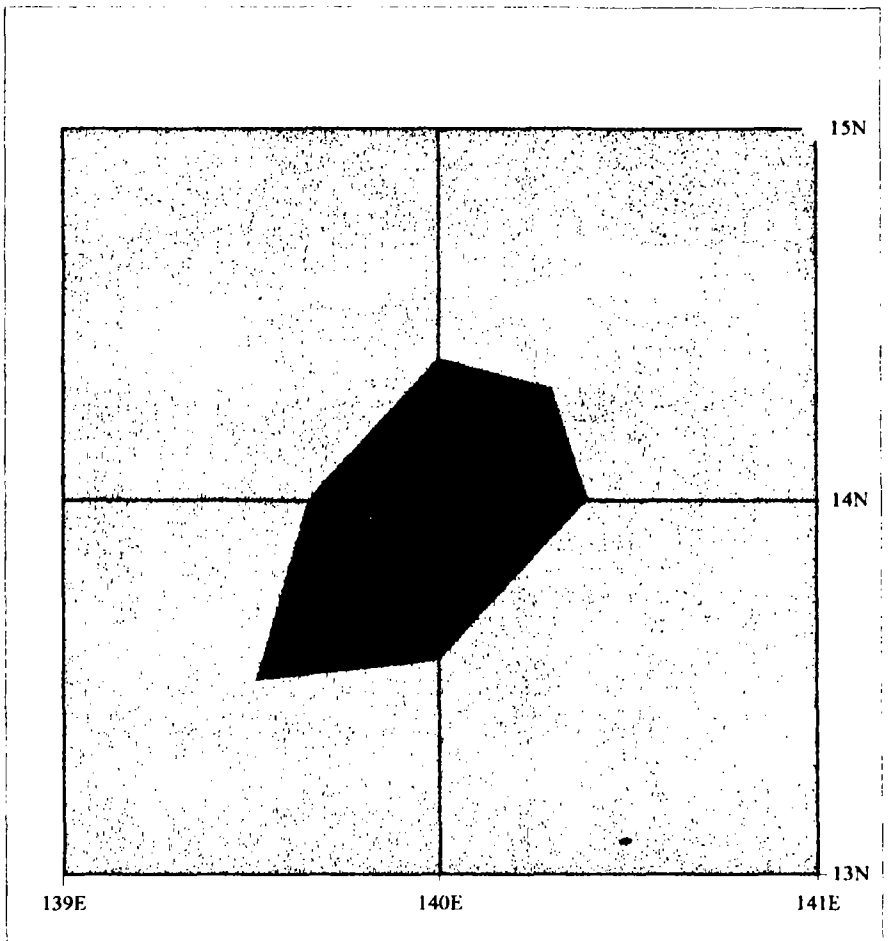
(REV.1)
FIGURE 3-11

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 11
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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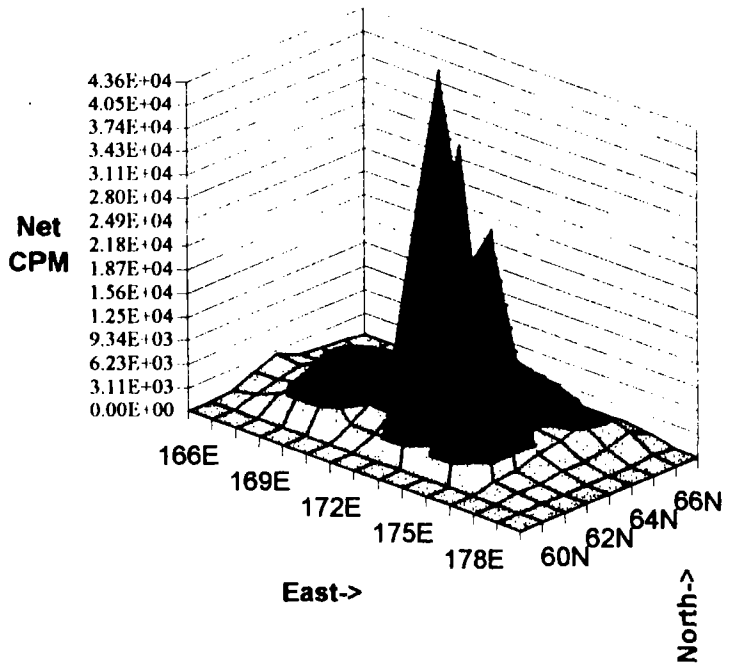
FIGURE 3-12 (REV.1)

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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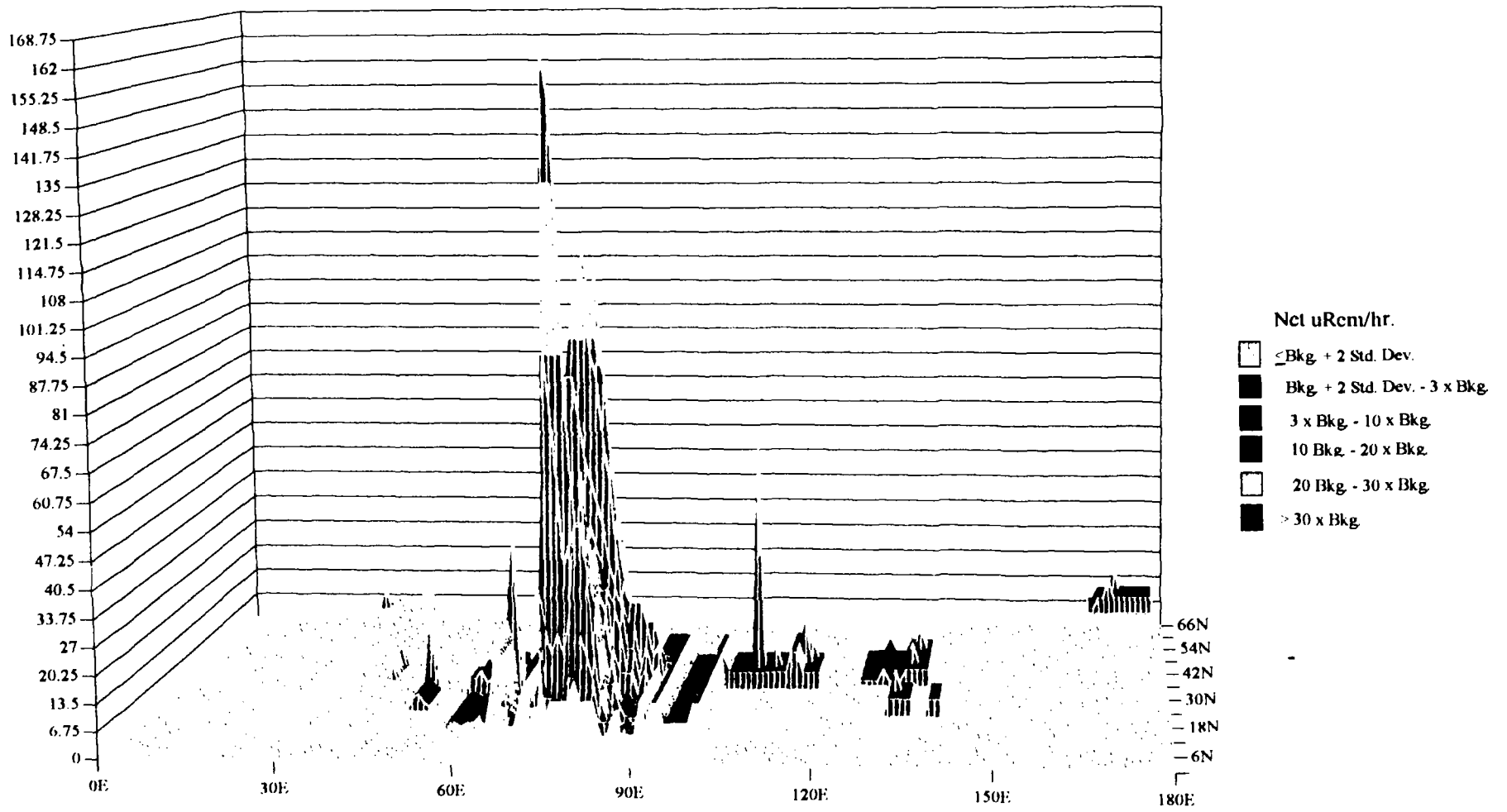
FIGURE 3-13 (REV.1)

Lindsay Light II Site
Overland Tissue Equivalent Dose Rate



*Background = 4.5 uRem/hr.
**Background + 2 Standard Deviations = 6.75 uRem/hr.

FIGURE 3-14
(REV.1)

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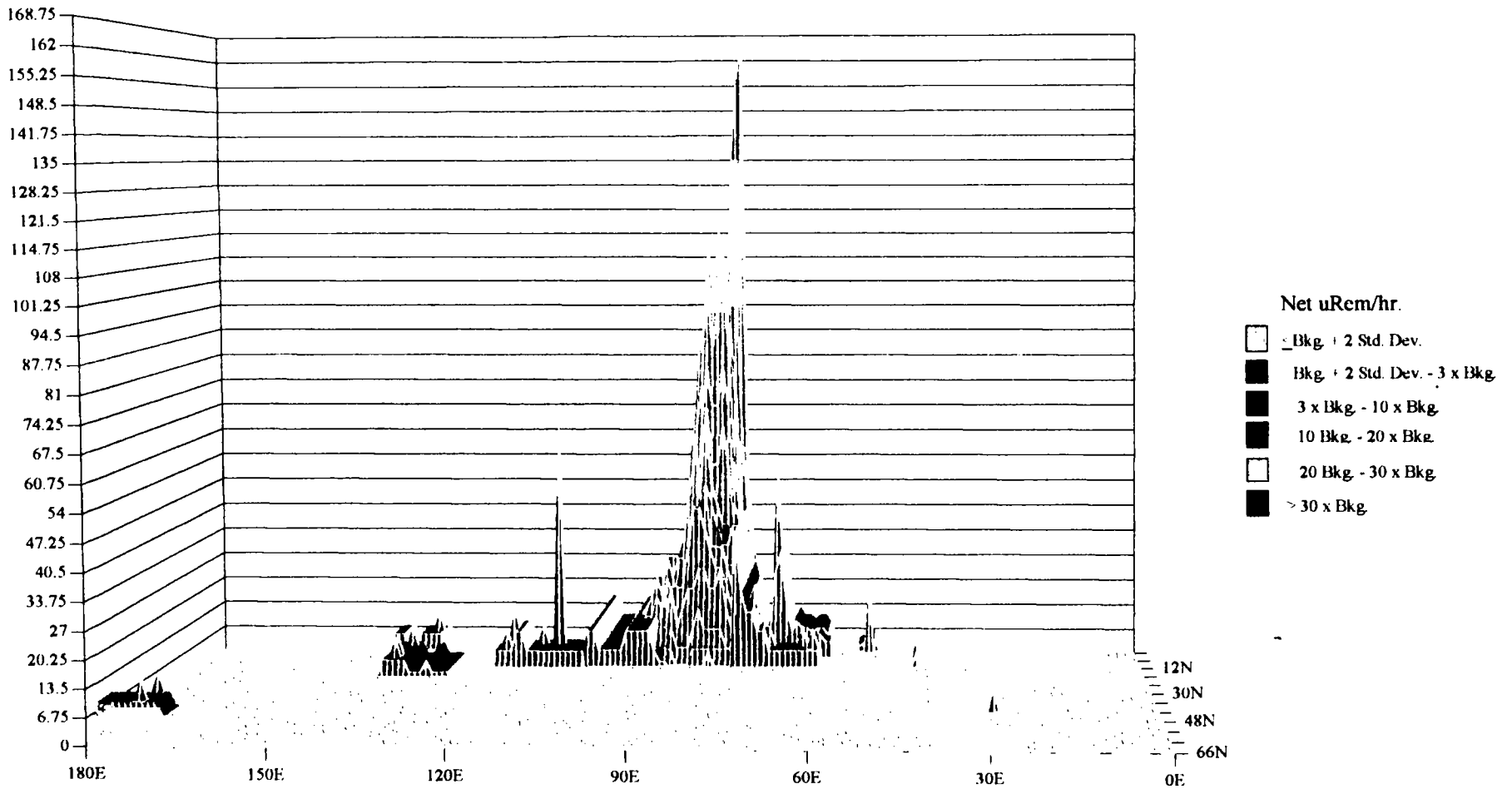
Lindsay Light II Site
Overland Tissue Equivalent Dose Rate



*Background = 4.5 uRem/hr.
**Background + 2 Standard Deviations = 6.75 uRem/hr.

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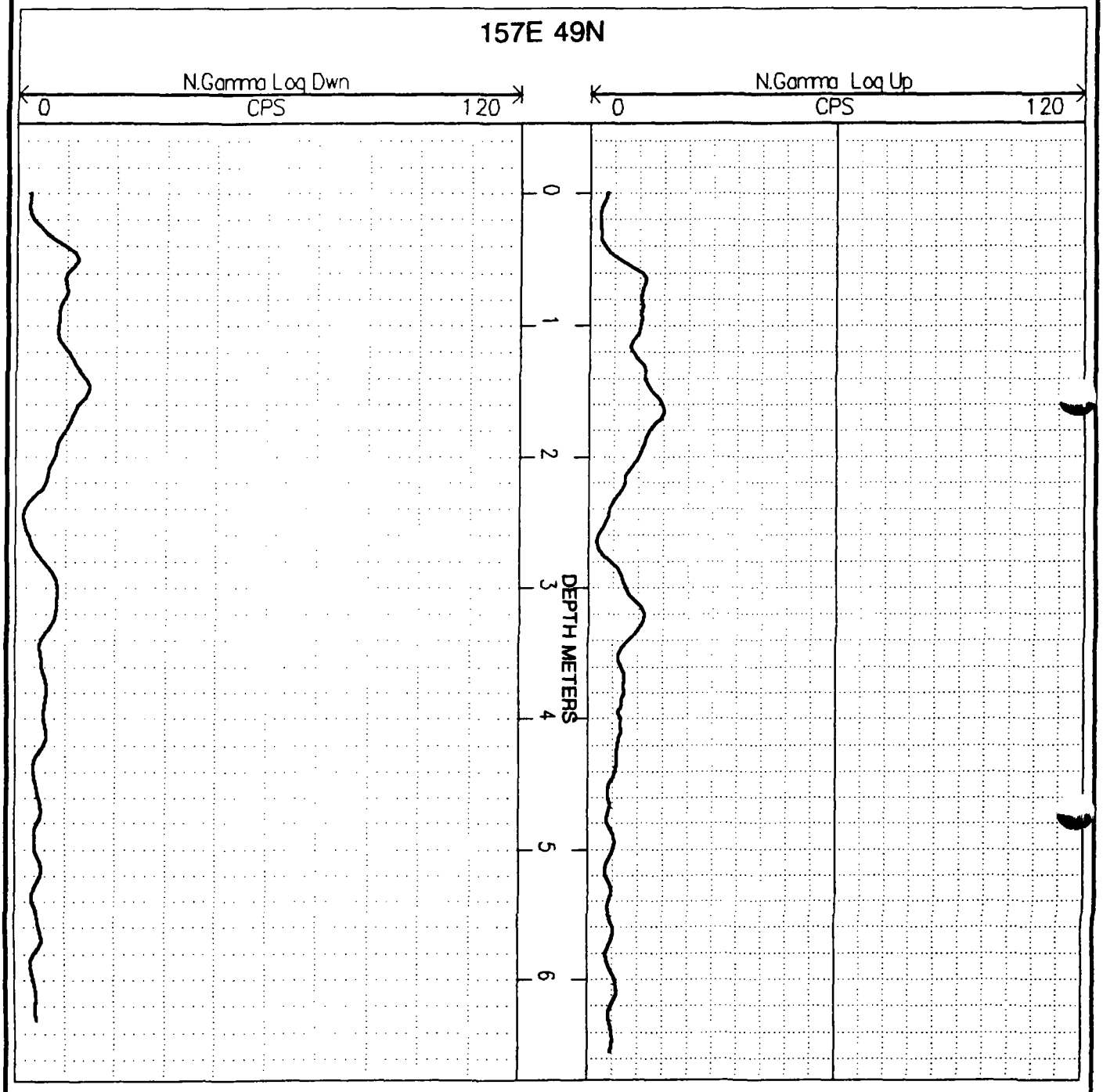
FIGURE 3-14A
(REV.1)

DOWN-HOLE GAMMA LOG

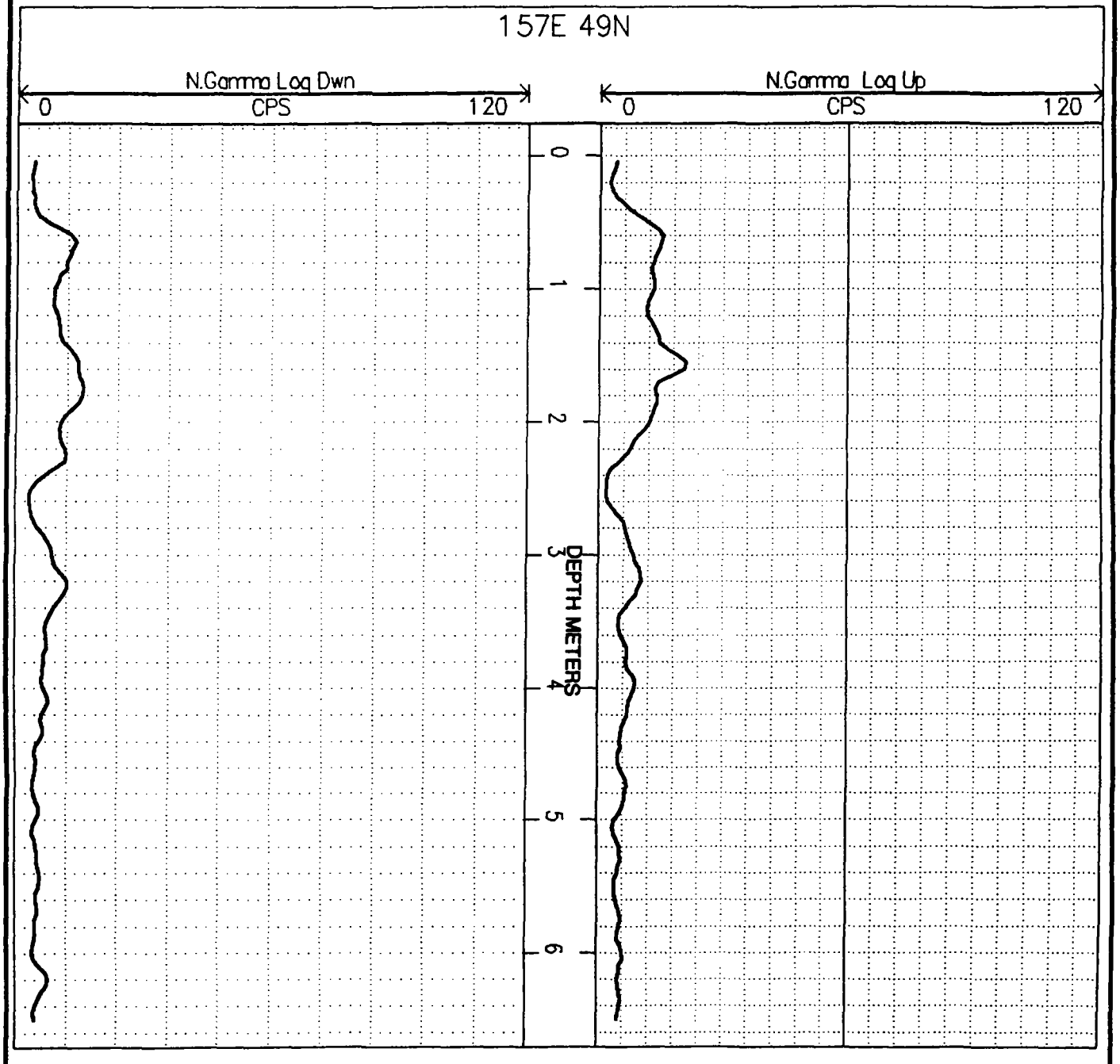


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
BACKGROUND RUN 5-21-94

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-15

DOWN-HOLE GAMMA LOG

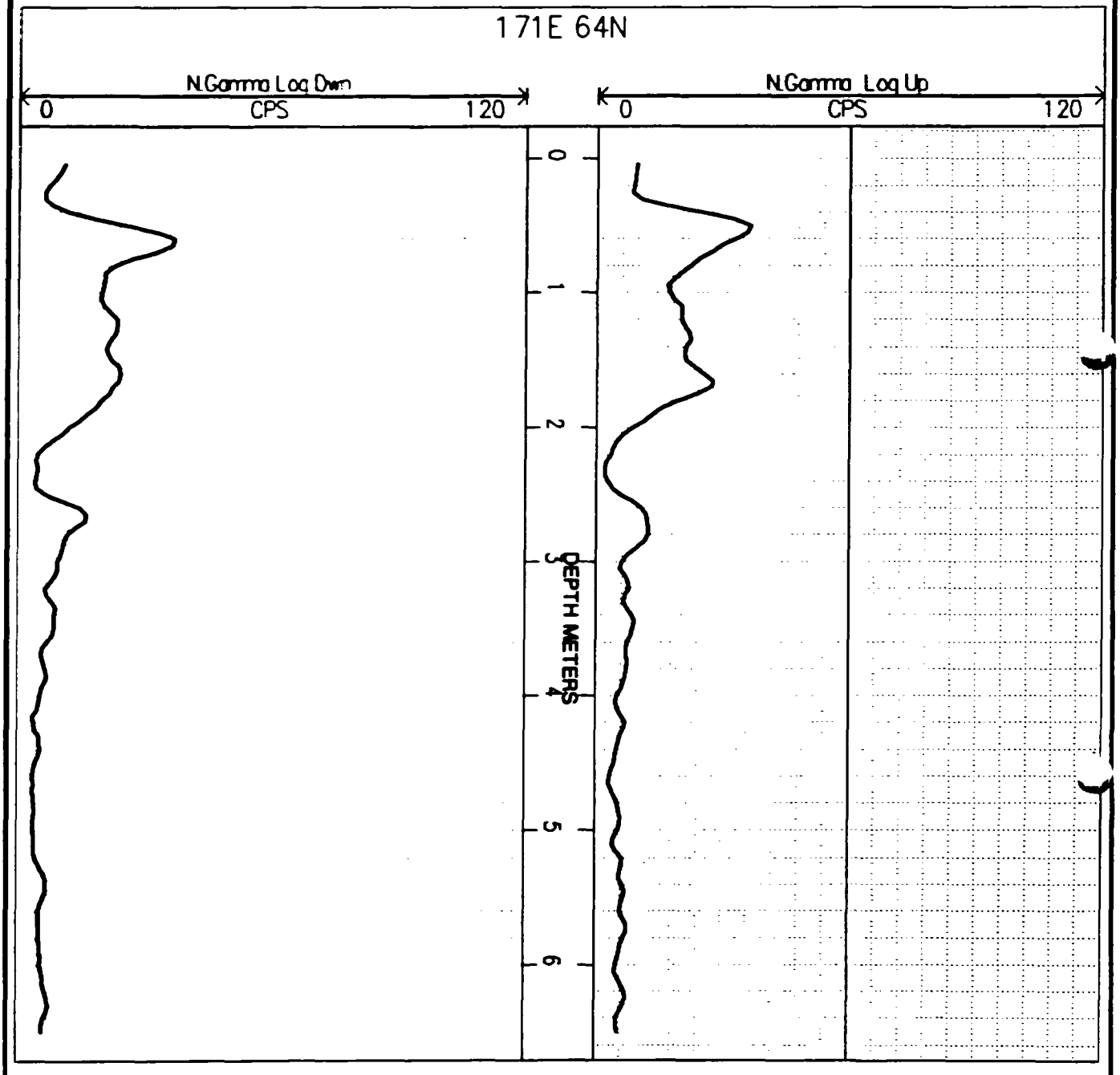


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
BACKGROUND RUN 5-22-94

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-15A

DOWN-HOLE GAMMA LOG

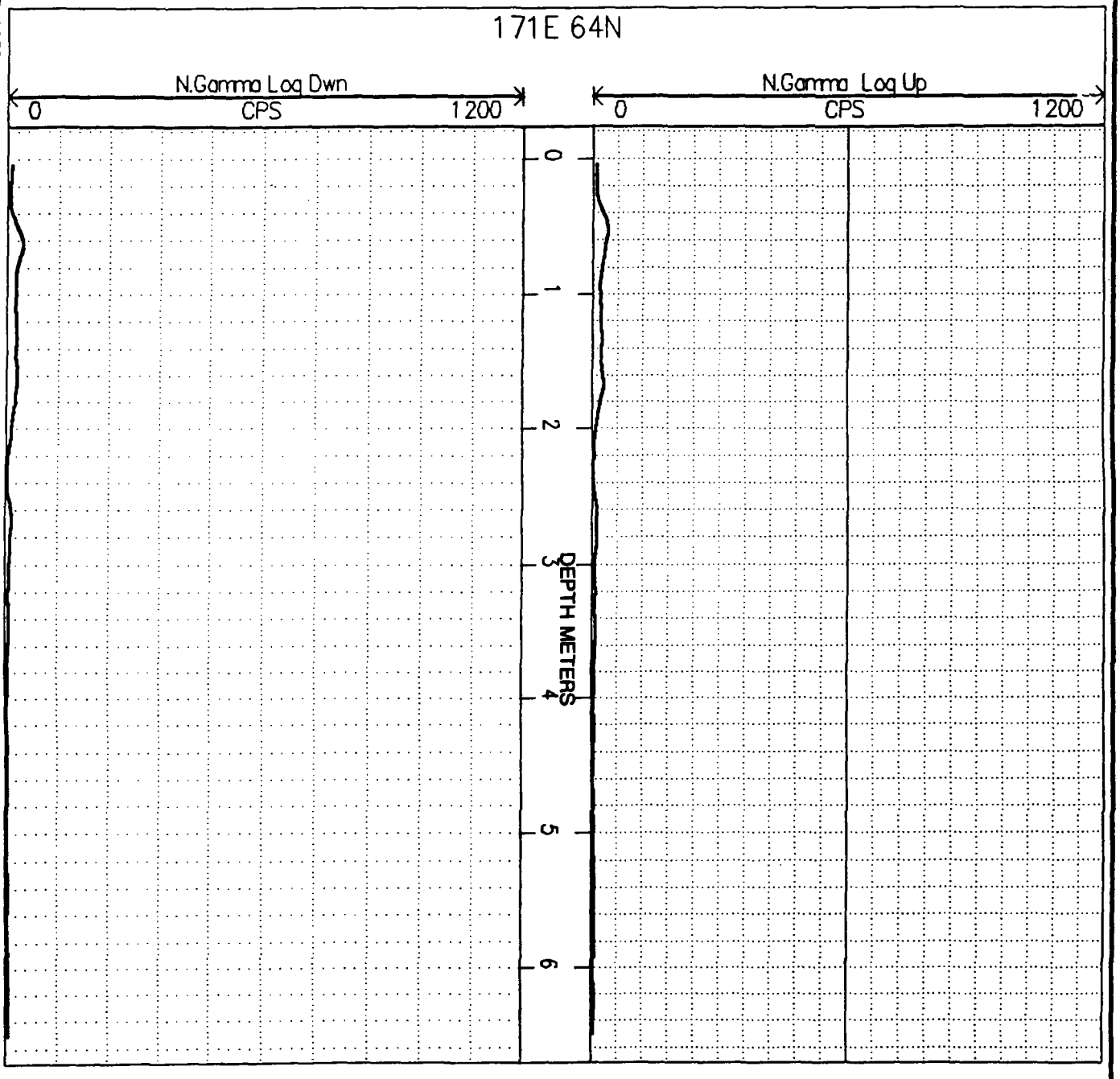


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL/BACKGROUND

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-16

DOWN-HOLE GAMMA LOG

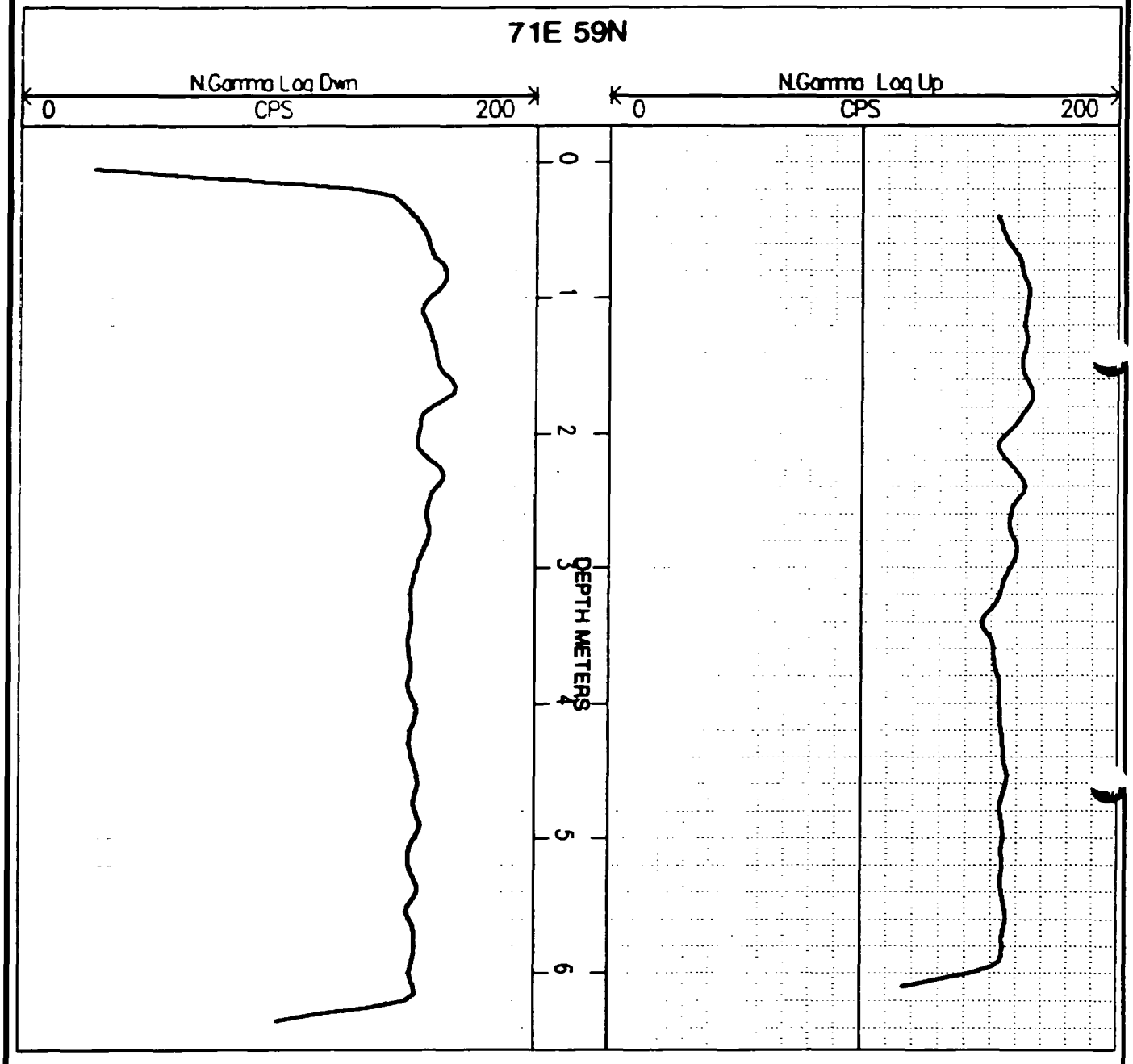


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL/BACKGROUND

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-16A

DOWN-HOLE GAMMA LOG

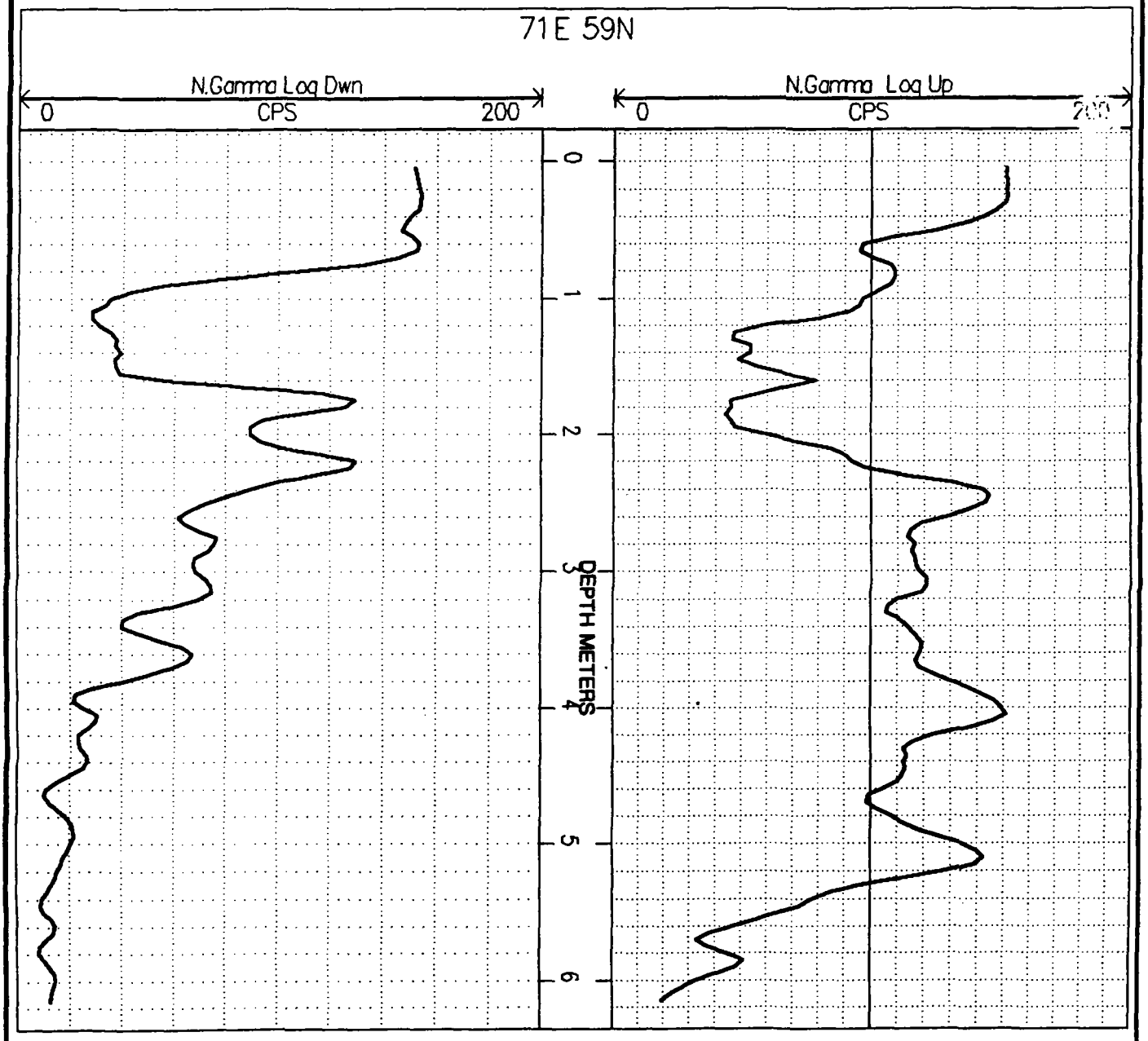


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
BACKGROUND (ANOMALOUS RECORD)
NOTE SCALE = 200 CPS

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-17

DOWN-HOLE GAMMA LOG

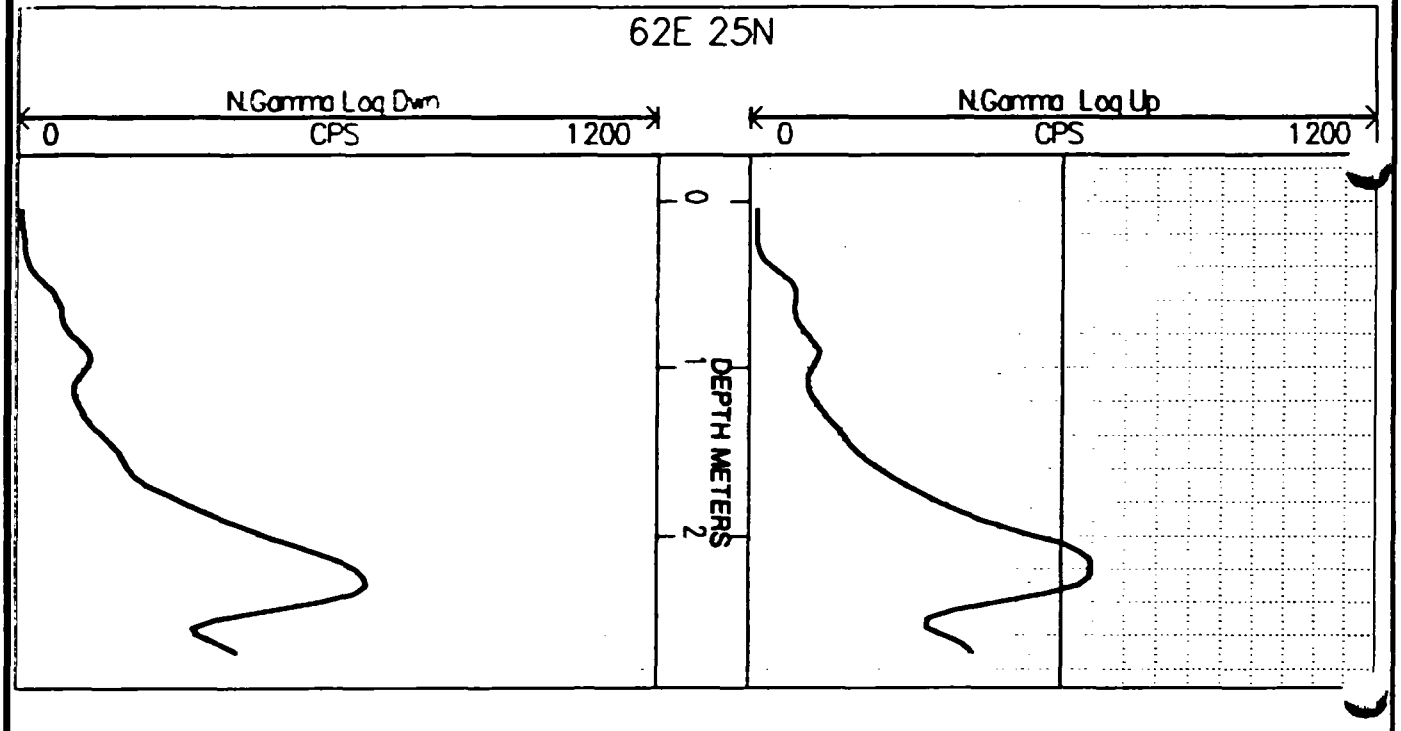


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
BACKGROUND (ANOMALOUS RECORD)
NOTE SCALE = 200 CPS

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-17A

DOWN-HOLE GAMMA LOG

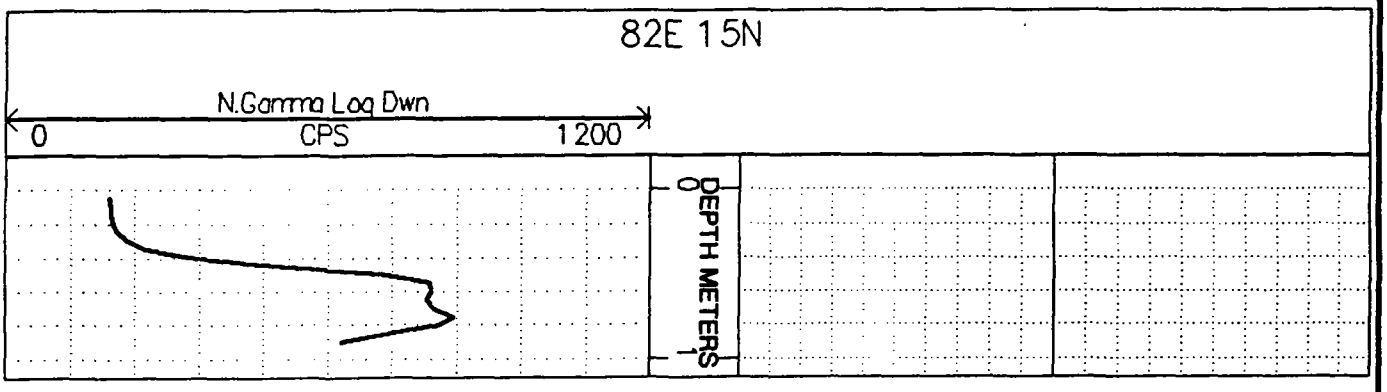


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL (OBSTRUCTED)

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-18

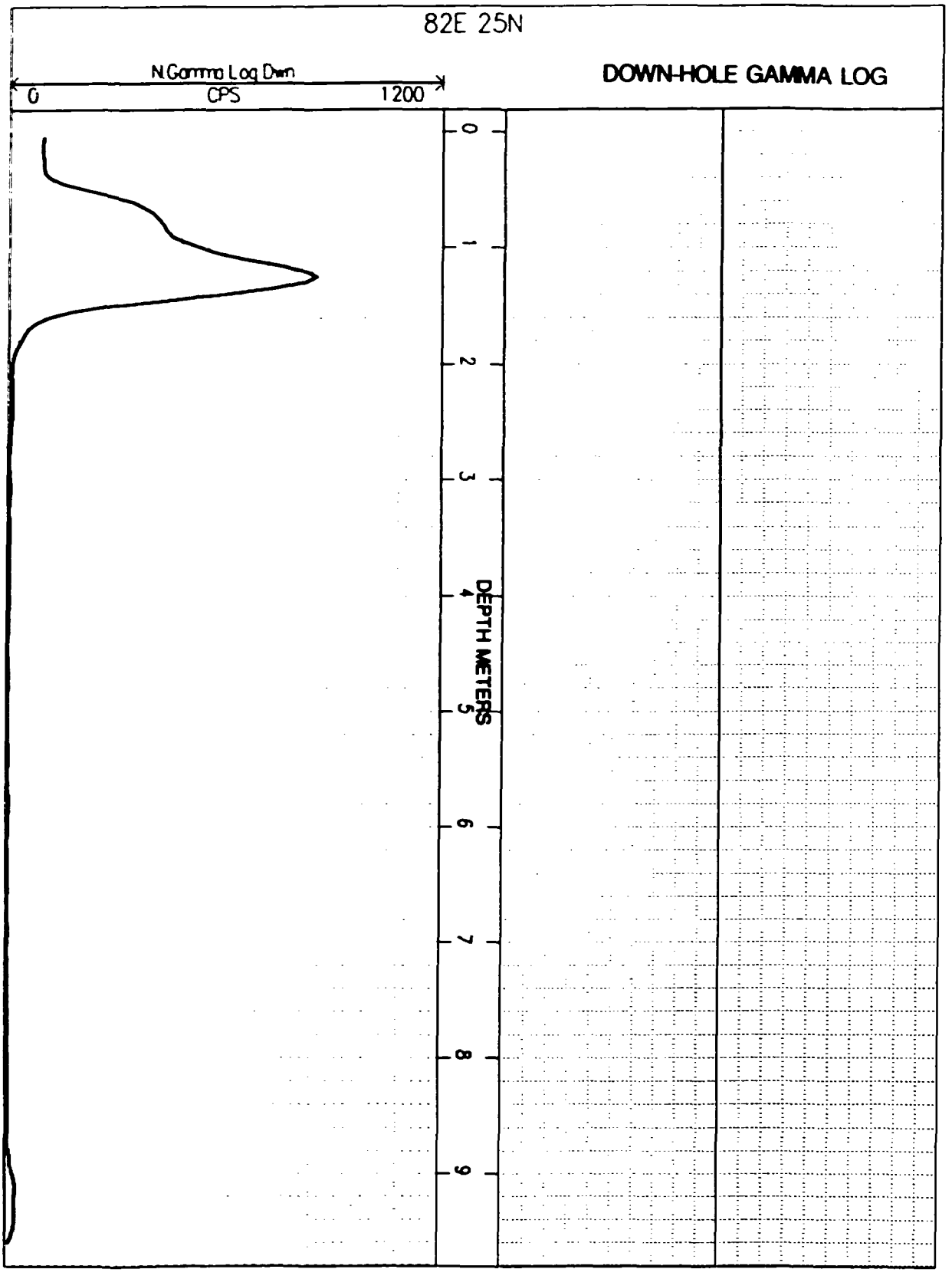
DOWN-HOLE GAMMA LOG



STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL (OBSTRUCTED)

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-19

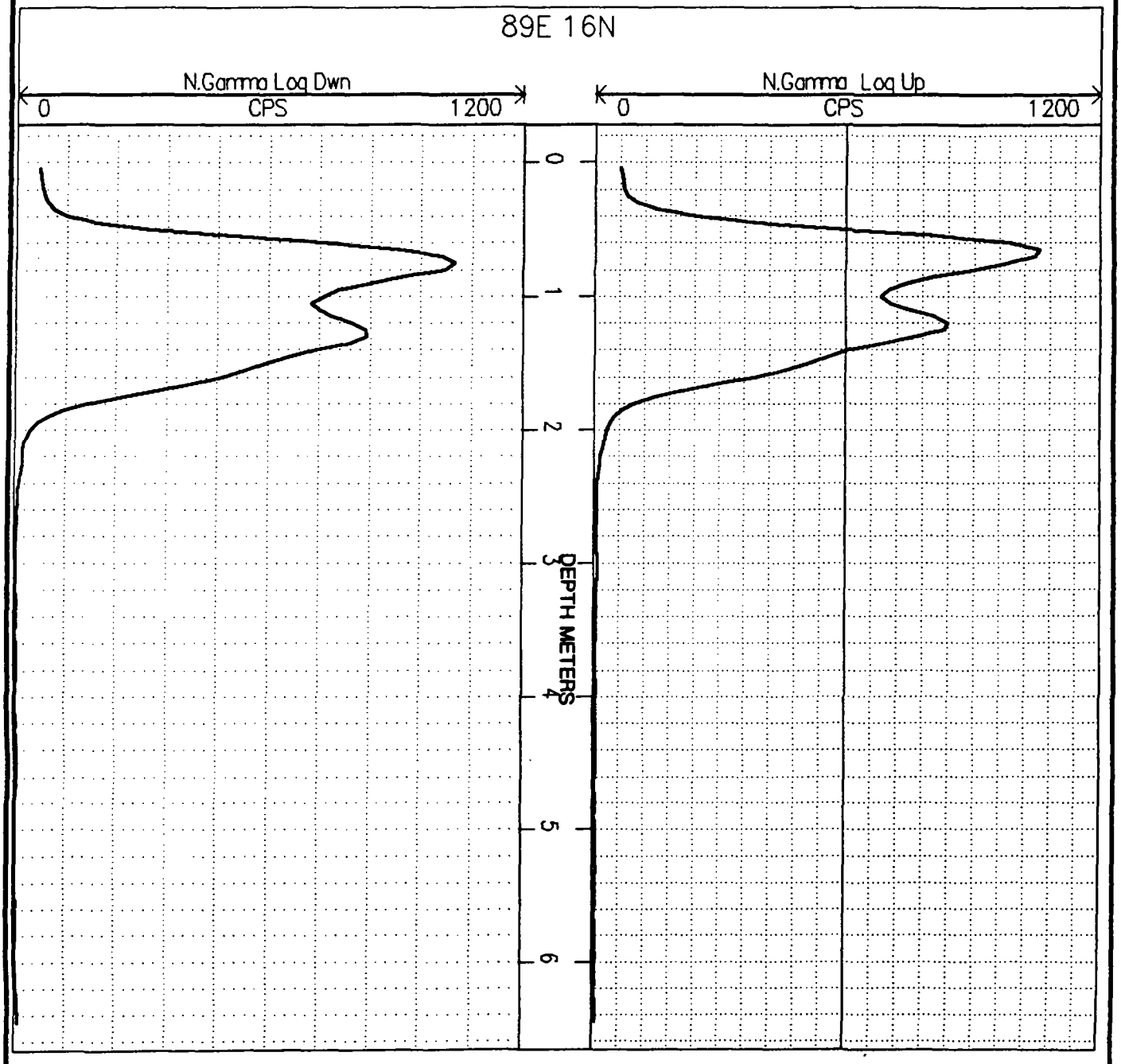


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-20

DOWN-HOLE GAMMA LOG

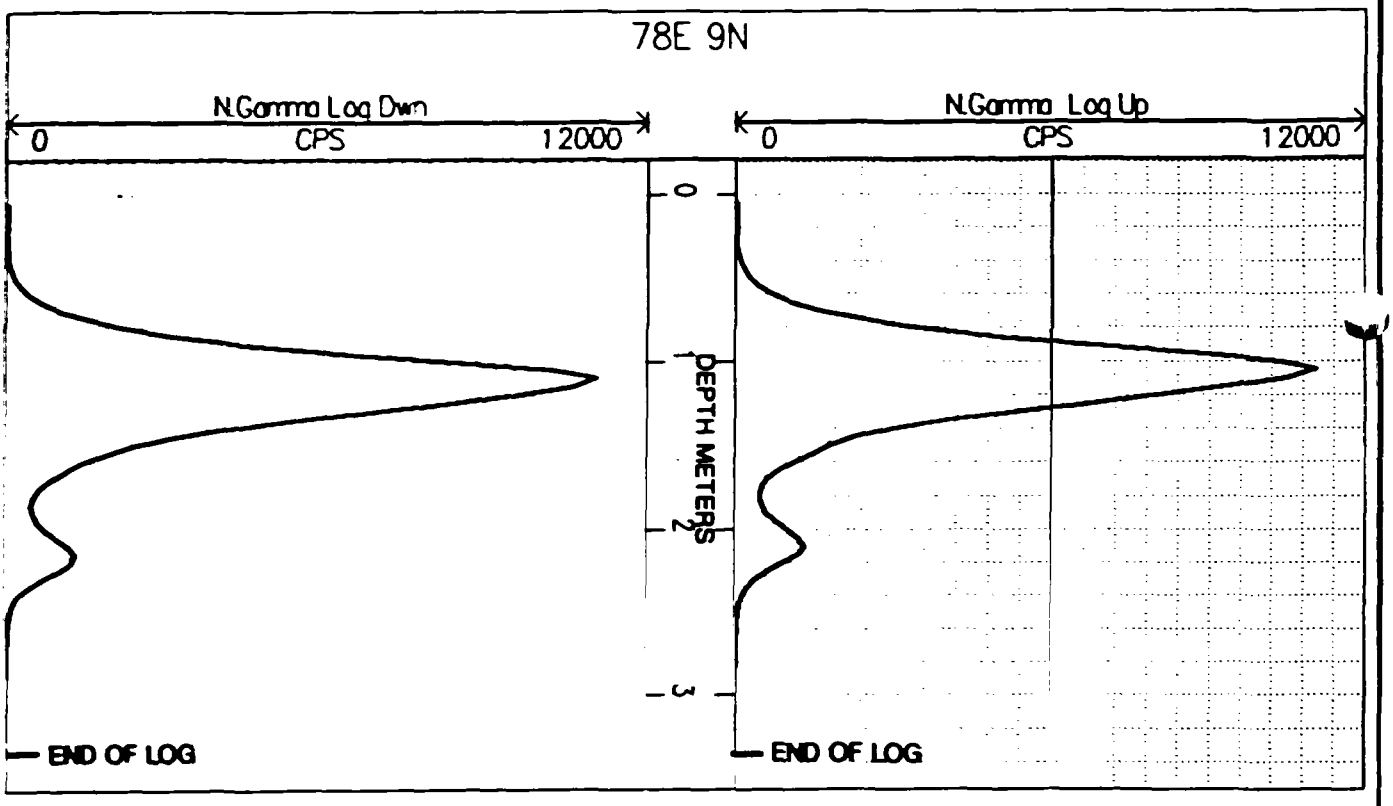


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
TRANSITIONAL

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-21

DOWN-HOLE GAMMA LOG

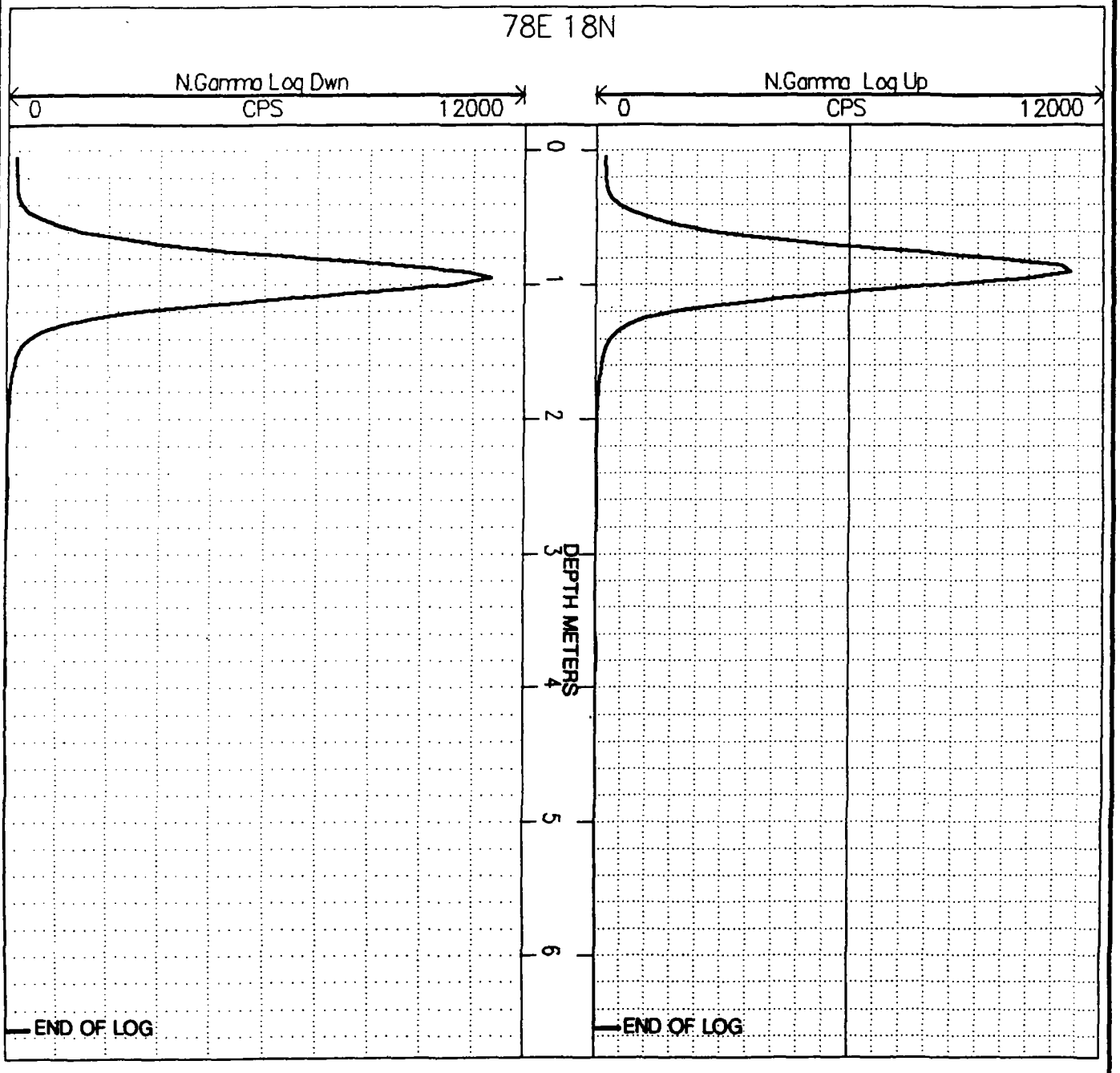


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
HIGH GAMMA (OBSTRUCTED)

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-22

DOWN-HOLE GAMMA LOG

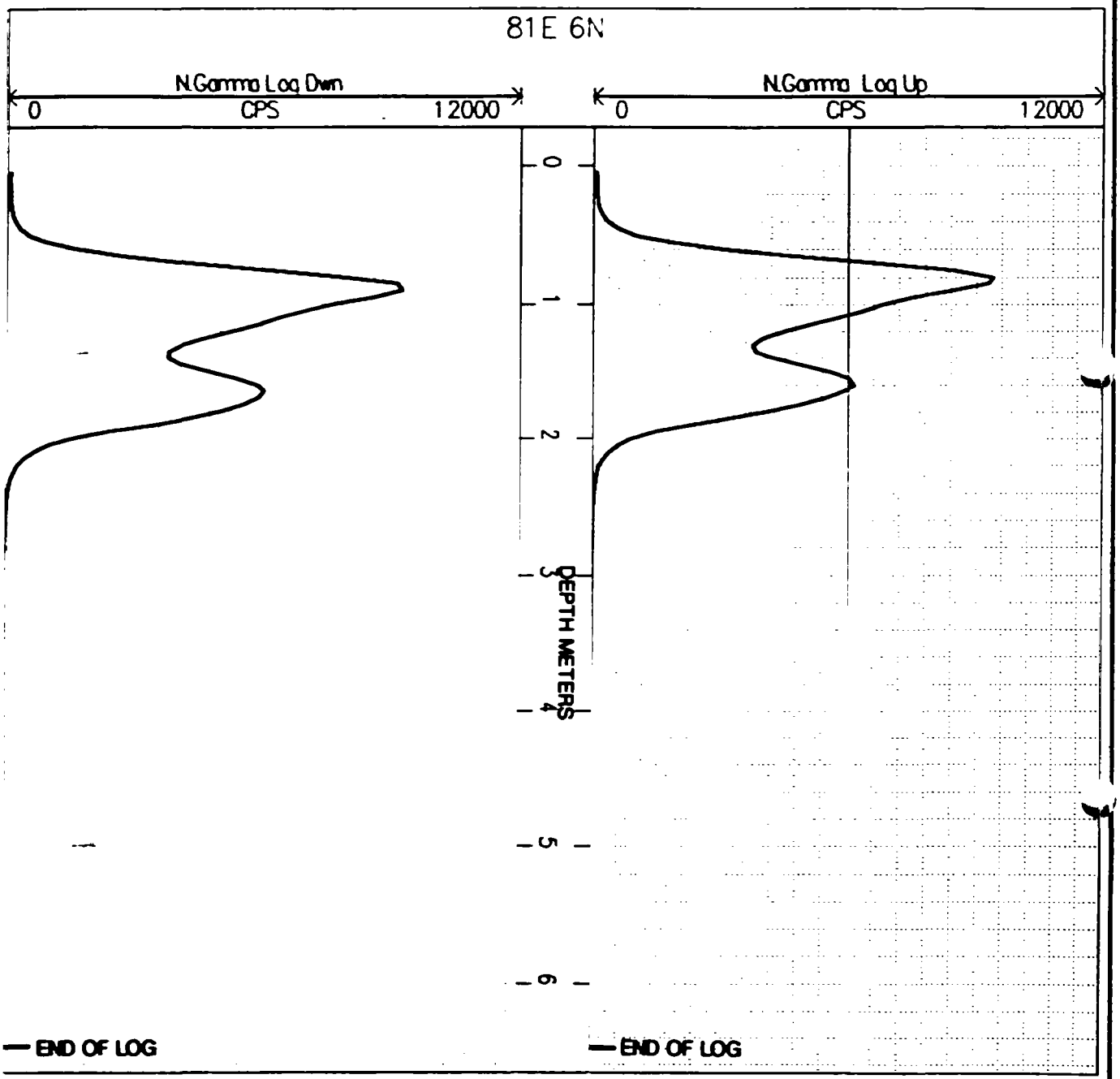


STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
HIGH GAMMA

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE	SHOWN
STS PROJECT NO. 27313-ZH	FIGURE NO.	3-23

DOWN-HOLE GAMMA LOG



STS Consultants Ltd.
Consulting Engineers

READING IN COUNTS PER SECOND
SUBSURFACE GAMMA SURVEY
HIGH GAMMA

DRAWN BY	KKB	10-5-94
CHECKED BY		
APPROVED BY	RGB	10-5-94
CADFILE	SCALE SHOWN	
STS PROJECT NO. 27313-ZH	FIGURE NO. 3-24	

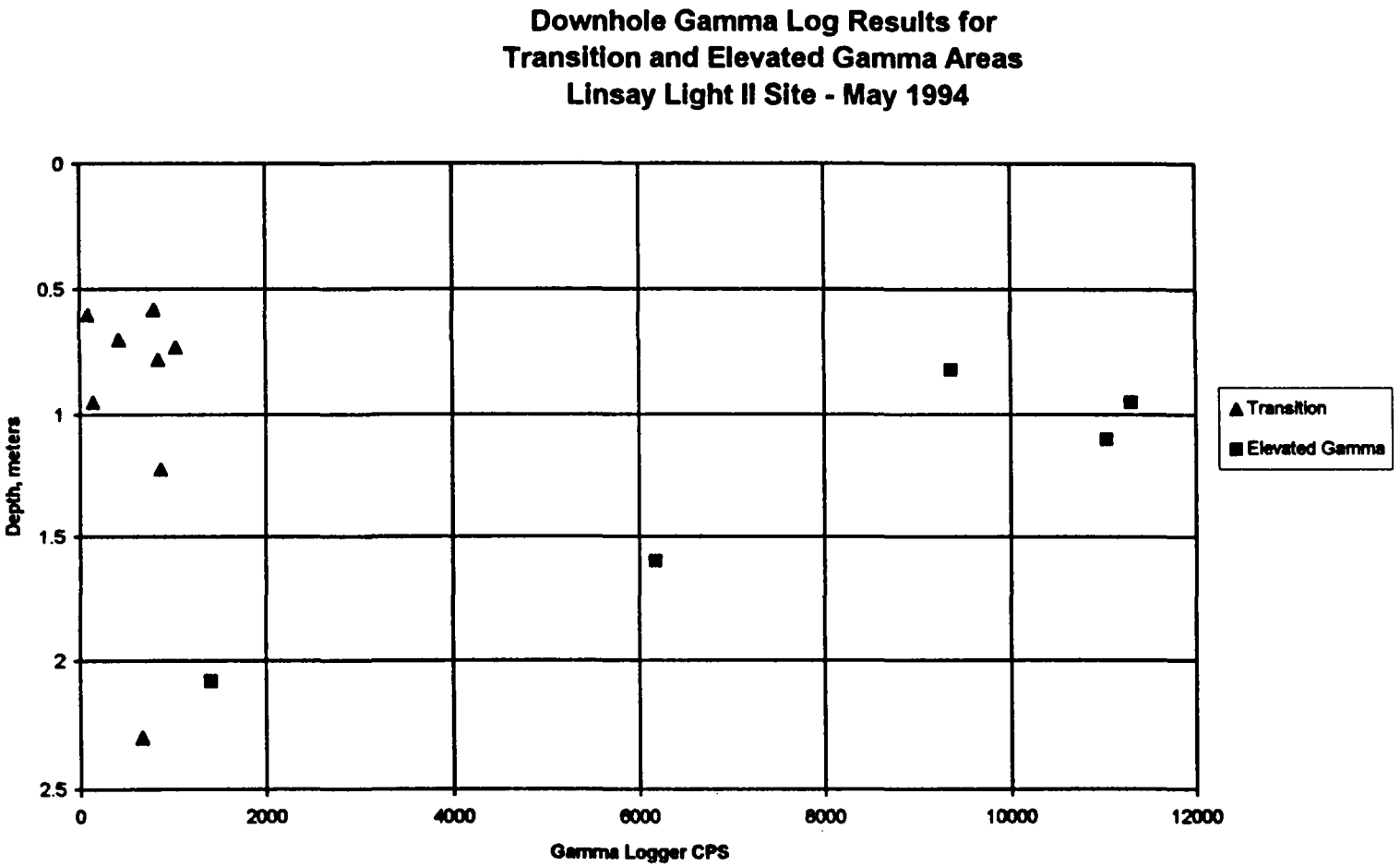


FIGURE 3-25

FIGURE 3-25. Plot of Gamma Logger CPS Versus Depth for Transitional and Elevated Gamma Borings

EQUILIBRIUM CHART
SAMPLE NO. CD-S82E25N-2-3
LAB NO. 5179-003

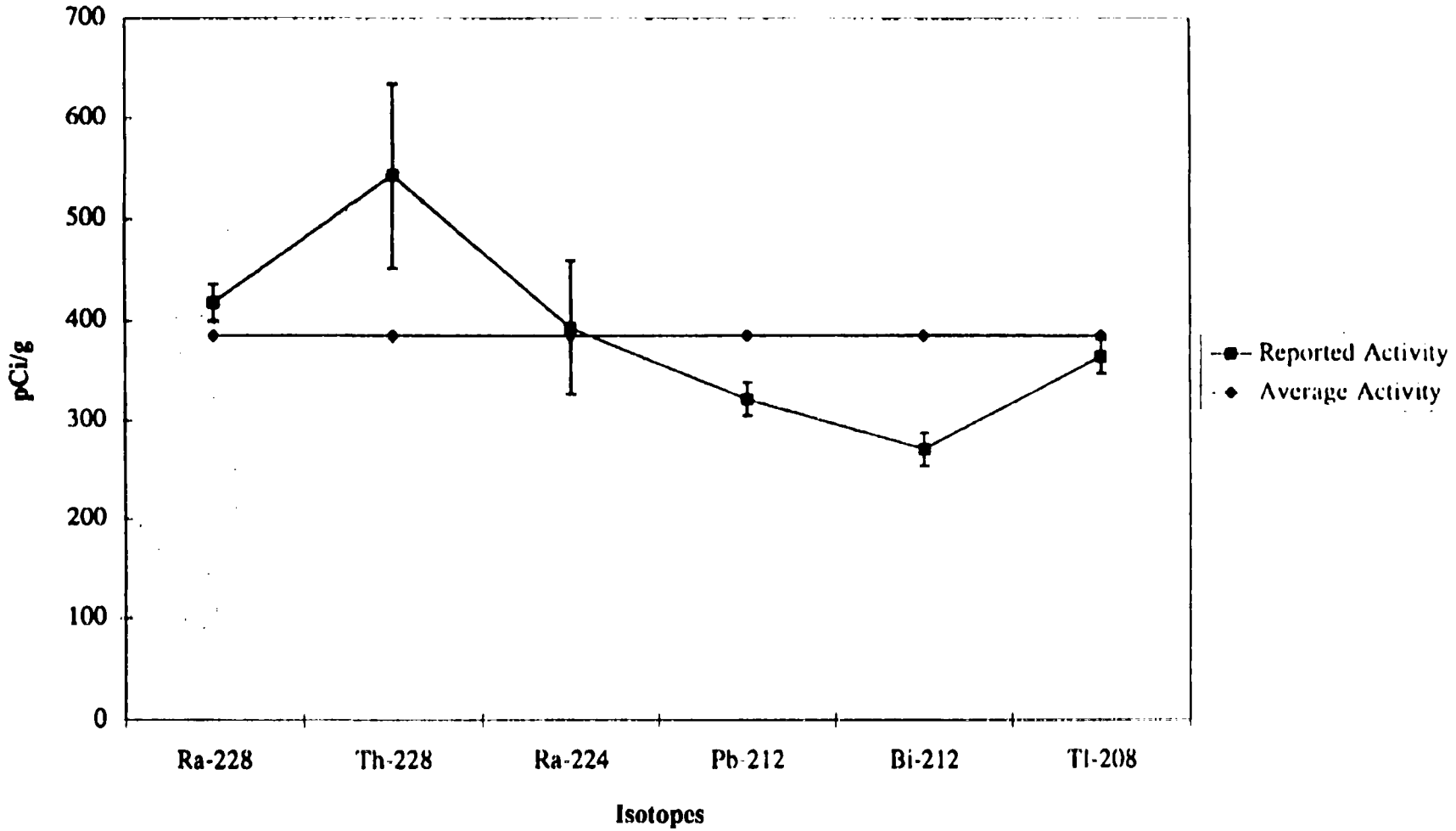


FIGURE 3-26 (REV.1)

EQUILIBRIUM CHART

Sample No. CD-S82E25N-3-4
Lab No. 5179-004

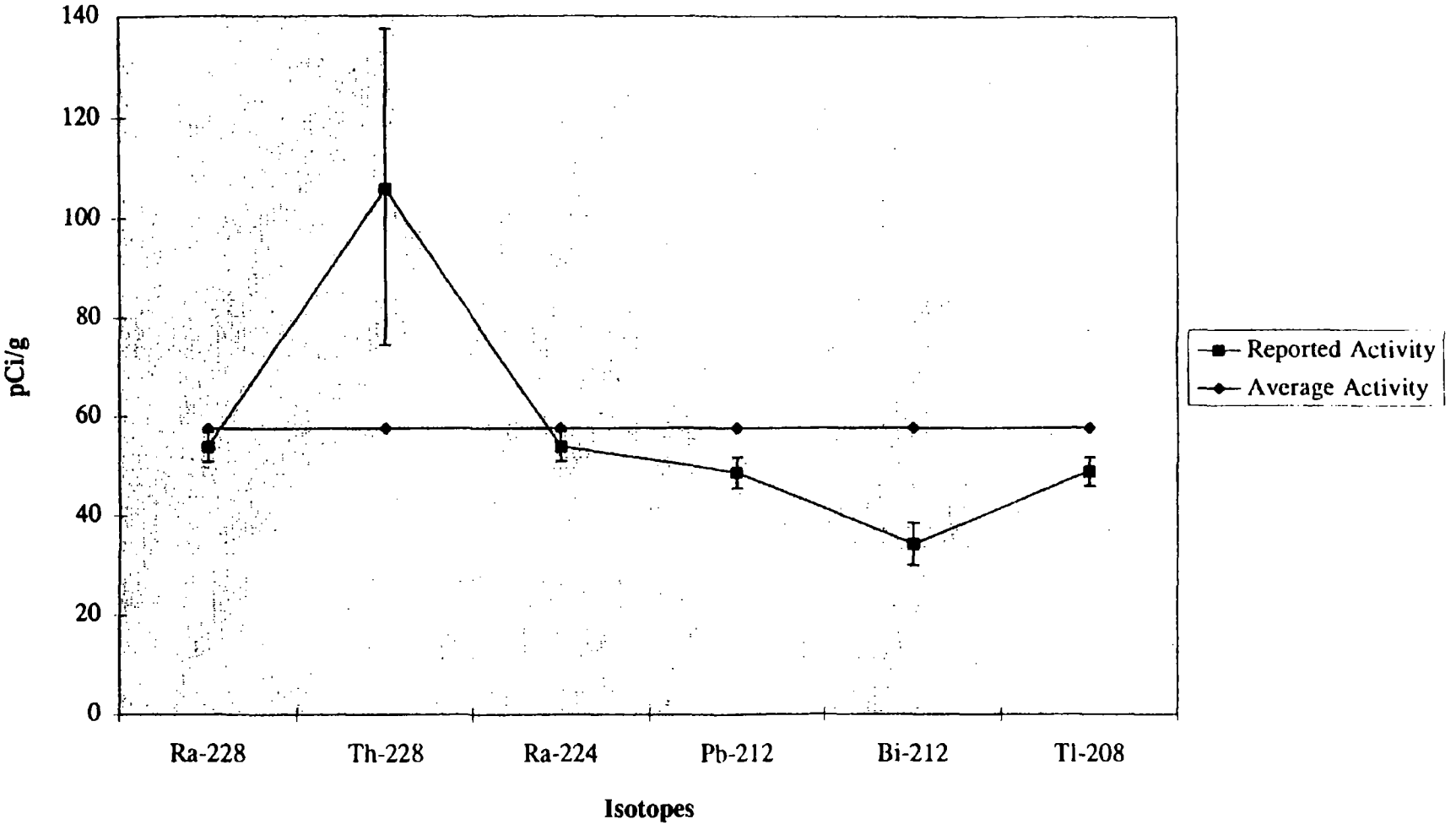
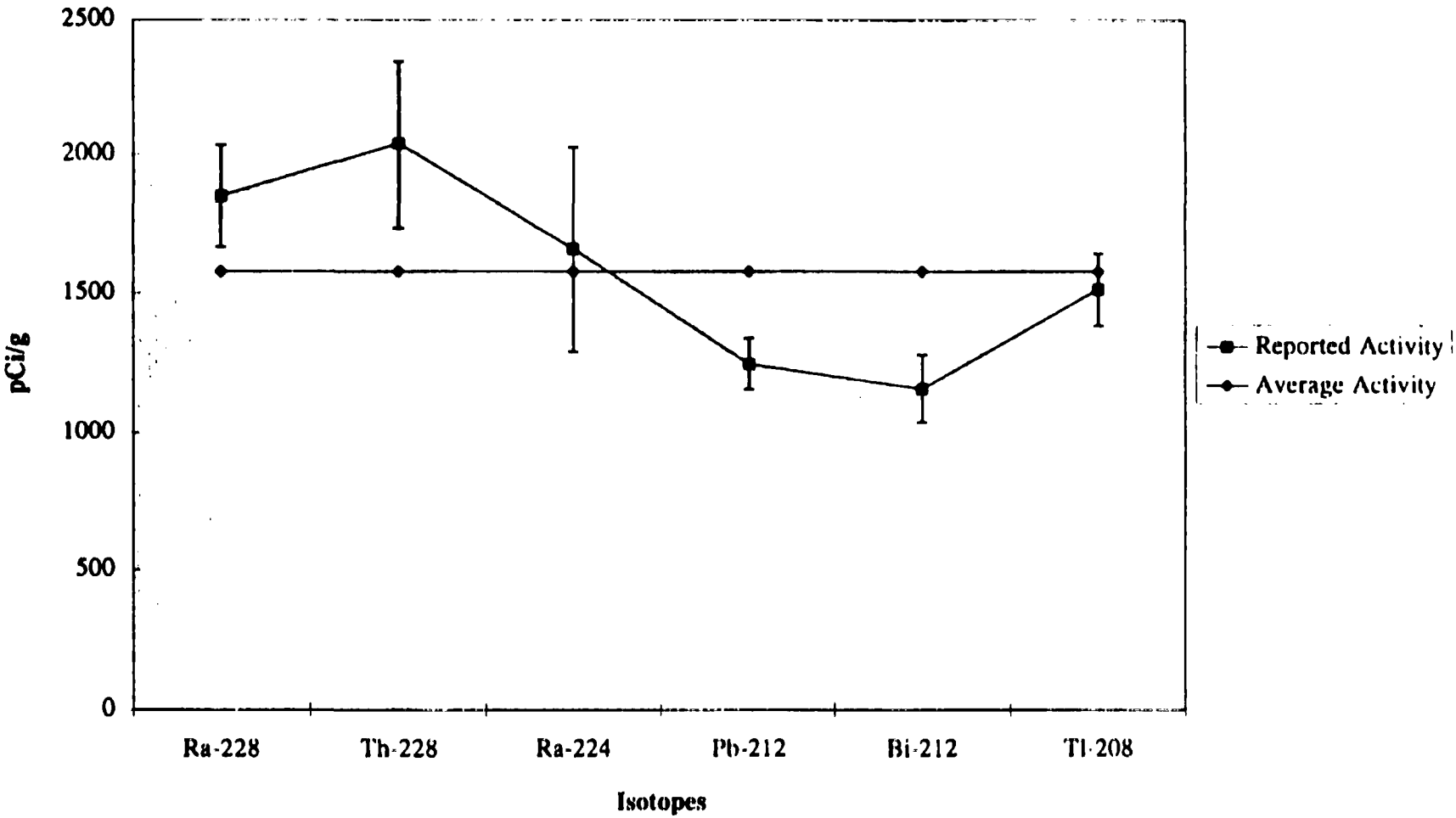


FIGURE 3-27 (REV.1)

EQUILIBRIUM CHART

Sample No. CD-S78E18N-2-3
Lab No. 5179-005



(REV.1)
FIGURE 3-28

EQUILIBRIUM CHART

Sample No. CD-S89E16N-2-3
Lab No. 5179-006

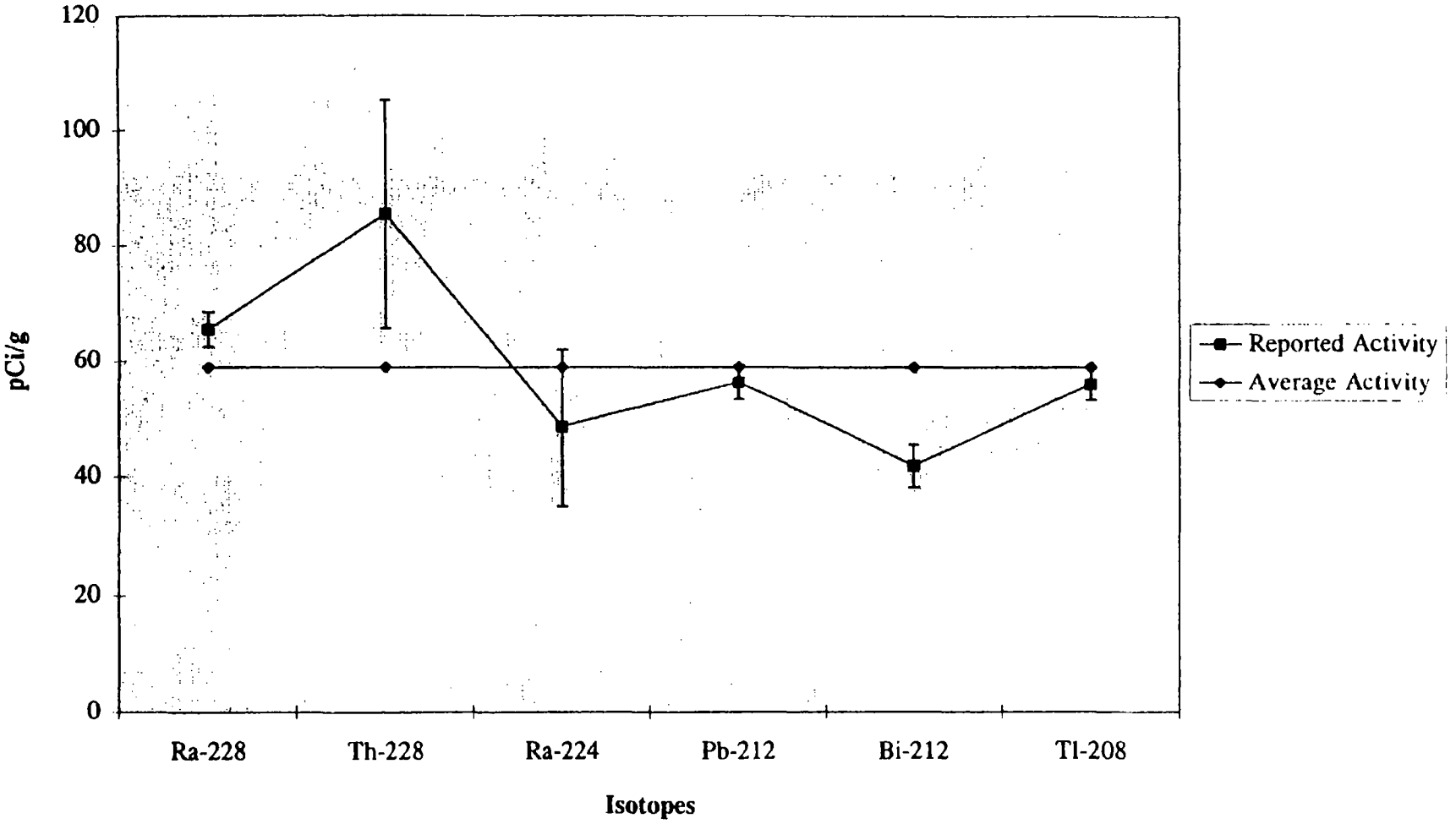
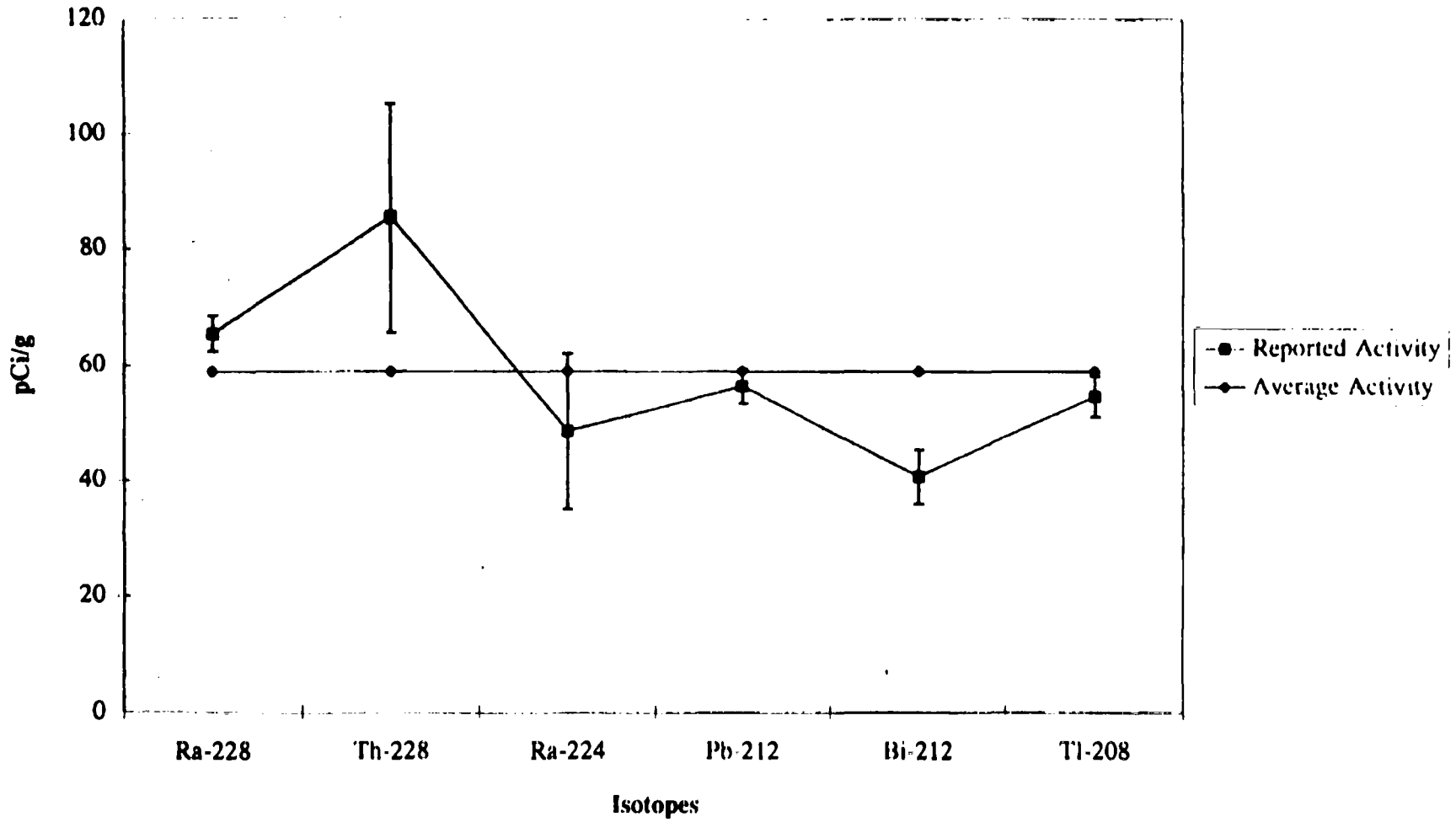


FIGURE 3-29 (REV.1)

EQUILIBRIUM CHART

Sample No.. CD-S89E16N-3-4

Lab No. 5179-007



(REV.1)
FIGURE 3-30

EQUILIBRIUM CHART

SAMPLE NO. CD-S78E18N-3-4-9

Lab No. 5179-008

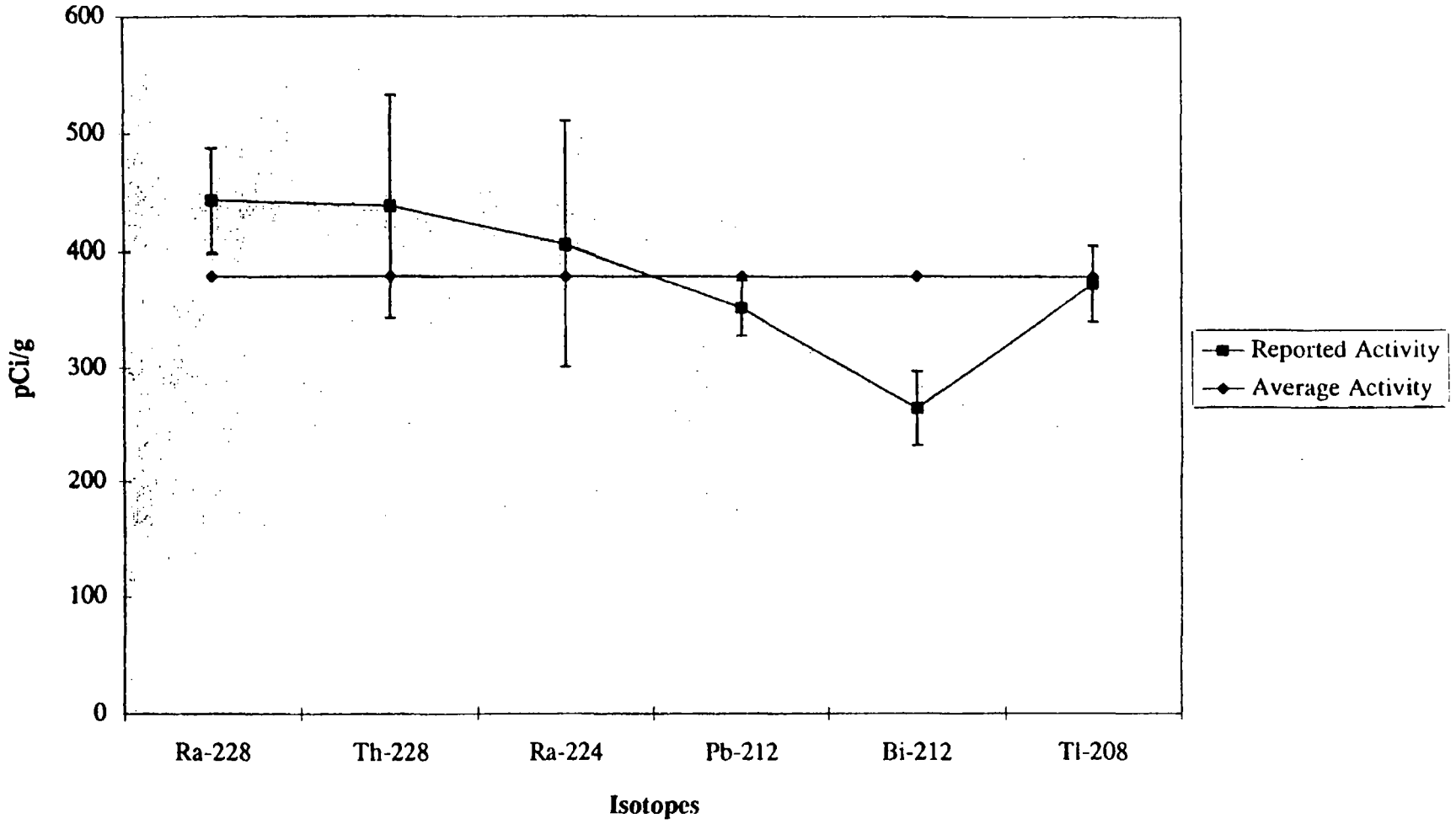


FIGURE 3-31 (REV.1)

EQUILIBRIUM CHART

Sample No. CD-S78E18N-3-4
Lab No. 5179-009

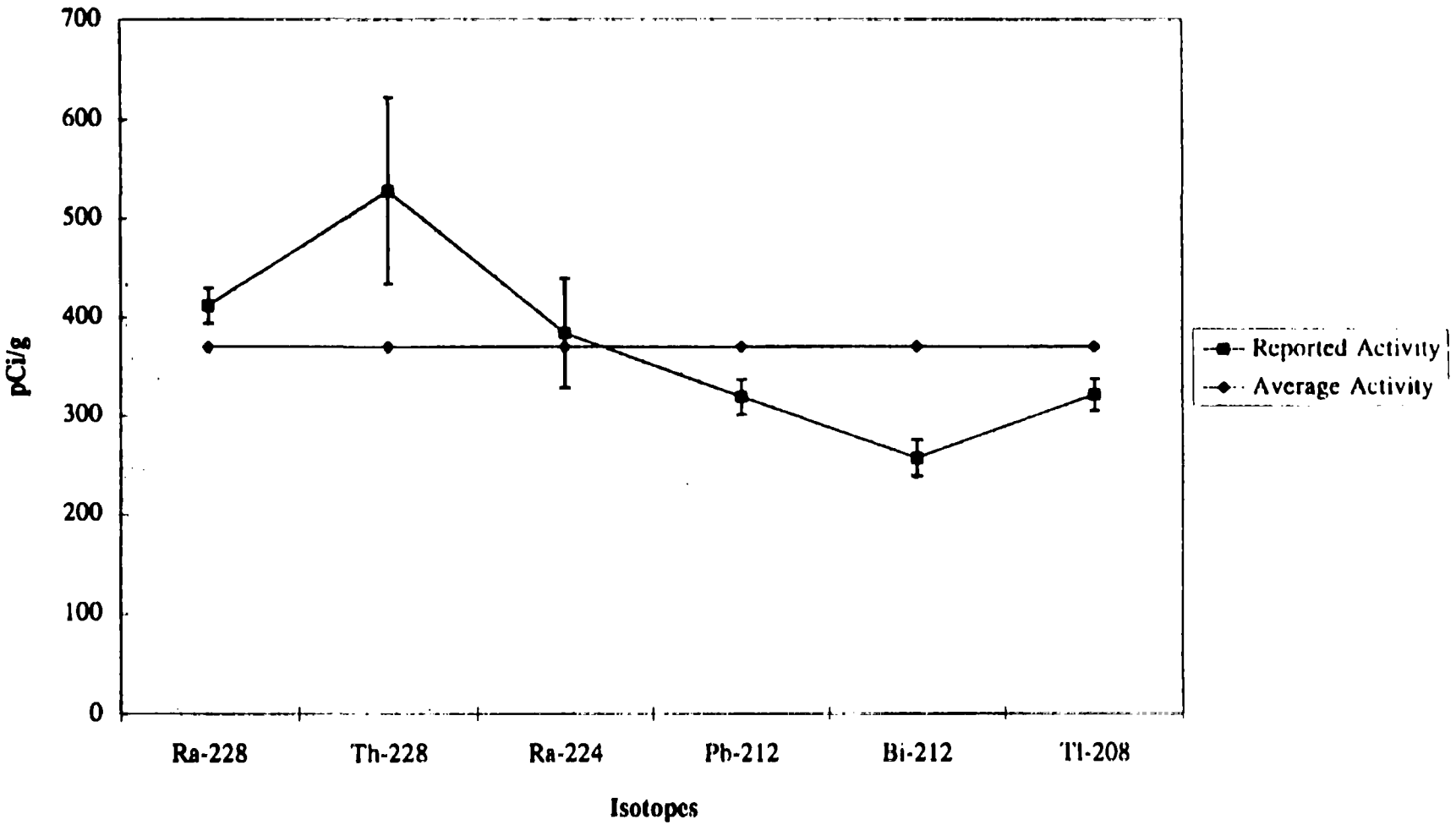


FIGURE 3-32 (REV.1)

EQUILIBRIUM CHART

Sample No.. CD-S81E5N-2-3-9

Lab No. 5179-010

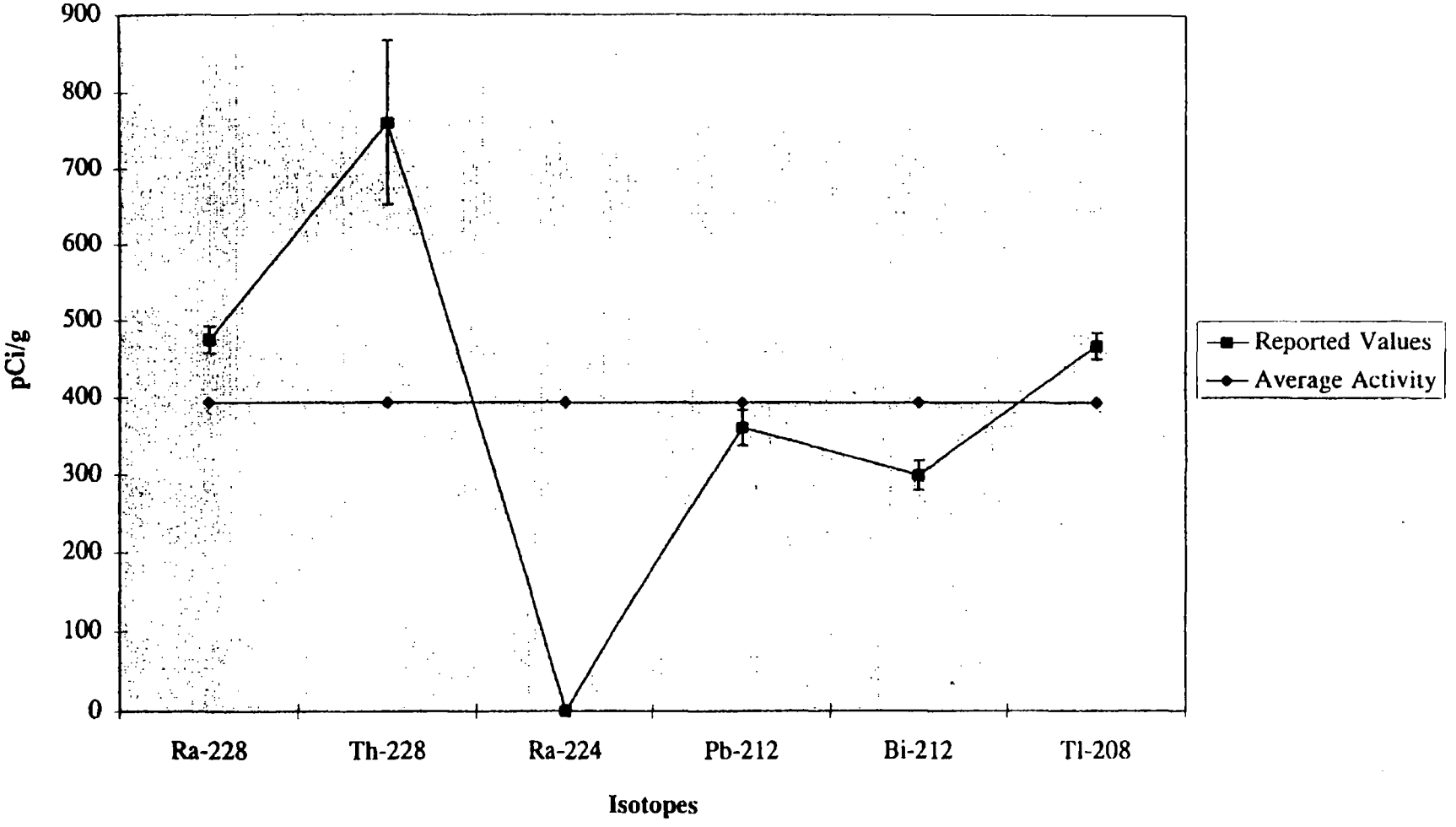


FIGURE 3-33 (REV.1)

EQUILIBRIUM CHART

Sample No. CD-S81E5N-3-4
Lab No. 5179-011

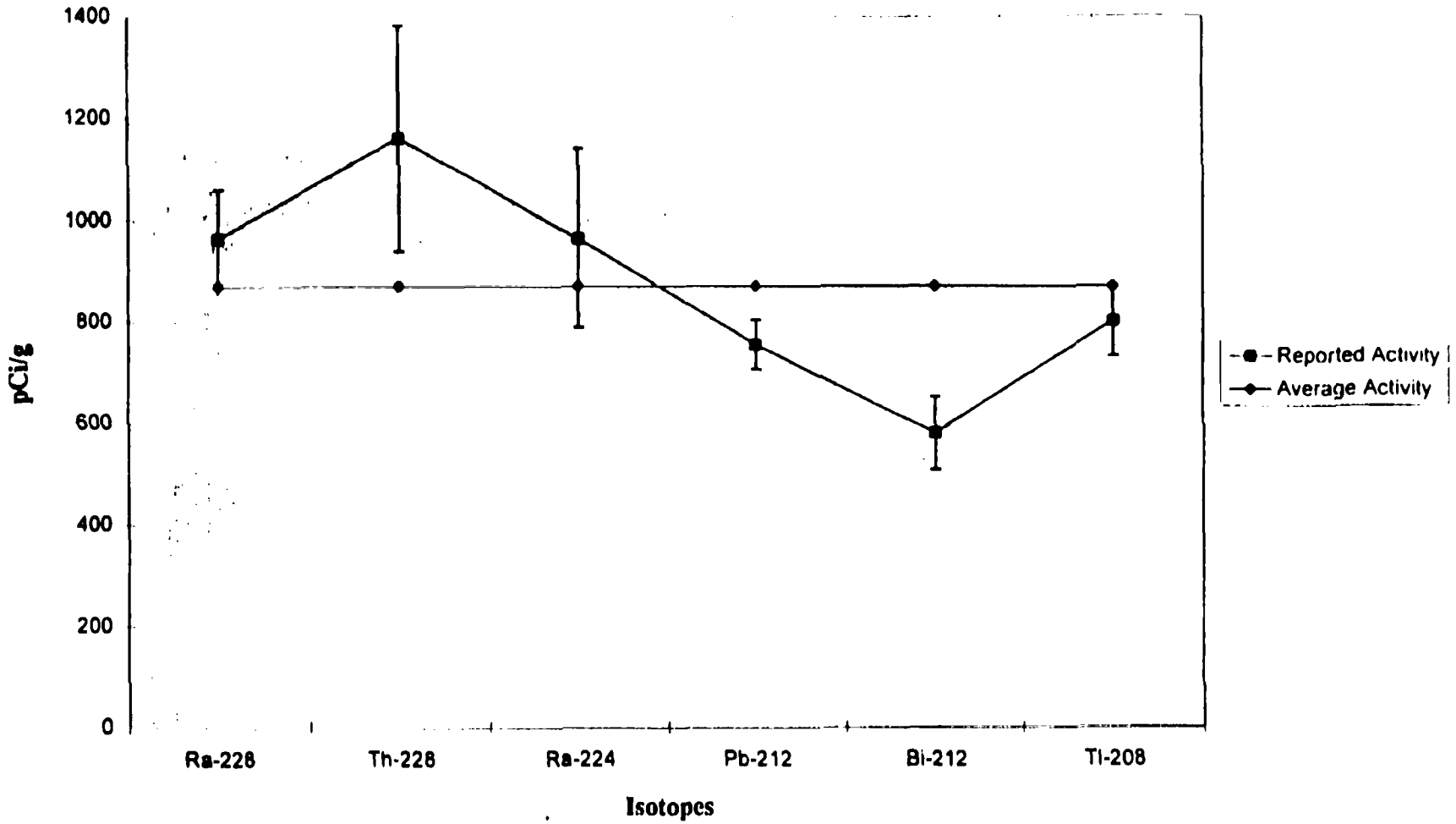


FIGURE 3-34 (REV.1)

EQUILIBRIUM CHART

Sample No. CD-S81E5N-2-3

Lab No. 5179-012

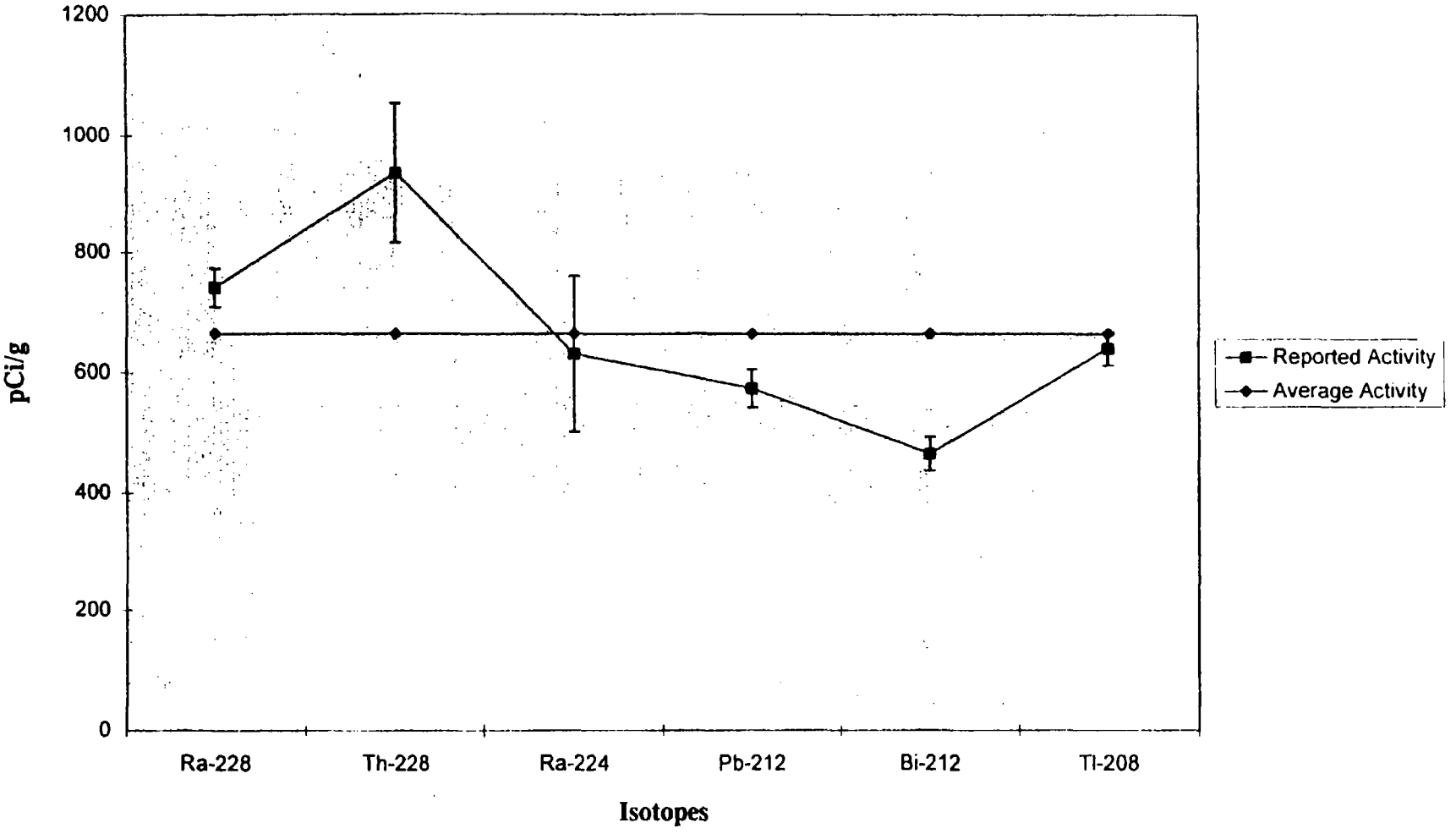


FIGURE 3-35 (REV.1)

The Chicago Dock & Canal Trust

REPORT

VOLUME II

ATTACHMENT A, B, C, D

Report for Characterization Investigation Gamma Radiation Survey

Lindsay Light II Site
316 E. Illinois St.
Chicago, Illinois

STS Consultants Ltd.
Consulting Engineers

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ATTACHMENT A

Lindsay Light II Site
Overland Gamma Survey Report
MJW Corporation, Inc.

DRAFT

LINDSAY LIGHT II SITE

OVERLAND GAMMA SURVEY REPORT

for

Chicago Dock & Canal Trust
455 East Illinois Street, Suite 565, Chicago, IL 60439

and

STS Consultants, Ltd.
1415 Lake Cook Road
Deerfield, IL 60015

by

MJW Corporation Inc.
334 Harris Hill Road, Suite 200
Williamsville, New York 14221

SEPTEMBER 1994

Lindsay Light II Site
Overland Gamma Survey Report

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EXECUTIVE SUMMARY

This report details the results of an overland gamma survey of the Lindsay Light II Site located in the downtown area of the city of Chicago, Illinois. These radiological surveys were conducted using standard 2x2 inch sodium iodide (NaI) detectors and a tissue equivalent dose rate meter. Licensed land surveyors established a six meter grid across the entire 2.7 acre site and a one meter grid for the footprint of a former building suspected to have been used for the storage of radioactive thorium lantern mantles for about a 20 year period in the early 1900s.

Measurements for the 6 meter grid were taken at a distance of 1 meter and 1 centimeter from the ground surface. Detailed one meter grid surveys were measured at 1 centimeter from the ground surface using the NaI detectors and at one meter with the tissue equivalent instrument. Background measurements were collected in areas adjacent to the site also at distances of 1 meter and 1 centimeter. Inter-grid surveys were performed for each 6 meter grid section which resulted in the identification of eleven discrete areas of elevated readings which then received one meter grid surveys. All but four (4) of the eleven (11) discrete areas identified appear to be directly related geographically to the former building site.

The largest concentration of elevated readings, as expected, was found within the building footprint. The highest instrument readings for the NaI units were 1.3×10^5 counts per minute (CPM), and 165 microRem per hour (μRem/hr) for the tissue equivalent instrument at one meter, and 3.3×10^5 CPM and 650 μRem/hr at one centimeter, respectively. General site background averaged about 2,500 CPM for the NaI detectors and 4.5 μRem/hr for the tissue equivalent instrument.

Of the eleven elevated areas identified outside the building footprint, only six showed readings as high as 20 times background (~50,000 CPM) at the surface. All of these areas, with the exception of a small area in the extreme northeast corner of the site were adjacent to the building

footprint. Based on the general radiological data patterns, it is suspected that the radioactive material originally within the building may have been dispersed during site grading activities in preparation for paving, or may have been the result of demolition activities associated with the former building. The pattern is more suggestive of the former scenario.

A rudimentary risk assessment was performed based on the dose rate data collected with the tissue equivalent instrument capable of responding to gamma ray energies from 17 KeV to 1.3 MeV. The only plausible exposure scenario for the site in its present use as a paved parking lot is from direct exposure of lot attendants or lot patrons. Under the most unlikely exposure conditions, the annual dose to an individual would not exceed 4 mrem/yr, whereas a more common and likely scenario associated with the most elevated location on site predicts a dose much less than 1 mrem/yr. Therefore, based on this basic assessment, the site in its present condition possesses no additional risk to lot attendants or patrons in excess of that already present for general radiological conditions associated with the downtown Chicago area.

LINDSAY LIGHT II SITE
OVERLAND GAMMA SURVEY REPORT

I. INTRODUCTION

This report has been compiled to serve as an appendix or a companion report to the final site characterization report for the Lindsay Light II Site located at 316 East Illinois Street, Chicago, Illinois. The overland gamma survey portion of the site characterization was performed in accordance with the site work plan and procedures approved by the EPA's Region 5 office on May 13, 1994. This report will present computer spreadsheet data as well as colored graphics to depict those areas of the site where radiological measurements were found to be above area background levels measured near the site.

II. SITE DESCRIPTION

A description of the site is found in Section 1.2 of the Work Plan with additional information in Appendix E of the Plan. The site is a paved parking lot approximately 200' by 594' covering approximately 2.7 acres. It is bounded by Grand Avenue on the north, East Illinois Street on the south, McClurg Street on the east and Columbus Drive on the West. There are two automated ticket island entrances and two manned cash booth exits to Grand Avenue and East Illinois Street, respectively.

A two-foot high steel guard rail is installed around the entire lot perimeter and storm drain piping is installed in the center of the lot running approximately west to east with eleven (11) grates installed for collection of surface run-off. The parking lot is paved with standard macadam and is well maintained. A seam in the paving running north/south is located at about 132 meters east of Columbus Drive with a small amount of dirt visible as outcropping along the seam.

III. PROCEDURES AND METHODS

A six (6) meter grid was laid out across the site using the known property markers as the references. The grid 0,0 point was located at the corner of the intersection of Columbus Drive and East Illinois streets. The licensed survey team then proceeded to lay out the 6 meter grid using orange spray paint from the 0,0 reference to the north along the perimeter sidewalk and then to the east on the site property. The parking lot was bordered by new concrete sidewalks on the south and west, inlaid concrete "tiles" on the east and an old concrete sidewalk in need of repair on the north side.

The zero east, zero north (0E, 0N) coordinate was approximately 2 meters south and 1 meter west of the installed parking lot guardrail (see Figure 1). The 6 meter grid was extended north along approximately the middle of the western border sidewalk to 66 meters, which was approximately 1 meter north of the parking lot guardrail along Grand Avenue and 180 meters to the east which was just outside (to the east of) the site guardrail along McClurg Street. Due to thick shrubbery and small trees growing along the guardrail on the eastern end of the site, the 180 meter locations were neither marked nor included in the radiological survey. Six meter grid locations were marked by the survey team to 174 meters east. Inter-grid surveys were performed between the 174 meter mark and the guardrail to provide full coverage of the surface of the site on the initial survey.

The most likely location of the former carriage house used to store material produced by the Lindsay Light Company was also marked out by the survey team using a one meter grid and green spray paint. The 30x30 meter grid started at 72E, 0N and ended at 102E, 30N.

Any areas of elevated readings discovered during the 6 meter survey were also marked at the point of the highest reading. A one meter grid was then marked out around the highest reading location using the 6 meter grid points as reference and a rope marked at one meter intervals. These detailed surveys were completed following the initial 6 meter grid survey work.

Instrument Calibrations and Checks

A Ludlum Model 44-10 2x2" sodium iodide (NaI) detector coupled to an Eberline ESP-1 portable ratemeter/scaler was used to perform the radiological surveys. Two instrument sets were used to allow for two survey teams to complete the survey work. Special lead collimators manufactured by Ludlum were installed on the 44-10 detectors to improve the signal to noise ratio of the instrument. One instrument set used a 2.5" lead collimator while the other used a 6" lead collimator. The six inch collimator improved the signal to noise ratio by a factor of 2 when compared to the 2.5 inch collimator.

The ESP-1/44-10 instrument combinations were calibrated in the offices of MJW. The ESP-1 scaler/ratemeters were calibrated on all available ranges using a calibrated Ludlum Model 500 pulser. Once the ESP-1 scaler/ratemeters were calibrated, the instrument sets were calibrated by performing a high voltage plateau to establish the optimum operating voltage and then by counting N.I.S.T.-traceable radioactivity sources to determine the NaI detector efficiency.

The Bicron instruments (Model LE) used to measure the tissue equivalent dose rate in and around the site are a special low energy version of the Bicron MicroRem capable of detecting gamma radiations from about 17 keV to 1,300 keV with a very flat response over this entire energy range. The Bicron instruments were calibrated by the manufacturer at their facility in Solon, Ohio.

Control charts were established for each instrument per Procedure RCP-43. Data used to establish the control charts is shown on Attachment 2 of RCP-43 while the results of the individual tests are provided on Attachments 1 and 3. This procedure was not included in the original Work Plan and is provided in Appendix A to this report.

Prior to each day's field work, the instruments were functionally tested for proper operation using a known N.I.S.T.-traceable radiation source. This check was recorded for each individual instrument on Form RCP 41-1, "Instrument Field Source Check Form". All instrument field checks were conducted in accordance with MJW Procedure RCP-41 and RCP-9.

All calibration, control chart and field check data is shown in Appendices B1 through B3, respectively for all instruments used during the survey.

Site Radiological Measurements

Six Meter Grid

As discussed briefly in the Grid Layout and Site Survey in the previous section, the 6 meter grid was the first to be laid out across the site. One minute counts were taken at 1 meter and 1 centimeter above the survey locations in accordance with MJW procedure RCP-40. Count data for the 6 meter grid survey was recorded on Attachments 40-3 and 40-3A of RCP-40.

Once all grid measurements were completed for the north/south row, an inter-grid survey was performed of each square formed by the 6 meter grid points. Inter-grid surveys were performed at a traverse speed of approximately 3 feet per second (~1 m/sec.). The survey instrument was held as close to the surface as possible and the grid surveyed in a "zig-zag" pattern. For all inter-grid surveys, the ESP-1 external speaker was activated to provide an auditory indication of any increased count rate, since this method is more sensitive than observing the ratemeter LDC display for subtle count rate changes. Areas discovered in the inter-grid surveys which showed increased count rates were marked with an "X" or several "Xs" at the location(s) of the highest reading(s). Once the 6 meter and inter-grid surveys were complete, detailed one meter grids were laid out around the "Xs" using a rope marked at one meter intervals and the 6 meter markings for reference.

Detailed Surveys

All one meter grids were measured at the grid point intersections using the same instrumentation as that used for the 6 meter grid. Count data was only collected, however, at 1 centimeter above the surface. Counting times to collect the detailed survey data ranged from 1 minute to as few as 15 seconds in areas of significantly elevated activity.

Detailed survey data was recorded on Attachments 40-4 and 40-4A per RCP-40. In all instances, detailed grids were laid out such that the edge of the grid was at or below the average background rate for the site. Detailed grids were also surveyed at a distance of one meter from the surface using a tissue equivalent, low energy dose rate meter, the Bicron micro-Rem LE. These measurements were taken to allow for a rudimentary risk analysis to be performed based on the results of the Bicron surveys in areas found to be above site area background levels.

Determination of Site Background

The downtown Chicago area is not an area where one would consider making typical background measurements for comparison to an overland gamma survey. However, because the majority of the area is either paved or covered with concrete sidewalks, three (3) background measurement locations were chosen adjacent to the site. One location was on the western edge of the site along the east side of the Columbus Drive sidewalk and 2 locations were chosen to the east of the site along the eastern and western sidewalks on McClurg Street between East Illinois Street and Grand Avenue. The survey designations for the three background locations were 0 meters East, 187 meters East and 207 meters East from 0 to 66 meters North. Background measurements were made at 6 meter intervals from south to north at each of these locations. One minute counts were recorded with each ESP-1/44-10 instrument set at one meter and one centimeter above the surface.

Background measurements were also taken with the Bicron microRem LE at the one meter and one centimeter locations, pausing for at least 15 seconds at each measurement location to allow for adequate response time. An average was determined for the Bicron analog readout based on the meter fluctuation at each measurement location. All background data was recorded on Form RCP 40-1 in accordance with Procedure RCP-40.

Quality Assurance

Quality Assurance measures were performed in accordance with Quality Assurance procedures in Appendix D of the Work Plan. A minimum of ten (10) percent of the 6 meter grid points were resurveyed using an ESP-1/44-10 instrument set. The QA measurements were made at 1 centimeter above the surface in a random pattern starting at the western edge of the site and moving to the east similar to the original 6 meter grid survey pattern.

IV. RESULTS

Background Measurements

Background data for each ESP-1/44-10 instrument set and the Bicron instrument used to measure surface dose rates is shown in Appendices C1 through C3, respectively. The results of the one minute counts at each measurement location for the one meter and the one centimeter distances are given on the top of each page for each instrument. Measurements were broken down into one meter and one centimeter data and within each group, the data from the two sidewalks adjacent to the site were compared to the data collected from the sidewalk on the eastern side of the McClurg street. This comparison shows that there is no statistically significant difference between the near site and the off-site numbers within the one meter or one centimeter groupings. All one meter and one centimeter data sets were then combined and an average and standard deviation calculated for each measurement distance. Statistical comparison of the one meter and one centimeter data sets at a 95% confidence level (α = 0.05) showed that again there was no significant difference. Therefore, an overall average and standard deviation was calculated for the combined one meter and one centimeter data.

The shield size used on each detector accounts for the difference in the overall background averages in that the 6" lead shield for detector S/N 111127 produced an average background of 1385 counts per minute (CPM), while the 2.5" shield on detector S/N 112642 had a background of 2418 CPM. With no added shielding, both detector backgrounds were in the 5000 to 6000 CPM range. All background data measurements were normalized to the 2.5" lead shield configuration. As a consequence, all measurements taken with detector S/N 111127 and the 6" lead shield were multiplied by a factor of 1.75.

Dose rate background data was collected using the Bicron microRem LE in the same manner and locations as the ESP-1/44-10 instrument sets. These data are shown in Appendix C-3. The surface measurement is about 3 centimeters (to the detector) for the Bicron versus 1 centimeter

for the 44-10 detectors. Like the 44-10 data, no statistically significant difference was seen between the 1 meter and 1 centimeter data. The overall average for the Bicron background was 4.45 μRem/hr ± 1.14 at one standard deviation. The average of 4.45 is rounded to 4.5 μRem/hr for the purposes of this survey.

Six Meter Grid

The results of the 6 meter grid surveys are shown in Appendix D-1 through D-5.

Appendix D-1 is a Microsoft Excel, Version 5.0 spreadsheet showing the measurement location, the raw data measurement and the net CPM after subtraction of the average background value. If the net result was ≥ the average background value the "Net CPM" column is designated as < BKG. If the Net CPM is greater than background, the numerical value is given. If the numerical value for the Net CPM exceeds the background value plus two standard deviations (BKG +2σ), the value is shown in red for easy identification of elevated readings. The spreadsheet is layed out such that the locations begin near 0E, 0N with points north moving up the page and points east increasing from left to right. This format is consistent for all spreadsheets and graphics presented in this overland survey report.

The results of the 1 meter survey data for the 6 meter grid show that only 19 data points exceed BKG +2σ or approximately 5% of all measurements. The highest Net CPM value measured of 1.15 E+05 was at location 78E, 12N which is within the former Carriage Building footprint. The majority (12/19) of the elevated measurements for the 6 meter grid were within the building footprint.

Appendix D-2 is identical to Appendix D-1 with the exception that Net CPM values in red are >3 times the average background value. Based on this criterion, only 10 Net CPM data points are shown in red, all but one of which is located in the old building footprint.

The numerical filter for the Net CPM value of >3 times background (>3 x BKG) follows the guidance of NUREG 2082 and a host of other publications which assume that a count rate or exposure rate which is more than 3 times the average background value is more likely than not, from a statistical standpoint, to be due to the presence of residual radioactive material. The unique downtown location, where establishing a "normal" background is not possible and the fact that the suspected radiation source is shielded at a minimum by the presence of a stone base and a 2-3 inch thick macadam surface, makes use of the >3 x BKG criterion to establish the presence and location of residual radioactivity a logical choice which significantly reduces false positive indications and refines the overland gamma radiation footprints. Due to the low fluctuation of background throughout the area (i.e., ±25% at 2 sigma) it is likely that the average BKG number $+2\sigma$ is artificially low. Therefore, we contend that the most reliable "cut-off" between background and actual residual radioactivity at this site based on surface measurements with the ESP-1/44-10 instrument sets is three times the measured background rate.

Appendix D-3 presents ESP-1/44-10 measurements at 1 cm above the ground surface. The average background at 1 cm was slightly higher than its counterpart at 1 meter and was used to calculate the Net CPM for the 1 centimeter data. The data are set up identical to Appendices D-1 and D-2. Values in red are Net CPM results which are greater than the BKG $+2\sigma$. Again, like Appendix D-1, 19 data points exceed the background cut-off and are primarily located within the former Carriage Building footprint.

Appendix D-4 is identical to D-3 with the exception that the Net CPM values in red are >3 times the average background value. Like the one meter data >3 x BKG, fewer points exceed this criterion for the 1 cm data. Only 11 points exceed >3 x BKG, 10 of which are, as expected, inside the Carriage Building footprint.

Appendix D-5 presents the 6 meter grid inter-grid survey data. Results are given as the average and the maximum count rate for each grid square formed by the 6 meter survey locations. The survey tables begin on the western edge of the site and proceed from north to south for each sector. For example, the 0E to 6E, 66N to 60N grid would have 0E, 66N; 0E, 60N, 6E, 60N and 6E, 66N as the four corners of the grid area surveyed. Average and maximum count rate values which exceed BKG +2σ are shown in red.

The results of the inter-grid survey identified eleven (11) areas outside the Carriage Building footprint which had elevated measurements after area background subtraction. All readings > BKG +2σ after background subtraction are shown in red. The average count was obtained by observing the changes in count rate as the grid was traversed and estimating the most frequently occurring value over the data range. The maximum reading was taken from the highest value noted during the walkover. As previously discussed, the highest elevated areas within a grid was marked with an "X" for additional characterization using a one meter grid. As with the 6 meter grid surveys, the majority of elevated readings for the inter-grid survey were found in the Carriage Building footprint.

Quality Assurance Data

Per Section 3.2.2 of the Work Plan, duplicate measurements were conducted for approximately 10% of the 6 meter grid stations. QA measurements were made randomly across the site at surveyor -established 6 meter grid points using the ESP-1/44-10 instrument set with the 2.5" lead shield (S/N 112642). All 6 meter grid QA data is shown in Appendix E. The site was walked randomly from west to east and north to south to north in a "zig-zag" pattern similar to the inter-grid survey technique. A total of 100 QA measurements were made, where only 36 measurements were required by the Work Plan. The additional measurements were made to provide for a random sampling across the entire site versus only a portion of the site.

All QA measurements were collected for 30 seconds. Appendix D-6 gives the raw 30 second data, the corrected CPM for the QA count, the initial raw data, the corrected raw data as CPM and the percent difference between the Corrected QA CPM and Corrected Initial CPM, using the initial CPM as the "true" or expected value for the percent difference calculation. The result of percent difference test range from -31.8% to 50.77% with an overall average of -1.56±12.3% at one standard deviation. These QA data show that the average variation is excellent and that 95% of the data are within an error range of less than ± 25% at 2 standard deviations. Given the fact that the QA measurements were made on different days and that the majority of the QA data is in the range of site background, an error of only 25% at 2 sigma is considered to be acceptable.

Detailed Survey Data - 1 Meter Grids

As discussed in the 6 meter grid section, during the inter-grid surveys, any elevated areas discovered were marked with an "X" at the highest reading and a 1 meter grid was established in the area of the "X" using the 6 meter grid points as a reference and a rope marked in 1 meter increments. Detailed 1 meter grid surveys were performed for the 11 areas identified during the inter-grid surveys in addition to the one meter 30x30 grid established as the former Carriage Building footprint. The results of all detailed surveys are found in Appendix E1 and E2. Appendix E-1 contains the detailed survey data for Areas 1 through 12 as shown on Figure 1. The data are presented in a spreadsheet format similar to the 6 meter data with the measurement location, the raw data and the Net CPM. Net CPM values which do not exceed or are equal to background are listed as "<BKG". Net CPM values which exceed BKG +2σ are shown in red. Some areas may have only one sheet of data while others require multiple sheets. Refer to the bottom center of each page for the number of pages of data for each Area. In addition, the spreadsheets are set up, to the extent possible, to mimic the relative shape of the detailed survey points collected. When the detailed surveys were made, additional grid points were established for several areas to insure that the perimeter of the grid was at or near background levels. There are a few instances, for example, Area 3, where an additional measurement could have been taken at 52E, 12N, to completely encircle the elevated reading at 51E, 13N. However, without

foreknowledge of background statistics, making such a decision at the time of the measurement for any of these areas in this regard was not possible. Any such one meter data which may appear to be missing adjacent to areas above background are not considered critical for 2 reasons: 1) in most cases at least 2 or 3 of the adjacent grid points were measured and background levels were approached and/or 2) the trend of the data for surrounding grid points was decreasing toward background levels within a few meters of the elevated point. Regardless of the above, the presence or absence of these additional data are not critical to providing an accurate and complete picture of the site radiological conditions.

Trends of declining readings as the survey progressed out of an elevated area and best professional judgement were used during field measurements to determine the edge of the detailed area surveys.

Areas 1 through 4 located to the west of the Carriage Building footprint showed only a few Net CPM values greater than BKG +2σ. Area 5, beginning only 12 meters west of the Carriage building footprint, show readings above the BKG +2σ criterion for nearly 48% of the data, with the number of points exceeding background increasing as the survey neared the building footprint. Area 5 data overlaps with Area 7 data for the 72E to 74E, and 19N to 29N grid points. Comparison of these data overlaps taken with 2 different instruments shows precise agreement of points greater than the BKG +2σ criterion for 18 of the 20 elevated points. Point 74E, 27N for Area 5 does not exceed the background criterion but does in Area 7 and the reverse is true for grid point 74E, 19N. This serves as an impromptu QA check for 3.4% of the Area 7 grid.

Area 6, like Area 5 begins about 12 meters to the west of the building footprint, and also shows an increase in the number of points above background the nearer the points are to the footprint. However, only 26% of the survey points exceed the background criterion. The Area 6 survey did not overlap the footprint grid. All of the elevated points were generally located between 3N and 8N for this area.

Area 7 is the Carriage Building footprint and consists of 900 grid points in a 30x30 meter array beginning at 72E, 0N and ending at 102E, 30N. One point in the grid, 73E, 19N was inaccessible due to a concrete pedestal for a street light at that point. All points measured around the post within one meter were at background levels. Nearly 65% of the Area 7 measurements exceed the background criterion, with the heaviest concentration of elevated data occurring between 74E and 89E. Area 7 also has the highest Net CPM values in comparison to any detailed area. The highest Net CPM value of 6.26 E+05 was measured at grid point 81E, 5N. In general, some of the highest values in the 74E to 89E area were located in 2 "seams" between 2N and 6N and 13N to 20N.

Areas 8 through 12 to the east of the building footprint are similar to Areas 1 through 4 to the west in that they have only a few points above background with the majority of elevated data grouped fairly close together and/or running in a "seam". Area 8 which begins at the northeastern end of Area 7, continues east approximately 17 meters to 120E. Thirty-five (35) percent of the Area 8 measurements exceed BKG +2σ, with the highest value of 5.22 E+04 CPM measured at 106E, 26N.

Area 9 encompassed a rather large area beginning at 126E and ending at 138E and from 24N to 38N. Very few (11%) of the Area 9 measurements were >BKG +2σ although the majority of points were greater than the general area background of 2,484 CPM. These patterns of surface readings may indicate a diffuse source perhaps caused by the construction of the site's subsurface drainage, or the result of site grading, where material in Area 7 was relocated to the east before the site was paved.

Area 10 is a small area to the south of Area 9 running from 132E to 136E and 11N to 16N. Only 6 points, concentrated at 134E and 135E, exceed BKG +2σ, with the highest number at 1.08 E+04 CPM or approximately 4 times background.

Area 11 consisted of only 8 measurements in the 139E to 141E, 13N to 15N area with only one value at about 2 times background. Area 12 measurements ran from 166E to 179E and from 60N to 66N. Located in the extreme northeast corner of the site, 37 of 94 measurements exceed BKG +2σ with the majority of above background measurements running from 169E to 176E. At 170E there is an indication that contamination may extend slightly beyond the site boundary in that the measurement at 170E, 66N was approximately 12 times background. A quick survey of the sidewalk area at 67N showed readings returning to normal, however, as previously discussed, the concrete sidewalk is a much more effective shield for subsurface gamma radiation. Therefore, no conclusion can be drawn from these surface measurements taken outside the site boundary.

While completing the inter-grid survey from 174E to the perimeter guardrail along 180E two anomalies were noted at 0N and at 18N. One centimeter readings were taken at each of these locations. The net CPM was slightly above background but not greater than BKG +2σ.

Special two- and three-dimensional graphs have been prepared for each of the detailed area surveys and are shown in order from Area 1 to Area 12 in Appendix E-2. A color of medium gray denotes areas less than or equal to BKG +2σ, and blue is used for areas greater than the background criterion but less than 10 times the background levels. Alternating contrasting colors are used for each succeeding 10-fold increase in range above background used for example in the Area 7 graphic. All graphs depict data collected on the one meter grids with background subtracted, and the shape of elevated areas on the two dimensional plot are chosen by the Microsoft Excel program based on the magnitude of adjacent data points. The effect of adjacent data on the shape of the elevated areas is better illustrated on the 3-D plot on the left side of the page.

As previously described, Area 1 through 4 are small, well defined areas with respect to background. Area 4 may require 5 more readings at 63E from 18N to 22N to bound the one data point at 62E, 20N, however, Area 5 measurements do cover this area and show that the surrounding area along 63E is less than Area 5 is the first to show data greater than 10 times background in 5 small areas, with about 1/3 of the area between background and 10 times background. A few additional measurements may be needed west of the 60E, 28N mark to completely characterize this small elevated area, however, its shape is likely similar to the data at 73E, 28N. Area 6 is similar to Area 5 in that they are both adjacent to the building footprint and increase in size and magnitude as the western edge of the footprint at 72E is approached.

The graph for Area 7 is complex by comparison to the other areas due to the wide range of data seen for the 900 data points collected. The color variations show that there are two areas which have the highest readings of >50 to >100 times background. Because of the size of plots in the Area 7, the two-dimensional and three-dimensional graphics are shown on separate pages. In general, the data show a north/south pattern which may be predictive of the general movement of material within the former Carriage Building, with the entrance likely being in the 80E, 0N area. An overlay transparency was prepared for the Area 7 two-dimensional plot to demonstrate the difference in the "shadow" created when data are compared to BKG +2σ and 3 x BKG. Placing the transparency over the Area 7 two-dimensional plot shows that using 3 x BKG significantly reduces the "shadow" around the elevated areas, and in our opinion, better defines the potentially affected areas which may require remediation. The lack of a "shadow"-reducing effect in the northeastern portion of the Area 7 grid may add support to the hypothesis that some of the material may have been pushed to the east during grading of the site in preparation for paving, since there does seem to be some connection between these data and that of Areas 8 and 9.

In Area 7 there could also be contaminated material to the south of the 0N, 80 to 82E area, but the presence of the sidewalk may provide too much shielding to give an accurate picture of the extent of contamination south of the site.

Areas 8 through 12 are, as previously discussed, like Areas 1 through 6 in magnitude of readings and shapes of potentially contaminated areas. A few additional readings may be required to bound Area 9 east of 138E based on comparison of the data to BKG +2σ. Areas 10 and 11 are unremarkable and Area 12 may, as previously discussed, extend somewhat to the north of the site by a few meters.

All of the data generated in Appendices E-1 and E-2 was reworked and compared to 3 times background as shown in Appendices F-1 and F-2. It is our opinion that this comparison provides a more accurate representation of the extent of subsurface contamination on the site. Areas 5 through 10 and number 12 are the only areas which have data exceeding the >3 x BKG criterion. As expected, the two-dimensional plots for these areas are smaller when the elevated areas are compared to the plots of Appendix E-2. The Area 7 plot of Appendix E-2 was not repeated in Appendix F-2 but rather only the two-dimensional plot of regions >3 x BKG are shown which corresponds to the overlay transparency shown for Area 7 in Appendix E-2.

The Bicron dose rate data for the twelve elevated areas are shown in Appendix G-1. Individual spreadsheets are shown for each area, with both the gross reading and net μRem/hr, given. General area Bicron background averaged 4.5 μRem/hr. The Bicron data corresponds well to the ESP-1/44-10 results for the twelve areas, increasing toward Area 7 and remaining low in the more distant detailed areas. Dose rates greater than 3 x BKG are seen only for Areas 5 through 8, whereas all areas measured, except for Areas 1 and 2, exceed the criterion of BKG +2σ or 7.73 μRem/hr. The Bicron spreadsheet net μRem/hr data is presented relative to the overall site in Appendix G-2. Appendix G-2 is presented on 4 pages due to the extremely large number of data points (nearly 12,000). The highest net reading for the Bicron measurements of 165.5 μRem/hr made 1 meter from the surface is within Area 7 at 76E, 4N. A three-dimensional plot of the

Bicron data is shown in Appendix G-3. Due to the large number of net "zero" values in yellow, the elevated areas show up very well and the dose rate of Area 7 in the center of the plot dwarfs all other areas. Two plots are presented in Appendix G-3, one looking north and a second looking south to better visualize the data behind Area 7 and the outlying elevated areas.

Appendix G-4 presents a QA check to correlate ESP-1/44-10 readings with those of the Bicron μRem/hr instruments at the most elevated reading measured on the site near survey point 76E, 4N. The highest Bicron contact reading was 650 μRem/hr at the surface. The average correction factor calculated for converting the ESP-1 data to equivalent μRem/hr data was 487 CPM/μRem/hr at 1 cm and 745 CPM/μRem/hr at one meter above the surface.

V. DISCUSSION

The results of the overland gamma survey show that the majority of the subsurface activity is located in Area 7 within the coordinates 72E to 102E and 0N to 30N. Eleven (11) additional areas were also characterized as having potential subsurface radiological contamination many of which, Areas 5, 6, 8 and 9 for example, may have been created in the process of preparing the site for paving or during construction or demolition activities which pre-date the current site configuration.

Within Area 7, the most elevated readings were found in 2 discrete areas; one at 76E, 4N and 81E, 4N to 5N. The ESP-1/44-10 NaI detector readings for these areas exceeded 100 times background and the highest Bicron dose rate on the site was measured near 76E, 4N at 165.5 μRem/hr. This Bicron dose rate at this location is about 37 times the average background dose rate for the site of 4.5 μRem/hr. Other elevated areas greater than 50 x the ESP-1/44-10 background are located between 14N and 19N in the same general area, 76E to 81E. The highest Bicron dose rate measurement in this area was 120 μRem/hr or about 27 times the background dose rate.

The apparent discrepancy between the Bicron Data and the ESP-1/44-10 results with respect to background likely involves the limited energy range for the Bicron meter response of 17 KeV to 1.3 MeV. There is likely a strong low energy component given that the source gamma signal must penetrate a significant amount of crushed stone and asphalt before possible detection.

The graphics for all areas show that a significant "shadow" is created around elevated readings by comparison of the net data to BKG +2σ from the mean. The 3 x BKG overlay for Area 7 found in Appendix E-2 dramatically illustrates this point, where the blue BKG +2σ edge around the elevated areas is substantially reduced when the 3 x BKG overlay is superimposed on the Area 7 figure.

The overlay also illustrates that there may be areas of diffuse activity between 3 and 10 times background which are not associated with nearby elevated areas such as is shown in the 20-30 m^2 area centered at 92E, 23N. On this basis, we postulate that the graphics of Appendix F-2 showing areas >3 x BKG are more representative of the affected areas which may require further investigation and/or remediation. As previously discussed, Areas 5 through 10 and Area 12 are the only areas on-site which have regions exceeding the 3 x BKG criterion. Areas 5, 6, 8, 9 and 10 all seem to be related to the activity of Area 7 by their proximity. Area 12 however, is an anomaly both by its location in the extreme northeastern corner of the site and by the number of discrete elevated locations as shown by the Area 12 plot in Appendix F-2. The Area 12 activity may be associated with a small refuse area which may have existed in the northeast corner of the site since the historical maps show no buildings or other structures to have existed in this area. This is only one of many plausible explanations for the Area 12 activity. In addition, Area 12, like Area 7, may extend slightly beyond the site boundary, however, the presence of the concrete sidewalk precludes more precise determination of the off-site extent of the contaminated material.

Figure 1-2 of the Work Plan shows the exposure rates reported by EPA/IDNS during their walkover of the site. The reported reading locations roughly correspond with Area 5, 7, 8, 9 and 12 of the present survey and the highest reading of 280 μR/hr corresponds roughly with the reading of 120μRem/hr taken with the Bicron instrument in this location. These data are in good agreement since the typical μR meter tends to over-respond by a factor of about 2 in the low energy range. Therefore, the 280 μR/hr EPA reading would correspond to about 140 μRem/hr with the proper correction factor applied.

A rudimentary risk assessment of the site shows that the only potential exposure pathway to members of the general public working at or using the site parking facilities is via direct exposure. The most concern would be for the parking lot attendants who man the cash booths. Both of the check-out booths on site are located in background areas and therefore, individuals working at these locations would incur no greater risk than anyone else in the downtown Chicago area with regard to direct radiation exposure. Further, these individuals are typically captive in the cashier

booth due to the volume of business and they do not typically walk around the site during slow periods. Therefore, the most reasonable scenario for exposure becomes an individual member of the public who parks their car in the lot in the same location each day and which corresponds to the location of the highest Bicron reading of 165 μRem/hr at one meter from the surface. If we assume that this individual parks in this location 250 days per year and spends a minimum of 5 minutes per day outside the car directly over the highest measured location, the calculated annual dose would be 165 μRem/hr x 250 days/yr x 5 min/day x 1 hr/60 min. = 3,438 μRem/yr or 3.4 mrem/yr. This calculated dose would only apply to an individual who spent time outside the car without moving off the elevated location. This may be a reasonable scenario for summer months but seems more unlikely for winter months. Further, the likelihood of someone parking in the same location every day without a reserved parking space is very remote.

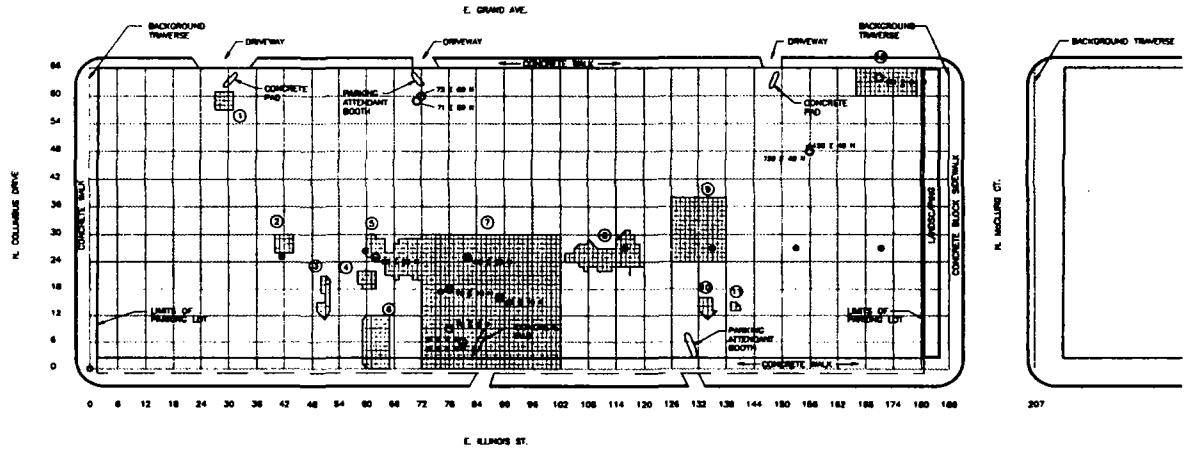
In a more realistic case where an individual only occasionally parks in the location where he could receive the maximum dose rate, the actual annual dose is likely much less than 1 mrem/yr. Such a dose satisfies all current as well as all proposed federal regulations concerning allowable doses to individual members of the general public from sources of residual radioactive material accessible by the general public. Under either the maximum exposure conditions or the realistic conditions, the site does not present a risk beyond that of the normal radiation environment in the downtown Chicago area.

VI. REFERENCES

NUREG/CR-2082, 1981, Monitoring for Compliance with Decommissioning Termination Survey Criteria, USNRC, Washington, DC.

NUREG/CR-5512, 1992, Residual Radioactive Contamination From Decommissioning, USNRC, Washington, DC.

Work Plan for Characterization of Radioactive Contamination, 316 East Illinois Street, Chicago, Illinois, STS Consultants, Ltd., 1994.



SCALE IN FEET

40' 0 40'

DRAWING REDUCED
NOT TO SCALE
AS INDICATED

LEGEND

- 8 METER OVERLAND GAMMA SURVEY GRID
- 1 METER OVERLAND GAMMA SURVEY GRID (AREA REFERENCE NO.)
- CPT DOWN-HOLE GAMMA SURVEY (WITH STATION REFERENCE)
- SOIL SAMPLE LOCATION (WITH STATION REFERENCE)
- CATCH BASINS

FIGURE 1

GAMMA RADIATION SURVEY
SHOWING ELEVATED GAMMA AREAS DOWN-HOLE
LOG LOCATIONS AND SOIL SAMPLE LOCATIONS

LINDSAY LIGHT II
318 E. ILLINOIS ST.
CHICAGO, ILLINOIS

STS Consultants Ltd.
Consulting Engineers

STS PROJECT NUMBER
27313-2H

STS PROJECT FILE
27313Z42

SCALE
1"=40'

SHEET NUMBER
FIGURE 3-1

APPENDIX A

RADIOLOGICAL PROCEDURES NOT INCLUDED IN WORK PLAN

M.J.W. Corporation Inc.

RADIOLOGICAL CONTROL PROCEDURE 43

Controlled Copy Number _____

CONTROL CHART PROCEDURE

1.0 PURPOSE

This procedure details steps to ensure that accuracy, precision and sensitivity of counting systems and portable counters are maintained within acceptable limits.

2.0 SCOPE

This procedure provides general criteria for the performance and evaluation of calibrations and sensitivity measurements. The instruments covered in this procedure measure primarily gross alpha, beta and gamma radiations.

3.0 RESPONSIBILITIES

3.1 Personnel

3.1.1 This procedure applies to all project personnel who calibrate, use or response test either stationary or portable counting systems.

3.1.2 The Project Manager or designee is responsible for administering and implementing this procedure. Health Physics technicians are responsible for performing this procedure.

3.2 Prerequisites

3.2.1 Laboratory counting systems shall be calibrated annually, and portable counting systems shall be calibrated semi-annually. Counting systems and portable counters should also be calibrated following the change of essential components or repeated failure of QC tests, once the cause is discovered and corrected.

3.2.2 Calibrations and response tests shall be performed by personnel trained in the operation of the specific instrumentation.

3.2.3 All sources used to perform efficiency calibrations shall be traceable to the National Institute of Standards and Technology (NIST) or other nationally recognized groups.

3.2.4 Each instrument shall be calibrated in the energy range of interest.

3.2.5 All counting shall be performed in accordance with the established procedure for each instrument.

3.2.6 All instrumentation shall be operated within the ranges established by the manufacturer for electrical and environmental factors.

3.2.7 ALARA practices shall be observed to minimize personnel exposure and the spread of contamination during use of sources to perform response testing.

3.2.8 Certified sources shall be handled only with tweezers or other appropriate devices which prevent damage to the surface of the source.

3.2.9 Newly purchased sources should always be compared to old sources prior to use in calibrations.

3.2.10 Samples counted on instruments shall be handled to maintain the integrity of the sample throughout processing, to minimize unnecessary exposure to the individual AND to prevent contamination to the instrument.

3.2.11 This procedure does not apply to counting systems utilizing a multichannel analyzer (i.e., gamma spectroscopy systems) or to survey meters, except contamination survey instruments used for free release of materials.

4.0 PROCEDURE

4.1 Background Determination

4.1.1 Perform QC tracking for background when required by individual instrument procedures.

NOTE: The Gaussian Distribution requires approximately 30 observations to approximate a Poisson Distribution.

4.1.2 Determine background counting rate for establishment of QA parameters by setting background counting intervals for at least as long as the counting time interval used for actual sample counts.

4.1.2.1 Perform a minimum of 20 counts or, if practical, 30 counts to establish QA parameters.

4.1.2.2 WHEN possible, obtain counts over a period of days instead of consecutively.

4.1.3 Perform a background determination daily, or for instruments used intermittently, prior to each use.

4.1.3.1 Perform the background count on an appropriate "blank".

4.1.3.2 Subtract daily background determination from each sample analysis.

4.1.4 Plot daily background checks on a control chart (See Attachments) for each instrument.

4.1.4.1 Investigate background determinations falling outside the *upper and lower warning limits of the control chart.*

a. Count rates falling above the upper warning limit of the control chart may indicate improper instrument set up, contamination of the "blank" or instrument, or excessive environmental background.

b. Count rates falling below the lower warning limit of the control chart may indicate a change in media, improper "blank", or a change in instrument set up.

NOTE: Statistical trend reviews should include the following:

- **Values outside of 3 sigma are expected in less than 3% of the observations.**
- **Observations should be randomly distributed about the mean.**
- **Seven consecutive observations should not all be above or below the mean.**

4.1.4.2 IF the background determination is $\leq$ 3 sigma BUT > 2 sigma THEN:

a. Verify a proper, clean "blank" has been used.

b. IF a proper blank has been used, THEN proceed with the sample counting.

c. Record background determination on control chart and review trend.

4.1.4.3 IF the background determination is > 3 sigma, THEN:

a. Verify a proper, clean "blank" has been used and repeat the count.

b. IF the second background determination is $\leq$ 3 sigma THEN record count on control chart and review trend.

c. IF the second background determination is > 3 sigma, THEN tag out the instrument and notify the Project Manager or designee for instructions.

4.1.4.4 Report all background determinations falling outside the upper and lower warning limits of the control chart to the Project Manager or designee.

4.2 Check Source Measurements

4.2.1 Count QC check source for establishment of QA parameters.

4.2.1.1 Perform a minimum of 20 counts, or if practical, 30 counts to establish QA parameters.

4.2.1.2 WHEN possible, obtain counts over a period of days instead of consecutively.

4.2.2 Plot daily checks on a control chart for each instrument.

4.2.2.1 Investigate QC checks falling outside the upper and lower warning limits of the control chart.

4.2.2.2 IF the QC check is $\leq$ 3 sigma BUT > 2 sigma, THEN:

a. Recount QC check source.

b. Recount QC check on control chart and review trend.

c. IF the second QC check is $\leq$ 3 sigma BUT > 2 sigma, THEN record QC check on control chart, notify the Project Manager or designee, and proceed with counting.

4.2.2.3 IF the QC check is > 3 sigma, THEN:

a. Perform three additional QC checks.

b. IF any additional QC check is > 3 sigma, THEN tag instrument out for repair and notify the Project Manager or designee.

4.2.2.4 Report all QC checks falling outside the upper and lower warning limits of the control chart to the Project Manager or designee.

4.3 Control Charts

4.3.1 Maintain a control chart for each counting system and trend the following parameters, as appropriate:

- Background cpm
- QC check source

4.3.2 Graph control charts on graph paper or use computer generated control charts.

4.3.3 Define the limits of the control chart as:

- Mean
- Upper Warning Level (UWL): +2 sigma
- Lower Warning Level (LWL): -2 sigma
- Upper Control Level (UCL): +3 sigma
- Lower Control Level (LCL): -3 sigma

4.3.4 Complete control charts daily or prior to use for instruments used intermittently.

4.3.5 Maintain the control chart with the instrument log for each instrument.

4.3.6 Consider establishing new control and warning limits for the following conditions:

4.3.6.1. Immediately following maintenance on instrument electronics or detector which may change instrument performance.

4.3.6.2. Immediately following the introduction of a new reference standard into the counting system.

4.3.6.3. WHEN time trend review determines that the previous control and warning limits are no longer appropriate. However, first investigate cause of condition and determine if system is malfunctioning.

4.4 Records

4.4.1 Complete all QA records in a timely manner and submit to the Project Manager or designee for review and approval

4.4.2 Record counting data in accordance with specific procedures for individual instruments.

5.0 DEFINITIONS

5.1 4π Geometry

Counting geometry characterized by measurement of an emission rate in a 360° field or from all surfaces; such as a measurement, is representative of the total source activity. Measurement of an emission rate from a single surface (called 2 π) does not report total source activity.

5.2 Accuracy

The degree of agreement of the observed value with the conventionally true value of the quantity being measured.

5.3 Certification

The use of a derived standard to determine an exposure rate, activity or other value to the specified or required degree of accuracy.

5.4 Check Source

A radioactive source, not necessarily calibrated, which is used to confirm the continuing satisfactory operation of an instrument.

5.5 Counting Efficiency

The ratio of the number of counts to the total number of ionizing particles or quanta exposed to the sensitive volume of a detector when the count rate is low enough that deadtime correction is unnecessary.

5.6 Mean

The sum of all count values divided by the total number of counts taken. The mean is the statistical measure of central tendency, a value around which groups of counts tend to cluster.

5.7 Performance Test/Response Test

A procedure whereby an instrument or a component is evaluated against accepted criteria for continuing satisfactory operation.

5.8 Precision

The degree of agreement of repeated measurements of the same parameter.

5.9 Standard Deviation

A measure of the normal count dispersion for results of multiple independent observations (count cycles) around the mean as calculated for those observations.

6.0 REFERENCES

None

7.0 ATTACHMENTS

Attachment 1 - Calibration Record for Free Release Instruments - Form RCP 43-1

Attachment 2 - Sigma Calculation Worksheet - Form RCP 43- 2

Attachment 3 - Control Chart - Form RCP 43-3

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: _____	Scaler/Probe Serial Nos.: _____
Count Type: ☐ Background ☐ Source	Jig Number: _____
Radiation Type: ☐ Beta ☐ Alpha	Location: _____
Counting Duration (Seconds): _____	Source Isotope and DPM: _____
Source Manufacturer: _____	Source Serial #: _____

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.

M J W CORPORATION INC.

SIGMA CALCULATION WORKSHEET

Instrument Make/Model: _____	Scaler/Probe Serial Nos.: _____
Count Type: ☐ Background ☐ Source	Jig Number: _____
Radiation Type: ☐ Beta ☐ Alpha	Location: _____
Counting Duration (Seconds): _____	Source Isotope and DPM: _____
Source Manufacturer: _____	Source Serial #: _____

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background). Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\bar{X}$)

   Round all values to one decimal place.

4. Subtract the average count ($\bar{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.				11.				21.			
2.				12.				22			
3.				13.				23.			
4.				14.				24.			
5.				15.				25.			
6.				16.				26.			
7.				17.				27.			
8.				18.				28.			
9.				19.				29.			
10.				20.				30.			

7. Add all the $(X_i - \bar{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}} = \sqrt{\frac{\quad}{29}} =$ _____ counts

   N = Total number of counts, in this case, 30.

Performed By: _____	Date: _____
Checked By: _____	Date: _____

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: ____________ Scaler/Probe Serial Nos.: ____________ Jig Number: ____________

Count Type: ☐ Background ☐ Source Radiation Type: ☐ Beta ☐ Alpha Counting Duration (Seconds): ____________

Source Isotope and DPM: ____________ Source Serial #: ____________ Source Manufacturer: ____________

Location: ____________ Reviewed By: ____________ Date: ____________

																				Initials
																				CPM Value
																				Date

$\overline{X}$

Sigma Values
+3= ______
+2= ______
+1= ______
$\overline{X}$= ______
-1= ______
-2= ______
-3= ______

INSTRUCTIONS: Put the calculated average count ($\overline{X}$) next to the $\overline{X}$ in the Sigma Values box. Add the sigma count value to $\overline{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\overline{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\overline{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

APPENDIX B

CALIBRATION AND FIELD DATA

APPENDIX B1

CALIBRATION DATA

HARSHAW BICRON RADIATION MEASUREMENT PRODUCTS

BICRON • 6801 Cochran Road • Solon, Ohio 44139

Phone: (216) 248-7400 • Fax: (216) 349-6581

CERTIFICATE OF INSTRUMENT CALIBRATION

CUSTOMER: MJW CORPORATION Q# 2516

INSTRUMENT MODEL: micro rem SERIAL # B971N

CALIBRATION DATA

RANGE	EXPOSURE RATE	INST. READING	EXPOSURE RATE	INST. READING
X1000	160 mR/h	160	40 mR/h	40
X100	16 mR/h	16	4 mR/h	3.9
X10	1.6 mR/h	1.6	400 uR/h	400
X1	160 uR/h	160	40 uR/h	40
X0.1	16 uR/h	16		

THE Cs-137 1 Ci SOURCE USED FOR THIS CALIBRATION HAS A CERTIFICATE STATING ITS TRACEABILITY TO N.B.S. (N.I.S.T.) STANDARDS.

* **INSTRUMENT CALIBRATED WITH A CS-137 GAMMA SOURCE USING A CONVERSION FACTOR OF** $\frac{\text{1 urem/h}}{\text{1 uR/h}}$

* **CALIBRATOR : J.L.SHEPHERD / MODEL: 28-6A S.N.:10081**

CALIBRATED BY: T. J. Compton DATE: 5-10-94

HARSHAW BICRON RADIATION MEASUREMENT PRODUCTS

BICRON • 6801 Cochran Road • Solon, Ohio 44139

Phone: (216) 248-7400 • Fax: (216) 349-6581

CERTIFICATE OF INSTRUMENT CALIBRATION

CUSTOMER: MJW CORP. Q# RGR-4097

INSTRUMENT MODEL: micro rem SERIAL # B378A

CALIBRATION DATA

RANGE	EXPOSURE RATE	INST. READING	EXPOSURE RATE	INST. READING
X1000	160 mR/h	160	40 mR/h	41
X100	16 mR/h	16	4 mR/h	4
X10	1.6 mR/h	1.6	400 uR/h	410
X1	160 uR/h	160	40 uR/h	40
X0.1	16 uR/h	16		

THE Cs-137 1 Ci SOURCE USED FOR THIS CALIBRATION HAS A CERTIFICATE STATING ITS TRACEABILITY TO N.B.S. (N.I.S.T.) STANDARDS.

- INSTRUMENT CALIBRATED WITH A CS-137 GAMMA SOURCE USING A CONVERSION FACTOR OF $\frac{1 \text{ urem/h}}{1 \text{ uR/h}}$

- CALIBRATOR : J.L.SHEPHERD / MODEL: 28-6A S.N.:10081

CALIBRATED BY: Peg Compton DATE: 1-12-94

Saint-Gobain / Norton Industrial Ceramics Corporation

CALIBRATION CERTIFICATE

LUDLUM MEASUREMENTS, INC.
PO BOX 810/501 OAK STREET
SWEETWATER, TEXAS 79556, U. S. A.
FAX No. 915/235-4672 915/235-5494

LUDLUM MODEL 500 S/N

CUSTOMER MJ&J Corporation, Inc. ORDER NO. 26203

Cal Date 5-16-94 Due Date 5-16-95 Interval 1YR Temp 77 °F RH 61 % Alt 706.8 mmHg

☑ Meter Zeroed ☑ Mechanical check ☐ New instrument ☐ Instrument required repair

Multiplier	Pulser CPM Setting	Reference Counter Reading + -2%	As Found Readings	Multiplier	Pulser CPM Setting	Reference Counter Reading + -2%	As Found Readings
0.1	250	25	25	0.1	750	75	74
1	250	250	248	1	750	750	746
10	250	2507	2484	10	750	7507	7460
100	250	25073	24823	100	750	75071	74644
1k	250	250919	248271	1k	750	750494	746149
10k*	250	2504135	2477185	10k*	750	7500498	7462993

*0.1 minute count time

Range	Amplitude Setting	Amplitude Reading + -10%	As Found Reading	Amplitude Setting	Amplitude Reading + -10%	As Found Reading
5 mV	1	1 mV	1 mV	4	4 mV	4 mV
50 mV	1	10 "	10 "	4	41 "	41 "
500mV	1	100 "	100 "	4	410 "	410 "
5 V	1	1 V	1 V	4	4.1 V	4.1 V

High Voltage Setting	High Voltage Reading + -5%	As Found Reading	High Voltage Setting	High Voltage Reading + -5%	As Found Reading
500	500	500	2000	1990	1990

Ludlum Measurements, Inc. certifies that the calibration system conforms to the requirements of MIL STD-45662A and ANSI N323-1978.

Reference Instruments:

Scaler	Model 2200	S/N 104287	Cal Date 3-8-94	NIST Traceable
Voltmeter	Model Fluke 75	S/N 57710262	Cal Date 2-4-94	NIST Traceable
Freq Counter	Model 1900A	S/N 2807069	Cal Date 4-20-94	NIST Traceable
Oscilloscope	Model 8060	S/N 0717442	Cal Date 5-3-94	NIST Traceable

Calibrated By Michael Moore Date 5-16-94

Reviewed By Jimmie Fleming Date 5-17-94

Form 16-1 10/91

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORPORATION Last Cal. Date 8/15/91

Manufacturer EBERLINE Model RM-19 Serial Number 181

Probe LUDLUM MDL 44-9 (GM) Serial Number 111048

Batteries Checked (✓)Yes ( )No Batteries Replaced ( )Yes (✓)No

Electronic Pulse Test: MDL 500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
x 1	200	190	200	
	400	380	400	
x 10	2000	2200	2000	
	4000	4200	4000	
x 100	20000	22000	20000	
	40000	42000	40000	
x 1K	200000	→	→	COULD NOT ADJUST
	400000	→	→	COULD NOT ADJUST

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
SR 90	26555	11,000	41.4
Tc 99	22089	3400	15.4

Check Source Response 300 cpm at 1/4 cm / in.

CHECK SOURCE RANGE ± 20% 240 CPM TO 360 CPM @ 80 CPM BKG

Repair Required ( )Yes (✓)No

Calibrated By [signature] Date 4/30/94

Type of Reference Standard:

Alpha, Beta, Gamma

HPP-8-4

8860 MAIN STREET WILLIAMSVILLE, NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORPORATION Last Cal. Date 11/13/93

Manufacturer LUDLUM Model 1000 Serial Number 64318

Probe LUDLUM MDL 43-10 (ALPHA Serial Number 023475

Batteries Checked (✓)Yes ( )No Batteries Replaced ( )Yes (✓)No

Electronic Pulse Test: MDL 500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
200	200	199		
800	800	794		
2000	2000	1990		
8000	8000	7945		
20000	20000	19888		
80000	80000	79464		
200000	200000	198837		
800000	800000	794617		

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
S/N 1635 AM 241	21534	7300	33.9
S/N 1634 AM 241	84360	29070	34.4
		AVER	34.1
BKG	TOTAL COUNTS 234	2.34	(100 MIN)

Check Source Response 220 cpm at 1/9 ~~cm~~ / in.
CHECK SOURCE RANGE ± 20% 176 TO 264 CPM
Repair Required ( )Yes (✓)No

Type of Reference Standard:

(Alpha), Beta, Gamma

Calibrated By [signature] Date 4/30/94

HPP-8-4

8860 MAIN STREET WILLIAMSVILLE NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORPORATION Last Cal. Date 5/18/93

Manufacturer LUDLUM Model 1000 Serial Number 64322

Probe LUDLUM MDL 43-10 (ALPHA) Serial Number 034854

Batteries Checked (√)Yes ( )No Batteries Replaced ( )Yes (√)No

Electronic Pulse Test: MDL 500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
200	200	199		
800	800	795		
2000	2000	1988		
8000	8000	7942		
20000	20000	19883		
80000	80000	79451		
200000	200000	198804		
800000	800000	794644		
			NO ADJUSTMENTS MADE	

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
S/N 1635 AM 241	21534	7389	34.3%
S/N 1634 AM 241	84360	27165	32.2%
		AVER	33.3%
BKG	TOTAL COUNTS 69	.69	(100 MIN)

Check Source Response 202 cpm at 1/4 cm / in.
CHECK SOURCE RANGE: ± 20% = 160 CPM TO 240 CPM
Repair Required ( )Yes (√)No

Type of Reference Standard:

(Alpha), Beta, Gamma

Calibrated By Walt V Sch Date 4/30/94

HPP-8-4

8860 MAIN STREET, WILLIAMSVILLE, NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORPORATION Last Cal. Date 5/13/93

Manufacturer LUDLUM Model 2200 Serial Number 34451

Probe LUDLUM MDL 44-40 Serial Number 110596

Batteries Checked (✓)Yes ( )No Batteries Replaced (✓)Yes ( )No

Electronic Pulse Test: MDL 500 S/N ~~84266~~ 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments "SCALER"
X1	200	200	200	199
	400	400	400	398
X10	2000	2000	2000	1982
	4000	4000	4000	3976
X100	20000	20000	20000	19819
	40000	40000	40000	39755
X1000	200000	200000	200000	198157
	400000	400000	400000	397442

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
SN 371-68-4 Tc 99	21890	3254	14.8%
S/N 01634 Am 241	84360	4536	5.4%

Check Source Response 1772 cpm at 1/4 cm / in.
SOURCE CHECK RANGE 1418 - 2126 CPM + DEG
Repair Required ( )Yes (✓)No

Calibrated By [signature] Date 5/7/94

Type of Reference Standard:

Alpha, Beta, Gamma

HPP-8-4

8860 MAIN STREET, WILLIAMSVILLE, NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW Corp Last Cal. Date 1/12/93

Manufacturer LUDLUM Model 2220 Serial Number 98310

Probe MDL 43-5 Serial Number 055132

Batteries Checked (✓)Yes ( )No Batteries Replaced (✓)Yes ( )No

Electronic Pulse Test: MDL 500 S/N 84206

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments SCALER CPM
x 1	200	200	200	200
	400	400	400	
x 10	2000	2000	200	1994
	4000	4000	4000	
x 100	20000	20000	20000	19921
	40000	39000	39000	
x 1K	200000	200000	200000	199195
	400000	400000	400000	
LOG	500	500	500	
	50K	50K	50K	

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
Am241	21534	2649	12.3
SN 1635			
Am241	84360	10666	12.6
SN 1634			
		AVERAGE	12.4 %

Check Source Response 220 cpm at 0 cm / in.
CHECK SOURCE RANGE 176 CPM to 264 CPM
Repair Required ( )Yes (✓)No

Type of Reference Standard:

Alpha, Beta, Gamma

Calibrated By Will V Sch Date 4/30/94

HPP-8-4

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORPORATION Last Cal. Date 04/17/92

Manufacturer LUDLUM Model 2220 Serial Number 58316

Probe MDL 43-5 Serial Number 055133

Batteries Checked (✓)Yes ( )No Batteries Replaced ( )Yes (✓)No

Electronic Pulse Test: MDL500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
				SCALER
X1	200	200	200	199 CPM
	400	400	400	
X10	2000	2000	2000	1985 CPM
	4000	4000	4000	
X100	20000	20000	20000	19850 CPM
	40000	38000	38000	
X1K	200000	190000	190000	199221 CPM
	400000	380000	380000	
LOG	500	500	500	
	50000	50000	50000	

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
AM241	21534	2686	12.4
SN 1635			
AM241	84360	10786	12.7
SN 1634			
		AVERAGE	= 12.5%

Check Source Response 200 cpm at 0 cm / in.
CHECK SOURCE RANGE: 160 CPM TO 240 CPM
Repair Required ( )Yes (✓)No

Type of Reference Standard:

Alpha, Beta, Gamma

Calibrated By [signature] Date 4/30/94

HPP-8-4

8860 MAIN STREET, WILLIAMSVILLE, NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORP Last Cal. Date 6/18/93

Manufacturer EBERLINE Model ESP-1 Serial Number 2260

Probe LUDLUM MDL 44-10 Serial Number 112642

Batteries Checked (✓)Yes ( )No Batteries Replaced ( )Yes (✓)No

Electronic Pulse Test: MDL 500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
x 1	200	201	201	
	400	400	400	
x 10	2000	1980	1980	
	4000	3990	3990	
x 100	20000	19800	19800	
	40000	39800	39800	
x 1k	200000	199000	199000	
	400000	399000	399000	

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
SN 364-58 Cs 137	2,142,266	210,000	9.8 %

Check Source Response N/A cpm at ____ cm / in.

Repair Required ( )Yes (✓)No

Calibrated By [signature] Date 5/7/94

Type of Reference Standard:

Alpha, Beta, Gamma

HPP-8-4

8860 MAIN STREET, WILLIAMSVILLE, NEW YORK 14221--TELEPHONE(716)631-8291

M.J.W. CORPORATION, INC.

PULSE RATEMETER CALIBRATION RECORD

Instrument Owner MJW CORP Last Cal. Date 1/20/92

Manufacturer EBERLINE Model ESP-1 Serial Number 2261

Probe LUDLUM MDL 44-10 Serial Number 111127

Batteries Checked (✓)Yes ( )No Batteries Replaced (✓)Yes ( )No

Electronic Pulse Test: MDL 500 S/N 84246

Range	Pulser Frequency	Initial Response (cpm)	Adjusted Response (cpm)	Comments
x 1	200	198	198	
	400	396	396	
x 10	2000	1980	1980	
	4000	3960	3960	
x 100	20000	19800	19800	
	40000	39800	39800	
x 1K	200000	199000	199000	
	400000	399000	399000	

Efficiency Test:

Nuclide	Activity (dpm/gpm)	Response (cpm)	Percent Efficiency
S/N 364-58 Cs 137	2,142,266	200,000	9.3%

Check Source Response N/A cpm at ____ cm / in.

Repair Required ( )Yes (✓)No

Calibrated By Will J Sch Date 4/30/94

Type of Reference Standard:

Alpha, Beta, Gamma

HPP-8-4

8860 MAIN STREET WILLIAMSVILLE NEW YORK 14221--TELEPHONE(716)631-8291

CERTIFICATE OF CALIBRATION

CUSTOMER NAME: MJW Corporation

DATE 5-9-94

PURCHASE ORDER/CONTRACT NO. 94-05-01

MODEL NO		SERIAL NO.
862	4	405-0762 thru 405-0768

THIS IS TO CERTIFY THAT THE ABOVE DOSIMETERS WERE TESTED AND FOUND TO BE IN COMPLIANCE WITH ANSI SPECIFICATION NO. N322-(1977), YOUR PURCHASE ORDER OR CONTRACT AND ANSI SPECIFICATION NO. N13.5-(1972). THE CALIBRATIONS ARE ACCURATE TO ± 10% OF TRUE DOSE UTILIZING A STANDARD TRACEABLE TO THE U.S. NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY. IT IS FURTHER CERTIFIED THAT THE CALIBRATION PROGRAM AT DOSIMETER CORPORATION IS IN COMPLIANCE WITH MIL-STD 45662A.

Fred Reuter
Quality Assurance Manager
DOSIMETER CORPORATION

Nancy Muse
Quality Control Technician
DOSIMETER CORPORATION

NOTE: WHEN A LATER VERSION OF ANY STANDARDS LISTED ABOVE IS AVAILABLE, DOSIMETER CORPORATION WILL COMPLY WITH THE MOST CURRENT SPECIFICATION.

ALL QUESTIONS CONCERNING THIS CERTIFICATION SHOULD BE DIRECTED TO OUR CUSTOMER SERVICE DEPARTMENT.

Calibration and ANSI N323 Drift Test for MJW DRDs

Date: 5/7/94 1020 START 5/8/94 1020 END DAA 5/8/94

A) Calibration

24 hour test with Nuclear Associates (Victoreen) Multi-Dosimeter Calibrator, Model 06-201

Activity: 9 μci Cs-137, no date given for source for 6-hour exposure expect 25 to 35 mR

Exposure Period: 24 Hours

Expected Dose: 100 to 140 mR Decay Corrected: 81.2 to 113.6 mR DAA

DRD (S/N)	Initial Reading	Final Reading	P/F*
DCA 1042019	0	105	P
DCA 1042024	0	90	P
VIC 6356A	0	90	P
VIC 3211A	0	95	P

*P/F = Passed or Failed

B) Forty Eight Hour Drift Test per ANSI N323
(Passing Criteria ≤2% Full Scale)

DRD (S/N)	Initial Reading	Final Reading	P/F
DCA 1042019	0	<5	P
DCA 1042024	0	0	P
VIC 6356A	0	0	P
VIC 3211A	0	0	P

Start Time: 10:30 AM 5/8/94 End Time: 10:30 AM 5/10/94

Person Performing Test: Daniel A Dooley
Date: 5/10/94

MJW001.336

APPENDIX B2

CONTROL CHARTS

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: Bicron MicroRem LE	Scaler/Probe Serial Nos.: B 378A	Jig Number: N/A
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☒ ☐ Alpha	Counting Duration (Seconds): 10
Source Isotope and DPM: Cs-137 1.03/μC	Source Serial #: 364-5812	Source Manufacturer: ISOTOPE PRODUCTS
Location: ON window	Reviewed By: D A. Dooley	Date: 5/13/94

DAD	DAD	DAD	DAD	DAD	DAD														Initials
3950	3900	3925	3900	3500	3500														CPM Value
5/13/94	5/14/94	5/16/94	5/24/94	5/26/94	5/27/94														Date

Sigma Values	
+3=	4235.2
+2=	4107.9
+1=	3980.6
X̄=	3853.3
-1=	3726.0
-2=	3598.7
-3=	3471.4

INSTRUCTIONS: Put the calculated average count ($\bar{X}$) next to the $\bar{X}$ in the Sigma Values box. Add the sigma count value to $\bar{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\bar{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\bar{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: BICRON MICROREM LE	Scaler/Probe Serial Nos.: B378A
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ✓β	Location: ON window
Counting Duration (Seconds): 10 seconds	Source Isotope and DPM: Cs-137 (1.03 μCi)
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
5/13/94	OK	OK	N/A	N/A	3853	N/A	Response OK	DMD
5/14/94	OK	OK	N/A	N/A	3900	N/A	OK	DMD
5/15/94	OK	OK	N/A	N/A	3925	N/A	OK	DMD
5/20/94	OK	OK	N/A	N/A	3500	N/A	OK	DMD
5/21/94	OK	OK	N/A	N/A	3500	N/A	OK	DMD
5/22/94	OK	OK	N/A	N/A	3500	N/A	OK	DMD

M.J.W. CORPORATION INC.
SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Bicron Microrem LE	Scaler/Probe Serial Nos.: B378A
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ✓γ	Location: ON Window
Counting Duration (Seconds): 10 seconds	Source Isotope and DPM: Cs-137
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\bar{X}$)

   Round all values to one decimal place.

4. Subtract the average count ($\bar{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.	3900			11.	3950			21.	3750		
2.	3850			12.	3950			22.	3800		
3.	3950			13.	4000			23.	3950		
4.	4000			14.	3900			24.	3800		
5.	3800			15.	3800			25.	4000		
6.	3950			16.	3850			26.	3800		
7.	3800			17.	3800			27.	3900		
8.	4000			18.	3900			28.	3750		
9.	3750			19.	4000			29.	3800		
10.	3500			20.	3500			30.	3900		

7. Add all the $(X_i - \bar{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}}$ = $\sqrt{\frac{\quad}{29}}$ = 3853 / 127.3 counts (DAB)

   N = Total number of counts, in this case, 30.

Performed By: D. A. Cooley	Date: 5/13/94
Checked By: James V Kiernan	Date: 5/17/94

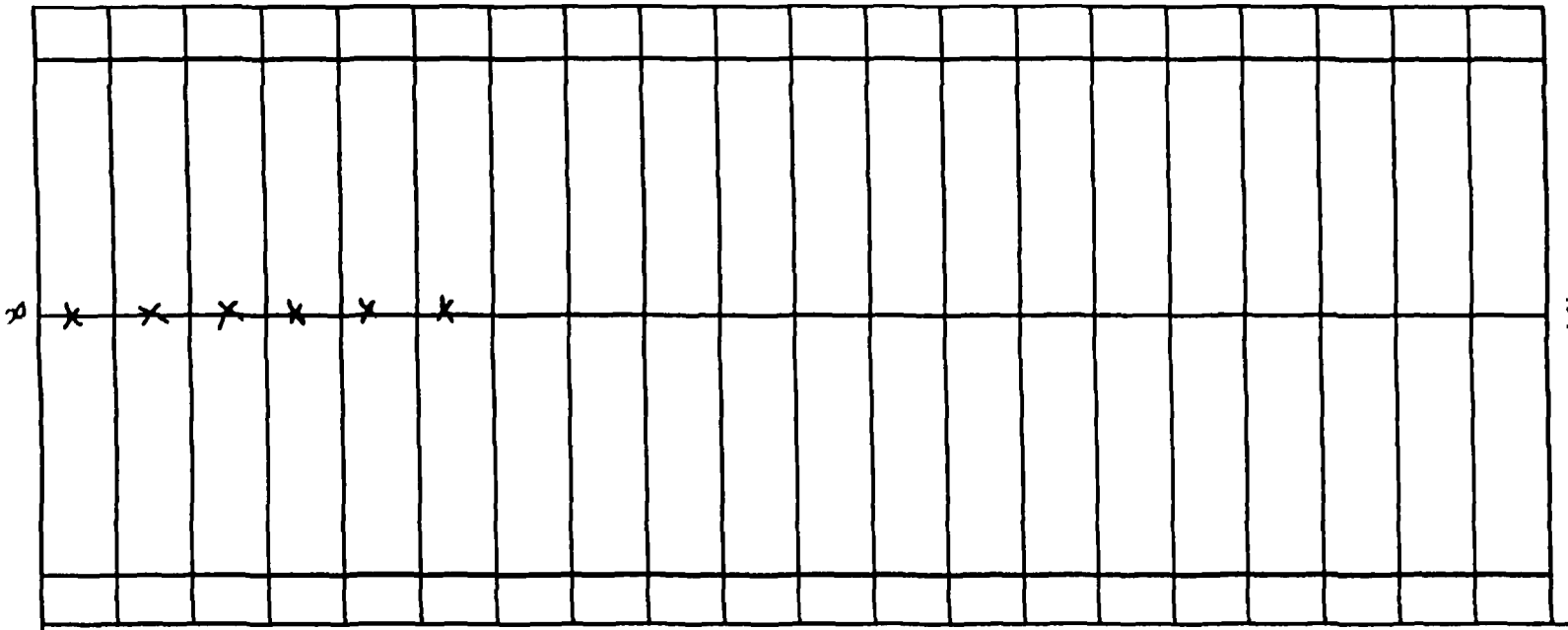
M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: Ludlum Measurements	Scaler/Probe Serial Nos.: B97IN	Jig Number: N/A
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☑ ☐ Alpha	Counting Duration (Seconds): 10 seconds
Source Isotope and DPM: Cs-137 1.03 µCi	Source Serial #: 364-58-12	Source Manufacturer: Isotope Products
Location: ON WINDOW	Reviewed By: D.A. DOOLEY	Date: 5/12/94

DAD	DAD	DAD	DAD	DAD	DAD															Initials
3520	3500	3500	3500	3500	3500															CPM Value
5/12/94	5/12/94	5/12/94	5/12/94	5/12/94	5/12/94															Date

Sigma Values	
+3=	3500
+2=	3500
+1=	3500
$\bar{X}$=	3500
-1=	3500
-2=	3500
-3=	3500



INSTRUCTIONS: Put the calculated average count ($\bar{X}$) next to the $\bar{X}$ in the Sigma Values box. Add the sigma count value to $\bar{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\bar{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\bar{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.
SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Bicron MicroRem # B971N	Scaler/Probe Serial Nos.: B971N
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ✓β	Location: ON WINDOW
Counting Duration (Seconds): 10 seconds	Source Isotope and DPM: Cs-137 1.03/μC.
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count $(\bar{X})$

   Round all values to one decimal place.

4. Subtract the average count $(\bar{X})$ from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.	3500			11.	3500			21.	3500		
2.	3500			12.	3500			22.	3500		
3.	3500			13.	3500			23.	3500		
4.	3500			14.	3500			24.	3500		
5.	3500			15.	3500			25.	3500		
6.	3500			16.	3500			26.	3500		
7.	3500			17.	3500			27.	3500		
8.	3500			18.	3500			28.	3500		
9.	3500			19.	3500			29.	3500		
10.	3500			20.	3500			30.	3500		

7. Add all the $(X_i - \bar{X})^2$ values = 3.5525E8

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values}}{N - 1}}$ (Calculated in No. 7) = $\sqrt{\frac{3.5525E8}{29}}$ = 3500 counts

   N = Total number of counts, in this case, 30.

Performed By: Jim Wright	Date: 5/13/94
Checked By: D. A. DOOLEY	Date: 5/13/94

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: Bicron MicroRem #B971N	Scaler/Probe Serial Nos.: B971N
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha V ∫	Location: ON WINDOW
Counting Duration (Seconds): 10 seconds	Source Isotope and DPM: Cs-137 1.03 μC
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

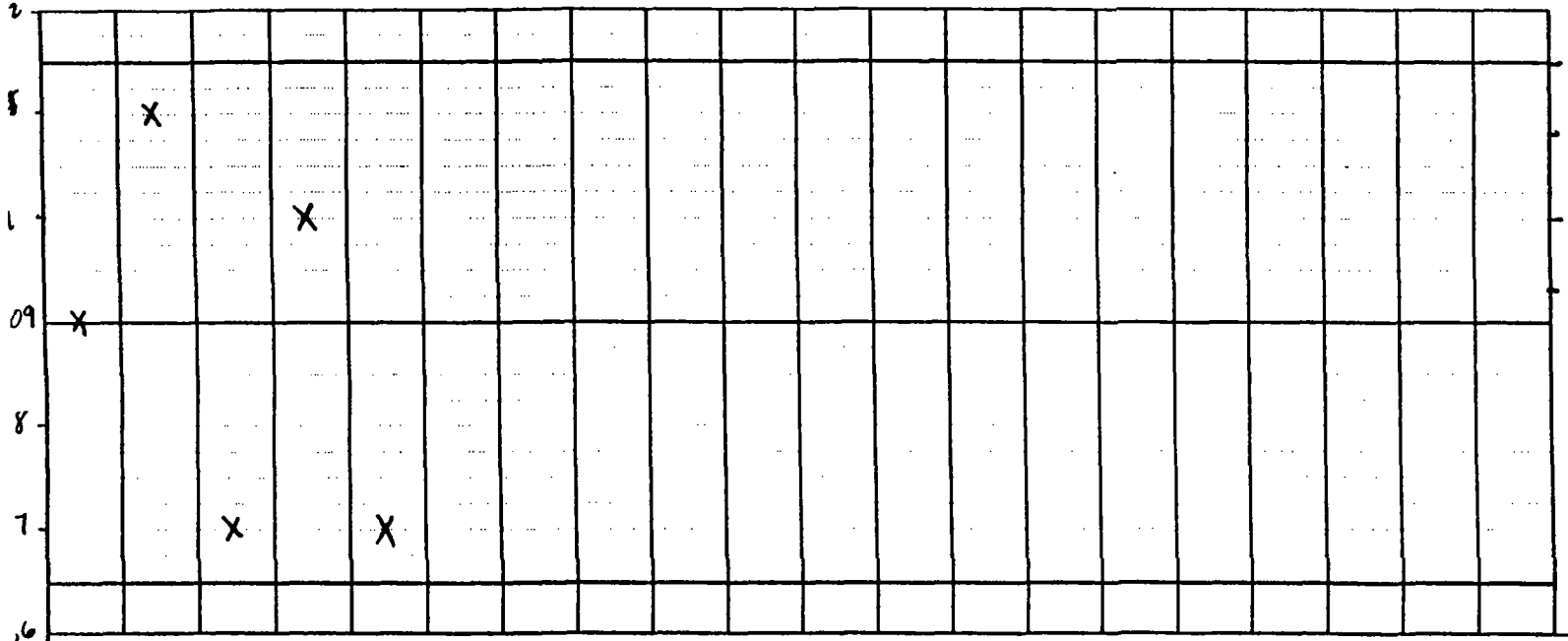
DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
5/13/94	SAT	900	N/A	N/A	3500	N/A	OK	[illegible]
5/14/94	SAT	900	N/A	N/A	3500	N/A	OK	[illegible]
5/20/94	SAT	900	N/A	N/A	3500	N/A	OK	[illegible]
5/21/94	SAT	900	N/A	N/A	3500	N/A	OK	[illegible]
5/21/94	SAT	900	N/A	N/A	3500	N/A	OK	[illegible]

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: Eberline ESP 1 #2260	Scaler/Probe Serial Nos.: Ludlum 44-10 / 112642	Jig Number: W Collimator (25)
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☑ ☐ Alpha	Counting Duration (Seconds): 60 seconds
Source Isotope and DPM: Cs 137 1.031 µCi	Source Serial #: 364-58-12	Source Manufacturer: ISOTOPE Products
Location: CENTER OF DETECTOR	Reviewed By: D. A Dooley	Date: 6/13/94

Initials	JEW	JEW	JEW	JEW	JEW														
CPM Value	2.09E5	2.1E5	2.07E5	2.1E5	2.07E5														
Date	5/13/94	5/14/94	5/15/94	5/21/94	5/22/94														



Sigma Values	
+3 =	2.115E+05
+2 =	2.108E+05
+1 =	2.1E+05
X̄ =	2.093E+05
-1 =	2.085E+05
-2 =	2.078E+05
-3 =	2.07E+5

INSTRUCTIONS: Put the calculated average count ($\bar{X}$) next to the $\bar{X}$ in the Sigma Values box. Add the sigma count value to $\bar{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\bar{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\bar{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

M J W CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

DAB

Instrument Make/Model: EBERLINE ESP 1 #2260	Scaler/Probe Serial Nos.: LUDLUM 44-10 # 144427 112642
Count Type: ☐ Background ☑ Source	Jig Number: WITH COLLIMATOR
Radiation Type: ☐ Beta ☐ Alpha ✓	Location: CENTER OF DETECTOR
Counting Duration (Seconds): 60	Source Isotope and DPM: Cs-137 1.031 μCi
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT
5/13/94	SAT	900	N/A	N/A	2.1E+05	9.18%	OK	DAB
5/14/94	SAT	900	N/A	N/A	2.12E+05	9.26%	OK	DAB
5/15/94	OK	900	N/A	N/A	2.07E+05	9.04%	OK	DAB
5/15/94	OK	900	N/A	N/A	2.16E+05	9.44%	OK	DAB
5/21/94	OK	900	N/A	N/A	2.13E+05	9.31%	OK	DAB
5/22/94	OK	900	N/A	N/A	2.1E+05	9.18%	OK	DAB

M.J.W. CORPORATION INC.
SIGMA CALCULATION WORKSHEET

DAD

Instrument Make/Model: EBERLINE ESP1 # 2260	Scaler/Probe Serial Nos.: LUDLUM 44-10 # 144271 / 117642
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ☑ γ	Location: Center of Detector
Counting Duration (Seconds): 60	Source Isotope and DPM: Cs 137
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\overline{X}$)

   Round all values to one decimal place.

4. Subtract the average count ($\overline{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$
1.	2.11+5			11.	2.09+5			21.	2.09+5		
2.	2.10+5			12.	2.09+5			22.	2.09+5		
3.	2.11+5			13.	2.09+5			23.	2.09+5		
4.	2.11+5			14.	2.09+5			24.	2.09+5		
5.	2.09+5			15.	2.09+5			25.	2.09+5		
6.	2.09+5			16.	2.09+5			26.	2.10+5		
7.	2.09+5			17.	2.09+5			27.	2.08+5		
8.	2.08+5			18.	2.09+5			28.	2.09+5		
9.	2.10+5			19.	2.10+5			29.	2.09+5		
10.	2.10+5			20.	2.09+5			30.	2.09+5		

7. Add all the $(X_i - \overline{X})^2$ values = _____

DAD

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \overline{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}} = \sqrt{\frac{}{29}} = \frac{2.093E+05}{700}$ counts

   N = Total number of counts, in this case, 30.

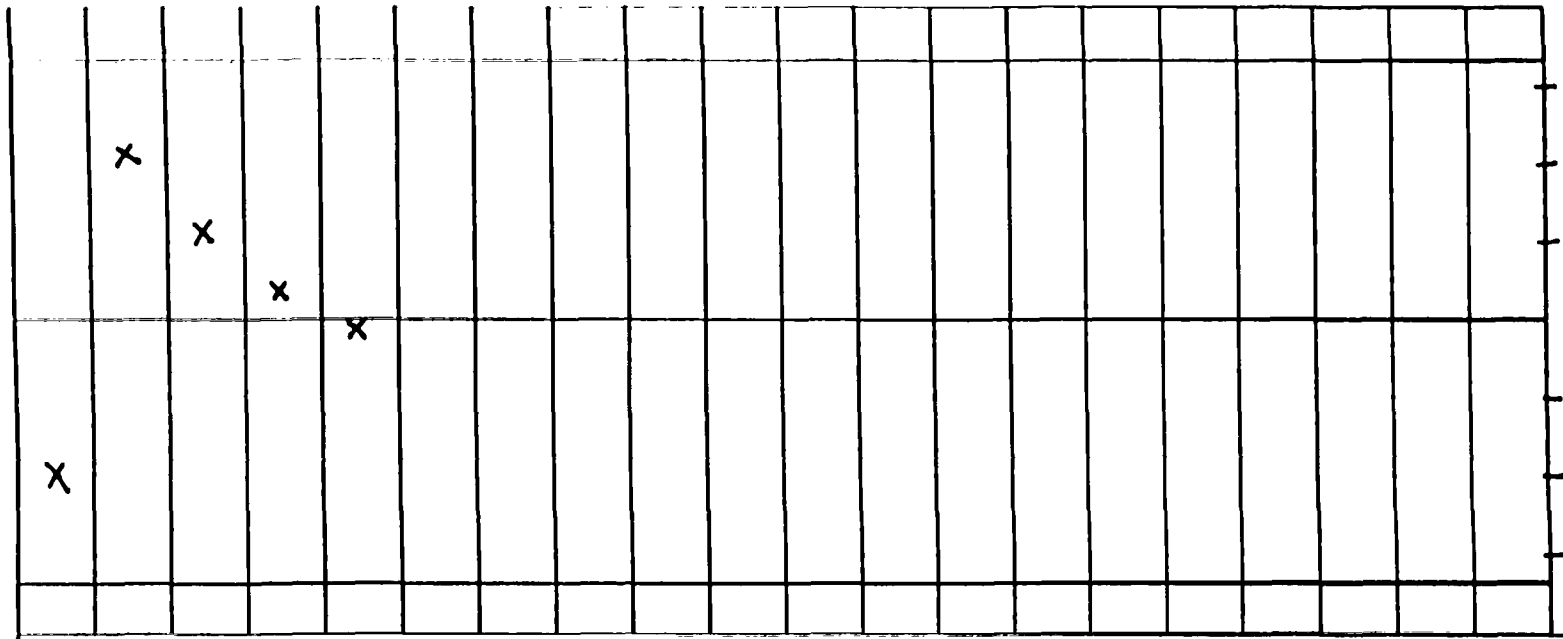
Performed By: Jan Naylor	Date: 5/13/94
Checked By: D.A Dooley	Date: 5/13/94

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: Eberline ESP-1 S/N 2261	Scaler/Probe Serial Nos.: Ludlum 44-10 (119273)	Jig Number: N/A
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☑ γ ☐ Alpha	Counting Duration (Seconds): 60 seconds
Source Isotope and DPM: Cs-137 1.03 μCi	Source Serial #: 364-58-12	Source Manufacturer: ISOTRAK PRODUCTS
Location: Center of Detector	Reviewed By: D. A. Dooley	Date: 6/13/94

Initials	JEW	JEW	JEW	JEW	JEW
CPM Value	1.98E5	2.04E5	2.03E5	2E5	1.95E5
Date	6/13/94	6/13/94	6/13/94	6/13/94	6/13/94



Sigma Values	
+3=	2.13E+05
+2=	2.08E+05
+1=	2.025E+05
X̄=	1.97E+05
-1=	1.916E+05
-2=	1.86E+05
-3=	1.81E+05

INSTRUCTIONS: Put the calculated average count ($\bar{X}$) next to the $\bar{X}$ in the Sigma Values box. Add the sigma count value to $\bar{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\bar{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\bar{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: EBERLINE ESP1 # 2261	Scaler/Probe Serial Nos.: LUDLUM 44-10 # 111127
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ✓β	Location: ON WINDOW
Counting Duration (Seconds): 60	Source Isotope and DPM: Cs 137 1.031 μC
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-5812

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
5/13/94	SAT	900	N/A	N/A	1.86E+05	8.13	OK	~~EW~~
5/14/94	OK	900	N/A	N/A	2.06E+05	9.0	OK	EW
5/15/94	OK	900	N/A	N/A	2.03E+05	8.87	OK	EW
5/21/94	OK	900	N/A	N/A	2E+05	8.74	OK	EW
5/22/94	OK	900	N/A	N/A	1.95E+05	8.52	OK	EW
							~~OK~~ ~~EW~~	

MJW CORPORATION INC.
SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Eberline RSP-1 S/N 2261	Scaler/Probe Serial Nos.: Ludlum 4470 (SN 111127)
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☐ Alpha ☑ ☑	Location: Chicago, IL
Counting Duration (Seconds): 60 sec	Source Isotope and DPM: Cs-137 1,031 µCi
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 364-58-12

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\bar{X}$) 1.971E+05

Round all values to one decimal place.

4. Subtract the average count ($\bar{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.	1.85E5			11.	2.03E5			21.	2.05E5		
2.	1.91E5			12.	2.0E5			22.	1.9E5		
3.	2.01E5			13.	1.94E5			23.	1.93E5		
4.	1.93E5			14.	1.95E5			24.	2.02E5		
5.	2.02E5			15.	2.01E5			25.	1.95E5		
6.	1.92E5			16.	1.98E5			26.	1.91E5		
7.	1.88E5			17.	1.96E5			27.	1.98E5		
8.	2.05E5			18.	2.04E5			28.	2.07E5		
9.	1.99E5			19.	1.92E5			29.	2.01E5		
10.	1.97E5			20.	1.96E5			30.	1.99E5		

7. Add all the $(X_i - \bar{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}}$ = $\sqrt{\frac{\quad}{29}}$ = 5,498 counts

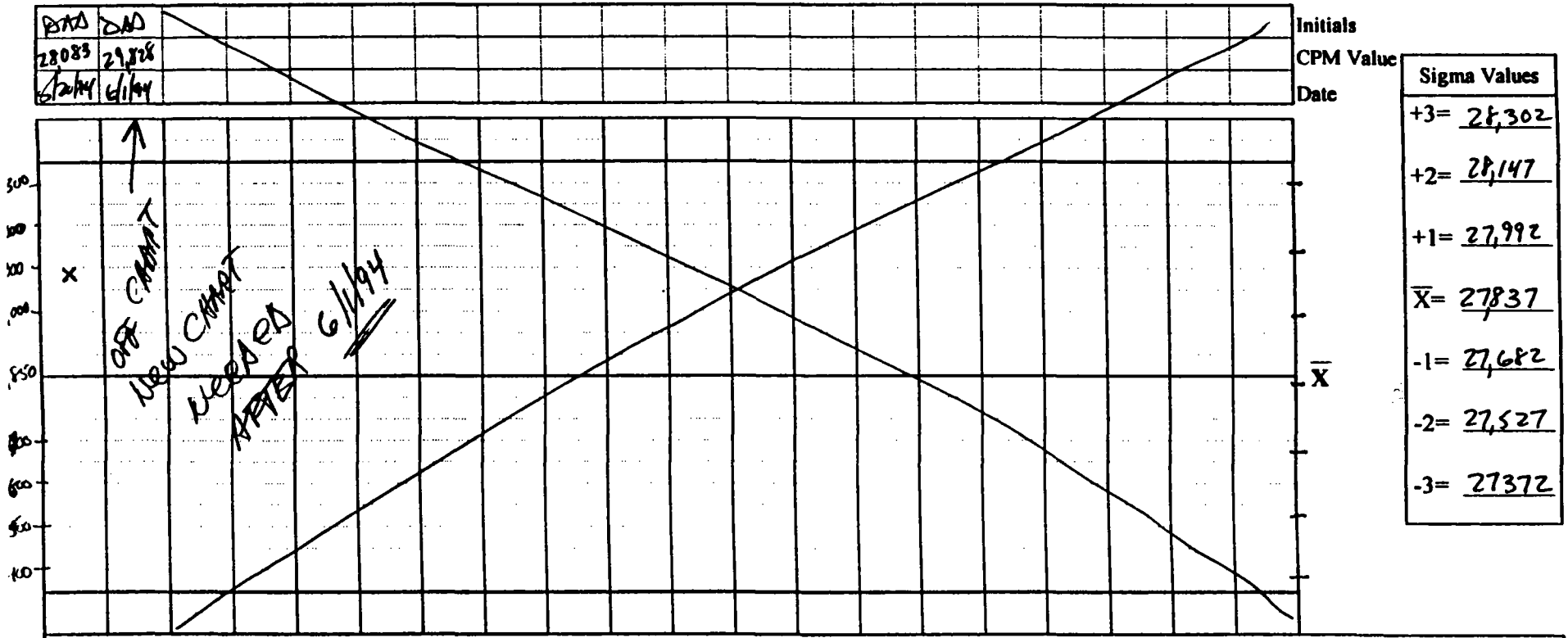
N = Total number of counts. in this case. 30.

Performed By: J. A. Dooley	Date: 5/13/94
Checked By: James V Wisniewski	Date: 5/17/94

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: LUDLUM 1000 w 43-10	Scaler/Probe Serial Nos.: 64322/PR054854	Jig Number: n/a
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☑ Alpha	Counting Duration (Seconds): 60
Source Isotope and DPM: Am-241 ; 84,360	Source Serial #: 01634	Source Manufacturer: Source
Location: MARRIOTT COURTYARD RM 216	Reviewed By: E. A. Dooley	Date: 5/25/94



Sigma Values	
+3=	28,302
+2=	28,147
+1=	27,992
$\overline{X}$=	27837
-1=	27,682
-2=	27,527
-3=	27372

INSTRUCTIONS: Put the calculated average count ($\overline{X}$) next to the $\overline{X}$ in the Sigma Values box. Add the sigma count value to $\overline{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\overline{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\overline{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: Ludlum 1000 w 43-10	Scaler/Probe Serial Nos.: 64322 / PR054854
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☑ Alpha	Location: N/A Manager Courtyard Rm 216
Counting Duration (Seconds): 60	Source Isotope and DPM: Am-241 84,360
Source Manufacturer: Source	Source Serial #: 01634

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT
5/20/94	N/A	900V	N/A	N/A	28,837	34.18%	OK	~~DAD~~
6/1/94	N/A	900V	N/A	N/A	29,828	35.36%	OFF CONTROL CHART REPLOT NEEDED	~~DAD~~

M.J.W. CORPORATION INC.
SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Ludlum 1000 w 43-10	Scaler/Probe Serial Nos.: 64322 / PR054854
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☑ Alpha	Location: MARRIOTT COURTYARD RM 216
Counting Duration (Seconds): 60	Source Isotope and DPM: Am-241, 84360
Source Manufacturer: Source	Source Serial #: 0634

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\overline{X}$)

   Round all values to one decimal place.

4. Subtract the average count ($\overline{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$
1.	27875			11.	27615			21.	27697		
2.	27743			12.	27958			22.	27788		
3.	28023			13.	28023			23.	27953		
4.	27754			14.	27892			24.	27861		
5.	27554			15.	27932			25.	27752		
6.	27820			16.	27880			26.	27656		
7.	27807			17.	27900			27.	27946		
8.	27901			18.	27932			28.	28025		
9.	27503			19.	27726			29.	28106		
10.	27555			20.	27934			30.	27985		

7. Add all the $(X_i - \overline{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \overline{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}}$ = $\sqrt{\frac{\quad}{29}}$ = 155 counts

   N = Total number of counts, in this case, 30.

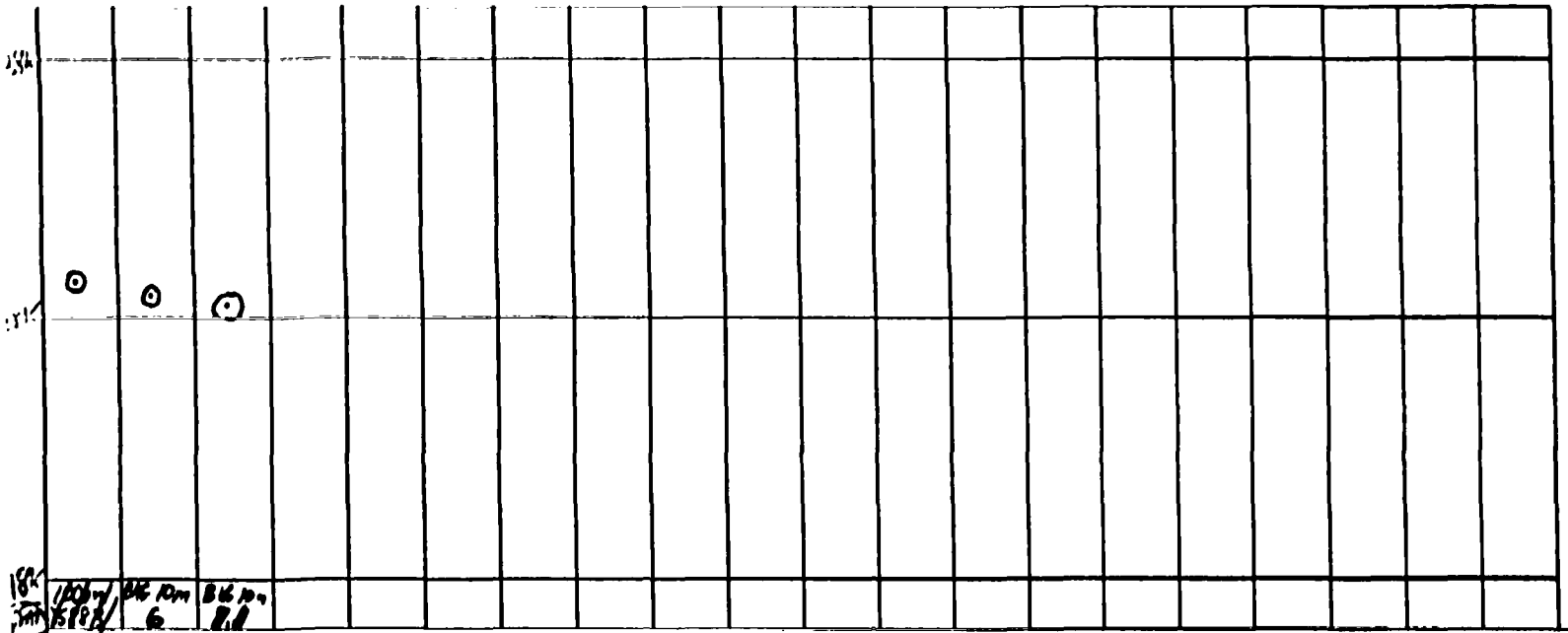
Performed By: O. A. Dooley	Date: 5/20/94
Checked By:	Date:

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: Ludlum 1000 w 43-10	Scaler/Probe Serial Nos.: G4322 / PR 054854	Jig Number: N/A, Planchett
Count Type: ☐ Background ☑ Source	Radiation Type: ☐ Beta ☑ Alpha	Counting Duration (Seconds): 60
Source Isotope and DPM: Am-241, 84360	Source Serial #: 01634	Source Manufacturer: The Source
Location: MJW Office, Conf. Room	Reviewed By: D. A. Dooley	Date: 6/1/94

Initials	DAD	DAD	DAD																		
CPM Value	29,435	28,917	28,593																		
Date	6/1/94	6/2/94	6/15/94																		
$\overline{X}$	⊙	⊙	⊙																		
	100 bm/ 5 88 B/	BG 10m 6	BG 10m 8.8																		



Sigma Values

+3=	43,145
+2=	38,108
+1=	33,071
$\overline{X}$=	28,034
-1=	22,997
-2=	17,960
-3=	12,923

INSTRUCTIONS: Put the calculated average count ($\overline{X}$) next to the $\overline{X}$ in the Sigma Values box. Add the sigma count value to $\overline{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\overline{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\overline{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: Ludlum 100 w/43-10	Scaler/Probe Serial Nos.: 64322, PR05484
Count Type: ☐ Background ☑ Source	Jig Number: N/A
Radiation Type: ☐ Beta ☑ Alpha	Location: MJW Office, Conf. Room
Counting Duration (Seconds): 60	Source Isotope and DPM: Am-241, 84,360
Source Manufacturer: The Source	Source Serial #: 01634

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
6/1/94	N/A	900 V	N/A	N/A	29,435	34.89%	OK	[illegible]
6/2/94	N/A	900V	N/A	N/A	28,917	34.29%	OK	[illegible]
6/18/94	N/A	900V	N/A	N/A	28,393	33.66%	OK	[illegible]

M J W CORPORATION INC.

SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Ludlum 1000 w 43-10	Scaler/Probe Serial Nos.: 64322 / PR 054854
Count Type: ☐ Background ☑ Source	Jig Number: N/A (Planchett)
Radiation Type: ☐ Beta ☑ Alpha	Location: MTW OFFICES, Conference Room
Counting Duration (Seconds): 60	Source Isotope and DPM: Am-241, 84,360
Source Manufacturer: The Source	Source Serial #: 01634

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\overline{X}$) = 28,034

   Round all values to one decimal place.

4. Subtract the average count ($\overline{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below

Count No	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$	Count No.	Source Count (X_i)	$X_i - \overline{X}$	$(X_i - \overline{X})^2$
1.	29,828			11.	27,674			21.	29,877		
2.	29,411			12.	30,523			22.	26,165		
3.	30,064			13.	28,070			23.	29,348		
4.	23,968			14.	30,696			24.	30,274		
5.	28,502			15.	28,467			25.	28,409		
6.	30,866			16.	31,051			26.	29,003		
7.	31,000			17.	28,462			27.	30,071		
8.	29,543			18.	24,049			28.	29,747		
9.	28,380			19.	30,359			29.	26,393		
10.	30,558			20.	28,647			30.	29,525		

7. Add all the $(X_i - \overline{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \overline{X})^2 \text{ values}}{N - 1}}$ (Calculated in No. 7) = $\sqrt{\frac{\quad}{29}}$ = 5037 counts

   N = Total number of counts, in this case, 30.

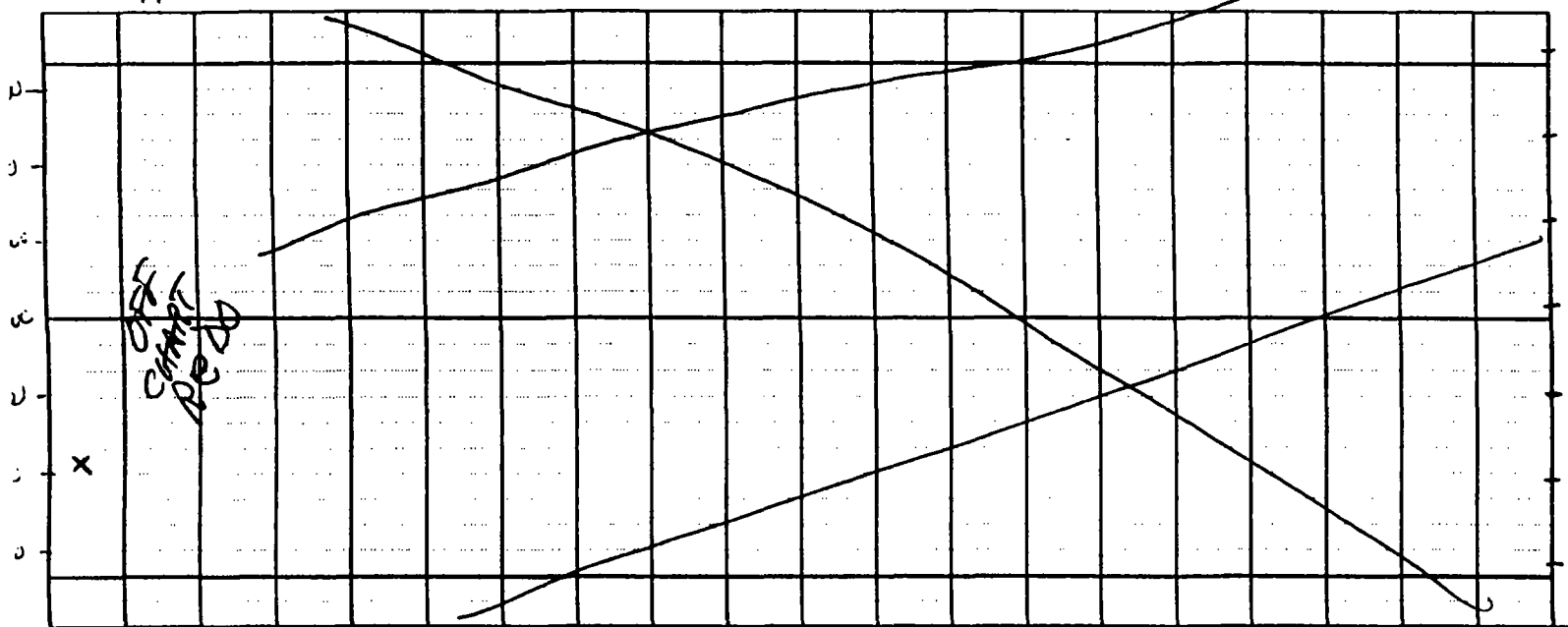
Performed By: O. A. Dooley	Date: 6/1/94
Checked By: James V Wuronski	Date: 6/1/94

M J W CORPORATION INC.

CONTROL CHART

Instrument Make/Model: WDWM 2200 # 00039	Scaler/Probe Serial Nos.: WDWM 44-40 # 110596	Jig Number:
Count Type: ☐ Background ☑ Source	Radiation Type: ☑ Beta ☐ Alpha	Counting Duration (Seconds): 60
Source Isotope and DPM: Tc-99 0.00995uCi 2.21E4 DPM	Source Serial # 371-68-4	Source Manufacturer: Isotope Products LABS
Location: MARRIOTT COURTYARD RM # 216	Reviewed By: D. A. DOOLEY	Date: 5/20/94

DAD	DAD	Initials
3909	4423	CPM Value
5/20/94	6/1/94	Date



Sigma Values	
+3=	4452
+2=	4340
+1=	4228
$\overline{X}$=	4116
-1=	4004
-2=	3892
-3=	3780

INSTRUCTIONS: Put the calculated average count ($\overline{X}$) next to the $\overline{X}$ in the Sigma Values box. Add the sigma count value to $\overline{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\overline{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\overline{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

M.J.W. CORPORATION INC.

SIGMA CALCULATION WORKSHEET

Instrument Make/Model: LUDLUM 2200 # 00039	Scaler/Probe Serial Nos.: LUDLUM 4440 # 110596
Count Type: ☐ Background ☑ Source	Jig Number:
Radiation Type: ☑ Beta ☐ Alpha	Location: MARCH# COURTYARD RM # 216
Counting Duration (Seconds): 60	Source Isotope and DPM: Tc-99 0.00995 uC 2.21E4 DPM
Source Manufacturer: Isotope Products LABS	Source Serial #: 371-68-4

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\bar{X}$)

   Round all values to one decimal place.

4. Subtract the average count ($\bar{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values.
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.	4264			11.	4174			21.	4239		
2.	4166			12.	4046			22.	4079		
3.	4231			13.	4046			23.	4286		
4.	4170			14.	4189			24.	4052		
5.	4310			15.	3889			25.	4208		
6.	3992			16.	3993			26.	3889		
7.	4008			17.	4133			27.	4003		
8.	4137			18.	3976			28.	4109		
9.	4236			19.	4191			29.	4096		
10.	4141			20.	4029			30.	4181		

7. Add all the $(X_i - \bar{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}}$ = $\sqrt{\frac{\quad}{29}}$ = 112 counts

   N = Total number of counts, in this case, 30.

Performed By: J. E. Wright	Date: 5/20/94
Checked By: E. A. Easley	Date: 5/20/94

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: LUDLUM 2200 #00039	Scaler/Probe Serial Nos. LUDLUM 44-40 #110596
Count Type: ☐ Background ☑ Source	Jig Number:
Radiation Type: ☑ Beta ☐ Alpha	Location: MacKlett Courtyard RM #216
Counting Duration (Seconds): 60	Source Isotope and DPM: Tc-99 0.0095uCi 2.21E4 dpm
Source Manufacturer: Isotope Products LABS	Source Serial #:

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
5/26/94	OK	900	N/A	N/A	3909	17.7%	OK	[illegible]
6/1/94	OK	900	N/A	N/A	4423	20%	OFF Chart	[illegible]
							Replot	
							Needed	

M J W CORPORATION INC.

CONTROL CHART

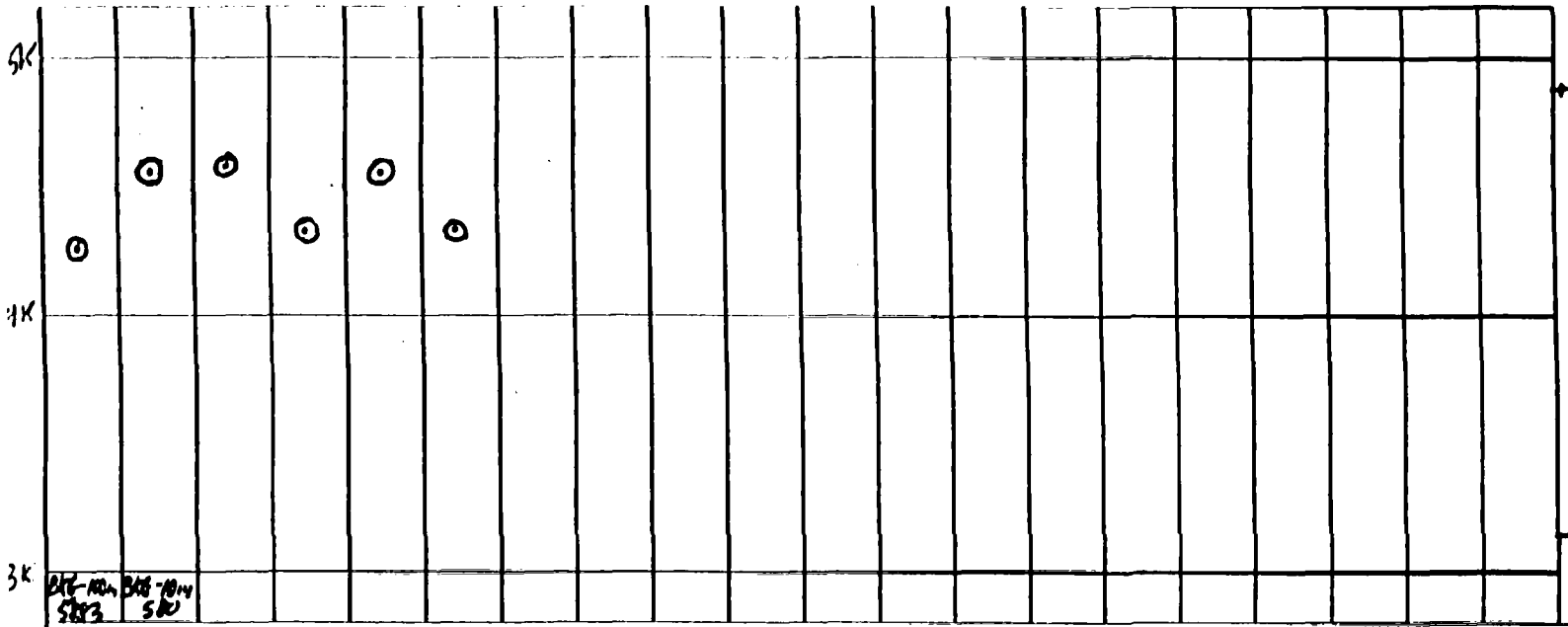
Instrument Make/Model: Ludlum 2200 / 44-40 | Scaler/Probe Serial Nos.: 34451 / 110586 (44) | Jig Number: 180-15 w Planchet

Count Type: ☐ Background ☑ Source | Radiation Type: ☑ Beta ☐ Alpha | Counting Duration (Seconds): 60

Source Isotope and DPM: Tc-99 0.0099 μCi | Source Serial #: 371-68-4 | Source Manufacturer: Isotope Products Lab

Location: NEW Offices Conf Rm | Reviewed By: DA Dailey | Date: 6/1/94

Initials	DAD	DAD	DAD	DAD	DAD	JMW
CPM Value	4265	4549	4583	4311	4557	4329
Date	6/1/94	6/6/94	6/15/94	7/24/94	7/26/94	7/28/94



Sigma Values	
+3=	4888
+2=	4596
+1=	4304
X̄=	4012
-1=	3720
-2=	3428
-3=	3136

INSTRUCTIONS: Put the calculated average count ($\bar{X}$) next to the $\bar{X}$ in the Sigma Values box. Add the sigma count value to $\bar{X}$ to obtain a +1 value. Add two times the sigma value to obtain a +2 value. Add three times the sigma value to obtain a +3 value. Subtract the sigma count value from $\bar{X}$ to obtain a -1 value. Subtract two times the sigma value to obtain a -2 value and subtract three times the sigma value to obtain a -3 value. Enter these in the Sigma Values box. Determine the appropriate scale for the graph, insuring that the + 3 sigma values are included on the top and bottom of the graph. $\bar{X}$ is plotted on the center line. Draw two red lines designated +3 sigma and -3 sigma at the corresponding values on the graph horizontally to serve as limits. Take one count at each check. Plot data point on graph in the same vertical column as the written entries of Initials, CPM values and Date.

MJW CORPORATION INC.

CALIBRATION RECORD FOR FREE RELEASE INSTRUMENTS

Instrument Make/Model: Ludlum 2200, 44-40	Scaler/Probe Serial Nos.: 34451 / 110596
Count Type: ☐ Background ☑ Source	Jig Number: 180-15 w Planchett
Radiation Type: ☑ Beta ☐ Alpha	Location: MJW Office, Calif. Room
Counting Duration (Seconds): 60	Source Isotope and DPM: Tc-99, 22,089
Source Manufacturer: ISOTOPE PRODUCTS	Source Serial #: 371-68-4

DATE	BAT CHECK	HV SETTING	THRESHOLD	WINDOW	AVG. CPM (X)	EFF.	REMARKS	INIT.
6/1/94	N/A	900V	OUT	OUT	4261	19.3%	OK	DHC
6/2/94	N/A	900V	OUT	OUT	4549	20.6%	OK	DAD
6/15/94	N/A	900V	OUT	OUT	4583	20.7%	OK	DAD
7/12/94	N/A	900V	N/A	N/A	4311	19.5%	OK	DAD
7/13/94	N/A	900V	N/A	N/A	4657	20.6%	OK	DAD
7/27/94	N/A	900V	N/A	N/A	4328	19.6%	OK	DAD

MJW CORPORATION INC.
SIGMA CALCULATION WORKSHEET

Instrument Make/Model: Ludlum 2200 / 44-40	Scaler/Probe Serial Nos.: 34451 / 110565
Count Type: ☐ Background ☑ Source	Jig Number: 180-15 (w Planchet)
Radiation Type: ☑ Beta ☐ Alpha	Location: MJW Conf. Room
Counting Duration (Seconds): 60	Source Isotope and DPM: Tc-99, 0.0095 μCi
Source Manufacturer: ISOTOPE PRODUCTS LAB	Source Serial #: 371-68-4

1. Perform 30 sixty-second counts of the type specified (beta or alpha and source or background).. Complete Control Chart Data Sheet. Transfer the Control Chart Count Data to the table below.

2. Add the 30 counts for the Total: _____

3. Divide Total by the number of counts taken (30) = $\frac{\text{Total of 30 counts}}{30}$ = Average Count ($\bar{X}$) = 4012

   Round all values to one decimal place.

4. Subtract the average count ($\bar{X}$) from each individual count (X_i). Indicate + or - values.
5. Square each of these values
6. Record results below.

Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$	Count No.	Source Count (X_i)	$X_i - \bar{X}$	$(X_i - \bar{X})^2$
1.	4423			11.	3775			21.	3416		
2.	3770			12.	4077			22.	4013		
3.	4013			13.	4403			23.	4433		
4.	4246			14.	4000			24.	3744		
5.	3811			15.	3984			25.	4286		
6.	3657			16.	3415			26.	4075		
7.	4315			17.	4355			27.	3643		
8.	3854			18.	3854			28.	4179		
9.	4095			19.	4221			29.	3720		
10.	4362			20.	3940			30.	4289		

7. Add all the $(X_i - \bar{X})^2$ values = _____

8. Sigma = $\sqrt{\frac{\text{Sum of 30 } (X_i - \bar{X})^2 \text{ values (Calculated in No. 7)}}{N - 1}}$ = $\sqrt{\frac{\quad}{29}}$ = 292 counts

   N = Total number of counts, in this case, 30.

Performed By: E. L. Cooley	Date: 6/1/94
Checked By: James V. Villarosa	Date: 6/1/94

APPENDIX B3

FIELD SOURCE CHECK FORMS

M.J.W. Corporation Inc.

INSTRUMENT FIELD SOURCE CHECK FORM

FORM RCP 41-1

Instrument Make/Model: Bicron MicroRem Serial Number: B 378A

Date	5/14/94	5/20/94	6/21/94	8/21/94											
Battery Check (sat/unsat)	SAT	SAT	SAT	SAT											
Calibration Label present (y/n)	N	N	N	N											
*Calibration Due Date	1/12/95	1/12/95	1/12/95	1/12/95											
Probe Type: Serial Number:	B378A	B378A	B378A	B378A											
Probe Calibrated with Inst. (y/n)	YES	YES	YES	YES											
Date of Last Plateau	1/12/94	1/12/94	1/12/94	1/12/94											
H.V. Setting	900	900	900	900											
Source Nuclide & Serial Number	Cs-137 3CH-58-12	Cs-137 3CH-58-12	Cs-137 3CH-58-12	Cs-137 3CH-58-12											
Source Activity (dpm)	1.03μCi	1.03μCi	1.03μCi	1.03μCi											
Source cpm μRem/hr	3900	3500	3500	3500											
Bkg	5-7	5-7	5-7	5-7											
% Efficiency (cpm/dpm)	N/A	N/A	N/A	N/A											
Correction Factor	N/A	N/A	N/A	N/A											
Tech. Initials	[illegible]	[illegible]	[illegible]	[illegible]											

*DO NOT use instrument if past calibration due date

M.J.W. Corporation Inc.

INSTRUMENT FIELD SOURCE CHECK FORM

FORM RCP 41-1

Instrument Make/Model: Bicron Micro Rem # B97IN LE Serial Number: B97IN

Date	5/1/94	5/2/94	5/2/94	5/2/94												
Battery Check (sat/unsat)	SAT	SAT	SAT	SAT												
Calibration Label present (y/n)	N	N	N	N												
*Calibration Due Date	5/7/95	5/7/95	5/7/95	5/7/95												
Probe Type: Serial Number:	P.S. B97IN	P.S B97IN	P.S. B97IN	P.S. B97IN												
Probe Calibrated with Inst. (y/n)	Yes	Yes	Yes	Yes												
Date of Last Plateau	5/7/94	5/7/94	5/7/94	5/7/94												
H.V. Setting	900	900	900	900												
Source Nuclide & Serial Number	Cs 137 364-58-2	Cs137 364.58K	Cs 137 364-58-2	Co 137 364.58 12												
Source Activity (dpm)	1.03 uCi	1.03 uCi	1.03 uCi	1.03 uCi												
Source cpm μRem/hr	3500	4000	4000	4000												
Bkg μRem/hr	5-7 2495	5-7 2495	5-7 2495	5-7 2495												
% Efficiency (cpm/dpm)	N/A	N/A	N/A	N/A												
Correction Factor	N/A	N/A	N/A	N/A												
Tech. Initials	gew	gew	gew	gew												

*DO NOT use instrument if past calibration due date

M.J.W. Corporation Inc.

INSTRUMENT FIELD SOURCE CHECK FORM

FORM RCP 41-1

Instrument Make/Model: Eberline ESP-1 w 44-10 (2.5" Collimator) Serial Number: 112642

Date	5/14/94	5/15/94	5/16/94	5/21/94	5/22/94										
Battery Check (sat/unsat)	✓	✓	✓	✓	✓										
Calibration Label present (y/n)	✓	✓	✓	✓	✓										
*Calibration Due Date	11/7/94	11/7/94	11/7/94	11/7/94	11/7/94										
Probe Type: Serial Number:	44-10 112642	44-10 112642	44-10 112642	44-10 112642	44-10 112642										
Probe Calibrated with Inst. (y/n)	Y	Y	Y	Y	Y										
Date of Last Plateau	5/7/94	5/7/94	5/7/94	5/7/94	5/7/94										
H.V. Setting	900 V	900 V	900 V	900 V	900 V										
Source Nuclide & Serial Number	Cs-137 364-58-12	Cs 137 364-58-12	Cs 137 364-58-12	Cs 137 364-58-12	Cs 137 364-58-12										
Source Activity (dpm)	1.03 uCi	1.03 uCi	1.03 uCi	1.03 uCi	1.03 uCi										
Source cpm	2.12E5	2.07E5	2.16E5	2.18E5	2.10E5										
Bkg	3.45E3	2.34E3	2.12E3	2.91E3	2.55E3										
% Efficiency (cpm/dpm)	9.26	9.04	9.44	9.31	9.48										
Correction Factor	10.8	11.06	10.6	10.75	10.4										
Tech. Initials	~~BJW~~	JEW	BJW	JEW	JEW										

*DO NOT use instrument if past calibration due date

M.J.W. Corporation Inc.

INSTRUMENT FIELD SOURCE CHECK FORM

FORM RCP 41-1

Instrument Make/Model: LBP-1 / 111127 w Large Collimator (6") Serial Number: # 111127 (44-10)

Date	5/14/94	5/15/94	5/20/94	5/21/94	5/22/94										
Battery Check (sat/unsat)	OK	OK	OK	OK	OK										
Calibration Label present (y/n)	Y	Y	Y	Y	Y										
*Calibration Due Date	10/30/94	10/30/94	10/30/94	10/30/94	10/30/94										
Probe Type: Serial Number:	44-10 111127	44-10 111127	44-10 111127	44-10 111127	44-10 111127										
Probe Calibrated with Inst. (y/n)	Y	Y	Y	Y	Y										
Date of Last Plateau	5/10/94	5/10/94	5/10/94	5/10/94	5/10/94										
H.V. Setting	OK	OK	OK	OK	OK										
Source Nuclide & Serial Number	CS-137 364-58-12	Cs 137 364-58-12	CS 137 364-58-12	Cs 137 364-58-12	Cs 137 364-58-12										
Source Activity (dpm)	1.031 uCi	1.031 uCi	1.031 uCi	1.031 uCi	1.031 uCi										
Source cpm	2.06E+05	2.05E5	2.05E5	1.92+5	2.04E5										
Bkg	1.33E+03	1.30+3 2.34 yrw	1.32+3	1.91+3	1.69E3										
% Efficiency (cpm/dpm)	9	8.9	8.96	8.4	8.91										
Correction Factor	11.1	11.2	11.1	11.9	11.2										
Tech. Initials	DBD	JEW	JEW	JEW	JEW										

*DO NOT use instrument if past calibration due date

APPENDIX B4

TRAINING AND DOSIMETRY RECORDS

	SERIES	EXPOSURE PERIOD	BADGE DATE
34		SPECIAL	5 1 2 94

. W CORPORATION
ATTN DAVE DOOLEY
334 HARRIS HILL ROAD
SUITE #200
WILLIAMSVILLE NY 14221

Landauer®

Landauer, Inc.
2 Science Road Glenwood, Illinois 60425-1586
Telephone: (708) 755-7000 Facsimile: (708) 755-7016

ACCT NO	SERIES	EXPOSURE PERIOD	BADGE DATE
121704		SPECIAL	5 1 2 94

M J W CORPORATION
ATTN DAVE DOOLEY
334 HARRIS HILL ROAD
SUITE #200
WILLIAMSVILLE NY 14221

Accredited by the
National Institute of Standards and Te
through NV

	USE THIS SIDE FOR DELETIONS PLACE "D" IN DELETE COLUMN
	USE REVERSE SIDE FOR ADDITIONS AND OTHER CHANGES.

SERVICE CHANGE ORDER

PARTICIPANT NUMBER	BADGE TYPE	NAME	DELETE (D)	CHANGE SERIES FROM	CHANGE SERIES TO	PARTICIPANT NUMBER	BADGE TYPE	NAME (LIMIT OF 16 CHARACTERS OR SPACES)	ID NUMBER	SEX	BIRTH DATE MO.	DAY	YEAR	
00000	K1	CONTROL				00000	K1							
99001	K1	GUERRIER, DUMARSAIS				99001	K1							
99002	K1	DOOLEY, DAVID A.				99002	K1							
99003	K1	WRIGHT, JAMES E.				99003	K1							3
99004	K1	KIEFER, TONY A.				99004	K1							
99005	K1	PRINCE, RICHARD				99005	K1							
99006	K1	NEWLIN, STEVE				99006	K1							6
99007	K1	BERGGREEN, RICHARD				99007	K1							
99008	K1	RAWLINSON, CRAIG				99008	K1							
99009	K1	THELWELL, DEON				99009	K1							9
99010	K1	NOT USED				99010	K1							
99011	K1	NOT USED				99011	K1							
99012	K1	NOT USED				99012	K1							12
														15
														18
														21
		P.C. ING LIST												
														24

FOR ADDRESS CHANGES O
PLEASE TYPE OR PRINT

SHIPPING ADDRESS (MAXIMUM 5 LINES OF 23 CHA
1
2
3
4 CITY STATE
5
BILLING ADDRESS (MAXIMUM 5 LINES OF 23 CHARACTER
1
2
3
4 CITY STATE
5
REPORTING ADDRESS (MAXIMUM 5 LINES OF 23 CHARA
1
2
3
4 CITY STATE
5

A BADGE NUMBER IS ASSIGNED PERMANENTLY AND CANN
A NEW PERSON NAME CHANGES MAY BE MADE ONLY TO C
OR DUE TO MARRIAGE DOSIMETERS MAY BE RETURNED
PING CONTAINER BUT OLD LABELS AND POSTMARKS MUS
PROPER POSTAGE AFFIXED

2 Science Road, Glenwood, Illinois 60425-1586

IMPORTANT: WHEN REQUESTING ANY CHANGES, ADDITIONS, OR DELETIONS, PLEASE MAKE THEM ON THIS FORM
CHANGES TO BE EFFECTIVE FOR YOUR NEXT WEAR DATE
MUST REACH THE GLENWOOD OFFICE NO LATER THAN 05/26/94
PLEASE DO NOT DUPLICATE CHANGES REQUESTED DURING PRECEDING 30 DAYS
DO NOT RETURN CHANGE REQUESTS WITH YOUR DOSIMETERS SINCE THIS DELAYS HANDLING.

G (REGULAR)	THERMAL	B (NEUTRON 144)	OTHER

May 20, 1994 - STS Site Work 5/20-22/94

*Areas 1 and 2 by J. Wright/D. Washington - All 30 seconds

Dosimetry Assignments - 5/21/94

Name	Soc. Sec. #	Birthdate	TLD #	DRD #	Reading In / Out
Demarcus J. Guerrier	[redacted]	[redacted]	99001	4050763	0 / 2
David A. Dooley	[redacted]	[redacted]	99002	4050764	0 / 0
James E. Wright	[redacted]	[redacted]	99003	4050767	0 / 0
Tony A. Kiefer	[redacted]	[redacted]	99004	4050765	0 / 0
Richard Prince	[redacted]	[redacted]	99005	4050766	0 / 0
Steve Newlin	[redacted]	[redacted]	99006	4050768	0 / 0
Richard Berggreen	[redacted]	[redacted]	99007	1042019	0 / 0
Craig Rawlinson	[redacted]	[redacted]	99008	4050768	0 / 0
Dean Thelwell	[redacted]	[redacted]	99009	4050765	0 / 0

Dosimetry Assignments - 5/22/94

Name	Soc. Sec. #	Birthdate	TLD #	DRD #	Reading In / Out
Demarcus J. Guerrier	[redacted]	[redacted]	99001	Same as 5/21/94	0 / 10
David A. Dooley	[redacted]	[redacted]	99002	Same as 5/21/94	0 / 0
James E. Wright	[redacted]	[redacted]	99003	Same as 5/21/94	0 / 0
Richard Berggreen	[redacted]	[redacted]	99007	Same as 5/21/94	0 / 0
Craig Rawlinson	[redacted]	[redacted]	99008	4050768	0 / 0
Dean Thelwell	[redacted]	[redacted]	99009	4050765	0 / 0

*All DRDs were read by D. Dooley

STS / Chicago Dock Job #142-94-072-01

10 CFR 19 - Training 5/21/94

Important Note: The original sheets will accompany this typed sheet because original signatures are presented on the original sheets.

Name	Social Security #	Company	Phone Number
Dumarsdis J. Guerrier	[redacted]	STS	(708) 866-6438
David A. Dooley	[redacted]	MJW	(716) 631-8291
James E. Wright	[redacted]	MJW	(716) 631-8291
Richard E. Prince	[redacted]	STS	(517) 321-4964
Tony A. Kiefer	[redacted]	STS	(708) 296-3218
Steve T. Newlin	[redacted]	STS	(708) 475-0439
Richard G. Berggreen	[redacted]	STS	(708) 272-6520
Craig Rawlinson	[redacted]	STS	(708) 272-6520
Deon Thelwell	[redacted]	STS	(708) 272-6520

N J 1 [illegible]
ATTN DAVE DOOLEY
304 HARRIS HILL ROAD
SUITE #300
WILLIAMSVILLE NY 14221

121704 | T2001 | 9/ 2/94 | 9/28/94 | 9 | 1 | RAH

** ONLY PAGE ***

LANDAUER®

RADIATION DOSIMETRY REPORT

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone (708)755-7000 Facsimile (708)755-7016

Accredited by the National Institute of Standards and Technology through NVLAP

NAME	PARTICIPANT NUMBER	TYPE OF RECORD	DOSIMETER TYPE OR SERVICE	NOTES	RADIATION QUALITY	DOSE EQUIVALENT (MREM) FOR PERIODS SHOWN BELOW: DEEP DDE	EYE LDE	SHALLOW SDE	ACCUMULATED DOSE EQUIVALENT (MREM): DEEP DDE	EYE LDE	SHALLOW SDE	ACCUMULATED DOSE EQUIVALENT (MREM): DEEP DDE	EYE LDE	SHALLOW SDE	INCEPTION DATE MO/YR	LAST AMENDMENT	RECORDS FOR YEAR	ID NUMBER	SEX	BIRTH DATE MO/DA/YR
FOR MONITORING PERIOD:						03/15/94 - 04/14/94				QTR 1			1994							
CONTROL		CONTROL	S			N	N	N							9/90		1			
DOOLEY DAVE	00001	WHL BODY	S			N	N	N											N	04/28/52
FOR MONITORING PERIOD:						05/12/94				QTR 2			1994							
CONTROL		CONTROL				N	N	N												
	00001	OTH WH B	X			N	N	N				NO TOTAL					1			
	00002	OTH WH B	X			N	N	N												
	00003	OTH WH B	X			N	N	N				NO TOTAL					1			
	00004	OTH WH B				N	N	N												
	00005	OTH WH B	X			N	N	N				NO TOTAL					1			
	00006	OTH WH B	X			N	N	N												
	00007	OTH WH B	X			N	N	N				NO TOTAL					1			
	00008	OTH WH B	X			N	N	N												
	00009	OTH WH B	X			N	N	N				NO TOTAL					1			
	00010	OTH WH B	X			N	N	N												
	00011	OTH WH B	X			N	N	N				NO TOTAL					1			
	00012	OTH WH B	X			N	N	N												
FOR MONITORING PERIOD:						05/15/94 - 06/14/94				QTR 2			1994							
CONTROL		CONTROL	S			N	N	N												
DOOLEY DAVE	00001	WHL BODY	S			N	N	N	N	N	N	N	N	N	9/90		2	000442308	N	04/28/52

*** 1993 DOSIMETER RESULTS ARE BEING MAILED SEPARATELY ***

1 - PR 5417 - RPT101 - N1

APPENDIX B5

TRIP NOTES

Survey Notes / Trip Report

May 13, 1994

- o Jim Wright and I arrive at STS Offices ~11:15 AM
- o Craig Rawlinson met with us, Steve Newlin's office had the equipment.
- o Since nobody was around, Jim and I went to lunch.
- o Upon return we moved equipment to 1st Floor.
- o Removed what we needed from the cases, did a quick operations check, put equipment in car and headed for downtown @ 1330 for 1500 meeting with EPA, et. al.
- o Meeting held at Job site trailer - 1500 to 1545.
- o Jim and I returned to the hotel and got the equipment out to prepare control chart paperwork.
- o Went to dinner.
- o Returned to room, prepared control charts and prepared source checks.
- o Everything ready to begin @ 0800 - 5/14/94

May 14, 1994

- o Arrived at site at 0755.
- o Deployed equipment - performed source/ops checks/ = control chart checks all OK [2 ESPs / 44-10 and 2 Bicrons]
- o Weather (AM) Sunny ~70° - very comfortable.
- o Did BKG points first on west property boundary, then east boundary, then sidewalk across the street from the east boundary. Eleven (11) points were measured along each boundary at 6 meter increments.

May 14, 1994 (Continued)

The grid reference point 0N, 0E was the property marker located in the sidewalk ~ 2 meters south and 1 meter west of the parking lot SW corner.

- o Background data was taken with ESP-1 44-10 with 2x2" collimator installed and using the Bicron μRem LE with the extended probe.

- o One minute counts were taken with the ESP-1/44-10 unit at 1 cm and 1 meter from the surface.

- o The Bicron μRem (BKG) was also established at 1 cm and 1 meter by allowing the meter to fluctuate approximately 10-15 seconds and the "average" of the fluctuations was recorded as the data point.

- o Larry Jensen of the EPA Region II was "at our heels" with a Bicron μRem LE (internal probe) and a 1x1" NaI hooked to a scaler/ratemeter (Ludlum).

- o Larry's (EPA) meter was nearly "dead nuts" on ours but was maybe 1-3 μRem higher when placed side by side during the background measurements.

- o BKG Measurements were completed ~10 AM. The STS data takers showed up and the overland gamma measurements of the site began ~10:30 AM.

  Dolan Washington worked with Jim Wright
  Gelina Georgeview worked with Dave Dooley

- o It was decided that the teams would "leapfrog" each other for the 6 meter grid to help speed things up.

- o For the 6 meter grid, one minute counts were recorded at 1 cm and 1 meter above grade. The grid coordinates and any site irregularities/interferences were recorded on the survey sheets. Only 2 vehicles interfered with the survey and were located about in the middle of the lot at coordinates 96E, 60N/96E, 54N and 78E, 36N/78E, 42N. There were no indications of elevated readings taken as close as possible around the vehicle perimeters.

May 14, 1994 (Continued)

- Once each row was completed from 0N to 66N, the intergrid region was scanned in a "zig-zag" pattern working from East to West and North to South. Both the average and maximum readings were recorded. Any areas within the grid which were significantly above background were marked with an "x" with spray paint. A one meter grid was then layed down around the elevated reading(s) based on the surveyors 6 m grid points. A detailed survey was then performed for each such area as described in the next bullet.

- The one meter detailed surveys consisted of taking readings 1 cm above grade with the ESP-1/44-10 scaler/detector instrument combinations. As with the 6 m survey, grid coordinates were recorded along with any irregularities/interferences. Due to the fact that in the one meter grid areas the general activity detected was much higher than for background areas, the count time was reduced to 15 seconds per grid point, versus the 1 min per point used for the 6 m grid.

- The work on Saturday was mildly hampered by the weather which was overcast, drizzly/rainy and with some wind. The background data and all but four (4) rows of the 6 meter grid were completed on Saturday by 2130. The total number of measurements made on Saturday was 957, including ESP 44/10 and Bicron measurements.

- Following work on Saturday the survey records were reviewed and any discrepancies and/or omissions corrected.

- Work started at 0700 on Sunday morning. Weather was still overcast and windy with drizzle on and off.

- The detailed surveys were completed on Sunday. Twelve discrete areas were identified as a result of the 6 meter grid survey which required performing a 1 meter detailed survey. Per the work plan, one of the detailed areas included performing a one meter grid survey of the presumed footprint of the former Carriage House located on the site and used to store Lindsey Light Company products. Readings were taken at one meter intervals, one cm above grade in the detailed areas. A sufficient number of readings were taken to assure that the elevated areas were characterized and at that the "edge" of the area was at or near the measured site (combined) background levels.

  A total of 1210 detailed survey readings were taken on Sunday. Jim Wright was taken to the airport at 12:30 pm by Dolan Washington. Rich Berggreen and Dolan continued performing elevated areas to the west of the building until about 1615 when I had to leave to catch my flight home.

- The Bicron walkover was performed at a walking rate of ~ 1/2 meter per second.

- Weather was very nice, sunny ~80-85°, slight breeze.

- On 5/20/94, D. Dooley and J. Wright arrived at STS at 11:00 AM CDT. We talked briefly with R. Berggreen, grabbed the equipment we needed to do the background counts with the ESP-1 and 44-10 with the long collimator. Left for the site at 1215.

  We met with V. Simon of the EPA at 1300 at the site. Discussed the plan for sampling briefly. She seemed to be in general agreement with our choices for BKG Transition and Hot Spot Sampling. Check of smear counters OK except for no HV on S/N 64318.

- D. Dooley and J. Wright performed BKG sampling from 0E, 0N to 0E, 66N; 187 E, 0N to 187E, 66N and from 207E, 0N to 207E, 66N with the ESP-1 with 44-10 (S/N - 111127) with the long collimator. The readings at 0E were nearly identical to the first few rows performed on-site last weekend. The 197E and 207E rows were slightly elevated by comparison. See data and perhaps do another statistical test of the 0E vs. 187E, etc.

- On 5/21/94, Instruments source checked OK. J. Wright provided Rad. Protection coverage for the CPT operations while D. Dooley performed ESP-1 measurements using the 44-10 with the short collimator (S/N 112642). Additional measurements were taken in several hot spot areas plus this same instrument was used to perform QA measurements at 100 - 1 cm locations. All QA locations were actual surveyors (orange) 6 meter grid marks to assist in data comparisons and reproducibility. After the ESP-1 measurements were completed, Bicron μRem LE measurements were made at 1 meter from the surface using S/N B378A. The Bicron survey proceeded from west to east at a walking pace of about 1/2 meter per second. In areas where the 44-10 surveys were low, the meter was continuously observed and the general reading range was given at 10-15 μRem/hr, for example. The twelve (12) elevated areas were surveyed using the Bicron at a rate of 1/4 meter per second, starting at Area 1 and proceeding to Area 12. All elevated areas with the exception of Area 7 were generally at or slightly above background. Area 7 which represents the footprint of the former Carraige House had significantly elevated readings such that it was necessary to make readings every meter from 72E to 90E, 0N to 30N. Beyond 90E readings were generally background with some higher readings found to the east of the storm drain

line located in the 17 to 20N area. All "Hot Spots" in all areas were measured at ground level (1 cm) with the Bicron instrument. The most elevated reading was found in Area 7 between 3 and 4 meters N and 76E and 77E ~ 2' north of the guardrail. All four (4) instruments used (the 2 ESP-1/44-10 and the 2 Bicrons) were used to make measurements at this highest location at both one meter and one cm from the surface. This exercise allows for the calculation and conversion of counts per minute (cpm) recorded with the ESP-1/44-10 combinations to approximate μRem/hr, as measured with the Bicrons. A meter stick was used to provide an accurate measure from the surface. All detectors were held at one meter with the sensitive volumes located from 0-5 cm above the one meter mark. Again, this was done to allow for more precise future comparisons, since the sensitive volumes of various detectors can vary greatly as can surveyors' techniques.

- Health and Safety training was provided each day to personnel who required it. TLDs and DRDs were issued per the Work Plan. DRDs were zeroed before issue and checked at the end of the day and the reading recorded. Only one DRD showed a positive reading of 2 mR for the day on 5/21/94 for Mr. Guerrier. All other DRDs showed no net change. Mr. Berggreens' DRD S/N 1042019, a 0-500 mR instrument, was read at about 10 AM and found to read 150 mR. All other personnel read their DRD and they were found to be zero. Mr. Berggreen's DRD was zeroed but it began to drift again and was exchanged for another 0-500 DRD S/N 1042024 which showed no drift for the day.

- Send copy of site photos to Jim Mitchell at EPA

- J. Wright debrief.

J. Wright Notes

Saturday, May 21, 1994

RP Coverage of CPT Borings of Soil Sampling

ESP1 #2260 - Ludlum 44-10 - S/N 111127 Bicron B97IN

Background at 0700 = 1.03 E3

		1st Attempt (1 min)	2nd Attempt (1 min)	3rd Attempt (6 min)	Bicron Contact Reading
Hole #1	Core Boring	1.04 E3	1.06 E3	3.08 E3	4 μRem/hr

		1st Attempt (1 min)	2nd Attempt (3 min)	3rd Attempt (3 min)	Bicron Contact Reading
Hole #2	Core Boring	1.02 E3	3.08 E3	3.11 E3	3 μRem/hr
Hole #3	Core Boring	1.01 E3	3.20 E3		3 μRem/hr

CPT Testing

	1st Attempt (1 min)
Hole #1	1.05 E3

	1st Attempt (3 min)	Probe (3 min)	2nd Attempt (3 min)
Hole #2	3.10 E3	3.03 E3	2.98 E3
Hole #3	3.15 E3		

Re-establish background at 1600 because instrument moved to end of Trailer 1.16 E3

Average over (5) 1 minute counts - remainder are all 3 minute counts)

	Core Smear	CPT Probe	Bicron Contact Reading
1st Transition Hole	3.61 E3	3.39 E3	12 μRem/hr
2nd Transition Hole (26N 82E)	3.41 E3	3.55 E3 (5 ft. outside of hole)	60 μRem/hr
		3.66 E3 (Inside)	
		3.59 E3 (End)	
3rd Transition Hole (25N 62E)	3.50 E3	3.59 E3	6 μRem/hr
4th Transition Hole (16N 89E)	3.63 E3	3.53 E3	20 μRem/hr

All tools and material ≤ BKG

Sample containers wiped down and smeared ≤ BKG

0 mrem received during this project.

Sunday - May 22, 1994

ESP-1 #2260 - Ludlum 44-10 - S/N 111127 Bicron B971N
BKG at 0800 based on 5 - One (1) minute counts 1.69 E3

	Core Smear (3 min)	CPT Probe (3 min)	Bicron Contact Reading
Hole (81E 5N)	5.42 E3	5.50 E3	55 μRem/hr
Hole (78E 18N)	5.39 E3	5.56 E3	170 μRem/hr
Hole (82E 15N)	5.42 E3	5.92 E3*	100 μRem/hr

* BKG at 1200 - 1.93 E3 based on 5 - One (1) minute counts
BKG at 1500 - 2.38 E3 based on 5 - One (1) minute counts

On Hole (78E 18N) material that was removed from hole was all black.

Dose rated at (310) μRem/hr, this was retained in a sample.

All sample points were surveyed for smearable loose surface contamination upon completion of sample taking evolution, all sample points were <20 cpm.

All tools and material used for this job smeared $\leq$ BKG.

J. Wright Notes

"Split Spoon Sampling"

During sampling of each location with the split spoon, the split spoon was dose rated on the external surface and also the end. No increase in background radiation levels were found on the sides of the spoon, but the ends showed an increase of 50-310 μRem/hr at contact in the higher sample locations, random smears were taken of the spoon and no contamination above 20 cpm above background were found.

Upon completion of each sample, the location was surveyed for loose surface contamination, no contamination was found greater than 20 cpm above background. The drill rig for the sampling was randomly smeared for loose surface contamination and again no contamination was found.

The samples were filled to the top with sample median and closed, each bottle was wiped down and smeared for loose surface contamination, no contamination was found greater than 20 cpm above background. A dose rate survey of the sample bottles showed very little or no increase in background radiation levels. Workers involved in obtaining samples wore gloves to protect themselves from any possible loose contamination, these gloves were smeared once or twice and revealed no smearable contamination.

All boring augers were smeared for loose surface contamination and no contamination was found greater than 20 cpm above bkg.

APPENDIX C

BACKGROUND DATA

APPENDIX C1

ESP-1/2x2 NaI DETECTOR - S/N 112642

Lindsay Light II Site

Background Data Measured Using ESP-1 and 2 x 2" NaI Detector (S/N 112642)

Background Data for Parking Lot - Data Collected May 14, 1994.								
ESP-1 Data (USING 2.5 INCH LEAD COLLIMATOR)						DETECTOR S/N = 112642		
		(ALL DATA GIVEN IN COUNTS PER MINUTE - CPM)						
Location	CPM@1M	CPM@1CM	Location	CPM@1M	CPM@1CM	Location	CPM@1M	CPM@1CM
0E,0N	2530	2440	187E,0N	2150	2480	207E,0N	2730	2690
0E,6N	2230	2130	187E,6N	2470	2690	207E,6N	2600	2700
0E,12N	2180	2200	187E,12N	2580	2610	207E,12N	2560	2660
0E,18N	2120	2140	187E,18N	2510	2440	207E,18N	2560	2620
0E,24N	2130	2150	187E,24N	2390	2530	207E,24N	2850	3210
0E,30N	2150	2150	187E,30N	2180	2440	207E,30N	2470	2620
0E,36N	2040	2250	187E,36N	2370	2410	207E,36N	2620	3010
0E,42N	2020	2180	187E,42N	2430	2440	207E,42N	2740	3190
0E,48N	2060	2080	187E,48N	2340	2460	207E,48N	2610	3130
0E,54N	2070	2220	187E,54N	2200	2280	207E,54N	2650	3100
0E,60N	2080	2230	187E,60N	2350	2330	207E,60N	2330	2360
0E,66N	2210	2450	187E,65N	2030	2110	207E,65N	2140	2290
ONE			ONE					
METER	COMBINED	OFF	CM	COMBINED	OFF		ALL ONE	ALL ONE
DATA	SITE	SITE	DATA	SITE	SITE		METER	CM
	2530	2730		2440	2690		2530	2440
	2230	2600		2130	2700		2230	2130
	2180	2560		2200	2660		2180	2200
	2120	2560		2140	2620		2120	2140
	2130	2850		2150	3210		2130	2150
	2150	2470		2150	2620		2150	2150
	2040	2620		2250	3010		2040	2250
	2020	2740		2180	3190		2020	2180
	2060	2610		2080	3130		2060	2080
	2070	2650		2220	3100		2070	2220
	2080	2330		2230	2360		2080	2230
	2210	2140		2450	2290		2210	2450
	2150			2480			2150	2480
	2470			2690			2470	2690
	2580			2610			2580	2610
	2510			2440			2510	2440
	2390			2530			2390	2530
	2180			2440			2180	2440
	2370			2410			2370	2410
	2430			2440			2430	2440
	2340			2460			2340	2460
	2200			2280			2200	2280
	2350			2330			2350	2330
	2030			2110			2030	2110
							2730	2690
Ave. =	2243	2152	Ave. =	2327	2218		2600	2700
Std. Dev.	170	131	Std. Dev.	168	111		2560	2660
							2560	2620
							2850	3210
							2470	2620

Lindsay Light II Site
Background Data Measured Using ESP-1 and 2 x 2" NaI Detector (S/N 112642)

							ALL ONE METER	ALL ONE CM
							2620	3010
							2740	3190
							2610	3130
							2650	3100
							2330	2360
							2140	2290
						Ave. =	2352	2484
						Std. Dev.	233	315
						Overall	Ave. =	2418
							Std. Dev.	285

APPENDIX C2

ESP-1/2x2" NaI DETECTOR - S/N 111127

Lindsay Light II Site

Background Data Measured Using ESP-1 and 2 x 2" NaI Dectector (S/N 111127)

Background Data for Parking Lot - Data Collected May 20, 1994.								
ESP-1 Data (USING 6 INCH LEAD COLLIMATOR)						DETECTOR S/N = 111127		
		(ALL DATA GIVEN IN COUNTS PER MINUTE . CPM)						
Location	CPM@1M	CPM@1CM	Location	CPM@1M	CPM@1CM	Location	CPM@1M	CPM@1CM
0E,0N	1160	1180	187E,0N	1200	1340	207E,0N	1340	2100
0E,6N	n/d*	1130	187E,6N	n/d	1950	207E,6N	n/d	1560
0E,12N	n/d	1080	187E,12N	n/d	1430	207E,12N	n/d	1470
0E,18N	1040	1010	187E,18N	1520	1390	207E,18N	1530	1460
0E,24N	n/d	1010	187E,24N	n/d	1520	207E,24N	n/d	1420
0E,30N	n/d	1050	187E,30N	n/d	1210	207E,30N	n/d	1420
0E,36N	1110	993	187E,36N	1400	1400	207E,36N	1510	2020
0E,42N	n/d	1050	187E,42N	n/d	1280	207E,42N	n/d	1880
0E,48N	n/d	1070	187E,48N	n/d	1200	207E,48N	n/d	2100
0E,54N	1110	1040	187E,54N	1450	2240	207E,54N	1550	2070
0E,60N	n/d	1140	187E,60N	n/d	1510	207E,60N	n/d	2080
0E,66N	1140	1110	187E,65N	1180	1280	207E,65N	1110	1100
ONE			ONE					
METER	COMBINED	OFF	CM	COMBINED	OFF		ALL ONE	ALL ONE
DATA	SITE	SITE	DATA	SITE	SITE		METER	CM
	1160	1340		1180	2100		1160	1180
	1040	1530		1130	1560		1040	1130
	1110	1510		1080	1470		1110	1080
	1110	1550		1010	1460		1110	1010
	1140	1110		1010	1420		1140	1010
	1200			1050	1420		1200	1050
	1520			993	2020		1520	993
	1400			1050	1880		1400	1050
	1450			1070	2100		1450	1070
	1180			1040	2070		1180	1040
				1140	2080		1340	1140
				1110	1100		1530	1110
				1340			1510	1340
				1950			1550	1950
				1430			1110	1430
				1390				1390
				1520				1520
				1210				1210
				1400				1400
				1280				1280
				1200				1200
				2240				2240
				1510				1510
				1280				1280
								2100
Ave. =	1231	1112	Ave. =	1276	1072			1560
Std. Dev.	156	41	Std. Dev.	296	56			1470
								1460
								1420
								1420

*n/d= no data collected.

8/19/94

Lindsay Light II Site

Background Data Measured Using ESP-1 and 2 x 2" Nal Dectector (S/N 111127)

							ALL ONE METER	ALL ONE CM
								2020
								1880
								2100
								2070
								2080
								1100
						Ave. =	1290	1425
						Std. Dev.	180	376
						Overall	Ave. =	1385
							Std. Dev.	336

8/19/94

APPENDIX C3

BICRON MICROREM METER - S/N B971N

Lindsay Light II Site

Background Data Measured Using Bicron Microrem LE Tissue Equivalent Meter (S/N B971N)

Background Data for Parking Lot - Data Collected May 14, 1994.								
Bicron Microrem LE - S/N B971N			(ALL DATA REPORTED IN MICROREM/HR)					
Location	uR/hr@1M	uR/hr@1CM	Location	uR/hr@1M	uR/hr@1CM	Location	uR/hr@1M	uR/hr@1CM
0E,0N	5.00	3.50	187E,0N	5.00	2.50	207E,0N	4.50	4.00
0E,6N	3.50	5.50	187E,6N	4.50	5.50	207E,6N	5.00	6.00
0E,12N	3.00	4.50	187E,12N	6.00	5.00	207E,12N	5.00	5.00
0E,18N	4.00	4.50	187E,18N	5.00	4.00	207E,18N	5.00	6.00
0E,24N	3.50	5.00	187E,24N	2.00	2.50	207E,24N	6.00	5.00
0E,30N	5.50	4.00	187E,30N	3.50	5.00	207E,30N	5.00	4.00
0E,36N	4.00	4.00	187E,36N	4.50	4.00	207E,36N	5.50	4.50
0E,42N	4.50	3.00	187E,42N	3.50	6.00	207E,42N	5.00	8.00
0E,48N	5.00	4.00	187E,48N	3.50	5.00	207E,48N	5.50	5.50
0E,54N	4.00	3.50	187E,54N	4.00	4.50	207E,54N	4.00	7.00
0E,60N	3.00	6.50	187E,60N	5.00	3.50	207E,60N	2.50	4.00
0E,66N	5.50	3.50	187E,65N	1.50	4.00	207E,65N	3.00	4.00

ONE METER DATA	COMBINED SITE	OFF SITE	ONE CM DATA	COMBINED SITE	OFF SITE	ALL ONE METER	ALL ONE CM
	5.00	4.50		3.50	4.00	5.00	3.50
	3.50	5.00		5.50	6.00	3.50	5.50
	3.00	5.00		4.50	5.00	3.00	4.50
	4.00	5.00		4.50	6.00	4.00	4.50
	3.50	6.00		5.00	5.00	3.50	5.00
	5.50	5.00		4.00	4.00	5.50	4.00
	4.00	5.50		4.00	4.50	4.00	4.00
	4.50	5.00		3.00	8.00	4.50	3.00
	5.00	5.50		4.00	5.50	5.00	4.00
	4.00	4.00		3.50	7.00	4.00	3.50
	3.00	2.50		6.50	4.00	3.00	6.50
	5.50	3.00		3.50	4.00	5.50	3.50
	5.00			2.50		5.00	2.50
	4.50			5.50		4.50	5.50
	6.00			5.00		6.00	5.00
	5.00			4.00		5.00	4.00
	2.00			2.50		2.00	2.50
	3.50			5.00		3.50	5.00
	4.50			4.00		4.50	4.00
	3.50			6.00		3.50	6.00
	3.50			5.00		3.50	5.00
	4.00			4.50		4.00	4.50
	5.00			3.50		5.00	3.50
	1.50			4.00		1.50	4.00
						4.50	4.00
Ave. =	4.10	4.67	Ave. =	4.29	5.25	5.00	6.00
Std. Dev.	1.07	0.99	Std. Dev.	1.00	1.25	5.00	5.00
						5.00	6.00
						6.00	5.00
						5.00	4.00

Lindsay Light II Site

Background Data Measured Using Bicron Microrem LE Tissue Equivalent Meter (S/N B971N)

							ALL ONE METER	ALL ONE CM
							5.50	4.50
							5.00	8.00
							5.50	5.50
							4.00	7.00
							2.50	4.00
							3.00	4.00
						Ave. =	4.29	4.61
						Std. Dev.	1.08	1.18
						Overall	Ave. =	4.45
							Std. Dev.	1.14

8/19/94

APPENDIX D

SIX METER GRID DATA

APPENDIX D1

6 METER GRID DATA - 1 METER ABOVE SURFACE

(Compared to BKG + 2 Standard Deviations)

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
156E, 66N	1.11E+03	<BKG	162E, 66N	2.33E+03	<BKG	168E, 66N	2.94E+03	5.88E+02	174E, 66N	3.80E+03	1.45E+03
156E, 60N	1.30E+03	1.79E+01	162E, 60N	2.95E+03	5.98E+02	168E, 60N	4.31E+03	1.96E+03	174E, 60N	3.70E+03	1.35E+03
156E, 54N	1.26E+03	<BKG	162E, 54N	2.41E+03	5.80E+01	168E, 54N	2.53E+03	1.78E+02	174E, 54N	3.61E+03	1.26E+03
156E, 48N	1.22E+03	<BKG	162E, 48N	2.38E+03	2.80E+01	168E, 48N	2.48E+03	1.28E+02	174E, 48N	3.18E+03	8.28E+02
156E, 42N	1.18E+03	<BKG	162E, 42N	2.28E+03	<BKG	168E, 42N	2.46E+03	1.08E+02	174E, 42N	3.08E+03	7.28E+02
156E, 36N	1.24E+03	<BKG	162E, 36N	2.38E+03	2.80E+01	168E, 36N	2.61E+03	2.58E+02	174E, 36N	3.28E+03	9.28E+02
156E, 30N	1.30E+03	1.79E+01	162E, 30N	2.32E+03	<BKG	168E, 30N	2.82E+03	4.68E+02	174E, 30N	3.20E+03	8.48E+02
156E, 24N	1.45E+03	2.91E+02	162E, 24N	2.42E+03	6.80E+01	168E, 24N	3.25E+03	8.98E+02	174E, 24N	3.50E+03	1.15E+03
156E, 18N	1.77E+03	8.75E+02	162E, 18N	2.42E+03	6.80E+01	168E, 18N	2.81E+03	4.58E+02	174E, 18N	2.33E+03	<BKG
156E, 12N	1.34E+03	9.08E+01	162E, 12N	2.44E+03	8.80E+01	168E, 12N	2.71E+03	3.58E+02	174E, 12N	2.33E+03	<BKG
156E, 6N	1.42E+03	2.37E+02	162E, 6N	2.59E+03	2.38E+02	168E, 6N	2.80E+03	4.48E+02	174E, 6N	3.23E+03	8.78E+02
156E, 0N	1.42E+03	2.37E+02	162E, 0N	2.42E+03	6.80E+01	168E, 0N	2.62E+03	2.68E+02	174E, 0N	2.84E+03	4.88E+02

Notes:
Average background @ 1 m = 2352 CPM.
Net CPM values in red are > 3 x background.
< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
126E, 66N	2.46E+03	1.08E+02	132E, 66N	1.09E+03	<BKG	138E, 66N	2.31E+03	<BKG	144E, 66N	1.35E+03	1.09E+02	150E, 66N	2.30E+03	<BKG
126E, 60N	2.54E+03	1.88E+02	132E, 60N	1.33E+03	7.26E+01	138E, 60N	2.35E+03	<BKG	144E, 60N	1.24E+03	<BKG	150E, 60N	2.52E+03	1.68E+02
126E, 54N	2.35E+03	<BKG	132E, 54N	1.49E+03	3.64E+02	138E, 54N	2.26E+03	<BKG	144E, 54N	1.40E+03	2.00E+02	150E, 54N	2.75E+03	3.98E+02
126E, 48N	2.28E+03	<BKG	132E, 48N	1.22E+03	<BKG	138E, 48N	2.43E+03	7.80E+01	144E, 48N	1.54E+03	4.55E+02	150E, 48N	2.23E+03	<BKG
126E, 42N	2.41E+03	5.80E+01	132E, 42N	1.73E+03	8.02E+02	138E, 42N	2.66E+03	3.08E+02	144E, 42N	1.71E+03	7.65E+02	150E, 42N	2.17E+03	<BKG
126E, 36N	3.11E+03	7.58E+02	132E, 36N	1.95E+03	1.20E+03	138E, 36N	3.51E+03	1.16E+03	144E, 36N	1.42E+03	2.37E+02	150E, 36N	2.64E+03	2.88E+02
126E, 30N	3.01E+03	6.58E+02	132E, 30N	1.56E+03	4.92E+02	138E, 30N	3.17E+03	8.18E+02	144E, 30N	1.28E+03	<BKG	150E, 30N	2.42E+03	6.80E+01
126E, 24N	2.80E+03	4.48E+02	132E, 24N	1.54E+03	4.55E+02	138E, 24N	2.47E+03	1.18E+02	144E, 24N	1.35E+03	1.09E+02	150E, 24N	3.20E+03	8.48E+02
126E, 18N	2.58E+03	2.28E+02	132E, 18N	1.42E+03	2.37E+02	138E, 18N	2.66E+03	3.08E+02	144E, 18N	1.64E+03	6.38E+02	150E, 18N	2.85E+03	4.98E+02
126E, 12N	2.53E+03	1.78E+02	132E, 12N	1.51E+03	4.01E+02	138E, 12N	2.75E+03	3.98E+02	144E, 12N	1.68E+03	7.11E+02	150E, 12N	2.72E+03	3.68E+02
126E, 6N	3.70E+03	1.35E+03	132E, 6N	1.13E+03	<BKG	138E, 6N	2.65E+03	2.98E+02	144E, 6N	1.79E+03	9.11E+02	150E, 6N	2.90E+03	5.48E+02
126E, 0N	2.60E+03	2.48E+02	132E, 0N	1.48E+03	3.46E+02	138E, 0N	2.58E+03	2.28E+02	144E, 0N	1.25E+03	<BKG	150E, 0N	2.54E+03	1.88E+02

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
96E, 66N	1.58E+03	5.28E+02	102E, 66N	2.51E+03	1.58E+02	108E, 66N	1.12E+03	<BKG	114E, 66N	2.52E+03	1.68E+02	120E, 66N	1.33E+03	7.26E+01
96E, 60N	1.23E+03	<BKG	102E, 60N	2.30E+03	<BKG	108E, 60N	1.17E+03	<BKG	114E, 60N	2.32E+03	<BKG	120E, 60N	1.29E+03	<BKG
96E, 54N	1.20E+03	<BKG	102E, 54N	2.24E+03	<BKG	108E, 54N	1.19E+03	<BKG	114E, 54N	2.42E+03	6.80E+01	120E, 54N	1.30E+03	1.79E+01
96E, 48N	1.17E+03	<BKG	102E, 48N	2.27E+03	<BKG	108E, 48N	1.12E+03	<BKG	114E, 48N	2.33E+03	<BKG	120E, 48N	1.32E+03	5.44E+01
96E, 42N	1.13E+03	<BKG	102E, 42N	2.39E+03	3.80E+01	108E, 42N	1.23E+03	<BKG	114E, 42N	2.53E+03	1.78E+02	120E, 42N	1.28E+03	<BKG
96E, 36N	1.89E+03	1.09E+03	102E, 36N	2.98E+03	6.28E+02	108E, 36N	1.38E+03	1.64E+02	114E, 36N	2.93E+03	5.78E+02	120E, 36N	1.51E+03	4.01E+02
96E, 30N	2.03E+03	1.35E+03	102E, 30N	3.62E+03	1.27E+03	108E, 30N	1.31E+03	3.61E+01	114E, 30N	3.04E+03	6.88E+02	120E, 30N	1.56E+03	4.92E+02
96E, 24N	4.80E+03	6.40E+03	102E, 24N	5.95E+03	3.60E+03	108E, 24N	2.66E+03	2.50E+03	114E, 24N	4.24E+03	1.89E+03	120E, 24N	1.74E+03	8.20E+02
96E, 18N	8.81E+03	1.37E+04	102E, 18N	8.00E+03	5.65E+03	108E, 18N	1.93E+03	1.17E+03	114E, 18N	3.15E+03	7.98E+02	120E, 18N	1.50E+03	3.83E+02
96E, 12N	1.60E+03	5.65E+02	102E, 12N	3.02E+03	6.68E+02	108E, 12N	1.69E+03	7.29E+02	114E, 12N	2.77E+03	4.18E+02	120E, 12N	1.32E+03	5.44E+01
96E, 6N	2.89E+03	2.92E+03	102E, 6N	2.90E+03	5.48E+02	108E, 6N	1.66E+03	6.74E+02	114E, 6N	2.70E+03	3.48E+02	120E, 6N	1.48E+03	3.46E+02
96E, 0N	1.39E+03	1.82E+02	102E, 0N	2.81E+03	4.58E+02	108E, 0N	1.44E+03	2.73E+02	114E, 0N	2.66E+03	3.08E+02	120E, 0N	1.39E+03	1.82E+02

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
66E, 66N	2.20E+03	<BKG	72E, 66N	1.06E+03	<BKG	78E, 66N	2.46E+03	1.08E+02	84E, 66N	1.15E+03	<BKG	90E, 66N	2.43E+03	7.80E+01
66E, 60N	2.18E+03	<BKG	72E, 60N	1.39E+03	1.82E+02	78E, 60N	2.69E+03	3.38E+02	84E, 60N	1.40E+03	2.00E+02	90E, 60N	2.37E+03	1.80E+01
66E, 54N	2.26E+03	<BKG	72E, 54N	1.19E+03	<BKG	78E, 54N	2.52E+03	1.68E+02	84E, 54N	1.35E+03	1.09E+02	90E, 54N	2.23E+03	<BKG
66E, 48N	2.33E+03	<BKG	72E, 48N	1.36E+03	1.27E+02	78E, 48N	2.50E+03	1.48E+02	84E, 48N	1.20E+03	<BKG	90E, 48N	2.26E+03	<BKG
66E, 42N	2.43E+03	7.80E+01	72E, 42N	1.42E+03	2.37E+02	78E, 42N	2.85E+03	4.98E+02	84E, 42N	1.24E+03	<BKG	90E, 42N	2.57E+03	2.18E+02
66E, 36N	2.34E+03	<BKG	72E, 36N	1.15E+03	<BKG	78E, 36N	2.68E+03	3.28E+02	84E, 36N	1.56E+03	4.92E+02	90E, 36N	3.34E+03	9.88E+02
66E, 30N	2.61E+03	2.58E+02	72E, 30N	1.54E+03	4.55E+02	78E, 30N	2.77E+03	4.18E+02	84E, 30N	1.85E+03	1.02E+03	90E, 30N	3.93E+03	1.58E+03
66E, 24N	5.74E+03	3.39E+03	72E, 24N	9.98E+03	1.58E+04	78E, 24N	4.18E+03	1.83E+03	84E, 24N	2.99E+04	5.22E+04	90E, 24N	9.58E+03	7.23E+03
66E, 18N	2.63E+03	2.78E+02	72E, 18N	1.96E+03	1.22E+03	78E, 18N	4.80E+04	4.56E+04	84E, 18N	2.78E+04	4.83E+04	90E, 18N	1.13E+03	<BKG
66E, 12N	3.40E+03	1.05E+03	72E, 12N	2.95E+03	3.03E+03	78E, 12N	1.17E+05	1.15E+05	84E, 12N	1.72E+04	2.90E+04	90E, 12N	4.79E+03	2.44E+03
66E, 6N	6.55E+03	4.20E+03	72E, 6N	2.29E+03	1.82E+03	78E, 6N	3.48E+04	3.24E+04	84E, 6N	1.13E+04	1.82E+04	90E, 6N	3.89E+03	1.54E+03
66E, 0N	4.07E+03	1.72E+03	72E, 0N	1.59E+03	5.47E+02	78E, 0N	8.54E+03	6.19E+03	84E, 0N	4.45E+03	5.76E+03	90E, 0N	2.25E+03	<BKG

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
36E, 66N	1.35E+03	1.09E+02	42E, 66N	2.65E+03	2.98E+02	48E, 66N	1.31E+03	3.61E+01	54E, 66N	2.35E+03	<BKG	60E, 66N	1.16E+03	<BKG
36E, 60N	1.81E+03	9.48E+02	42E, 60N	3.93E+03	1.58E+03	48E, 60N	2.01E+03	1.31E+03	54E, 60N	2.57E+03	2.18E+02	60E, 60N	1.23E+03	<BKG
36E, 54N	1.60E+03	5.65E+02	42E, 54N	3.41E+03	1.06E+03	48E, 54N	1.44E+03	2.73E+02	54E, 54N	2.39E+03	3.80E+01	60E, 54N	1.16E+03	<BKG
36E, 48N	1.33E+03	7.26E+01	42E, 48N	2.49E+03	1.38E+02	48E, 48N	1.12E+03	<BKG	54E, 48N	2.21E+03	<BKG	60E, 48N	1.29E+03	<BKG
36E, 42N	1.26E+03	<BKG	42E, 42N	2.22E+03	<BKG	48E, 42N	2.12E+03	1.51E+03	54E, 42N	2.38E+03	2.80E+01	60E, 42N	1.26E+03	<BKG
36E, 36N	1.05E+03	<BKG	42E, 36N	2.13E+03	<BKG	48E, 36N	1.17E+03	<BKG	54E, 36N	2.38E+03	2.80E+01	60E, 36N	1.27E+03	<BKG
36E, 30N	1.36E+03	1.27E+02	42E, 30N	2.19E+03	<BKG	48E, 30N	1.30E+03	1.79E+01	54E, 30N	2.41E+03	5.80E+01	60E, 30N	1.30E+03	1.79E+01
36E, 24N	1.31E+03	3.61E+01	42E, 24N	2.41E+03	5.80E+01	48E, 24N	1.20E+03	<BKG	54E, 24N	2.79E+03	4.38E+02	60E, 24N	1.68E+03	7.11E+02
36E, 18N	1.11E+03	<BKG	42E, 18N	2.25E+03	<BKG	48E, 18N	1.24E+03	<BKG	54E, 18N	2.41E+03	5.80E+01	60E, 18N	1.92E+03	1.15E+03
36E, 12N	1.04E+03	<BKG	42E, 12N	2.05E+03	<BKG	48E, 12N	1.23E+03	<BKG	54E, 12N	2.70E+03	3.48E+02	60E, 12N	1.55E+03	4.74E+02
36E, 6N	1.07E+03	<BKG	42E, 6N	1.96E+03	<BKG	48E, 6N	1.44E+03	2.73E+02	54E, 6N	2.45E+03	9.80E+01	60E, 6N	2.04E+03	1.37E+03
36E, 0N	1.22E+03	<BKG	42E, 0N	2.35E+03	<BKG	48E, 0N	1.32E+03	5.44E+01	54E, 0N	2.86E+03	5.08E+02	60E, 0N	1.65E+03	6.56E+02

Notes:
Average background *(a)* 1 m = 2352 CPM.
Net CPM values in red are > 3 x background.
< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm	Location	1 m.	Net cpm
6E, 66N	2.36E+03	8.00E+00	12E, 66N	1.10E+03	<BKG	18E, 66N	2.25E+03	<BKG	24E, 66N	1.18E+03	<BKG	30E, 66N	2.35E+03	<BKG
6E, 60N	2.26E+03	<BKG	12E, 60N	1.20E+03	<BKG	18E, 60N	2.21E+03	<BKG	24E, 60N	1.26E+03	<BKG	30E, 60N	3.47E+03	1.12E+03
6E, 54N	2.14E+03	<BKG	12E, 54N	1.15E+03	<BKG	18E, 54N	2.13E+03	<BKG	24E, 54N	1.17E+03	<BKG	30E,54N	2.47E+03	1.18E+02
6E, 48N	2.18E+03	<BKG	12E, 48N	1.14E+03	<BKG	18E, 48N	2.05E+03	<BKG	24E, 48N	1.09E+03	<BKG	30E,48N	2.16E+03	<BKG
6E, 42N	2.04E+03	<BKG	12E, 42N	1.13E+03	<BKG	18E, 42N	2.17E+03	<BKG	24E, 42N	1.10E+03	<BKG	30E, 42N	2.20E+03	<BKG
6E, 36N	2.15E+03	<BKG	12E, 36N	1.13E+03	<BKG	18E, 36N	2.04E+03	<BKG	24E, 36N	9.75E+02	<BKG	30E, 36N	2.16E+03	<BKG
6E, 30N	2.18E+03	<BKG	12E, 30N	1.13E+03	<BKG	18E, 30N	2.05E+03	<BKG	24E, 30N	1.11E+03	<BKG	30E, 30N	2.24E+03	<BKG
6E, 24N	2.17E+03	<BKG	12E, 24N	1.13E+03	<BKG	18E, 24N	2.12E+03	<BKG	24E, 24N	1.05E+03	<BKG	30E,24N	2.14E+03	<BKG
6E, 18N	2.12E+03	<BKG	12E, 18N	1.11E+03	<BKG	18E, 18N	1.96E+03	<BKG	24E, 18N	1.06E+03	<BKG	30E,18N	2.13E+03	<BKG
6E, 12N	2.04E+03	<BKG	12E, 12N	1.15E+03	<BKG	18E, 12N	2.06E+03	<BKG	24E, 12N	1.13E+03	<BKG	30E,12N	1.98E+03	<BKG
6E, 6N	2.22E+03	<BKG	12E, 6N	1.13E+03	<BKG	18E, 6N	2.17E+03	<BKG	24E, 6N	1.01E+03	<BKG	30E, 6N	2.14E+03	<BKG
6E, 0N	2.23E+03	<BKG	12E, 0N	1.25E+03	<BKG	18E, 0N	2.32E+03	<BKG	24E, 0N	1.23E+03	<BKG	30E, 0N	2.34E+03	<BKG

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ BKG.

APPENDIX D2

6 METER GRID DATA - 1 METER ABOVE SURFACE

(Compared to 3x BKG)

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM
156E, 66N	1.11E+03	<BKG	162E, 66N	2.33E+03	<BKG	168E, 66N	2.94E+03	5.88E+02	174E, 66N	3.80E+03	1.45E+03
156E, 60N	1.30E+03	1.79E+01	162E, 60N	2.95E+03	5.98E+02	168E, 60N	4.31E+03	1.96E+03	174E, 60N	3.70E+03	1.35E+03
156E, 54N	1.26E+03	<BKG	162E, 54N	2.41E+03	5.80E+01	168E, 54N	2.53E+03	1.78E+02	174E, 54N	3.61E+03	1.26E+03
156E, 48N	1.22E+03	<BKG	162E, 48N	2.38E+03	2.80E+01	168E, 48N	2.48E+03	1.28E+02	174E, 48N	3.18E+03	8.28E+02
156E, 42N	1.18E+03	<BKG	162E, 42N	2.28E+03	<BKG	168E, 42N	2.46E+03	1.08E+02	174E, 42N	3.08E+03	7.28E+02
156E, 36N	1.24E+03	<BKG	162E, 36N	2.38E+03	2.80E+01	168E, 36N	2.61E+03	2.58E+02	174E, 36N	3.28E+03	9.28E+02
156E, 30N	1.30E+03	1.79E+01	162E, 30N	2.32E+03	<BKG	168E, 30N	2.82E+03	4.68E+02	174E, 30N	3.20E+03	8.48E+02
156E, 24N	1.45E+03	2.91E+02	162E, 24N	2.42E+03	6.80E+01	168E, 24N	3.25E+03	8.98E+02	174E, 24N	3.50E+03	1.15E+03
156E, 18N	1.77E+03	8.75E+02	162E, 18N	2.42E+03	6.80E+01	168E, 18N	2.81E+03	4.58E+02	174E, 18N	2.33E+03	<BKG
156E, 12N	1.34E+03	9.08E+01	162E, 12N	2.44E+03	8.80E+01	168E, 12N	2.71E+03	3.58E+02	174E, 12N	2.33E+03	<BKG
156E, 6N	1.42E+03	2.37E+02	162E, 6N	2.59E+03	2.38E+02	168E, 6N	2.80E+03	4.48E+02	174E, 6N	3.23E+03	8.78E+02
156E, 0N	1.42E+03	2.37E+02	162E, 0N	2.42E+03	6.80E+01	168E, 0N	2.62E+03	2.68E+02	174E, 0N	2.84E+03	4.88E+02

Notes:

Average background *(a)* 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM
126E, 66N	2.46E+03	1.08E+02	132E, 66N	1.09E+03	<BKG	138E, 66N	2.31E+03	<BKG	144E, 66N	1.35E+03	1.09E+02	150E, 66N	2.30E+03	<BKG
126E, 60N	2.54E+03	1.88E+02	132E, 60N	1.33E+03	7.26E+01	138E, 60N	2.35E+03	<BKG	144E, 60N	1.24E+03	<BKG	150E, 60N	2.52E+03	1.68E+02
126E, 54N	2.35E+03	<BKG	132E, 54N	1.49E+03	3.64E+02	138E, 54N	2.26E+03	<BKG	144E, 54N	1.40E+03	2.00E+02	150E, 54N	2.75E+03	3.98E+02
126E, 48N	2.28E+03	<BKG	132E, 48N	1.22E+03	<BKG	138E, 48N	2.43E+03	7.80E+01	144E, 48N	1.54E+03	4.55E+02	150E, 48N	2.23E+03	<BKG
126E, 42N	2.41E+03	5.80E+01	132E, 42N	1.73E+03	8.02E+02	138E, 42N	2.66E+03	3.08E+02	144E, 42N	1.71E+03	7.65E+02	150E, 42N	2.17E+03	<BKG
126E, 36N	3.11E+03	7.58E+02	132E, 36N	1.95E+03	1.20E+03	138E, 36N	3.51E+03	1.16E+03	144E, 36N	1.42E+03	2.37E+02	150E, 36N	2.64E+03	2.88E+02
126E, 30N	3.01E+03	6.58E+02	132E, 30N	1.56E+03	4.92E+02	138E, 30N	3.17E+03	8.18E+02	144E, 30N	1.28E+03	<BKG	150E, 30N	2.42E+03	6.80E+01
126E, 24N	2.80E+03	4.48E+02	132E, 24N	1.54E+03	4.55E+02	138E, 24N	2.47E+03	1.18E+02	144E, 24N	1.35E+03	1.09E+02	150E, 24N	3.20E+03	8.48E+02
126E, 18N	2.58E+03	2.28E+02	132E, 18N	1.42E+03	2.37E+02	138E, 18N	2.66E+03	3.08E+02	144E, 18N	1.64E+03	6.38E+02	150E, 18N	2.85E+03	4.98E+02
126E, 12N	2.53E+03	1.78E+02	132E, 12N	1.51E+03	4.01E+02	138E, 12N	2.75E+03	3.98E+02	144E, 12N	1.68E+03	7.11E+02	150E, 12N	2.72E+03	3.68E+02
126E, 6N	3.70E+03	1.35E+03	132E, 6N	1.13E+03	<BKG	138E, 6N	2.65E+03	2.98E+02	144E, 6N	1.79E+03	9.11E+02	150E, 6N	2.90E+03	5.48E+02
126E, 0N	2.60E+03	2.48E+02	132E, 0N	1.48E+03	3.46E+02	138E, 0N	2.58E+03	2.28E+02	144E, 0N	1.25E+03	<BKG	150E, 0N	2.54E+03	1.88E+02

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM
96E, 66N	1.58E+03	5.28E+02	102E, 66N	2.51E+03	1.58E+02	108E, 66N	1.12E+03	<BKG	114E, 66N	2.52E+03	1.68E+02	120E, 66N	1.33E+03	7.26E+01
96E, 60N	1.23E+03	<BKG	102E, 60N	2.30E+03	<BKG	108E, 60N	1.17E+03	<BKG	114E, 60N	2.32E+03	<BKG	120E, 60N	1.29E+03	<BKG
96E, 54N	1.20E+03	<BKG	102E, 54N	2.24E+03	<BKG	108E, 54N	1.19E+03	<BKG	114E, 54N	2.42E+03	6.80E+01	120E, 54N	1.30E+03	1.79E+01
96E, 48N	1.17E+03	<BKG	102E, 48N	2.27E+03	<BKG	108E, 48N	1.12E+03	<BKG	114E, 48N	2.33E+03	<BKG	120E, 48N	1.32E+03	5.44E+01
96E, 42N	1.13E+03	<BKG	102E, 42N	2.39E+03	3.80E+01	108E, 42N	1.23E+03	<BKG	114E, 42N	2.53E+03	1.78E+02	120E, 42N	1.28E+03	<BKG
96E, 36N	1.89E+03	1.09E+03	102E, 36N	2.98E+03	6.28E+02	108E, 36N	1.38E+03	1.64E+02	114E, 36N	2.93E+03	5.78E+02	120E, 36N	1.51E+03	4.01E+02
96E, 30N	2.03E+03	1.35E+03	102E, 30N	3.62E+03	1.27E+03	108E, 30N	1.31E+03	3.61E+01	114E, 30N	3.04E+03	6.88E+02	120E, 30N	1.56E+03	4.92E+02
96E, 24N	4.80E+03	6.40E+03	102E, 24N	5.95E+03	3.60E+03	108E, 24N	2.66E+03	2.50E+03	114E, 24N	4.24E+03	1.89E+03	120E, 24N	1.74E+03	8.20E+02
96E, 18N	8.81E+03	1.37E+04	102E, 18N	8.00E+03	5.65E+03	108E, 18N	1.93E+03	1.17E+03	114E, 18N	3.15E+03	7.98E+02	120E, 18N	1.50E+03	3.83E+02
96E, 12N	1.60E+03	5.65E+02	102E, 12N	3.02E+03	6.68E+02	108E, 12N	1.69E+03	7.29E+02	114E, 12N	2.77E+03	4.18E+02	120E, 12N	1.32E+03	5.44E+01
96E, 6N	2.89E+03	2.92E+03	102E, 6N	2.90E+03	5.48E+02	108E, 6N	1.66E+03	6.74E+02	114E, 6N	2.70E+03	3.48E+02	120E, 6N	1.48E+03	3.46E+02
96E, 0N	1.39E+03	1.82E+02	102E, 0N	2.81E+03	4.58E+02	108E, 0N	1.44E+03	2.73E+02	114E, 0N	2.66E+03	3.08E+02	120E, 0N	1.39E+03	1.82E+02

Notes:

Average background *(a)* 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM
66E, 66N	2.20E+03	<BKG	72E, 66N	1.06E+03	<BKG	78E, 66N	2.46E+03	1.08E+02	84E, 66N	1.15E+03	<BKG	90E, 66N	2.43E+03	7.80E+01
66E, 60N	2.18E+03	<BKG	72E, 60N	1.39E+03	1.82E+02	78E, 60N	2.69E+03	3.38E+02	84E, 60N	1.40E+03	2.00E+02	90E, 60N	2.37E+03	1.80E+01
66E, 54N	2.26E+03	<BKG	72E, 54N	1.19E+03	<BKG	78E, 54N	2.52E+03	1.68E+02	84E, 54N	1.35E+03	1.09E+02	90E, 54N	2.23E+03	<BKG
66E, 48N	2.33E+03	<BKG	72E, 48N	1.36E+03	1.27E+02	78E, 48N	2.50E+03	1.48E+02	84E, 48N	1.20E+03	<BKG	90E, 48N	2.26E+03	<BKG
66E, 42N	2.43E+03	7.80E+01	72E, 42N	1.42E+03	2.37E+02	78E, 42N	2.85E+03	4.98E+02	84E, 42N	1.24E+03	<BKG	90E, 42N	2.57E+03	2.18E+02
66E, 36N	2.34E+03	<BKG	72E, 36N	1.15E+03	<BKG	78E, 36N	2.68E+03	3.28E+02	84E, 36N	1.56E+03	4.92E+02	90E, 36N	3.34E+03	9.88E+02
66E, 30N	2.61E+03	2.58E+02	72E, 30N	1.54E+03	4.55E+02	78E, 30N	2.77E+03	4.18E+02	84E, 30N	1.85E+03	1.02E+03	90E, 30N	3.93E+03	1.58E+03
66E, 24N	5.74E+03	3.39E+03	72E, 24N	9.98E+03	1.58E+04	78E, 24N	4.18E+03	1.83E+03	84E, 24N	2.99E+04	5.22E+04	90E, 24N	9.58E+03	7.23E+03
66E, 18N	2.63E+03	2.78E+02	72E, 18N	1.96E+03	1.22E+03	78E, 18N	4.80E+04	4.56E+04	84E, 18N	2.78E+04	4.83E+04	90E, 18N	1.13E+03	<BKG
66E, 12N	3.40E+03	1.05E+03	72E, 12N	2.95E+03	3.03E+03	78E, 12N	1.17E+05	1.15E+05	84E, 12N	1.72E+04	2.90E+04	90E, 12N	4.79E+03	2.44E+03
66E, 6N	6.55E+03	4.20E+03	72E, 6N	2.29E+03	1.82E+03	78E, 6N	3.48E+04	3.24E+04	84E, 6N	1.13E+04	1.82E+04	90E, 6N	3.89E+03	1.54E+03
66E, 0N	4.07E+03	1.72E+03	72E, 0N	1.59E+03	5.47E+02	78E, 0N	8.54E+03	6.19E+03	84E, 0N	4.45E+03	5.76E+03	90E, 0N	2.25E+03	<BKG

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m	Net CPM	Location	1 m.	Net CPM
36E, 66N	1.35E+03	1.09E+02	42E, 66N	2.65E+03	2.98E+02	48E, 66N	1.31E+03	3.61E+01	54E, 66N	2.35E+03	<BKG	60E, 66N	1.16E+03	<BKG
36E, 60N	1.81E+03	9.48E+02	42E, 60N	3.93E+03	1.58E+03	48E, 60N	2.01E+03	1.31E+03	54E, 60N	2.57E+03	2.18E+02	60E, 60N	1.23E+03	<BKG
36E, 54N	1.60E+03	5.65E+02	42E, 54N	3.41E+03	1.06E+03	48E, 54N	1.44E+03	2.73E+02	54E, 54N	2.39E+03	3.80E+01	60E, 54N	1.16E+03	<BKG
36E, 48N	1.33E+03	7.26E+01	42E, 48N	2.49E+03	1.38E+02	48E, 48N	1.12E+03	<BKG	54E, 48N	2.21E+03	<BKG	60E, 48N	1.29E+03	<BKG
36E, 42N	1.26E+03	<BKG	42E, 42N	2.22E+03	<BKG	48E, 42N	2.12E+03	1.51E+03	54E, 42N	2.38E+03	2.80E+01	60E, 42N	1.26E+03	<BKG
36E, 36N	1.05E+03	<BKG	42E, 36N	2.13E+03	<BKG	48E, 36N	1.17E+03	<BKG	54E, 36N	2.38E+03	2.80E+01	60E, 36N	1.27E+03	<BKG
36E, 30N	1.36E+03	1.27E+02	42E, 30N	2.19E+03	<BKG	48E, 30N	1.30E+03	1.79E+01	54E, 30N	2.41E+03	5.80E+01	60E, 30N	1.30E+03	1.79E+01
36E, 24N	1.31E+03	3.61E+01	42E, 24N	2.41E+03	5.80E+01	48E, 24N	1.20E+03	<BKG	54E, 24N	2.79E+03	4.38E+02	60E, 24N	1.68E+03	7.11E+02
36E, 18N	1.11E+03	<BKG	42E, 18N	2.25E+03	<BKG	48E, 18N	1.24E+03	<BKG	54E, 18N	2.41E+03	5.80E+01	60E, 18N	1.92E+03	1.15E+03
36E, 12N	1.04E+03	<BKG	42E, 12N	2.05E+03	<BKG	48E, 12N	1.23E+03	<BKG	54E, 12N	2.70E+03	3.48E+02	60E, 12N	1.55E+03	4.74E+02
36E, 6N	1.07E+03	<BKG	42E, 6N	1.96E+03	<BKG	48E, 6N	1.44E+03	2.73E+02	54E, 6N	2.45E+03	9.80E+01	60E, 6N	2.04E+03	1.37E+03
36E, 0N	1.22E+03	<BKG	42E, 0N	2.35E+03	<BKG	48E, 0N	1.32E+03	5.44E+01	54E, 0N	2.86E+03	5.08E+02	60E, 0N	1.65E+03	6.56E+02

Notes:

Average background *(a)* 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 m Above Grade

Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM	Location	1 m.	Net CPM
6E, 66N	2.36E+03	8.00E+00	12E, 66N	1.10E+03	<BKG	18E, 66N	2.25E+03	<BKG	24E, 66N	1.18E+03	<BKG	30E, 66N	2.35E+03	<BKG
6E, 60N	2.26E+03	<BKG	12E, 60N	1.20E+03	<BKG	18E, 60N	2.21E+03	<BKG	24E, 60N	1.26E+03	<BKG	30E, 60N	3.47E+03	1.12E+03
6E, 54N	2.14E+03	<BKG	12E, 54N	1.15E+03	<BKG	18E, 54N	2.13E+03	<BKG	24E, 54N	1.17E+03	<BKG	30E,54N	2.47E+03	1.18E+02
6E, 48N	2.18E+03	<BKG	12E, 48N	1.14E+03	<BKG	18E, 48N	2.05E+03	<BKG	24E, 48N	1.09E+03	<BKG	30E,48N	2.16E+03	<BKG
6E, 42N	2.04E+03	<BKG	12E, 42N	1.13E+03	<BKG	18E, 42N	2.17E+03	<BKG	24E, 42N	1.10E+03	<BKG	30E, 42N	2.20E+03	<BKG
6E, 36N	2.15E+03	<BKG	12E, 36N	1.13E+03	<BKG	18E, 36N	2.04E+03	<BKG	24E, 36N	9.75E+02	<BKG	30E, 36N	2.16E+03	<BKG
6E, 30N	2.18E+03	<BKG	12E, 30N	1.13E+03	<BKG	18E, 30N	2.05E+03	<BKG	24E, 30N	1.11E+03	<BKG	30E, 30N	2.24E+03	<BKG
6E, 24N	2.17E+03	<BKG	12E, 24N	1.13E+03	<BKG	18E, 24N	2.12E+03	<BKG	24E, 24N	1.05E+03	<BKG	30E,24N	2.14E+03	<BKG
6E, 18N	2.12E+03	<BKG	12E, 18N	1.11E+03	<BKG	18E, 18N	1.96E+03	<BKG	24E, 18N	1.06E+03	<BKG	30E,18N	2.13E+03	<BKG
6E, 12N	2.04E+03	<BKG	12E, 12N	1.15E+03	<BKG	18E, 12N	2.06E+03	<BKG	24E, 12N	1.13E+03	<BKG	30E,12N	1.98E+03	<BKG
6E, 6N	2.22E+03	<BKG	12E, 6N	1.13E+03	<BKG	18E, 6N	2.17E+03	<BKG	24E, 6N	1.01E+03	<BKG	30E, 6N	2.14E+03	<BKG
6E, 0N	2.23E+03	<BKG	12E, 0N	1.25E+03	<BKG	18E, 0N	2.32E+03	<BKG	24E, 0N	1.23E+03	<BKG	30E, 0N	2.34E+03	<BKG

Notes:

Average background @ 1 m = 2352 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ BKG.

APPENDIX D3

6 METER GRID DATA - 1 CENTIMETER ABOVE SURFACE

(Compared to BKG + 2 Standard Deviations)

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm	Net CPM	Location	1 cm.	Net CPM
6E, 66N	2.34E+03	- BKG	12E, 66N	1.20E+03	<BKG	18E, 66N	2.28E+03	- BKG	24E, 66N	1.31E+03	<BKG	30E, 66N	2.13E+03	- BKG
6E, 60N	2.21E+03	<BKG	12E, 60N	1.33E+03	<BKG	18E, 60N	2.30E+03	<BKG	24E, 60N	1.18E+03	<BKG	30E, 60N	4.08E+03	1.60E+03
6E, 54N	2.14E+03	<BKG	12E, 54N	1.12E+03	<BKG	18E, 54N	2.16E+03	<BKG	24E, 54N	1.24E+03	<BKG	30E,54N	2.30E+03	<BKG
6E, 48N	2.08E+03	<BKG	12E, 48N	1.15E+03	<BKG	18E, 48N	2.00E+03	<BKG	24E, 48N	1.23E+03	<BKG	30E,48N	2.16E+03	<BKG
6E, 42N	1.98E+03	<BKG	12E, 42N	1.22E+03	<BKG	18E, 42N	2.27E+03	<BKG	24E, 42N	1.15E+03	<BKG	30E, 42N	2.08E+03	<BKG
6E, 36N	2.20E+03	<BKG	12E, 36N	1.22E+03	<BKG	18E, 36N	2.15E+03	<BKG	24E, 36N	1.05E+03	<BKG	30E, 36N	2.11E+03	<BKG
6E, 30N	2.23E+03	<BKG	12E, 30N	1.14E+03	<BKG	18E, 30N	2.11E+03	<BKG	24E, 30N	1.22E+03	<BKG	30E, 30N	2.12E+03	<BKG
6E, 24N	2.32E+03	<BKG	12E, 24N	1.16E+03	<BKG	18E, 24N	2.26E+03	<BKG	24E, 24N	1.15E+03	<BKG	30E,24N	2.22E+03	<BKG
6E, 18N	2.05E+03	<BKG	12E, 18N	1.22E+03	<BKG	18E, 18N	2.03E+03	<BKG	24E, 18N	1.17E+03	<BKG	30E,18N	2.37E+03	<BKG
6E, 12N	2.04E+03	<BKG	12E, 12N	1.19E+03	<BKG	18E, 12N	2.13E+03	<BKG	24E, 12N	1.15E+03	<BKG	30E,12N	2.02E+03	<BKG
6E, 6N	2.32E+03	<BKG	12E, 6N	1.13E+03	<BKG	18E, 6N	2.11E+03	<BKG	24E, 6N	1.18E+03	<BKG	30E, 6N	2.09E+03	<BKG
6E, 0N	2.39E+03	<BKG	12E, 0N	1.39E+03	<BKG	18E, 0N	2.28E+03	<BKG	24E, 0N	1.35E+03	<BKG	30E, 0N	2.37E+03	<BKG

Notes:

Average background *(a)* 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
36E, 66N	1.41E+03	<BKG	42E, 66N	2.81E+03	3.26E+02	48E, 66N	1.23E+03	<BKG	54E, 66N	2.70E+03	2.16E+02	60E, 66N	1.23E+03	<BKG
36E, 60N	2.32E+03	1.56E+03	42E, 60N	4.23E+03	1.75E+03	48E, 60N	2.10E+03	1.18E+03	54E, 60N	2.60E+03	1.16E+02	60E, 60N	1.16E+03	<BKG
36E, 54N	1.54E+03	2.00E+02	42E, 54N	3.46E+03	9.76E+02	48E, 54N	1.48E+03	9.56E+01	54E, 54N	2.33E+03	<BKG	60E, 54N	1.12E+03	<BKG
36E, 48N	1.45E+03	4.34E+01	42E, 48N	2.39E+03	<BKG	48E, 48N	2.19E+03	1.33E+03	54E, 48N	2.31E+03	<BKG	60E, 48N	1.32E+03	<BKG
36E, 42N	1.21E+03	<BKG	42E, 42N	2.28E+03	<BKG	48E, 42N	1.13E+03	<BKG	54E, 42N	2.39E+03	<BKG	60E, 42N	1.25E+03	<BKG
36E, 36N	1.11E+03	<BKG	42E, 36N	2.30E+03	<BKG	48E, 36N	1.20E+03	<BKG	54E, 36N	2.43E+03	<BKG	60E, 36N	1.13E+03	<BKG
36E, 30N	1.31E+03	<BKG	42E, 30N	2.26E+03	<BKG	48E, 30N	1.53E+03	1.83E+02	54E, 30N	2.27E+03	<BKG	60E, 30N	1.24E+03	<BKG
36E, 24N	1.39E+03	<BKG	42E, 24N	2.39E+03	<BKG	48E, 24N	1.37E+03	<BKG	54E, 24N	3.45E+03	9.66E+02	60E, 24N	1.66E+03	4.09E+02
36E, 18N	1.01E+03	<BKG	42E, 18N	2.19E+03	<BKG	48E, 18N	1.23E+03	<BKG	54E, 18N	3.12E+03	6.36E+02	60E, 18N	1.61E+03	3.22E+02
36E, 12N	1.04E+03	<BKG	42E, 12N	2.09E+03	<BKG	48E, 12N	1.10E+03	<BKG	54E, 12N	2.75E+03	2.66E+02	60E, 12N	1.48E+03	9.56E+01
36E, 6N	1.08E+03	<BKG	42E, 6N	2.10E+03	<BKG	48E, 6N	1.40E+03	<BKG	54E, 6N	2.40E+03	<BKG	60E, 6N	2.40E+03	1.70E+03
36E, 0N	1.32E+03	<BKG	42E, 0N	2.44E+03	<BKG	48E, 0N	1.43E+03	8.49E+00	54E, 0N	2.65E+03	1.66E+02	60E, 0N	1.52E+03	1.65E+02

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM *(a)* 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
66E, 66N	2.12E+03	<BKG	72E, 66N	1.36E+03	<BKG	78E, 66N	2.52E+03	3.60E+01	84E, 66N	1.40E+03	<BKG	90E, 66N	2.25E+03	<BKG
66E, 60N	2.20E+03	<BKG	72E, 60N	1.28E+03	<BKG	78E, 60N	2.77E+03	2.86E+02	84E, 60N	1.35E+03	<BKG	90E, 60N	2.28E+03	<BKG
66E, 54N	2.31E+03	<BKG	72E, 54N	1.35E+03	<BKG	78E, 54N	2.51E+03	2.60E+01	84E, 54N	1.28E+03	<BKG	90E, 54N	2.25E+03	<BKG
66E, 48N	2.37E+03	<BKG	72E, 48N	1.35E+03	<BKG	78E, 48N	2.40E+03	<BKG	84E, 48N	1.19E+03	<BKG	90E, 48N	2.14E+03	<BKG
66E, 42N	2.49E+03	6.00E+00	72E, 42N	1.35E+03	<BKG	78E, 42N	2.74E+03	2.56E+02	84E, 42N	1.19E+03	<BKG	90E, 42N	2.46E+03	<BKG
66E, 36N	2.28E+03	<BKG	72E, 36N	1.08E+03	<BKG	78E, 36N	2.90E+03	4.16E+02	84E, 36N	1.50E+03	1.31E+02	90E, 36N	2.22E+03	<BKG
66E, 30N	2.66E+03	1.76E+02	72E, 30N	1.35E+03	<BKG	78E, 30N	4.26E+03	1.78E+03	84E, 30N	1.81E+03	6.71E+02	90E, 30N	3.95E+03	1.47E+03
66E, 24N	6.64E+03	4.16E+03	72E, 24N	9.66E+03	1.44E+04	78E, 24N	2.77E+04	2.52E+04	84E, 24N	2.86E+04	4.74E+04	90E, 24N	9.56E+03	7.08E+03
66E, 18N	3.49E+03	1.01E+03	72E, 18N	1.72E+03	5.14E+02	78E, 18N	7.84E+04	7.59E+04	84E, 18N	3.65E+04	6.11E+04	90E, 18N	8.45E+03	5.97E+03
66E, 12N	3.29E+03	8.06E+02	72E, 12N	4.01E+03	4.51E+03	78E, 12N	3.14E+04	2.89E+04	84E, 12N	1.94E+04	3.13E+04	90E, 12N	4.29E+03	1.81E+03
66E, 6N	5.32E+03	2.84E+03	72E, 6N	1.90E+03	8.28E+02	78E, 6N	2.73E+04	2.48E+04	84E, 6N	1.26E+04	1.95E+04	90E, 6N	3.81E+03	1.33E+03
66E, 0N	2.83E+03	3.46E+02	72E, 0N	1.59E+03	2.87E+02	78E, 0N	8.51E+03	6.03E+03	84E, 0N	7.14E+03	9.96E+03	90E, 0N	2.95E+03	4.66E+02

Notes:

Average background *(a)* 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
96E, 66N	1.16E+03	<BKG	102E, 66N	2.39E+03	<BKG	108E, 66N	1.20E+03	<BKG	114E, 66N	2.52E+03	3.60E+01	120E, 66N	1.55E+03	2.18E+02
96E, 60N	1.22E+03	<BKG	102E, 60N	2.32E+03	<BKG	108E, 60N	1.17E+03	<BKG	114E, 60N	2.37E+03	<BKG	120E, 60N	1.46E+03	6.08E+01
96E, 54N	1.11E+03	<BKG	102E, 54N	2.08E+03	<BKG	108E, 54N	1.20E+03	<BKG	114E, 54N	2.47E+03	<BKG	120E, 54N	1.28E+03	<BKG
96E, 48N	1.10E+03	<BKG	102E, 48N	2.20E+03	<BKG	108E, 48N	9.72E+02	<BKG	114E, 48N	2.34E+03	<BKG	120E, 48N	1.33E+03	<BKG
96E, 42N	1.20E+03	<BKG	102E, 42N	2.26E+03	<BKG	108E, 42N	1.21E+03	<BKG	114E, 42N	2.60E+03	1.16E+02	120E, 42N	1.38E+03	<BKG
96E, 36N	2.04E+03	1.07E+03	102E, 36N	2.65E+03	1.66E+02	108E, 36N	1.36E+03	<BKG	114E, 36N	2.86E+03	3.76E+02	120E, 36N	1.53E+03	1.83E+02
96E, 30N	1.90E+03	8.28E+02	102E, 30N	3.74E+03	1.26E+03	108E, 30N	1.20E+03	<BKG	114E, 30N	2.90E+03	4.16E+02	120E, 30N	1.42E+03	<BKG
96E, 24N	5.31E+03	6.77E+03	102E, 24N	5.50E+03	3.02E+03	108E, 24N	2.28E+03	1.49E+03	114E, 24N	3.50E+03	1.02E+03	120E, 24N	2.86E+03	2.50E+03
96E, 18N	1.94E+04	3.13E+04	102E, 18N	9.54E+03	7.06E+03	108E, 18N	2.05E+03	1.09E+03	114E, 18N	3.22E+03	7.36E+02	120E, 18N	1.66E+03	4.09E+02
96E, 12N	1.37E+03	<BKG	102E, 12N	2.75E+03	2.66E+02	108E, 12N	1.73E+03	5.31E+02	114E, 12N	2.72E+03	2.36E+02	120E, 12N	1.37E+03	<BKG
96E, 6N	3.69E+03	3.95E+03	102E, 6N	2.95E+03	4.66E+02	108E, 6N	1.75E+03	5.66E+02	114E, 6N	2.66E+03	1.76E+02	120E, 6N	1.38E+03	<BKG
96E, 0N	1.33E+03	<BKG	102E, 0N	2.70E+03	2.16E+02	108E, 0N	1.43E+03	8.49E+00	114E, 0N	2.72E+03	2.36E+02	120E, 0N	1.39E+03	<BKG

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
126E, 66N	2.31E+03	<BKG	132E, 66N	1.24E+03	<BKG	138E, 66N	2.33E+03	<BKG	144E, 66N	1.52E+03	1.65E+02	150E, 66N	2.76E+03	2.76E+02
126E, 60N	2.57E+03	8.60E+01	132E, 60N	1.34E+03	<BKG	138E, 60N	2.37E+03	<BKG	144E, 60N	1.27E+03	<BKG	150E, 60N	2.58E+03	9.60E+01
126E, 54N	2.41E+03	<BKG	132E, 54N	1.56E+03	2.35E+02	138E, 54N	2.31E+03	<BKG	144E, 54N	1.32E+03	<BKG	150E, 54N	2.90E+03	4.16E+02
126E, 48N	2.47E+03	<BKG	132E, 48N	1.22E+03	<BKG	138E, 48N	2.28E+03	<BKG	144E, 48N	1.43E+03	8.49E+00	150E, 48N	2.12E+03	<BKG
126E, 42N	2.30E+03	<BKG	132E, 42N	1.78E+03	6.19E+02	138E, 42N	2.72E+03	2.36E+02	144E, 42N	1.26E+03	<BKG	150E, 42N	2.12E+03	<BKG
126E, 36N	2.92E+03	4.36E+02	132E, 36N	2.09E+03	1.16E+03	138E, 36N	3.36E+03	8.76E+02	144E, 36N	1.82E+03	6.88E+02	150E, 36N	2.65E+03	1.66E+02
126E, 30N	2.74E+03	2.56E+02	132E, 30N	1.25E+03	<BKG	138E, 30N	2.97E+03	4.86E+02	144E, 30N	1.18E+03	<BKG	150E, 30N	2.19E+03	<BKG
126E, 24N	2.81E+03	3.26E+02	132E, 24N	1.58E+03	2.70E+02	138E, 24N	2.87E+03	3.86E+02	144E, 24N	1.47E+03	7.82E+01	150E, 24N	3.28E+03	7.96E+02
126E, 18N	2.59E+03	1.06E+02	132E, 18N	1.43E+03	8.49E+00	138E, 18N	2.68E+03	1.96E+02	144E, 18N	1.81E+03	6.71E+02	150E, 18N	2.89E+03	4.06E+02
126E, 12N	2.56E+03	7.60E+01	132E, 12N	1.58E+03	2.70E+02	138E, 12N	2.78E+03	2.96E+02	144E, 12N	1.36E+03	<BKG	150E, 12N	2.73E+03	2.46E+02
126E, 6N	3.35E+03	8.66E+02	132E, 6N	1.47E+03	7.82E+01	138E, 6N	2.59E+03	1.06E+02	144E, 6N	1.99E+03	9.85E+02	150E, 6N	3.05E+03	5.66E+02
126E, 0N	2.58E+03	9.60E+01	132E, 0N	1.50E+03	1.31E+02	138E, 0N	2.53E+03	4.60E+01	144E, 0N	1.44E+03	2.59E+01	150E, 0N	2.48E+03	<BKG

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
156E, 66N	1.18E+03	<BKG	162E, 66N	2.59E+03	1.06E+02	168E, 66N	2.96E+03	4.76E+02	174E, 66N	3.80E+03	1.32E+03
156E, 60N	1.32E+03	<BKG	162E, 60N	3.03E+03	5.46E+02	168E, 60N	4.26E+03	1.78E+03	174E, 60N	3.95E+03	1.47E+03
156E, 54N	1.34E+03	<BKG	162E, 54N	2.40E+03	<BKG	168E, 54N	2.86E+03	3.76E+02	174E, 54N	2.87E+03	3.86E+02
156E, 48N	1.17E+03	<BKG	162E, 48N	2.41E+03	<BKG	168E, 48N	2.59E+03	1.06E+02	174E, 48N	3.46E+03	9.76E+02
156E, 42N	1.16E+03	<BKG	162E, 42N	2.25E+03	<BKG	168E, 42N	2.49E+03	6.00E+00	174E, 42N	3.25E+03	7.66E+02
156E, 36N	1.37E+03	<BKG	162E, 36N	2.48E+03	<BKG	168E, 36N	2.80E+03	3.16E+02	174E, 36N	3.56E+03	1.08E+03
156E, 30N	1.23E+03	<BKG	162E, 30N	2.45E+03	<BKG	168E, 30N	3.17E+03	6.86E+02	174E, 30N	3.48E+03	9.96E+02
156E, 24N	1.64E+03	3.75E+02	162E, 24N	2.81E+03	3.26E+02	168E, 24N	3.59E+03	1.11E+03	174E, 24N	3.12E+03	6.36E+02
156E, 18N	1.70E+03	4.79E+02	162E, 18N	2.72E+03	2.36E+02	168E, 18N	3.03E+03	5.46E+02	174E, 18N	3.33E+03	8.46E+02
156E, 12N	1.45E+03	4.34E+01	162E, 12N	2.71E+03	2.26E+02	168E, 12N	2.78E+03	2.96E+02	174E, 12N	3.23E+03	7.46E+02
156E, 6N	1.67E+03	4.27E+02	162E, 6N	2.90E+03	4.16E+02	168E, 6N	2.62E+03	1.36E+02	174E, 6N	3.42E+03	9.36E+02
156E, 0N	1.32E+03	<BKG	162E, 0N	2.60E+03	1.16E+02	168E, 0N	2.53E+03	4.60E+01	174E, 0N	2.90E+03	4.16E+02

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

< BKG in Net CPM column is actually ≤ background.

APPENDIX D4

6 METER GRID DATA - 1 CENTIMETER ABOVE SURFACE

(Compared to 3x BKG)

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
6E, 66N	2.34E+03	<BKG	12E, 66N	1.20E+03	<BKG	18E, 66N	2.28E+03	<BKG	24E, 66N	1.31E+03	<BKG	30E, 66N	2.13E+03	<BKG
6E, 60N	2.21E+03	<BKG	12E, 60N	1.33E+03	<BKG	18E, 60N	2.30E+03	<BKG	24E, 60N	1.18E+03	<BKG	30E, 60N	4.08E+03	1.60E+03
6E, 54N	2.14E+03	<BKG	12E, 54N	1.12E+03	<BKG	18E, 54N	2.16E+03	<BKG	24E, 54N	1.24E+03	<BKG	30E,54N	2.30E+03	<BKG
6E, 48N	2.08E+03	<BKG	12E, 48N	1.15E+03	<BKG	18E, 48N	2.00E+03	<BKG	24E, 48N	1.23E+03	<BKG	30E,48N	2.16E+03	<BKG
6E, 42N	1.98E+03	<BKG	12E, 42N	1.22E+03	<BKG	18E, 42N	2.27E+03	<BKG	24E, 42N	1.15E+03	<BKG	30E, 42N	2.08E+03	<BKG
6E, 36N	2.20E+03	<BKG	12E, 36N	1.22E+03	<BKG	18E, 36N	2.15E+03	<BKG	24E, 36N	1.05E+03	<BKG	30E, 36N	2.11E+03	<BKG
6E, 30N	2.23E+03	<BKG	12E, 30N	1.14E+03	<BKG	18E, 30N	2.11E+03	<BKG	24E, 30N	1.22E+03	<BKG	30E, 30N	2.12E+03	<BKG
6E, 24N	2.32E+03	<BKG	12E, 24N	1.16E+03	<BKG	18E, 24N	2.26E+03	<BKG	24E, 24N	1.15E+03	<BKG	30E,24N	2.22E+03	<BKG
6E, 18N	2.05E+03	<BKG	12E, 18N	1.22E+03	<BKG	18E, 18N	2.03E+03	<BKG	24E, 18N	1.17E+03	<BKG	30E,18N	2.37E+03	<BKG
6E, 12N	2.04E+03	<BKG	12E, 12N	1.19E+03	<BKG	18E, 12N	2.13E+03	<BKG	24E, 12N	1.15E+03	<BKG	30E,12N	2.02E+03	<BKG
6E, 6N	2.32E+03	<BKG	12E, 6N	1.13E+03	<BKG	18E, 6N	2.11E+03	<BKG	24E, 6N	1.18E+03	<BKG	30E, 6N	2.09E+03	<BKG
6E, 0N	2.39E+03	<BKG	12E, 0N	1.39E+03	<BKG	18E, 0N	2.28E+03	<BKG	24E, 0N	1.35E+03	<BKG	30E, 0N	2.37E+03	<BKG

Notes:
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.
< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
36E, 66N	1.41E+03	<BKG	42E, 66N	2.81E+03	3.26E+02	48E, 66N	1.23E+03	<BKG	54E, 66N	2.70E+03	2.16E+02	60E, 66N	1.23E+03	<BKG
36E, 60N	2.32E+03	1.56E+03	42E, 60N	4.23E+03	1.75E+03	48E, 60N	2.10E+03	1.18E+03	54E, 60N	2.60E+03	1.16E+02	60E, 60N	1.16E+03	<BKG
36E, 54N	1.54E+03	2.00E+02	42E, 54N	3.46E+03	9.76E+02	48E, 54N	1.48E+03	9.56E+01	54E, 54N	2.33E+03	<BKG	60E, 54N	1.12E+03	<BKG
36E, 48N	1.45E+03	4.34E+01	42E, 48N	2.39E+03	<BKG	48E, 48N	2.19E+03	1.33E+03	54E, 48N	2.31E+03	<BKG	60E, 48N	1.32E+03	<BKG
36E, 42N	1.21E+03	<BKG	42E, 42N	2.28E+03	<BKG	48E, 42N	1.13E+03	<BKG	54E, 42N	2.39E+03	<BKG	60E, 42N	1.25E+03	<BKG
36E, 36N	1.11E+03	<BKG	42E, 36N	2.30E+03	<BKG	48E, 36N	1.20E+03	<BKG	54E, 36N	2.43E+03	<BKG	60E, 36N	1.13E+03	<BKG
36E, 30N	1.31E+03	<BKG	42E, 30N	2.26E+03	<BKG	48E, 30N	1.53E+03	1.83E+02	54E, 30N	2.27E+03	<BKG	60E, 30N	1.24E+03	<BKG
36E, 24N	1.39E+03	<BKG	42E, 24N	2.39E+03	<BKG	48E, 24N	1.37E+03	<BKG	54E, 24N	3.45E+03	9.66E+02	60E, 24N	1.66E+03	4.09E+02
36E, 18N	1.01E+03	<BKG	42E, 18N	2.19E+03	<BKG	48E, 18N	1.23E+03	<BKG	54E, 18N	3.12E+03	6.36E+02	60E, 18N	1.61E+03	3.22E+02
36E, 12N	1.04E+03	<BKG	42E, 12N	2.09E+03	<BKG	48E, 12N	1.10E+03	<BKG	54E, 12N	2.75E+03	2.66E+02	60E, 12N	1.48E+03	9.56E+01
36E, 6N	1.08E+03	<BKG	42E, 6N	2.10E+03	<BKG	48E, 6N	1.40E+03	<BKG	54E, 6N	2.40E+03	<BKG	60E, 6N	2.40E+03	1.70E+03
36E, 0N	1.32E+03	<BKG	42E, 0N	2.44E+03	<BKG	48E, 0N	1.43E+03	8.49E+00	54E, 0N	2.65E+03	1.66E+02	60E, 0N	1.52E+03	1.65E+02

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
66E, 66N	2.12E+03	<BKG	72E, 66N	1.36E+03	<BKG	78E, 66N	2.52E+03	3.60E+01	84E, 66N	1.40E+03	<BKG	90E, 66N	2.25E+03	<BKG
66E, 60N	2.20E+03	<BKG	72E, 60N	1.28E+03	<BKG	78E, 60N	2.77E+03	2.86E+02	84E, 60N	1.35E+03	<BKG	90E, 60N	2.28E+03	<BKG
66E, 54N	2.31E+03	<BKG	72E, 54N	1.35E+03	<BKG	78E, 54N	2.51E+03	2.60E+01	84E, 54N	1.28E+03	<BKG	90E, 54N	2.25E+03	<BKG
66E, 48N	2.37E+03	<BKG	72E, 48N	1.35E+03	<BKG	78E, 48N	2.40E+03	<BKG	84E, 48N	1.19E+03	<BKG	90E, 48N	2.14E+03	<BKG
66E, 42N	2.49E+03	6.00E+00	72E, 42N	1.35E+03	<BKG	78E, 42N	2.74E+03	2.56E+02	84E, 42N	1.19E+03	<BKG	90E, 42N	2.46E+03	<BKG
66E, 36N	2.28E+03	<BKG	72E, 36N	1.08E+03	<BKG	78E, 36N	2.90E+03	4.16E+02	84E, 36N	1.50E+03	1.31E+02	90E, 36N	2.22E+03	<BKG
66E, 30N	2.66E+03	1.76E+02	72E, 30N	1.35E+03	<BKG	78E, 30N	4.26E+03	1.78E+03	84E, 30N	1.81E+03	6.71E+02	90E, 30N	3.95E+03	1.47E+03
66E, 24N	6.64E+03	4.16E+03	72E, 24N	9.66E+03	1.44E+04	78E, 24N	2.77E+04	2.52E+04	84E, 24N	2.86E+04	4.74E+04	90E, 24N	9.56E+03	7.08E+03
66E, 18N	3.49E+03	1.01E+03	72E, 18N	1.72E+03	5.14E+02	78E, 18N	7.84E+04	7.59E+04	84E, 18N	3.65E+04	6.11E+04	90E, 18N	8.45E+03	5.97E+03
66E, 12N	3.29E+03	8.06E+02	72E, 12N	4.01E+03	4.51E+03	78E, 12N	3.14E+04	2.89E+04	84E, 12N	1.94E+04	3.13E+04	90E, 12N	4.29E+03	1.81E+03
66E, 6N	5.32E+03	2.84E+03	72E, 6N	1.90E+03	8.28E+02	78E, 6N	2.73E+04	2.48E+04	84E, 6N	1.26E+04	1.95E+04	90E, 6N	3.81E+03	1.33E+03
66E, 0N	2.83E+03	3.46E+02	72E, 0N	1.59E+03	2.87E+02	78E, 0N	8.51E+03	6.03E+03	84E, 0N	7.14E+03	9.96E+03	90E, 0N	2.95E+03	4.66E+02

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
96E, 66N	1.16E+03	<BKG	102E, 66N	2.39E+03	<BKG	108E, 66N	1.20E+03	<BKG	114E, 66N	2.52E+03	3.60E+01	120E, 66N	1.55E+03	2.18E+02
96E, 60N	1.22E+03	<BKG	102E, 60N	2.32E+03	<BKG	108E, 60N	1.17E+03	<BKG	114E, 60N	2.37E+03	<BKG	120E, 60N	1.46E+03	6.08E+01
96E, 54N	1.11E+03	<BKG	102E, 54N	2.08E+03	<BKG	108E, 54N	1.20E+03	<BKG	114E, 54N	2.47E+03	<BKG	120E, 54N	1.28E+03	<BKG
96E, 48N	1.10E+03	<BKG	102E, 48N	2.20E+03	<BKG	108E, 48N	9.72E+02	<BKG	114E, 48N	2.34E+03	<BKG	120E, 48N	1.33E+03	<BKG
96E, 42N	1.20E+03	<BKG	102E, 42N	2.26E+03	<BKG	108E, 42N	1.21E+03	<BKG	114E, 42N	2.60E+03	1.16E+02	120E, 42N	1.38E+03	<BKG
96E, 36N	2.04E+03	1.07E+03	102E, 36N	2.65E+03	1.66E+02	108E, 36N	1.36E+03	<BKG	114E, 36N	2.86E+03	3.76E+02	120E, 36N	1.53E+03	1.83E+02
96E, 30N	1.90E+03	8.28E+02	102E, 30N	3.74E+03	1.26E+03	108E, 30N	1.20E+03	<BKG	114E, 30N	2.90E+03	4.16E+02	120E, 30N	1.42E+03	<BKG
96E, 24N	5.31E+03	6.77E+03	102E, 24N	5.50E+03	3.02E+03	108E, 24N	2.28E+03	1.49E+03	114E, 24N	3.50E+03	1.02E+03	120E, 24N	2.86E+03	2.50E+03
96E, 18N	1.94E+04	3.13E+04	102E, 18N	9.54E+03	7.06E+03	108E, 18N	2.05E+03	1.09E+03	114E, 18N	3.22E+03	7.36E+02	120E, 18N	1.66E+03	4.09E+02
96E, 12N	1.37E+03	<BKG	102E, 12N	2.75E+03	2.66E+02	108E, 12N	1.73E+03	5.31E+02	114E, 12N	2.72E+03	2.36E+02	120E, 12N	1.37E+03	<BKG
96E, 6N	3.69E+03	3.95E+03	102E, 6N	2.95E+03	4.66E+02	108E, 6N	1.75E+03	5.66E+02	114E, 6N	2.66E+03	1.76E+02	120E, 6N	1.38E+03	<BKG
96E, 0N	1.33E+03	<BKG	102E, 0N	2.70E+03	2.16E+02	108E, 0N	1.43E+03	8.49E+00	114E, 0N	2.72E+03	2.36E+02	120E, 0N	1.39E+03	<BKG

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ background.

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
126E, 66N	2.31E+03	<BKG	132E, 66N	1.24E+03	<BKG	138E, 66N	2.33E+03	<BKG	144E, 66N	1.52E+03	1.65E+02	150E, 66N	2.76E+03	2.76E+02
126E, 60N	2.57E+03	8.60E+01	132E, 60N	1.34E+03	<BKG	138E, 60N	2.37E+03	<BKG	144E, 60N	1.27E+03	<BKG	150E, 60N	2.58E+03	9.60E+01
126E, 54N	2.41E+03	<BKG	132E, 54N	1.56E+03	2.35E+02	138E, 54N	2.31E+03	<BKG	144E, 54N	1.32E+03	<BKG	150E, 54N	2.90E+03	4.16E+02
126E, 48N	2.47E+03	<BKG	132E, 48N	1.22E+03	<BKG	138E, 48N	2.28E+03	<BKG	144E, 48N	1.43E+03	8.49E+00	150E, 48N	2.12E+03	<BKG
126E, 42N	2.30E+03	<BKG	132E, 42N	1.78E+03	6.19E+02	138E, 42N	2.72E+03	2.36E+02	144E, 42N	1.26E+03	<BKG	150E, 42N	2.12E+03	<BKG
126E, 36N	2.92E+03	4.36E+02	132E, 36N	2.09E+03	1.16E+03	138E, 36N	3.36E+03	8.76E+02	144E, 36N	1.82E+03	6.88E+02	150E, 36N	2.65E+03	1.66E+02
126E, 30N	2.74E+03	2.56E+02	132E, 30N	1.25E+03	<BKG	138E, 30N	2.97E+03	4.86E+02	144E, 30N	1.18E+03	<BKG	150E, 30N	2.19E+03	<BKG
126E, 24N	2.81E+03	3.26E+02	132E, 24N	1.58E+03	2.70E+02	138E, 24N	2.87E+03	3.86E+02	144E, 24N	1.47E+03	7.82E+01	150E, 24N	3.28E+03	7.96E+02
126E, 18N	2.59E+03	1.06E+02	132E, 18N	1.43E+03	8.49E+00	138E, 18N	2.68E+03	1.96E+02	144E, 18N	1.81E+03	6.71E+02	150E, 18N	2.89E+03	4.06E+02
126E, 12N	2.56E+03	7.60E+01	132E, 12N	1.58E+03	2.70E+02	138E, 12N	2.78E+03	2.96E+02	144E, 12N	1.36E+03	<BKG	150E, 12N	2.73E+03	2.46E+02
126E, 6N	3.35E+03	8.66E+02	132E, 6N	1.47E+03	7.82E+01	138E, 6N	2.59E+03	1.06E+02	144E, 6N	1.99E+03	9.85E+02	150E, 6N	3.05E+03	5.66E+02
126E, 0N	2.58E+03	9.60E+01	132E, 0N	1.50E+03	1.31E+02	138E, 0N	2.53E+03	4.60E+01	144E, 0N	1.44E+03	2.59E+01	150E, 0N	2.48E+03	<BKG

Notes:
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.
< BKG in Net CPM column is actually ≤ background.

8/19/94

Lindsay Light II Site
6 Meter Grid
Raw Data and Corrected Net CPM @ 1 cm Above Grade

Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM	Location	1 cm.	Net CPM
156E, 66N	1.18E+03	<BKG	162E, 66N	2.59E+03	1.06E+02	168E, 66N	2.96E+03	4.76E+02	174E, 66N	3.80E+03	1.32E+03
156E, 60N	1.32E+03	<BKG	162E, 60N	3.03E+03	5.46E+02	168E, 60N	4.26E+03	1.78E+03	174E, 60N	3.95E+03	1.47E+03
156E, 54N	1.34E+03	<BKG	162E, 54N	2.40E+03	<BKG	168E, 54N	2.86E+03	3.76E+02	174E, 54N	2.87E+03	3.86E+02
156E, 48N	1.17E+03	<BKG	162E, 48N	2.41E+03	<BKG	168E, 48N	2.59E+03	1.06E+02	174E, 48N	3.46E+03	9.76E+02
156E, 42N	1.16E+03	<BKG	162E, 42N	2.25E+03	<BKG	168E, 42N	2.49E+03	6.00E+00	174E, 42N	3.25E+03	7.66E+02
156E, 36N	1.37E+03	<BKG	162E, 36N	2.48E+03	<BKG	168E, 36N	2.80E+03	3.16E+02	174E, 36N	3.56E+03	1.08E+03
156E, 30N	1.23E+03	<BKG	162E, 30N	2.45E+03	<BKG	168E, 30N	3.17E+03	6.86E+02	174E, 30N	3.48E+03	9.96E+02
156E, 24N	1.64E+03	3.75E+02	162E, 24N	2.81E+03	3.26E+02	168E, 24N	3.59E+03	1.11E+03	174E, 24N	3.12E+03	6.36E+02
156E, 18N	1.70E+03	4.79E+02	162E, 18N	2.72E+03	2.36E+02	168E, 18N	3.03E+03	5.46E+02	174E, 18N	3.33E+03	8.46E+02
156E, 12N	1.45E+03	4.34E+01	162E, 12N	2.71E+03	2.26E+02	168E, 12N	2.78E+03	2.96E+02	174E, 12N	3.23E+03	7.46E+02
156E, 6N	1.67E+03	4.27E+02	162E, 6N	2.90E+03	4.16E+02	168E, 6N	2.62E+03	1.36E+02	174E, 6N	3.42E+03	9.36E+02
156E, 0N	1.32E+03	<BKG	162E, 0N	2.60E+03	1.16E+02	168E, 0N	2.53E+03	4.60E+01	174E, 0N	2.90E+03	4.16E+02

Notes:

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

< BKG in Net CPM column is actually ≤ background.

APPENDIX D5

6 METER GRID DATA - INTER-GRID SURVEYS

Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

		Average	Maximum
Direction East	Direction North	Count Rate (CPM)**	Count Rate (CPM)**
Grid 0E to 6E	66N to 60N	2.20E+03	2.47E+03
	60N to 54N	1.90E+03	2.32E+03
	54N to 48N	2.10E+03	2.39E+03
	48N to 42N	2.20E+03	2.46E+03
	42N to 36N	2.30E+03	2.49E+03
	36N to 30N	2.30E+03	2.60E+03
	30N to 24N	2.50E+03	2.94E+03
	24N to 18N	2.30E+03	2.52E+03
	18N to 12N	2.30E+03	2.64E+03
	12N to 6N	2.50E+03	2.64E+03
	6N to 0N	2.40E+03	2.62E+03
Grid 6E to 12E	66N to 60N	1.97E+03	2.06E+03
	60N to 54N	2.02E+03	2.32E+03
	54N to 48N	1.86E+03	2.30E+03
	48N to 42N	2.02E+03	2.30E+03
	42N to 36N	1.99E+03	2.42E+03
	36N to 30N	1.97E+03	2.70E+03
	30N to 24N	2.13E+03	2.52E+03
	24N to 18N	2.13E+03	2.33E+03
	18N to 12N	1.82E+03	2.33E+03
	12N to 6N	2.19E+03	2.88E+03
	6N to 0N	2.52E+03	3.08E+03
Grid 12E to 18E	66N to 60N	2.40E+03	2.56E+03
	60N to 54N	2.30E+03	2.59E+03
	54N to 48N	2.40E+03	2.65E+03
	48N to 42N	2.30E+03	2.52E+03
	42N to 36N	2.00E+03	2.44E+03
	36N to 30N	2.00E+03	2.26E+03
	30N to 24N	2.30E+03	2.51E+03
	24N to 18N	2.20E+03	2.40E+03
	18N to 12N	2.10E+03	2.29E+03
	12N to 6N	2.10E+03	2.30E+03
	6N to 0N	2.20E+03	2.48E+03
Grid 18E to 24E	66N to 60N	2.26E+03	2.72E+03
	60N to 54N	2.13E+03	2.81E+03
	54N to 48N	2.11E+03	2.59E+03
	48N to 42N	2.11E+03	2.33E+03
	42N to 36N	1.75E+03	1.95E+03
	36N to 30N	2.08E+03	2.13E+03
	30N to 24N	2.19E+03	2.33E+03
	24N to 18N	1.91E+03	2.06E+03
	18N to 12N	1.99E+03	2.10E+03
	12N to 6N	2.13E+03	2.30E+03
	6N to 0N	2.19E+03	2.42E+02

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

Direction East	Direction North	Average Count Rate (CPM)**	Maximum Count Rate (CPM)**
Grid 24E to 30E	66N to 60N	2.50E+03	2.78E+03
	60N to 54N	3.00E+03	**7.70E+03**
	54N to 48N	2.20E+03	2.53E+03
	48N to 42N	2.00E+03	2.26E+03
	42N to 36N	2.20E+03	2.15E+03
	36N to 30N	2.10E+03	2.38E+03
	30N to 24N	2.00E+03	2.28E+03
	24N to 18N	2.20E+03	2.47E+03
	18N to 12N	2.40E+03	2.70E+03
	12N to 6N	2.10E+03	2.34E+03
	6N to 0N	2.40E+03	3.63E+03
Grid 30E to 36E	66N to 60N	4.08E+03	4.81E+03
	60N to 54N	2.83E+03	3.06E+03
	54N to 48N	2.10E+03	2.35E+03
	48N to 42N	2.19E+03	2.32E+03
	42N to 36N	1.91E+03	2.17E+03
	36N to 30N	2.06E+03	2.42E+03
	30N to 24N	2.50E+03	2.55E+03
	24N to 18N	2.06E+03	2.35E+03
	18N to 12N	1.86E+03	2.08E+03
	12N to 6N	2.08E+03	2.50E+03
	6N to 0N	2.37E+03	2.84E+03
Grid 36E to 42E	66N to 60N	3.90E+03	4.33E+03
	60N to 54N	3.70E+03	4.60E+03
	54N to 48N	3.30E+03	3.90E+03
	48N to 42N	2.40E+03	2.60E+03
	42N to 36N	2.30E+03	2.57E+03
	36N to 30N	2.20E+03	2.67E+03
	30N to 24N	2.50E+03	**8.66E+03**
	24N to 18N	2.10E+03	2.36E+03
	18N to 12N	2.10E+03	2.38E+03
	12N to 6N	2.10E+03	2.38E+03
	6N to 0N	2.50E+03	2.62E+03
Grid 42E to 48E	66N to 60N	4.63E+03	5.36E+03
	60N to 54N	3.50E+03	4.59E+03
	54N to 48N	2.46E+03	3.10E+03
	48N to 42N	2.01E+03	2.39E+03
	42N to 36N	2.26E+03	2.48E+03
	36N to 30N	2.19E+03	2.52E+03
	30N to 24N	2.77E+03	3.61E+03
	24N to 18N	2.11E+03	2.68E+03
	18N to 12N	2.24E+03	2.35E+03
	12N to 6N	1.99E+03	2.19E+03
	6N to 0N	2.64E+03	2.73E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

Direction East	Direction North	Average Count Rate (CPM)**	Maximum Count Rate (CPM)**
Grid 48E to 54E	66N to 60N	3.90E+03	3.93E+03
	60N to 54N	3.50E+03	3.71E+03
	54N to 48N	2.20E+03	2.45E+03
	48N to 42N	2.20E+03	2.44E+03
	42N to 36N	2.50E+03	2.64E+03
	36N to 30N	2.60E+03	2.82E+03
	30N to 24N	3.00E+03	3.22E+03
	24N to 18N	3.00E+03	**1.74E+04**
	18N to 12N	5.00E+03	**1.04E+04**
	12N to 6N	4.00E+03	4.74E+03
	6N to 0N	3.80E+03	4.04E+03
Grid 54E to 60E	66N to 60N	2.28E+03	2.48E+03
	60N to 54N	2.26E+03	2.39E+03
	54N to 48N	2.13E+03	2.42E+03
	48N to 42N	2.22E+03	2.32E+03
	42N to 36N	2.22E+03	2.37E+03
	36N to 30N	2.92E+03	3.54E+03
	30N to 24N	**6.20E+03**	**7.38E+03**
	24N to 18N	3.10E+03	3.54E+03
	18N to 12N	2.92E+03	3.24E+03
	12N to 6N	2.10E+03	2.24E+03
	6N to 0N	**8.39E+03**	**1.86E+04**
Grid 60E to 66E	66N to 60N	2.40E+03	2.66E+03
	60N to 54N	2.30E+03	2.55E+03
	54N to 48N	2.50E+03	2.80E+03
	48N to 42N	2.50E+03	2.74E+03
	42N to 36N	2.50E+03	2.80E+03
	36N to 30N	2.95E+03	3.91E+03
	30N to 24N	**7.00E+03**	**1.10E+04**
	24N to 18N	5.00E+03	**8.00E+03**
	18N to 12N	3.30E+03	4.04E+03
	12N to 6N	**7.00E+03**	**1.10E+04**
	6N to 0N	**7.00E+03**	**2.10E+04**
Grid 66E to 72E	66N to 60N	2.46E+03	2.75E+03
	60N to 54N	3.74E+03	**6.25E+03**
	54N to 48N	2.19E+03	2.59E+03
	48N to 42N	2.37E+03	2.55E+03
	42N to 36N	2.10E+03	2.24E+03
	36N to 30N	2.42E+03	2.64E+03
	30N to 24N	**7.31E+03**	**2.08E+04**
	24N to 18N	3.32E+03	**1.10E+04**
	18N to 12N	4.07E+03	5.38E+03
	12N to 6N	**1.46E+04**	**1.45E+05**
	6N to 0N	**6.89E+03**	**1.84E+04**

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

Direction East	Direction North	Average Count Rate (CPM)**	Maximum Count Rate (CPM)**
Grid 72E to 78E	66N to 60N	2.50E+03	2.70E+03
	60N to 54N	3.50E+03	3.90E+03
	54N to 48N	2.30E+03	2.60E+03
	48N to 42N	2.60E+03	2.83E+03
	42N to 36N	2.90E+03	3.90E+03
	36N to 30N	2.80E+03	3.44E+03
	30N to 24N	**1.00E+04**	**3.00E+04**
	24N to 18N	**3.00E+04**	**2.00E+05**
	18N to 12N	**5.00E+04**	**2.00E+05**
	12N to 6N	**1.00E+04**	**5.00E+04**
	6N to 0N	**1.00E+04**	**2.00E+05**
Grid 78E to 84E	66N to 60N	2.55E+03	2.81E+03
	60N to 54N***	2.64E+03	2.66E+03
	54N to 48N	2.30E+03	2.55E+03
	48N to 42N	2.37E+03	2.63E+03
	42N to 36N	2.30E+03	2.44E+03
	36N to 30N	3.17E+03	3.65E+03
	30N to 24N	**6.82E+04**	**7.60E+04**
	24N to 18N	**3.17E+05**	**8.66E+05**
	18N to 12N	**6.85E+04**	**8.28E+04**
	12N to 6N	**1.02E+05**	**2.81E+05**
	6N to 0N	**1.25E+04**	**8.66E+04**
Grid 84E to 90E	66N to 60N	2.60E+03	2.80E+03
	60N to 54N	2.50E+03	2.73E+03
	54N to 48N	2.40E+03	2.61E+03
	48N to 42N	2.60E+03	3.36E+03
	42N to 36N	3.20E+03	3.48E+03
	36N to 30N	3.50E+03	3.76E+03
	30N to 24N	**1.00E+04**	**3.00E+04**
	24N to 18N	**1.00E+04**	**3.00E+04**
	18N to 12N	**3.00E+04**	**5.00E+04**
	12N to 6N	**1.00E+04**	**3.00E+04**
	6N to 0N	**1.00E+04**	**2.00E+04**
Grid 90E to 96E	66N to 60N	3.28E+03	4.65E+03
	60N to 54N	1.95E+03	2.13E+03
	54N to 48N	1.93E+03	1.97E+03
	48N to 42N	2.84E+03	3.68E+03
	42N to 36N	3.41E+03	3.70E+03
	36N to 30N	4.59E+03	**1.20E+04**
	30N to 24N	3.97E+03	**6.42E+03**
	24N to 18N	4.76E+03	**2.06E+04**
	18N to 12N	3.30E+03	5.05E+03
	12N to 6N	2.92E+03	4.39E+03
	6N to 0N	2.73E+03	3.12E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

***Maximum value was originally recorded in the field as the average. Those values have been reversed on this table such that the highest value is recorded as the maximum.

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Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

		Average	Maximum
Direction East	Direction North	Count Rate (CPM)**	Count Rate (CPM)**
Grid 96E to 102E	66N to 60N	2.90E+03	3.03E+03
	60N to 54N	2.50E+03	2.71E+03
	54N to 48N	2.30E+03	2.45E+03
	48N to 42N	2.40E+03	2.56E+03
	42N to 36N	4.00E+03	6.00E+03
	36N to 30N	2.20E+03	2.75E+03
	30N to 24N	1.00E+04	3.00E+04
	24N to 18N	1.00E+04	2.00E+04
	18N to 12N	2.00E+03	7.00E+03
	12N to 6N	3.00E+03	3.20E+03
	6N to 0N	3.40E+03	3.80E+03
Grid 102E to 108E	66N to 60N	3.01E+03	3.65E+03
	60N to 54N	3.19E+03	3.85E+03
	54N to 48N***	2.17E+03	2.33E+03
	48N to 42N	2.37E+03	2.52E+03
	42N to 36N	1.88E+03	2.01E+03
	36N to 30N	2.13E+03	2.26E+03
	30N to 24N	6.34E+03	7.15E+03
	24N to 18N	4.56E+03	4.72E+03
	18N to 12N***	4.38E+03	4.89E+03
	12N to 6N***	2.37E+03	3.10E+03
	6N to 0N	4.63E+03	4.89E+03
Grid 108E to 114E	66N to 60N	2.40E+03	2.60E+03
	60N to 54N	2.40E+03	2.66E+03
	54N to 48N	2.60E+03	2.85E+03
	48N to 42N	2.40E+03	2.62E+03
	42N to 36N	3.00E+03	3.23E+03
	36N to 30N	3.00E+03	3.40E+03
	30N to 24N	1.00E+04	5.00E+04
	24N to 18N	4.00E+04	4.30E+04
	18N to 12N	3.00E+03	3.46E+03
	12N to 6N	3.00E+03	3.40E+03
	6N to 0N	3.00E+03	3.65E+03
Grid 114E to 120E	66N to 60N	2.30E+03	2.72E+03
	60N to 54N	2.37E+03	2.66E+03
	54N to 48N	2.44E+03	2.77E+03
	48N to 42N	2.55E+03	2.83E+03
	42N to 36N	2.70E+03	3.12E+03
	36N to 30N	3.24E+03	3.77E+03
	30N to 24N	7.16E+03	8.46E+04
	24N to 18N	3.83E+03	4.27E+03
	18N to 12N	2.92E+03	3.10E+03
	12N to 6N	2.73E+03	3.06E+03
	6N to 0N	2.95E+03	3.14E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

***Maximum value was originally recorded in the field as the average. Those values have been reversed on this table such that the highest value is recorded as the maximum.

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Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

Direction East	Direction North	Average Count Rate (CPM)**	Maximum Count Rate (CPM)**
Grid 120E to 126E	66N to 60N	2.80E+03	3.80E+03
	60N to 54N	2.60E+03	2.83E+03
	54N to 48N	2.50E+03	2.76E+03
	48N to 42N	2.40E+03	2.57E+03
	42N to 36N	2.50E+03	2.83E+03
	36N to 30N	3.80E+03	4.20E+03
	30N to 24N	3.80E+03	4.05E+03
	24N to 18N	2.80E+03	3.50E+03
	18N to 12N	2.90E+03	3.90E+03
	12N to 6N	2.40E+03	2.69E+03
	6N to 0N	2.95E+03	3.08E+03
Grid 126E to 132E	66N to 60N	2.55E+03	2.70E+03
	60N to 54N	2.79E+03	2.92E+03
	54N to 48N	2.28E+03	2.39E+03
	48N to 42N	2.83E+03	3.08E+03
	42N to 36N	3.10E+03	3.35E+03
	36N to 30N	2.92E+03	3.81E+03
	30N to 24N	3.46E+03	3.83E+03
	24N to 18N	2.55E+03	2.84E+03
	18N to 12N	2.46E+03	2.59E+03
	12N to 6N	2.37E+03	2.64E+03
	6N to 0N	2.70E+03	2.86E+03
Grid 132E to 138E	66N to 60N	2.40E+03	2.68E+03
	60N to 54N	2.50E+03	2.81E+03
	54N to 48N	2.40E+03	2.50E+03
	48N to 42N	2.40E+03	2.54E+03
	42N to 36N	3.00E+03	5.50E+03
	36N to 30N	**6.00E+03**	**1.20E+04**
	30N to 24N	4.00E+03	**8.00E+03**
	24N to 18N	2.50E+03	3.00E+03
	18N to 12N	4.00E+03	**8.00E+03**
	12N to 6N	3.00E+03	3.80E+03
	6N to 0N	2.60E+03	3.00E+03
Grid 138E to 144E	66N to 60N	2.73E+03	2.92E+03
	60N to 54N	2.48E+03	2.70E+03
	54N to 48N	2.77E+03	3.06E+03
	48N to 42N	2.73E+03	2.99E+03
	42N to 36N	2.92E+03	3.24E+03
	36N to 30N	3.06E+03	3.50E+03
	30N to 24N	3.37E+03	3.50E+03
	24N to 18N	3.65E+03	3.92E+03
	18N to 12N	4.19E+03	**9.66E+03**
	12N to 6N	3.01E+03	3.10E+03
	6N to 0N	3.10E+03	3.17E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

		Average	Maximum
Direction East	Direction North	Count Rate (CPM)**	Count Rate (CPM)**
Grid 144E to 150E	66N to 60N	2.30E+03	2.50E+03
	60N to 54N	2.50E+03	2.96E+03
	54N to 48N	2.40E+03	2.80E+03
	48N to 42N	2.40E+03	2.70E+03
	42N to 36N	2.60E+03	2.85E+03
	36N to 30N	2.70E+03	3.00E+03
	30N to 24N	2.80E+03	3.20E+03
	24N to 18N	3.00E+03	3.30E+03
	18N to 12N	3.00E+03	3.60E+03
	12N to 6N	3.00E+03	3.30E+03
	6N to 0N	2.60E+03	3.10E+03
Grid 150E to 156E	66N to 60N	2.83E+03	2.97E+03
	60N to 54N	2.55E+03	2.92E+03
	54N to 48N	2.83E+03	2.99E+03
	48N to 42N	2.33E+03	2.48E+03
	42N to 36N	2.64E+03	2.86E+03
	36N to 30N	3.28E+03	3.52E+03
	30N to 24N	2.73E+03	3.24E+03
	24N to 18N	3.46E+03	4.45E+03
	18N to 12N	3.01E+03	3.24E+03
	12N to 6N	3.14E+03	3.28E+03
	6N to 0N	2.92E+03	3.24E+03
Grid 156E to 162E	66N to 60N	3.50E+03	3.78E+03
	60N to 54N	2.50E+03	2.61E+03
	54N to 48N	2.43E+03	2.50E+03
	48N to 42N	2.20E+03	2.34E+03
	42N to 36N	2.40E+03	2.58E+03
	36N to 30N	2.45E+03	2.54E+03
	30N to 24N	2.70E+03	2.97E+03
	24N to 18N	2.92E+03	3.08E+03
	18N to 12N	2.80E+03	3.06E+03
	12N to 6N	2.80E+03	3.13E+03
	6N to 0N	2.50E+03	2.66E+03
Grid 162E to 168E	66N to 60N	3.80E+03	5.86E+03
	60N to 54N	2.75E+03	3.75E+03
	54N to 48N	2.55E+03	2.71E+03
	48N to 42N	2.60E+03	2.86E+03
	42N to 36N	2.50E+03	2.62E+03
	36N to 30N	2.90E+03	3.85E+03
	30N to 24N	3.20E+03	3.49E+03
	24N to 18N	3.20E+03	3.55E+03
	18N to 12N	3.20E+03	3.57E+03
	12N to 6N***	3.42E+03	3.80E+03
	6N to 0N	3.40E+03	3.52E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

***Maximum value was originally recorded in the field as the average. Those values have been reversed on this table such that the highest value is recorded as the maximum.

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Lindsay Light II Site
Results of Inter-Grid Surveys for 6 m Grid
Performed with 2x2" NaI Detectors at 1 cm Above Ground Surface*

Direction East	Direction North	Average Count Rate (CPM)**	Maximum Count Rate (CPM)**
Grid 168E to 174E	66N to 60N	**8.50E+03**	**1.24E+04**
	60N to 54N	3.95E+03	4.08E+03
	54N to 48N	3.28E+03	3.44E+03
	48N to 42N***	2.80E+03	2.84E+03
	42N to 36N***	2.10E+03	2.90E+03
	36N to 30N	3.50E+03	3.68E+03
	30N to 24N	3.38E+03	3.70E+03
	24N to 18N	3.90E+03	4.28E+03
	18N to 12N	3.40E+03	3.45E+03
	12N to 6N	3.42E+03	3.66E+03
	6N to 0N	3.45E+03	3.50E+03
Grid 174E to 180E	66N to 60N	**9.96E+03**	**1.24E+04**
	60N to 54N	3.65E+03	3.85E+03
	54N to 48N	3.30E+03	3.45E+03
	48N to 42N	2.80E+03	3.01E+03
	42N to 36N	2.90E+03	3.15E+03
	36N to 30N	3.00E+03	3.10E+03
	30N to 24N	3.22E+03	3.30E+03
	24N to 18N	3.20E+03	3.30E+03
	18N to 12N	3.40E+03	3.65E+03
	12N to 6N	3.15E+03	3.39E+03
	6N to 0N	3.20E+03	3.50E+03

*Traverse speed was approximately 3' per second.
**Average and maximum count per minute (CPM) values in red are > background +2 standard deviations after background subtraction.

***Maximum value was originally recorded in the field as the average. Those values have been reversed on this table such that the highest value is recorded as the maximum.

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APPENDIX D6

6 METER GRID QUALITY ASSURANCE DATA

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location (1)	Raw QA Counts at 1 cm (2)	Corrected QA CPM (3)	Raw Initial CPM at 1 cm (4)	Corrected Initial CPM (5)	% Difference **	Location (1)	Raw QA Counts at 1 cm (2)	Corrected QA CPM (3)	Raw Initial CPM at 1 cm (4)	Corrected Initial CPM (5)	% Difference **
						12E, 60N	1.12E+03	2.24E+03	1.33E+03	2.32E+03	-3.37
6E, 54N	1.10E+03	2.20E+03	2.14E+03	2.14E+03	2.80						
						12E, 48N	1.09E+03	2.18E+03	1.15E+03	2.00E+03	8.76
6E, 42N	9.86E+02	1.97E+03	1.98E+03	1.98E+03	-0.40						
						12E, 36N	1.01E+03	2.02E+03	1.22E+03	2.13E+03	-5.01
6E, 30N	1.09E+03	2.18E+03	2.23E+03	2.23E+03	-2.24						
						12E, 24N	1.05E+03	2.10E+03	1.16E+03	2.02E+03	3.86
6E, 18N	9.69E+02	1.94E+03	2.05E+03	2.05E+03	-5.46						
						12E, 12N	1.06E+03	2.12E+03	1.19E+03	2.07E+03	2.21

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

8/19/94

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm**	Corrected Initial CPM	% Difference **
18E, 66N	1.11E+03	2.22E+03	2.28E+03	2.28E+03	-2.63						
						24E, 60N	1.20E+03	2.40E+03	1.18E+03	2.06E+03	16.69

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
30E, 54N	1.14E+03	2.28E+03	2.30E+03	2.30E+03	-0.87						
						36E, 48N	1.33E+03	2.66E+03	1.45E+03	2.53E+03	5.25
30E, 42N	9.82E+02	1.96E+03	2.08E+03	2.08E+03	-5.58						
						36E, 36N	1.05E+03	2.10E+03	1.11E+03	1.93E+03	8.54
30N, 30E	1.06E+03	2.12E+03	2.12E+03	2.12E+03	0.00						
						36E, 24N	1.24E+03	2.48E+03	1.39E+03	2.42E+03	2.36
30N, 18E	1.23E+03	2.46E+03	2.37E+03	2.37E+03	3.80						
						36E, 12N	1.07E+03	2.14E+03	1.04E+03	1.81E+03	18.05

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
42E, 60N	2.16E+03	4.32E+03	4.23E+03	4.23E+03	2.13						
						48E, 54N	1.33E+03	2.66E+03	1.48E+03	2.58E+03	3.12
42E, 48N	1.22E+03	2.44E+03	2.39E+03	2.39E+03	2.09						
						48E, 42N	1.16E+03	2.32E+03	1.13E+03	1.97E+03	17.79
						48E, 36N	1.12E+03	2.24E+03	1.20E+03	2.09E+03	7.10
42E, 30N	1.13E+03	2.26E+03	2.26E+03	2.26E+03	0.00						
						48E, 24N	1.28E+03	2.56E+03	1.37E+03	2.39E+03	7.21
42E, 18N	1.18E+03	2.36E+03	2.19E+03	2.19E+03	7.76						

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
54E, 60N	1.22E+03	2.44E+03	2.60E+03	2.60E+03	-6.15						
						60E, 54N	1.07E+03	2.14E+03	1.12E+03	1.95E+03	9.62
						60E, 42N	1.17E+03	2.34E+03	1.25E+03	2.18E+03	7.40
						60E, 30N	1.32E+03	2.64E+03	1.24E+03	2.16E+03	22.15
						60E, 18N	1.22E+03	2.44E+03	1.61E+03	2.81E+03	-13.05
						60E, 6N	1.94E+03	3.88E+03	2.40E+03	4.18E+03	-7.25

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
66E, 48N	1.15E+03	2.30E+03	2.37E+03	2.37E+03	-2.95						
66E, 36N	1.17E+03	2.34E+03	2.28E+03	2.28E+03	2.63						
66E, 24N	3.28E+03	6.56E+03	6.64E+03	6.64E+03	-1.20						
66E, 12N	1.54E+03	3.08E+03	3.29E+03	3.29E+03	-6.38	72E, 12N	3.25E+03	6.50E+03	4.01E+03	6.99E+03	-7.00
66E, 6 N	2.66E+03	5.32E+03	5.32E+03	5.32E+03	0.00	72E, 6N	1.87E+03	3.74E+03	1.90E+03	3.31E+03	12.93
						72E, 0N	1.57E+03	3.14E+03	1.59E+03	2.77E+03	13.30

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
						84E, 60N	1.18E+03	2.36E+03	1.35E+03	2.35E+03	0.30
						84E, 48N	1.11E+03	2.22E+03	1.19E+03	2.07E+03	7.03
						84E, 36N	1.40E+03	2.80E+03	1.50E+03	2.61E+03	7.10
						84E, 24N	1.70E+04	3.40E+04	2.86E+04	4.98E+04	-31.80
78E, 18N	5.91E+04	1.18E+05	7.84E+04	7.84E+04	50.77						
						84E, 12N	1.18E+04	2.36E+04	1.94E+04	3.38E+04	-30.21

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
90E, 66N	1.10E+03	2.20E+03	2.25E+03	2.25E+03	-2.22						
						96E, 60N	1.08E+03	2.16E+03	1.22E+03	2.13E+03	1.58
90E, 54N	1.14E+03	2.28E+03	2.25E+03	2.25E+03	1.33						
						96E, 48N	1.16E+03	2.32E+03	1.10E+03	1.92E+03	21.00
90E, 42N	1.25E+03	2.50E+03	2.46E+03	2.46E+03	1.63						
						96E, 36N	1.75E+03	3.50E+03	2.04E+03	3.56E+03	-1.57
90E, 30N	1.89E+03	3.78E+03	3.95E+03	3.95E+03	-4.30						
						96E, 24N	3.27E+03	6.54E+03	5.31E+03	9.26E+03	-29.34
90E, 18N	4.12E+03	8.24E+03	8.45E+03	8.45E+03	-2.49						
						96E, 12N	1.50E+03	3.00E+03	1.37E+03	2.39E+03	25.63
						96E, 0N	1.32E+03	2.64E+03	1.33E+03	2.32E+03	13.88

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
102E, 54N	1.06E+03	2.12E+03	2.08E+03	2.08E+03	1.92	108E, 48N	9.90E+02	1.98E+03	9.72E+02	1.69E+03	16.87
102E, 42N	1.19E+03	2.38E+03	2.26E+03	2.26E+03	5.31	108E, 36N	1.31E+03	2.62E+03	1.36E+03	2.37E+03	10.53
102E, 30N	1.66E+03	3.32E+03	3.74E+03	3.74E+03	-11.23	108E, 24N	1810.00	3.62E+03	2.28E+03	3.97E+03	-8.91
102E, 18N	5.00E+03	1.00E+04	9.54E+03	9.54E+03	4.82	108E, 12N	1.45E+03	2.90E+03	1.73E+03	3.02E+03	-3.83
102E, 6N	1.39E+03	2.78E+03	2.95E+03	2.95E+03	-5.76	108E, 0N	1.21E+03	2.42E+03	1.43E+03	2.49E+03	-2.91

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
						120E, 60N	1.08E+03	2.16E+03	1.46E+03	2.54E+03	-15.12
114E, 54N	1.05E+03	2.10E+03	2.47E+03	2.47E+03	-14.98						
114E, 42N	1.11E+03	2.22E+03	2.60E+03	2.60E+03	-14.62						
114E, 30N	1.27E+03	2.54E+03	2.90E+03	2.90E+03	-12.41						
114E, 18N	1.52E+03	3.04E+03	3.22E+03	3.22E+03	-5.59						
114E, 6N	1.25E+03	2.50E+03	2.66E+03	2.66E+03	-6.02						

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
126E, 54N	1.12E+03	2.24E+03	2.41E+03	2.41E+03	-7.05						
						132E, 48N	1.09E+03	2.18E+03	1.22E+03	2.13E+03	2.52
						132E, 36N	1.55E+03	3.10E+03	2.09E+03	3.64E+03	-14.90
						132E, 24N	1.26E+03	2.52E+03	1.58E+03	2.75E+03	-8.49
						132E, 12N	1.17E+03	2.34E+03	1.58E+03	2.75E+03	-15.03

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
138E, 42N	1.29E+03	2.58E+03	2.72E+03	2.72E+03	-5.15						
138E, 30N	1.53E+03	3.06E+03	2.97E+03	2.97E+03	3.03						
138E, 18N	1.31E+03	2.62E+03	2.68E+03	2.68E+03	-2.24						
138E, 0N	1.23E+03	2.46E+03	2.53E+03	2.53E+03	-2.77	144E, 0N	1.17E+03	2.34E+03	1.44E+03	2.51E+03	-6.77

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points.
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
						156E, 36N	1.18E+03	2.36E+03	1.37E+03	2.39E+03	-1.17
						156E, 24N	1.38E+03	2.76E+03	1.64E+03	2.86E+03	-3.45
						156E, 12N	1.12E+03	2.24E+03	1.45E+03	2.53E+03	-11.37
150E, 6N	1.43E+03	2.86E+03	3.05E+03	3.05E+03	-6.23						

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **	Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
162E, 66N	1.20E+03	2.40E+03	2.59E+03	2.59E+03	-7.34	168E, 66N	1.26E+03	2.52E+03	2.96E+03	2.96E+03	-14.86
						168E, 60N	1.83E+03	3.66E+03	4.26E+03	4.26E+03	-14.08
162E, 54N	1.11E+03	2.22E+03	2.40E+03	2.40E+03	-7.50						
						168E, 48N	1.06E+03	2.12E+03	2.59E+03	2.59E+03	-18.15
162E, 42N	1.10E+03	2.20E+03	2.25E+03	2.25E+03	-2.22						
162N, 30N	1.10E+03	2.20E+03	2.45E+03	2.45E+03	-10.20						
162E, 18N	1.29E+03	2.58E+03	2.72E+03	2.72E+03	-5.15						

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

Lindsay Light II Site
QA Data for 6 m Grid Points,
Measured with ESP-1/44-10*

Location	Raw QA Counts at 1 cm	Corrected QA CPM	Raw Initial CPM at 1 cm	Corrected Initial CPM	% Difference **
174E, 60N	1.45E+03	2.90E+03	3.95E+03	3.95E+03	-26.58
174E, 54N	1.45E+03	2.90E+03	2.87E+03	2.87E+03	1.05
174E, 48N	1.20E+03	2.40E+03	3.46E+03	3.46E+03	-30.64
174E, 12N	1.20E+03	2.40E+03	3.23E+03	5.63E+03	-25.70

*S/N 112642
**% Difference =((Column 3 - Column 5)/Column 5)*100

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APPENDIX E

DETAILED SURVEY DATA COMPARED TO BACKGROUND +2 STANDARD DEVIATION

APPENDIX E1

DETAILED SURVEY DATA - RAW AND CORRECTED NET CPM

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 1
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
27E, 61N	1.76E+03	1.04E+03	28E, 61N	2.32E+03	2.16E+03	29E, 61N	2.06E+03	1.64E+03	30E, 61N	1.03E+03	<BKG	31E, 61N	1.25E+03	1.60E+01
27E, 60N	1.84E+03	1.20E+03	28E, 60N	2.33E+03	2.18E+03	29E, 60N	3.52E+03	4.56E+03	30E, 60N	2.31E+03	2.14E+03	31E, 60N	1.39E+03	2.96E+02
27E, 59N	1.64E+03	7.96E+02	28E, 59N	1.72E+03	9.56E+02	29E, 59N	2.10E+03	1.72E+03	30E, 59N	1.75E+03	1.02E+03	31E, 59N	1.99E+03	1.50E+03
27E, 58N	1.69E+03	8.96E+02	28E, 58N	1.62E+03	7.56E+02	29E, 58N	1.63E+03	7.76E+02	30E, 58N	1.51E+03	5.36E+02	31E, 58N	1.57E+03	6.56E+02
27E, 57N	1.67E+03	8.56E+02	28E, 57N	1.59E+03	6.96E+02	29E, 57N	1.47E+03	4.56E+02	30E, 57N	1.47E+03	4.56E+02	31E, 57N	1.64E+03	7.96E+02

Notes:

*Raw 1 cm data from 30 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 2
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
40E, 30N	1.20E+03	<BKG	41E, 30N	1.28E+03	7.60E+01	42E, 30N	1.20E+03	<BKG	43E, 30N	1.29E+03	9.60E+01	44E, 30N	1.28E+03	7.60E+01
40E, 29N	1.25E+03	1.60E+01	41E, 29N	1.36E+03	2.36E+02	42E, 29N	1.27E+03	5.60E+01	43E, 29N	1.24E+03	<BKG	44E, 29N	1.53E+03	5.76E+02
40E, 28N	1.29E+03	9.60E+01	41E, 28N	1.43E+03	3.76E+02	42E, 28N	4.79E+03	7.10E+03	43E, 28N	1.53E+03	5.76E+02	44E, 28N	2.53E+03	2.58E+03
40E, 27N	1.30E+03	1.16E+02	41E, 27N	1.39E+03	2.96E+02	42E, 27N	2.51E+03	2.54E+03	43E, 27N	1.86E+03	1.24E+03	44E, 27N	1.96E+03	1.44E+03
40E, 26N	1.29E+03	9.60E+01	41E, 26N	1.34E+03	1.96E+02	42E, 26N	1.91E+03	1.34E+03	43E, 26N	1.38E+03	2.76E+02	44E, 26N	1.34E+03	1.96E+02

Notes:

*Raw 1 cm data from 30 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 1
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
			50E, 21N	5.57E+02	<BKG	51E, 21N	8.87E+02	1.06E+03			
			50E, 20N	5.83E+02	<BKG	51E, 20N	1.50E+03	1.52E+03	52E, 20N	7.14E+02	3.72E+02
			50E, 19N	6.34E+02	5.20E+01	51E, 19N	3.84E+03	1.29E+04	52E, 19N	9.42E+02	1.28E+03
			50E, 18N	6.48E+02	1.08E+02	51E, 18N	1.89E+03	5.08E+03	52E, 18N	1.02E+03	1.60E+03
			50E, 17N	6.26E+03	2.26E+04	51E, 17N	1.87E+03	5.00E+03	52E, 17N	9.53E+02	1.33E+03
49E, 15N	6.12E+02	<BKG	50E, 15N	6.10E+02	<BKG	51E, 16N	1.26E+03	2.56E+03	52E, 16N	1.09E+03	1.88E+03
49E, 14N	7.11E+02	3.60E+02	50E, 14N	8.74E+02	1.01E+03	51E, 15N	1.55E+03	3.72E+03	52E, 15N	8.59E+02	9.52E+02
49E, 13N	7.59E+02	5.52E+02	50E, 13N	6.84E+02	2.52E+02	51E, 14N	2.84E+03	8.88E+03	52E, 14N	9.95E-02	1.50E+03
			50E, 12N	6.49E+02	1.12E+02	51E, 13N	3.06E+03	9.76E+03	52E, 13N	8.62E+02	9.64E+02
						51E, 12N	9.90E+02	1.48E+03			
						51E, 11N	8.33E+02	8.48E+02			

Notes:
*Raw 1 cm data from 15 second counts.
Average background *(a)* 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 4
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
58E, 22N	6.78E+02	2.28E+02	59E, 22N	7.36E+02	4.60E+02	60E, 22N	7.07E+02	3.44E+02	61E, 22N	8.19E+02	7.92E+02	62E, 22N	9.79E+02	1.43E+03
58E, 21N	1.08E+03	1.84E+03	59E, 21N	1.06E+03	1.76E+03	60E, 21N	1.19E+03	2.28E+03				62E, 21N	9.50E+02	1.32E+03
58E, 20N	8.61E+02	9.60E+02	59E, 20N	1.09E+03	1.88E+03	60E, 20N	1.16E+03	2.16E+03	61E, 20N	1.26E+03	2.56E+03	62E, 20N	1.60E+03	3.92E+03
58E, 19N	1.05E+03	1.72E+03	59E, 19N	1.28E+03	2.64E+03	60E, 19N	1.06E+03	1.76E+03	61E, 19N	9.30E+02	1.24E+03	62E, 19N	8.85E+02	1.06E+03
			59E, 18N	8.48E+02	9.08E+02	60E, 18N	7.61E+02	5.60E+02	61E, 18N	8.46E+02	9.00E+02	62E, 18N	8.35E+02	8.56E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
60E, 30N	6.37E+02	6.40E+01	61E, 30N	7.05E+02	3.36E+02	62E, 30N	7.03E+02	3.28E+02			
60E, 29N	6.99E+03	2.55E+04	61E, 29N	7.57E+02	5.44E+02	62E, 29N	6.79E+02	2.32E+02	63E, 29N	6.46E+03	2.34E+04
60E, 28N	8.90E+03	3.31E+04	61E, 28N	1.02E+03	1.60E+03	62E, 28N	8.18E+02	7.88E+02	63E, 28N	7.82E+03	2.88E+04
60E, 27N	1.00E+03	1.52E+03	61E, 27N	1.27E+03	2.60E+03	62E, 27N	1.22E+03	2.40E+03	63E, 27N	1.71E+03	4.36E+03
60E, 26N	9.55E+02	1.34E+03	61E, 26N	1.21E+03	2.36E+03	62E, 26N	1.63E+03	4.04E+03	63E, 26N	1.91E+03	5.16E+03
60E, 25N	7.21E+02	4.00E+02	61E, 25N	8.50E+02	9.16E+02	62E, 25N	1.80E+03	4.72E+03	63E, 25N	2.57E+03	7.80E+03
						62E, 24N	1.42E+03	3.20E+03	63E, 24N	1.15E+03	2.12E+03

Notes
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
64E, 29N	6.77E+02	2.24E+02	65E, 29N	6.66E+02	1.80E+02				67E, 29N	6.94E+02	2.92E+02
64E, 28N	8.21E+02	8.00E+02	65E, 28N	9.01E+02	1.12E+03	66E, 28N	7.81E+02	6.40E+02	67E, 28N	7.97E+02	7.04E+02
64E, 27N	2.19E+03	6.28E+03	65E, 27N	1.93E+03	5.24E+03	66E, 27N	1.44E+03	3.28E+03	67E, 27N	1.28E+03	2.64E+03
64E, 26N	1.87E+03	5.00E+03	65E, 26N	1.78E+03	4.64E+03	66E, 26N	2.48E+03	7.44E+03	67E, 26N	1.66E+03	4.16E+03
64E, 25N	2.15E+03	6.12E+03	65E, 25N	1.94E+03	5.28E+03	66E, 25N	1.86E+03	4.96E+03	67E, 25N	1.61E+03	3.96E+03
64E, 24N	1.23E+03	2.44E+03	65E, 24N	1.41E+03	3.16E+03	66E, 24N	1.72E+03	4.40E+03	67E, 24N	1.36E+03	2.96E+03
64E, 23N	1.19E+03	2.28E+03	65E, 23N	1.45E+03	3.32E+03	66E, 23N	1.14E+03	2.08E+03	67E, 23N	1.64E+03	4.08E+03
64E, 22N	9.54E+02	1.33E+03	65E, 22N	9.68E+02	1.39E+03	66E, 22N	9.94E+02	1.49E+03	67E, 22N	1.22E+03	2.40E+03
64E, 21N	9.95E+02	1.50E+03	65E, 21N	9.12E+02	1.16E+03	66E, 21N	9.89E+02	1.47E+03	67E, 21N	9.78E+02	1.43E+03
						66E 20N	8.61E+02	9.60E+02	67E, 20N	9.46E+02	1.30E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
68E, 29N	6.90E+02	2.76E+02	69E, 29N	7.32E+03	2.68E+04	70E, 29N	7.47E+02	5.04E+02	71E, 29N	7.19E+02	3.92E+02
68E, 28N	8.28E+02	8.28E+02	69E, 28N	8.28E+02	8.28E+02	70E, 28N	8.38E+02	8.68E+02	71E, 28N	8.75E+02	1.02E+03
68E, 27N	1.01E+03	1.56E+03	69E, 27N	9.88E+03	3.70E+04	70E, 27N	1.11E+03	1.96E+03	71E, 27N	1.03E+03	1.64E+03
68E, 26N	1.35E+03	2.92E+03	69E, 26N	1.32E+03	2.80E+03	70E, 26N	1.74E+03	4.48E+03	71E, 26N	1.67E+03	4.20E+03
68E, 25N	1.83E+03	4.84E+03	69E, 25N	1.78E+03	4.64E+03	70E, 25N	1.73E+03	4.44E+03	71E, 25N	1.62E+03	4.00E+03
68E, 24N	1.64E+03	4.08E+03	69E, 24N	2.78E+03	8.64E+03	70E, 24N	2.45E+03	7.32E+03	71E, 24N	4.44E+03	1.53E+04
68E, 23N	1.19E+03	2.28E+03	69E, 23N	1.46E+03	3.36E+03	70E, 23N	3.53E+03	1.16E+04	71E, 23N	3.17E+03	1.02E+04
68E, 22N	1.09E+03	1.88E+03	69E, 22N	1.28E+03	2.64E+03	70E, 22N	2.41E+03	7.16E+03	71E, 22N	2.24E+03	6.48E+03
68E, 21N	9.02E+02	1.12E+03	69E, 21N	9.74E+02	1.41E+03	70E, 21N	9.29E+02	1.23E+03	71E, 21N	1.06E+03	1.76E+03
						70E, 20N	9.37E+02	1.26E+03	71E, 20N	8.78E+02	1.03E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
*Raw Data and Corrected Net CPM**

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
72E, 29N	7.71E+02	6.00E+02	73E, 29N	7.10E+03	3.56E+02			
72E, 28N	8.92E+02	1.08E+03	73E, 28N	9.30E+03	1.24E+03	74E, 28N	9.08E+02	1.15E+03
72E, 27N	1.12E+03	2.00E+03	73E, 27N	1.43E+03	3.24E+03	74E, 27N	1.27E+03	2.60E+03
72E, 26N	1.77E+03	4.60E+03	73E, 26N	1.50E+03	3.52E+03	74E, 26N	1.56E+03	3.76E+03
72E, 25N	2.13E+03	6.04E+03	73E, 25N	2.51E+03	7.56E+03	74E, 25N	2.43E+03	7.24E+03
72E, 24N	3.00E+03	9.52E+03	73E, 24N	3.60E+03	1.19E+04	74E, 24N	6.15E+03	2.21E+04
72E, 23N	4.48E+03	1.54E+04	73E, 23N	4.66E+03	1.62E+04	74E, 23N	4.42E+03	1.52E+04
72E, 22N	2.28E+03	6.64E+03	73E, 22N	2.43E+03	7.24E+03	74E, 22N	1.40E+03	3.12E+03
72E, 21N	1.75E+03	4.52E+03	73E, 21N	1.34E+03	2.88E+03	74E, 21N	1.07E+03	1.80E+03
72E, 20N	9.12E+02	1.16E+03	73E, 20N	8.57E+02	9.44E+02	74E, 20N	1.30E+03	2.72E+03
72E, 19N	8.41E+02	8.80E+02				74E, 19N	1.46E+03	3.36E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net cpm	Location	*1 cm	Net cpm	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									**60E, 12N	7.24E+02	4.12E+02	**61E, 12N	8.06E+02	7.38E+02			
						**59E, 11N	6.91E+02	2.80E+02	**60E, 11N	8.93E+02	1.09E+03	**61E, 11N	1.02E+03	1.59E+03			
						**59E, 10N	7.53E+02	5.26E+02	**60E, 10N	1.08E+03	1.82E+03	**61E, 10N	1.08E+03	1.84E+03			
						**59E, 9N	7.18E+02	3.88E+02	**60E, 9N	7.89E+02	6.72E+02	**61E, 9N	8.36E+02	8.60E+02			
						**59E, 8N	6.98E+02	3.08E+02	**60E, 8N	7.93E+02	6.86E+02	**61E, 8N	1.31E+03	2.74E+03			
						59E, 7N	7.18E+02	3.88E+02	60E, 7N	7.40E+02	4.76E+02	**61E, 7N	1.02E+03	1.61E+03			
						59E, 6N	7.38E+02	4.68E+02	60E, 6N	9.90E+02	1.48E+03	61E, 6N	1.62E+03	4.00E+03			
						59E, 5N	7.06E+02	3.40E+02	60E, 5N	1.00E+03	1.52E+03	61E, 5N	2.20E+03	6.32E+03			
						59E, 4N	7.48E+02	5.08E+02	60E, 4N	8.50E+03	3.15E+04	61E, 4N	1.81E+03	4.76E+03			
57E, 3N	1.46E+03	3.36E+03				59E, 3N	2.09E+03	5.88E+03	60E, 3N	2.04E+03	5.68E+03	61E, 3N	3.13E+03	1.00E+04			
			58E, 2N	7.20E+02	3.96E+02	59E, 2N	1.17E+03	2.20E+03	60E, 2N	9.20E+02	1.20E+03	61E, 2N	7.92E+02	6.84E+02			
						59E, 1N	7.61E+02	5.60E+02	60E, 1N	7.76E+02	6.20E+02	61E, 1N	7.44E+02	4.92E+02			
									60E, 0N	7.04E+02	3.32E+02	61E, 0N	7.19E+02	3.92E+02			

Notes.

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background (α) 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
**62E 12N	7.89E+02	6.72E+02	**63E 12N	8.15E+02	7.74E+02	64E, 12N	8.04E+02	7.32E+02	65E, 12N	7.73E+02	6.08E+02	66E, 12N	7.85E+02	6.56E+02
**62E 11N	8.30E+02	8.36E+02	**63E 11N	8.09E+02	7.50E+02	**64E 11N	7.79E+02	6.32E+02	**65E 11N	7.96E+02	7.00E+02	66E, 11N	8.40E+02	8.76E+02
**62E 10N	1.73E+03	4.44E+03	**63E 10N	9.33E+02	1.25E+03	**64E 10N	1.01E+03	1.55E+03	**65E 10N	8.56E+02	9.40E+02	66E, 10N	9.12E+02	1.16E+03
**62E 9N	1.15E+03	2.12E+03	**63E 9N	8.66E+02	9.78E+02	**64E 9N	1.24E+03	2.46E+03	**65E 9N	9.12E+02	1.16E+03	66E, 9N	9.44E+02	1.29E+03
**62E 8N	8.00E+02	7.14E+02	**63E 8N	8.63E+02	9.68E+02	**64E 8N	8.64E+02	9.72E+02	**65E 8N	8.79E+02	1.03E+03	66E, 8N	1.04E+03	1.68E+03
**62E 7N	1.18E+03	2.22E+03	**63E 7N	1.65E+03	4.12E+03	**64E 7N	1.21E+03	2.36E+03	**65E 7N	9.80E+02	1.43E+03	66E, 7N	1.23E+03	2.44E+03
62E, 6N	8.83E+02	1.05E+03	**63E 6N	1.30E+03	2.70E+03	**64E 6N	1.23E+03	2.44E+03	**65E 6N	1.03E+03	1.62E+03	66E, 6N	1.39E+03	3.08E+03
62E, 5N	8.45E+02	8.96E+02	**63E 5N	9.82E+02	1.44E+03	**64E 5N	1.21E+03	2.36E+03	**65E 5N	1.40E+03	3.10E+03	66E, 5N	1.47E+03	3.40E+03
62E, 4N	1.90E+03	5.12E+03	**63E 4N	1.50E+03	3.50E+03	**64E 4N	2.83E+03	8.84E+03	**65E 4N	1.69E+03	4.28E+03	66E, 4N	1.40E+03	3.12E+03
62E, 3N	4.46E+03	1.54E+04	**63E 3N	2.44E+03	7.28E+03	**64E 3N	2.37E+03	6.98E+03	**65E 3N	3.82E+03	1.28E+04	66E, 3N	1.84E+03	4.88E+03
62E, 2N	8.81E+02	1.04E+03	**63E 2N	9.32E+02	1.24E+03	**64E 2N	1.14E+03	2.08E+03	**65E 2N	1.21E+03	2.34E+03	66E, 2N	1.18E+03	2.24E+03
62E, 1N	7.12E+02	3.64E+02	**63E 1N	7.27E+02	4.24E+02	**64E 1N	7.80E+02	6.34E+02	65E, 1N	9.30E+02	1.24E+03	66E, 1N	1.19E+03	2.28E+03
62E, 0N	6.82E+02	2.44E+02	63E, 0N	7.68E+02	5.88E+02	64E, 0N	7.17E+02	3.84E+02	65E, 0N	9.74E+02	1.41E+03	**66E 0N	9.62E+02	1.36E+03

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
67E, 12N	8.51E+02	9.20E+02	68E, 12N	8.68E+02	9.88E+02	69E, 12N	8.39E+02	8.72E+02	70E, 12N	8.91E+02	1.08E+03	71E, 12N	9.56E+02	1.34E+03
67E, 11N	7.98E+02	7.08E+02	68E, 11N	9.03E+02	1.13E+03	69E, 11N	9.12E+02	1.16E+03	70E, 11N	9.57E+02	1.34E+03	71E, 11N	1.19E+03	2.28E+03
67E, 10N	8.69E+02	9.92E+02	68E, 10N	9.13E+02	1.17E+03	69E, 10N	9.43E+02	1.29E+03	70E, 10N	1.12E+03	2.00E+03	71E, 10N	1.74E+03	4.48E+03
67E, 9N	9.74E+02	1.41E+03	68E, 9N	1.08E+03	1.84E+03	69E, 9N	1.31E+03	2.76E+03	70E, 9N	3.98E+03	1.34E+04	71E, 9N	2.65E+03	8.12E+03
67E, 8N	1.30E+03	2.72E+03	68E, 8N	2.17E+03	6.20E+03	69E, 8N	7.89E+03	2.91E+04	70E, 8N	5.98E+03	2.14E+04	71E, 8N	1.03E+03	1.64E+03
67E, 7N	2.61E+03	7.96E+03	68E, 7N	1.40E+04	5.35E+04	69E, 7N	9.32E+03	3.48E+04	70E, 7N	1.69E+03	4.28E+03	71E, 7N	9.65E+02	1.38E+03
67E, 6N	1.47E+03	3.40E+03	68E, 6N	3.88E+03	1.30E+04	69E, 6N	1.18E+03	2.24E+03	70E, 6N	1.45E+03	3.32E+03	71E, 6N	1.17E+03	2.20E+03
67E, 5N	1.47E+03	3.40E+03	68E, 5N	1.07E+03	1.80E+03	69E, 5N	1.17E+03	2.20E+03	70E, 5N	1.19E+03	2.28E+03	71E, 5N	1.10E+03	1.92E+03
67E, 4N	1.27E+03	2.60E+03	68E, 4N	1.20E+03	2.32E+03	69E, 4N	1.17E+03	2.20E+03	70E, 4N	1.05E+03	1.72E+03	71E, 4N	9.55E+03	3.57E+04
67E, 3N	2.44E+03	7.28E+03	68E, 3N	9.06E+03	3.38E+04	69E, 3N	2.66E+03	8.16E+03	70E, 3N	2.03E+03	5.64E+03	71E, 3N	3.77E+03	1.26E+04
67E, 2N	1.14E+03	2.08E+03	68E, 2N	1.51E+03	3.56E+03	69E, 2N	1.04E+03	1.68E+03	70E, 2N	1.04E+03	1.68E+03	71E, 2N	1.25E+03	2.52E+03
67E, 1N	1.57E+03	3.80E+03	68E, 1N	1.47E+03	3.40E+03	69E, 1N	1.45E+03	3.32E+03	70E, 1N	9.47E+02	1.30E+03	71E, 1N	8.18E+02	7.88E+02
67E, 0N	1.02E+03	1.60E+03	68E, 0N	1.09E+03	1.88E+03	69E, 0N	1.22E+03	2.40E+03	70E, 0N	8.30E+02	8.36E+02	71E, 0N	7.71E+02	6.00E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
72E, 30N	2.95E+02	<BKG	73E, 30N	2.45E+02	<BKG	74E, 30N	4.52E+02	6.67E+02	75E, 30N	4.00E+02	3.05E+02	76E, 30N	4.57E+03	2.94E+04
72E, 29N	3.30E+02	<BKG	73E, 29N	4.13E+02	3.95E+02	74E, 29N	4.00E+02	3.05E+02	75E, 29N	4.49E+02	6.46E+02	76E, 29N	4.63E+03	2.98E+04
72E, 28N	4.30E+02	5.14E+02	73E, 28N	4.92E+02	9.46E+02	74E, 28N	5.02E+02	1.02E+03	75E, 28N	4.78E+02	8.49E+02	76E, 28N	5.23E+03	3.40E+04
72E, 27N	7.04E+02	2.42E+03	73E, 27N	9.90E+02	4.42E+03	74E, 27N	8.18E+02	3.22E+03	75E, 27N	5.88E+02	1.62E+03	76E, 27N	5.25E+03	3.41E+04
72E, 26N	1.22E+03	6.02E+03	73E, 26N	1.02E+03	4.63E+03	74E, 26N	1.01E+03	4.56E+03	75E, 26N	2.16E+03	1.26E+04	76E, 26N	2.99E+03	1.84E+04
72E, 25N	1.57E+03	8.46E+03	73E, 25N	1.78E+03	9.93E+03	74E, 25N	1.49E+03	7.90E+03	75E, 25N	1.08E+03	5.05E+03	76E, 25N	3.02E+03	1.86E+04
72E, 24N	2.35E+03	1.39E+04	73E, 24N	3.21E+03	1.99E+04	74E, 24N	1.83E+03	1.03E+04	75E, 24N	3.17E+03	1.96E+04	76E, 24N	3.71E+03	2.34E+04
72E, 23N	3.55E+03	2.23E+04	73E, 23N	4.20E+03	2.68E+04	74E, 23N	5.10E+03	3.31E+04	75E, 23N	6.47E+03	4.26E+04	76E, 23N	1.31E+04	8.88E+04
72E, 22N	1.80E+03	1.01E+04	73E, 22N	1.78E+03	9.93E+03	74E, 22N	3.43E+03	2.14E+04	75E, 22N	4.56E+03	2.93E+04	76E, 22N	5.44E+03	3.54E+04
72E, 21N	1.10E+03	5.19E+03	73E, 21N	7.70E+02	2.88E+03	74E, 21N	7.35E+02	2.64E+03	75E, 21N	1.37E+03	7.07E+03	76E, 21N	5.47E+03	3.57E+04
72E, 20N	2.30E+02	<BKG	73E, 20N	3.85E+02	2.00E+02	74E, 20N	4.58E+02	7.09E+02	75E, 20N	9.38E+02	4.06E+03	76E, 20N	5.06E+03	3.28E+04
72E, 19N	4.12E+02	3.88E+02	73E, 19N	Light Post	0.00E+00	74E, 19N	6.59E+02	2.11E+03	75E, 19N	7.85E+02	2.99E+03	76E, 19N	5.68E+03	3.71E+04
72E, 18N	4.19E+02	4.37E+02	73E, 18N	5.15E+02	1.11E+03	74E, 18N	9.28E+02	3.99E+03	75E, 18N	2.04E+03	1.17E+04	76E, 18N	1.22E+04	8.26E+04
72E, 17N	4.56E+02	6.95E+02	73E, 17N	8.86E+02	3.69E+03	74E, 17N	1.46E+03	7.70E+03	75E, 17N	2.83E+03	1.72E+04	76E, 17N	1.91E+04	1.31E+05
72E, 16N	4.00E+02	3.05E+02	73E, 16N	8.61E+02	3.52E+03	74E, 16N	1.48E+03	7.83E+03	75E, 16N	3.22E+03	2.00E+04	76E, 16N	1.79E+04	1.22E+05
72E, 15N	4.44E+02	6.12E+02	73E, 15N	6.53E+03	4.30E+04	74E, 15N	1.57E+03	8.46E+03	75E, 15N	2.04E+03	1.17E+04	76E, 15N	4.12E+03	2.62E+04
72E, 14N	5.54E+02	1.38E+03	73E, 14N	5.71E+03	3.73E+04	74E, 14N	3.28E+03	2.04E+04	75E, 14N	9.47E+02	4.12E+03	76E, 14N	1.12E+04	7.56E+04
72E, 13N	6.65E+02	2.15E+03	73E, 13N	5.58E+03	3.64E+04	74E, 13N	7.91E+03	5.27E+04	75E, 13N	9.89E+02	4.41E+03	76E, 13N	7.19E+03	4.76E+04
72E, 12N	1.68E+02	<BKG	73E, 12N	6.53E+02	2.07E+03	74E, 12N	4.58E+03	2.94E+04	75E, 12N	6.75E+02	2.22E+03	76E, 12N	5.83E+03	3.82E+04
72E, 11N	6.32E+02	1.92E+03	73E, 11N	4.59E+02	7.16E+02	74E, 11N	3.76E+03	2.37E+04	75E, 11N	8.69E+02	3.57E+03	76E, 11N	6.60E+03	4.35E+04
72E, 10N	5.09E+02	1.06E+03	73E, 10N	4.56E+02	6.95E+02	74E, 10N	1.05E+03	4.84E+03	75E, 10N	1.01E+03	4.56E+03	76E, 10N	5.71E+03	3.73E+04
72E, 9N	4.47E+02	6.32E+02	73E, 9N	4.76E+02	8.35E+02	74E, 9N	1.17E+03	5.67E+03	75E, 9N	8.28E+02	3.29E+03	76E, 9N	2.31E+03	1.36E+04
72E, 8N	4.27E+02	4.93E+02	73E, 8N	4.43E+02	6.05E+02	74E, 8N	1.17E+03	5.67E+03	75E, 8N	6.30E+02	1.91E+03	76E, 8N	2.54E+03	1.52E+04
72E, 7N	4.11E+02	3.81E+02	73E, 7N	5.40E+02	1.28E+03	74E, 7N	1.24E+03	6.16E+03	75E, 7N	5.43E+02	1.30E+03	76E, 7N	1.40E+03	7.28E+03
72E, 6N	4.70E+02	7.93E+02	73E, 6N	5.47E+02	1.33E+03	74E, 6N	1.37E+03	7.07E+03	75E, 6N	5.14E+02	1.10E+03	76E, 6N	1.67E+03	9.16E+03
72E, 5N	4.11E+02	3.81E+02	73E, 5N	4.41E+02	5.91E+02	74E, 5N	4.51E+02	6.60E+02	75E, 5N	5.32E+02	1.23E+03	76E, 5N	6.07E+03	3.98E+04
72E, 4N	5.25E+02	1.18E+03	73E, 4N	6.17E+02	1.82E+03	74E, 4N	5.26E+02	1.18E+03	75E, 4N	1.24E+03	6.16E+03	76E, 4N	7.12E+04	4.94E+05
72E, 3N	3.57E+03	2.24E+04	73E, 3N	1.41E+03	7.35E+03	74E, 3N	2.62E+03	1.58E+04	75E, 3N	1.50E+03	7.97E+03	76E, 3N	1.50E+04	1.02E+05
72E, 2N	1.02E+02	<BKG	73E, 2N	8.60E+02	3.51E+03	74E, 2N	7.33E+02	2.63E+03	75E, 2N	9.66E+02	4.25E+03	76E, 2N	2.14E+03	1.24E+04
72E, 1N	1.39E+02	<BKG	73E, 1N	5.10E+02	1.07E+03	74E, 1N	6.52E+02	2.06E+03	75E, 1N	1.41E+03	7.35E+03	76E, 1N	1.64E+03	8.95E+03
72E, 0N	3.68E+02	8.17E+01	73E, 0N	4.05E+02	3.40E+02	74E, 0N	6.85E+02	2.29E+03	75E, 0N	8.54E+02	3.47E+03	76E, 0N	9.96E+02	4.46E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	**1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
77E, 30N	4.32E+02	5.28E+02	78E, 30N	2.47E+03	1.82E+03	79E, 30N	1.03E+03	4.70E+03	80E, 30N	5.46E+02	1.32E+03	81E, 30N	7.90E+02	3.02E+03
77E, 29N	6.22E+02	1.85E+03	78E, 29N	2.26E+03	1.46E+03	79E, 29N	1.07E+03	4.98E+03	80E, 29N	6.34E+02	1.94E+03	81E, 29N	7.25E+02	2.57E+03
77E, 28N	5.64E+02	1.45E+03	78E, 28N	2.40E+03	1.70E+03	79E, 28N	1.04E+03	4.77E+03	80E, 28N	7.15E+02	2.50E+03	81E, 28N	7.40E+02	2.68E+03
77E, 27N	4.11E+03	2.62E+04	78E, 27N	1.90E+04	3.06E+04	79E, 27N	1.36E+03	7.00E+03	80E, 27N	1.37E+03	7.07E+03	81E, 27N	2.42E+03	1.44E+04
77E, 26N	3.66E+03	2.30E+04	78E, 26N	1.40E+04	2.19E+04	79E, 26N	8.82E+03	5.90E+04	80E, 26N	3.70E+03	2.33E+04	81E, 26N	8.34E+03	5.57E+04
77E, 25N	4.29E+03	2.74E+04	78E, 25N	5.57E+04	9.46E+04	79E, 25N	1.24E+04	8.40E+04	80E, 25N	4.50E+03	2.89E+04	81E, 25N	8.19E+03	5.46E+04
77E, 24N	4.14E+03	2.64E+04	78E, 24N	4.32E+04	7.28E+04	79E, 24N	9.57E+03	6.42E+04	80E, 24N	5.81E+03	3.80E+04	81E, 24N	6.61E+03	4.36E+04
77E, 23N	4.65E+03	2.99E+04	78E, 23N	2.75E+04	4.54E+04	79E, 23N	1.16E+04	7.84E+04	80E, 23N	4.76E+03	3.07E+04	81E, 23N	1.13E+04	7.63E+04
77E, 22N	4.72E+03	3.04E+04	78E, 22N	1.66E+04	2.64E+04	79E, 22N	1.05E+04	7.07E+04	80E, 22N	5.11E+03	3.31E+04	81E, 22N	9.68E+03	6.50E+04
77E, 21N	8.82E+03	5.90E+04	78E, 21N	2.49E+04	4.09E+04	79E, 21N	1.04E+04	7.00E+04	80E, 21N	7.34E+03	4.87E+04	81E, 21N	1.25E+04	8.47E+04
77E, 20N	1.05E+04	7.07E+04	78E, 20N	6.08E+04	1.03E+05	***79E, 20N	1.03E+04	3.34E+04	80E, 20N	7.62E+03	5.06E+04	81E, 20N	1.44E+04	9.79E+04
77E, 19N	1.62E+04	1.10E+05	78E, 19N	4.48E+04	7.56E+04	***79E, 19N	1.19E+04	3.90E+04	80E, 19N	1.16E+04	7.84E+04	81E, 19N	1.66E+04	1.13E+05
77E, 18N	1.23E+04	8.33E+04	78E, 18N	1.04E+05	1.79E+05	***79E, 18N	1.83E+04	6.13E+04	80E, 18N	1.32E+04	8.95E+04	81E, 18N	2.33E+04	1.60E+05
77E, 17N	1.23E+04	8.33E+04	78E, 17N	6.95E+04	1.19E+05	***79E, 17N	1.89E+04	6.34E+04	80E, 17N	1.52E+04	1.03E+05	81E, 17N	1.59E+04	1.08E+05
77E, 16N	1.62E+04	1.10E+05	78E, 16N	6.07E+04	1.03E+05	***79E, 16N	1.91E+04	6.41E+04	80E, 16N	1.76E+04	1.20E+05	81E, 16N	1.52E+04	1.03E+05
77E, 15N	7.56E+03	5.02E+04	78E, 15N	9.59E+04	1.65E+05	***79E, 15N	1.03E+04	3.34E+04	80E, 15N	2.10E+04	1.44E+05	81E, 15N	2.48E+04	1.70E+05
77E, 14N	1.70E+04	1.16E+05	78E, 14N	9.12E+04	1.56E+05	***79E, 14N	5.83E+03	1.78E+04	80E, 14N	9.21E+03	6.17E+04	81E, 14N	6.63E+03	4.37E+04
77E, 13N	9.24E+03	6.19E+04	78E, 13N	3.48E+04	5.82E+04	***79E, 13N	4.94E+03	1.47E+04	80E, 13N	5.70E+03	3.73E+04	81E, 13N	5.37E+03	3.50E+04
77E, 12N	6.23E+03	4.10E+04	78E, 12N	2.56E+04	4.21E+04	***79E, 12N	2.98E+03	7.90E+03	80E, 12N	5.64E+03	3.68E+04	81E, 12N	8.67E+03	5.80E+04
77E, 11N	8.91E+03	5.96E+04	78E, 11N	2.52E+04	4.14E+04	***79E, 11N	2.45E+03	6.06E+03	80E, 11N	4.44E+03	2.85E+04	81E, 11N	5.55E+03	3.62E+04
77E, 10N	6.60E+03	4.35E+04	78E, 10N	1.83E+04	2.94E+04	***79E, 10N	4.46E+03	1.31E+04	80E, 10N	3.48E+03	2.18E+04	81E, 10N	6.93E+03	4.58E+04
77E, 9N	3.46E+03	2.16E+04	78E, 9N	2.08E+04	3.38E+04	***79E, 9N	5.30E+03	1.60E+04	80E, 9N	4.04E+03	2.57E+04	81E, 9N	7.26E+03	4.81E+04
77E, 8N	3.37E+03	2.10E+04	78E, 8N	2.05E+04	3.32E+04	***79E, 8N	8.39E+03	2.68E+04	80E, 8N	6.97E+03	4.61E+04	81E, 8N	9.31E+03	6.24E+04
77E, 7N	2.12E+03	1.23E+04	78E, 7N	1.66E+04	2.64E+04	***79E, 7N	8.40E+03	2.68E+04	80E, 7N	8.70E+03	5.82E+04	81E, 7N	9.72E+03	6.53E+04
77E, 6N	2.29E+03	1.35E+04	78E, 6N	2.90E+04	4.81E+04	***79E, 6N	9.79E+03	3.16E+04	80E, 6N	7.56E+03	5.02E+04	81E, 6N	1.01E+04	6.79E+04
77E, 5N	1.08E+04	7.28E+04	78E, 5N	1.52E+04	2.40E+04	***79E, 5N	1.44E+04	4.77E+04	80E, 5N	6.21E+03	4.08E+04	81E, 5N	9.02E+04	6.26E+05
77E, 4N	1.79E+04	1.22E+05	78E, 4N	1.27E+05	2.19E+05	***79E, 4N	1.25E+04	4.11E+04	80E, 4N	1.09E+04	7.35E+04	81E, 4N	7.59E+04	5.27E+05
77E, 3N	5.25E+03	3.41E+04	78E, 3N	2.37E+04	3.88E+04	***79E, 3N	3.54E+04	1.21E+05	80E, 3N	6.50E+03	4.28E+04	81E, 3N	8.77E+03	5.87E+04
77E, 2N	1.57E+03	8.46E+03	78E, 2N	1.13E+04	1.72E+04	***79E, 2N	1.71E+03	3.48E+03	80E, 2N	8.45E+03	5.64E+04	81E, 2N	1.11E+04	7.49E+04
77E, 1N	1.16E+03	5.60E+03	78E, 1N	4.82E+03	5.92E+03	***79E, 1N	1.59E+03	3.06E+03	80E, 1N	8.93E+03	5.98E+04	81E, 1N	1.83E+04	1.25E+05
77E, 0N	1.10E+03	5.19E+03	78E, 0N	5.83E+03	7.68E+03	***79E, 0N	1.32E+03	2.12E+03	80E, 0N	6.70E+03	4.42E+04	81E, 0N	5.42E+02	1.29E+03

Notes:

*Raw 1 cm data from 15 second counts.

** Raw 1 cm data from 60 second counts.

***Raw 1 cm data from 30 second counts

Average background @ 1 cm = 2484 CPM

Net CPM values in red are > background + 2 standard deviations

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
82E, 30N	8.48E+02	3.43E+03	83E, 30N	4.64E+02	7.51E+02	84E, 30N	5.10E+02	1.07E+03	85E, 30N	4.99E+02	9.95E+02	86E, 30N	5.65E+02	1.46E+03
82E, 29N	9.11E+02	3.87E+03	83E, 29N	5.04E+02	1.03E+03	84E, 29N	6.84E+02	2.28E+03	85E, 29N	5.24E+02	1.17E+03	86E, 29N	4.99E+02	9.95E+02
82E, 28N	1.11E+03	5.25E+03	83E, 28N	1.19E+02	<BKG	84E, 28N	7.26E+02	2.58E+03	85E, 28N	6.58E+02	2.10E+03	86E, 28N	7.20E+02	2.54E+03
82E, 27N	3.85E+03	2.44E+04	83E, 27N	8.59E+03	5.74E+04	84E, 27N	1.96E+03	1.12E+04	85E, 27N	3.56E+03	2.23E+04	86E, 27N	3.29E+03	2.05E+04
82E, 26N	8.13E+03	5.42E+04	83E, 26N	6.30E+03	4.14E+04	84E, 26N	7.89E+03	5.25E+04	85E, 26N	5.22E+03	3.39E+04	86E, 26N	4.67E+03	3.01E+04
82E, 25N	8.04E+03	5.36E+04	83E, 25N	1.49E+04	1.01E+05	84E, 25N	9.93E+03	6.67E+04	85E, 25N	1.93E+03	1.10E+04	86E, 25N	1.35E+03	6.93E+03
82E, 24N	7.58E+03	5.04E+04	83E, 24N	1.66E+03	9.09E+03	84E, 24N	7.13E+03	4.72E+04	85E, 24N	4.96E+03	3.21E+04	86E, 24N	3.31E+03	2.06E+04
82E, 23N	1.20E+04	8.12E+04	83E, 23N	9.48E+03	6.36E+04	84E, 23N	5.09E+03	3.30E+04	85E, 23N	4.98E+03	3.22E+04	86E, 23N	4.93E+03	3.19E+04
82E, 22N	7.06E+03	4.67E+04	83E, 22N	4.74E+03	3.06E+04	84E, 22N	2.65E+03	1.60E+04	85E, 22N	2.97E+03	1.82E+04	86E, 22N	1.76E+03	9.79E+03
82E, 21N	9.23E+03	6.19E+04	83E, 21N	4.55E+03	2.92E+04	84E, 21N	3.83E+03	2.42E+04	85E, 21N	1.83E+03	1.03E+04	86E, 21N	1.30E+03	6.58E+03
82E, 20N	1.02E+04	6.86E+04	83E, 20N	4.85E+03	3.13E+04	84E, 20N	3.99E+03	2.53E+04	85E, 20N	2.00E+03	1.15E+04	86E, 20N	1.54E+03	8.25E+03
82E, 19N	1.09E+04	7.35E+04	83E, 19N	1.07E+04	7.21E+04	84E, 19N	7.12E+03	4.72E+04	85E, 19N	2.21E+03	1.29E+04	86E, 19N	2.31E+03	1.36E+04
82E, 18N	1.76E+04	1.20E+05	83E, 18N	1.22E+04	8.26E+04	84E, 18N	8.96E+03	6.00E+04	85E, 18N	4.21E+03	2.69E+04	86E, 18N	1.24E+03	6.16E+03
82E, 17N	1.11E+04	7.49E+04	83E, 17N	9.83E+03	6.61E+04	84E, 17N	7.60E+03	5.05E+04	85E, 17N	4.60E+03	2.96E+04	86E, 17N	3.54E+03	2.22E+04
82E, 16N	1.04E+04	7.00E+04	83E, 16N	1.28E+04	8.68E+04	84E, 16N	1.74E+04	1.19E+05	85E, 16N	1.27E+04	8.61E+04	86E, 16N	8.25E+03	5.50E+04
82E, 15N	2.43E+04	1.67E+05	83E, 15N	1.84E+04	1.26E+05	84E, 15N	9.79E+03	6.58E+04	85E, 15N	5.74E+03	3.75E+04	86E, 15N	3.70E+03	2.33E+04
82E, 14N	7.65E+03	5.09E+04	83E, 14N	7.91E+03	5.27E+04	84E, 14N	4.49E+03	2.88E+04	85E, 14N	4.64E+03	2.99E+04	86E, 14N	3.17E+03	1.96E+04
82E, 13N	5.91E+03	3.87E+04	83E, 13N	6.38E+03	4.20E+04	84E, 13N	3.63E+03	2.28E+04	85E, 13N	7.72E+03	5.13E+04	86E, 13N	1.41E+03	7.35E+03
82E, 12N	6.69E+03	4.42E+04	83E, 12N	6.66E+03	4.39E+04	84E, 12N	4.90E+03	3.17E+04	85E, 12N	3.52E+03	2.21E+04	86E, 12N	1.73E+03	9.58E+03
82E, 11N	6.67E+03	4.40E+04	83E, 11N	6.08E+03	3.99E+04	84E, 11N	3.95E+03	2.51E+04	85E, 11N	2.30E+03	1.36E+04	86E, 11N	1.34E+03	6.86E+03
82E, 10N	7.70E+03	5.12E+04	83E, 10N	6.14E+03	4.03E+04	84E, 10N	2.19E+03	1.28E+04	85E, 10N	2.35E+03	1.39E+04	86E, 10N	1.65E+03	9.02E+03
82E, 9N	8.28E+03	5.52E+04	83E, 9N	6.42E+03	4.23E+04	84E, 9N	2.76E+03	1.68E+04	85E, 9N	2.67E+03	1.61E+04	86E, 9N	1.68E+03	9.23E+03
82E, 8N	9.90E+03	6.65E+04	83E, 8N	6.07E+03	3.98E+04	84E, 8N	2.68E+03	1.62E+04	85E, 8N	2.16E+03	1.26E+04	86E, 8N	2.06E+03	1.19E+04
82E, 7N	8.07E+03	5.38E+04	83E, 7N	6.14E+03	4.03E+04	84E, 7N	3.88E+03	2.46E+04	85E, 7N	2.24E+03	1.31E+04	86E, 7N	1.59E+03	8.60E+03
82E, 6N	8.27E+03	5.52E+04	83E, 6N	5.25E+03	3.41E+04	84E, 6N	3.05E+03	1.88E+04	85E, 6N	1.90E+03	1.08E+04	86E, 6N	1.66E+03	9.09E+03
82E, 5N	5.55E+03	3.62E+04	83E, 5N	5.58E+03	3.64E+04	84E, 5N	3.15E+03	1.95E+04	85E, 5N	1.85E+03	1.04E+04	86E, 5N	1.51E+02	<BKG
82E, 4N	5.57E+03	3.64E+04	83E, 4N	4.42E+03	2.83E+04	84E, 4N	3.75E+03	2.37E+04	85E, 4N	1.94E+03	1.10E+04	86E, 4N	5.19E+02	1.13E+03
82E, 3N	1.01E+04	6.79E+04	83E, 3N	9.93E+03	6.67E+04	84E, 3N	5.63E+03	3.68E+04	85E, 3N	8.75E+02	3.62E+03	86E, 3N	1.35E+03	6.93E+03
82E, 2N	1.62E+03	8.81E+03	83E, 2N	6.51E+03	4.29E+04	84E, 2N	4.03E+03	2.56E+04	85E, 2N	4.65E+03	2.99E+04	86E, 2N	1.22E+03	6.02E+03
82E, 1N	3.57E+03	2.24E+04	83E, 1N	6.29E+03	4.14E+04	84E, 1N	2.57E+03	1.54E+04	85E, 1N	1.51E+03	8.04E+03	86E, 1N	1.08E+03	5.05E+03
82E, 0N	5.77E+03	3.77E+04	83E, 0N	1.30E+03	6.58E+03	84E, 0N	1.79E+03	1.00E+04	85E, 0N	9.69E+02	4.27E+03	86E, 0N	5.08E+02	1.06E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
87E, 30N	5.20E+02	1.14E+03	88E, 30N	5.62E+02	1.43E+03	89E 30N	6.19E+02	1.83E+03	90E, 30N	6.81E+02	2.26E+03	91E, 30N	6.69E+02	2.18E+03
87E, 29N	6.39E+02	1.97E+03	88E, 29N	6.82E+02	2.27E+03	89E 29N	7.31E+02	2.61E+03	90E, 29N	7.34E+02	2.63E+03	91E, 29N	7.41E+02	2.68E+03
87E, 28N	8.78E+02	3.64E+03	88E, 28N	1.09E+03	5.12E+03	89E 28N	1.11E+03	5.25E+03	90E, 28N	8.02E+02	3.11E+03	91E, 28N	7.66E+02	2.86E+03
87E, 27N	3.12E+03	1.93E+04	88E, 27N	2.94E+03	1.80E+04	89E 27N	2.29E+03	1.35E+04	90E, 27N	1.55E+03	8.32E+03	91E, 27N	1.27E+03	6.37E+03
87E, 26N	5.03E+03	3.26E+04	88E, 26N	5.05E+03	3.27E+04	89E 26N	4.97E+03	3.22E+04	90E, 26N	3.84E+03	2.43E+04	91E, 26N	2.95E+03	1.81E+04
87E, 25N	1.47E+03	7.76E+03	88E, 25N	1.66E+03	9.09E+03	89E 25N	2.13E+03	1.24E+04	90E, 25N	1.71E+03	9.44E+03	91E, 25N	1.68E+03	9.23E+03
87E, 24N	1.26E+03	6.30E+03	88E, 24N	1.22E+03	6.02E+03	89E 24N	1.72E+03	9.51E+03	90E, 24N	1.88E+03	1.06E+04	91E, 24N	1.56E+03	8.39E+03
87E, 23N	2.27E+03	1.33E+04	88E, 23N	1.56E+03	8.39E+03	89E 23N	1.89E+03	1.07E+04	90E, 23N	1.76E+03	9.79E+03	91E, 23N	1.30E+03	6.58E+03
87E, 22N	1.92E+03	1.09E+04	88E, 22N	1.57E+03	8.46E+03	89E 22N	2.00E+03	1.15E+04	90E, 22N	1.82E+03	1.02E+04	91E, 22N	2.08E+03	1.20E+04
87E, 21N	1.19E+03	5.81E+03	88E, 21N	9.04E+02	3.82E+03	89E 21N	1.41E+03	7.35E+03	90E, 21N	1.99E+03	1.14E+04	91E, 21N	2.68E+03	1.62E+04
87E, 20N	1.04E+03	4.77E+03	88E, 20N	8.35E+02	3.34E+03	89E 20N	1.06E+03	4.91E+03	90E, 20N	1.21E+03	5.95E+03	91E, 20N	1.52E+03	8.11E+03
87E, 19N	2.18E+03	1.27E+04	88E, 19N	2.09E+03	1.21E+04	89E 19N	1.36E+03	7.00E+03	90E, 19N	1.14E+03	5.46E+03	91E, 19N	1.36E+03	7.00E+03
87E, 18N	3.17E+03	1.96E+04	88E, 18N	3.45E+03	2.16E+04	89E 18N	2.50E+03	1.49E+04	90E, 18N	1.62E+03	8.81E+03	91E, 18N	2.03E+03	1.17E+04
87E, 17N	3.45E+03	2.16E+04	88E, 17N	4.68E+03	3.01E+04	89E 17N	2.98E+03	1.83E+04	90E, 17N	3.95E+03	2.51E+04	91E, 17N	5.83E+03	3.82E+04
87E, 16N	7.15E+03	4.74E+04	88E, 16N	7.43E+03	4.93E+04	89E 16N	7.30E+03	4.84E+04	90E, 16N	6.28E+03	4.13E+04	91E, 16N	2.56E+03	1.54E+04
87E, 15N	3.54E+03	2.22E+04	88E, 15N	3.32E+03	2.07E+04	89E 15N	2.35E+03	1.39E+04	90E, 15N	1.25E+03	6.23E+03	91E, 15N	8.82E+02	3.67E+03
87E, 14N	2.38E+03	1.41E+04	88E, 14N	1.35E+03	6.93E+03	89E 14N	1.13E+03	5.39E+03	90E, 14N	8.16E+02	3.21E+03	91E, 14N	7.00E+02	2.40E+03
87E, 13N	1.77E+03	9.86E+03	88E, 13N	1.01E+03	4.56E+03	89E 13N	1.01E+03	4.56E+03	90E, 13N	7.44E+02	2.70E+03	91E, 13N	6.41E+02	1.99E+03
87E, 12N	1.02E+03	4.63E+03	88E, 12N	9.16E+02	3.90E+03	89E 12N	8.81E+02	3.66E+03	90E, 12N	6.93E+02	2.35E+03	91E, 12N	6.48E+02	2.03E+03
87E, 11N	9.25E+02	3.97E+03	88E, 11N	8.15E+02	3.20E+03	89E 11N	7.59E+02	2.81E+03	90E, 11N	6.69E+02	2.18E+03	91E, 11N	5.73E+02	1.51E+03
87E, 10N	9.82E+02	4.36E+03	88E, 10N	8.25E+02	3.27E+03	89E 10N	7.61E+02	2.82E+03	90E, 10N	7.29E+02	2.60E+03	91E, 10N	6.32E+02	1.92E+03
87E, 9N	1.45E+03	7.63E+03	88E, 9N	9.36E+02	4.04E+03	89E 9N	8.20E+02	3.23E+03	90E, 9N	7.25E+02	2.57E+03	91E, 9N	5.53E+02	1.37E+03
87E, 8N	1.71E+03	9.44E+03	88E, 8N	5.22E+02	1.16E+03	89E 8N	8.25E+02	3.27E+03	90E, 8N	7.62E+02	2.83E+03	91E, 8N	5.43E+02	1.30E+03
87E, 7N	6.61E+02	2.12E+03	88E, 7N	1.14E+03	5.46E+03	89E 7N	7.56E+02	2.79E+03	90E, 7N	7.31E+02	2.61E+03	91E, 7N	4.92E+02	9.46E+02
87E, 6N	5.67E+02	1.47E+03	88E, 6N	9.14E+02	3.89E+03	89E 6N	9.46E+02	4.11E+03	90E, 6N	7.12E+02	2.48E+03	91E, 6N	5.03E+02	1.02E+03
87E, 5N	8.25E+02	3.27E+03	88E, 5N	8.36E+02	3.34E+03	89E 5N	7.54E+02	2.77E+03	90E, 5N	5.64E+02	1.45E+03	91E, 5N	4.56E+02	6.95E+02
87E, 4N	7.62E+02	2.83E+03	88E, 4N	7.48E+02	2.73E+03	89E 4N	6.60E+02	2.12E+03	90E, 4N	6.03E+02	1.72E+03	91E, 4N	4.74E+02	8.21E+02
87E, 3N	1.07E+03	4.98E+03	88E, 3N	8.82E+02	3.67E+03	89E 3N	6.15E+02	1.80E+03	90E, 3N	5.48E+02	1.34E+03	91E, 3N	6.41E+02	1.99E+03
87E, 2N	9.99E+02	4.48E+03	88E, 2N	8.63E+02	3.53E+03	89E 2N	6.09E+02	1.76E+03	90E, 2N	5.48E+02	1.34E+03	91E, 2N	4.65E+02	7.58E+02
87E, 1N	9.46E+02	4.11E+03	88E, 1N	8.40E+02	3.37E+03	89E 1N	8.40E+02	3.37E+03	90E, 1N	5.27E+02	1.19E+03	91E, 1N	4.57E+02	7.02E+02
87E, 0N	5.61E+02	1.43E+03	88E, 0N	5.94E+02	1.66E+03	89E 0N	5.91E+02	1.64E+03	90E, 0N	5.20E+02	1.14E+03	91E, 0N	4.08E+02	3.61E+02

Notes

*Raw 1 cm data from 15 second counts

Average background @ 1 cm = 2484 CPM

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
92E, 30N	6.25E+02	1.87E+03	93E 30N	6.45E+02	2.01E+03	94E, 30N	6.76E+02	2.23E+03	95E, 30N	5.98E+02	1.69E+03	96E, 30N	5.98E+02	1.69E+03
92E, 29N	7.81E+02	2.96E+03	93E 29N	7.31E+02	2.61E+03	94E, 29N	7.65E+02	2.85E+03	95E, 29N	6.08E+02	1.75E+03	96E, 29N	6.40E+02	1.98E+03
92E, 28N	8.31E+02	3.31E+03	93E 28N	8.08E+02	3.15E+03	94E, 28N	7.76E+02	2.93E+03	95E, 28N	5.49E+02	1.34E+03	96E, 28N	1.04E+03	4.77E+03
92E, 27N	1.32E+03	6.72E+03	93E 27N	1.21E+03	5.95E+03	94E, 27N	1.08E+03	5.05E+03	95E, 27N	1.03E+03	4.70E+03	96E, 27N	8.83E+02	3.67E+03
92E, 26N	2.82E+03	1.72E+04	93E 26N	2.22E+03	1.30E+04	94E, 26N	2.45E+03	1.46E+04	95E, 26N	1.65E+03	9.02E+03	96E, 26N	1.57E+03	8.46E+03
92E, 25N	1.51E+03	8.04E+03	93E 25N	1.36E+03	7.00E+03	94E, 25N	1.58E+03	8.53E+03	95E, 25N	1.50E+03	7.97E+03	96E, 25N	1.29E+03	6.51E+03
92E, 24N	2.03E+03	1.17E+04	93E 24N	1.74E+03	9.65E+03	94E, 24N	1.80E+03	1.01E+04	95E, 24N	1.95E+03	1.11E+04	96E, 24N	1.23E+03	6.09E+03
92E, 23N	1.40E+03	7.28E+03	93E 23N	1.41E+03	7.35E+03	94E, 23N	1.17E+03	5.67E+03	95E, 23N	1.36E+03	7.00E+03	96E, 23N	1.37E+03	7.07E+03
92E, 22N	2.20E+03	1.29E+04	93E 22N	1.69E+03	9.30E+03	94E, 22N	1.23E+03	6.09E+03	95E, 22N	1.95E+03	1.11E+04	96E, 22N	1.28E+03	6.44E+03
92E, 21N	1.71E+03	9.44E+03	93E 21N	1.54E+03	8.25E+03	94E, 21N	1.77E+03	9.86E+03	95E, 21N	3.70E+03	2.33E+04	96E, 21N	1.48E+03	7.83E+03
92E, 20N	1.46E+03	7.70E+03	93E 20N	1.43E+03	7.49E+03	94E, 20N	1.83E+03	1.03E+04	95E, 20N	1.27E+03	6.37E+03	96E, 20N	9.20E+02	3.93E+03
92E, 19N	1.68E+03	9.23E+03	93E 19N	9.09E+02	3.85E+03	94E, 19N	1.17E+03	5.67E+03	95E, 19N	7.54E+02	2.77E+03	96E, 19N	5.86E+02	1.60E+03
92E, 18N	1.49E+03	7.90E+03	93E 18N	1.33E+03	6.79E+03	94E, 18N	1.14E+03	5.46E+03	95E, 18N	3.41E+03	2.13E+04	96E, 18N	4.73E+03	3.05E+04
92E, 17N	3.53E+03	2.21E+04	93E 17N	5.57E+03	3.64E+04	94E, 17N	3.38E+03	2.11E+04	95E, 17N	2.57E+03	1.54E+04	96E, 17N	1.35E+03	6.93E+03
92E, 16N	1.31E+03	6.65E+03	93E 16N	7.54E+02	2.77E+03	94E, 16N	5.62E+02	1.43E+03	95E, 16N	4.67E+02	7.72E+02	96E, 16N	4.59E+02	7.16E+02
92E, 15N	6.93E+02	2.35E+03	93E 15N	7.77E+02	2.93E+03	94E, 15N	6.41E+02	1.99E+03	95E, 15N	4.66E+02	7.65E+02	96E, 15N	4.22E+02	4.58E+02
92E, 14N	7.28E+02	2.59E+03	93E 14N	1.08E+03	5.05E+03	94E, 14N	7.29E+02	2.60E+03	95E, 14N	5.27E+02	1.19E+03	96E, 14N	4.85E+02	8.97E+02
92E, 13N	5.77E+02	1.54E+03	93E 13N	7.96E+02	3.07E+03	94E, 13N	6.75E+02	2.22E+03	95E, 13N	5.54E+02	1.38E+03	96E, 13N	4.54E+02	6.81E+02
92E, 12N	5.89E+02	1.62E+03	93E 12N	5.26E+02	1.18E+03	94E, 12N	5.12E+02	1.09E+03	95E, 12N	4.89E+02	9.25E+02	96E, 12N	3.92E+02	2.49E+02
92E, 11N	4.86E+02	9.04E+02	93E 11N	4.27E+02	4.93E+02	94E, 11N	4.81E+02	8.70E+02	95E, 11N	5.13E+02	1.09E+03	96E, 11N	4.03E+02	3.26E+02
92E, 10N	4.82E+02	8.77E+02	93E 10N	4.55E+02	6.88E+02	94E, 10N	4.81E+02	8.70E+02	95E, 10N	4.84E+02	8.90E+02	96E, 10N	4.00E+02	3.05E+02
92E, 9N	4.97E+02	9.81E+02	93E 9N	4.54E+02	6.81E+02	94E, 9N	4.66E+02	7.65E+02	95E, 9N	4.72E+02	8.07E+02	96E, 9N	4.45E+02	6.19E+02
92E, 8N	4.82E+02	8.77E+02	93E 8N	5.15E+02	1.11E+03	94E, 8N	4.35E+02	5.49E+02	95E, 8N	5.02E+02	1.02E+03	96E, 8N	4.32E+02	5.28E+02
92E, 7N	4.67E+02	7.72E+02	93E 7N	4.56E+02	6.95E+02	94E, 7N	4.70E+02	7.93E+02	95E, 7N	5.98E+02	1.69E+03	96E, 7N	5.42E+02	1.29E+03
92E, 6N	4.28E+02	5.00E+02	93E 6N	4.32E+02	5.28E+02	94E, 6N	4.99E+02	9.95E+02	95E, 6N	7.35E+02	2.64E+03	96E, 6N	9.99E+02	4.48E+03
92E, 5N	4.77E+02	8.42E+02	93E 5N	4.33E+02	5.35E+02	94E, 5N	4.15E+02	4.09E+02	95E, 5N	6.75E+02	2.22E+03	96E, 5N	1.11E+03	5.25E+03
92E, 4N	4.29E+02	5.07E+02	93E 4N	4.24E+02	4.72E+02	94E, 4N	4.05E+02	3.40E+02	95E, 4N	5.20E+02	1.14E+03	96E, 4N	7.28E+02	2.59E+03
92E, 3N	5.32E+02	1.23E+03	93E 3N	5.47E+02	1.33E+03	94E, 3N	5.05E+02	1.04E+03	95E, 3N	7.24E+02	2.56E+03	96E, 3N	5.42E+02	1.29E+03
92E, 2N	5.11E+02	1.08E+03	93E 2N	4.27E+02	4.93E+02	94E, 2N	4.09E+02	3.68E+02	95E, 2N	4.09E+02	3.68E+02	96E, 2N	3.81E+02	1.72E+02
92E, 1N	5.36E+02	1.25E+03	93E 1N	4.32E+02	5.28E+02	94E, 1N	4.24E+02	4.72E+02	95E, 1N	4.13E+02	3.95E+02	96E, 1N	3.81E+02	1.72E+02
92E, 0N	4.84E+02	8.90E+02	93E 0N	4.46E+02	6.26E+02	94E, 0N	4.23E+02	4.65E+02	95E, 0N	2.49E+02	<BKG	96E, 0N	3.79E+02	1.58E+02

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
97E, 30N	5.32E+02	1.23E+03	98E, 30N	5.19E+02	1.13E+03	99E, 30N	4.69E+02	7.86E+02	100E, 30N	4.80E+02	8.63E+02	101E, 30N	4.55E+02	6.88E+02
97E, 29N	5.92E+02	1.64E+03	98E, 29N	6.16E+02	1.81E+03	99E, 29N	7.44E+02	2.70E+03	100E, 29N	5.95E+02	1.66E+03	101E, 29N	5.80E+02	1.56E+03
97E, 28N	1.01E+03	4.56E+03	98E, 28N	1.89E+02	<BKG	99E, 28N	8.87E+02	3.70E+03	100E, 28N	7.71E+03	5.13E+04	101E, 28N	7.34E+02	2.63E+03
97E, 27N	1.00E+03	4.49E+03	98E, 27N	1.67E+03	9.16E+03	99E, 27N	1.10E+03	5.19E+03	100E, 27N	1.19E+03	5.81E+03	101E, 27N	8.38E+02	3.36E+03
97E, 26N	1.71E+03	9.44E+03	98E, 26N	1.69E+03	9.30E+03	99E, 26N	2.13E+03	1.24E+04	100E, 26N	2.27E+03	1.33E+04	101E, 26N	2.07E+03	1.19E+04
97E, 25N	1.21E+03	5.95E+03	98E, 25N	1.48E+03	7.83E+03	99E, 25N	1.20E+03	5.88E+03	100E, 25N	1.34E+03	6.86E+03	101E, 25N	1.05E+03	4.84E+03
97E, 24N	1.16E+03	5.60E+03	98E, 24N	1.28E+03	6.44E+03	99E, 24N	1.08E+03	5.05E+03	100E, 24N	1.38E+03	7.14E+03	101E, 24N	8.68E+02	3.57E+03
97E, 23N	1.22E+03	6.02E+03	98E, 23N	1.09E+03	5.12E+03	99E, 23N	9.05E+02	3.83E+03	100E, 23N	6.90E+02	2.33E+03	101E, 23N	8.44E+02	3.40E+03
97E, 22N	1.10E+03	5.19E+03	98E, 22N	7.87E+02	3.00E+03	99E, 22N	7.94E+02	3.05E+03	100E, 22N	8.66E+02	3.55E+03	101E, 22N	9.89E+02	4.41E+03
97E, 21N	1.02E+03	4.63E+03	98E, 21N	1.01E+03	4.56E+03	99E, 21N	9.27E+02	3.98E+03	100E, 21N	6.72E+02	2.20E+03	101E, 21N	6.56E+02	2.09E+03
97E, 20N	6.70E+02	2.19E+03	98E, 20N	6.16E+02	1.81E+03	99E, 20N	6.14E+02	1.80E+03	100E, 20N	1.01E+03	4.56E+03	101E, 20N	6.58E+03	4.34E+04
97E, 19N	5.44E+02	1.31E+03	98E, 19N	6.30E+02	1.91E+03	99E, 19N	5.12E+02	1.09E+03	100E, 19N	9.55E+02	4.17E+03	101E, 19N	5.27E+02	1.19E+03
97E, 18N	1.86E+03	1.05E+04	98E, 18N	1.43E+03	7.49E+03	99E, 18N	1.20E+03	5.88E+03	100E, 18N	9.67E+02	4.26E+03	101E, 18N	3.76E+03	2.37E+04
97E, 17N	6.04E+02	1.73E+03	98E, 17N	4.86E+02	9.04E+02	99E, 17N	6.55E+02	2.08E+03	100E, 17N	6.53E+02	2.07E+03	101E, 17N	1.14E+03	5.46E+03
97E, 16N	4.76E+02	8.35E+02	98E, 16N	4.68E+02	7.79E+02	99E, 16N	5.28E+02	1.20E+03	100E, 16N	5.38E+02	1.27E+03	101E, 16N	5.81E+02	1.57E+03
97E, 15N	4.37E+02	5.63E+02	98E, 15N	5.24E+02	1.17E+03	99E, 15N	5.98E+02	1.69E+03	100E, 15N	5.51E+02	1.36E+03	101E, 15N	5.61E+02	1.43E+03
97E, 14N	4.73E+02	8.14E+02	98E, 14N	4.81E+02	8.70E+02	99E, 14N	4.65E+02	7.58E+02	100E, 14N	4.63E+02	7.44E+02	101E, 14N	4.33E+02	5.35E+02
97E, 13N	4.42E+02	5.98E+02	98E, 13N	3.81E+02	1.72E+02	99E, 13N	4.11E+02	3.81E+02	100E, 13N	3.81E+02	1.72E+02	101E, 13N	2.53E+02	<BKG
97E, 12N	3.69E+02	8.87E+01	98E, 12N	3.76E+02	1.37E+02	99E, 12N	3.77E+02	1.44E+02	100E, 12N	3.47E+02	<BKG	101E, 12N	2.67E+02	<BKG
97E, 11N	3.75E+02	1.31E+02	98E, 11N	3.81E+02	1.72E+02	99E, 11N	3.68E+02	8.17E+01	100E, 11N	3.81E+02	1.72E+02	101E, 11N	2.44E+02	<BKG
97E, 10N	3.60E+02	2.59E+01	98E, 10N	3.67E+02	7.47E+01	99E, 10N	3.75E+02	1.31E+02	100E, 10N	3.66E+02	6.78E+01	101E, 10N	2.58E+02	<BKG
97E, 9N	4.02E+02	3.19E+02	98E, 9N	2.55E+02	<BKG	99E, 9N	3.23E+02	<BKG	100E, 9N	3.49E+02	<BKG	101E, 9N	3.30E+02	<BKG
97E, 8N	3.64E+02	5.38E+01	98E, 8N	3.46E+02	<BKG	99E, 8N	3.27E+02	<BKG	100E, 8N	3.42E+02	<BKG	101E, 8N	3.57E+02	5.00E+00
97E, 7N	4.01E+02	3.12E+02	98E, 7N	4.75E+02	8.28E+02	99E, 7N	3.19E+02	<BKG	100E, 7N	3.88E+02	2.21E+02	101E, 7N	2.08E+02	<BKG
97E, 6N	4.63E+02	7.44E+02	98E, 6N	4.91E+02	9.39E+02	99E, 6N	4.43E+02	6.05E+02	100E, 6N	3.83E+02	1.86E+02	101E, 6N	2.91E+02	<BKG
97E, 5N	6.88E+02	2.31E+03	98E, 5N	4.70E+02	7.93E+02	99E, 5N	4.72E+02	8.07E+02	100E, 5N	4.91E+02	9.39E+02	101E, 5N	2.95E+02	<BKG
97E, 4N	5.47E+02	1.33E+03	98E, 4N	5.01E+02	1.01E+03	99E, 4N	6.77E+02	2.24E+03	100E, 4N	5.70E+02	1.49E+03	101E, 4N	4.88E+02	9.18E+02
97E, 3N	4.75E+02	8.28E+02	98E, 3N	5.04E+02	1.03E+03	99E, 3N	5.42E+02	1.29E+03	100E, 3N	5.51E+02	1.36E+03	101E, 3N	9.16E+02	3.90E+03
97E, 2N	4.97E+02	9.81E+02	98E, 2N	3.64E+02	5.38E+01	99E, 2N	4.24E+02	4.72E+02	100E, 2N	4.48E+02	6.39E+02	101E, 2N	5.70E+02	1.49E+03
97E, 1N	3.72E+02	1.10E+02	98E, 1N	3.59E+02	1.89E+01	99E, 1N	2.76E+02	<BKG	100E, 1N	2.50E+02	<BKG	101E, 1N	3.84E+02	1.93E+02
97E, 0N	4.05E+02	3.40E+02	98E, 0N	3.30E+02	<BKG	99E, 0N	3.33E+02	<BKG	100E, 0N	3.53E+02	<BKG	101E, 0N	3.75E+02	1.31E+02

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM
102E, 30N	4.85E+02	8.97E+02
102E, 29N	5.48E+02	1.34E+03
102E, 28N	6.68E+02	2.17E+03
102E, 27N	1.21E+03	5.95E+03
102E, 26N	4.63E+03	2.98E+04
102E, 25N	1.01E+03	4.56E+03
102E, 24N	9.67E+02	4.26E+03
102E, 23N	9.93E+02	4.44E+03
102E, 22N	6.73E+02	2.21E+03
102E, 21N	5.50E+02	1.35E+03
102E, 20N	9.04E+02	3.82E+03
102E, 19N	1.43E+03	7.49E+03
102E, 18N	1.81E+03	1.01E+04
102E, 17N	7.67E+02	2.86E+03
102E, 16N	6.48E+02	2.03E+03
102E, 15N	5.03E+02	1.02E+03
102E, 14N	4.47E+02	6.32E+02
102E, 13N	3.90E+02	2.35E+02
102E, 12N	3.42E+02	<BKG
102E, 11N	3.36E+02	<BKG
102E, 10N	3.20E+02	<BKG
102E, 9N	3.50E+02	<BKG
102E, 8N	3.28E+02	<BKG
102E, 7N	3.03E+02	<BKG
102E, 6N	3.95E+02	2.70E+02
102E, 5N	3.62E+02	3.99E+01
102E, 4N	4.15E+02	4.09E+02
102E, 3N	8.47E+02	3.42E+03
102E, 2N	5.75E+02	1.52E+03
102E, 1N	4.01E+02	3.12E+02
102E, 0N	3.48E+02	<BKG

Notes:

*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									106E, 28N	5.19E+02	1.13E+03	107E, 28N	3.20E+02	<BKG
						105E, 27N	7.62E+02	2.83E+03	106E, 27N	7.74E+03	5.15E+04	107E, 27N	4.44E+02	6.12E+02
103E, 26N	2.60E+03	1.56E+04	104E, 26N	4.17E+03	2.66E+04	105E, 26N	2.94E+03	1.80E+04	106E, 26N	7.85E+03	5.22E+04	107E, 26N	2.94E+02	<BKG
103E, 25N	1.05E+03	4.84E+03	104E, 25N	6.84E+02	2.28E+03	105E, 25N	8.05E+02	3.13E+03	106E, 25N	9.21E+02	3.94E+03	107E, 25N	8.20E+02	3.23E+03
103E, 24N	9.52E+02	4.15E+03	104E, 24N	9.94E+02	4.45E+03	105E, 24N	7.39E+02	2.67E+03	106E, 24N	6.68E+02	2.17E+03	107E, 24N	4.85E+02	8.97E+02
									106E, 23N	7.45E+02	2.71E+03	107E, 23N	7.07E+02	2.45E+03
												107E, 22N	4.96E+02	9.74E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
108E, 29N	3.89E+02	2.28E+02												
108E, 28N	3.94E+02	2.63E+02												
108E, 27N	2.07E+03	1.19E+04	109E, 27N	3.81E+02	1.72E+02	110E 27N	3.71E+02	1.03E+02	111E, 27N	2.19E+02	<BKG	112E, 27N	4.21E+02	4.51E+02
108E, 26N	7.27E+02	2.58E+03	109E, 26N	5.95E+02	1.66E+03	110E 26N	6.48E+02	2.03E+03	111E, 26N	5.90E+02	1.63E+03	112E, 26N	4.58E+02	7.09E+02
108E, 25N	5.27E+02	1.19E+03	109E, 25N	6.82E+02	2.27E+03	110E 25N	6.98E+02	2.38E+03	111E, 25N	6.93E+02	2.35E+03	112E, 25N	5.77E+02	1.54E+03
108E, 24N	4.92E+02	9.46E+02	109E, 24N	5.55E+02	1.39E+03	110E 24N	5.79E+02	1.55E+03	111E, 24N	8.22E+02	3.25E+03	112E, 24N	4.81E+02	8.70E+02
108E, 23N	6.09E+02	1.76E+03	109E, 23N	4.44E+02	6.12E+02	110E 23N	5.26E+02	1.18E+03	111E, 23N	6.12E+02	1.78E+03	112E, 23N	4.97E+02	9.81E+02
			109E, 22N	6.71E+02	2.19E+03	110E 22N	6.42E+02	1.99E+03	111E, 22N	5.89E+02	1.62E+03	112E, 22N	4.50E+02	6.53E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									116E, 31N	2.41E+02	<BKG			
						115E, 30N	3.70E+02	9.56E+01	116E, 30N	6.02E+02	1.71E+03	117E, 30N	4.26E+02	4.86E+02
			114E, 29N	4.30E+02	5.14E+02	115E, 29N	5.00E+02	1.00E+03	116E, 29N	1.32E+03	6.72E+03	117E, 29N	5.55E+02	1.39E+03
			114E, 28N	8.64E+02	3.54E+03	115E, 28N	8.52E+02	3.46E+03	116E, 28N	7.18E+03	4.76E+04	117E, 28N	5.51E+03	3.59E+04
113E, 27N	4.45E+02	6.19E+02	114E, 27N	8.19E+02	3.23E+03	115E, 27N	6.70E+02	2.19E+03	116E, 27N	1.48E+03	7.83E+03	117E, 27N	8.47E+02	3.42E+03
113E, 26N	4.59E+02	7.16E+02	114E, 26N	2.00E+03	1.15E+04	115E, 26N	6.14E+02	1.80E+03	116E, 26N	1.15E+03	5.53E+03	117E, 26N	8.37E+02	3.35E+03
113E, 25N	4.94E+02	9.60E+02	114E, 25N	8.39E+02	3.37E+03	115E, 25N	8.64E+02	3.54E+03	116E, 25N	7.71E+02	2.89E+03	117E, 25N	8.57E+02	3.49E+03
113E, 24N	4.94E+02	9.60E+02	114E, 24N	4.13E+02	3.95E+02	115E, 24N	8.30E+02	3.30E+03	116E, 24N	9.02E+02	3.80E+03	117E, 24N	1.23E+03	6.09E+03
												117E, 23N	1.23E+03	6.09E+03
												117E, 22N	6.89E+02	2.32E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background (a) 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
118E, 29N	3.54E+02	<BKG						
118E, 28N	1.01E+03	4.56E+03	119E, 28N	4.67E+02	7.72E+02			
118E, 27N	7.38E+02	2.66E+03	119E, 27N	4.52E+02	6.67E+02			
118E, 26N	7.74E+02	2.91E+03	119E, 26N	5.89E+02	1.62E+03			
118E, 25N	1.55E+03	8.32E+03	119E, 25N	1.06E+03	4.91E+03			
118E, 24N	1.27E+03	6.37E+03	119E, 24N	1.39E+03	7.21E+03	120E, 24N	6.69E+02	2.18E+03
118E, 23N	7.80E+02	2.95E+03	119E, 23N	6.43E+02	2.00E+03			
118E, 22N	7.29E+02	2.60E+03						

Notes:

*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
126E, 38N	6.52E+02	1.24E+02	127E, 38N	6.85E+02	2.56E+02	128E, 38N	7.63E+02	5.68E+02	129E, 38N	8.28E+02	8.28E+02	130E, 38N	6.43E+02	8.80E+01
126E, 37N	6.69E+02	1.92E+02	127E, 37N	6.95E+02	2.96E+02	128E, 37N	8.01E+02	7.20E+02	129E, 37N	7.82E+02	6.44E+02	130E, 37N	6.40E+02	7.60E+01
126E, 36N	6.88E+02	2.68E+02	127E, 36N	7.92E+02	6.84E+02	128E, 36N	7.95E+02	6.96E+02	129E, 36N	7.75E+02	6.16E+02	130E, 36N	9.80E+02	1.44E+03
126E, 35N	8.00E+02	7.16E+02	127E, 35N	1.06E+03	1.76E+03	128E, 35N	1.14E+03	2.08E+03	129E, 35N	1.11E+03	1.96E+03	130E, 35N	9.68E+02	1.39E+03
126E, 34N	6.99E+02	3.12E+02	127E, 34N	7.83E+02	6.48E+02	128E, 34N	8.12E+02	7.64E+02	129E, 34N	7.94E+02	6.92E+02	130E, 34N	1.06E+03	1.76E+03
126E, 33N	6.73E+02	2.08E+02	127E, 33N	6.50E+02	1.16E+02	128E, 33N	6.69E+02	1.92E+02	129E, 33N	8.43E+02	8.88E+02	130E, 33N	8.40E+02	8.76E+02
126E, 32N	6.98E+02	3.08E+02	127E, 32N	6.30E+02	3.60E+01	128E, 32N	6.32E+02	4.40E+01	129E, 32N	8.30E+02	8.36E+02	130E, 32N	8.37E+02	8.64E+02
126E, 31N	6.55E+02	1.36E+02	127E, 31N	6.71E+02	2.00E+02	128E, 31N	6.25E+02	1.60E+01	129E, 31N	7.31E+02	4.40E+02	130E, 31N	1.07E+03	1.80E+03
126E, 30N	6.50E+02	1.16E+02	127E, 30N	6.42E+02	8.40E+01	128E, 30N	6.44E+02	9.20E+01	129E, 30N	6.30E+02	3.60E+01	130E, 30N	6.64E+02	1.72E+02
126E, 29N	6.99E+02	3.12E+02	127E, 29N	6.70E+02	1.96E+02	128E, 29N	7.60E+02	5.56E+02	129E, 29N	6.43E+02	8.80E+01	130E, 29N	5.28E+02	<BKG
126E, 28N	7.03E+02	3.28E+02	127E, 28N	7.11E+02	3.60E+02	128E, 28N	6.68E+02	1.88E+02	129E, 28N	6.85E+02	2.56E+02	130E, 28N	5.55E+02	<BKG
126E, 27N	8.57E+02	9.44E+02	127E, 27N	8.10E+02	7.56E+02	128E, 27N	7.27E+02	4.24E+02	129E, 27N	6.36E+02	6.00E+01	130E, 27N	5.85E+02	<BKG
126E, 26N	7.24E+02	4.12E+02	127E, 26N	6.81E+02	2.40E+02	128E, 26N	8.10E+02	7.56E+02	129E, 26N	7.57E+02	5.44E+02	130E, 26N	7.44E+02	4.92E+02
126E, 25N	6.24E+02	1.20E+01	127E, 25N	8.44E+02	8.92E+02	128E, 25N	7.92E+02	6.84E+02	129E, 25N	7.44E+02	4.92E+02	130E, 25N	6.40E+02	7.60E+01
126E, 24N	6.55E+02	1.36E+02	127E, 24N	6.38E+02	6.80E+01	128E, 24N	6.40E+02	7.60E+01	129E, 24N	6.40E+02	7.60E+01	130E, 24N	6.40E+02	7.60E+01

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
131E, 38N	7.04E+02	3.32E+02	132E, 38N	6.46E+02	1.00E+02	133E, 38N	7.19E+02	3.92E+02	134E, 38N	5.86E+02	<BKG	135E, 38N	5.98E+02	<BKG
131E, 37N	6.82E+02	2.44E+02	132E, 37N	7.01E+02	3.20E+02	133E, 37N	6.50E+02	1.16E+02	134E, 37N	3.60E+02	2.59E+01	135E, 37N	5.32E+02	1.23E+03
131E, 36N	9.25E+02	1.22E+03	132E, 36N	4.80E+02	8.63E+02	133E, 36N	4.44E+02	6.12E+02	134E, 36N	4.03E+02	3.26E+02	135E, 36N	6.34E+02	1.94E+03
131E, 35N	1.16E+03	2.16E+03	132E, 35N	7.30E+02	2.61E+03	133E, 35N	6.72E+02	2.20E+03	134E, 35N	7.39E+02	2.67E+03	135E, 35N	8.24E+02	3.26E+03
131E, 34N	1.07E+03	1.80E+03	132E, 34N	6.82E+02	2.27E+03	133E, 34N	1.28E+03	6.44E+03	134E, 34N	1.70E+03	9.37E+03	135E, 34N	1.36E+03	7.00E+03
**131E. 33N	8.59E+02	9.52E+02	132E, 33N	1.05E+03	4.84E+03	133E, 33N	1.46E+03	7.70E+03	134E, 33N	2.89E+03	1.77E+04	135E, 33N	1.46E+03	7.70E+03
131E, 32N	9.11E+02	1.16E+03	132E, 32N	7.86E+02	3.00E+03	133E, 32N	1.02E+03	4.63E+03	134E, 32N	4.74E+02	8.21E+02	135E, 32N	5.69E+02	1.48E+03
131E, 31N	6.94E+02	2.92E+02	132E, 31N	4.51E+02	6.60E+02	133E, 31N	4.36E+02	5.56E+02	134E, 31N	2.91E+02	<BKG	135E, 31N	3.97E+02	2.84E+02
131E, 30N	5.64E+02	<BKG	132E, 30N	2.98E+02	<BKG	133E, 30N	4.21E+02	4.51E+02	134E, 30N	1.17E+03	5.67E+03	135E, 30N	5.84E+02	1.59E+03
131E, 29N	5.44E+02	<BKG	132E, 29N	6.00E+02	<BKG	133E, 29N	3.43E+02	<BKG	134E, 29N	6.41E+02	1.99E+03	135E, 29N	5.69E+02	1.48E+03
131E, 28N	6.36E+02	6.00E+01	132E, 28N	6.30E+02	3.60E+01	133E, 28N	6.41E+02	1.99E+03	134E, 28N	9.67E+02	4.26E+03	135E, 28N	5.75E+02	1.52E+03
131E, 27N	6.36E+02	6.00E+01	132E, 27N	6.88E+02	2.68E+02	133E, 27N	2.25E+02	<BKG	134E, 27N	3.25E+02	<BKG	135E, 27N	1.59E+03	8.60E+03
131E, 26N	7.26E+02	4.20E+02	132E, 26N	6.30E+02	3.60E+01	133E, 26N	6.47E+02	1.04E+02	134E, 26N	3.96E+02	2.77E+02	135E, 26N	8.83E+02	3.67E+03
131E, 25N	6.62E+02	1.64E+02	132E, 25N	6.56E+02	1.40E+02	133E, 25N	7.72E+02	6.04E+02				135E, 25N	4.48E+02	6.39E+02
131E, 24N	6.44E+02	9.20E+01	132E, 24N	6.06E+02	<BKG	133E, 24N	6.77E+02	2.24E+02	134E, 24N	7.19E+02	2.88E+03	135E, 24N	6.62E+02	1.64E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
136E, 38N	7.16E+02	3.80E+02	137E, 38N	4.19E+02	4.37E+02	138E, 38N	4.22E+02	4.58E+02
136E, 37N	6.07E+02	1.75E+03	137E, 37N	6.23E+02	1.86E+03	138E, 37N	5.12E+02	1.09E+03
136E, 36N	8.02E+02	3.11E+03	137E, 36N	6.98E+02	2.38E+03	138E, 36N	5.39E+02	1.27E+03
136E, 35N	2.18E+03	1.27E+04	137E, 35N	6.76E+02	2.23E+03	138E, 35N	4.56E+02	6.95E+02
136E, 34N	2.18E+03	1.27E+04	137E, 34N	8.29E+02	3.30E+03	138E, 34N	4.43E+02	6.05E+02
136E, 33N	1.84E+03	1.03E+04	137E, 33N	6.96E+02	2.37E+03	138E, 33N	5.19E+02	1.13E+03
136E, 32N	4.81E+02	8.70E+02	137E, 32N	1.34E+03	6.86E+03	138E, 32N	8.00E+02	3.09E+03
136E, 31N	3.80E+02	1.65E+02	137E, 31N	7.40E+02	2.68E+03	138E, 31N	4.42E+02	5.98E+02
136E, 30N	3.92E+02	2.49E+02	137E, 30N	4.20E+02	4.44E+02	138E, 30N	4.31E+02	5.21E+02
136E, 29N	4.48E+02	6.39E+02	137E, 29N	3.78E+02	1.51E+02	138E, 29N	3.67E+02	7.47E+01
136E, 28N	4.12E+02	3.88E+02	137E, 28N	3.83E+02	1.86E+02	138E, 28N	3.35E+02	<BKG
136E, 27N	1.19E+03	5.81E+03	137E, 27N	3.80E+02	1.65E+02	138E, 27N	4.18E+02	4.30E+02
136E, 26N	9.99E+02	4.48E+03	137E, 26N	2.15E+03	1.25E+04	138E, 26N	2.69E+03	1.63E+04
136E, 25N	4.99E+02	9.95E+02	137E, 25N	5.31E+02	1.22E+03	138E, 25N	1.14E+03	2.08E+03
136E, 24N	6.54E+02	1.32E+02	137N, 24N	7.59E+02	5.52E+02	138E 24N	6.92E+02	2.84E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM

Net CPM values in red are > background + 2 standard deviations.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 10
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net cpm
132E, 16N	2.30E+02	<BKG	133E, 16N	2.44E+02	<BKG	134E, 16N	4.79E+02	8.56E+02	135E, 16N	3.82E+02	1.79E+02			
132E, 15N	3.70E+02	9.56E+01	133E, 15N	4.80E+02	8.63E+02	134E, 15N	7.95E+02	3.06E+03	135E, 15N	6.69E+02	2.18E+03			
132E, 14N	3.20E+02	<BKG	133E, 14N	8.50E+02	3.44E+03	134E, 14N	1.35E+03	6.93E+03	135E, 14N	8.62E+02	3.53E+03			
132E, 13N	3.40E+02	<BKG	133E, 13N	7.88E+02	3.01E+03	134E, 13N	1.90E+03	1.08E+04	135E, 13N	9.72E+02	4.29E+03	136E, 13N	4.14E+02	4.02E+02
			133E, 12N	6.94E+02	2.35E+03	134E, 12N	8.66E+02	3.55E+03	135E, 12N	5.06E+02	1.04E+03			
						134E, 11N	3.68E+02	8.17E+01						

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 11
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
139E, 15N	2.78E+02	<BKG	140E, 15N	4.93E+02	9.53E+02			
139E, 14N	4.35E+02	5.49E+02	140E, 14N	9.96E+02	4.46E+03	141E, 14N	5.11E+02	1.08E+03
139E, 13N	5.97E+02	1.68E+03	140E, 13N	5.49E+02	1.34E+03	141E, 13N	4.40E+02	5.84E+02

Notes:

*Raw 1 cm data from 15 second counts.

Average background (a) 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
166E, 66N	6.85E+02	2.56E+02	167E, 66N	6.80E+02	2.36E+02	168E, 66N	5.75E+02	<BKG	169E, 66N	6.29E+02	3.20E+01	170E, 66N	4.62E+03	2.97E+04
166E, 65N	8.12E+02	7.64E+02	167E, 65N	6.54E+02	1.32E+02	168E, 65N	7.46E+02	5.00E+02	169E, 65N	7.54E+02	5.32E+02	170E, 65N	1.08E+03	5.05E+03
166E, 64N	4.94E+02	9.60E+02	167E, 64N	7.83E+02	6.48E+02	168E, 64N	6.63E+02	1.68E+02	**169E, 64N	6.20E+02	1.84E+03	170E, 64N	5.82E+02	1.57E+03
166E, 63N	5.47E+02	1.33E+03	167E, 63N	5.92E+02	1.64E+03	168E, 63N	6.54E+02	2.08E+03	169E, 63N	1.14E+03	5.46E+03	170E, 63N	1.26E+03	6.30E+03
166E, 62N	7.43E+02	2.70E+03	167E, 62N	6.89E+02	2.32E+03	168E, 62N	8.92E+02	3.74E+03	169E, 62N	1.38E+03	7.14E+03	170E, 62N	1.52E+03	8.11E+03
166E, 61N	5.73E+02	1.51E+03	167E, 61N	5.91E+02	1.64E+03	168E, 61N	6.98E+02	2.38E+03	169E, 61N	1.43E+03	7.49E+03	170E, 61N	1.69E+03	9.30E+03
166E, 60N	4.02E+02	3.19E+02	167E, 60N	4.85E+02	8.97E+02	168E, 60N	6.70E+02	2.19E+03	169E, 60N	1.05E+03	4.84E+03	170E, 60N	1.08E+03	5.05E+03

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
171E, 66N	4.36E+02	5.56E+02	172E, 66N	4.32E+02	5.28E+02	173E, 66N	4.45E+02	6.19E+02	174E, 66N	5.03E+02	1.02E+03	175E, 66N	5.08E+02	1.06E+03
171E, 65N	1.17E+03	5.67E+03	172E, 65N	9.11E+02	3.87E+03	173E, 65N	7.84E+02	2.98E+03	174E, 65N	1.12E+03	5.32E+03	175E, 65N	1.10E+03	5.19E+03
171E, 64N	6.59E+03	4.35E+04	172E, 64N	8.41E+02	3.38E+03	173E, 64N	1.48E+03	7.83E+03	174E, 64N	1.65E+03	9.02E+03	175E, 64N	6.63E+02	2.14E+03
171E, 63N	1.21E+03	5.95E+03	172E, 63N	1.11E+03	5.25E+03	173E, 63N	9.65E+02	4.24E+03	174E, 63N	7.67E+02	2.86E+03	175E, 63N	9.40E+02	4.07E+03
171E, 62N	1.14E+03	5.46E+03	172E, 62N	1.05E+03	4.84E+03	173E, 62N	1.06E+03	4.91E+03	174E, 62N	9.14E+02	3.89E+03	175E, 62N	1.01E+03	4.56E+03
171E, 61N	8.54E+02	3.47E+03	172E, 61N	8.85E+02	3.69E+03	173E, 61N	6.35E+02	1.94E+03	174E, 61N	5.69E+02	1.48E+03	175E, 61N	6.40E+02	1.98E+03
171E, 60N	5.58E+02	1.41E+03	172E, 60N	5.44E+02	1.31E+03	173E, 60N	5.12E+02	1.09E+03	174E, 60N	4.37E+03	2.80E+04	175E, 60N	4.57E+02	7.02E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > background + 2 standard deviations.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
176E, 66N	7.96E+02	7.00E+02	177E, 66N	9.22E+02	1.20E+03	178E, 66N	8.04E+02	7.32E+02			
176E, 65N	1.48E+03	3.44E+03	177E, 65N	1.48E+03	3.44E+03	178E, 65N	1.19E+03	2.28E+03	179E, 65N	7.31E+02	4.40E+02
176E, 64N	1.80E+03	4.72E+03	177E, 64N	1.49E+03	3.48E+03	178E, 64N	9.62E+02	1.36E+03			
176E, 63N	1.33E+03	2.84E+03	177E, 63N	1.23E+03	2.44E+03	178E, 63N	7.89E+02	6.72E+02			
176E, 62N	1.31E+03	2.76E+03	177E, 62N	1.09E+03	1.88E+03	178E, 62N	8.10E+02	7.56E+02			
176E, 61N	8.53E+03	3.16E+04	177E, 61N	8.46E+02	9.00E+02	178E, 61N	6.74E+02	2.12E+02			
176E, 60N	7.70E+03	2.83E+04	177E, 60N	8.04E+02	7.32E+02	178E, 60N	6.92E+02	2.84E+02			

Notes:
*Raw 1 cm data from 15 second counts.
**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > background + 2 standard deviations.

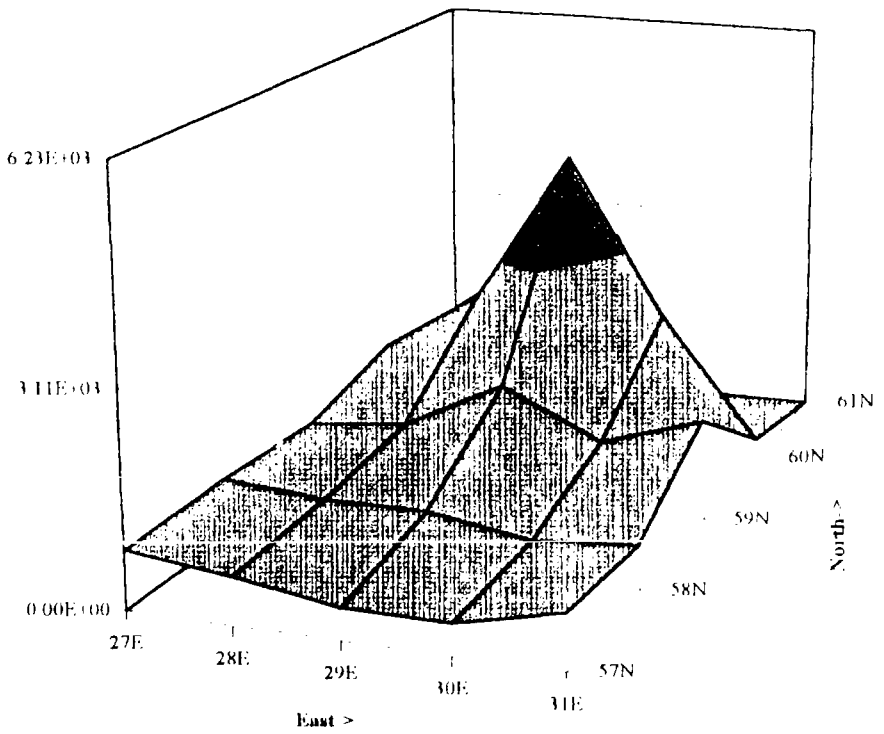
Special readings taken along eastern guardrail south of Area 12 (Same footnotes above apply).

Location	*1 cm	Net CPM
180E, 18E	6.44E+02	9.20E+01
180E, 0N	6.56E+02	1.40E+02

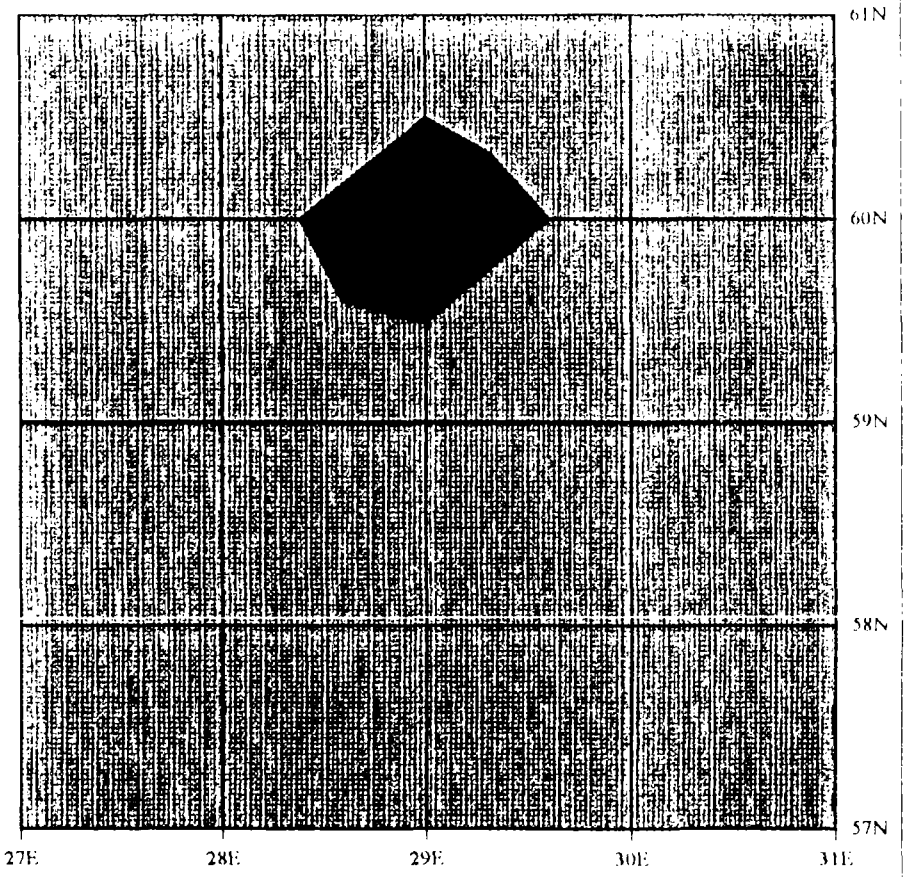
APPENDIX E2

DETAILED SURVEY DATA MAPS FOR AREAS 1-12

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 1
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



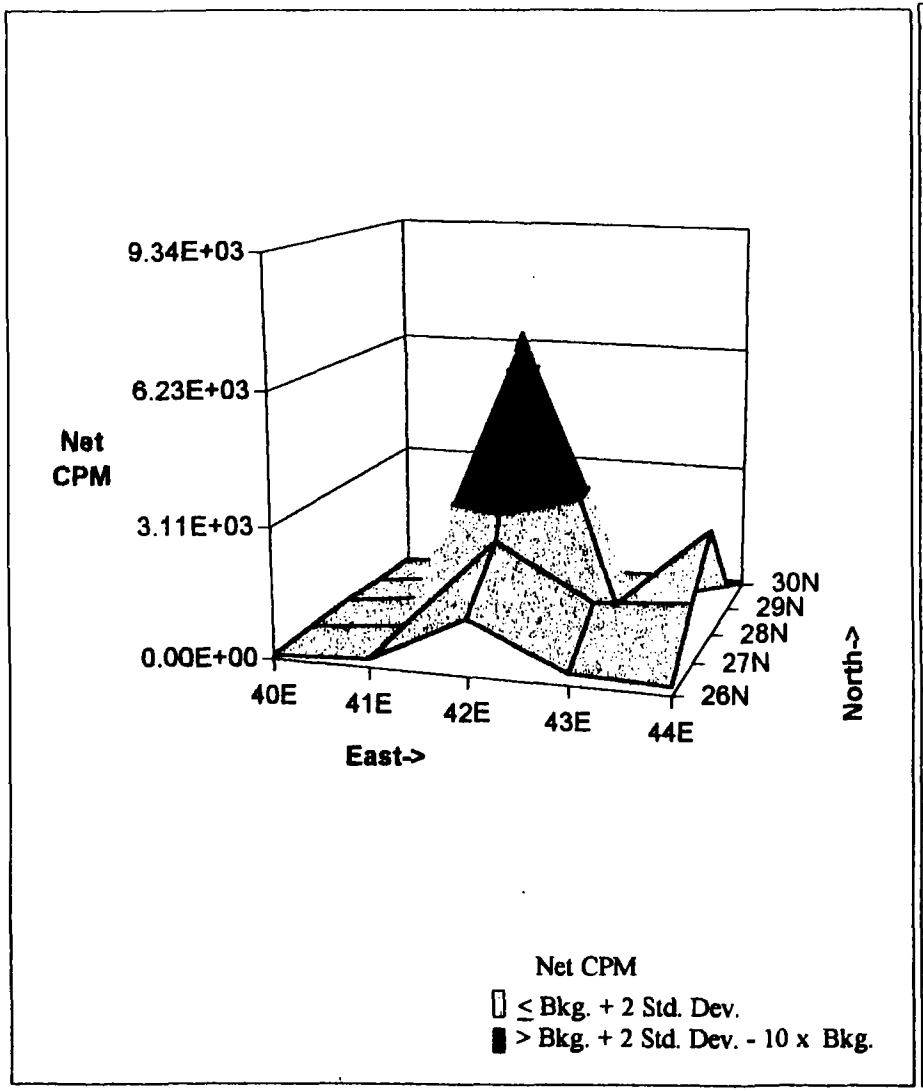
Net CPM
≤ Bkg. + 2 Std. Dev.
> Bkg. + 2 Std. Dev. - 10 x Bkg.

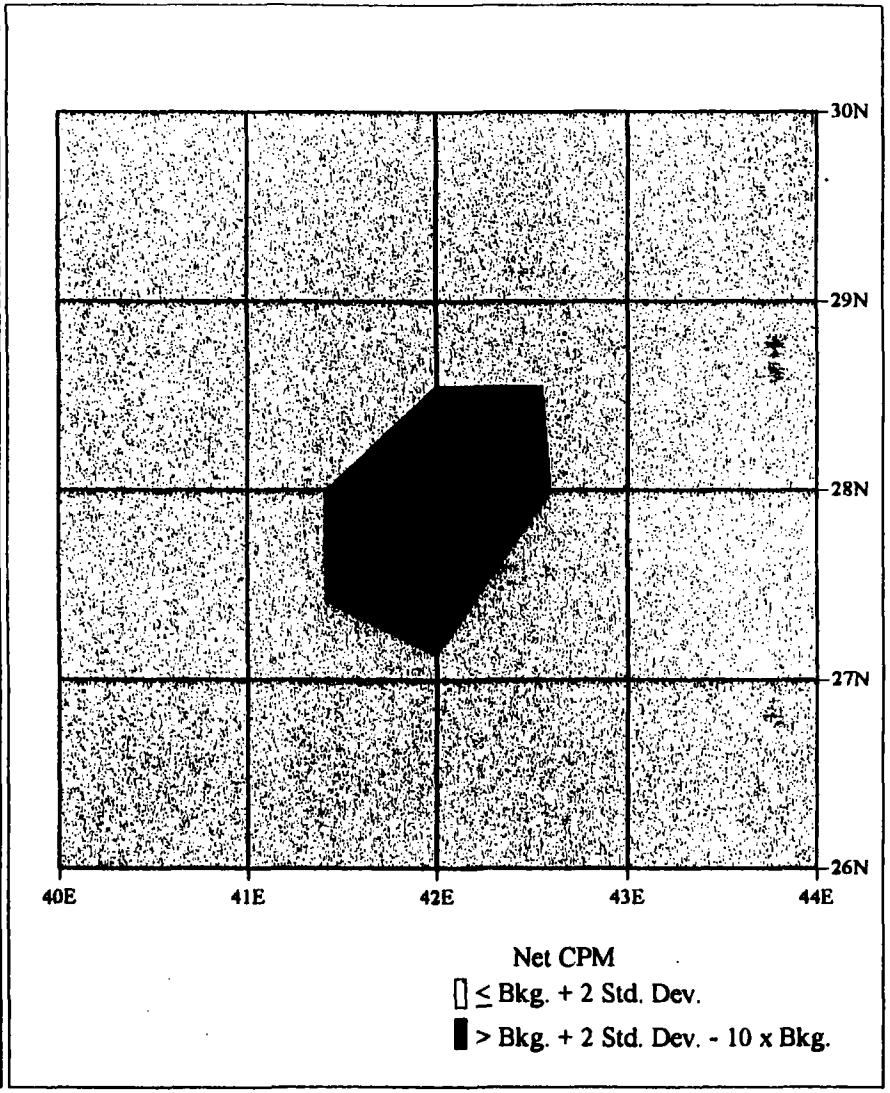


Net CPM
≤ Bkg. + 2 Std. Dev.
> Bkg. + 2 Std. Dev. - 10 x Bkg.

*[illegible] 8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 2
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; Background + 2 Standard Deviations = 3114 CPM

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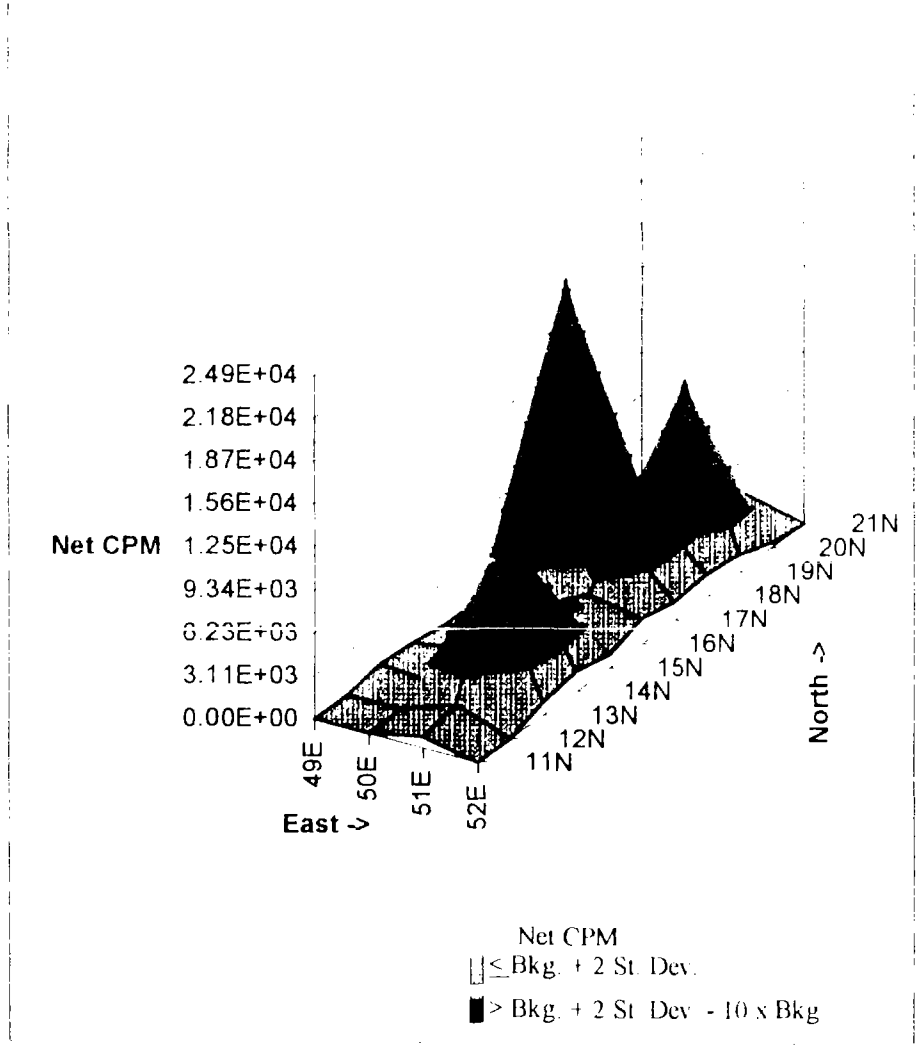
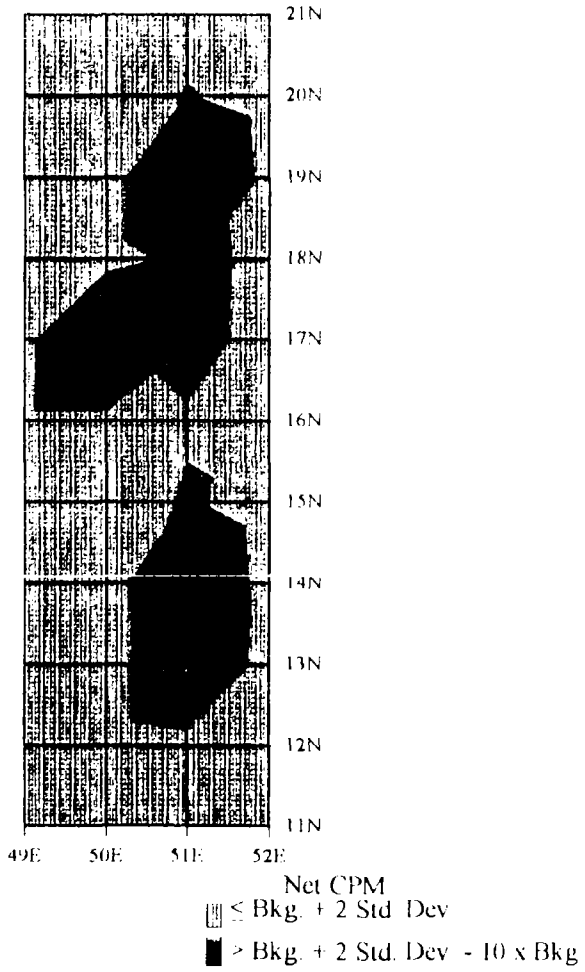
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 3
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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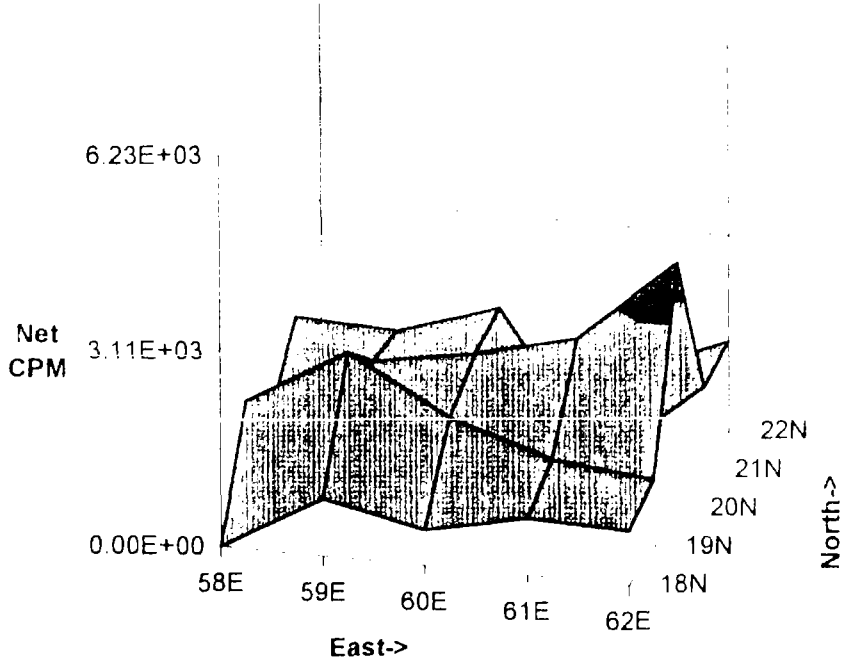
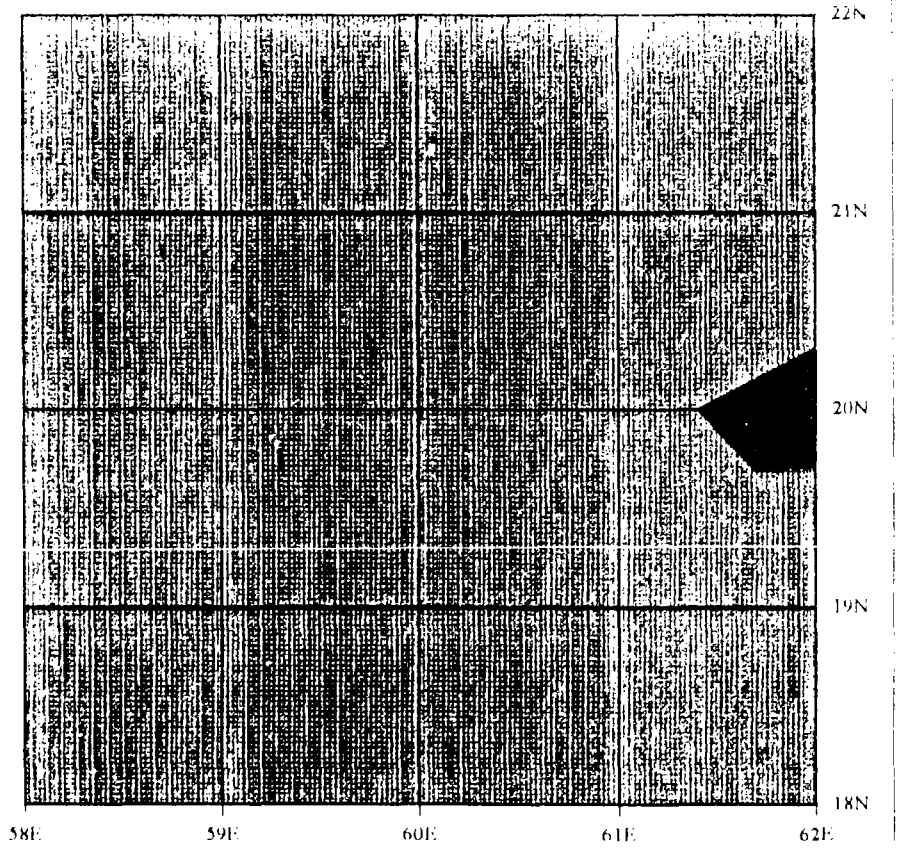
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 4
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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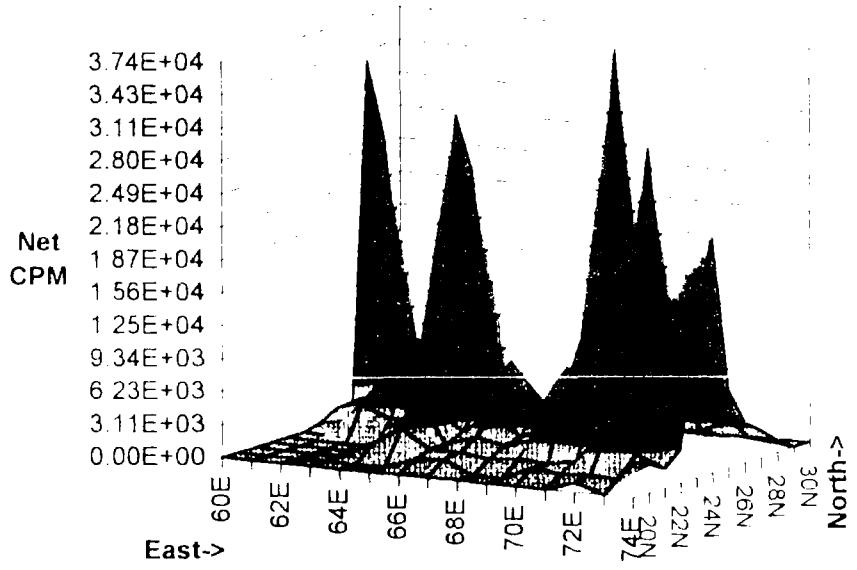
Lindsay Light II Site

Detailed Overland Gamma Survey - Area 5

One (1) Meter Grid, Net CPM @ 1 cm Above Grade*

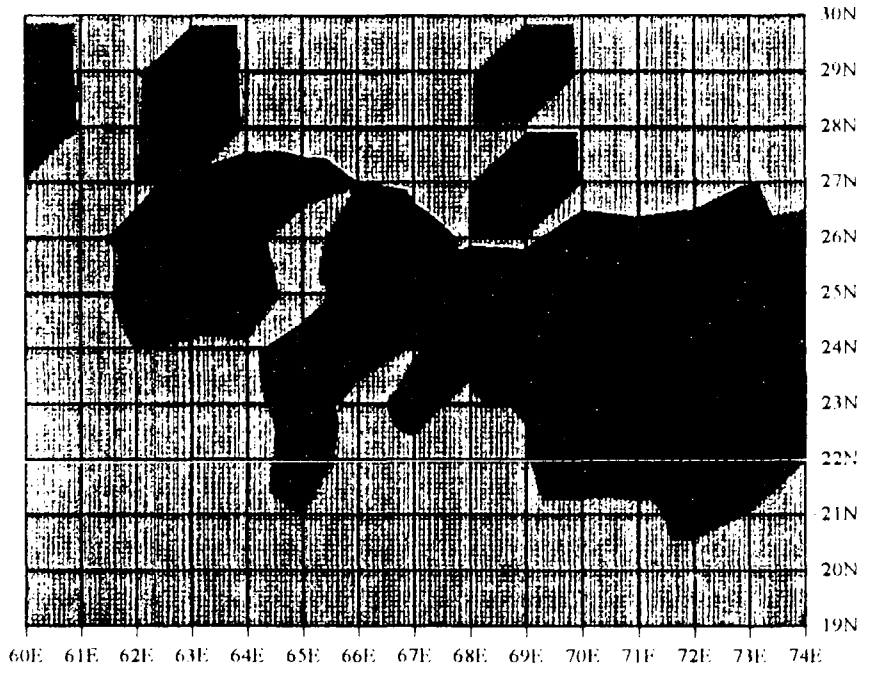


Net CPM

< Bkg + 2 Std Dev

> Bkg + 2 Std. Dev. - 10 x Bkg.

> 10 x Bkg.



Net CPM

< Bkg + 2 Std Dev

> Bkg + 2 Std Dev - 10 x Bkg

> 10 x Bkg

*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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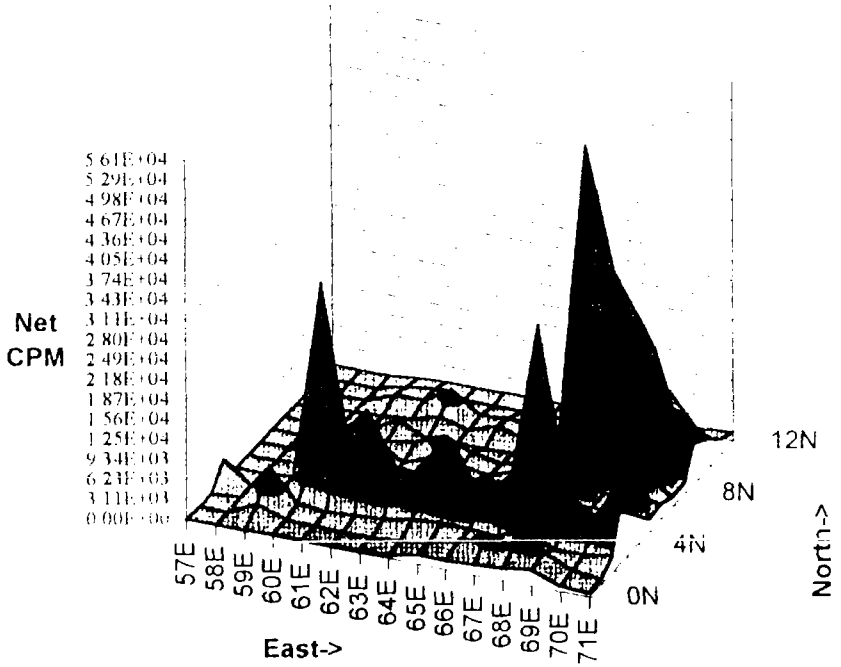
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Net CPM

- ≤ Bkg. + 2 Std. Dev
- > Bkg. + 2 Std. Dev - 10 x Bkg
- > 10 x Bkg - 20 x Bkg
- 20 x Bkg

Net CPM

- < Bkg + 2 Std. Dev.
- > Bkg + 2 Std. Dev. - 10 x Bkg
- > 10 x Bkg - 20 x Bkg
- > 20 x Bkg

*Background = 2484 CPM Background + 2 Standard Deviations = 9114 CPM

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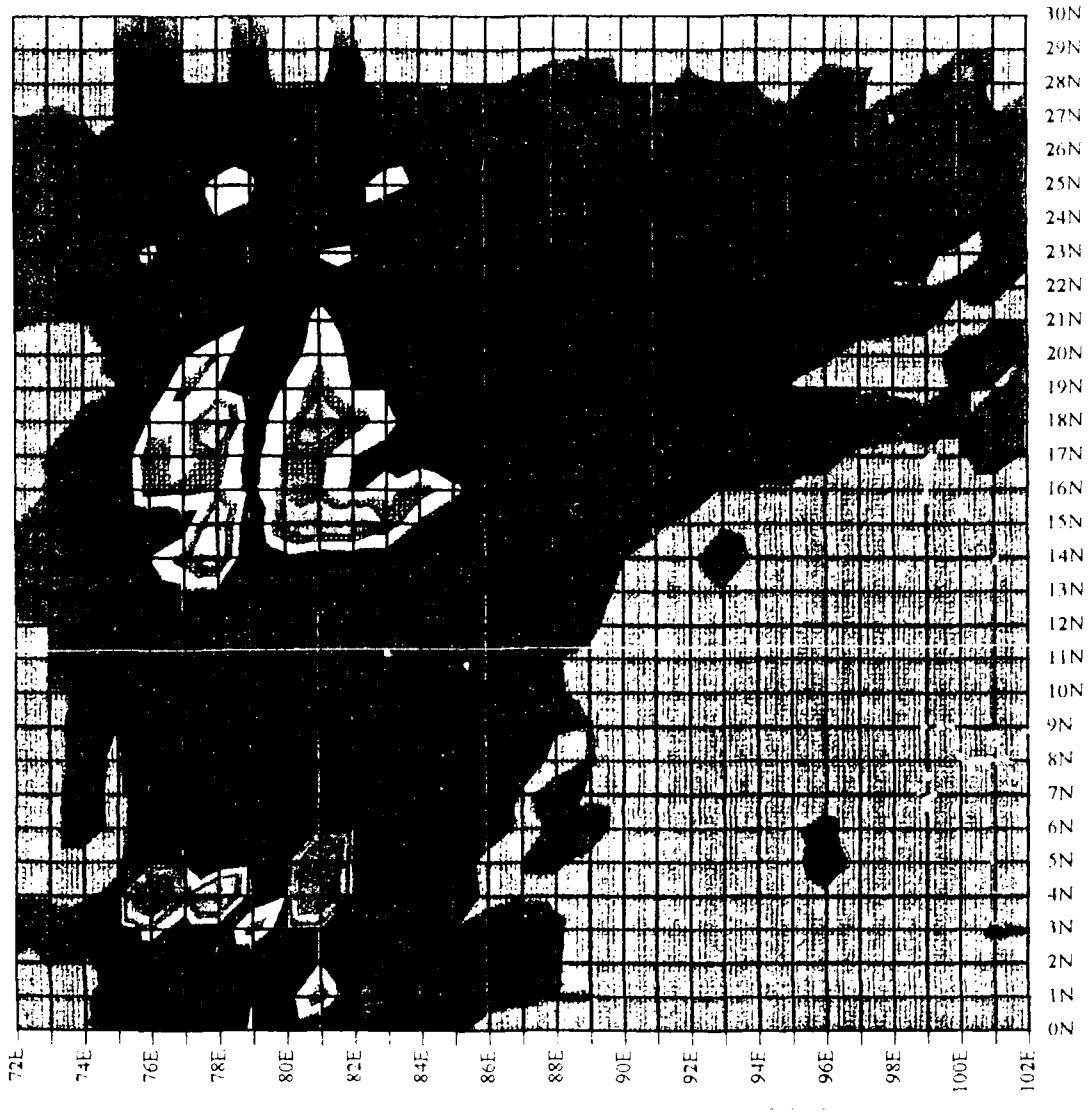
Lindsay Light II Site
Detailed Overland Gamma Survey -Area 7
One (1) Meter Grid, Net CPM *at* 1 cm Above Grade*



Net CPM

- ± Bkg + 2 Std Dev
- + Bkg + 2 Std Dev - 10 x Bkg
- + 10 x Bkg - 20 x Bkg
- + 20 x Bkg - 30 x Bkg
- + 30 x Bkg - 40 x Bkg
- + 40 x Bkg - 50 x Bkg
- + 50 x Bkg - 100 x Bkg
- + 100 x Bkg

*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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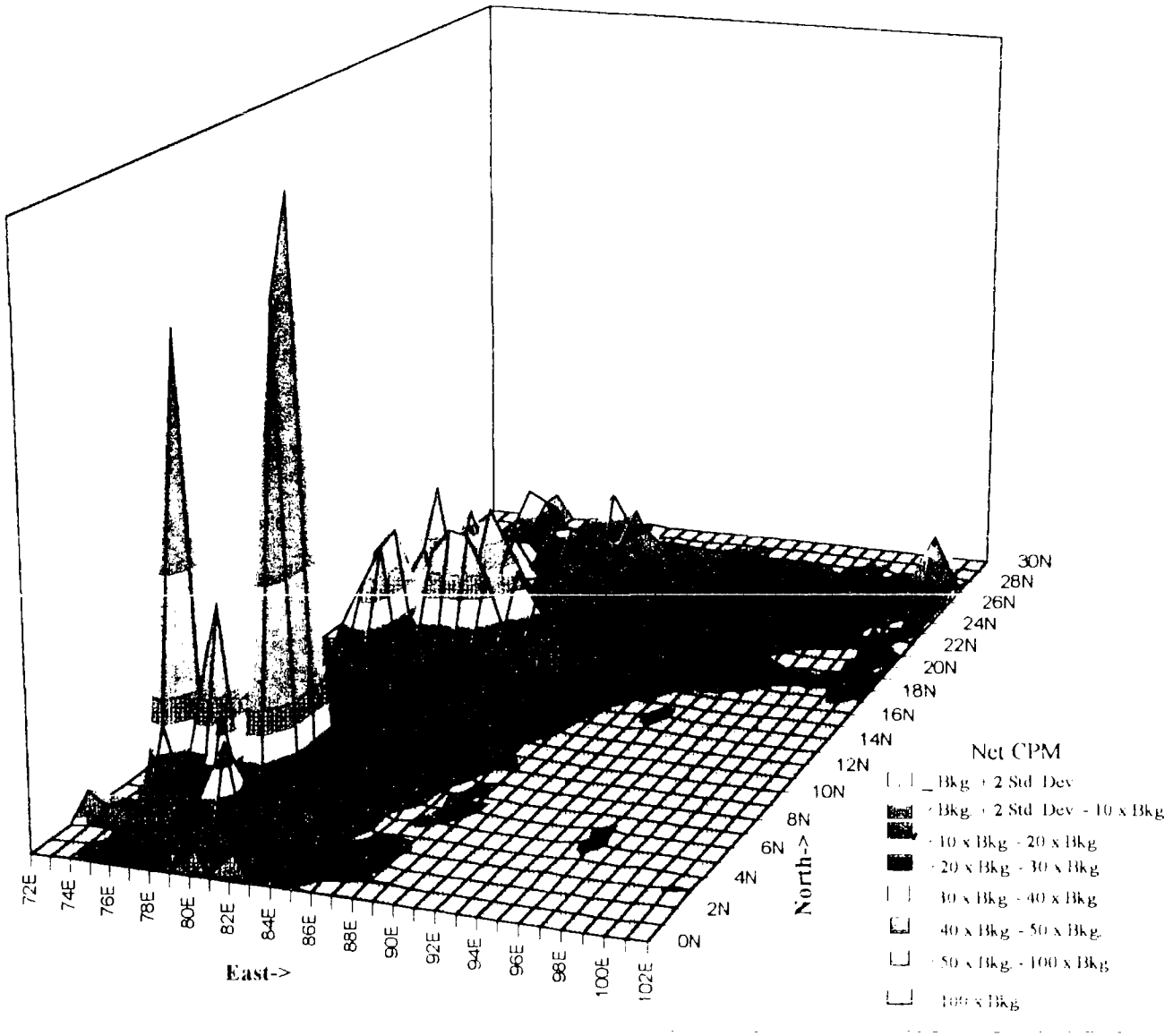
Lindsay Light II Site

Detailed Overland Gamma Survey - Area 7

One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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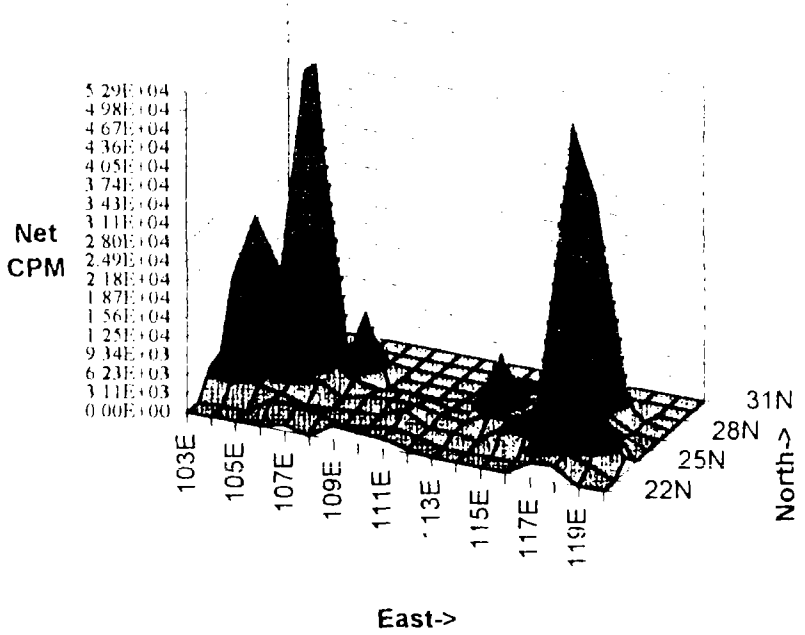
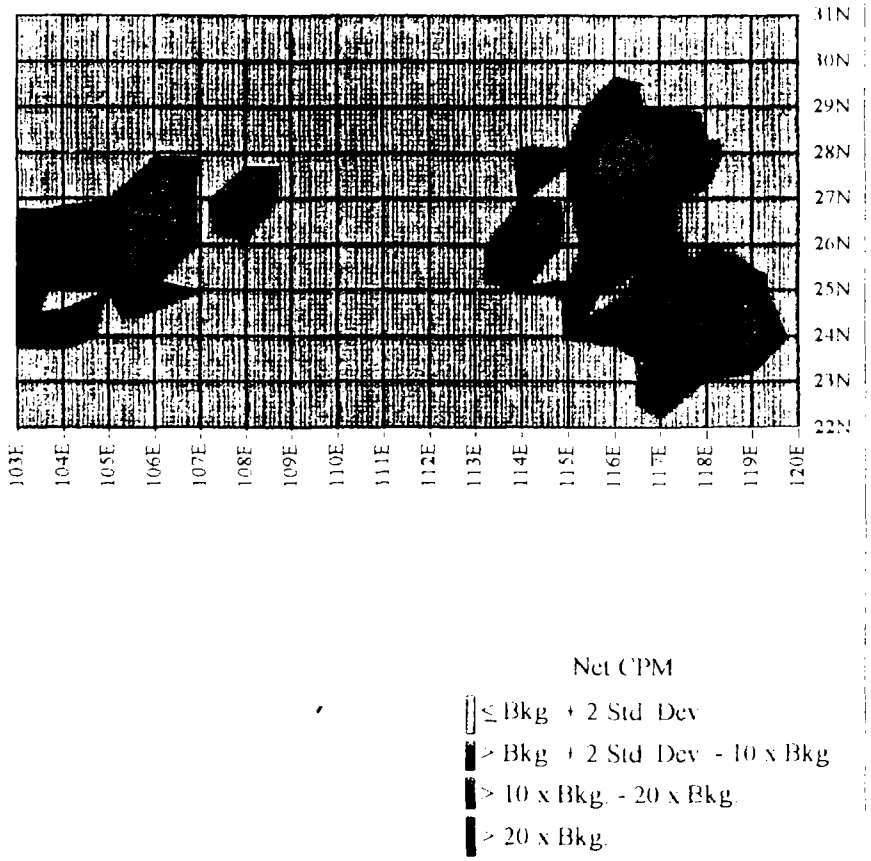
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Devia s = 3114 CPM

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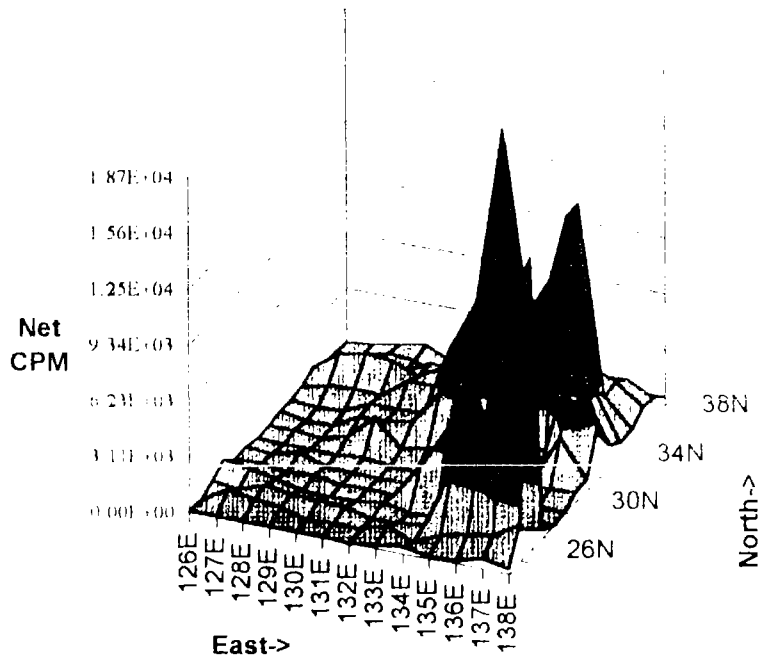
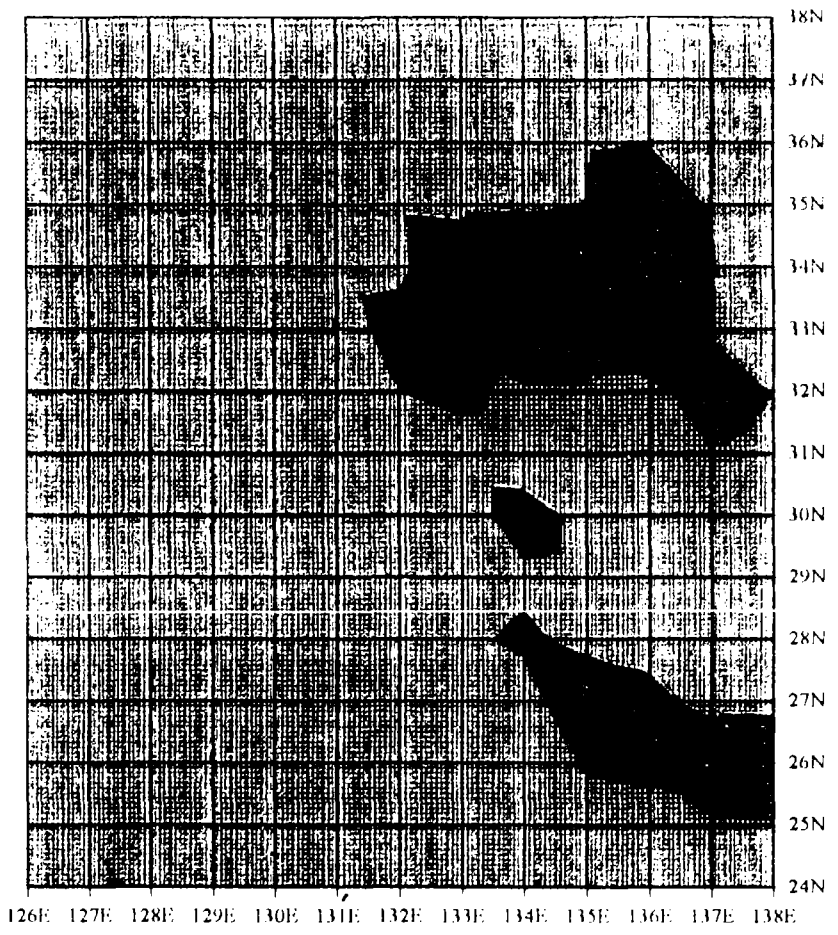
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Net CPM
≤ Bkg. + 2 Std. Dev.
> Bkg. + 2 Std. Dev. - 10 x Bkg.



Net CPM
≤ Bkg + 2 Std Dev
> Bkg + 2 Std Dev - 10 x Bkg

*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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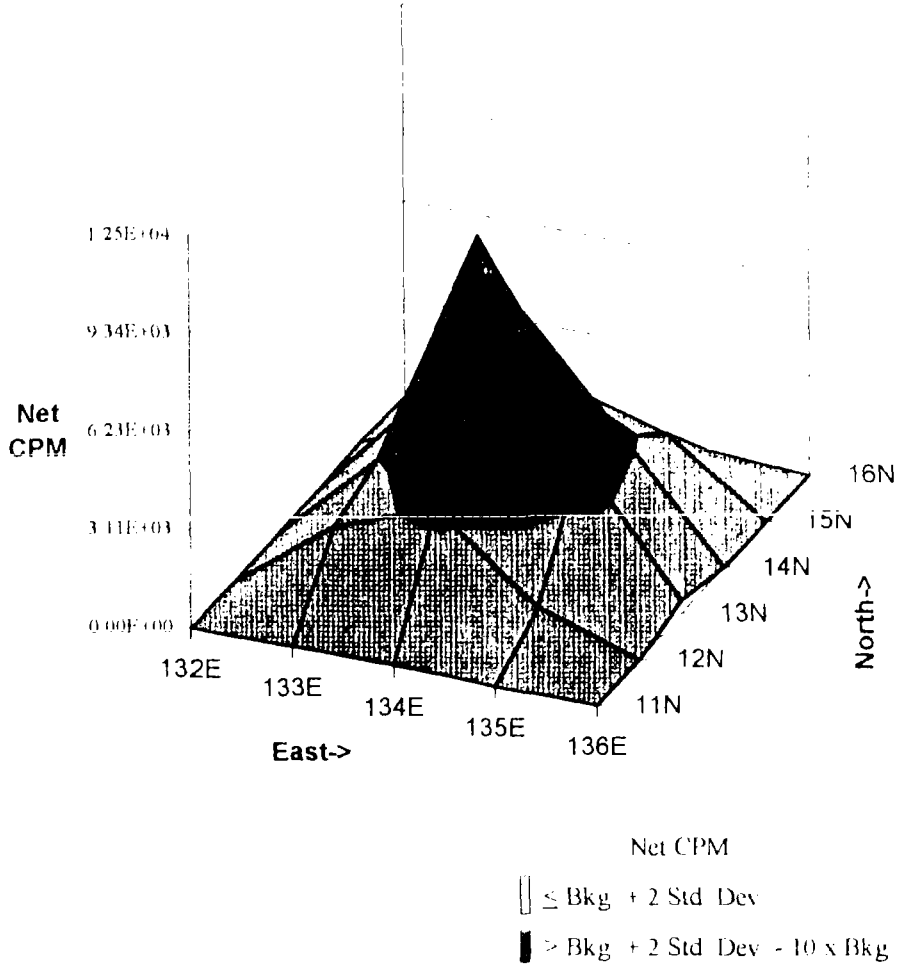
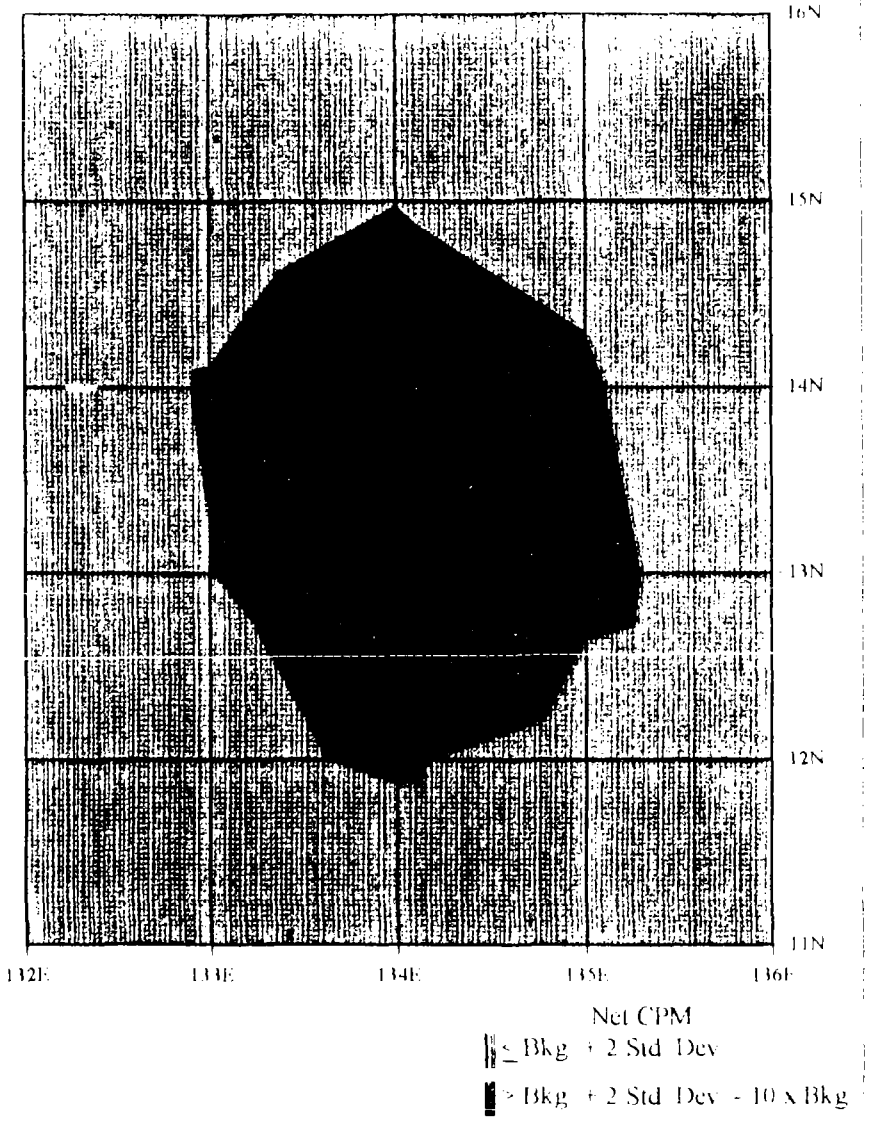
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 10
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Deviations = 4134 CPM

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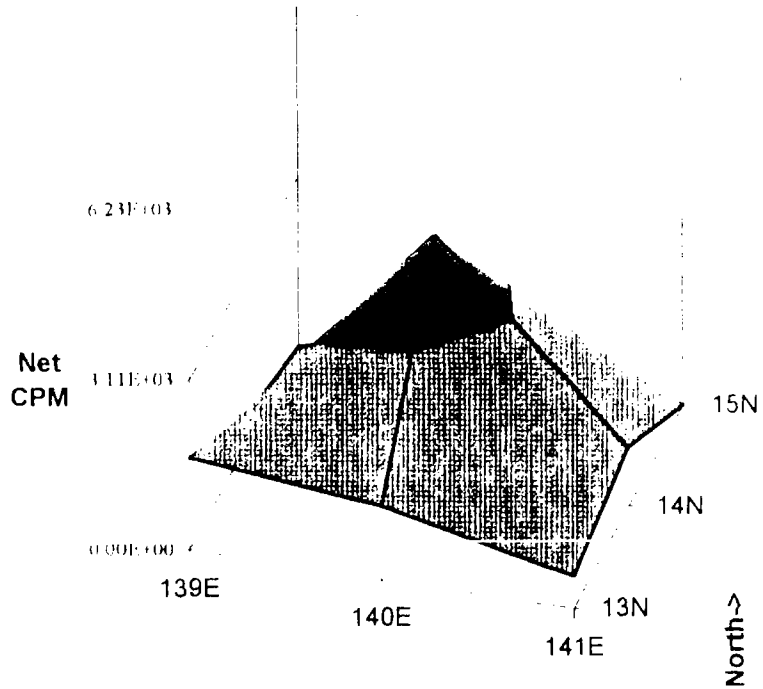
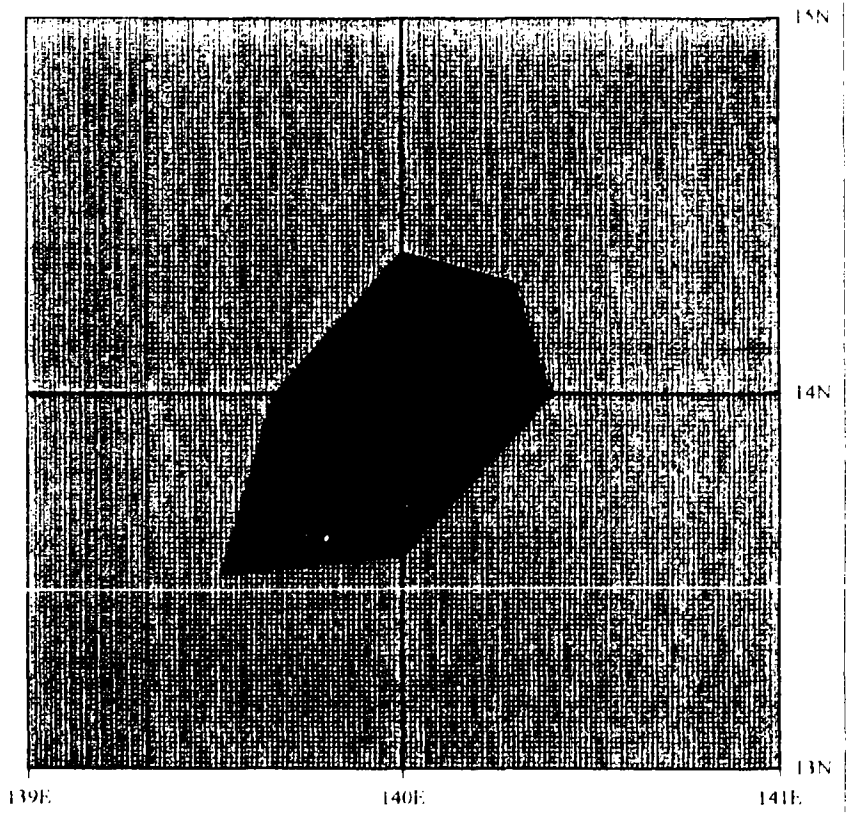
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 11
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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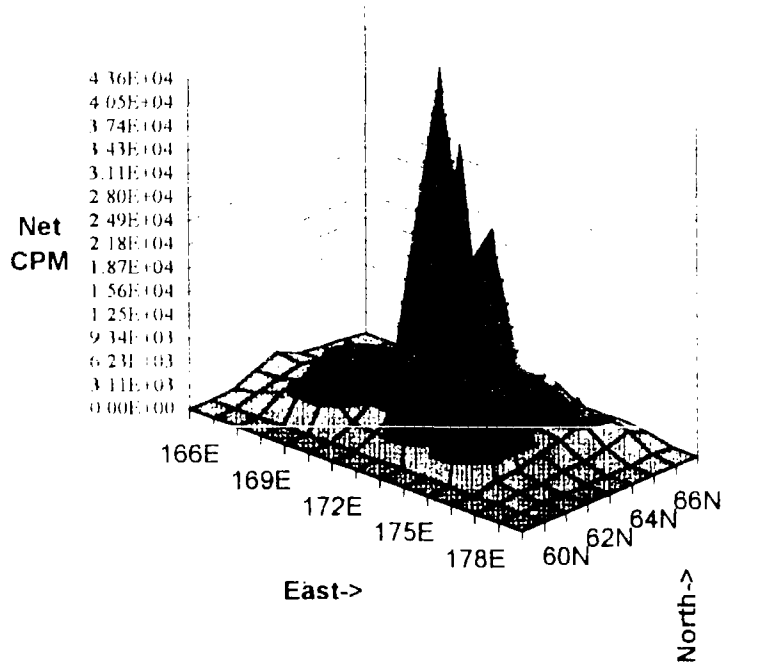
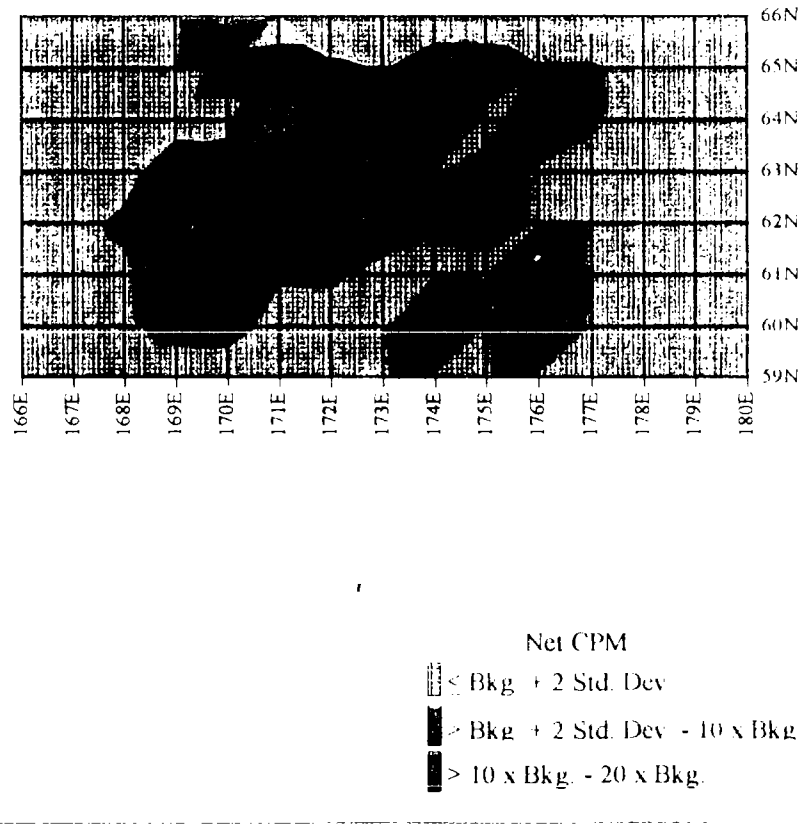
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM, Background + 2 Standard Deviations = 3114 CPM

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APPENDIX F

DETAILED SURVEY DATA COMPARED TO THREE TIMES BACKGROUND

APPENDIX F1

DETAILED SURVEY DATA - RAW AND CORRECTED NET CPM

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 1
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
27E, 61N	1.76E+03	1.04E+03	28E, 61N	2.32E+03	2.16E+03	29E, 61N	2.06E+03	1.64E+03	30E, 61N	1.03E+03	<BKG	31E, 61N	1.25E+03	1.60E+01
27E, 60N	1.84E+03	1.20E+03	28E, 60N	2.33E+03	2.18E+03	29E, 60N	3.52E+03	4.56E+03	30E, 60N	2.31E+03	2.14E+03	31E, 60N	1.39E+03	2.96E+02
27E, 59N	1.64E+03	7.96E+02	28E, 59N	1.72E+03	9.56E+02	29E, 59N	2.10E+03	1.72E+03	30E, 59N	1.75E+03	1.02E+03	31E, 59N	1.99E+03	1.50E+03
27E, 58N	1.69E+03	8.96E+02	28E, 58N	1.62E+03	7.56E+02	29E, 58N	1.63E+03	7.76E+02	30E, 58N	1.51E+03	5.36E+02	31E, 58N	1.57E+03	6.56E+02
27E, 57N	1.67E+03	8.56E+02	28E, 57N	1.59E+03	6.96E+02	29E, 57N	1.47E+03	4.56E+02	30E, 57N	1.47E+03	4.56E+02	31E, 57N	1.64E+03	7.96E+02

Notes:
*Raw 1 cm data from 30 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 2
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
40E, 30N	1.20E+03	<BKG	41E, 30N	1.28E+03	7.60E+01	42E, 30N	1.20E+03	<BKG	43E, 30N	1.29E+03	9.60E+01	44E, 30N	1.28E+03	7.60E+01
40E, 29N	1.25E+03	1.60E+01	41E, 29N	1.36E+03	2.36E+02	42E, 29N	1.27E+03	5.60E+01	43E, 29N	1.24E+03	<BKG	44E, 29N	1.53E+03	5.76E+02
40E, 28N	1.29E+03	9.60E+01	41E, 28N	1.43E+03	3.76E+02	42E, 28N	4.79E+03	7.10E+03	43E, 28N	1.53E+03	5.76E+02	44E, 28N	2.53E+03	2.58E+03
40E, 27N	1.30E+03	1.16E+02	41E, 27N	1.39E+03	2.96E+02	42E, 27N	2.51E+03	2.54E+03	43E, 27N	1.86E+03	1.24E+03	44E, 27N	1.96E+03	1.44E+03
40E, 26N	1.29E+03	9.60E+01	41E, 26N	1.34E+03	1.96E+02	42E, 26N	1.91E+03	1.34E+03	43E, 26N	1.38E+03	2.76E+02	44E, 26N	1.34E+03	1.96E+02

Notes:

*Raw 1 cm data from 30 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 3
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
			50E, 21N	5.57E+02	<BKG	51E, 21N	8.87E+02	1.06E+03			
			50E, 20N	5.83E+02	<BKG	51E, 20N	1.50E+03	3.52E+03	52E, 20N	7.14E+02	3.72E+02
			50E, 19N	6.34E+02	5.20E+01	51E, 19N	3.84E+03	1.29E+04	52E, 19N	9.42E+02	1.28E+03
			50E, 18N	6.48E+02	1.08E+02	51E, 18N	1.89E+03	5.08E+03	52E, 18N	1.02E+03	1.60E+03
			50E, 17N	6.26E+03	2.26E+04	51E, 17N	1.87E+03	5.00E+03	52E, 17N	9.53E+02	1.33E+03
49E, 15N	6.12E+02	<BKG	50E, 15N	6.10E+02	<BKG	51E, 16N	1.26E+03	2.56E+03	52E, 16N	1.09E+03	1.88E+03
49E, 14N	7.11E+02	3.60E+02	50E, 14N	8.74E+02	1.01E+03	51E, 15N	1.55E+03	3.72E+03	52E, 15N	8.59E+02	9.52E+02
49E, 13N	7.59E+02	5.52E+02	50E, 13N	6.84E+02	2.52E+02	51E, 14N	2.84E+03	8.88E+03	52E, 14N	9.95E-02	1.50E+03
			50E, 12N	6.49E+02	1.12E+02	51E, 13N	3.06E+03	9.76E+03	52E, 13N	8.62E+02	9.64E+02
						51E, 12N	9.90E+02	1.48E+03			
						51E, 11N	8.33E+02	8.48E+02			

Notes:
*Raw 1 cm data from 15 second counts.
Average background *(a)* 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 4
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
58E, 22N	6.78E+02	2.28E+02	59E, 22N	7.36E+02	4.60E+02	60E, 22N	7.07E+02	3.44E+02	61E, 22N	8.19E+02	7.92E+02	62E, 22N	9.79E+02	1.43E+03
58E, 21N	1.08E+03	1.84E+03	59E, 21N	1.06E+03	1.76E+03	60E, 21N	1.19E+03	2.28E+03				62E, 21N	9.50E+02	1.32E+03
58E, 20N	8.61E+02	9.60E+02	59E, 20N	1.09E+03	1.88E+03	60E, 20N	1.16E+03	2.16E+03	61E, 20N	5.04E+03	2.56E+03	62E, 20N	1.60E+03	3.92E+03
58E, 19N	1.05E+03	1.72E+03	59E, 19N	1.28E+03	2.64E+03	60E, 19N	1.06E+03	1.76E+03	61E, 19N	3.72E+03	1.24E+03	62E, 19N	8.85E+02	1.06E+03
			59E, 18N	8.48E+02	9.08E+02	60E, 18N	7.61E+02	5.60E+02	61E, 18N	3.38E+03	1.24E+03	62E, 18N	8.35E+02	8.56E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
60E, 30N	6.37E+02	6.40E+01	61E, 30N	7.05E+02	3.36E+02	62E, 30N	7.03E+02	3.28E+02			
60E, 29N	6.99E+03	2.55E+04	61E, 29N	7.57E+02	5.44E+02	62E, 29N	6.79E+02	2.32E+02	63E, 29N	6.46E+03	2.41E+04
60E, 28N	8.90E+03	3.31E+04	61E, 28N	1.02E+03	1.60E+03	62E, 28N	8.18E+02	7.88E+02	63E, 28N	7.82E+03	2.88E+04
60E, 27N	1.00E+03	1.52E+03	61E, 27N	1.27E+03	2.60E+03	62E, 27N	1.22E+03	2.40E+03	63E, 27N	1.71E+03	4.36E+03
60E, 26N	9.55E+02	1.34E+03	61E, 26N	1.21E+03	2.36E+03	62E, 26N	1.63E+03	4.04E+03	63E, 26N	1.91E+03	5.16E+03
60E, 25N	7.21E+02	4.00E+02	61E, 25N	8.50E+02	9.16E+02	62E, 25N	1.80E+03	4.72E+03	63E, 25N	2.57E+03	7.80E+03
						62E, 24N	1.42E+03	3.20E+03	63E, 24N	1.15E+03	2.12E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background (a) 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
64E, 29N	6.77E+02	2.24E+02	65E, 29N	6.66E+02	1.80E+02				67E, 29N	6.94E+02	2.92E+02
64E, 28N	8.21E+02	8.00E+02	65E, 28N	9.01E+02	1.12E+03	66E, 28N	7.81E+02	6.40E+02	67E, 28N	7.97E+02	7.04E+02
64E, 27N	2.19E+03	6.28E+03	65E, 27N	1.93E+03	5.24E+03	66E, 27N	1.44E+03	3.28E+03	67E, 27N	1.28E+03	2.64E+03
64E, 26N	1.87E+03	5.00E+03	65E, 26N	1.78E+03	4.64E+03	66E, 26N	2.48E+03	7.44E+03	67E, 26N	1.66E+03	4.16E+03
64E, 25N	2.15E+03	6.12E+03	65E, 25N	1.94E+03	5.28E+03	66E, 25N	1.86E+03	4.96E+03	67E, 25N	1.61E+03	3.96E+03
64E, 24N	1.23E+03	2.44E+03	65E, 24N	1.41E+03	3.16E+03	66E, 24N	1.72E+03	4.40E+03	67E, 24N	1.36E+03	2.96E+03
64E, 23N	1.19E+03	2.28E+03	65E, 23N	1.45E+03	3.32E+03	66E, 23N	1.14E+03	2.08E+03	67E, 23N	1.64E+03	4.08E+03
64E, 22N	9.54E+02	1.33E+03	65E, 22N	9.68E+02	1.39E+03	66E, 22N	9.94E+02	1.49E+03	67E, 22N	1.22E+03	2.40E+03
64E, 21N	9.95E+02	1.50E+03	65E, 21N	9.12E+02	1.16E+03	66E, 21N	9.89E+02	1.47E+03	67E, 21N	9.78E+02	1.43E+03
						66E 20N	8.61E+02	9.60E+02	67E, 20N	9.46E+02	1.30E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
68E, 29N	6.90E+02	2.76E+02	69E, 29N	7.32E+03	2.68E+04	70E, 29N	7.47E+02	5.04E+02	71E, 29N	7.19E+02	3.92E+02
68E, 28N	8.28E+02	8.28E+02	69E, 28N	8.28E+02	8.28E+02	70E, 28N	8.38E+02	8.68E+02	71E, 28N	8.75E+02	1.02E+03
68E, 27N	1.01E+03	1.56E+03	69E, 27N	9.88E+03	3.70E+04	70E, 27N	1.11E+03	1.96E+03	71E, 27N	1.03E+03	1.64E+03
68E, 26N	1.35E+03	2.92E+03	69E, 26N	1.32E+03	2.80E+03	70E, 26N	1.74E+03	4.48E+03	71E, 26N	1.67E+03	4.20E+03.
68E, 25N	1.83E+03	4.84E+03	69E, 25N	1.78E+03	4.64E+03	70E, 25N	1.73E+03	4.44E+03	71E, 25N	1.62E+03	4.00E+03
68E, 24N	1.64E+03	4.08E+03	69E, 24N	2.78E+03	8.64E+03	70E, 24N	2.45E+03	7.32E+03	71E, 24N	4.44E+03	1.53E+04
68E, 23N	1.19E+03	2.28E+03	69E, 23N	1.46E+03	3.36E+03	70E, 23N	3.53E+03	1.16E+04	71E, 23N	3.17E+03	1.02E+04
68E, 22N	1.09E+03	1.88E+03	69E, 22N	1.28E+03	2.64E+03	70E, 22N	2.41E+03	7.16E+03	71E, 22N	2.24E+03	6.48E+03
68E, 21N	9.02E+02	1.12E+03	69E, 21N	9.74E+02	1.41E+03	70E, 21N	9.29E+02	1.23E+03	71E, 21N	1.06E+03	1.76E+03
						70E, 20N	9.37E+02	1.26E+03	71E, 20N	8.78E+02	1.03E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
72E, 29N	7.71E+02	6.00E+02	73E, 29N	7.10E+02	3.56E+02			
72E, 28N	8.92E+02	1.08E+03	73E, 28N	9.30E+02	1.24E+03	74E, 28N	9.08E+02	1.15E+03
72E, 27N	1.12E+03	2.00E+03	73E, 27N	1.43E+03	3.24E+03	74E, 27N	1.27E+03	2.60E+03
72E, 26N	1.77E+03	4.60E+03	73E, 26N	1.50E+03	3.52E+03	74E, 26N	1.56E+03	3.76E+03
72E, 25N	2.13E+03	6.04E+03	73E, 25N	2.51E+03	7.56E+03	74E, 25N	2.43E+03	7.24E+03
72E, 24N	3.00E+03	9.52E+03	73E, 24N	3.60E+03	1.19E+04	74E, 24N	6.15E+03	2.21E+04
72E, 23N	4.48E+03	1.54E+04	73E, 23N	4.66E+03	1.62E+04	74E, 23N	4.42E+03	1.52E+04
72E, 22N	2.28E+03	6.64E+03	73E, 22N	2.43E+03	7.24E+03	74E, 22N	1.40E+03	3.12E+03
72E, 21N	1.75E+03	4.52E+03	73E, 21N	1.34E+03	2.88E+03	74E, 21N	1.07E+03	1.80E+03
72E, 20N	9.12E+02	1.16E+03	73E, 20N	8.57E+02	9.44E+02	74E, 20N	1.30E+03	2.72E+03
72E, 19N	8.41E+02	8.80E+02				74E, 19N	1.46E+03	3.36E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net cpm	Location	*1 cm	Net cpm	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									**60E 12N	7.24E+02	4.12E+02	**61E 12N	8.06E+02	7.38E+02
						**59E, 11N	6.91E+02	2.80E+02	**60E 11N	8.93E+02	1.09E+03	**61E 11N	1.02E+03	1.59E+03
						**59E, 10N	7.53E+02	5.26E+02	**60E 10N	1.08E+03	1.82E+03	**61E 10N	1.08E+03	1.84E+03
						**59E, 9N	7.18E+02	3.88E+02	**60E 9N	7.89E+02	6.72E+02	**61E 9N	8.36E+02	8.60E+02
						**59E, 8N	6.98E+02	3.08E+02	**60E 8N	7.93E+02	6.86E+02	**61E 8N	1.31E+03	2.74E+03
						59E, 7N	7.18E+02	3.88E+02	60E, 7N	7.40E+02	4.76E+02	**61E 7N	1.02E+03	1.61E+03
						59E, 6N	7.38E+02	4.68E+02	60E, 6N	9.90E+02	1.48E+03	61E, 6N	1.62E+03	4.00E+03
						59E, 5N	7.06E+02	3.40E+02	60E, 5N	1.00E+03	1.52E+03	61E, 5N	2.20E+03	6.32E+03
						59E, 4N	7.48E+02	5.08E+02	60E, 4N	8.50E+03	3.15E+04	61E, 4N	1.81E+03	4.76E+03
57E, 3N	1.46E+03	3.36E+03				59E, 3N	2.09E+03	5.88E+03	60E, 3N	2.04E+03	5.68E+03	61E, 3N	3.13E+03	1.00E+04
			58E, 2N	7.20E+02	3.96E+02	59E, 2N	1.17E+03	2.20E+03	60E, 2N	9.20E+02	1.20E+03	61E, 2N	7.92E+02	6.84E+02
						59E, 1N	7.61E+02	5.60E+02	60E, 1N	7.76E+02	6.20E+02	61E, 1N	7.44E+02	4.92E+02
									60E, 0N	7.04E+02	3.32E+02	61E, 0N	7.19E+02	3.92E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
**62E, 12N	7.89E+02	6.72E+02	**63E, 12N	8.15E+02	7.74E+02	64E, 12N	8.04E+02	7.32E+02	65E, 12N	7.73E+02	6.08E+02	66E, 12N	7.85E+02	6.56E+02
**62E, 11N	8.30E+02	8.36E+02	**63E, 11N	8.09E+02	7.50E+02	**64E, 11N	7.79E+02	6.32E+02	**65E, 11N	7.96E+02	7.00E+02	66E, 11N	8.40E+02	8.76E+02
**62E, 10N	1.73E+03	4.44E+03	**63E, 10N	9.33E+02	1.25E+03	**64E, 10N	1.01E+03	1.55E+03	**65E 10N	8.56E+02	9.40E+02	66E, 10N	9.12E+02	1.16E+03
**62E, 9N	1.15E+03	2.12E+03	**63E, 9N	8.66E+02	9.78E+02	**64E, 9N	1.24E+03	2.46E+03	**65E, 9N	9.12E+02	1.16E+03	66E, 9N	9.44E+02	1.29E+03
**62E, 8N	8.00E+02	7.14E+02	**63E, 8N	8.63E+02	9.68E+02	**64E, 8N	8.64E+02	9.72E+02	**65E, 8N	8.79E+02	1.03E+03	66E, 8N	1.04E+03	1.68E+03
**62E, 7N	1.18E+03	2.22E+03	**63E, 7N	1.65E+03	4.12E+03	**64E, 7N	1.21E+03	2.36E+03	**65E, 7N	9.80E+02	1.43E+03	66E, 7N	1.23E+03	2.44E+03
62E, 6N	8.83E+02	1.05E+03	**63E, 6N	1.30E+03	2.70E+03	**64E, 6N	1.23E+03	2.44E+03	**65E, 6N	1.03E+03	1.62E+03	66E, 6N	1.39E+03	3.08E+03
62E, 5N	8.45E+02	8.96E+02	**63E, 5N	9.82E+02	1.44E+03	**64E, 5N	1.21E+03	2.36E+03	**65E, 5N	1.40E+03	3.10E+03	66E, 5N	1.47E+03	3.40E+03
62E, 4N	1.90E+03	5.12E+03	**63E, 4N	1.50E+03	3.50E+03	**64E, 4N	2.83E+03	8.84E+03	**65E, 4N	1.69E+03	4.28E+03	66E, 4N	1.40E+03	3.12E+03
62E, 3N	4.46E+03	1.54E+04	**63E, 3N	2.44E+03	7.28E+03	**64E, 3N	2.37E+03	6.98E+03	**65E, 3N	3.82E+03	1.28E+04	66E, 3N	1.84E+03	4.88E+03
62E, 2N	8.81E+02	1.04E+03	**63E, 2N	9.32E+02	1.24E+03	**64E, 2N	1.14E+03	2.08E+03	**65E, 2N	1.21E+03	2.34E+03	66E, 2N	1.18E+03	2.24E+03
62E, 1N	7.12E+02	3.64E+02	**63E, 1N	7.27E+02	4.24E+02	**64E, 1N	7.80E+02	6.34E+02	65E, 1N	9.30E+02	1.24E+03	66E, 1N	1.19E+03	2.28E+03
62E, 0N	6.82E+02	2.44E+02	63E, 0N	7.68E+02	5.88E+02	64E, 0N	7.17E+02	3.84E+02	65E, 0N	9.74E+02	1.41E+03	**66E 0N	9.62E+02	1.36E+03

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
67E, 12N	8.51E+02	9.20E+02	68E, 12N	8.68E+02	9.88E+02	69E, 12N	8.39E+02	8.72E+02	70E, 12N	8.91E+02	1.08E+03	71E, 12N	9.56E+02	1.34E+03
67E, 11N	7.98E+02	7.08E+02	68E, 11N	9.03E+02	1.13E+03	69E, 11N	9.12E+02	1.16E+03	70E, 11N	9.57E+02	1.34E+03	71E, 11N	1.19E+03	2.28E+03
67E, 10N	8.69E+02	9.92E+02	68E, 10N	9.13E+02	1.17E+03	69E, 10N	9.43E+02	1.29E+03	70E, 10N	1.12E+03	2.00E+03	71E, 10N	1.74E+03	4.48E+03
67E, 9N	9.74E+02	1.41E+03	68E, 9N	1.08E+03	1.84E+03	69E, 9N	1.31E+03	2.76E+03	70E, 9N	3.98E+03	1.34E+04	71E, 9N	2.65E+03	8.12E+03
67E, 8N	1.30E+03	2.72E+03	68E, 8N	2.17E+03	6.20E+03	69E, 8N	7.89E+03	2.91E+04	70E, 8N	5.98E+03	2.14E+04	71E, 8N	1.03E+03	1.64E+03
67E, 7N	2.61E+03	7.96E+03	68E, 7N	1.40E+04	5.35E+04	69E, 7N	9.32E+03	3.48E+04	70E, 7N	1.69E+03	4.28E+03	71E, 7N	9.65E+02	1.38E+03
67E, 6N	1.47E+03	3.40E+03	68E, 6N	3.88E+03	1.30E+04	69E, 6N	1.18E+03	2.24E+03	70E, 6N	1.45E+03	3.32E+03	71E, 6N	1.17E+03	2.20E+03
67E, 5N	1.47E+03	3.40E+03	68E, 5N	1.07E+03	1.80E+03	69E, 5N	1.17E+03	2.20E+03	70E, 5N	1.19E+03	2.28E+03	71E, 5N	1.10E+03	1.92E+03
67E, 4N	1.27E+03	2.60E+03	68E, 4N	1.20E+03	2.32E+03	69E, 4N	1.17E+03	2.20E+03	70E, 4N	1.05E+03	1.72E+03	71E, 4N	9.55E+03	3.57E+04
67E, 3N	2.44E+03	7.28E+03	68E, 3N	9.06E+03	3.38E+04	69E, 3N	2.66E+03	8.16E+03	70E, 3N	2.03E+03	5.64E+03	71E, 3N	3.77E+03	1.26E+04
67E, 2N	1.14E+03	2.08E+03	68E, 2N	1.51E+03	3.56E+03	69E, 2N	1.04E+03	1.68E+03	70E, 2N	1.04E+03	1.68E+03	71E, 2N	1.25E+03	2.52E+03
67E, 1N	1.57E+03	3.80E+03	68E, 1N	1.47E+03	3.40E+03	69E, 1N	1.45E+03	3.32E+03	70E, 1N	9.47E+02	1.30E+03	71E, 1N	8.18E+02	7.88E+02
67E, 0N	1.02E+03	1.60E+03	68E, 0N	1.09E+03	1.88E+03	69E, 0N	1.22E+03	2.40E+03	70E, 0N	8.30E+02	8.36E+02	71E, 0N	7.71E+02	6.00E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional readings taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
72E, 30N	2.95E+02	<BKG	73E, 30N	2.45E+02	<BKG	74E, 30N	4.52E+02	6.67E+02	75E, 30N	4.00E+02	3.05E+02	76E, 30N	4.57E+03	2.94E+04
72E, 29N	3.30E+02	<BKG	73E, 29N	4.13E+02	3.95E+02	74E, 29N	4.00E+02	3.05E+02	75E, 29N	4.49E+02	6.46E+02	76E, 29N	4.63E+03	2.98E+04
72E, 28N	4.30E+02	5.14E+02	73E, 28N	4.92E+02	9.46E+02	74E, 28N	5.02E+02	1.02E+03	75E, 28N	4.78E+02	8.49E+02	76E, 28N	5.23E+03	3.40E+04
72E, 27N	7.04E+02	2.42E+03	73E, 27N	9.90E+02	4.42E+03	74E, 27N	8.18E+02	3.22E+03	75E, 27N	5.88E+02	1.62E+03	76E, 27N	5.25E+03	3.41E+04
72E, 26N	1.22E+03	6.02E+03	73E, 26N	1.02E+03	4.63E+03	74E, 26N	1.01E+03	4.56E+03	75E, 26N	2.16E+03	1.26E+04	76E, 26N	2.99E+03	1.84E+04
72E, 25N	1.57E+03	8.46E+03	73E, 25N	1.78E+03	9.93E+03	74E, 25N	1.49E+03	7.90E+03	75E, 25N	1.08E+03	5.05E+03	76E, 25N	3.02E+03	1.86E+04
72E, 24N	2.35E+03	1.39E+04	73E, 24N	3.21E+03	1.99E+04	74E, 24N	1.83E+03	1.03E+04	75E, 24N	3.17E+03	1.96E+04	76E, 24N	3.71E+03	2.34E+04
72E, 23N	3.55E+03	2.23E+04	73E, 23N	4.20E+03	2.68E+04	74E, 23N	5.10E+03	3.31E+04	75E, 23N	6.47E+03	4.26E+04	76E, 23N	1.31E+04	8.88E+04
72E, 22N	1.80E+03	1.01E+04	73E, 22N	1.78E+03	9.93E+03	74E, 22N	3.43E+03	2.14E+04	75E, 22N	4.56E+03	2.93E+04	76E, 22N	5.44E+03	3.54E+04
72E, 21N	1.10E+03	5.19E+03	73E, 21N	7.70E+02	2.88E+03	74E, 21N	7.35E+02	2.64E+03	75E, 21N	1.37E+03	7.07E+03	76E, 21N	5.47E+03	3.57E+04
72E, 20N	2.30E+02	<BKG	73E, 20N	3.85E+02	2.00E+02	74E, 20N	4.58E+02	7.09E+02	75E, 20N	9.38E+02	4.06E+03	76E, 20N	5.06E+03	3.28E+04
72E, 19N	4.12E+02	3.88E+02	73E, 19N	Light Post	0.00E+00	74E, 19N	6.59E+02	2.11E+03	75E, 19N	7.85E+02	2.99E+03	76E, 19N	5.68E+03	3.71E+04
72E, 18N	4.19E+02	4.37E+02	73E, 18N	5.15E+02	1.11E+03	74E, 18N	9.28E+02	3.99E+03	75E, 18N	2.04E+03	1.17E+04	76E, 18N	1.22E+04	8.26E+04
72E, 17N	4.56E+02	6.95E+02	73E, 17N	8.86E+02	3.69E+03	74E, 17N	1.46E+03	7.70E+03	75E, 17N	2.83E+03	1.72E+04	76E, 17N	1.91E+04	1.31E+05
72E, 16N	4.00E+02	3.05E+02	73E, 16N	8.61E+02	3.52E+03	74E, 16N	1.48E+03	7.83E+03	75E, 16N	3.22E+03	2.00E+04	76E, 16N	1.79E+04	1.22E+05
72E, 15N	4.44E+02	6.12E+02	73E, 15N	6.53E+03	4.30E+04	74E, 15N	1.57E+03	8.46E+03	75E, 15N	2.04E+03	1.17E+04	76E, 15N	4.12E+03	2.62E+04
72E, 14N	5.54E+02	1.38E+03	73E, 14N	5.71E+03	3.73E+04	74E, 14N	3.28E+03	2.04E+04	75E, 14N	9.47E+02	4.12E+03	76E, 14N	1.12E+04	7.56E+04
72E, 13N	6.65E+02	2.15E+03	73E, 13N	5.58E+03	3.64E+04	74E, 13N	7.91E+03	5.27E+04	75E, 13N	9.89E+02	4.41E+03	76E, 13N	7.19E+03	4.76E+04
72E, 12N	1.68E+02	<BKG	73E, 12N	6.53E+02	2.07E+03	74E, 12N	4.58E+03	2.94E+04	75E, 12N	6.75E+02	2.22E+03	76E, 12N	5.83E+03	3.82E+04
72E, 11N	6.32E+02	1.92E+03	73E, 11N	4.59E+02	7.16E+02	74E, 11N	3.76E+03	2.37E+04	75E, 11N	8.69E+02	3.57E+03	76E, 11N	6.60E+03	4.35E+04
72E, 10N	5.09E+02	1.06E+03	73E, 10N	4.56E+02	6.95E+02	74E, 10N	1.05E+03	4.84E+03	75E, 10N	1.01E+03	4.56E+03	76E, 10N	5.71E+03	3.73E+04
72E, 9N	4.47E+02	6.32E+02	73E, 9N	4.76E+02	8.35E+02	74E, 9N	1.17E+03	5.67E+03	75E, 9N	8.28E+02	3.29E+03	76E, 9N	2.31E+03	1.36E+04
72E, 8N	4.27E+02	4.93E+02	73E, 8N	4.43E+02	6.05E+02	74E, 8N	1.17E+03	5.67E+03	75E, 8N	6.30E+02	1.91E+03	76E, 8N	2.54E+03	1.52E+04
72E, 7N	4.11E+02	3.81E+02	73E, 7N	5.40E+02	1.28E+03	74E, 7N	1.24E+03	6.16E+03	75E, 7N	5.43E+02	1.30E+03	76E, 7N	1.40E+03	7.28E+03
72E, 6N	4.70E+02	7.93E+02	73E, 6N	5.47E+02	1.33E+03	74E, 6N	1.37E+03	7.07E+03	75E, 6N	5.14E+02	1.10E+03	76E, 6N	1.67E+03	9.16E+03
72E, 5N	4.11E+02	3.81E+02	73E, 5N	4.41E+02	5.91E+02	74E, 5N	4.51E+02	6.60E+02	75E, 5N	5.32E+02	1.23E+03	76E, 5N	6.07E+03	3.98E+04
72E, 4N	5.25E+02	1.18E+03	73E, 4N	6.17E+02	1.82E+03	74E, 4N	5.26E+02	1.18E+03	75E, 4N	1.24E+03	6.16E+03	76E, 4N	7.12E+04	4.94E+05
72E, 3N	3.57E+03	2.24E+04	73E, 3N	1.41E+03	7.35E+03	74E, 3N	2.62E+03	1.58E+04	75E, 3N	1.50E+03	7.97E+03	76E, 3N	1.50E+04	1.02E+05
72E, 2N	1.02E+02	<BKG	73E, 2N	8.60E+02	3.51E+03	74E, 2N	7.33E+02	2.63E+03	75E, 2N	9.66E+02	4.25E+03	76E, 2N	2.14E+03	1.24E+04
72E, 1N	1.39E+02	<BKG	73E, 1N	5.10E+02	1.07E+03	74E, 1N	6.52E+02	2.06E+03	75E, 1N	1.41E+03	7.35E+03	76E, 1N	1.64E+03	8.95E+03
72E, 0N	3.68E+02	8.17E+01	73E, 0N	4.05E+02	3.40E+02	74E, 0N	6.85E+02	2.29E+03	75E, 0N	8.54E+02	3.47E+03	76E, 0N	9.96E+02	4.46E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	**1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
77E, 30N	4.32E+02	5.28E+02	78E, 30N	2.47E+03	1.82E+03	79E, 30N	1.03E+03	4.70E+03	80E, 30N	5.46E+02	1.32E+03	81E, 30N	7.90E+02	3.02E+03
77E, 29N	6.22E+02	1.85E+03	78E, 29N	2.26E+03	1.46E+03	79E, 29N	1.07E+03	4.98E+03	80E, 29N	6.34E+02	1.94E+03	81E, 29N	7.25E+02	2.57E+03
77E, 28N	5.64E+02	1.45E+03	78E, 28N	2.40E+03	1.70E+03	79E, 28N	1.04E+03	4.77E+03	80E, 28N	7.15E+02	2.50E+03	81E, 28N	7.40E+02	2.68E+03
77E, 27N	4.11E+03	2.62E+04	78E, 27N	1.90E+04	1.06E+04	79E, 27N	1.36E+03	7.00E+03	80E, 27N	1.37E+03	7.07E+03	81E, 27N	2.42E+03	1.44E+04
77E, 26N	3.66E+03	2.30E+04	78E, 26N	1.40E+04	2.19E+04	79E, 26N	8.82E+03	5.90E+04	80E, 26N	3.70E+03	2.33E+04	81E, 26N	8.34E+03	5.57E+04
77E, 25N	4.29E+03	2.74E+04	78E, 25N	5.57E+04	9.46E+04	79E, 25N	1.24E+04	8.40E+04	80E, 25N	4.50E+03	2.89E+04	81E, 25N	8.19E+03	5.46E+04
77E, 24N	4.14E+03	2.64E+04	78E, 24N	4.32E+04	7.28E+04	79E, 24N	9.57E+03	6.42E+04	80E, 24N	5.81E+03	3.80E+04	81E, 24N	6.61E+03	4.36E+04
77E, 23N	4.65E+03	2.99E+04	78E, 23N	2.75E+04	4.54E+04	79E, 23N	1.16E+04	7.84E+04	80E, 23N	4.76E+03	3.07E+04	81E, 23N	1.13E+04	7.63E+04
77E, 22N	4.72E+03	3.04E+04	78E, 22N	1.66E+04	2.64E+04	79E, 22N	1.05E+04	7.07E+04	80E, 22N	5.11E+03	3.31E+04	81E, 22N	9.68E+03	6.50E+04
77E, 21N	8.82E+03	5.90E+04	78E, 21N	2.49E+04	4.09E+04	79E, 21N	1.04E+04	7.00E+04	80E, 21N	7.34E+03	4.87E+04	81E, 21N	1.25E+04	8.47E+04
77E, 20N	1.05E+04	7.07E+04	78E, 20N	6.08E+04	1.03E+05	***79E, 20N	1.03E+04	3.14E+04	80E, 20N	7.62E+03	5.06E+04	81E, 20N	1.44E+04	9.79E+04
77E, 19N	1.62E+04	1.10E+05	78E, 19N	4.48E+04	7.56E+04	***79E, 19N	1.19E+04	3.90E+04	80E, 19N	1.16E+04	7.84E+04	81E, 19N	1.66E+04	1.13E+05
77E, 18N	1.23E+04	8.33E+04	78E, 18N	1.04E+05	1.79E+05	***79E, 18N	1.83E+04	6.13E+04	80E, 18N	1.32E+04	8.95E+04	81E, 18N	2.33E+04	1.60E+05
77E, 17N	1.23E+04	8.33E+04	78E, 17N	6.95E+04	1.19E+05	***79E, 17N	1.89E+04	6.34E+04	80E, 17N	1.52E+04	1.03E+05	81E, 17N	1.59E+04	1.08E+05
77E, 16N	1.62E+04	1.10E+05	78E, 16N	6.07E+04	1.03E+05	***79E, 16N	1.91E+04	6.41E+04	80E, 16N	1.76E+04	1.20E+05	81E, 16N	1.52E+04	1.03E+05
77E, 15N	7.56E+03	5.02E+04	78E, 15N	9.59E+04	1.65E+05	***79E, 15N	1.03E+04	3.34E+04	80E, 15N	2.10E+04	1.44E+05	81E, 15N	2.48E+04	1.70E+05
77E, 14N	1.70E+04	1.16E+05	78E, 14N	9.12E+04	1.56E+05	***79E, 14N	5.83E+03	1.78E+04	80E, 14N	9.21E+03	6.17E+04	81E, 14N	6.63E+03	4.47E+04
77E, 13N	9.24E+03	6.19E+04	78E, 13N	3.48E+04	5.82E+04	***79E, 13N	4.94E+03	1.47E+04	80E, 13N	5.70E+03	3.73E+04	81E, 13N	5.37E+03	3.50E+04
77E, 12N	6.23E+03	4.10E+04	78E, 12N	2.56E+04	4.21E+04	***79E, 12N	2.98E+03	7.90E+03	80E, 12N	5.64E+03	3.68E+04	81E, 12N	8.67E+03	5.80E+04
77E, 11N	8.91E+03	5.96E+04	78E, 11N	2.52E+04	4.14E+04	***79E, 11N	2.45E+03	6.06E+03	80E, 11N	4.44E+03	2.85E+04	81E, 11N	5.55E+03	3.62E+04
77E, 10N	6.60E+03	4.35E+04	78E, 10N	1.83E+04	2.94E+04	***79E, 10N	4.46E+03	1.31E+04	80E, 10N	3.48E+03	2.18E+04	81E, 10N	6.93E+03	4.58E+04
77E, 9N	3.46E+03	2.16E+04	78E, 9N	2.08E+04	3.38E+04	***79E, 9N	5.30E+03	1.60E+04	80E, 9N	4.04E+03	2.57E+04	81E, 9N	7.26E+03	4.81E+04
77E, 8N	3.37E+03	2.10E+04	78E, 8N	2.05E+04	3.32E+04	***79E, 8N	8.39E+03	2.68E+04	80E, 8N	6.97E+03	4.61E+04	81E, 8N	9.31E+03	6.24E+04
77E, 7N	2.12E+03	1.23E+04	78E, 7N	1.66E+04	2.64E+04	***79E, 7N	8.40E+03	2.68E+04	80E, 7N	8.70E+03	5.82E+04	81E, 7N	9.72E+03	6.53E+04
77E, 6N	2.29E+03	1.35E+04	78E, 6N	2.90E+04	4.81E+04	***79E, 6N	9.79E+03	3.16E+04	80E, 6N	7.56E+03	5.02E+04	81E, 6N	1.01E+04	6.79E+04
77E, 5N	1.08E+04	7.28E+04	78E, 5N	1.52E+04	2.40E+04	***79E, 5N	1.44E+04	4.77E+04	80E, 5N	6.21E+03	4.08E+04	81E, 5N	9.02E+04	6.26E+05
77E, 4N	1.79E+04	1.22E+05	78E, 4N	1.27E+05	2.19E+05	***79E, 4N	1.25E+04	4.11E+04	80E, 4N	1.09E+04	7.35E+04	81E, 4N	7.59E+04	5.27E+05
77E, 3N	5.25E+03	3.41E+04	78E, 3N	2.37E+04	3.88E+04	***79E, 3N	3.54E+04	1.21E+05	80E, 3N	6.50E+03	4.28E+04	81E, 3N	8.77E+03	5.87E+04
77E, 2N	1.57E+03	8.46E+03	78E, 2N	1.13E+04	1.72E+04	***79E, 2N	1.71E+03	3.48E+03	80E, 2N	8.45E+03	5.64E+04	81E, 2N	1.11E+04	7.49E+04
77E, 1N	1.16E+03	5.60E+03	78E, 1N	4.82E+03	5.92E+03	***79E, 1N	1.59E+03	3.06E+03	80E, 1N	8.93E+03	5.98E+04	81E, 1N	1.83E+04	1.25E+05
77E, 0N	1.10E+03	5.19E+03	78E, 0N	5.83E+03	7.68E+03	***79E, 0N	1.32E+03	2.12E+03	80E, 0N	6.70E+03	4.42E+04	81E, 0N	5.42E+02	1.29E+03

Notes:

*Raw 1 cm data from 15 second counts.
**Raw 1 cm data from 60 second counts.
***Raw 1 cm data from 30 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
82E, 30N	8.48E+02	3.43E+03	83E, 30N	4.64E+02	7.51E+02	84E, 30N	5.10E+02	1.07E+03	85E, 30N	4.99E+02	9.95E+02	86E, 30N	5.65E+02	1.46E+03
82E, 29N	9.11E+02	3.87E+03	83E, 29N	5.04E+02	1.03E+03	84E, 29N	6.84E+02	2.28E+03	85E, 29N	5.24E+02	1.17E+03	86E, 29N	4.99E+02	9.95E+02
82E, 28N	1.11E+03	5.25E+03	83E, 28N	1.19E+02	<BKG	84E, 28N	7.26E+02	2.58E+03	85E, 28N	6.58E+02	2.10E+03	86E, 28N	7.20E+02	2.54E+03
82E, 27N	3.85E+03	2.44E+04	83E, 27N	8.59E+03	5.74E+04	84E, 27N	1.96E+03	1.12E+04	85E, 27N	3.56E+03	2.23E+04	86E, 27N	3.29E+03	2.05E+04
82E, 26N	8.13E+03	5.42E+04	83E, 26N	6.30E+03	4.14E+04	84E, 26N	7.89E+03	5.25E+04	85E, 26N	5.22E+03	3.39E+04	86E, 26N	4.67E+03	3.01E+04
82E, 25N	8.04E+03	5.36E+04	83E, 25N	1.49E+04	1.01E+05	84E, 25N	9.93E+03	6.67E+04	85E, 25N	1.93E+03	1.10E+04	86E, 25N	1.35E+03	6.93E+03
82E, 24N	7.58E+03	5.04E+04	83E, 24N	1.66E+03	9.09E+03	84E, 24N	7.13E+03	4.72E+04	85E, 24N	4.96E+03	3.21E+04	86E, 24N	3.31E+03	2.06E+04
82E, 23N	1.20E+04	8.12E+04	83E, 23N	9.48E+03	6.36E+04	84E, 23N	5.09E+03	3.30E+04	85E, 23N	4.98E+03	3.22E+04	86E, 23N	4.93E+03	3.19E+04
82E, 22N	7.06E+03	4.67E+04	83E, 22N	4.74E+03	3.06E+04	84E, 22N	2.65E+03	1.60E+04	85E, 22N	2.97E+03	1.82E+04	86E, 22N	1.76E+03	9.79E+03
82E, 21N	9.23E+03	6.19E+04	83E, 21N	4.55E+03	2.92E+04	84E, 21N	3.83E+03	2.42E+04	85E, 21N	1.83E+03	1.03E+04	86E, 21N	1.30E+03	6.58E+03
82E, 20N	1.02E+04	6.86E+04	83E, 20N	4.85E+03	3.13E+04	84E, 20N	3.99E+03	2.53E+04	85E, 20N	2.00E+03	1.15E+04	86E, 20N	1.54E+03	8.25E+03
82E, 19N	1.09E+04	7.35E+04	83E, 19N	1.07E+04	7.21E+04	84E, 19N	7.12E+03	4.72E+04	85E, 19N	2.21E+03	1.29E+04	86E, 19N	2.31E+03	1.36E+04
82E, 18N	1.76E+04	1.20E+05	83E, 18N	1.22E+04	8.26E+04	84E, 18N	8.96E+03	6.00E+04	85E, 18N	4.21E+03	2.69E+04	86E, 18N	1.24E+03	6.16E+03
82E, 17N	1.11E+04	7.49E+04	83E, 17N	9.83E+03	6.61E+04	84E, 17N	7.60E+03	5.05E+04	85E, 17N	4.60E+03	2.96E+04	86E, 17N	3.54E+03	2.22E+04
82E, 16N	1.04E+04	7.00E+04	83E, 16N	1.28E+04	8.68E+04	84E, 16N	1.74E+04	1.19E+05	85E, 16N	1.27E+04	8.61E+04	86E, 16N	8.25E+03	5.50E+04
82E, 15N	2.43E+04	1.67E+05	83E, 15N	1.84E+04	1.26E+05	84E, 15N	9.79E+03	6.58E+04	85E, 15N	5.74E+03	3.75E+04	86E, 15N	3.70E+03	2.33E+04
82E, 14N	7.65E+03	5.09E+04	83E, 14N	7.91E+03	5.27E+04	84E, 14N	4.49E+03	2.88E+04	85E, 14N	4.64E+03	2.99E+04	86E, 14N	3.17E+03	1.96E+04
82E, 13N	5.91E+03	3.87E+04	83E, 13N	6.38E+03	4.20E+04	84E, 13N	3.63E+03	2.28E+04	85E, 13N	7.72E+03	5.13E+04	86E, 13N	1.41E+03	7.35E+03
82E, 12N	6.69E+03	4.42E+04	83E, 12N	6.66E+03	4.39E+04	84E, 12N	4.90E+03	3.17E+04	85E, 12N	3.52E+03	2.21E+04	86E, 12N	1.73E+03	9.58E+03
82E, 11N	6.67E+03	4.40E+04	83E, 11N	6.08E+03	3.99E+04	84E, 11N	3.95E+03	2.51E+04	85E, 11N	2.30E+03	1.36E+04	86E, 11N	1.34E+03	6.86E+03
82E, 10N	7.70E+03	5.12E+04	83E, 10N	6.14E+03	4.03E+04	84E, 10N	2.19E+03	1.28E+04	85E, 10N	2.35E+03	1.39E+04	86E, 10N	1.65E+03	9.02E+03
82E, 9N	8.28E+03	5.52E+04	83E, 9N	6.42E+03	4.23E+04	84E, 9N	2.76E+03	1.68E+04	85E, 9N	2.67E+03	1.61E+04	86E, 9N	1.68E+03	9.23E+03
82E, 8N	9.90E+03	6.65E+04	83E, 8N	6.07E+03	3.98E+04	84E, 8N	2.68E+03	1.62E+04	85E, 8N	2.16E+03	1.26E+04	86E, 8N	2.06E+03	1.19E+04
82E, 7N	8.07E+03	5.38E+04	83E, 7N	6.14E+03	4.03E+04	84E, 7N	3.88E+03	2.46E+04	85E, 7N	2.24E+03	1.31E+04	86E, 7N	1.59E+03	8.60E+03
82E, 6N	8.27E+03	5.52E+04	83E, 6N	5.25E+03	3.41E+04	84E, 6N	3.05E+03	1.88E+04	85E, 6N	1.90E+03	1.08E+04	86E, 6N	1.66E+03	9.09E+03
82E, 5N	5.55E+03	3.62E+04	83E, 5N	5.58E+03	3.64E+04	84E, 5N	3.15E+03	1.95E+04	85E, 5N	1.85E+03	1.04E+04	86E, 5N	1.51E+02	<BKG
82E, 4N	5.57E+03	3.64E+04	83E, 4N	4.42E+03	2.83E+04	84E, 4N	3.75E+03	2.37E+04	85E, 4N	1.94E+03	1.10E+04	86E, 4N	5.19E+02	1.13E+03
82E, 3N	1.01E+04	6.79E+04	83E, 3N	9.93E+03	6.67E+04	84E, 3N	5.63E+03	3.68E+04	85E, 3N	8.75E+02	3.62E+03	86E, 3N	1.35E+03	6.93E+03
82E, 2N	1.62E+03	8.81E+03	83E, 2N	6.51E+03	4.29E+04	84E, 2N	4.03E+03	2.56E+04	85E, 2N	4.65E+03	2.99E+04	86E, 2N	1.22E+03	6.02E+03
82E, 1N	3.57E+03	2.24E+04	83E, 1N	6.29E+03	4.14E+04	84E, 1N	2.57E+03	1.54E+04	85E, 1N	1.51E+03	8.04E+03	86E, 1N	1.08E+03	5.05E+03
82E, 0N	5.77E+03	3.77E+04	83E, 0N	1.30E+03	6.58E+03	84E, 0N	1.79E+03	1.00E+04	85E, 0N	9.69E+02	4.27E+03	86E, 0N	5.08E+02	1.06E+03

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
87E, 30N	5.20E+02	1.14E+03	88E, 30N	5.62E+02	1.43E+03	89E 30N	6.19E+02	1.83E+03	90E, 30N	6.81E+02	2.26E+03	91E, 30N	6.69E+02	2.18E+03
87E, 29N	6.39E+02	1.97E+03	88E, 29N	6.82E+02	2.27E+03	89E 29N	7.31E+02	2.61E+03	90E, 29N	7.34E+02	2.63E+03	91E, 29N	7.41E+02	2.68E+03
87E, 28N	8.78E+02	3.64E+03	88E, 28N	1.09E+03	5.12E+03	89E 28N	1.11E+03	5.25E+03	90E, 28N	8.02E+02	3.11E+03	91E, 28N	7.66E+02	2.86E+03
87E, 27N	3.12E+03	1.93E+04	88E, 27N	2.94E+03	1.80E+04	89E 27N	2.29E+03	1.35E+04	90E, 27N	1.55E+03	8.32E+03	91E, 27N	1.27E+03	6.37E+03
87E, 26N	5.03E+03	3.26E+04	88E, 26N	5.05E+03	3.27E+04	89E 26N	4.97E+03	3.22E+04	90E, 26N	3.84E+03	2.43E+04	91E, 26N	2.95E+03	1.81E+04
87E, 25N	1.47E+03	7.76E+03	88E, 25N	1.66E+03	9.09E+03	89E 25N	2.13E+03	1.24E+04	90E, 25N	1.71E+03	9.44E+03	91E, 25N	1.68E+03	9.23E+03
87E, 24N	1.26E+03	6.30E+03	88E, 24N	1.22E+03	6.02E+03	89E 24N	1.72E+03	9.51E+03	90E, 24N	1.88E+03	1.06E+04	91E, 24N	1.56E+03	8.39E+03
87E, 23N	2.27E+03	1.33E+04	88E, 23N	1.56E+03	8.19E+03	89E 23N	1.89E+03	1.07E+04	90E, 23N	1.76E+03	9.79E+03	91E, 23N	1.30E+03	6.58E+03
87E, 22N	1.92E+03	1.09E+04	88E, 22N	1.57E+03	8.46E+03	89E 22N	2.00E+03	1.15E+04	90E, 22N	1.82E+03	1.02E+04	91E, 22N	2.08E+03	1.20E+04
87E, 21N	1.19E+03	5.81E+03	88E, 21N	9.04E+02	3.82E+03	89E 21N	1.41E+03	7.35E+03	90E, 21N	1.99E+03	1.14E+04	91E, 21N	2.68E+03	1.62E+04
87E, 20N	1.04E+03	4.77E+03	88E, 20N	8.35E+02	3.34E+03	89E 20N	1.06E+03	4.91E+03	90E, 20N	1.21E+03	5.95E+03	91E, 20N	1.52E+03	8.11E+03
87E, 19N	2.18E+03	1.27E+04	88E, 19N	2.09E+03	1.21E+04	89E 19N	1.36E+03	7.00E+03	90E, 19N	1.14E+03	5.46E+03	91E, 19N	1.36E+03	7.00E+03
87E, 18N	3.17E+03	1.96E+04	88E, 18N	3.45E+03	2.16E+04	89E 18N	2.50E+03	1.49E+04	90E, 18N	1.62E+03	8.81E+03	91E, 18N	2.03E+03	1.17E+04
87E, 17N	3.45E+03	2.16E+04	88E, 17N	4.68E+03	3.01E+04	89E 17N	2.98E+03	1.83E+04	90E, 17N	3.95E+03	2.51E+04	91E, 17N	5.83E+03	3.82E+04
87E, 16N	7.15E+03	4.74E+04	88E, 16N	7.43E+03	4.93E+04	89E 16N	7.30E+03	4.84E+04	90E, 16N	6.28E+03	4.13E+04	91E, 16N	2.56E+03	1.54E+04
87E, 15N	3.54E+03	2.22E+04	88E, 15N	3.32E+03	2.07E+04	89E 15N	2.35E+03	1.39E+04	90E, 15N	1.25E+03	6.23E+03	91E, 15N	8.82E+02	3.67E+03
87E, 14N	2.38E+03	1.41E+04	88E, 14N	1.35E+03	6.93E+03	89E 14N	1.13E+03	5.39E+03	90E, 14N	8.16E+02	3.21E+03	91E, 14N	7.00E+02	2.40E+03
87E, 13N	1.77E+03	9.86E+03	88E, 13N	1.01E+03	4.56E+03	89E 13N	1.01E+03	4.56E+03	90E, 13N	7.44E+02	2.70E+03	91E, 13N	6.41E+02	1.99E+03
87E, 12N	1.02E+03	4.63E+03	88E, 12N	9.16E+02	3.90E+03	89E 12N	8.81E+02	3.66E+03	90E, 12N	6.93E+02	2.35E+03	91E, 12N	6.48E+02	2.03E+03
87E, 11N	9.25E+02	3.97E+03	88E, 11N	8.15E+02	3.20E+03	89E 11N	7.59E+02	2.81E+03	90E, 11N	6.69E+02	2.18E+03	91E, 11N	5.73E+02	1.51E+03
87E, 10N	9.82E+02	4.36E+03	88E, 10N	8.25E+02	3.27E+03	89E 10N	7.61E+02	2.82E+03	90E, 10N	7.29E+02	2.60E+03	91E, 10N	6.32E+02	1.92E+03
87E, 9N	1.45E+03	7.63E+03	88E, 9N	9.36E+02	4.04E+03	89E 9N	8.20E+02	3.23E+03	90E, 9N	7.25E+02	2.57E+03	91E, 9N	5.53E+02	1.37E+03
87E, 8N	1.71E+03	9.44E+03	88E, 8N	5.22E+02	1.16E+03	89E 8N	8.25E+02	3.27E+03	90E, 8N	7.62E+02	2.83E+03	91E, 8N	5.43E+02	1.30E+03
87E, 7N	6.61E+02	2.12E+03	88E, 7N	1.14E+03	5.46E+03	89E 7N	7.56E+02	2.79E+03	90E, 7N	7.31E+02	2.61E+03	91E, 7N	4.92E+02	9.46E+02
87E, 6N	5.67E+02	1.47E+03	88E, 6N	9.14E+02	3.89E+03	89E 6N	9.46E+02	4.11E+03	90E, 6N	7.12E+02	2.48E+03	91E, 6N	5.03E+02	1.02E+03
87E, 5N	8.25E+02	3.27E+03	88E, 5N	8.36E+02	3.34E+03	89E 5N	7.54E+02	2.77E+03	90E, 5N	5.64E+02	1.45E+03	91E, 5N	4.56E+02	6.95E+02
87E, 4N	7.62E+02	2.83E+03	88E, 4N	7.48E+02	2.73E+03	89E 4N	6.60E+02	2.12E+03	90E, 4N	6.03E+02	1.72E+03	91E, 4N	4.74E+02	8.21E+02
87E, 3N	1.07E+03	4.98E+03	88E, 3N	8.82E+02	3.67E+03	89E 3N	6.15E+02	1.80E+03	90E, 3N	5.48E+02	1.34E+03	91E, 3N	6.41E+02	1.99E+03
87E, 2N	9.99E+02	4.48E+03	88E, 2N	8.63E+02	3.53E+03	89E 2N	6.09E+02	1.76E+03	90E, 2N	5.48E+02	1.34E+03	91E, 2N	4.65E+02	7.58E+02
87E, 1N	9.46E+02	4.11E+03	88E, 1N	8.40E+02	3.37E+03	89E 1N	8.40E+02	3.37E+03	90E, 1N	5.27E+02	1.19E+03	91E, 1N	4.57E+02	7.02E+02
87E, 0N	5.61E+02	1.43E+03	88E, 0N	5.94E+02	1.66E+03	89E 0N	5.91E+02	1.64E+03	90E, 0N	5.20E+02	1.14E+03	91E, 0N	4.08E+02	3.61E+02

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
92E, 30N	6.25E+02	1.87E+03	93E 30N	6.45E+02	2.01E+03	94E, 30N	6.76E+02	2.23E+03	95E, 30N	5.98E+02	1.69E+03	96E, 30N	5.98E+02	1.69E+03
92E, 29N	7.81E+02	2.96E+03	93E 29N	7.31E+02	2.61E+03	94E, 29N	7.65E+02	2.85E+03	95E, 29N	6.08E+02	1.75E+03	96E, 29N	6.40E+02	1.98E+03
92E, 28N	8.31E+02	3.31E+03	93E 28N	8.08E+02	3.15E+03	94E, 28N	7.76E+02	2.93E+03	95E, 28N	5.49E+02	1.34E+03	96E, 28N	1.04E+03	4.77E+03
92E, 27N	1.32E+03	6.72E+03	93E 27N	1.21E+03	5.95E+03	94E, 27N	1.08E+03	5.05E+03	95E, 27N	1.03E+03	4.70E+03	96E, 27N	8.83E+02	3.67E+03
92E, 26N	2.82E+03	1.72E+04	93E 26N	2.22E+03	1.30E+04	94E, 26N	2.45E+03	1.46E+04	95E, 26N	1.65E+03	9.02E+03	96E, 26N	1.57E+03	8.46E+03
92E, 25N	1.51E+03	8.04E+03	93E 25N	1.36E+03	7.00E+03	94E, 25N	1.58E+03	8.53E+03	95E, 25N	1.50E+03	7.97E+03	96E, 25N	1.29E+03	6.51E+03
92E, 24N	2.03E+03	1.17E+04	93E 24N	1.74E+03	9.65E+03	94E, 24N	1.80E+03	1.01E+04	95E, 24N	1.95E+03	1.11E+04	96E, 24N	1.23E+03	6.09E+03
92E, 23N	1.40E+03	7.28E+03	93E 23N	1.41E+03	7.35E+03	94E, 23N	1.17E+03	5.67E+03	95E, 23N	1.36E+03	7.00E+03	96E, 23N	1.37E+03	7.07E+03
92E, 22N	2.20E+03	1.29E+04	93E 22N	1.69E+03	9.30E+03	94E, 22N	1.23E+03	6.09E+03	95E, 22N	1.95E+03	1.11E+04	96E, 22N	1.28E+03	6.44E+03
92E, 21N	1.71E+03	9.44E+03	93E 21N	1.54E+03	8.25E+03	94E, 21N	1.77E+03	9.86E+03	95E, 21N	3.70E+03	2.33E+04	96E, 21N	1.48E+03	7.83E+03
92E, 20N	1.46E+03	7.70E+03	93E 20N	1.43E+03	7.49E+03	94E, 20N	1.83E+03	1.03E+04	95E, 20N	1.27E+03	6.37E+03	96E, 20N	9.20E+02	3.93E+03
92E, 19N	1.68E+03	9.23E+03	93E 19N	9.09E+02	3.85E+03	94E, 19N	1.17E+03	5.67E+03	95E, 19N	7.54E+02	2.77E+03	96E, 19N	5.86E+02	1.60E+03
92E, 18N	1.49E+03	7.90E+03	93E 18N	1.33E+03	6.79E+03	94E, 18N	1.14E+03	5.46E+03	95E, 18N	3.41E+03	2.13E+04	96E, 18N	4.73E+03	3.05E+04
92E, 17N	3.53E+03	2.21E+04	93E 17N	5.57E+03	3.64E+04	94E, 17N	3.38E+03	2.11E+04	95E, 17N	2.57E+03	1.54E+04	96E, 17N	1.35E+03	6.93E+03
92E, 16N	1.31E+03	6.65E+03	93E 16N	7.54E+02	2.77E+03	94E, 16N	5.62E+02	1.43E+03	95E, 16N	4.67E+02	7.72E+02	96E, 16N	4.59E+02	7.16E+02
92E, 15N	6.93E+02	2.35E+03	93E 15N	7.77E+02	2.93E+03	94E, 15N	6.41E+02	1.99E+03	95E, 15N	4.66E+02	7.65E+02	96E, 15N	4.22E+02	4.58E+02
92E, 14N	7.28E+02	2.59E+03	93E 14N	1.08E+03	5.05E+03	94E, 14N	7.29E+02	2.60E+03	95E, 14N	5.27E+02	1.19E+03	96E, 14N	4.85E+02	8.97E+02
92E, 13N	5.77E+02	1.54E+03	93E 13N	7.96E+02	3.07E+03	94E, 13N	6.75E+02	2.22E+03	95E, 13N	5.54E+02	1.38E+03	96E, 13N	4.54E+02	6.81E+02
92E, 12N	5.89E+02	1.62E+03	93E 12N	5.26E+02	1.18E+03	94E, 12N	5.12E+02	1.09E+03	95E, 12N	4.89E+02	9.25E+02	96E, 12N	3.92E+02	2.49E+02
92E, 11N	4.86E+02	9.04E+02	93E 11N	4.27E+02	4.93E+02	94E, 11N	4.81E+02	8.70E+02	95E, 11N	5.13E+02	1.09E+03	96E, 11N	4.03E+02	3.26E+02
92E, 10N	4.82E+02	8.77E+02	93E 10N	4.55E+02	6.88E+02	94E, 10N	4.81E+02	8.70E+02	95E, 10N	4.84E+02	8.90E+02	96E, 10N	4.00E+02	3.05E+02
92E, 9N	4.97E+02	9.81E+02	93E 9N	4.54E+02	6.81E+02	94E, 9N	4.66E+02	7.65E+02	95E, 9N	4.72E+02	8.07E+02	96E, 9N	4.45E+02	6.19E+02
92E, 8N	4.82E+02	8.77E+02	93E 8N	5.15E+02	1.11E+03	94E, 8N	4.35E+02	5.49E+02	95E, 8N	5.02E+02	1.02E+03	96E, 8N	4.32E+02	5.28E+02
92E, 7N	4.67E+02	7.72E+02	93E 7N	4.56E+02	6.95E+02	94E, 7N	4.70E+02	7.93E+02	95E, 7N	5.98E+02	1.69E+03	96E, 7N	5.42E+02	1.29E+03
92E, 6N	4.28E+02	5.00E+02	93E 6N	4.32E+02	5.28E+02	94E, 6N	4.99E+02	9.95E+02	95E, 6N	7.35E+02	2.64E+03	96E, 6N	9.99E+02	4.48E+03
92E, 5N	4.77E+02	8.42E+02	93E 5N	4.33E+02	5.35E+02	94E, 5N	4.15E+02	4.09E+02	95E, 5N	6.75E+02	2.22E+03	96E, 5N	1.11E+03	5.25E+03
92E, 4N	4.29E+02	5.07E+02	93E 4N	4.24E+02	4.72E+02	94E, 4N	4.05E+02	3.40E+02	95E, 4N	5.20E+02	1.14E+03	96E, 4N	7.28E+02	2.59E+03
92E, 3N	5.32E+02	1.23E+03	93E 3N	5.47E+02	1.33E+03	94E, 3N	5.05E+02	1.04E+03	95E, 3N	7.24E+02	2.56E+03	96E, 3N	5.42E+02	1.29E+03
92E, 2N	5.11E+02	1.08E+03	93E 2N	4.27E+02	4.93E+02	94E, 2N	4.09E+02	3.68E+02	95E, 2N	4.09E+02	3.68E+02	96E, 2N	3.81E+02	1.72E+02
92E, 1N	5.36E+02	1.25E+03	93E 1N	4.32E+02	5.28E+02	94E, 1N	4.24E+02	4.72E+02	95E, 1N	4.13E+02	3.95E+02	96E, 1N	3.81E+02	1.72E+02
92E, 0N	4.84E+02	8.90E+02	93E 0N	4.46E+02	6.26E+02	94E, 0N	4.23E+02	4.65E+02	95E, 0N	2.49E+02	<BKG	96E, 0N	3.79E+02	1.58E+02

Notes:

*Raw 1 cm data from 15 second counts.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
97E, 30N	5.32E+02	1.23E+03	98E, 30N	5.19E+02	1.13E+03	99E, 30N	4.69E+02	7.86E+02	100E, 30N	4.80E+02	8.63E+02	101E, 30N	4.55E+02	6.88E+02
97E, 29N	5.92E+02	1.64E+03	98E, 29N	6.16E+02	1.81E+03	99E, 29N	7.44E+02	2.70E+03	100E, 29N	5.95E+02	1.66E+03	101E, 29N	5.80E+02	1.56E+03
97E, 28N	1.01E+03	4.56E+03	98E, 28N	1.89E+02	<BKG	99E, 28N	8.87E+02	3.70E+03	100E, 28N	7.71E+03	5.13E+04	101E, 28N	7.34E+02	2.63E+03
97E, 27N	1.00E+03	4.49E+03	98E, 27N	1.67E+03	9.16E+03	99E, 27N	1.10E+03	5.19E+03	100E, 27N	1.19E+03	5.81E+03	101E, 27N	8.38E+02	3.36E+03
97E, 26N	1.71E+03	9.44E+03	98E, 26N	1.69E+03	9.30E+03	99E, 26N	2.13E+03	1.24E+04	100E, 26N	2.27E+03	1.33E+04	101E, 26N	2.07E+03	1.19E+04
97E, 25N	1.21E+03	5.95E+03	98E, 25N	1.48E+03	7.81E+03	99E, 25N	1.20E+03	5.88E+03	100E, 25N	1.34E+03	6.86E+03	101E, 25N	1.05E+03	4.84E+03
97E, 24N	1.16E+03	5.60E+03	98E, 24N	1.28E+03	6.44E+03	99E, 24N	1.08E+03	5.05E+03	100E, 24N	1.38E+03	7.14E+03	101E, 24N	8.68E+02	3.57E+03
97E, 23N	1.22E+03	6.02E+03	98E, 23N	1.09E+03	5.12E+03	99E, 23N	9.05E+02	3.83E+03	100E, 23N	6.90E+02	2.33E+03	101E, 23N	8.44E+02	3.40E+03
97E, 22N	1.10E+03	5.19E+03	98E, 22N	7.87E+02	3.00E+03	99E, 22N	7.94E+02	3.05E+03	100E, 22N	8.66E+02	3.55E+03	101E, 22N	9.89E+02	4.41E+03
97E, 21N	1.02E+03	4.63E+03	98E, 21N	1.01E+03	4.56E+03	99E, 21N	9.27E+02	3.98E+03	100E, 21N	6.72E+02	2.20E+03	101E, 21N	6.56E+02	2.09E+03
97E, 20N	6.70E+02	2.19E+03	98E, 20N	6.16E+02	1.81E+03	99E, 20N	6.14E+02	1.80E+03	100E, 20N	1.01E+03	4.56E+03	101E, 20N	6.58E+03	4.34E+04
97E, 19N	5.44E+02	1.31E+03	98E, 19N	6.30E+02	1.91E+03	99E, 19N	5.12E+02	1.09E+03	100E, 19N	9.55E+02	4.17E+03	101E, 19N	5.27E+02	1.19E+03
97E, 18N	1.86E+03	1.05E+04	98E, 18N	1.43E+03	7.49E+03	99E, 18N	1.20E+03	5.88E+03	100E, 18N	9.67E+02	4.26E+03	101E, 18N	3.76E+03	2.37E+04
97E, 17N	6.04E+02	1.73E+03	98E, 17N	4.86E+02	9.04E+02	99E, 17N	6.55E+02	2.08E+03	100E, 17N	6.53E+02	2.07E+03	101E, 17N	1.14E+03	5.46E+03
97E, 16N	4.76E+02	8.35E+02	98E, 16N	4.68E+02	7.79E+02	99E, 16N	5.28E+02	1.20E+03	100E, 16N	5.38E+02	1.27E+03	101E, 16N	5.81E+02	1.57E+03
97E, 15N	4.37E+02	5.63E+02	98E, 15N	5.24E+02	1.17E+03	99E, 15N	5.98E+02	1.69E+03	100E, 15N	5.51E+02	1.36E+03	101E, 15N	5.61E+02	1.43E+03
97E, 14N	4.73E+02	8.14E+02	98E, 14N	4.81E+02	8.70E+02	99E, 14N	4.65E+02	7.58E+02	100E, 14N	4.63E+02	7.44E+02	101E, 14N	4.33E+02	5.35E+02
97E, 13N	4.42E+02	5.98E+02	98E, 13N	3.81E+02	1.72E+02	99E, 13N	4.11E+02	3.81E+02	100E, 13N	3.81E+02	1.72E+02	101E, 13N	2.53E+02	<BKG
97E, 12N	3.69E+02	8.87E+01	98E, 12N	3.76E+02	1.37E+02	99E, 12N	3.77E+02	1.44E+02	100E, 12N	3.47E+02	<BKG	101E, 12N	2.67E+02	<BKG
97E, 11N	3.75E+02	1.31E+02	98E, 11N	3.81E+02	1.72E+02	99E, 11N	3.68E+02	8.17E+01	100E, 11N	3.81E+02	1.72E+02	101E, 11N	2.44E+02	<BKG
97E, 10N	3.60E+02	2.59E+01	98E, 10N	3.67E+02	7.47E+01	99E, 10N	3.75E+02	1.31E+02	100E, 10N	3.66E+02	6.78E+01	101E, 10N	2.58E+02	<BKG
97E, 9N	4.02E+02	3.19E+02	98E, 9N	2.55E+02	<BKG	99E, 9N	3.23E+02	<BKG	100E, 9N	3.49E+02	<BKG	101E, 9N	3.30E+02	<BKG
97E, 8N	3.64E+02	5.38E+01	98E, 8N	3.46E+02	<BKG	99E, 8N	3.27E+02	<BKG	100E, 8N	3.42E+02	<BKG	101E, 8N	3.57E+02	5.00E+00
97E, 7N	4.01E+02	3.12E+02	98E, 7N	4.75E+02	8.28E+02	99E, 7N	3.19E+02	<BKG	100E, 7N	3.88E+02	2.21E+02	101E, 7N	2.08E+02	<BKG
97E, 6N	4.63E+02	7.44E+02	98E, 6N	4.91E+02	9.39E+02	99E, 6N	4.43E+02	6.05E+02	100E, 6N	3.83E+02	1.86E+02	101E, 6N	2.91E+02	<BKG
97E, 5N	6.88E+02	2.31E+03	98E, 5N	4.70E+02	7.93E+02	99E, 5N	4.72E+02	8.07E+02	100E, 5N	4.91E+02	9.39E+02	101E, 5N	2.95E+02	<BKG
97E, 4N	5.47E+02	1.33E+03	98E, 4N	5.01E+02	1.01E+03	99E, 4N	6.77E+02	2.24E+03	100E, 4N	5.70E+02	1.49E+03	101E, 4N	4.88E+02	9.18E+02
97E, 3N	4.75E+02	8.28E+02	98E, 3N	5.04E+02	1.03E+03	99E, 3N	5.42E+02	1.29E+03	100E, 3N	5.51E+02	1.36E+03	101E, 3N	9.16E+02	3.90E+03
97E, 2N	4.97E+02	9.81E+02	98E, 2N	3.64E+02	5.38E+01	99E, 2N	4.24E+02	4.72E+02	100E, 2N	4.48E+02	6.39E+02	101E, 2N	5.70E+02	1.49E+03
97E, 1N	3.72E+02	1.10E+02	98E, 1N	3.59E+02	1.89E+01	99E, 1N	2.76E+02	<BKG	100E, 1N	2.50E+02	<BKG	101E, 1N	3.84E+02	1.93E+02
97E, 0N	4.05E+02	3.40E+02	98E, 0N	3.30E+02	<BKG	99E, 0N	3.33E+02	<BKG	100E, 0N	3.53E+02	<BKG	101E, 0N	3.75E+02	1.31E+02

Notes:

*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM
102E, 30N	4.85E+02	8.97E+02
102E, 29N	5.48E+02	1.34E+03
102E, 28N	6.68E+02	2.17E+03
102E, 27N	1.21E+03	5.95E+03
102E, 26N	4.63E+03	2.98E+04
102E, 25N	1.01E+03	4.56E+03
102E, 24N	9.67E+02	4.26E+03
102E, 23N	9.93E+02	4.44E+03
102E, 22N	6.73E+02	2.21E+03
102E, 21N	5.50E+02	1.35E+03
102E, 20N	9.04E+02	3.82E+03
102E, 19N	1.43E+03	7.49E+03
102E, 18N	1.81E+03	1.01E+04
102E, 17N	7.67E+02	2.86E+03
102E, 16N	6.48E+02	2.03E+03
102E, 15N	5.03E+02	1.02E+03
102E, 14N	4.47E+02	6.32E+02
102E, 13N	3.90E+02	2.35E+02
102E, 12N	3.42E+02	<BKG
102E, 11N	3.36E+02	<BKG
102E, 10N	3.20E+02	<BKG
102E, 9N	3.50E+02	<BKG
102E, 8N	3.28E+02	<BKG
102E, 7N	3.03E+02	<BKG
102E, 6N	3.95E+02	2.70E+02
102E, 5N	3.62E+02	3.99E+01
102E, 4N	4.15E+02	4.09E+02
102E, 3N	8.47E+02	3.42E+03
102E, 2N	5.75E+02	1.52E+03
102E, 1N	4.01E+02	3.12E+02
102E, 0N	3.48E+02	<BKG

Notes:

*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									106E, 28N	5.19E+02	1.13E+03	107E, 28N	3.20E+02	<BKG
						105E, 27N	7.62E+02	2.83E+03	106E, 27N	7.74E+03	5.15E+04	107E, 27N	4.44E+02	6.12E+02
103E, 26N	2.60E+03	1.56E+04	104E, 26N	4.17E+03	2.66E+04	105E, 26N	2.94E+03	1.80E+04	106E, 26N	7.85E+03	5.22E+04	107E, 26N	2.94E+02	<BKG
103E, 25N	1.05E+03	4.84E+03	104E, 25N	6.84E+02	2.28E+03	105E, 25N	8.05E+02	3.13E+03	106E, 25N	9.21E+02	3.94E+03	107E, 25N	8.20E+02	3.23E+03
103E, 24N	9.52E+02	4.15E+03	104E, 24N	9.94E+02	4.45E+03	105E, 24N	7.39E+02	2.67E+03	106E, 24N	6.68E+02	2.17E+03	107E, 24N	4.85E+02	8.97E+02
									106E, 23N	7.45E+02	2.71E+03	107E, 23N	7.07E+02	2.45E+03
												107E, 22N	4.96E+02	9.74E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
108E, 29N	3.89E+02	2.28E+02												
108E, 28N	3.94E+02	2.63E+02												
108E, 27N	2.07E+03	1.19E+04	109E, 27N	3.81E+02	1.72E+02	110E 27N	3.71E+02	1.03E+02	111E, 27N	2.19E+02	<BKG	112E, 27N	4.21E+02	4.51E+02
108E, 26N	7.27E+02	2.58E+03	109E, 26N	5.95E+02	1.66E+03	110E 26N	6.48E+02	2.03E+03	111E, 26N	5.90E+02	1.63E+03	112E, 26N	4.58E+02	7.09E+02
108E, 25N	5.27E+02	1.19E+03	109E, 25N	6.82E+02	2.27E+03	110E 25N	6.98E+02	2.38E+03	111E, 25N	6.93E+02	2.35E+03	112E, 25N	5.77E+02	1.54E+03
108E, 24N	4.92E+02	9.46E+02	109E, 24N	5.55E+02	1.39E+03	110E 24N	5.79E+02	1.55E+03	111E, 24N	8.22E+02	3.25E+03	112E, 24N	4.81E+02	8.70E+02
108E, 23N	6.09E+02	1.76E+03	109E, 23N	4.44E+02	6.12E+02	110E 23N	5.26E+02	1.18E+03	111E, 23N	6.12E+02	1.78E+03	112E, 23N	4.97E+02	9.81E+02
			109E, 22N	6.71E+02	2.19E+03	110E 22N	6.42E+02	1.99E+03	111E, 22N	5.89E+02	1.62E+03	112E, 22N	4.50E+02	6.53E+02

Notes:

*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
									116E, 31N	2.41E+02	<BKG			
						115E, 30N	3.70E+02	9.56E+01	116E, 30N	6.02E+02	1.71E+03	117E, 30N	4.26E+02	4.86E+02
			114E, 29N	4.30E+02	5.14E+02	115E, 29N	5.00E+02	1.00E+03	116E, 29N	1.32E+03	6.72E+03	117E, 29N	5.55E+02	1.39E+03
			114E, 28N	8.64E+02	3.54E+03	115E, 28N	8.52E+02	3.46E+03	116E, 28N	7.18E+03	4.76E+04	117E, 28N	5.51E+03	3.59E+04
113E, 27N	4.45E+02	6.19E+02	114E, 27N	8.19E+02	3.23E+03	115E, 27N	6.70E+02	2.19E+03	116E, 27N	1.48E+03	7.83E+03	117E, 27N	8.47E+02	3.42E+03
113E, 26N	4.59E+02	7.16E+02	114E, 26N	2.00E+03	1.15E+04	115E, 26N	6.14E+02	1.80E+03	116E, 26N	1.15E+03	5.53E+03	117E, 26N	8.37E+02	3.35E+03
113E, 25N	4.94E+02	9.60E+02	114E, 25N	8.39E+02	3.37E+03	115E, 25N	8.64E+02	3.54E+03	116E, 25N	7.71E+02	2.89E+03	117E, 25N	8.57E+02	3.49E+03
113E, 24N	4.94E+02	9.60E+02	114E, 24N	4.13E+02	3.95E+02	115E, 24N	8.30E+02	3.30E+03	116E, 24N	9.02E+02	3.80E+03	117E, 24N	1.23E+03	6.09E+03
												117E, 23N	1.23E+03	6.09E+03
												117E, 22N	6.89E+02	2.32E+03

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

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Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
118E, 29N	3.54E+02	<BKG						
118E, 28N	1.01E+03	4.56E+03	119E, 28N	4.67E+02	7.72E+02			
118E, 27N	7.38E+02	2.66E+03	119E, 27N	4.52E+02	6.67E+02			
118E, 26N	7.74E+02	2.91E+03	119E, 26N	5.89E+02	1.62E+03			
118E, 25N	1.55E+03	8.32E+03	119E, 25N	1.06E+03	4.91E+03			
118E, 24N	1.27E+03	6.37E+03	119E, 24N	1.39E+03	7.21E+03	120E, 24N	6.69E+02	2.18E+03
118E, 23N	7.80E+02	2.95E+03	119E, 23N	6.43E+02	2.00E+03			
118E, 22N	7.29E+02	2.60E+03						

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
126E, 38N	6.52E+02	1.24E+02	127E, 38N	6.85E+02	2.56E+02	128E, 38N	7.63E+02	5.68E+02	129E, 38N	8.28E+02	8.28E+02	130E, 38N	6.43E+02	8.80E+01
126E, 37N	6.69E+02	1.92E+02	127E, 37N	6.95E+02	2.96E+02	128E, 37N	8.01E+02	7.20E+02	129E, 37N	7.82E+02	6.44E+02	130E, 37N	6.40E+02	7.60E+01
126E, 36N	6.88E+02	2.68E+02	127E, 36N	7.92E+02	6.84E+02	128E, 36N	7.95E+02	6.96E+02	129E, 36N	7.75E+02	6.16E+02	130E, 36N	9.80E+02	1.44E+03
126E, 35N	8.00E+02	7.16E+02	127E, 35N	1.06E+03	1.76E+03	128E, 35N	1.14E+03	2.08E+03	129E, 35N	1.11E+03	1.96E+03	130E, 35N	9.68E+02	1.39E+03
126E, 34N	6.99E+02	3.12E+02	127E, 34N	7.83E+02	6.48E+02	128E, 34N	8.12E+02	7.64E+02	129E, 34N	7.94E+02	6.92E+02	130E, 34N	1.06E+03	1.76E+03
126E, 33N	6.73E+02	2.08E+02	127E, 33N	6.50E+02	1.16E+02	128E, 33N	6.69E+02	1.92E+02	129E, 33N	8.43E+02	8.88E+02	130E, 33N	8.40E+02	8.76E+02
126E, 32N	6.98E+02	3.08E+02	127E, 32N	6.30E+02	3.60E+01	128E, 32N	6.32E+02	4.40E+01	129E, 32N	8.30E+02	8.36E+02	130E, 32N	8.37E+02	8.64E+02
126E, 31N	6.55E+02	1.36E+02	127E, 31N	6.71E+02	2.00E+02	128E, 31N	6.25E+02	1.60E+01	129E, 31N	7.31E+02	4.40E+02	130E, 31N	1.07E+03	1.80E+03
126E, 30N	6.50E+02	1.16E+02	127E, 30N	6.42E+02	8.40E+01	128E, 30N	6.44E+02	9.20E+01	129E, 30N	6.30E+02	3.60E+01	130E, 30N	6.64E+02	1.72E+02
126E, 29N	6.99E+02	3.12E+02	127E, 29N	6.70E+02	1.96E+02	128E, 29N	7.60E+02	5.56E+02	129E, 29N	6.43E+02	8.80E+01	130E, 29N	5.28E+02	<BKG
126E, 28N	7.03E+02	3.28E+02	127E, 28N	7.11E+02	3.60E+02	128E, 28N	6.68E+02	1.88E+02	129E, 28N	6.85E+02	2.56E+02	130E, 28N	5.55E+02	<BKG
126E, 27N	8.57E+02	9.44E+02	127E, 27N	8.10E+02	7.56E+02	128E, 27N	7.27E+02	4.24E+02	129E, 27N	6.36E+02	6.00E+01	130E, 27N	5.85E+02	<BKG
126E, 26N	7.24E+02	4.12E+02	127E, 26N	6.81E+02	2.40E+02	128E, 26N	8.10E+02	7.56E+02	129E, 26N	7.57E+02	5.44E+02	130E, 26N	7.44E+02	4.92E+02
126E, 25N	6.24E+02	1.20E+01	127E, 25N	8.44E+02	8.92E+02	128E, 25N	7.92E+02	6.84E+02	129E, 25N	7.44E+02	4.92E+02	130E, 25N	6.40E+02	7.60E+01
126E, 24N	6.55E+02	1.36E+02	127E, 24N	6.38E+02	6.80E+01	128E, 24N	6.40E+02	7.60E+01	129E, 24N	6.40E+02	7.60E+01	130E, 24N	6.40E+02	7.60E+01

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background (α) 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
131E, 38N	7.04E+02	3.32E+02	132E, 38N	6.46E+02	1.00E+02	133E, 38N	7.19E+02	3.92E+02	134E, 38N	5.86E+02	<BKG	135E, 38N	5.98E+02	<BKG
131E, 37N	6.82E+02	2.44E+02	132E, 37N	7.01E+02	3.20E+02	133E, 37N	6.50E+02	1.16E+02	134E, 37N	3.60E+02	2.59E+01	135E, 37N	5.32E+02	1.23E+03
131E, 36N	9.25E+02	1.22E+03	132E, 36N	4.80E+02	8.63E+02	133E, 36N	4.44E+02	6.12E+02	134E, 36N	4.03E+02	3.26E+02	135E, 36N	6.34E+02	1.94E+03
131E, 35N	1.16E+03	2.16E+03	132E, 35N	7.30E+02	2.61E+03	133E, 35N	6.72E+02	2.20E+03	134E, 35N	7.39E+02	2.67E+03	135E, 35N	8.24E+02	3.26E+03
131E, 34N	1.07E+03	1.80E+03	132E, 34N	6.82E+02	2.27E+03	133E, 34N	1.28E+03	6.44E+03	134E, 34N	1.70E+03	9.37E+03	135E, 34N	1.36E+03	7.00E+03
131E 33N	8.59E+02	9.52E+02	132E, 33N	1.05E+03	4.84E+03	133E, 33N	1.46E+03	7.70E+03	134E, 33N	2.89E+03	1.77E+04	135E, 33N	1.46E+03	7.70E+03
131E, 32N	9.11E+02	1.16E+03	132E, 32N	7.86E+02	3.00E+03	133E, 32N	1.02E+03	4.63E+03	134E, 32N	4.74E+02	8.21E+02	135E, 32N	5.69E+02	1.48E+03
131E, 31N	6.94E+02	2.92E+02	132E, 31N	4.51E+02	6.60E+02	133E, 31N	4.36E+02	5.56E+02	134E, 31N	2.91E+02	<BKG	135E, 31N	3.97E+02	2.84E+02
131E, 30N	5.64E+02	<BKG	132E, 30N	2.98E+02	<BKG	133E, 30N	4.21E+02	4.51E+02	134E, 30N	1.17E+03	5.67E+03	135E, 30N	5.84E+02	1.59E+03
131E, 29N	5.44E+02	<BKG	132E, 29N	6.00E+02	<BKG	133E, 29N	3.43E+02	<BKG	134E, 29N	6.41E+02	1.99E+03	135E, 29N	5.69E+02	1.48E+03
131E, 28N	6.36E+02	6.00E+01	132E, 28N	6.30E+02	3.60E+01	133E, 28N	6.41E+02	1.99E+03	134E, 28N	9.67E+02	4.26E+03	135E, 28N	5.75E+02	1.52E+03
131E, 27N	6.36E+02	6.00E+01	132E, 27N	6.88E+02	2.68E+02	133E, 27N	2.25E+02	<BKG	134E, 27N	3.25E+02	<BKG	135E, 27N	1.59E+03	8.60E+03
131E, 26N	7.26E+02	4.20E+02	132E, 26N	6.30E+02	3.60E+01	133E, 26N	6.47E+02	1.04E+02	134E, 26N	3.96E+02	2.77E+02	135E, 26N	8.83E+02	3.67E+03
131E, 25N	6.62E+02	1.64E+02	132E, 25N	6.56E+02	1.40E+02	133E, 25N	7.72E+02	6.04E+02				135E, 25N	4.48E+02	6.39E+02
131E, 24N	6.44E+02	9.20E+01	132E, 24N	6.06E+02	<BKG	133E, 24N	6.77E+02	2.24E+02	134E, 24N	7.19E+02	2.88E+03	135E, 24N	6.62E+02	1.64E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
136E, 38N	7.16E+02	3.80E+02	137E, 38N	4.19E+02	4.37E+02	138E, 38N	4.22E+02	4.58E+02
136E, 37N	6.07E+02	1.75E+03	137E, 37N	6.23E+02	1.86E+03	138E, 37N	5.12E+02	1.09E+03
136E, 36N	8.02E+02	3.11E+03	137E, 36N	6.98E+02	2.38E+03	138E, 36N	5.39E+02	1.27E+03
136E, 35N	2.18E+03	1.27E+04	137E, 35N	6.76E+02	2.23E+03	138E, 35N	4.56E+02	6.95E+02
136E, 34N	2.18E+03	1.27E+04	137E, 34N	8.29E+02	3.30E+03	138E, 34N	4.43E+02	6.05E+02
136E, 33N	1.84E+03	1.03E+04	137E, 33N	6.96E+02	2.37E+03	138E, 33N	5.19E+02	1.13E+03
136E, 32N	4.81E+02	8.70E+02	137E, 32N	1.34E+03	6.86E+03	138E, 32N	8.00E+02	3.09E+03
136E, 31N	3.80E+02	1.65E+02	137E, 31N	7.40E+02	2.68E+03	138E, 31N	4.42E+02	5.98E+02
136E, 30N	3.92E+02	2.49E+02	137E, 30N	4.20E+02	4.44E+02	138E, 30N	4.31E+02	5.21E+02
136E, 29N	4.48E+02	6.39E+02	137E, 29N	3.78E+02	1.51E+02	138E, 29N	3.67E+02	7.47E+01
136E, 28N	4.12E+02	3.88E+02	137E, 28N	3.83E+02	1.86E+02	138E, 28N	3.35E+02	<BKG
136E, 27N	1.19E+03	5.81E+03	137E, 27N	3.80E+02	1.65E+02	138E, 27N	4.18E+02	4.30E+02
136E, 26N	9.99E+02	4.48E+03	137E, 26N	2.15E+03	1.25E+04	138E, 26N	2.69E+03	1.63E+04
136E, 25N	4.99E+02	9.95E+02	137E, 25N	5.31E+02	1.22E+03	138E, 25N	1.14E+03	2.08E+03
136E, 24N	6.54E+02	1.32E+02	137N, 24N	7.59E+02	5.52E+02	138E 24N	6.92E+02	2.84E+02

Notes

*Raw 1 cm data from 15 second counts

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 10
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net cpm
132E, 16N	2.30E+02	<BKG	133E, 16N	2.44E+02	<BKG	134E, 16N	4.79E+02	8.56E+02	135E, 16N	3.82E+02	1.79E+02			
132E, 15N	3.70E+02	9.56E+01	133E, 15N	4.80E+02	8.63E+02	134E, 15N	7.95E+02	3.06E+03	135E, 15N	6.69E+02	2.18E+03			
132E, 14N	3.20E+02	<BKG	133E, 14N	8.50E+02	3.44E+03	134E, 14N	1.35E+03	6.93E+03	135E, 14N	8.62E+02	3.53E+03			
132E, 13N	3.40E+02	<BKG	133E, 13N	7.88E+02	3.01E+03	134E, 13N	1.90E+03	1.08E+04	135E, 13N	9.72E+02	4.29E+03	136E, 13N	4.14E+02	4.02E+02
			133E, 12N	6.94E+02	2.35E+03	134E, 12N	8.66E+02	3.55E+03	135E, 12N	5.06E+02	1.04E+03			
						134E, 11N	3.68E+02	8.17E+01						

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 11
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
139E, 15N	2.78E+02	<BKG	140E, 15N	4.93E+02	9.53E+02			
139E, 14N	4.35E+02	5.49E+02	140E, 14N	9.96E+02	4.46E+03	141E, 14N	5.11E+02	1.08E+03
139E, 13N	5.97E+02	1.68E+03	140E, 13N	5.49E+02	1.34E+03	141E, 13N	4.40E+02	5.84E+02

Notes:
*Raw 1 cm data from 15 second counts.
Average background @ 1 cm = 2484 CPM.
Net CPM values in red are > 3 x background.

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
166E, 66N	6.85E+02	2.56E+02	167E, 66N	6.80E+02	2.36E+02	168E, 66N	5.75E+02	<BKG	169E, 66N	6.29E+02	3.20E+01	170E, 66N	4.62E+03	2.97E+04
166E, 65N	8.12E+02	7.64E+02	167E, 65N	6.54E+02	1.32E+02	168E, 65N	7.46E+02	5.00E+02	169E, 65N	7.54E+02	5.32E+02	170E, 65N	1.08E+03	5.05E+03
166E, 64N	4.94E+02	9.60E+02	167E, 64N	7.83E+02	6.48E+02	168E, 64N	6.63E+02	1.68E+02	**169E, 64N	6.20E+02	1.84E+03	170E, 64N	5.82E+02	1.57E+03
166E, 63N	5.47E+02	1.33E+03	167E, 63N	5.92E+02	1.64E+03	168E, 63N	6.54E+02	2.08E+03	169E, 63N	1.14E+03	5.46E+03	170E, 63N	1.26E+03	6.30E+03
166E, 62N	7.43E+02	2.70E+03	167E, 62N	6.89E+02	2.32E+03	168E, 62N	8.92E+02	3.74E+03	169E, 62N	1.38E+03	7.14E+03	170E, 62N	1.52E+03	8.11E+03
166E, 61N	5.73E+02	1.51E+03	167E, 61N	5.91E+02	1.64E+03	168E, 61N	6.98E+02	2.38E+03	169E, 61N	1.43E+03	7.49E+03	170E, 61N	1.69E+03	9.30E+03
166E, 60N	4.02E+02	3.19E+02	167E, 60N	4.85E+02	8.97E+02	168E, 60N	6.70E+02	2.19E+03	169E, 60N	1.05E+03	4.84E+03	170E, 60N	1.08E+03	5.05E+03

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
171E, 66N	4.36E+02	5.56E+02	172E, 66N	4.32E+02	5.28E+02	173E, 66N	4.45E+02	6.19E+02	174E, 66N	5.03E+02	1.02E+03	175E, 66N	5.08E+02	1.06E+03
171E, 65N	1.17E+03	5.67E+03	172E, 65N	9.11E+02	3.87E+03	173E, 65N	7.84E+02	2.98E+03	174E, 65N	1.12E+03	5.32E+03	175E, 65N	1.10E+03	5.19E+03
171E, 64N	6.59E+03	4.35E+04	172E, 64N	8.41E+02	3.38E+03	173E, 64N	1.48E+03	7.83E+03	174E, 64N	1.65E+03	9.02E+03	175E, 64N	6.63E+02	2.14E+03
171E, 63N	1.21E+03	5.95E+03	172E, 63N	1.11E+03	5.25E+03	173E, 63N	9.65E+02	4.24E+03	174E, 63N	7.67E+02	2.86E+03	175E, 63N	9.40E+02	4.07E+03
171E, 62N	1.14E+03	5.46E+03	172E, 62N	1.05E+03	4.84E+03	173E, 62N	1.06E+03	4.91E+03	174E, 62N	9.14E+02	3.89E+03	175E, 62N	1.01E+03	4.56E+03
171E, 61N	8.54E+02	3.47E+03	172E, 61N	8.85E+02	3.69E+03	173E, 61N	6.35E+02	1.94E+03	174E, 61N	5.69E+02	1.48E+03	175E, 61N	6.40E+02	1.98E+03
171E, 60N	5.58E+02	1.41E+03	172E, 60N	5.44E+02	1.31E+03	173E, 60N	5.12E+02	1.09E+03	174E, 60N	4.37E+03	2.80E+04	175E, 60N	4.57E+02	7.02E+02

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
Raw Data and Corrected Net CPM*

Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM	Location	*1 cm	Net CPM
176E, 66N	7.96E+02	7.00E+02	177E, 66N	9.22E+02	1.20E+03	178E, 66N	8.04E+02	7.32E+02			
176E, 65N	1.48E+03	3.44E+03	177E, 65N	1.48E+03	3.44E+03	178E, 65N	1.19E+03	2.28E+03	179E, 65N	7.31E+02	4.40E+02
176E, 64N	1.80E+03	4.72E+03	177E, 64N	1.49E+03	3.48E+03	178E, 64N	9.62E+02	1.36E+03			
176E, 63N	1.33E+03	2.84E+03	177E, 63N	1.23E+03	2.44E+03	178E, 63N	7.89E+02	6.72E+02			
176E, 62N	1.31E+03	2.76E+03	177E, 62N	1.09E+03	1.88E+03	178E, 62N	8.10E+02	7.56E+02			
176E, 61N	8.53E+03	3.16E+04	177E, 61N	8.46E+02	9.00E+02	178E, 61N	6.74E+02	2.12E+02			
176E, 60N	7.70E+03	2.83E+04	177E, 60N	8.04E+02	7.32E+02	178E, 60N	6.92E+02	2.84E+02			

Notes:

*Raw 1 cm data from 15 second counts.

**Based on 5/14/94 measurements and additional measurements taken 5/21/94 and 5/22/94. Values in table represent the average of multiple measurements.

Average background @ 1 cm = 2484 CPM.

Net CPM values in red are > 3 x background.

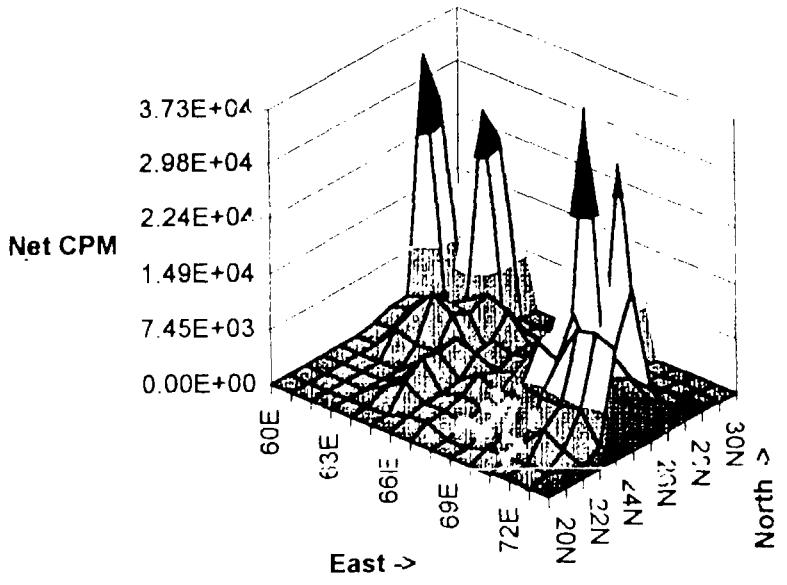
Special readings taken along eastern guardrail south of Area 12 (Same footnotes above apply).

Location	*1 cm	Net CPM
180E, 18N	6.44E+02	9.20E+01
180E, 0N	6.56E+02	1.40E+02

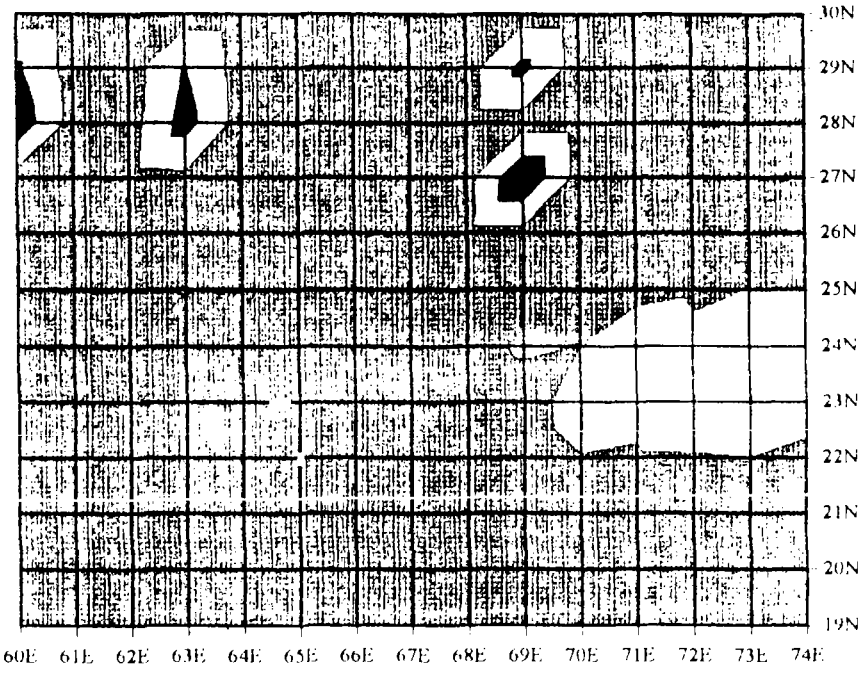
APPENDIX F2

DETAILED SURVEY DATA MAPS FOR AREAS 1-12

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 5
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Net CPM
≤ 3 x Bkg
> 3 x Bkg - 10 x Bkg.
> 10 x Bkg



Net CPM
≤ 3 x Bkg.
> 3 x Bkg - 10 x Bkg
> 10 x Bkg.

*Background = 2484 CPM, 3 x Background = 7452 CPM

8/19/94

ATTACHMENT B

Kerr-McGee Chemical Corporation
Borehole Logging Procedure

APPENDIX G4

QUALITY ASSURANCE CHECK OF ESP-1 AND BICRON INSTRUMENTS AT MOST ELEVATED LOCATION, 76E, 4N

M.J.W. Corporation Inc.

DETAILED AREA SURVEY MAP*
FORM RCP 40-4A

Client: STS Consultants, Ltd. | Job No: 142-94-073-01

Work Description: QA Check of all 4 Instruments (2) 44-10 and (2) Bicron at Most Elevated Reading Location

INDICATE NORTH

Elevated Spot Location Near 76E, 4N*

Instrument # 1 - ESP1, S/N 02260 / Model 44-10, S/N 111127 (Large 6" Collimator)

At Surface	At 1 Meter Above Surface
Count rate = 3.07 E5 (CPM)	1.16 E5 (CPM)
1 Minute Count = 2.91 E5	1.15 E5

Instrument # 2 - ESP1, S/N 02261 with Model 44-10, S/N 112642 (Small 2.5" Collimator)

At Surface	At 1 Meter Above Surface
Count rate = 3.30 E5 (CPM)	1.30 E5 (CPM)
1 Minute Count = 3.3 E5	1.31 E5

Instrument #3 - Bicron, S/N B378A

At Surface	At 1 Meter Above Surface
650 uRem/hour	165 uRem/hour

Instrument #4 - Bicron, S/N B971N

At Surface	At 1 Meter Above Surface
625 uRem/hour	165 uRem/hour

Calculated Average Correction Factor = 487 CPM/uRem/hr at 1 cm above the surface, 745 CPM/uRem/hr at 1 meter above surface.

*This small spot gave the most elevated readings on the site. It is located approximately 2 meters west of the building boundary which (supposedly) begins at 78E.

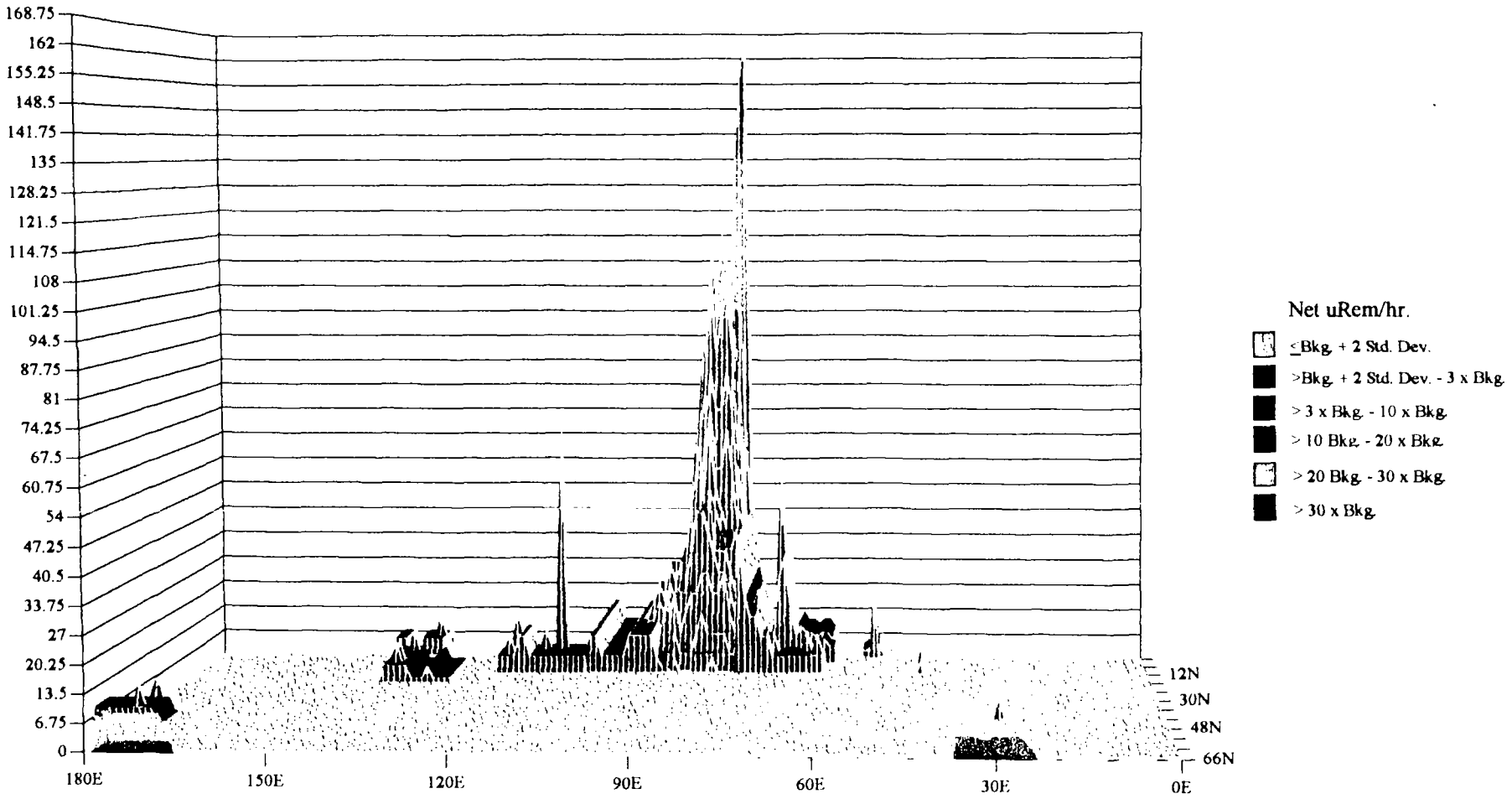
76,4 • X • 77,4

76,3 • • 77,3

MEASUREMENT UNITS: CPM and uRem/hr | DATA RECORDED BY: D. Dooley DMD DATE: 5/22/94

DRAWING SCALE: None | CHECKED BY: J. V. Wiernwski JVW DATE: 5/24/94

Lindsay Light II Site
Overland Tissue Equivalent Dose Rate



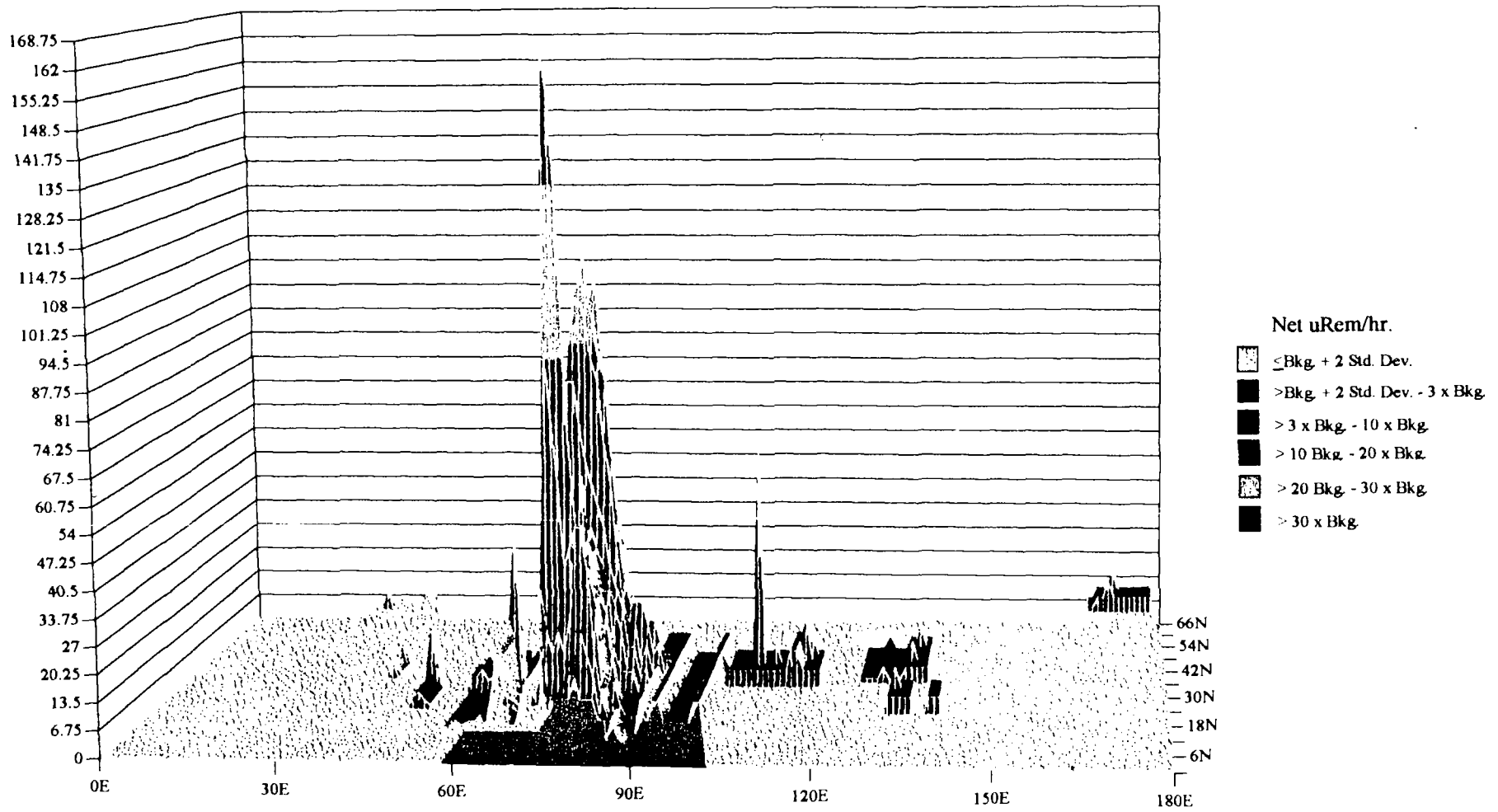
*Background = 4.5 uRem/hr.
**Background + 2 Standard Deviations = 6.75 uRem/hr.

8/19/94

APPENDIX G3

THREE-DIMENSIONAL REPRESENTATION OF BICRON DATA

Lindsay Light II Site
Overland Tissue Equivalent Dose Rate



*Background = 4.5 uRem/hr.
**Background + 2 Standard Deviations = 6.75 uRem/hr.

8/19/94

Lindsay Light II Site, Overland Tissue Equivalent Dose Rate Data (uRem/hr) **137E - 180E**

	137E	138E	139E	140E	141E	142E	143E	144E	145E	146E	147E	148E	149E	150E	151E	152E	153E	154E	155E	156E	157E	158E	159E	160E	161E	162E	163E	164E	165E	166E	167E	168E	169E	170E	171E	172E	173E	174E	175E	176E	177E	178E	179E	180E
66N																														7.5	7.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
65N																														7.5	7.5	10.5	10.5	10.5	13.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
64N																														7.5	7.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
63N																														7.5	7.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
62N																														7.5	7.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
61N																														7.5	7.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
60N																														7.5	7.5	10.5	10.5	13.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
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Lindsay Light II Site, Overland Tissue Equivalent Dose Rate Data (uRem/hr)

	52E	53E	54E	55E	56E	57E	58E	59E	60E	61E	62E	63E	64E	65E	66E	67E	68E	69E	70E	71E	72E	73E	74E	75E	76E	77E	78E	79E	80E	81E	82E	83E	84E	85E	86E	87E	88E	89E	90E	91E	92E	93E	94E
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30N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	20.5	25.5	40.5	5.5	5.5	5.5	5.5	10.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	7.5	7.5	10.5	15.5	15.5	15.5	15.5
29N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	20.5	25.5	40.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	5.5	5.5	5.5	10.5	10.5	7.5	10.5	15.5	15.5	15.5	15.5
28N									10.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	20.5	25.5	40.5	10.5	10.5	15.5	15.5	15.5	20.5	15.5	10.5	10.5	10.5	15.5	10.5	10.5	10.5	15.5	15.5	15.5	15.5	15.5
27N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	20.5	25.5	40.5	15.5	20.5	30.5	25.5	25.5	30.5	30.5	25.5	25.5	20.5	15.5	25.5	15.5	15.5	10.5	15.5	15.5	15.5	15.5
26N									10.5	10.5	10.5	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	15.5	20.5	20.5	25.5	40.5	20.5	25.5	30.5	30.5	35.5	40.5	45.5	45.5	35.5	25.5	25.5	25.5	20.5	20.5	10.5	15.5	15.5	15.5	15.5
25N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	20.5	25.5	40.5	25.5	30.5	35.5	35.5	35.5	40.5	45.5	45.5	40.5	25.5	15.5	17.5	20.5	17.5	10.5	15.5	15.5	15.5	15.5
24N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	25.5	20.5	25.5	40.5	30.5	30.5	35.5	35.5	35.5	50.5	45.5	45.5	40.5	25.5	20.5	15.5	15.5	13.5	10.5	15.5	15.5	15.5	15.5
23N							10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	40.5	35.5	35.5	40.5	45.5	50.5	45.5	40.5	35.5	25.5	15.5	15.5	15.5	15.5	10.5	15.5	15.5	15.5	15.5
22N							10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	35.5	40.5	40.5	45.5	50.5	65.5	50.5	35.5	25.5	20.5	15.5	15.5	15.5	15.5	10.5	15.5	15.5	15.5	15.5
21N							10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	40.5	35.5	65.5	55.5	55.5	70.5	55.5	35.5	25.5	15.5	15.5	15.5	10.5	10.5	10.5	15.5	15.5	15.5	15.5
20N							10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	45.5	70.5	80.5	70.5	70.5	80.5	65.5	45.5	35.5	20.5	15.5	15.5	10.5	15.5	10.5	15.5	15.5	15.5	15.5
19N							10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	55.5	85.5	100.5	95.5	85.5	100.5	75.5	65.5	45.5	25.5	20.5	20.5	15.5	20.5	10.5	15.5	15.5	15.5	15.5
18N	8.5	7.5	5.0				10.5	10.5	12.5	9.5	10.5										15.5	20.5	25.5	40.5	70.5	85.5	105.5	115.5	100.5	110.5	90.5	70.5	45.5	35.5	25.5	25.5	20.5	25.5	17.5	20.5	15.5	15.5	15.5
17N	8.5	7.5	5.0																		15.5	20.5	25.5	40.5	80.5	85.5	105.5	110.5	100.5	100.5	90.5	65.5	55.5	45.5	30.5	30.5	25.5	30.5	20.5	25.5	20.5	15.5	15.5
16N	8.5	7.5	5.0																		15.5	20.5	25.5	40.5	75.5	85.5	105.5	110.5	105.5	100.5	90.5	85.5	65.5	50.5	35.5	30.5	30.5	30.5	25.5	17.5	20.5	10.5	15.5
15N	8.5	7.5	5.0																		15.5	20.5	25.5	40.5	70.5	90.5	105.5	105.5	100.5	90.5	85.5	70.5	60.5	45.5	30.5	25.5	25.5	15.5	20.5	13.5	15.5	10.5	15.5
14N	8.5	7.5	5.0																		15.5	20.5	25.5	40.5	70.5	85.5	85.5	75.5	65.5	60.5	55.5	50.5	40.5	35.5	30.5	20.5	20.5	12.5	15.5	7.5	15.5	10.5	15.5
13N	8.5	7.5	5.0																		15.5	20.5	25.5	40.5	45.5	55.5	55.5	50.5	45.5	50.5	45.5	40.5	35.5	30.5	25.5	15.5	15.5	15.5	10.5	10.5	7.5	15.5	10.5	15.5
12N	8.5	7.5	5.0					8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	40.5	45.5	40.5	35.5	40.5	45.5	45.5	35.5	35.5	20.5	15.5	15.5	15.5	10.5	7.5	7.5	15.5	10.5	15.5
11N	8.5	7.5	5.0					8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	35.5	45.5	45.5	30.5	35.5	45.5	45.5	35.5	30.5	20.5	10.5	10.5	10.5	7.5	7.5	7.5	15.5	10.5	15.5
10N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	30.5	30.5	30.5	30.5	40.5	40.5	45.5	35.5	30.5	20.5	10.5	10.5	7.5	7.5	7.5	7.5	15.5	10.5	15.5
9N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	25.5	25.5	35.5	35.5	40.5	45.5	45.5	35.5	25.5	15.5	15.5	10.5	10.5	7.5	7.5	7.5	15.5	10.5	15.5
8N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	30.5	9.5	9.5	15.5	20.5	25.5	40.5	20.5	25.5	35.5	40.5	45.5	55.5	50.5	35.5	25.5	15.5	15.5	10.5	10.5	7.5	7.5	7.5	15.5	10.5	15.5
7N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	15.5	25.5	35.5	55.5	50.5	65.5	50.5	35.5	25.5	15.5	15.5	10.5	7.5	7.5	7.5	7.5	15.5	10.5	15.5
6N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	25.5	35.5	60.5	65.5	55.5	65.5	45.5	30.5	25.5	15.5	10.5	5.5	5.5	5.5	7.5	7.5	15.5	10.5	15.5
5N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	65.5	105.5	115.5	75.5	55.5	50.5	45.5	35.5	25.5	15.5	5.5	10.5	5.5	5.5	7.5	7.5	15.5	10.5	15.5
4N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	165.5	155.5	130.5	90.5	65.5	50.5	45.5	30.5	30.5	15.5	5.5	10.5	5.5	5.5	7.5	7.5	15.5	10.5	15.5
3N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	95.5	80.5	65.5	45.5	50.5	55.5	55.5	45.5	35.5	15.5	10.5	10.5	5.5	10.5	7.5	7.5	15.5	10.5	15.5
2N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	30.5	25.5	30.5	25.5	35.5	55.5	55.5	45.5	25.5	15.5	10.5	10.5	5.5	7.5	7.5	7.5	15.5	10.5	15.5
1N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	15.5	15.5	15.5	15.5	20.5	20.5	30.5	25.5	20.5	10.5	5.5	10.5	5.5	5.5	7.5	7.5	15.5	10.5	15.5
0N								8.5	10.5	10.5	9.5	10.5	10.5	12.5	9.5	17.5	30.5	25.5	9.5	9.5	15.5	20.5	25.5	40.5	10.5	15.5	15.5	15.5	15.5	20.5	15.5	15.5	15.5	10.5	10.5	10.5	7.5	5.5	7.5	7.5	15.5	10.5	15.5

	95E	96E	97E	98E	99E	100E	101E	102E	103E	104E	105E	106E	107E	108E	109E	110E	111E	112E	113E	114E	115E	116E	117E	118E	119E	120E	121E	122E	123E	124E	125E	126E	127E	128E	129E	130E	131E	132E	133E	134E	135E	136E
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38N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
37N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
36N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	15.5
35N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
34N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	15.5
33N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
32N																																7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
31N									10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
30N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
29N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	15.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
28N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
27N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	20.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	15.5	10.5
26N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
25N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	65.5	10.5	10.5	15.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
24N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5							7.5	7.5	7.5	7.5	10.5	7.5	7.5	7.5	10.5	10.5	10.5
23N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5																		
22N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5	10.5	10.5	10.5	10.5																		
21N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
20N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
19N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
18N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
17N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
16N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
15N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	15.5	10.5	10.5	10.5		
14N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
13N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
12N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
11N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																												10.5	10.5	10.5	10.5	10.5		
10N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
9N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
8N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
7N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
6N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
5N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
4N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
3N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
2N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		
1N	15.5	10.5	10.5	10.5	10.5	10.5	15.5	15.5																																		

APPENDIX G2

BICRON DATA OVERLAYED ON 1 METER SITE GRID

Lindsay Light II Site, Overland Tissue Equivalent Dose Rate Data (uRem/hr)

	0E	1E	2E	3E	4E	5E	6E	7E	8E	9E	10E	11E	12E	13E	14E	15E	16E	17E	18E	19E	20E	21E	22E	23E	24E	25E	26E	27E	28E	29E	30E	31E	32E	33E	34E	35E	36E	37E	38E	39E	40E	41E	42E	43E	44E	45E	46E	47E	48E	49E	50E	51E
64N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
63N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
62N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
61N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
60N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
59N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
58N																									3.5	4.5	5.5	5.5	5.5	11.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
57N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
56N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
55N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
54N																									3.5	4.5	5.5	5.5	5.5	5.5	5.5	4.5	4.5	5.5	6.5	6.5	6.5																				
53N																																																					
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21N																																																					
20N																																																					
19N																																																				2.5	5
18N																																																		6.5	5.5	6.5	9.5	10.5
17N																																																		6.5	5.5	6.5	9.5	10.5
16N																																																		6.5	5.5	6.5	9.5	10.5
15N																																																		6.5	5.5	6.5	9.5	10.5
14N																																																		6.5	5.5	6.5	9.5	10.5
13N																																																		6.5	5.5	6.5	9.5	10.5
12N																																																		6.5	5.5	6.5	9.5	10.5
11N																																																		6.5	5.5	6.5	9.5	10.5
10N																																																					
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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 11 (uRem/hr)*

AREA 11

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
18N	15	10.5	15	10.5	15	10.5
17N	15	10.5	15	10.5	15	10.5
16N	15	10.5	15	10.5	15	10.5
15N	15	10.5	15	10.5	15	10.5
14N	15	10.5	15	10.5	15	10.5
13N	15	10.5	15	10.5	15	10.5
12N	15	10.5	15	10.5	15	10.5
11N	15	10.5	15	10.5	15	10.5
	139E		**140E**		**141E**	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 12 (uRem/hr)*

AREA 12

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
66N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
65N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	20	15.5	15	10.5
64N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
63N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
62N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
61N	12	7.5	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
60N	12	7.5	12	7.5	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5
	166E		167E		168E		169E		170E		171E		172E	

AREA 12

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
66N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
65N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
64N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
63N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
62N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
61N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
60N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
	173E		174E		175E		176E		177E		178E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

Lindsay Light II Site

AREA 9 Overland Tissue Equivalent Dose Rate Data - Area 9 (uRem/hr)*

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
38N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
37N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
36N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
35N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
34N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
33N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
32N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
31N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
30N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
29N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
28N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
27N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
26N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
25N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
24N	12	7.5	12	7.5	12	7.5	12	7.5	15	10.5	12	7.5	12	7.5
	126E		**127E**		**128E**		**129E**		**130E**		**131E**		**132E**	

AREA 9

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
38N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
37N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
36N	12	7.5	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5
35N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
34N	12	7.5	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5
33N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
32N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
31N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
30N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
29N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
28N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
27N	12	7.5	15	10.5	20	15.5	15	10.5	15	10.5	15	10.5
26N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
25N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
24N	12	7.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
	133E		**134E**		**135E**		**136E**		**137E**		**138E**	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 urem/hr.

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 10 (uRem/hr)*

AREA 10

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
18N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
17N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
16N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
15N	15	10.5	20	15.5	15	10.5	15	10.5	15	10.5
14N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
13N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
12N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
11N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
	132E		133E		134E		135E		136E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 8 (uRem/hr)*

AREA 8

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
31N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
30N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
28N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
27N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
26N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
25N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	70	65.5
24N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
23N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
22N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
	103E		**104E**		**105E**		**106E**		**107E**		**108E**	

AREA 8

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
31N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
30N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
28N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
27N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
26N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
25N	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5	20	15.5
24N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
23N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
22N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5
	109E		**110E**		**111E**		**112E**		**113E**		**114E**	

*All measurements recorded at 1 meter above ground surface

**Net urem/hr. = Gross - Average background. Average background = 4.5uRem/hr.

8/19/94

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 8 (uRem/hr)*

AREA 8

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
31N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
30N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
29N	20	15.5	15	10.5	20	15.5	15	10.5	15	10.5
28N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
27N	20	15.5	25	20.5	15	10.5	15	10.5	15	10.5
26N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
25N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
24N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
23N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
22N	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
	115E		**116E**		**117E**		**118E**		**119E**	

*All measurements recorded at 1 meter above ground surface

**Net urem/hr. = Gross - Average background. Average background = 4.5uRem/hr.

8/19/94

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 7 (uRem/hr)*

AREA 7

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
29N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
28N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
27N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
26N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
25N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
24N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
23N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
22N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
21N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
20N	15	10.5	20	15.5	20	15.5	20	15.5	20	15.5	20	15.5
19N	15	10.5	20	15.5	18	13.5	20	15.5	20	15.5	20	15.5
18N	22	17.5	25	20.5	20	15.5	20	15.5	20	15.5	20	15.5
17N	25	20.5	30	25.5	25	20.5	20	15.5	20	15.5	20	15.5
16N	30	25.5	22	17.5	25	20.5	15	10.5	20	15.5	20	15.5
15N	25	20.5	18	13.5	20	15.5	15	10.5	20	15.5	20	15.5
14N	20	15.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
13N	15	10.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
12N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
11N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
10N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
9N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
8N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
7N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
6N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
5N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
4N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
3N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
2N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
1N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
0N	12	7.5	12	7.5	20	15.5	15	10.5	20	15.5	20	15.5
	90E		**91E**		**92E**		**93E**		**94E**		**95E**	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 7 (uRem/hr)*

AREA 7

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
28N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
27N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
26N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
25N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
24N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
23N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
22N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
21N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
20N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
19N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
18N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
17N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
16N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
15N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
14N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
13N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
12N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
11N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
10N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
9N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
8N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
7N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
6N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
5N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
4N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
3N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
2N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
1N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
0N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
	96E		97E		98E		99E		100E		101E		102E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr = Gross - Average background Average background = 4 5 uRem/hr

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 7 (uRem/hr)*

AREA 7

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	10	5.5	10	5.5	15	10.5	10	5.5	10	5.5	10	5.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
28N	20	15.5	20	15.5	20	15.5	20	15.5	25	20.5	20	15.5
27N	35	30.5	30	25.5	30	25.5	35	30.5	35	30.5	30	25.5
26N	35	30.5	35	30.5	40	35.5	45	40.5	50	45.5	50	45.5
25N	40	35.5	40	35.5	40	35.5	45	40.5	50	45.5	50	45.5
24N	40	35.5	40	35.5	40	35.5	55	50.5	50	45.5	50	45.5
23N	40	35.5	45	40.5	50	45.5	55	50.5	50	45.5	45	40.5
22N	45	40.5	50	45.5	55	50.5	70	65.5	55	50.5	40	35.5
21N	70	65.5	60	55.5	60	55.5	75	70.5	60	55.5	40	35.5
20N	85	80.5	75	70.5	75	70.5	85	80.5	70	65.5	50	45.5
19N	105	100.5	100	95.5	90	85.5	105	100.5	80	75.5	70	65.5
18N	110	105.5	120	115.5	105	100.5	115	110.5	95	90.5	75	70.5
17N	110	105.5	115	110.5	105	100.5	105	100.5	95	90.5	70	65.5
16N	110	105.5	115	110.5	110	105.5	105	100.5	95	90.5	90	85.5
15N	110	105.5	110	105.5	105	100.5	95	90.5	90	85.5	75	70.5
14N	90	85.5	80	75.5	70	65.5	65	60.5	60	55.5	55	50.5
13N	60	55.5	55	50.5	50	45.5	55	50.5	50	45.5	45	40.5
12N	45	40.5	40	35.5	45	40.5	50	45.5	50	45.5	40	35.5
11N	50	45.5	35	30.5	40	35.5	50	45.5	50	45.5	40	35.5
10N	35	30.5	35	30.5	45	40.5	45	40.5	50	45.5	40	35.5
9N	40	35.5	40	35.5	45	40.5	50	45.5	50	45.5	40	35.5
8N	40	35.5	45	40.5	50	45.5	60	55.5	55	50.5	40	35.5
7N	40	35.5	60	55.5	55	50.5	70	65.5	55	50.5	40	35.5
6N	65	60.5	70	65.5	60	55.5	70	65.5	50	45.5	35	30.5
5N	120	115.5	80	75.5	60	55.5	55	50.5	50	45.5	40	35.5
4N	135	130.5	95	90.5	70	65.5	55	50.5	50	45.5	35	30.5
3N	70	65.5	50	45.5	55	50.5	60	55.5	60	55.5	50	45.5
2N	35	30.5	30	25.5	40	35.5	60	55.5	60	55.5	50	45.5
1N	20	15.5	20	15.5	25	20.5	25	20.5	35	30.5	30	25.5
0N	20	15.5	20	15.5	20	15.5	25	20.5	20	15.5	20	15.5
	78E		**79E**		**80E**		**81E**		**82E**		**83E**	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr = Gross - Average background Average background = 4.5 uRem/hr

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 7 (uRem/hr)*

AREA 7

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	10	5.5	10	5.5	10	5.5	10	5.5	12	7.5	12	7.5
29N	10	5.5	10	5.5	10	5.5	15	10.5	15	10.5	12	7.5
28N	15	10.5	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5
27N	30	25.5	25	20.5	20	15.5	30	25.5	20	15.5	20	15.5
26N	40	35.5	30	25.5	30	25.5	30	25.5	25	20.5	25	20.5
25N	45	40.5	30	25.5	20	15.5	22	17.5	25	20.5	22	17.5
24N	45	40.5	30	25.5	25	20.5	20	15.5	20	15.5	18	13.5
23N	40	35.5	30	25.5	20	15.5	18	13.5	20	15.5	20	15.5
22N	30	25.5	25	20.5	20	15.5	18	13.5	18	13.5	20	15.5
21N	30	25.5	20	15.5	20	15.5	20	15.5	15	10.5	15	10.5
20N	40	35.5	25	20.5	20	15.5	20	15.5	15	10.5	20	15.5
19N	50	45.5	30	25.5	25	20.5	25	20.5	20	15.5	25	20.5
18N	50	45.5	40	35.5	30	25.5	30	25.5	25	20.5	30	25.5
17N	60	55.5	50	45.5	35	30.5	35	30.5	30	25.5	35	30.5
16N	70	65.5	55	50.5	40	35.5	35	30.5	35	30.5	35	30.5
15N	65	60.5	50	45.5	35	30.5	30	25.5	30	25.5	20	15.5
14N	45	40.5	40	35.5	35	30.5	25	20.5	25	20.5	17	12.5
13N	40	35.5	35	30.5	30	25.5	20	15.5	20	15.5	15	10.5
12N	40	35.5	25	20.5	20	15.5	20	15.5	20	15.5	15	10.5
11N	35	30.5	25	20.5	15	10.5	15	10.5	15	10.5	12	7.5
10N	35	30.5	25	20.5	15	10.5	15	10.5	12	7.5	12	7.5
9N	30	25.5	20	15.5	20	15.5	15	10.5	15	10.5	12	7.5
8N	30	25.5	20	15.5	20	15.5	15	10.5	15	10.5	12	7.5
7N	30	25.5	20	15.5	20	15.5	15	10.5	12	7.5	12	7.5
6N	30	25.5	20	15.5	15	10.5	10	5.5	10	5.5	10	5.5
5N	30	25.5	20	15.5	10	5.5	15	10.5	10	5.5	10	5.5
4N	35	30.5	20	15.5	10	5.5	15	10.5	10	5.5	10	5.5
3N	40	35.5	20	15.5	15	10.5	15	10.5	10	5.5	15	10.5
2N	30	25.5	20	15.5	15	10.5	15	10.5	10	5.5	12	7.5
1N	25	20.5	15	10.5	10	5.5	15	10.5	10	5.5	10	5.5
0N	20	15.5	15	10.5	15	10.5	15	10.5	12	7.5	10	5.5
	84E		85E		86E		87E		88E		89E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 6 (uRem/hr)*

AREA 6

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
12N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
11N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
10N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
9N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
8N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
7N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
6N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
5N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
4N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
3N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
2N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
1N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
0N	13	8.5	15	10.5	15	10.5	14	9.5	15	10.5	15	10.5	17	12.5
	59E		60E		61E		62E		63E		64E		65E	

AREA 6

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
12N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
11N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
10N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
9N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
8N	14	9.5	22	17.5	35	30.5	55	50.5	14	9.5	14	9.5
7N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
6N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
5N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
4N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
3N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
2N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
1N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
0N	14	9.5	22	17.5	35	30.5	30	25.5	14	9.5	14	9.5
	66E		67E		68E		69E		70E		71E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 7 (uRem/hr)*

AREA 7

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	20	15.5	25	20.5	30	25.5	45	40.5	10	5.5	10	5.5
29N	20	15.5	25	20.5	30	25.5	45	40.5	15	10.5	15	10.5
28N	20	15.5	25	20.5	30	25.5	45	40.5	15	10.5	15	10.5
27N	20	15.5	25	20.5	30	25.5	45	40.5	20	15.5	25	20.5
26N	20	15.5	25	20.5	30	25.5	45	40.5	25	20.5	30	25.5
25N	20	15.5	25	20.5	30	25.5	45	40.5	30	25.5	35	30.5
24N	20	15.5	25	20.5	30	25.5	45	40.5	35	30.5	35	30.5
23N	20	15.5	25	20.5	30	25.5	45	40.5	45	40.5	40	35.5
22N	20	15.5	25	20.5	30	25.5	45	40.5	40	35.5	45	40.5
21N	20	15.5	25	20.5	30	25.5	45	40.5	45	40.5	60	55.5
20N	20	15.5	25	20.5	30	25.5	45	40.5	50	45.5	75	70.5
19N	20	15.5	25	20.5	30	25.5	45	40.5	60	55.5	90	85.5
18N	20	15.5	25	20.5	30	25.5	45	40.5	75	70.5	90	85.5
17N	20	15.5	25	20.5	30	25.5	45	40.5	85	80.5	90	85.5
16N	20	15.5	25	20.5	30	25.5	45	40.5	80	75.5	90	85.5
15N	20	15.5	25	20.5	30	25.5	45	40.5	75	70.5	95	90.5
14N	20	15.5	25	20.5	30	25.5	45	40.5	75	70.5	90	85.5
13N	20	15.5	25	20.5	30	25.5	45	40.5	50	45.5	60	55.5
12N	20	15.5	25	20.5	30	25.5	45	40.5	45	40.5	50	45.5
11N	20	15.5	25	20.5	30	25.5	45	40.5	40	35.5	50	45.5
10N	20	15.5	25	20.5	30	25.5	45	40.5	35	30.5	35	30.5
9N	20	15.5	25	20.5	30	25.5	45	40.5	30	25.5	30	25.5
8N	20	15.5	25	20.5	30	25.5	45	40.5	25	20.5	30	25.5
7N	20	15.5	25	20.5	30	25.5	45	40.5	20	15.5	30	25.5
6N	20	15.5	25	20.5	30	25.5	45	40.5	30	25.5	40	35.5
5N	20	15.5	25	20.5	30	25.5	45	40.5	70	65.5	110	105.5
4N	20	15.5	25	20.5	30	25.5	45	40.5	170	165.5	160	155.5
3N	20	15.5	25	20.5	30	25.5	45	40.5	100	95.5	85	80.5
2N	20	15.5	25	20.5	30	25.5	45	40.5	35	30.5	30	25.5
1N	20	15.5	25	20.5	30	25.5	45	40.5	20	15.5	20	15.5
0N	20	15.5	25	20.5	30	25.5	45	40.5	15	10.5	20	15.5
	72E		73E		74E		75E		76E		77E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 4 (uRem/hr)*

AREA 4

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
23N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
22N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
21N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
20N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
19N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
18N	15	10.5	15	10.5	17	12.5	14	9.5	15	10.5
	58E		**59E**		**60E**		**61E**		**62E**	

*All measurements recorded at 1 meter above ground surface.

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site
Overland Tissue Equivalent Dose Rate Data - Area 5 (uRem/hr)*

AREA 5

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
28N	15	10.5	20	15.5	15	10.5	15	10.5	15	10.5	15	10.5
27N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
26N	15	10.5	15	10.5	15	10.5	20	15.5	15	10.5	15	10.5
25N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
24N	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5	15	10.5
	60E		61E		62E		63E		64E		65E	

AREA 5

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
29N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
28N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
27N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
26N	15	10.5	15	10 5	15	10.5	20	15.5	20	15.5	20	15.5
25N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
24N	15	10.5	15	10.5	15	10.5	15	10.5	20	15.5	20	15.5
	66E		67E		68E		69E		70E		71E	

AREA 5

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	25	20.5	25	20.5	20	15.5
29N	25	20.5	25	20.5	20	15.5
28N	25	20.5	25	20.5	20	15.5
27N	25	20.5	25	20.5	20	15.5
26N	25	20.5	25	20.5	20	15.5
25N	25	20.5	25	20.5	20	15.5
24N	30	25.5	25	20.5	20	15.5
	72E		73E		74E	

*All measurements recorded at 1 meter above ground surface.
**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 2 (uRem/hr)*

AREA 2

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
30N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
29N	9	4.5	9	4.5	18	13.5	11	6.5	11	6.5
28N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
27N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
26N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
25N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
24N	9	4.5	9	4.5	15	10.5	11	6.5	11	6.5
	40E		**41E**		**42E**		**43E**		**44E**	

*All measurements recorded at 1 meter above ground surface.

**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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Lindsay Light II Site
Overland Tissue Equivalent Dose Rate Data - Area 3 (uRem/hr)*

AREA 3

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
19N									30	25.5		
18N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
17N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
16N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
15N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
14N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
13N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
12N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
11N	11	6.5	10	5.5	11	6.5	14	9.5	15	10.5	13	8.5
	47E		48E		49E		50E		51E		52E	

AREA 3

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
19N				
18N	12	7.5	11	5
17N	12	7.5	11	5
16N	12	7.5	11	5
15N	12	7.5	11	5
14N	12	7.5	11	5
13N	12	7.5	11	5
12N	12	7.5	11	5
11N	12	7.5	11	5
	53E		54E	

*All measurements recorded at 1 meter above ground surface.
**Net uRem/hr. = Gross - Average background. Average background = 4.5 uRem/hr.

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APPENDIX G1

BICRON DATA - AREAS 1-12

Lindsay Light II Site

Overland Tissue Equivalent Dose Rate Data - Area 1 (uRem/hr)*

AREA 1

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
66N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
65N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
64N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
63N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
62N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
61N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
60N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
59N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	16	11.5	10	5.5
58N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
57N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
56N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
55N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
54N	8	3.5	9	4.5	10	5.5	10	5.5	10	5.5	10	5.5	10	5.5
	24E		25E		26E		27E		28E		29E		30E	

AREA 1

	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr	Gross uRem/hr	**Net uRem/hr
66N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
65N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
64N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
63N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
62N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
61N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
60N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
59N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
58N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
57N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
56N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
55N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
54N	9	4.5	9	4.5	10	5.5	11	6.5	11	6.5	11	6.5
	31E		32E		33E		34E		35E		36E	

*All measurements recorded at 1 meter above ground surface

**Net uRem/hr = Gross - Average background Average background = 4 5 uRem/hr

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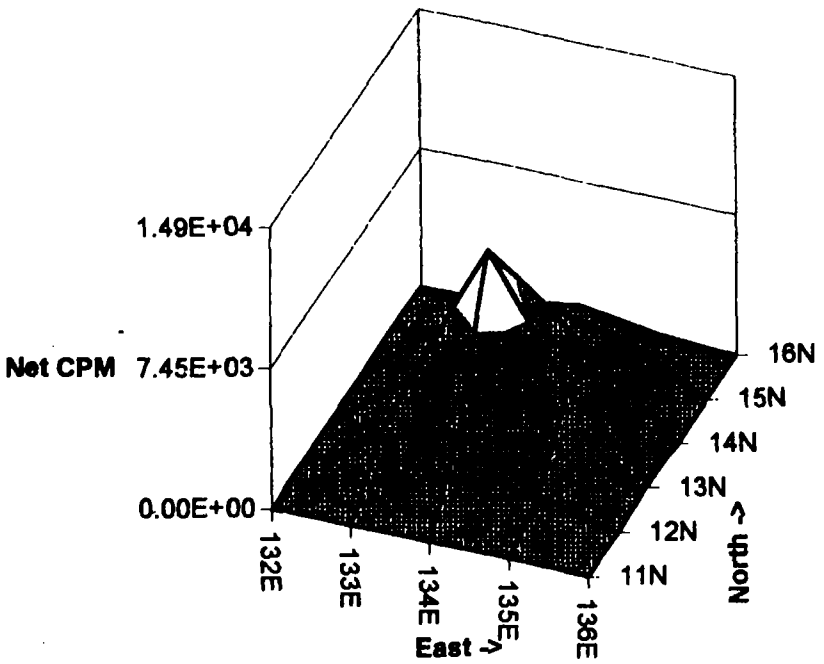
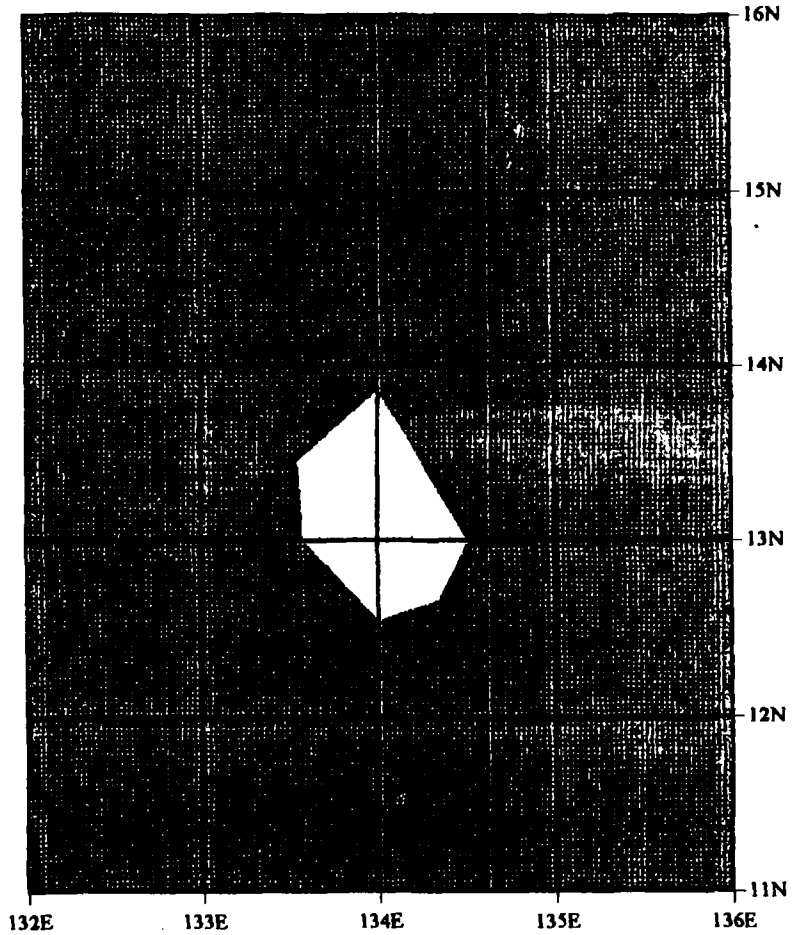
APPENDIX G

DOSE RATE DATA

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 10
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.



Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.

*Background = 2484 CPM; 3 x Background = 7452 CPM

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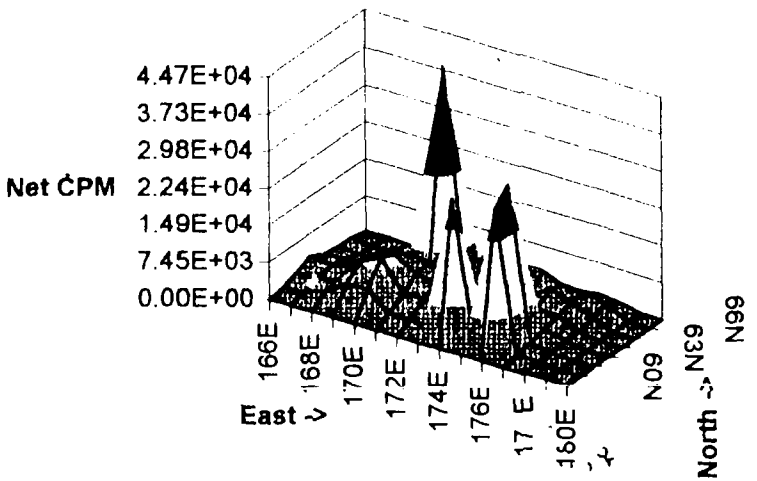
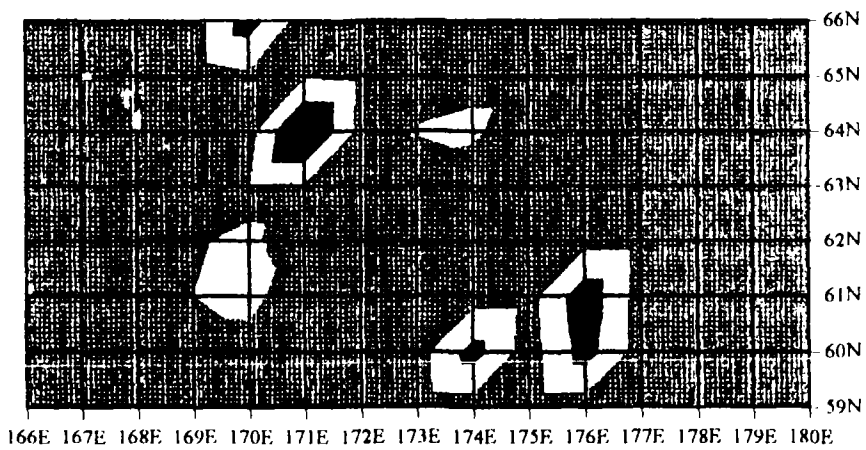
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 12
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.
> 10 x Bkg. - 20 x Bkg.



Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.
> 10 x Bkg. - 20 x Bkg.

*Background = 2484 CPM; 3 x Background = 7452 CPM

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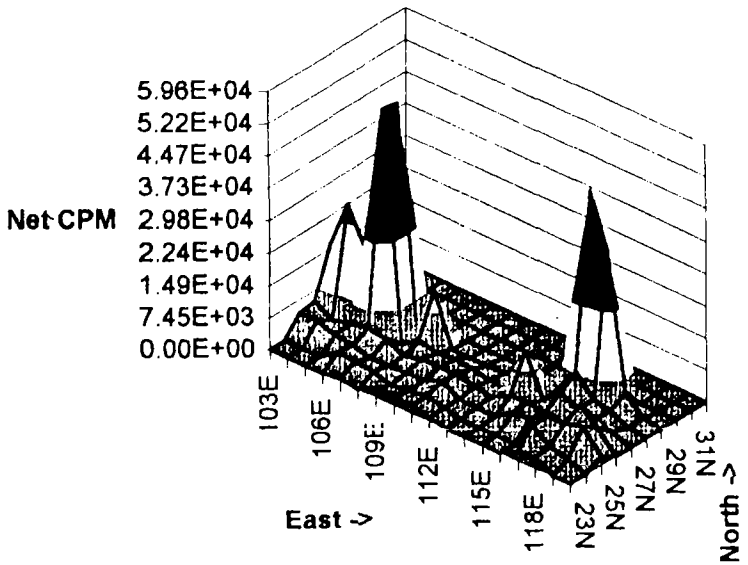
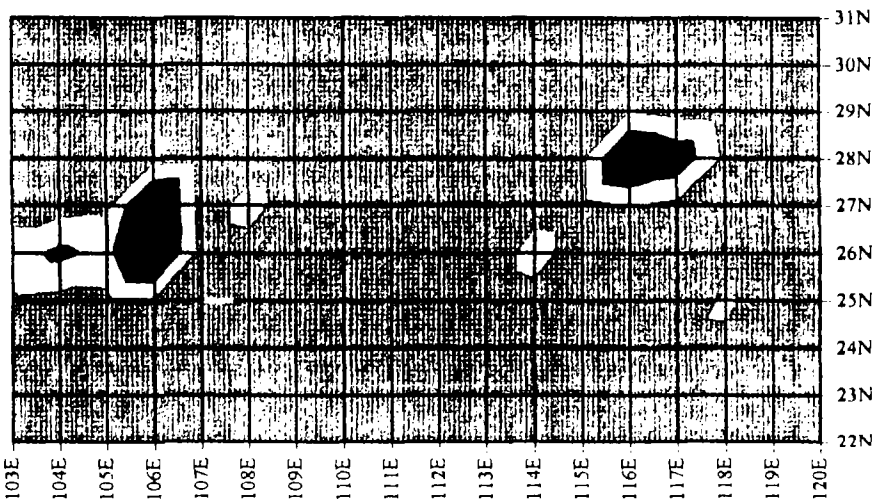
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 8
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.
>10 x Bkg. - 20 x Bkg.
>20 x Bkg.

Net CPM
≤ 3 x Bkg.
> 3 x Bkg. - 10 x Bkg.
>10 x Bkg. - 20 x Bkg.
>20 x Bkg.

*Background = 2484 CPM; 3 x Background = 7452 CPM

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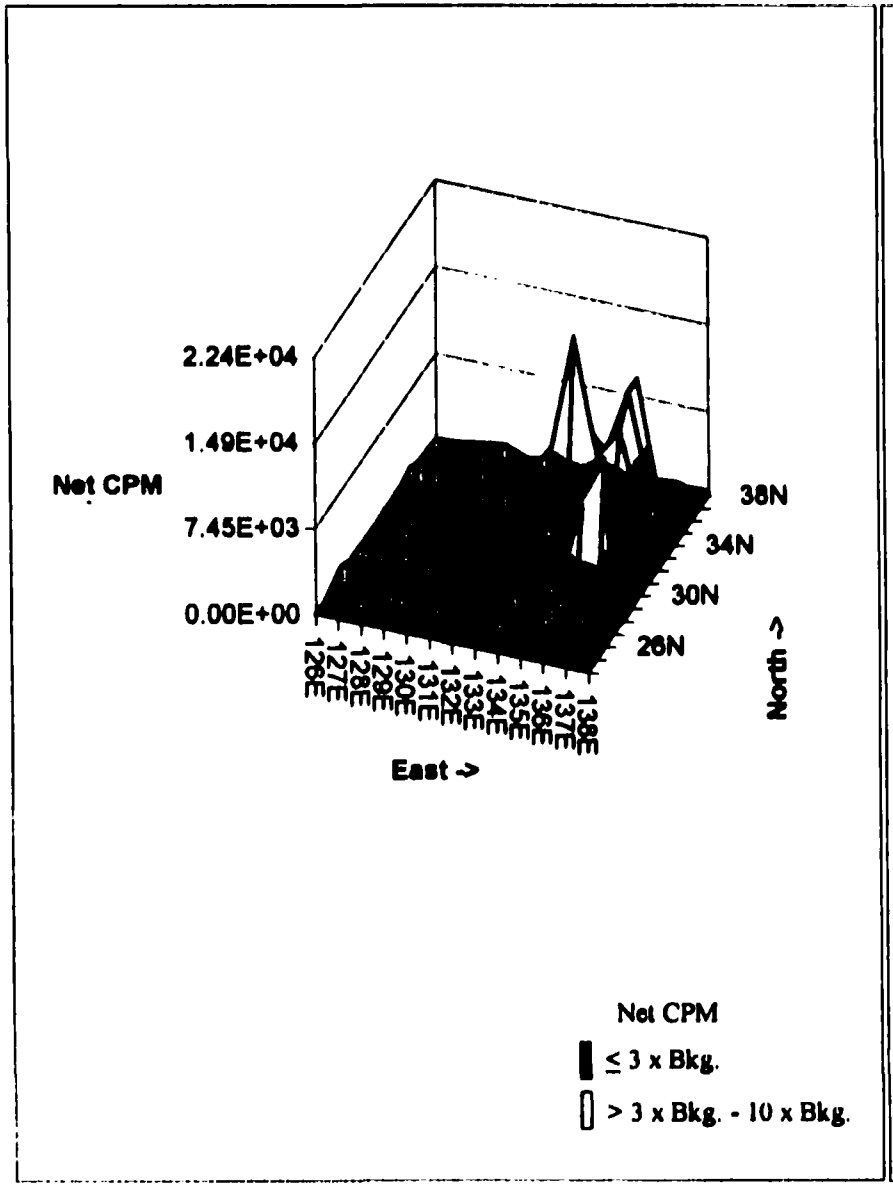
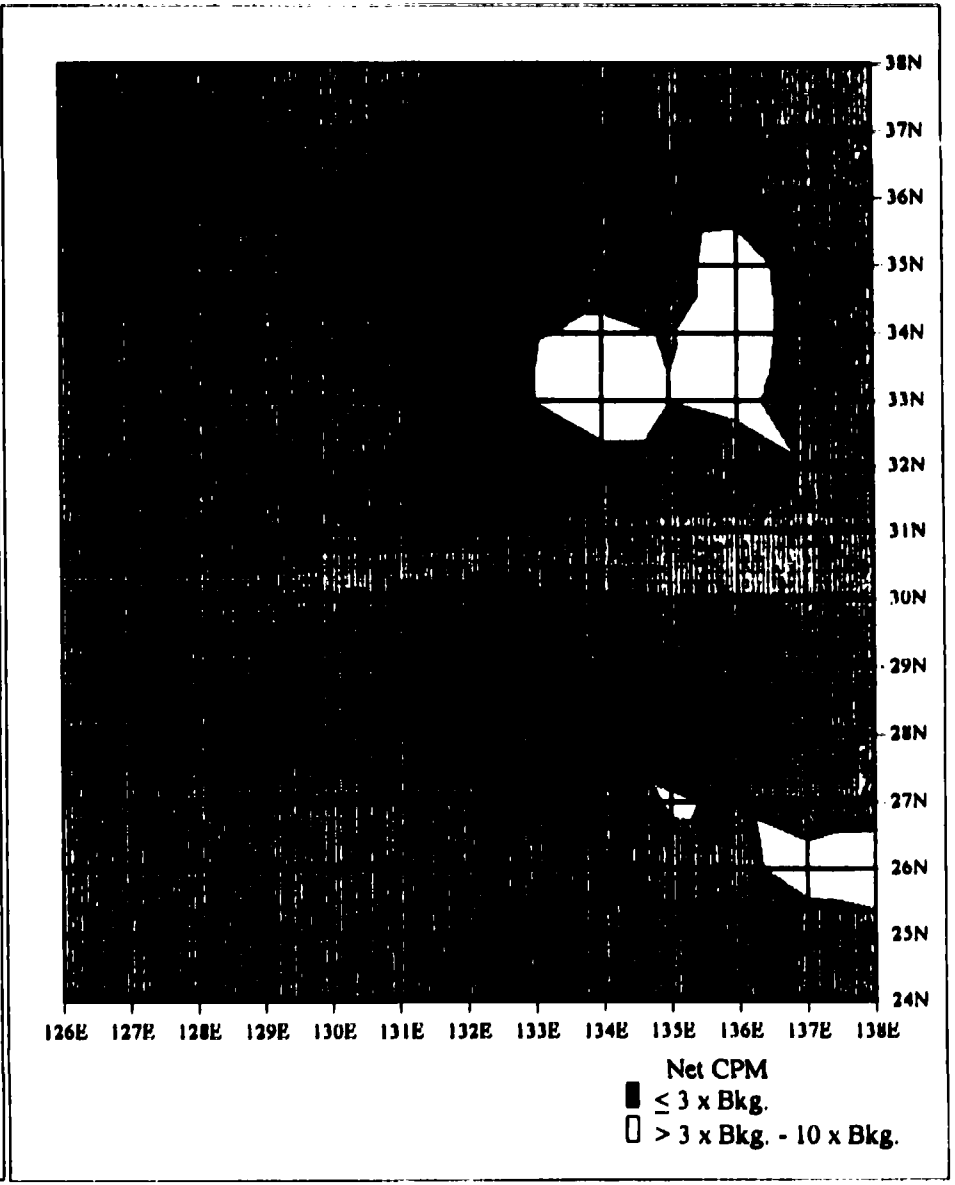
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 9
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*

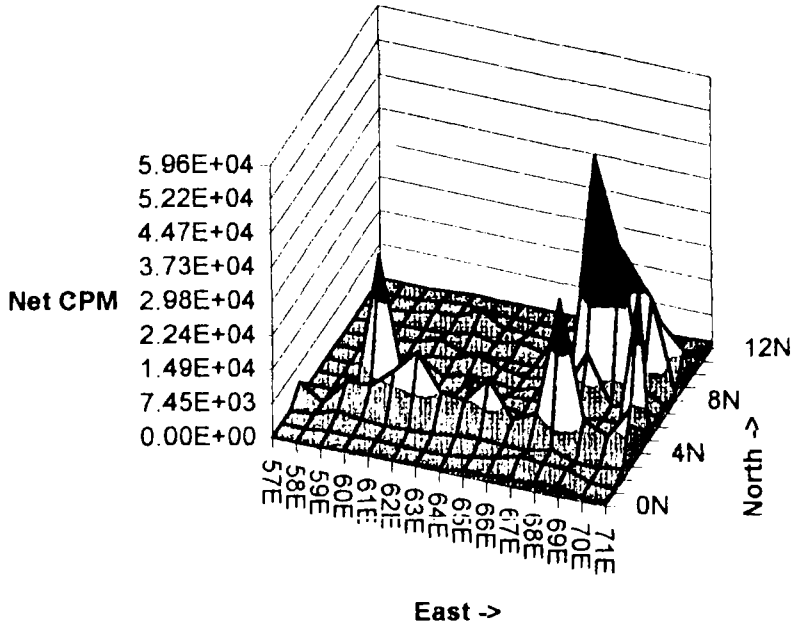


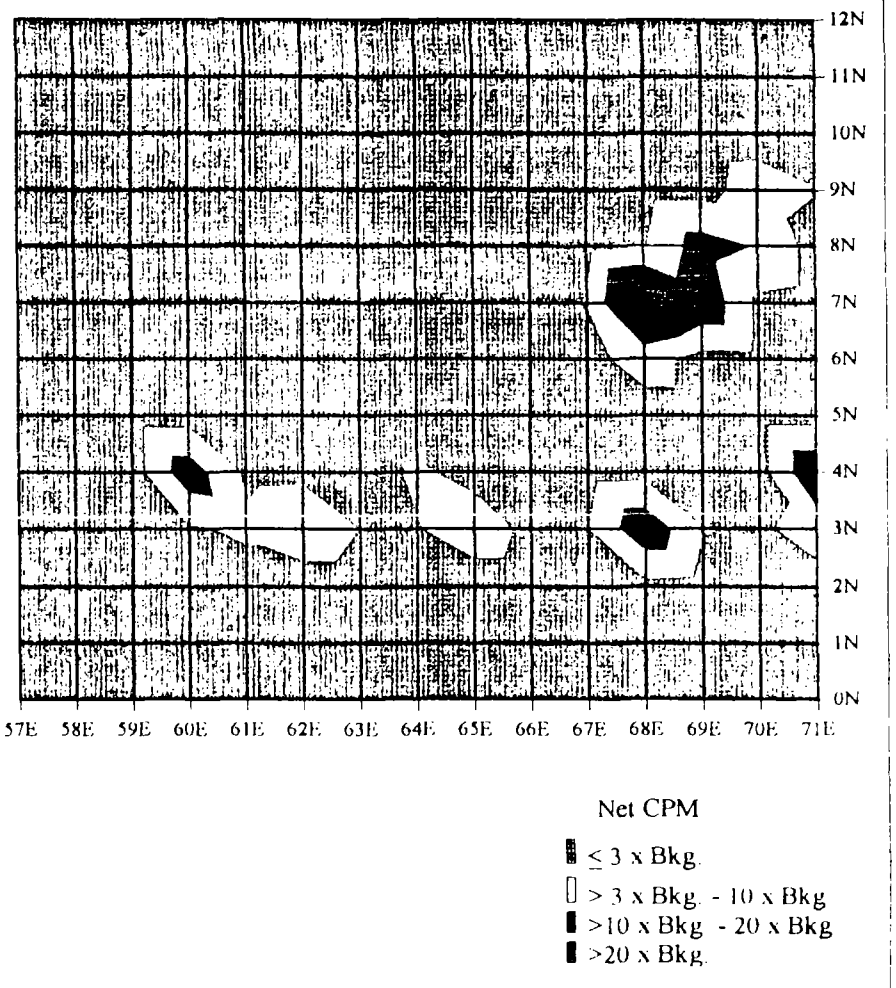


*Background = 2484 CPM; 3 x Background =7452CPM

8/19/94

Lindsay Light II Site
Detailed Overland Gamma Survey - Area 6
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*





*Background = 2484 CPM; 3 x Background = 7452 CPM

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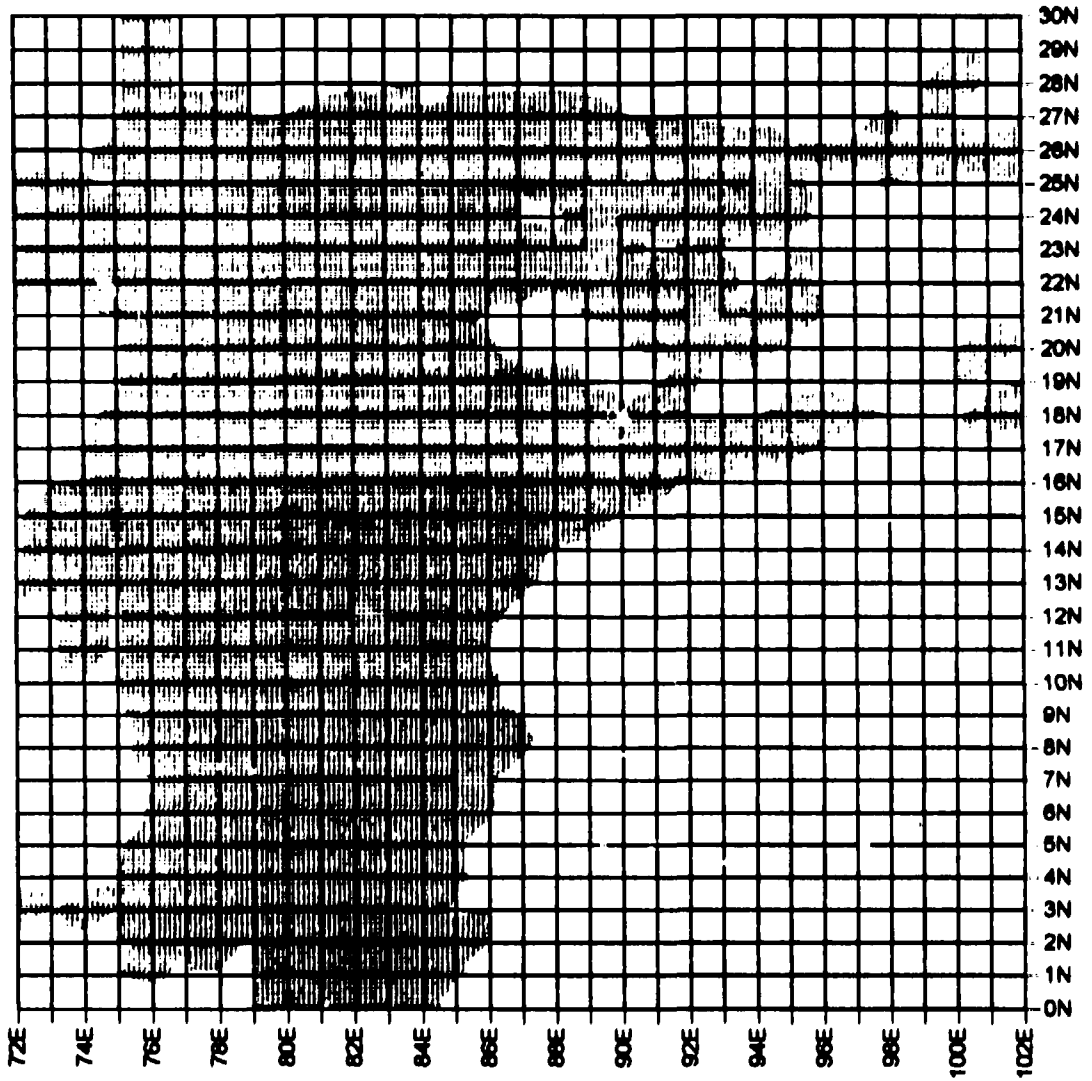
Lindsay Light II Site
Detailed Overland Gamma Survey - Area 7
One (1) Meter Grid, Net CPM @ 1 cm Above Grade*



*Background = 2484 CPM; 3 x Background = 7452 CPM

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC-
Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC		
CDS78E18N-2-7	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TCLP VOAs	FOR	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	USE	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ML AMBER	500ML	NONE	& SPEC	ONLY	
CD-S84E16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC		
CD-S78E18N-3-4-9	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC		
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	FOR	
CD S84E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	USE	
CD S81E 5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metals & SVOA	ONLY	
CD S81E 5N 2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs		
CD S81E 5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs		
CD S81E 5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	FOR	
CD S81E 5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ml	NONE	TCC	USE	
CDS81E 5N 2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80ML	NONE	TOC	ONLY	
CD-S81E 5N-2-3-9	SS SOIL	5/22/94 1500	500 ML AMBER	500ml	NONE	& SPEC		
CD-S81E 5N-3-4	SS SOIL	5/22/94 500	500 ML AMBER	400ml	NONE	& SPEC		

COPY

White: To accompany samples Yellow: Field copy

*See back of form for special instructions

ATTACHMENT D

Chain of Custody Records

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 502240
Page 1 of 2

Project Name/No. [1] LINSAY LIGHT II
Samples Shipment Date [7] 5/23/94
Bill to: [5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R.G. BERGGREEN

Sample Team Members [2] RAWLINSON, BERGGREEN
Lab Destination [8] ST LOUIS

~~Profit Center No.~~ [3]
Lab Contact [9] John Powell

Project Manager [4] BERGGREEN
Project Contact/Phone [12]
Report to: [10] (SAME)

Purchase Order No. [6] 27313-ZH
Carrier/Waybill No. [13]

Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12:40	500 ml AMBER	500 ml	NONE	γ SPEC		
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500 ml Amber	500 ml	NONE	γ SPEC		
CD-S-82E25N2-3	SS-SOIL	5/22/94 1345	500 ML AMBER	500 ML	None	γ SPEC		
CD-S82E25N-3-4	SS-SOIL	5/22/94 1405	500 ML AMBER	500 ML	NONE	γ SPEC		
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	TCLP Metals & SVOAs		
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml Amber	500 ml	None	γ SPEC		
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250 ml	None	Reactivity Corrosivity Ignitability		
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120 ml	None	TOC		

FOR LAB USE ONLY

FOR LAB USE ONLY

COPY

Special Instructions: [23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th Isotope. Also ~~CD-S156E49N~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) Richard Berggreen	Date: 5/23/94 Time: 1045	1. Received by [28] (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

STS Consultants Ltd.

CLIENT: Chicago Dock and Canal	LOG OF BORING NUMBER: 82E25N
PROJECT NAME: Chicago Dock Lindsay Light	ARCHITECT-ENGINEER:
SITE LOCATION: 316 E. Illinois; Chicago, Illinois	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
SURFACE ELEVATION					
		HS			Asphalt pavement, gravel subbase
		HS			Fill: Silty clay, sand, gravel, brick, mortar and cinders - black to brown
2.5	A	SS			
					Concrete slab, pavement
4.5	B	SS			Fill: Silty clay, broken concrete, bricks and wood - brown to black
					End of Boring Borehole filled with neat cement grout upon completion.

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL: Dry — WS OR WD	BORING STARTED: 05/22/94	STS OFFICE: Chicago Area-01	
WL — BCR — ACR	BORING COMPLETED: 05/22/94	ENTERED BY: KKB	SHEET NO. 1 OF 1
WL	RIG/FOREMAN: B-55/Dumas	APP'D BY: RGB	STS JOB NO.: 27313-ZH

STS Consultants Ltd.

CLIENT: Chicago Dock and Canal	LOG OF BORING NUMBER: 81E5N
PROJECT NAME: Chicago Dock Lindsay Light	ARCHITECT-ENGINEER:

SITE LOCATION: 316 E. Illinois; Chicago, Illinois

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} (1 2 3 4 5)

PLASTIC LIMIT % × — WATER CONTENT % ● — LIQUID LIMIT % △ (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. ⊗ (10 20 30 40 50)

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
SURFACE ELEVATION					
		HSA			Asphalt pavement, base course
		HSA			Fill: Soil, cinders, brick and concrete - brown to black
2.5	A	SS			Note: Spoon driven again 4-4.5 ft. for additional material to split sample.
	B	SS			
4.5	C	SS			
					End of Boring Borehole filled with neat cement grout upon completion.

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL: Dry — WS OR WD	BORING STARTED: 05/22/94	STS OFFICE: Chicago Area-01	
WL — BCR — ACR	BORING COMPLETED: 05/22/94	ENTERED BY: KKB	SHEET NO. 1 OF 1
WL	RIG/FOREMAN: B-55/Dumas	APP'D BY: RGB	STS JOB NO.: 27313-ZH

STS Consultants Ltd

CLIENT: Chicago Dock and Canal

LOG OF BORING NUMBER: 89E16N

PROJECT NAME: Chicago Dock Lindsay Light

ARCHITECT-ENGINEER:

SITE LOCATION: 316 E. Illinois; Chicago, Illinois

UNCONFINED COMPRESSIVE STRENGTH TONS/FT² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % — 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT — 10 20 30 40 50

DEPTH (FT) / ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL
				SURFACE ELEVATION
		HSA		Asphalt pavement, gravel subbase
		HSA		Fill: Silt and clay, some sand, cinders, brick and wood - brown to black
2.5	A	SS		
4.0	B	SS		
				End of Boring Borehole filled with neat cement grout upon completion

The stratification lines represent the approximate boundary lines between soil types in-situ, the transition may be gradual.

WL: Dry — WS OR WD	BORING STARTED: 05/22/94	STS OFFICE: Chicago Area-01	
WL: BCR — ACR	BORING COMPLETED: 05/22/94	ENTERED BY: KKB	SHEET NO: 1 OF 1
WL:	RIG/FOREMAN: B-55/Dumas	APP'D BY: RGE	STS JOB NO: 27313-ZH

STS Consultants Ltd.

CLIENT: Chicago Dock and Canal	LOG OF BORING NUMBER: 156E49N
PROJECT NAME: Chicago Dock Lindsay Light	ARCHITECT-ENGINEER

SITE LOCATION: 316 E. Illinois; Chicago, Illinois

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2} 1 2 3 4 5

PLASTIC LIMIT % × - - - - - - WATER CONTENT % ● - - - - - LIQUID LIMIT % △ 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. ⊗ 10 20 30 40 50

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	PHOTO-IONIZATION DETECTOR READING (PPM)
			HS			Asphalt, gravel subbase	
			HS			Fill: Silty clay, gravel, brick, mortar, cinders and wire - dry to moist	
2.5		A	SS				<1
4.0		B	SS				
						End of Boring Borehole filled with neat cement grout upon completion.	

The stratification lines represent the approximate boundary lines between soil types: in-situ, the transition may be gradual.

WL Dry WS OR WD	BORING STARTED 05/22/94	STS OFFICE Chicago Area-01	
WL BCR ACR	BORING COMPLETED 05/22/94	ENTERED BY KKB	SHEET NO. 1 OF 1
WL	RIG/FOREMAN B-55/Dumas	APP'D BY RGB	STS JOB NO. 27313-ZH

STS Consultants Ltd

CLIENT: Chicago Dock and Canal

LOG OF BORING NUMBER: 78E18N

PROJECT NAME: Chicago Dock Lindsay Light

ARCHITECT-ENGINEER:

SITE LOCATION: 316 E. Illinois; Chicago, Illinois

UNCONFINED COMPRESSIVE STRENGTH TONS/FT^2: 1 2 3 4 5

PLASTIC LIMIT % | WATER CONTENT % | LIQUID LIMIT %: 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT: 10 20 30 40 50

DEPTH (FT)	ELEVATION (FT)	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL
						SURFACE ELEVATION
			HSA			Asphalt pavement, gravel base course
			HSA			Fill: Silty clay, sandy soil cinders, brick and cement pieces - brown and black
2.5		A	SS			Note: Drove Spoon twice to get enough sample to split
		B	SS			
4.5		C	SS			
						End of Boring Borehole filled with neat cement grout upon completion

The stratification lines represent the approximate boundary lines between soil types in-situ, the transition may be gradual

WL	Dry	WS OR ND	BORING STARTED 05/22/94	STS OFFICE Chicago Area-01	
WL	BCR	ACR	BORING COMPLETED 05/22/94	ENTERED BY KKB	SHEET NO 1 OF 1
WL			RIG/FOREMAN B-55/Dumas	APP'D BY RGB	STS JOB NO 27313-ZH

ATTACHMENT C

Boring Logs

Graph of Logging Probe Response vs. Soil Activity

3-25-86

Ludlum 2000 #42418 w/ Probe PR 29242 HV, Setting 2.5 Sens. 3.0

Cal Drum	Avg Activity pCi/g (Th-232 + Ra-226)	Inst. Response (c/0.1 min)
CD-1	1.4	430
CD-2	42.7	4763
CD-3	87.7	9008
CD-4 *	267	24440
CD-5 *	1794	101682

* not used in equation

15 pCi/g → 1860 cnts/0.1 min

$y = mx + b$

where:

$m = 99.3$

$b = 370$

INSTRUMENT RESPONSE, counts/0.1 min.

AVERAGE ACTIVITY (Th-232 + Ra-226), pCi/g

PR028242

Graph of Logging Probe Response vs. Soil Activity

9-5-86

Cal Drum	Avg Act Th-232 + Ra-226	Int. Response
CD-1	1.7	397
CD-8	12.9	1709
CD-7	23.4	3952
CD-2	48.0	4726
CD-3	97.4	9333
CD-4 *	299.9	26102

* Drums with activities 0-100 pCi/g used in calibration equation

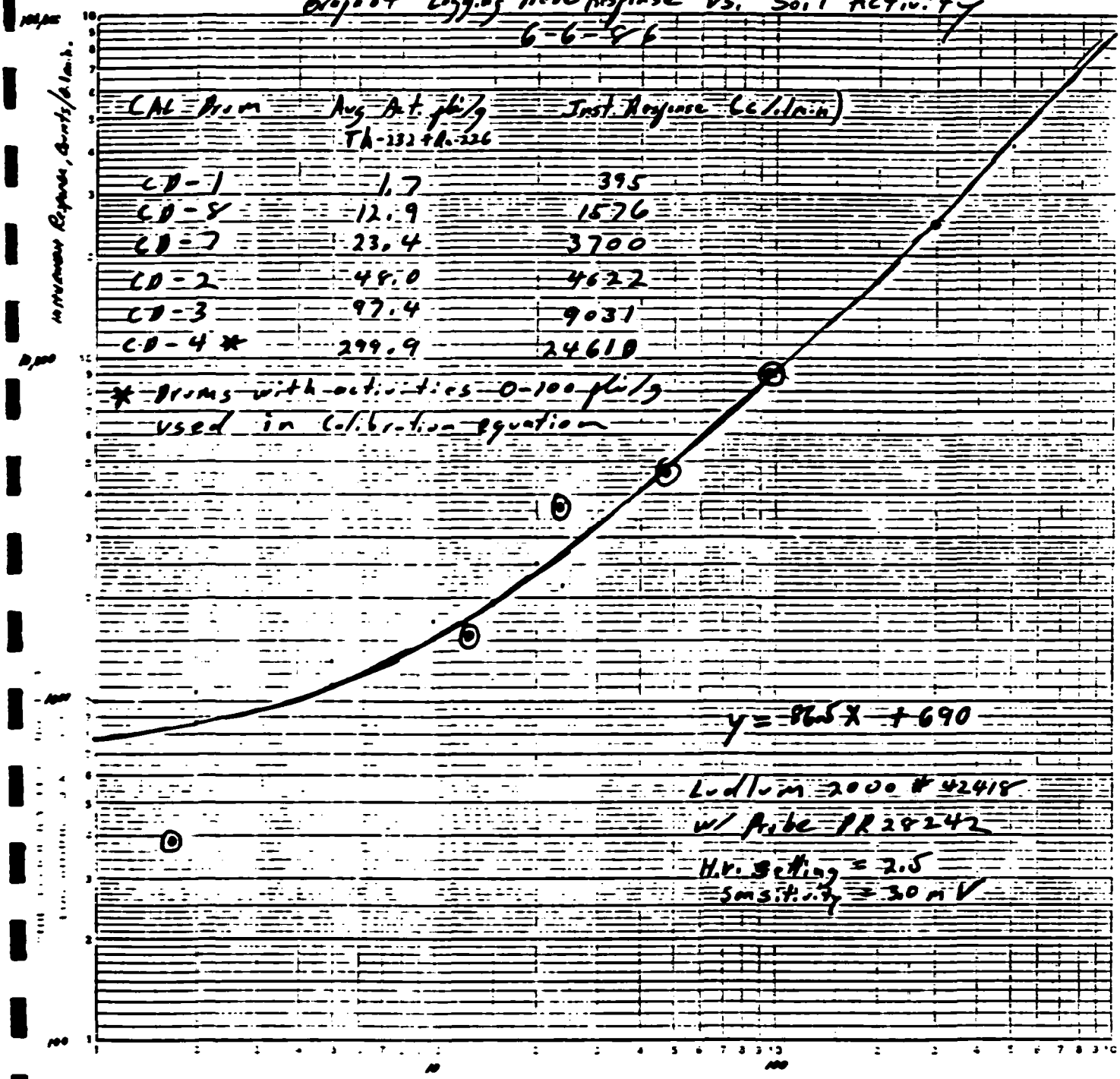
y = 86.8x + 767

Ludlum Model 200 # 42418
with probe PR-028242
H.V. setting 2.9
sensitivity 7.0 mV

Avg. Activity (Th-232 + Ra-226), pCi/g

PR 028242

Graph of Logging Probe Response vs. Soil Activity
6-6-86



CAL Drum	Avg Act. pCi/g Th-232 + Ra-226	Inst. Response (c/.1 min)
CD-1	1.7	395
CD-8	12.9	1576
CD-7	23.4	3700
CD-2	48.0	4622
CD-3	97.4	9031
CD-4 *	299.9	24610

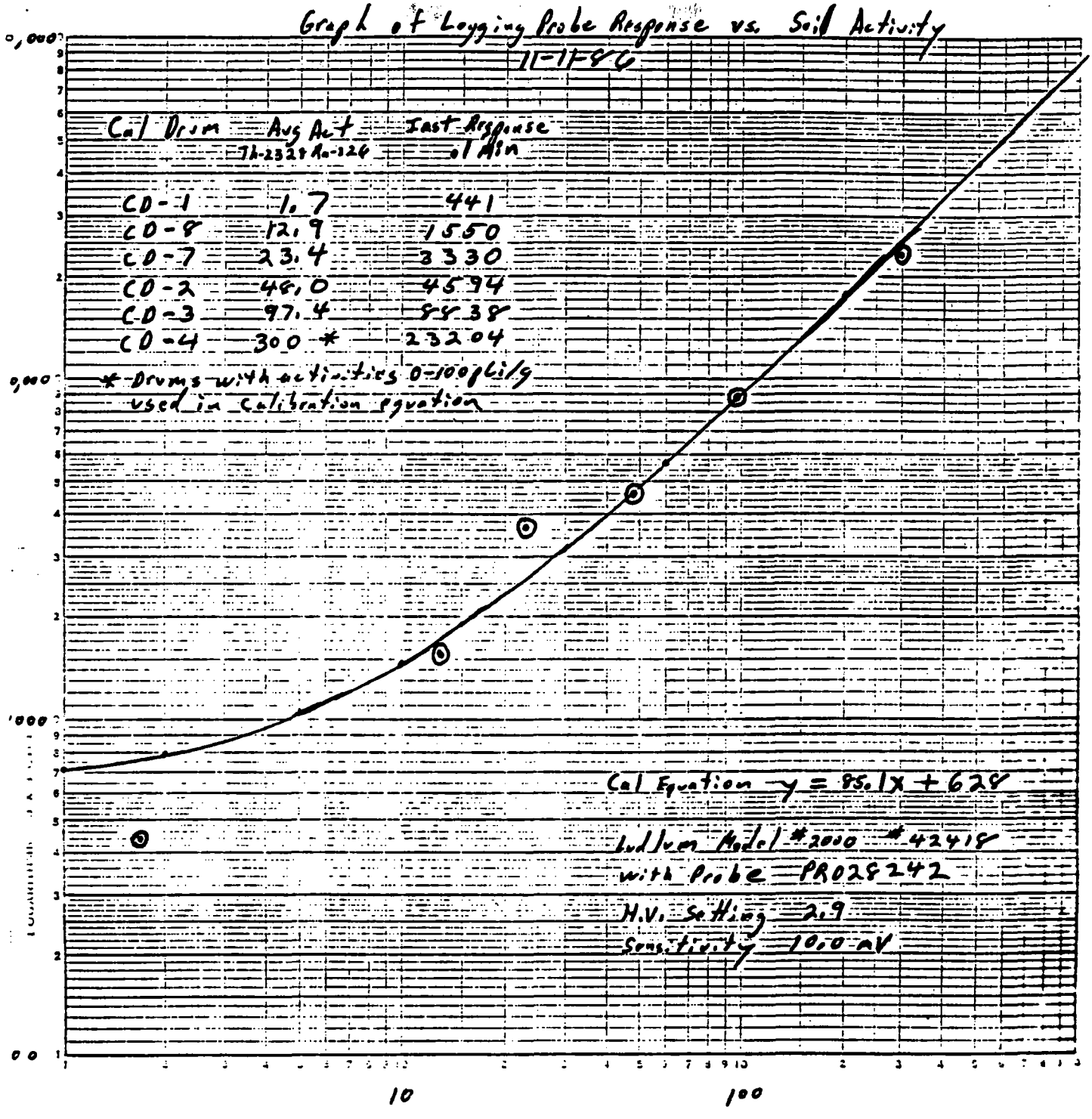
* Drums with activities 0-100 pCi/g used in Calibration equation

$y = 86.5X + 690$

Ludlum 2000 # 42418
w/ Probe PR 28242
H.V. Setting = 2.5
Sensitivity = 3.0 mV

Average Activity (Th-232 + R2-226), pCi/g

PR028242


Graph of Logging Probe Response vs. Soil Activity
11-1-86
Cal Drum | Avg Act Th-232+Ra-226 | Last Response cpm
CD-1 | 1.7 | 441
CD-8 | 12.9 | 1550
CD-7 | 23.4 | 3330
CD-2 | 46.0 | 4594
CD-3 | 97.4 | 8838
CD-4 | 300 * | 23204
*-Drums with activities 0-100 pCi/g used in calibration equation
Cal Equation y = 85.1x + 628
Ludlum Model #2000 #42418
with Probe PR028242
H.V. Setting 2.9
Sensitivity 10.0 mV
10
100
Avg. Activity (Th-232+Ra-226) pCi/g

PR·026968

Graph of Logging Probe Response vs. Soil Activity

9-8-86

Cal Drum	Avg. Act. Th-232+Ra-226	Instr. Response
CD-1	1.7	320
CD-8	72.9	1361
CD-7	23.4	3138
CD-2	48.0	8737
CD-3	97.4	7564
CD-4 *	299	20196

* Drums with activities 0-100 pCi/g used in calibration equation

100,000

10,000

1000

100

10

100

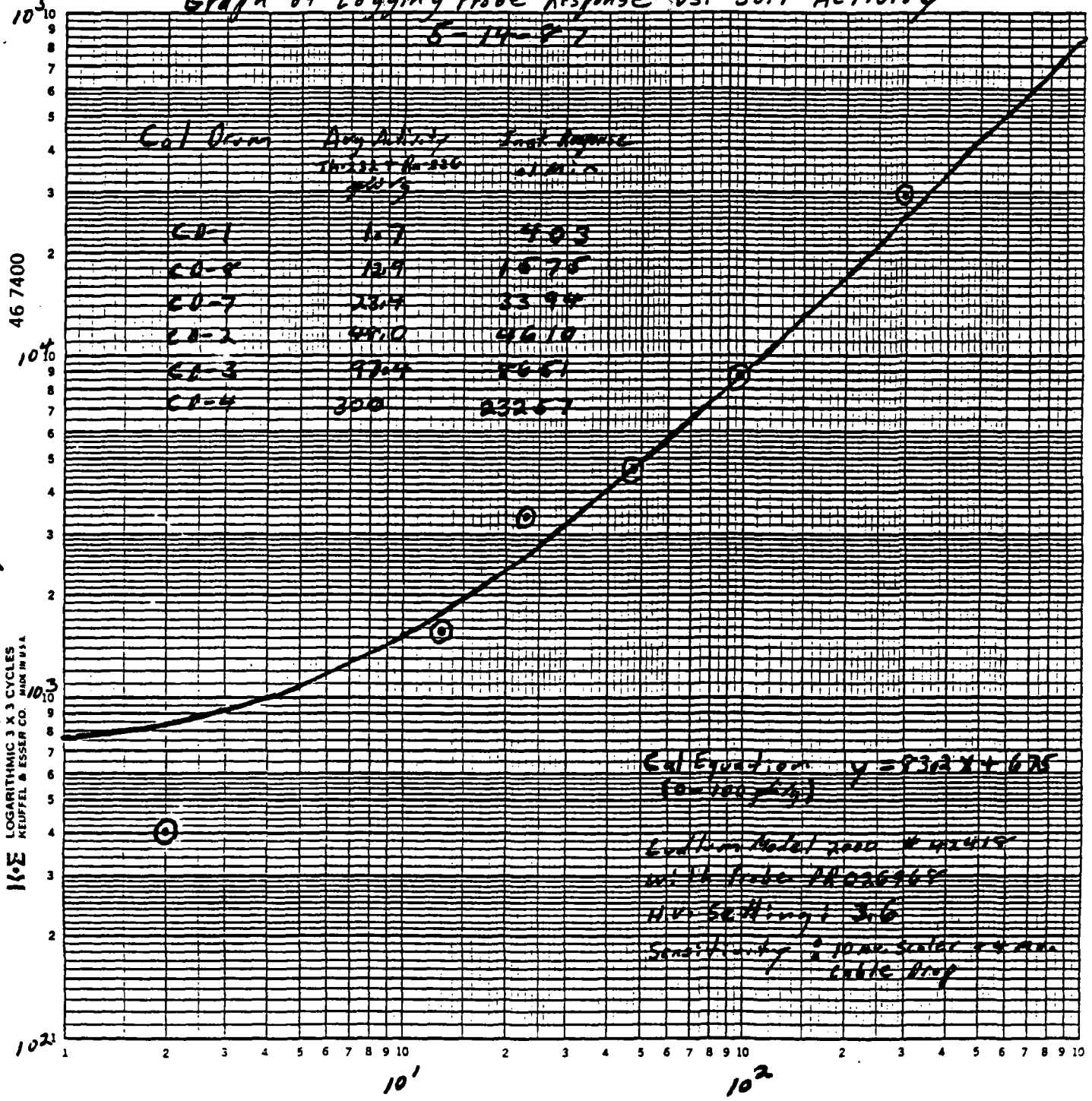
$y = 70x + 582$

Ludlum Model 2000 #42418
with probe PR 026968
H.V. Setting = 2.9
Sens. Unit = 7.0 mV

Avg Activity (Th-232+Ra-226), pCi/g

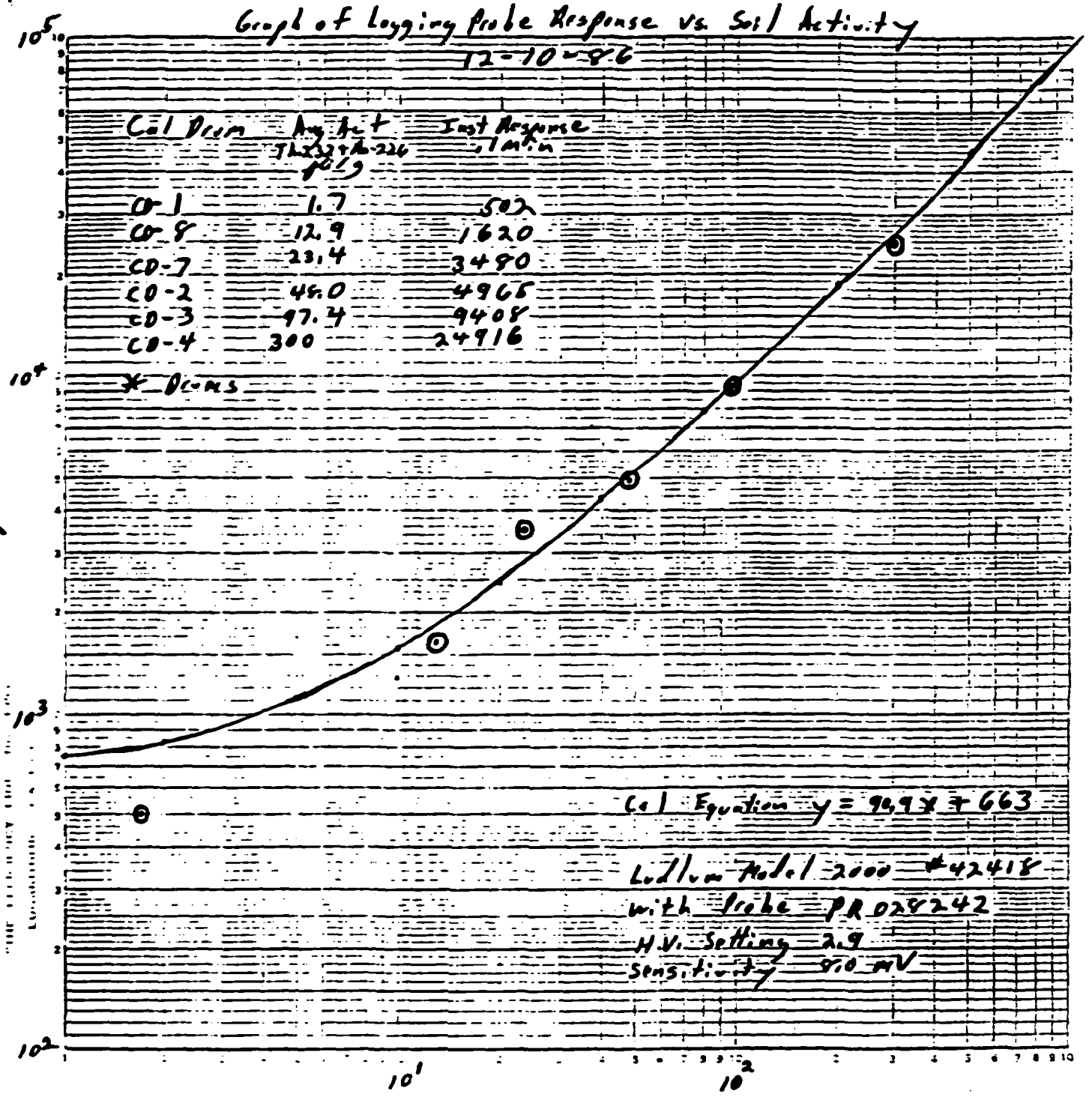
PR 026468
17.1000

Graph of Logging Probe Response vs. Soil Activity
5-14-87



Avg Activity (Th-232 + Ra-226) pCi/g

PR 028242


Graph of Logging Probe Response vs. Soil Activity
12-10-86
Cal Drum
Avg Act Th-232 + Ra-226 pCi/g
Inst Response cpm
CD-1 1.7 502
CD-8 12.9 1620
CD-7 23.4 3480
CD-2 45.0 4965
CD-3 97.4 9408
CD-4 300 24916
* Drums
Cal Equation y = 90.9x + 663
Ludlum Model 2000 #42418
with Probe PR 028242
H.V. Setting 2.9
Sensitivity 9.0 mV
Avg Activity (Th-232+Ra-226) pCi/g

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: CALIBRATION DRUM #8

FILE NAME: CAL DRUM 8

DATE ANALYZED: 860603 ANALYZED BY mrl

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD-8 L1A	27.6	6.7 ← 2.7	10.8 ← .6	3.0 ← 3.9	.2 ← .3	20.7 ← 4.8
CD-8 L1B	27.4	2.8 ← 2.4	10.9 ← .6	3.9 ← 3.4	.3 ← .2	17.9 ← 4.2
CD-8 L1C	27.1	6.8 ← 2.6	8.8 ← .6	3.0 ← 3.7	.7 ← .2	19.3 ← 4.6
CD-8 L1D	27.7	8.5 ← 2.9	11.4 ← .7	4.2 ← 4.2	.1 ← .3	24.2 ← 5.2
CD-8 L2A	27.7	3.3 ← 2.1	9.8 ← .5	2.3 ← 3.0	.6 ← .2	16.0 ← 3.6
CD-8 L2B	28.9	6.8 ← 1.9	10.2 ← .4	3.4 ← 2.8	.2 ← .2	20.5 ← 3.4
CD-8 L2C	27.4	2.7 ← 2.6	10.5 ← .6	2.5 ← 3.8	.2 ← .3	16.0 ← 4.7
CD-8 L2D	27.8	2.0 ← 3.0	10.3 ← .7	3.7 ← 4.4	0.0 ← 0.0	16.0 ← 5.4
CD-8 L3A	28.5	1.0 ← 2.2	10.3 ← .5	1.8 ← 3.2	.6 ← .2	13.6 ← 3.9
CD-8 L3B	30.8	4.0 ← 2.1	8.5 ← .5	3.1 ← 3.1	.3 ← .2	15.9 ← 3.8
CD-8 L3C	29.3	3.4 ← 1.8	9.8 ← .4	2.6 ← 2.6	.1 ← .2	15.9 ← 3.2
CD-8 L3D	30.2	1.2 ← 2.1	9.3 ← .5	3.4 ← 3.0	.2 ← .2	14.1 ← 3.8
CD-8 L4A	30.3	3.7 ← 1.9	8.7 ← .4	3.0 ← 2.7	.5 ← .2	15.9 ← 3.4
CD-8 L4B	28.8	6.5 ← 2.6	9.2 ← .6	1.7 ← 3.7	.6 ← .2	18.1 ← 4.5
CD-8 L4C	29.6	3.5 ← 2.1	9.7 ← .5	3.0 ← 3.0	.3 ← .2	16.5 ← 3.7
CD-8 L4D	27.8	6.0 ← 2.0	9.4 ← .5	3.1 ← 2.8	.3 ← .2	18.8 ← 3.5

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

$\overline{Th} = 9.9$

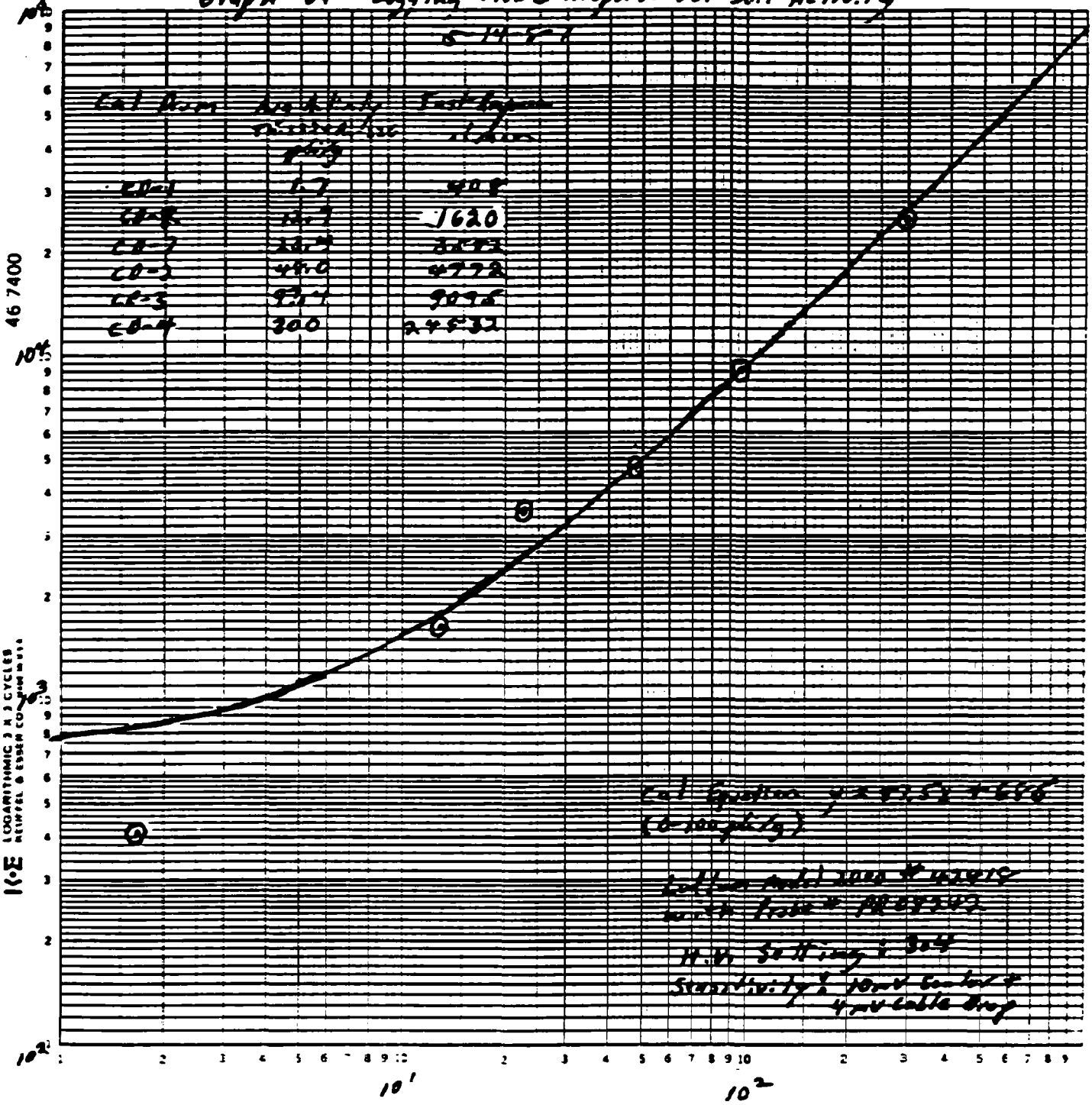
$\overline{Ra} = 3.0$

$\overline{Th} + \overline{Ra} = 12.9$

PR 028242

17.1000

Graph of Logging Probe Response vs. Soil Activity



Average Activity
(Th-232 + Ra-226)
pCi/g

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 6A

DATE ANALYZED: 860117 ANALYZED BY NS

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD6-1	19.9	1.0 ± 1.8	1.0 ± .4	.8 ± 2.6	.2 ± .2	3.1 ± 3.1
CD6-2	19.5	.9 ± 1.7	.7 ± .3	.7 ± 2.4	.4 ± .2	2.7 ± 2.9
CD6-3	19.4	1.7 ± 1.6	1.1 ± .3	1.1 ± 2.3	.1 ± .2	4.0 ± 2.8
CD6-4	21.1	3.0 ± 1.8	1.0 ± .4	.1 ± 2.5	.2 ± .2	4.3 ± 3.1
CD6-5	19.6	0.0 ± 0.0	1.0 ± .3	.4 ± .5	.3 ± .2	1.8 ± .6
CD6-6	19.4	0.0 ± 0.0	1.2 ± .4	1.3 ± .5	.2 ± .2	2.7 ± .6
CD6-7	19.5	0.0 ± 0.0	.9 ± .4	.7 ± .6	.3 ± .2	1.9 ± .7
CD6-8	20.0	0.0 ± 0.0	.2 ± .4	.9 ± .5	.3 ± .2	1.5 ± .7
CD6-9	20.3	0.0 ± 0.0	277.9 ± 7.5	64.2 ± 7.1	4.1 ± 2.4	346.2 ± 10.6
CD6-10	19.9	0.0 ± 0.0	251.1 ± 5.5	57.2 ± 5.2	5.7 ± 1.8	314.1 ± 7.8
CD6-11	21.8	0.0 ± 0.0	261.6 ± 5.9	57.5 ± 5.6	4.4 ± 1.9	323.5 ± 8.4
CD6-12	21.1	0.0 ± 0.0	264.6 ± 6.1	63.1 ± 5.7	2.9 ± 2.0	330.6 ± 8.6
CD6-13	19.6	0.0 ± 0.0	275.7 ± 7.3	63.8 ± 6.9	3.2 ± 2.4	342.7 ± 10.3
CD6-14	19.4	0.0 ± 0.0	261.4 ± 6.1	57.0 ± 5.7	3.5 ± 2.0	322.0 ± 8.6
CD6-15	19.8	0.0 ± 0.0	254.3 ± 5.8	54.9 ± 5.5	5.0 ± 1.9	314.2 ± 8.2
CD6-16	19.6	0.0 ± 0.0	273.4 ± 6.3	59.0 ± 6.0	4.9 ± 2.1	337.2 ± 8.9

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: CALIBRATION DRUM #7

FILE NAME: CAL DRUM 7

DATE ANALYZED: 860602 ANALYZED BY ML

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD-7 L1A	30.5	2.4 ± 2.7	18.3 ± .7	4.3 ± 3.8	.7 ± .3	25.8 ± 4.7
CD-7 L1B	30.5	5.5 ± 2.9	18.2 ± .7	5.6 ± 4.2	.8 ± .3	30.1 ± 5.1
CD-7 L1C	31.8	.5 ± 3.0	19.0 ± .8	4.1 ± 4.4	.7 ± .3	24.2 ± 5.4
CD-7 L1D	30.5	3.6 ± 2.8	18.5 ± .7	5.4 ± 4.0	.6 ± .3	28.1 ± 4.9
CD-7 L2A	31.9	6.9 ± 3.4	16.9 ± .8	5.6 ± 4.9	.6 ± .3	29.9 ± 6.1
CD-7 L2B	30.3	9.6 ± 3.6	18.3 ± .9	5.1 ± 5.2	.4 ± .3	33.4 ± 6.5
CD-7 L2C	30.6	10.3 ± 3.8	16.9 ± .9	4.7 ± 5.5	.4 ± .3	32.4 ± 6.7
CD-7 L2D	30.9	11.5 ± 4.4	17.5 ± 1.2	6.2 ± 6.5	0.0 ± 0.0	35.3 ± 7.9
CD-7 L3A	29.9	4.1 ± 3.1	17.8 ± .8	5.3 ± 4.5	.8 ± .3	28.1 ± 5.5
CD-7 L3B	30.3	7.6 ± 3.4	17.9 ± .8	5.7 ± 4.9	.4 ± .3	31.6 ± 6.0
CD-7 L3C	27.6	5.4 ± 3.4	16.3 ± .8	4.5 ± 4.9	1.0 ± .3	27.2 ± 6.0
CD-7 L3D	28.6	4.9 ± 4.0	19.4 ± 1.0	5.0 ± 5.8	.4 ± .4	29.6 ± 7.1
CD-7 L4A	27.7	8.0 ± 3.7	19.9 ± .9	5.2 ± 5.4	.4 ± .3	33.4 ± 6.6
CD-7 L4B	29	4.3 ± 2.8	17.6 ± .7	5.4 ± 4.1	.4 ± .3	27.7 ± 5.0
CD-7 L4C	28.2	4.2 ± 3.2	20.0 ± .8	5.3 ± 4.5	.7 ± .3	30.1 ± 5.6
CD-7 L4D	28.4	.8 ± 3.2	18.6 ± .8	5.4 ± 4.6	1.1 ± .3	25.9 ± 5.7

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

$\overline{Th} = 18.2$

$\overline{R_a} = 5.2$

$\overline{R_a} + \overline{Th} = 23.4$

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 4

DATE ANALYZED: 860116 ANALYZED BY NS

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD4-1	18.1	0.0 ± 0.0	237.0 ± 4.6	57.8 ± 4.2	3.1 ± 1.5	297.9 ± 6.4
CD4-2	19.5	0.0 ± 0.0	231.8 ± 4.4	49.6 ± 4.0	4.2 ± 1.4	285.5 ± 6.1
CD4-3	17.9	7.5 ± 19.6	246.1 ± 5.4	54.3 ± 28.1	3.1 ± 1.8	311.0 ± 34.7
CD4-4	21.5	7.1 ± 14.3	216.2 ± 4.0	49.9 ± 20.5	1.7 ± 1.3	275.0 ± 25.4
CD4-5	17.7	17.0 ± 12.8	222.9 ± 3.6	52.5 ± 18.3	1.8 ± 1.1	294.2 ± 22.7
CD4-6	16.6	0.0 ± 0.0	259.6 ± 5.1	57.5 ± 4.6	1.7 ± 1.6	318.8 ± 7.0
CD4-7	18.0	0.0 ± 0.0	242.4 ± 4.6	58.9 ± 4.2	2.6 ± 1.4	303.9 ± 6.4
CD4-8	18.8	0.0 ± 0.0	219.3 ± 3.9	52.3 ± 3.6	2.6 ± 1.2	274.2 ± 5.5
CD4-9	19.4	0.0 ± 0.0	268.4 ± 5.4	58.7 ± 5.0	4.0 ± 1.7	331.1 ± 7.6
CD4-10	18.6	0.0 ± 0.0	244.4 ± 4.4	56.9 ± 4.1	4.4 ± 1.4	305.7 ± 6.2
CD4-11	18.8	0.0 ± 0.0	253.9 ± 4.6	61.5 ± 4.2	2.9 ± 1.5	318.2 ± 6.4
CD4-12	21.6	0.0 ± 0.0	261.8 ± 5.6	58.6 ± 5.3	5.7 ± 1.9	326.2 ± 8.0
CD4-13	18.8	0.0 ± 0.0	253.5 ± 5.5	60.9 ± 5.2	2.9 ± 1.8	317.3 ± 7.8
CD4-14	17.9	0.0 ± 0.0	268.3 ± 5.5	57.9 ± 5.2	5.1 ± 1.8	331.3 ± 7.8
CD4-15	18.6	0.0 ± 0.0	229.8 ± 3.8	50.1 ± 3.5	3.6 ± 1.2	283.5 ± 5.3
CD4-16	17.9	2.2 ± 15.8	248.6 ± 4.5	57.7 ± 22.6	2.4 ± 1.4	310.9 ± 28.0

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

Th + Ra - 299.9

Th - 244.0

Ra - 55.9

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 5A

DATE ANALYZED: 860116 ANALYZED BY VS

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CDS-1	23.6	0.0 ← 0.0	1185.3 ← 107.7	201.2 ← 123.8	78.5 ← 44.9	1465.0 ← 170.1
CDS-2	23.7	0.0 ← 0.0	1134.7 ← 102.4	199.4 ← 117.9	76.3 ← 42.8	1410.4 ← 161.9
CDS-3	24.2	0.0 ← 0.0	1118.6 ← 101.9	196.7 ← 116.8	73.5 ← 42.3	1388.7 ← 160.7
CDS-4	23.5	0.0 ← 0.0	1085.6 ← 93.8	198.2 ← 107.0	70.8 ← 38.8	1354.6 ← 147.4
CDS-5	22.6	0.0 ← 0.0	1187.9 ← 108.4	199.3 ← 123.9	77.6 ← 45.0	1464.8 ← 170.7
CDS-6	23.1	0.0 ← 0.0	1225.1 ← 114.8	207.4 ← 132.8	83.4 ← 48.2	1515.9 ← 182.1
CDS-7	20	0.0 ← 0.0	1254.3 ← 109.3	225.3 ← 122.9	76.7 ← 44.4	1556.3 ← 170.3
CDS-8	20	0.0 ← 0.0	1498.6 ← 137.2	251.8 ← 158.8	100.7 ← 57.7	1851.1 ← 217.7
CDS-9	24.0	0.0 ← 0.0	1199.2 ← 110.3	195.7 ← 127.0	79.4 ← 46.1	1465.4 ← 174.4
CDS-10	24.4	0.0 ← 0.0	1267.4 ← 126.2	196.0 ← 147.3	88.6 ← 53.6	1552.0 ← 201.2
CDS-11	25.0	0.0 ← 0.0	1196.1 ← 104.0	206.5 ← 119.2	76.9 ← 43.3	1479.5 ← 164.0
CDS-12	25.2	0.0 ← 0.0	1151.9 ← 100.0	194.4 ← 115.4	77.3 ← 42.0	1423.5 ← 158.4
CDS-13	24.7	0.0 ← 0.0	1274.3 ← 114.8	215.1 ← 132.1	82.8 ← 48.0	1572.1 ← 181.4
CDS-14	25.3	0.0 ← 0.0	1313.0 ← 138.0	197.1 ← 162.4	93.4 ← 59.1	1603.5 ← 221.1
CDS-15	24.2	0.0 ← 0.0	1284.1 ← 122.3	206.3 ← 141.9	87.1 ← 51.6	1577.5 ← 194.3
CDS-16	26.4	0.0 ← 0.0	1309.6 ← 130.2	197.0 ← 153.1	92.1 ← 55.8	1598.6 ← 208.6

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

$\overline{Th} = 1229.8$

$\overline{Ra} = 205.5$

$\overline{Th} + \overline{Ra} = 1435.3$

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 2A

DATE ANALYZED: 860115 ANALYZED BY _____

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD2-1	16.8	5.9 ± 4.8	41.8 ± 1.3	11.2 ± 6.9	.1 ± .4	58.9 ± 8.5
CD2-2	17.5	9.2 ± 4.2	35.2 ± 1.1	10.6 ± 6.1	.4 ± .4	55.3 ± 7.5
CD2-3	18.3	3.1 ± 4.9	41.6 ± 1.3	10.2 ± 7.1	.3 ± .4	55.2 ± 8.7
CD2-4	17.8	1.5 ± 5.0	44.9 ± 1.3	10.2 ± 7.2	.5 ± .5	57.1 ± 8.9
CD2-5	16.5	0.0 ± 0.0	39.3 ± 1.1	10.9 ± 1.2	0.0 ± 0.0	50.3 ± 1.6
CD2-6	16.1	0.0 ± 0.0	37.3 ± 1.1	8.2 ± 1.1	1.1 ± .4	46.6 ± 1.7
CD2-7	17.9	5.7 ± 4.4	33.4 ± 1.1	9.6 ± 6.4	.5 ± .4	49.2 ± 7.9
CD2-8	21.2	10.3 ± 3.4	33.7 ± .9	8.8 ± 4.8	.5 ± .3	53.3 ± 6.0
CD2-9	18.1	0.0 ± 0.0	40.3 ± 1.4	9.3 ± 1.4	.4 ± .5	50.0 ± 2.0
CD2-10	18.4	12.6 ± 5.1	40.7 ± 1.3	10.4 ± 7.4	.0 ± .5	63.7 ± 9.1
CD2-11	18.8	8.9 ± 4.1	36.4 ± 1.0	8.6 ± 5.9	.2 ± .4	54.0 ± 7.2
CD2-12	21.8	5.9 ± 3.0	33.7 ± .8	8.7 ± 4.4	.1 ± .3	48.4 ± 5.4
CD2-13	17.9	9.1 ± 4.1	37.7 ± 1.1	8.5 ± 5.8	.4 ± .4	55.7 ± 7.2
CD2-14	18.9	4.4 ± 4.9	37.3 ± 1.4	11.1 ± 7.2	0.0 ± 0.0	52.7 ± 8.8
CD2-15	17.9	1.1 ± 4.9	38.6 ± 1.3	10.3 ± 7.0	.4 ± .5	50.6 ± 8.7
CD2-16	18.2	6.0 ± 4.2	39.2 ± 1.1	9.8 ± 6.0	.2 ± .4	55.2 ± 7.4

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

$\overline{Th + Ra} - \cancel{22.8} = 48.0$

$Th - 38.2$

$Ra - 9.8$

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 3A

DATE ANALYZED: 860115 ANALYZED BY _____

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CB3-1	19.3	12.2 ± 6.6	59.5 ± 1.8	16.9 ± 9.5	.3 ± .6	88.9 ± 11.8
CB3-2	19.2	3.5 ± 5.8	66.5 ± 1.6	15.9 ± 8.3	.5 ± .5	86.4 ± 10.2
CB3-3	18.8	1.0 ± 5.0	66.9 ± 1.4	16.9 ± 7.1	.7 ± .5	85.5 ± 8.8
CB3-4	19.4	14.6 ± 5.4	61.2 ± 1.4	14.3 ± 7.8	1.0 ± .5	91.0 ± 9.6
CB3-5	18.1	10.9 ± 8.0	90.6 ± 2.2	20.8 ± 11.5	.5 ± .7	122.8 ± 14.2
CB3-6	17.2	9.1 ± 6.0	75.5 ± 1.6	17.8 ± 8.6	.9 ± .6	103.4 ± 10.6
CB3-7	18.7	6.6 ± 8.6	75.2 ± 2.4	16.8 ± 12.4	.1 ± .8	98.7 ± 15.3
CB3-8	19.1	.4 ± 5.9	85.0 ± 1.6	18.4 ± 8.5	1.5 ± .6	105.2 ± 10.5
CB3-9	18.6	15.1 ± 8.3	92.9 ± 2.2	21.2 ± 12.0	.9 ± .8	130.0 ± 14.8
CB3-10	16.1	11.2 ± 7.3	86.1 ± 1.9	17.4 ± 10.5	1.4 ± .7	116.1 ± 12.9
CB3-11	17.1	0.0 ± 0.0	85.4 ± 2.2	19.9 ± 2.1	1.6 ± .7	106.9 ± 3.2
CB3-12	18.9	.2 ± 6.1	87.3 ± 1.7	17.7 ± 8.8	1.1 ± .6	106.4 ± 10.9
CB3-13	17.5	3.8 ± 5.8	77.6 ± 1.6	20.1 ± 8.4	1.1 ± .5	102.6 ± 10.4
CB3-14	18.0	0.0 ± 0.0	90.9 ± 1.8	23.3 ± 1.7	1.4 ± .6	115.7 ± 2.6
CB3-15	18.3	5.5 ± 7.0	85.5 ± 1.9	18.7 ± 10.1	1.3 ± .6	110.9 ± 12.5
CB3-16	19.1	6.4 ± 6.5	76.3 ± 1.7	20.2 ± 9.3	.9 ± .6	103.8 ± 11.5

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

$\overline{Th + L}$ ~~49.7~~ = 97.4

$\overline{Th}$ - 78.9

$\overline{L_a}$ - 18.5

AS BUILT CD-7

Calibration Drum Constructed Friday, May 30, 1986

	lb.		lb.		lb.		lb.	TOTAL
Lift #1	43	Lift #2	41	Lift #3	45	Lift #4	42	
	45		48		42		45	
	45		48		45		38	
	41		41		41		48	
	32.4		28.4		33.4		33.4	
	206.4		206.4		206.4		206.4	825.6 lb.

Total soil wt. used 825.6 lb. = 374.85 kg
Total Monazite Sand wt used 826 g.

AS BUILT CD-8

	lb.		lb.		lb.		lb.	TOTAL
Lift #1	43	Lift #2	48	Lift #3	44	Lift #4	47	
	46		46		43		43	
	48		45		45		48	
	50		50		46		52	
	19.4		17.4		28.4		16.4	
	206.4		206.4		206.4		206.4	825.6 lb.

Total soil wt. used 825.6 lb. = 374.85 kg
Total Monazite Sand wt used 413 g.

GAMMA-SPEC ANALYSIS RESULTS

SAMPLE DESCRIPTION: DRUM CALIBRATION STANDARDS

FILE NAME: CAL DRUM 1

DATE ANALYZED: 860114 ANALYZED BY NS/CT +

SAMPLE NAME	WEIGHT in Grams	U-238 pCi/g	Th-232 pCi/g	Ra-226 pCi/g	Other Gamma pCi/g	Total Gamma * pCi/g
CD1-1	19.9	.7 ← 1.8	.5 ← .4	1.1 ← 2.6	.2 ← .2	2.4 ← 3.2
CD1-2	21.0	0.0 ← 0.0	1.2 ← .3	.7 ← .4	.1 ← .1	2.1 ← .4
CD1-3	19.2	1.1 ← 1.3	.8 ← .3	.3 ← 1.9	.5 ← .1	2.7 ← 2.4
CD1-4	19.2	0.0 ← 0.0	.8 ← .3	.2 ← .4	.6 ← .1	1.6 ← .5
CD1-5	17.8	1.5 ← 1.4	.8 ← .3	.9 ← 2.0	.3 ← .1	3.4 ← 2.4
CD1-6	17.7	1.3 ← 1.4	.7 ← .3	1.1 ← 2.0	.2 ← .1	3.4 ← 2.4
CD1-7	19.0	0.0 ← 0.0	1.1 ← .3	.2 ← .4	.4 ← .1	1.7 ← .5
CD1-8	16.6	1.6 ← 1.8	.7 ← .4	1.3 ← 2.6	.1 ← .2	3.7 ← 3.2
CD1-9	18.2	0.0 ← 0.0	1.3 ← .4	.9 ← .6	.2 ← .2	2.5 ← .7
CD1-10	18.8	.1 ← 1.4	.8 ← .3	1.0 ← 2.1	.2 ← .2	2.1 ← 2.5
CD1-11	17.8	0.0 ← 0.0	.9 ← .3	.3 ← .4	.4 ← .1	1.6 ← .5
CD1-12	18.6	.8 ← 1.7	.8 ← .4	1.1 ← 2.5	.2 ← .2	2.8 ← 3.0
CD1-13	19.4	.0 ← 1.6	1.1 ← .4	1.5 ← 2.5	0.0 ← 0.0	2.6 ← 3.0
CD1-14	17.9	.8 ← 1.8	.3 ← .4	1.7 ← 2.6	.3 ← .2	3.1 ← 3.2
CD1-15	19.6	3.7 ← 1.5	1.4 ← .3	.7 ← 2.3	0.0 ← 0.0	5.8 ← 2.8
CD1-16	19.5	0.0 ← 0.0	.9 ← .4	.2 ← .6	.5 ← .2	1.6 ← .8

* RESULTS ASSUME NUCLIDES TO BE 100% GAMMA EMITTERS

Th - .88 Ra - .82

Th 232 + Ra 226 - ~~.85 eqv~~ = 1.7

Several different types of source material are available for use in calibration. Pulverized black dirt may be used for background material. Various rare earth materials located at the West Chicago Facility can be used for lower concentration (15 to 30 pCi/g) materials and should provide a homogenous concentration of radioactivity. Other sources of higher concentrations are available on-site. It is important that the activity be distributed uniformly throughout the material placed into the drums. A statistically significant number of samples must be collected from each drum to determine what concentrations of thorium, uranium, and radium are present. At least 16 samples shall be collected as the material is placed into each drum.

BOREHOLE LOGGING CALIBRATION DRUMS

Drums Contents:

Source Activity - Monazite sand from bldg. #19 (drum #164)
Background Soil - Toyota dirt pile, West Chicago
Drum Construction - 85 gallon salvage drum with 4 inch PVC pipe centered in drum

DRUM NO.	MATERIAL MIXTURE, kg		KMTC ACTIVITY, pCi/g		KMMC ACTIVITY, pCi/g	
	SOIL	MONAZITE	Th-232	Ra-226	Th-232	Ra-226
CD-1	385.6	0	0.9	1.1	0.8	0.8
CD-2	374.8	1.652	37.4	5.6	37.6	9.2
CD-3	368.6	3.304	78.0	9.9	78.6	18.1
CD-4	360.9	11.012	235	30	239	52
CD-5	365.6	110.7	1,595	191	1,423	229
CD-6*	44.9	1.376	247	32	265	58

* Background soil w/activity layer @ 8"-14.5" from barrel rim.

A.7.4 SYSTEM CALIBRATION

The borehole logging system will be calibrated using at least five specially prepared calibration devices. These devices will be constructed by placing a homogenous material of known activity into a 55-gallon drum. A PVC pipe placed in the center of the drum will provide a portal for the probe to be inserted. It is important that the hole diameter, probe collimation, moisture content of the material, and other factors duplicate actual field measurement conditions as closely as possible.

Concentrations of material placed into each drum will be approximately 2.0 pCi/g (background), 15 pCi/g, 30 pCi/g, 100 pCi/g, and 1,000 pCi/g. Readings will be taken with the detector located in the center of each drum and a calibration curve prepared for the system. Calibration will also be required with each drum filled with water to simulate measurements to be taken below the water table. A water correction factor of about 1.1 has been reported for a 4-inch diameter hole. (See Figure 4.8 of NUREG/CR-3429, "Borehole Logging for Radium-226: Recommended Procedures and Equipment," October 1984.)

Radiation Management Corporation reported in NUREG/CR-3035, "Radiological Survey of Reed-Keppler Park Site, West Chicago, Illinois," November 1982, that an "infinite" thickness in soil for a borehole logging device is about 10 inches from the center

of the detector. For a 4-inch hole, gamma logging will "see" activity out to about 7 or 8 inches from the hole. In addition, the National Council on Radiation Protection and Measurements (NCRP) reported in NCRP Report No. 50 (Figure 2-4) that greater than 95 percent of the relative contribution to the total exposure rate at one meter above the ground results from natural sources (Th, U, and K) in the top ten inches of soil. A 55-gallon drum of homogenous material with a 4-inch diameter hole through its center will provide an "infinite" source for calibration purposes.

NCRP Report No. 50 also reports the average gamma emissions for uranium and thorium series radionuclides to be 0.61 and 0.88 MeV, respectively (Table 2-14 of NCRP Report No. 50). However, more gamma photons are emitted from the thorium series resulting in greater exposure rates. Radium-226, uranium-238 plus daughters, and thorium-232 plus daughters result in exposure rates at one meter above uniform soil concentrations of 1.80, 1.82, and 2.82 $\mu Rhr^{-1}/pCig^{-1}$, respectively (Table 2-18 of NCRP Report No. 50). Therefore, a gamma system calibrated with thorium-232 plus daughters will result in lower than actual estimates of total gamma activity in soil containing elevated levels of radium or uranium. Calibration of the system must consider this difference between the decay series. An evaluation will be made during system calibration, and if necessary a correction factor applied to the appropriate measurements.

FIGURE 1

BOREHOLE FIELD LOG

Date:_____ Technician:_____ Hole #:_____

Sealer Model and Serial Number:_____

Probe Model and Serial Number:_____

Instrument Response Check: Before_____(cpm) After_____(cpm)

Depth (feet)	Obs. Count (cpm)	Est. Activity (pCi/g)	Depth (feet)	Obs. Count (cpm)	Est. Activity (pCi/g)

Remarks:

ADIOLOGICAL SURVEY DOWNHOLE LOG KH-8547

		PAGE of
...EVATION	COUNT TIME	CALIBRATION CHECK

HOLE	DEPTH	COUNT		REMARKS

WEATHER

INSTRUMENT PROBE NO. HIGH VOLTAGE INPUT SENSITIVITY

APPROVALS FIELD TECHNICIAN HEALTH PHYSICS

APPENDIX A.7

BOREHOLE LOGGING PROCEDURE

A.7.1 GENERAL

Borehole logging will be used to determine the total gamma activity profiles at selected locations of the West Chicago Facility. Each hole will be logged with a sodium iodide (NaI) detection system. This document describes the logging and calibration procedure.

A.7.2 INSTRUMENTATION AND EQUIPMENT

The NaI detection system consists of a NaI detector coupled to a photomultiplier tube, a lead shield with slits located around the center of the detector, approximately 40 feet of cable, and a portable scaler. A hoist cable and reel mounted on a tripod will be used to lower the detector into the hole. Standard drilling equipment for augering holes to depths of approximately 35 feet will be required.

A.7.3 LOGGING PROCEDURE

Two types of borehole drilling may be required, depending on whether the hole is drilled above or below the water table. A hole will be drilled with a 3- to 4-inch auger to the depth of the water table. Drill cuttings should be removed from

around the hole to minimize the amount of material that may fall back into the hole. Contaminated material allowed to fall into the hole may result in erroneous readings near the bottom of the hole. The hole should be logged at six-inch intervals from the bottom up, immediately after drilling. The observed count rate at each measurement point will be documented and converted to total gamma activity. If an activity greater than 15 pCi/g appears to continue to a greater depth, the hole will be drilled below the water table and logged at six-inch intervals by five-foot sections. Elevated readings at the bottom of a hole may be due to contamination which has sloughed from the side of the hole and may not be due to material representative of that depth. The evaluation to drill deeper must consider this possibility. Drilling below the water table will require special procedures to ensure that the hole stays open during logging. Drilling mud or installation of PVC pipe will be used for this purpose.

A Borehole Field Log (See Figure 1) will be used to document field data collected. Remarks such as depth to the water table and unusual texture or color changes of the drill cuttings should be noted.

Ten random soil samples shall be collected and the radionuclide content of each determined by gamma pulse height analysis. The sample analysis and borehole logging results for those locations will be compared and evaluated.

EXHIBIT 1

Borehole Logging Procedure

System Calibration

Logging Results

Boreing Location Diagram
(Location Map)

KERR-McGEE CHEMICAL CORPORATION
KERR-McGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

April 13, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Neil Meldgin
Remedial Planning Manager
Waste Management Division
Region V
U.S. Environmental Protection Agency
230 South Dearborn Street
Chicago, IL 60604

RE: West Chicago, Illinois
Sewage Treatment Plant Remedial Program

Dear Mr. Meldgin:

Enclosed is a report (2-volumes) describing the site program and records documenting the activities involved in Kerr-McGee Chemical Corporation's clean-up of the West Chicago Sewage Treatment Plant done as part of the thorium removal program. The clean-up was completed in November 1987.

If you have any questions concerning this information, please contact me at your earliest convenience.

Sincerely,

I.L. Denny, Manager
West Chicago Project

SCM/ILD/at

Enclosure as stated

BOOK 1 OF 2

April 13, 1988

RE: West Chicago, IL
Sewage Treatment
Plant Remedial
Program

Distribution:

Ms. Nancy Rich
Assistant Attorney General
Environmental Control Division
Office of the Attorney General
State of Illinois
100 West Randolph Street, 13th Floor
Chicago, Illinois 60601

Honorable A. Eugene Rennels, Mayor
City of West Chicago
475 Main Street
West Chicago, Illinois 60185

Ms. Merri Horn
U.S. Nuclear Regulatory Commission
Uranium Fuel Licensing Branch
Division of Fuel Cycle & Material Safety
Office of Nuclear Material
Safety & Safeguards (NMSS)
Washington, D.C. 20555

The Chicago Dock & Canal Trust

REPORT

VOLUME III

ATTACHMENT E

Report for Characterization Investigation Gamma Radiation Survey

Lindsay Light II Site
316 E. Illinois St.
Chicago, Illinois

STS Consultants Ltd.

TABLE OF CONTENTS

VOLUME III

ATTACHMENT E - Analytical Reports

ATTACHMENT E

Analytical Reports

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CASE NARRATIVE

Kerr - McGee Corporation
3301 N.W. 150th Street
Oklahoma City, OK 73134

ATTENTION: Garet E. Van De Steeg

October 3, 1995

PROJECT NUMBER:	578.03
DATE RECEIVED:	May 24, 1994
NUMBER OF SAMPLES:	Four (4)
SAMPLE MATRIX:	Soil

I. Introduction

On May 24, 1994, twelve (12) samples were received at Quanterra Environmental Services at St. Louis from STS Consultants. On September 18, 1995 an additional analysis was requested by Kerr - McGee for the samples listed below. The list of analytical tests performed, as well as receipt and analysis, can be found in the attached report. The samples were labeled as follows:

CLIENT SAMPLE ID	QUANTERRA SAMPLE ID
CD-S156E49N-2-3	9369-001
CD-S156E49N-2-3	9369-001MSD
CD-S156E49N-2-3	9369-001MS
CD-S78E18N-2-3	9369-002
CD-S815E5N-3-4	9369-003
CD-S81E5N-2-3	9369-004

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The analysis requested include: Isotopic Uranium by EPA method U-NAS-NS-3050

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

See the attached correspondence attached in regards to QC analysis. Sample CD-S156E49N-2-3 (9369-001) was chosen for an MS and Dup which is normally performed for Kerr-McGee projects. The lab mistakenly ran an MS and MSD and these QC results are reported.

See the attached Conversation Records in regards to running Alpha Spec. Analysis for 4 samples received from STS in May 1994. Quanterra processes the Alpha Spec analysis by using Region of Interests not Pulse Height as indicated in Mr. Berggreens's letter dated 9/20/95.

ISOTOPIC URANIUM

The comparison of the U^{234}, U^{235} and U^{238} results indicate that the sample is of natural isotopic ratios, not enriched.

I certify that this Case Narrative in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or his designee, as verified by the following signature.

Reviewed and approved:

Diane W. Mueller
Project Manager

Quanterra September 28, 1995 03:47 pm
Account: 11111 Project: 578.03 Kerr McGee QAS No. 578.03 Rev. 0
Master Sample Login: 9369

Project Manager: D. Mueller

Draft: Final: Entered and Reviewed by: Kathy R Giacopelli Review: Diane W Mueller 9-28-95

Sample Header Template:

Sample No. / # Data:	Comments / Container Type	Client ID	Analysis	C-Matrix	Date: Collected / Class	Preservative	Received / Anal. Due Date	Due / Hold Date	Shipper / Site	Rad Category	Rad Sample No. / (Container Numbers:% Filled)
9369-001		CD-S156E49N-2-3		Soil	22-MAY-94 12:40		24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179516:25)
9369-001DUP		CD-S156E49N-2-3		Soil	22-MAY-94 12:40		24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179516:25)
9369-001MS		CD-S156E49N-2-3		Soil	22-MAY-94 12:40		24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179516:25)
9369-002		CD-S78E18N-2-3		Soil	22-MAY-94 16:00		24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179517:25)
9369-003		CD-S81E5N-3-4		Soil	22-MAY-94 15:00		24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179518:25)
9369-004		CD-S81E5N-2-3		Soil	22-MAY-94 15:00		24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required
1	AN - Amber Glass-500ml		RAD/ISOU/Q4		S	COLD	02-OCT-95	20-NOV-94	R19D		(179519:25)

3*=Sample has not been rad screened.

LIAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 937.01 STS Consultants GAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Original Entered and Reviewed by: VRShaw . PM Review:
due dates

Sample Header Template:

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	*Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Rad Category / Site	Rad Sample No. / (Container Numbers:% Filled)
5179-001	CD-8156649N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 All - Amber Glass-500ml		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79580:100)
1		RAD/ISOTH/04	S COLD	09-JUN-94	20-NOV-94	R190		(79580:100)
1		RAD/ISOU/04	S COLD	09-JUN-94	20-NOV-94	R190		(79580:100)
1		RAD/SCREEN/04	S COLD	09-JUN-94	20-NOV-94	R190		(79580:100)
5179-001DUP	CD-8156649N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 All - Amber Glass-500ml		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79580:100)
5179-002	CD-8156649N-3-4	Soil	22-MAY-94 12:50	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-011
1 All - Amber Glass-500ml		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79581:100)
1		RAD/SCREEN/04	S COLD	09-JUN-94	20-NOV-94	R190		(79581:100)
5179-003	CD-8-8282542-3	Soil	22-MAY-94 13:45	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-010
1 All - Amber Glass-500ml		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79584:100)
1		RAD/SCREEN/04	S COLD	09-JUN-94	20-NOV-94	R190		(79584:100)
5179-004	CD-8282254-3-4	Soil	22-MAY-94 14:05	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-009
1 All - Amber Glass-500ml		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79585:100)
1		RAD/SCREEN/04	S COLD	09-JUN-94	20-NOV-94	R190		(79585:100)
5179-005	CD-8788184-2-3	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-008
1 All - Amber Glass-500ml		DNA/TCLP/04	S COLD	09-JUN-94	01-JUL-94	R190		(7959?:100)
1		EXT/TCLP/04	S COLD	09-JUN-94	05-JUL-94	R190		(7956?:100)
1		HG/TCLP/04	S COLD	09-JUN-94	22-JUN-94	R190		(79595:100)
1		ICAP/TCLP/04	S COLD	09-JUN-94	21-NOV-94	R190		(79595:100)
1		RAD/GAMMA/04	S COLD	09-JUN-94	20-NOV-94	R190		(79596:100)
1		RAD/ISOTH/04	S COLD	09-JUN-94	20-NOV-94	R190		(79596:100)
1		RAD/ISOU/04	S COLD	09-JUN-94	20-NOV-94	R190		(79596:100)
1		RAD/SCREEN/04	S COLD	09-JUN-94	20-NOV-94	R190		(79596:100)
1 All - Amber Glass-250ml		SVL/8010/04	S COLD	09-JUN-94	05-JUL-94	R190		(79598:100)

3*=Sample has not been rad screened.

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	*Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
Comments								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79594:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79594:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79594:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79594:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D	(79594:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79594:100)
2	AM - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79590:100 79591:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B	(79592:100 79593:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B	(79592:100 79593:100)
5179-006	CD-889E14N-2-3	Soil	22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-007
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79613:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79613:90)
5179-007	CD-889E16N-3-4	Soil	22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-006
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79624:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79624:90)
5179-008	CD-878E18N-3-4-9	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-005
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79625:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79625:90)
5179-009	CD-878E18N-3-4	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-004
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79630:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79630:90)
5179-010	CD-881E5N-2-3-9	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-003
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79635:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79635:90)
5179-011	CD-881E5N-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-002
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)

3*=Sample has not been rad screened.

Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0

Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Containers	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		RAD/TOTAL/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79636:90)
5179-012	CB-881654-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-001
1	All - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R190	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79644:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R190	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R190	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	28-NOV-94	R190	(79643:100)
1	All - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R190	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79645:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R190	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R190	(79645:100)
1		TCN/9020/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79645:100)
2	All - Amber Glass-125ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	1098	(79646:100 79647:100)
2		8260/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	1098	(79646:100 79647:100)

3*=Sample has not been rad screened.

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra
Environmental Services

Category: Isotopic Uranium
Method: NAS-NS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-S156E49N-2-3	9369-001	Uranium-238	09/27/95	10/03/95	1.62	PCI/G	0.55	0.14
CD-S156E49N-2-3	9369-001	Uranium-235/236	09/27/95	10/03/95	0.08	PCI/G	0.12	0.16
CD-S156E49N-2-3	9369-001	Uranium-234	09/27/95	10/03/95	1.66	PCI/G	0.56	0.12

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra
Environmental Services

Category: Isotopic Uranium
Method: HAS-HS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-S156E49N-2-3	9369-001MS	Uranium-238	09/27/95	10/03/95	144	%REC		
CD-S156E49N-2-3	9369-001MS	Uranium-234	09/27/95	10/03/95	157	%REC		

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra
Environmental Services

Category: Isotopic Uranium
Method: NAS-NS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-S156E49N-2-3	9369-001MSD	Uranium-238	09/27/95	10/03/95	124	%REC		
CD-S156E49N-2-3	9369-001MSD	Uranium-234	09/27/95	10/03/95	128	%REC		

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra Environmental Services

Category: Isotopic Uranium
Method: HAS-HS-300B
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-S78E18N-2-3	9369-002	Uranium-238	09/27/95	10/03/95	32.0	PCI/G	6.8	0.2
CD-S78E18N-2-3	9369-002	Uranium-235/236	09/27/95	10/03/95	3.25	PCI/G	1.08	0.27
CD-S78E18N-2-3	9369-002	Uranium-234	09/27/95	10/03/95	30.0	PCI/G	6.4	0.2

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra
Environmental Services

Category: Isotopic Uranium
Method: NAS-NS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-S81E5N-3-4	9369-003	Uranium-238	09/27/95	10/03/95	82.8	PCI/G	17.2	0.2
CD-S81E5N-3-4	9369-003	Uranium-235/236	09/27/95	10/03/95	10.4	PCI/G	2.6	0.2
CD-S81E5N-3-4	9369-003	Uranium-234	09/27/95	10/03/95	89.6	PCI/G	18.6	0.2

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra Environmental Services

Category: Isotopic Uranium
Method: HAS-HS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: 05/22/94
Date Received: 05/24/94

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
CD-SB1ESW-2-3	9369-004	Uranium-238	09/27/95	10/03/95	52.4	PCI/G	11.1	0.2
CD-SB1ESW-2-3	9369-004	Uranium-235/236	09/27/95	10/03/95	7.47	PCI/G	2.04	0.31
CD-SB1ESW-2-3	9369-004	Uranium-234	09/27/95	10/03/95	51.1	PCI/G	10.8	0.3

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra Environmental Services

Category: Isotopic Uranium
Method: NAS-NS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: N/A
Date Received: N/A

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
NA	QCBLK78772-1	Uranium-238	09/27/95	10/03/95	-0.0007	PCI/G	0.0014	0.0959
NA	QCBLK78772-1	Uranium-235/236	09/27/95	10/03/95	0.10	PCI/G	0.12	0.14
NA	QCBLK78772-1	Uranium-234	09/27/95	10/03/95	-0.001	PCI/G	0.002	0.105

Kerr McGee
3301 N.W. 150th Street
Oklahoma City, OK 73134

Project: 578.03

Quanterra
Environmental Services

Category: Isotopic Uranium
Method: HAS-HS-3050
Matrix: Soil

Report Date: 10/03/95
Date Sampled: N/A
Date Received: N/A

Client ID	Quanterra ID	Parameter	Prep Date	Date Analyzed	Result	Units	2 Sigma Error (+/-)	MDA
NA	QCLCS78772-1	Uranium-238	09/27/95	10/03/95	146	%REC		
NA	QCLCS78772-1	Uranium-234	09/27/95	10/03/95	126	%REC		

Quanterra
Environmental
Services

Alpha Spectroscopy

Uranium

578.03
9369

Quanterra
Environmental
Services

DATA REPORTS AND CHANNEL BY CHANNEL REPORT

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 08:59:44

****

Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-001_UU.CNF

****

RELEASE/BATCH #	78772	SAMPLE ID:	9369-001
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.026E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	005
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	31.3%
ELAPSED LIVE TIME:	5989.	RECOVERY:	42.25%
TRACER ID:	U-232	TRACER FWHM (kev):	36.60
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_005_29SEP95		

****

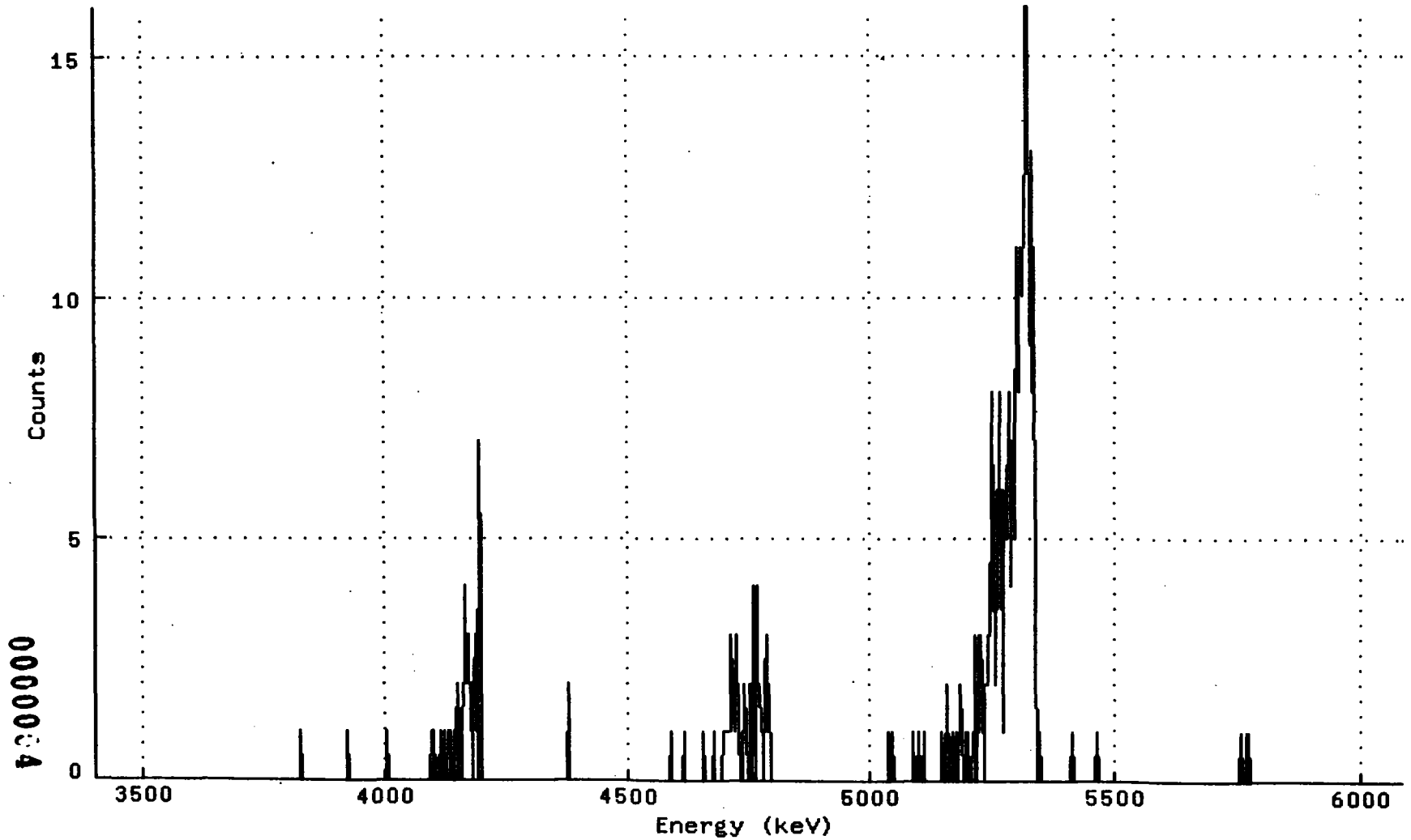
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	296.75	0.25	99.8	9.884E+00	1.525E+00	1.677E-01	1.290E-01
U-234	4761.5	49.95	0.05	99.8	1.664E+00	5.624E-01	1.249E-01	1.076E-01
U-235	4385.5	1.93	0.07	80.9	7.910E-02	1.172E-01	1.637E-01	1.375E-01
U-238	4184.4	48.88	0.12	100.2	1.621E+00	5.524E-01	1.444E-01	1.171E-01

****

*** POSITIVE ***

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-001_UU.CNF;1
Title : 005
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.39533E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-001 Energy Slope : 2.63077E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : -8.07213E-06



Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-001_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	1	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	1	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	1
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	1	0	1	0	0	0
273:	0	1	0	0	1	0	0	1
281:	1	0	0	1	0	1	2	0
289:	1	0	1	2	2	4	2	3
297:	2	2	0	2	2	3	2	0
305:	7	4	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	0	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	0	0	0
369:	0	0	0	0	0	2	0	0
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	0	0	0	0	0	0
425:	0	0	0	0	0	0	0	0

433:	0	0	0	0	0	0	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	1	0	0
457:	0	0	0	0	0	0	0	1
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	1
481:	0	0	0	0	0	0	0	1
489:	0	0	0	0	0	0	1	1
497:	1	1	1	1	1	3	2	1
505:	1	3	1	1	0	1	0	2
513:	1	1	0	0	2	0	4	1
521:	0	4	2	2	1	1	0	2
529:	3	1	2	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	1	0	1	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	1	0	0	0	1
649:	0	0	0	1	0	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	1	0	0	0	2	0	0
673:	0	0	1	0	0	1	0	2
681:	2	1	0	0	1	0	1	0
689:	0	0	1	0	3	0	3	1
697:	3	2	0	2	2	2	3	3
705:	6	8	5	2	3	4	8	5
713:	6	1	6	5	6	5	8	6
721:	4	7	5	6	11	8	10	11
729:	10	10	12	13	16	16	9	13
737:	8	11	3	3	0	1	1	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	1
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	1	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	1	0	0	0	0	1	1
905:	0	0	0	0	0	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 08:59:02.24

Detector ID: 5 Acquisition Start: 3-OCT-1995 06:49:30.05
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-001
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4170.92	49	0	32.36	295.08	262	64	8.18E-03	14.3	
2	0	4378.11	2	0	2.63	374.00	363	58	3.34E-04	70.7	
3	0	4744.73	50	0	73.64	513.74	482	64	8.35E-03	14.1	
4	0	5293.43	297	0	36.60	723.10	690	64	4.96E-02	5.8	

Background Counts Within Peak Regions Generated: 3-OCT-1995 08:59:13.10

Acquisition Start: 29-SEP-1995 11:42:13.05
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4158.51	5	0	3.95	293.50	262	64	2.09E-05	44.7	
2	0	4419.07	3	0	53.80	391.50	363	58	1.25E-05	57.7	
3	0	4742.21	2	0	83.39	513.50	482	64	8.35E-06	70.7	
4	0	5290.00	10	0	0.00	721.50	690	64	4.17E-05	31.6	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 08:58:18

Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-001MS_UU.CNF

RELEASE/BATCH #	78772	SAMPLE ID:	9369-001MS
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.021E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	006
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	30.4%
ELAPSED LIVE TIME:	5989.	RECOVERY:	33.44%
TRACER ID:	U-232	TRACER FWHM (kev):	69.99
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_006_29SEP95		

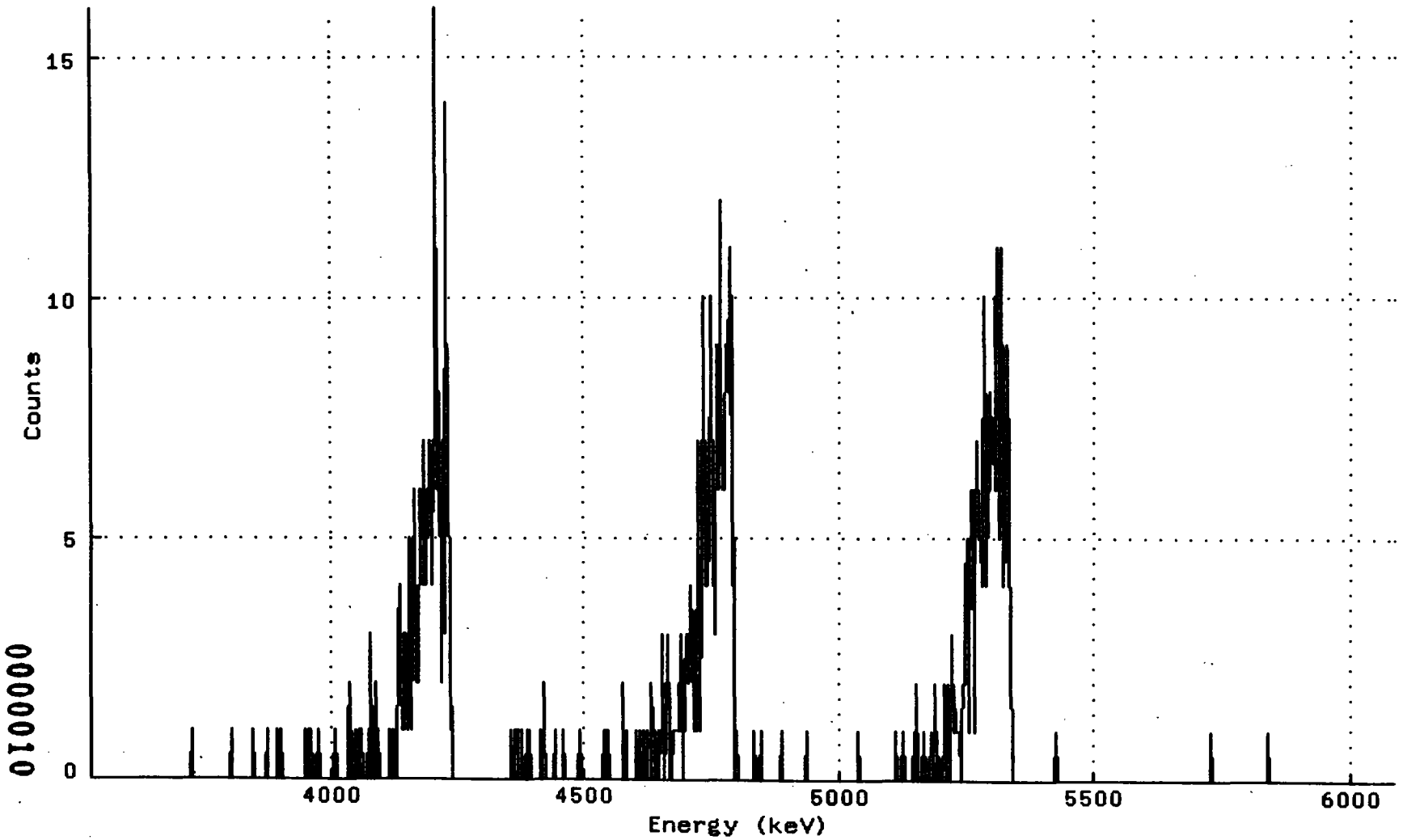
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	227.80	0.20	99.8	9.934E+00	1.655E+00	2.089E-01	1.635E-01
U-234	4761.5	229.88	0.12	99.8	1.002E+01	2.358E+00	1.899E-01	1.540E-01
U-235	4385.5	14.93	0.07	80.9	8.029E-01	4.451E-01	2.143E-01	1.800E-01
U-238	4184.4	213.80	0.20	100.2	9.283E+00	2.210E+00	2.080E-01	1.628E-01

*** POSITIVE ***

	MS spike	% Rec
^{234}U	5.32 pCi/g	157%
^{238}U	↓	144%

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-001MS_UU.CNF;1
Title : 006
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.51785E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-001MS Energy Slope : 2.38533E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 1.14892E-04



Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-001MS_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	1	0	0
89:	0	0	0	0	0	0	0	0
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	1	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	1
137:	0	0	0	0	0	0	0	0
145:	0	0	1	0	0	0	0	0
153:	0	0	0	1	0	0	1	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	1	0	1	0	1	0
185:	0	0	0	0	1	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	1	1	0	0	0	0	0
209:	0	0	0	0	0	1	2	0
217:	0	0	0	1	0	0	1	1
225:	0	0	0	0	0	1	0	3
233:	0	0	0	2	0	1	0	0
241:	0	0	0	0	0	0	1	0
249:	1	1	0	1	0	3	4	2
257:	1	1	3	3	2	1	2	5
265:	1	3	4	6	2	2	2	6
273:	4	4	4	7	4	6	5	7
281:	4	5	6	8	16	6	7	8
289:	2	6	7	3	14	8	9	1
297:	3	0	0	0	0	0	0	0
305:	0	0	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	1	0	1	0	1	0	1	1
353:	1	0	0	0	0	1	0	1
361:	0	0	0	0	0	0	0	0
369:	1	0	2	1	0	0	0	0
377:	0	0	0	1	0	0	0	0
385:	0	0	1	0	0	0	0	0
393:	0	0	0	0	0	0	0	1
401:	0	0	0	0	0	0	0	0
409:	0	0	0	0	0	0	0	0
417:	0	0	1	0	1	0	1	0
425:	0	0	0	0	0	0	0	0

433:	0	0	2	0	1	0	0	0
441:	0	0	0	0	1	0	1	0
449:	0	1	0	0	1	0	0	0
457:	2	1	1	0	0	1	0	1
465:	1	3	0	1	1	3	0	2
473:	0	1	1	1	1	1	1	3
481:	2	0	2	2	3	2	2	4
489:	3	1	2	1	6	7	1	4
497:	4	10	4	7	4	5	5	10
505:	4	6	3	9	7	6	12	7
513:	6	6	7	9	8	8	11	4
521:	10	0	1	0	0	0	0	0
529:	0	0	0	0	0	0	0	0
537:	1	0	0	0	0	1	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	1	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	1	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	0	0	0	0	0	0
617:	0	1	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	0	0	0	0	0	0	1	0
649:	0	0	0	1	1	0	0	0
657:	0	0	0	0	1	0	2	0
665:	0	0	0	1	1	0	0	0
673:	0	1	0	0	2	0	1	0
681:	0	0	0	1	2	0	1	2
689:	0	3	1	2	1	1	1	1
697:	0	1	2	2	4	5	1	4
705:	6	6	1	5	7	5	5	5
713:	4	5	10	6	4	6	6	8
721:	7	7	6	9	11	7	5	11
729:	7	4	5	8	9	6	2	1
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	1	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	1
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	1	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 08:57:40.65

Detector ID: 6 Acquisition Start: 3-OCT-1995 06:49:30.06
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-001MS
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4191.84	214	0	26.53	278.81	235	69	3.57E-02	6.8	
2	0	4402.15	15	0	3.50	364.33	343	62	2.50E-03	25.8	
3	0	4749.36	230	0	67.73	504.05	469	67	3.84E-02	6.6	
4	0	5287.91	228	0	69.99	717.28	685	66	3.81E-02	6.6	

Background Counts Within Peak Regions Generated: 3-OCT-1995 08:57:52.12

Acquisition Start: 29-SEP-1995 11:42:13.06
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4168.03	8	0	2.39	269.00	235	69	3.34E-05	35.4	
2	0	4425.14	3	0	71.62	373.50	343	62	1.25E-05	57.7	
3	0	4744.71	5	0	155.17	502.00	469	67	2.09E-05	44.7	
4	0	5289.11	8	0	2.39	717.50	685	66	3.34E-05	35.4	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 08:56:59

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Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-001MSD_UU.CNF

****

RELEASE/BATCH #	78772	SAMPLE ID:	9369-001MSD
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.010E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	007
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	30.5%
ELAPSED LIVE TIME:	5989.	RECOVERY:	44.07%
TRACER ID:	U-232	TRACER FWHM (kev):	73.88
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_007_29SEP95		

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	301.28	1.72	99.8	1.004E+01	1.543E+00	2.939E-01	1.921E-01
U-234	4761.5	256.50	1.50	99.8	8.550E+00	1.903E+00	2.802E-01	1.853E-01
U-235	4385.5	13.48	1.52	80.9	5.541E-01	3.348E-01	3.476E-01	2.295E-01
U-238	4184.4	249.70	2.30	100.2	8.288E+00	1.853E+00	3.240E-01	2.070E-01

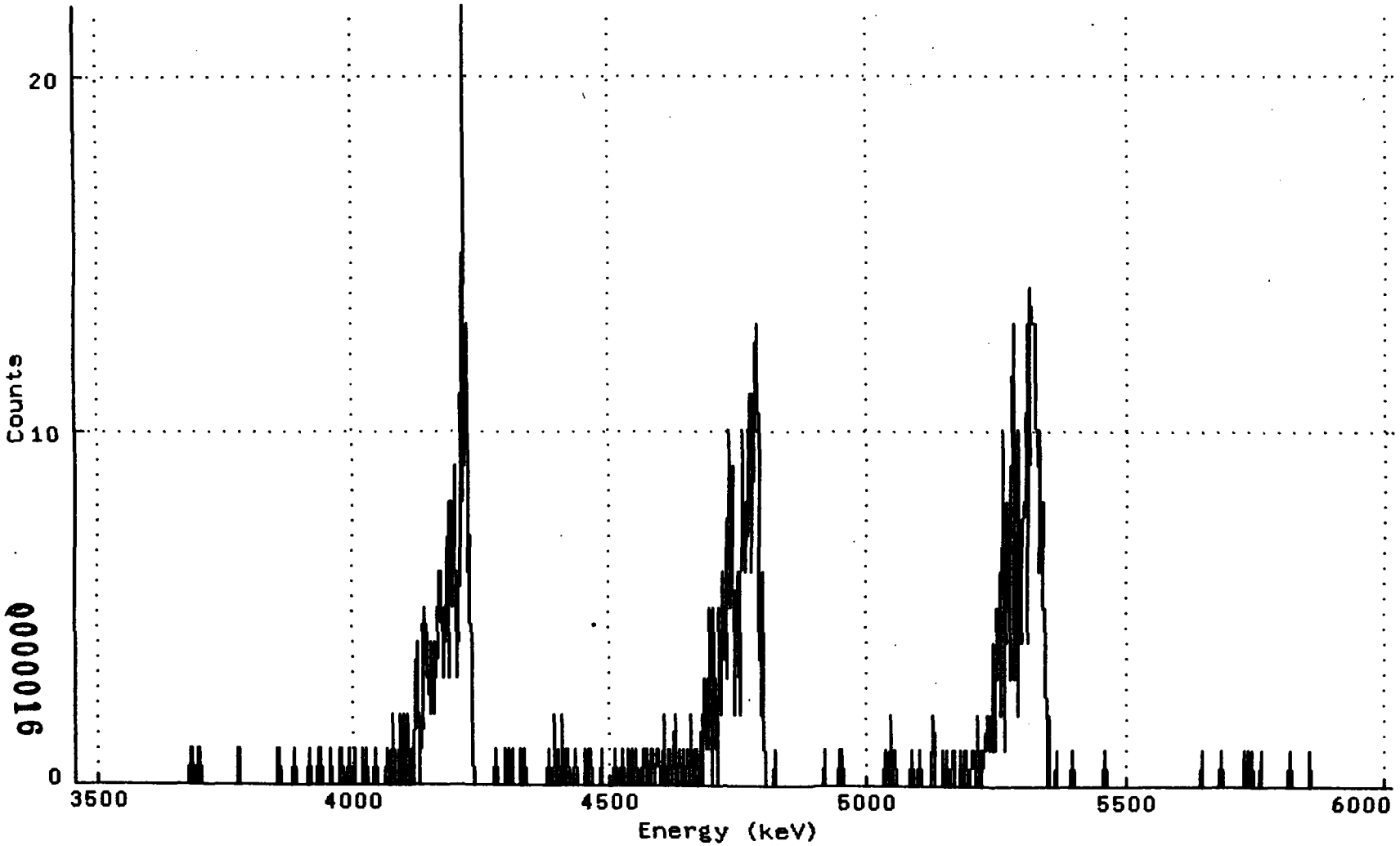
****

*** POSITIVE ***

	MS Spike	%Rec
^{234}U	5.38 pCi/g	128%
^{238}U	↓	124%

0000015

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-001MSD_UU.CNF;1
Title : 007
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.44659E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-001MSD Energy Slope : 2.42252E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 7.87397E-05



Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-001MSD_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	1
97:	0	1	0	0	0	1	0	1
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	1	1	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	1	1	0
169:	0	0	0	0	0	0	0	0
177:	0	0	1	0	0	0	0	0
185:	0	0	0	0	0	0	1	0
193:	0	0	0	0	0	1	0	1
201:	0	0	0	0	0	0	0	1
209:	0	0	0	0	0	0	0	1
217:	1	0	0	0	0	0	1	0
225:	0	0	1	0	0	0	0	0
233:	0	1	0	0	1	0	0	0
241:	0	0	0	1	0	0	0	0
249:	0	0	0	0	1	0	0	0
257:	2	2	0	0	0	0	2	0
265:	0	1	2	0	2	2	0	1
273:	1	0	3	3	4	0	1	1
281:	2	4	5	4	3	3	2	4
289:	3	2	4	3	4	4	6	5
297:	6	3	5	4	6	8	3	8
305:	5	5	9	3	6	4	7	11
313:	8	22	9	10	13	6	7	2
321:	1	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	1	0	0	0	0	0	0
345:	0	1	0	1	0	0	1	0
353:	0	0	0	0	0	1	0	0
361:	1	0	0	0	0	0	0	0
369:	0	0	0	0	0	0	0	0
377:	0	0	0	1	0	0	0	1
385:	2	0	1	1	0	0	2	0
393:	1	0	1	0	0	0	0	0
401:	1	0	0	0	0	0	0	0
409:	1	0	0	1	1	0	0	0
417:	0	0	0	0	1	0	0	0
425:	0	0	0	0	0	0	0	1

433:	0	0	0	0	0	1	0	0
441:	0	0	1	0	0	1	0	1
449:	1	0	0	0	0	1	0	1
457:	1	0	0	1	0	1	0	1
465:	1	1	0	0	0	2	0	0
473:	1	0	1	0	0	1	2	0
481:	0	1	1	0	0	1	0	1
489:	1	0	1	2	0	0	1	1
497:	0	0	1	2	0	3	1	2
505:	1	5	0	0	5	1	3	0
513:	5	3	2	5	6	4	3	5
521:	10	5	6	9	2	4	5	6
529:	4	2	10	8	7	6	10	7
537:	11	11	6	11	10	12	13	8
545:	5	2	6	2	0	0	0	0
553:	0	0	0	1	0	0	0	0
561:	0	0	0	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	0	0	0
593:	0	1	0	0	0	0	0	0
601:	0	0	0	0	0	1	0	1
609:	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	0
633:	0	0	0	0	0	0	0	0
641:	1	0	0	0	0	2	0	0
649:	1	0	0	0	0	0	0	0
657:	0	0	0	0	0	1	0	0
665:	0	0	0	1	0	0	0	0
673:	0	0	0	0	0	2	1	0
681:	0	0	0	0	0	1	0	0
689:	1	0	0	0	1	1	0	0
697:	0	0	1	0	0	1	1	0
705:	0	0	1	1	1	0	0	2
713:	0	1	0	1	1	1	2	1
721:	2	2	1	4	1	5	3	4
729:	6	2	10	1	8	4	7	3
737:	8	10	13	3	4	10	2	6
745:	4	7	8	8	13	4	14	13
753:	13	13	13	11	9	10	6	8
761:	8	5	5	0	2	0	0	0
769:	0	0	1	0	0	0	0	0
777:	0	0	0	0	0	0	1	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	1
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	1	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	1
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0

913:	0	1	0	1	0	0	1	0
921:	0	0	0	0	0	1	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	1	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	1	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 08:56:15.71

Detector ID: 7 Acquisition Start: 3-OCT-1995 06:49:30.07
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-001MSD
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4184.78	252	0	9.86	301.76	261	68	4.21E-02	6.3	
2	0	4417.43	15	0	18.09	395.67	369	61	2.50E-03	25.8	
3	0	4751.90	258	0	58.41	529.70	494	67	4.31E-02	6.2	
4	0	5295.77	303	0	73.88	745.27	710	66	5.06E-02	5.7	

Background Counts Within Peak Regions Generated: 3-OCT-1995 08:56:25.80

Acquisition Start: 29-SEP-1995 11:42:13.07
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4162.94	92	0	136.20	294.50	261	68	3.84E-04	10.4	
2	0	4424.33	61	0	137.36	399.00	369	61	2.55E-04	12.8	
3	0	4746.09	60	0	0.00	527.00	494	67	2.50E-04	12.9	
4	0	5291.81	69	0	149.82	742.50	710	66	2.88E-04	12.0	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 09:01:47

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Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-002_UU.CNF

****

RELEASE/BATCH #	78772	SAMPLE ID:	9369-002
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.025E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	008
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	33.1%
ELAPSED LIVE TIME:	5989.	RECOVERY:	28.77%
TRACER ID:	U-232	TRACER FWHM (kev):	64.23
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_008_29SEP95		

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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	213.58	0.42	99.8	9.900E+00	1.685E+00	2.661E-01	1.959E-01
U-234	4761.5	646.88	0.12	99.8	2.998E+01	6.387E+00	2.018E-01	1.637E-01
U-235	4385.5	56.83	0.17	80.9	3.249E+00	1.077E+00	2.662E-01	2.106E-01
U-238	4184.4	693.88	0.12	100.2	3.203E+01	6.790E+00	2.010E-01	1.630E-01

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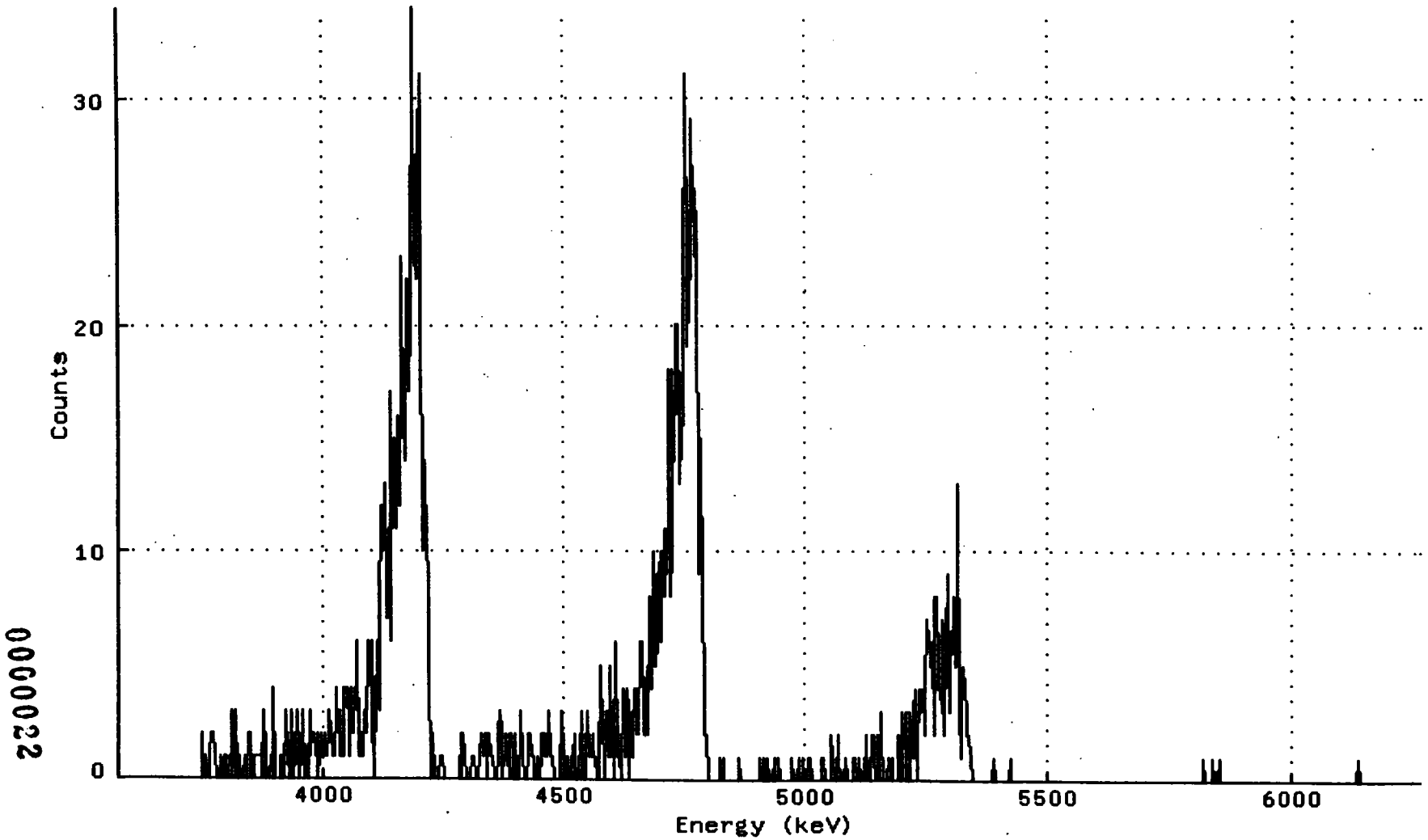
*** POSITIVE ***

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-002_UU.CNF;1
Title : 008
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.56429E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-002 Energy Slope : 2.59108E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 4.28379E-05



2000022

Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-002_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	2	0
73:	1	1	0	0	1	2	2	2
81:	1	0	0	0	0	1	0	1
89:	0	1	0	0	1	0	3	1
97:	0	3	0	1	0	0	0	0
105:	1	0	0	2	2	0	1	0
113:	1	1	1	1	1	1	0	3
121:	1	0	0	0	0	1	0	4
129:	0	0	0	0	0	1	1	0
137:	0	3	1	1	0	3	1	0
145:	1	1	3	1	0	1	1	3
153:	0	0	0	0	3	1	2	2
161:	2	1	2	0	1	2	2	1
169:	2	1	1	2	3	2	1	1
177:	1	3	4	2	3	1	1	1
185:	4	4	4	2	1	4	2	2
193:	4	3	6	1	2	1	1	3
201:	2	2	6	5	5	6	3	0
209:	4	3	6	3	7	12	12	10
217:	13	7	10	11	6	17	11	13
225:	15	11	16	14	12	18	23	15
233:	16	14	22	19	17	20	34	30
241:	23	22	27	28	31	22	10	13
249:	14	10	9	5	0	2	2	0
257:	0	0	0	1	1	1	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	2	0	2	1	1
281:	0	0	0	0	1	1	1	0
289:	0	0	1	1	2	1	1	2
297:	0	2	2	1	1	1	0	0
305:	0	1	2	3	2	0	1	1
313:	2	1	0	2	2	1	0	2
321:	0	0	0	2	3	1	0	0
329:	0	1	2	2	1	1	0	0
337:	1	1	0	1	2	2	1	2
345:	1	2	3	1	1	1	0	0
353:	0	0	0	0	3	1	0	1
361:	1	0	0	1	0	1	2	0
369:	0	0	1	1	3	0	0	2
377:	0	3	1	1	1	2	1	1
385:	0	1	0	5	2	3	0	3
393:	2	1	5	1	3	0	1	6
401:	1	1	1	0	0	4	1	1
409:	4	3	0	2	1	2	4	2
417:	4	2	6	5	6	3	2	2
425:	4	2	8	4	7	10	5	6

433:	9	9	10	6	10	8	11	9
441:	12	18	8	10	18	14	18	20
449:	20	16	13	15	16	21	31	22
457:	19	21	29	22	27	25	23	25
465:	9	12	15	8	4	2	2	0
473:	0	0	0	0	0	0	0	0
481:	0	1	0	1	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	1	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	1	0	0	1	0	0	1	0
521:	0	0	0	1	0	0	0	1
529:	0	0	0	0	0	0	0	0
537:	0	1	0	0	0	0	1	0
545:	0	0	1	0	0	0	1	0
553:	1	0	0	0	0	0	0	0
561:	0	1	1	0	0	0	0	0
569:	2	1	0	0	0	2	1	0
577:	0	0	0	1	1	0	0	0
585:	0	0	1	1	0	0	1	0
593:	0	0	0	2	0	0	0	0
601:	2	2	1	0	0	2	0	3
609:	2	0	0	0	0	1	1	0
617:	1	0	0	0	0	2	0	3
625:	0	0	0	3	3	3	0	2
633:	1	3	4	0	1	4	3	4
641:	4	2	4	7	6	6	5	6
649:	2	8	8	5	4	4	3	7
657:	2	6	6	9	3	5	6	7
665:	8	5	7	13	3	1	3	5
673:	4	3	2	2	1	1	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	1	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	1	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	1	0	0	0	0	0	0	1
865:	0	0	0	0	1	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	1
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 09:00:46.49

Detector ID: 8 Acquisition Start: 3-OCT-1995 06:49:30.08
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-002
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4169.66	694	0	42.74	232.74	200	64	1.16E-01	3.8	
2	0	4423.05	57	0	132.79	329.63	302	58	9.52E-03	13.2	
3	0	4740.89	647	0	59.62	450.74	421	63	1.08E-01	3.9	
4	0	5279.12	214	0	64.23	654.73	627	63	3.57E-02	6.8	

Background Counts Within Peak Regions Generated: 3-OCT-1995 09:01:03.06

Acquisition Start: 29-SEP-1995 11:42:13.08
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4169.99	5	0	142.48	231.50	200	64	2.09E-05	44.7	
2	0	4428.78	7	0	0.00	330.50	302	58	2.92E-05	37.8	
3	0	4747.50	5	0	137.30	452.00	421	63	2.09E-05	44.7	
4	0	5290.70	17	0	2.59	658.00	627	63	7.10E-05	24.3	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 09:04:01

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Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-003_UU.CNF

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RELEASE/BATCH #	78772	SAMPLE ID:	9369-003
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.043E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	009
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	31.1%
ELAPSED LIVE TIME:	5989.	RECOVERY:	28.10%
TRACER ID:	U-232	TRACER FWHM (kev):	92.82
LAMBDA VALUE:	1000.	ROI TYPE:	EXPANDED
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_009_29SEP95		

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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	195.75	0.25	99.8	9.724E+00	1.701E+00	2.501E-01	1.924E-01
U-234	4761.5	1803.85	0.15	99.8	8.961E+01	1.857E+01	2.241E-01	1.794E-01
U-235	4385.5	169.00	0.00	80.9	1.036E+01	2.629E+00	1.661E-01	1.661E-01
U-238	4184.4	1672.95	0.05	100.2	8.275E+01	1.719E+01	1.855E-01	1.598E-01

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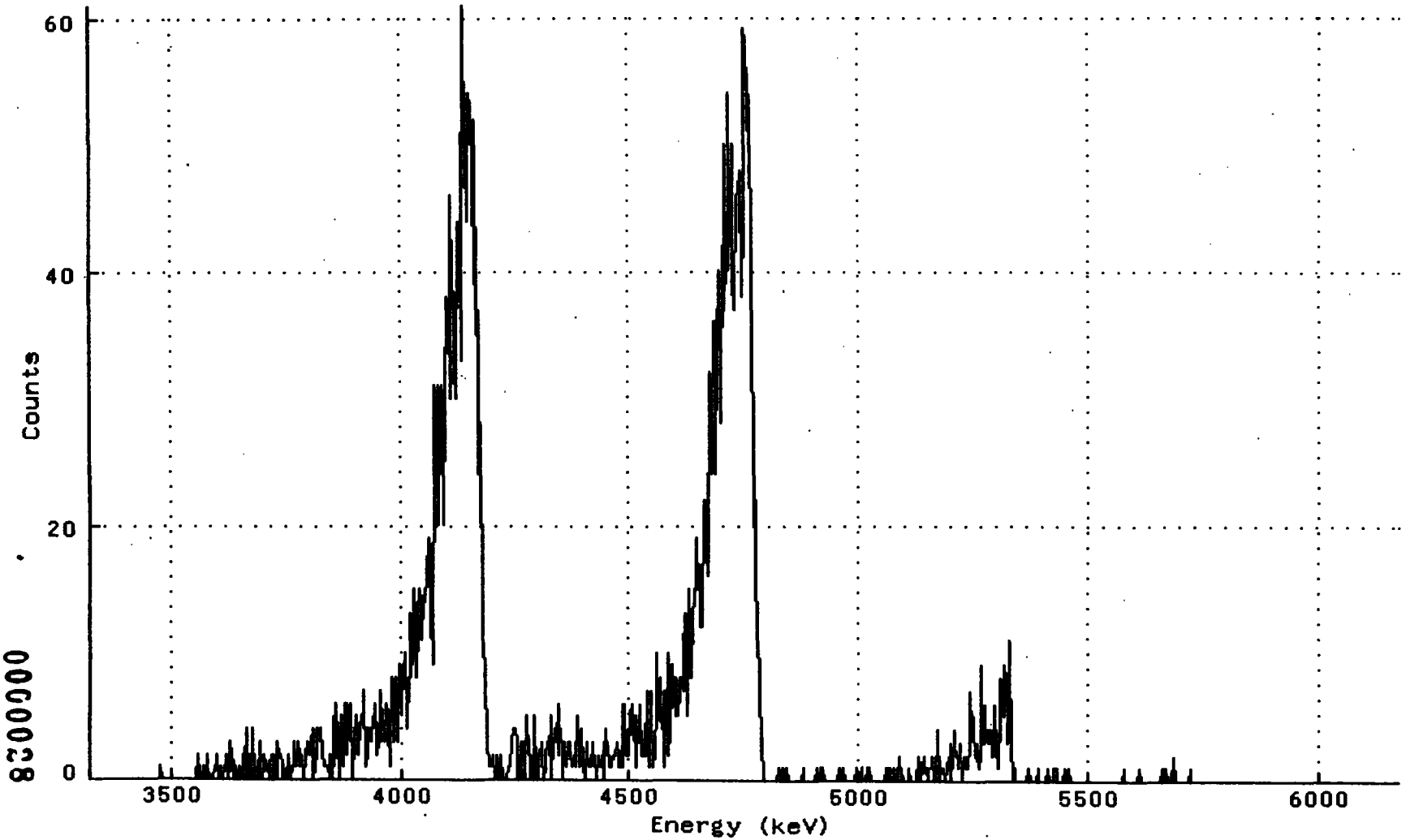
*** POSITIVE ***

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-003_UU.CNF;1
Title : 009
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.31227E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-003 Energy Slope : 2.90198E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : -1.10080E-04



Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-003_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	1
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	2	0	1	0	1
89:	0	0	2	1	0	0	0	0
97:	1	1	2	0	1	1	0	1
105:	1	2	0	1	3	2	1	0
113:	1	0	0	1	0	0	2	1
121:	4	0	2	0	0	4	0	0
129:	0	0	3	1	0	1	2	1
137:	1	0	1	2	2	0	1	0
145:	3	2	2	1	0	0	0	0
153:	2	0	0	1	1	3	1	3
161:	2	1	2	0	0	2	3	3
169:	2	3	4	0	1	2	4	4
177:	3	4	2	1	1	1	1	0
185:	2	0	2	4	6	3	3	0
193:	5	1	2	6	2	6	4	3
201:	6	0	3	3	5	2	4	4
209:	5	4	7	1	2	4	4	3
217:	4	4	6	3	2	3	3	7
225:	4	4	3	6	5	4	1	8
233:	7	3	8	5	3	9	7	5
241:	9	8	10	4	8	8	13	9
249:	11	15	8	12	13	15	14	11
257:	14	15	14	16	19	12	13	9
265:	28	31	25	20	31	24	31	29
273:	20	30	38	35	37	30	46	39
281:	38	32	30	44	42	44	33	41
289:	61	49	44	48	54	53	52	48
297:	39	52	35	37	24	28	12	7
305:	8	3	1	1	1	2	2	0
313:	0	2	0	1	2	0	0	0
321:	0	1	1	1	3	4	4	4
329:	3	0	0	3	0	3	0	1
337:	5	2	2	0	0	3	5	0
345:	0	2	2	3	2	0	1	2
353:	3	2	5	0	3	3	4	3
361:	6	2	4	2	0	3	1	1
369:	3	3	2	1	2	2	1	5
377:	1	1	4	1	1	0	3	2
385:	1	1	1	3	1	2	0	2
393:	1	1	2	0	2	4	2	3
401:	1	1	1	2	2	2	3	2
409:	1	1	1	6	6	2	3	2
417:	5	6	4	5	1	5	3	3
425:	6	2	2	2	2	7	3	1

433:	7	5	1	2	6	10	5	8
441:	5	4	7	1	7	2	10	3
449:	8	9	7	8	5	5	7	8
457:	8	7	10	13	5	11	15	8
465:	13	12	15	15	19	15	16	12
473:	12	22	17	19	18	16	32	24
481:	26	36	36	24	34	40	28	29
489:	42	37	50	39	41	54	42	50
497:	39	37	46	45	47	46	48	38
505:	44	59	58	51	56	52	41	41
513:	20	22	15	13	6	4	3	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	1	0	0	1	0
537:	0	1	0	0	0	0	0	0
545:	0	0	0	0	0	0	1	0
553:	0	0	0	0	0	0	0	0
561:	1	0	0	1	0	1	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	1	1	0	0	1	0
585:	0	0	0	0	0	0	0	0
593:	1	0	0	0	1	0	0	0
601:	0	1	0	1	0	0	0	0
609:	0	0	0	0	0	0	0	1
617:	0	1	1	0	0	0	1	0
625:	1	0	2	0	1	0	0	0
633:	0	0	1	0	0	0	0	0
641:	0	2	1	0	1	2	1	1
649:	0	1	1	1	2	0	0	0
657:	4	0	1	1	1	1	0	1
665:	1	2	0	3	1	4	3	2
673:	2	1	3	0	1	2	1	2
681:	1	3	7	4	5	4	2	3
689:	2	1	2	9	3	6	3	4
697:	4	3	4	2	2	6	2	4
705:	1	5	8	7	5	9	8	5
713:	3	11	2	3	0	1	0	0
721:	0	0	0	0	0	0	0	0
729:	1	0	0	0	0	0	0	1
737:	0	0	0	0	0	0	0	1
745:	0	0	0	0	1	1	1	0
753:	0	0	0	0	1	0	0	0
761:	1	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	1	0	0	0	0
809:	0	0	0	0	0	0	0	1
817:	1	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	1	0	1	0	1	0	0
841:	0	0	2	2	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	1	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 09:02:58.52

Detector ID: 9 Acquisition Start: 3-OCT-1995 06:49:30.09
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-003
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4125.26	1673	0	100.45	283.19	251	82	2.79E-01	2.4	
2	0	4413.83	169	0	192.00	385.22	345	77	2.82E-02	7.7	
3	0	4716.55	1804	0	97.56	493.13	456	83	3.01E-01	2.4	
4	0	5272.46	196	0	92.82	693.72	651	85	3.27E-02	7.1	

Background Counts Within Peak Regions Generated: 3-OCT-1995 09:03:11.07

Acquisition Start: 29-SEP-1995 11:42:13.09
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4157.44	2	0	65.27	291.50	251	82	8.35E-06	70.7	
2	0	4412.93	0	0	0.00	383.00	345	77	0.00E+00	0.0	
3	0	4729.65	6	0	0.00	497.00	456	83	2.50E-05	40.8	
4	0	5270.08	10	0	221.36	693.00	651	85	4.17E-05	31.6	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 09:06:16

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Spectral File: ND_AMS_ARCHIVE_S:S_78772$9369-004_UU.CNF

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RELEASE/BATCH #	78772	SAMPLE ID:	9369-004
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.008E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	010
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	30.8%
ELAPSED LIVE TIME:	5989.	RECOVERY:	28.29%
TRACER ID:	U-232	TRACER FWHM (kev):	94.56
LAMBDA VALUE:	1000.	ROI TYPE:	EXPANDED
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_010_29SEP95		

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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	195.70	0.30	99.8	1.006E+01	1.760E+00	2.702E-01	2.047E-01
U-234	4761.5	994.65	0.35	99.8	5.112E+01	1.082E+01	2.807E-01	2.100E-01
U-235	4385.5	117.78	0.22	80.9	7.467E+00	2.042E+00	3.117E-01	2.417E-01
U-238	4184.4	1023.85	0.15	100.2	5.239E+01	1.107E+01	2.308E-01	1.848E-01

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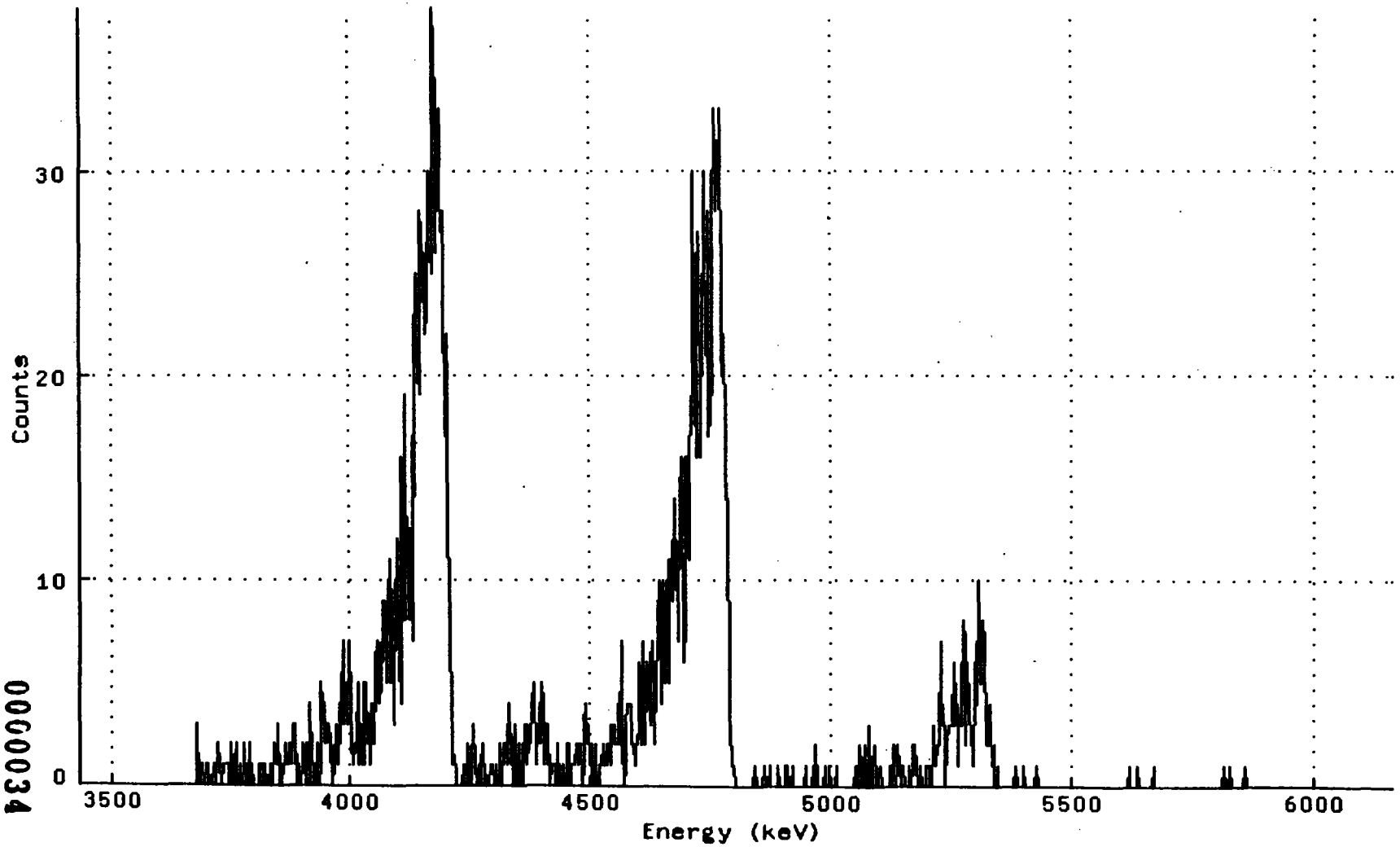
*** POSITIVE ***

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.S]S_78772$9369-004_UU.CNF;1
Title : 010
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.42671E+03
Real Time : 0 01:39:48.99 Sample ID : 9369-004 Energy Slope : 2.64208E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 2.39620E-05



00000034

Channel Contents for ND_AMS_ARCHIVE_S:S_78772$9369-004_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	3
97:	0	1	0	1	0	0	1	1
105:	0	0	0	0	1	1	0	2
113:	1	0	0	1	1	1	1	1
121:	0	2	0	0	1	2	0	0
129:	1	0	0	1	2	0	1	0
137:	2	0	1	0	0	0	0	0
145:	1	1	1	0	1	0	0	0
153:	1	0	0	2	2	1	1	3
161:	0	1	0	1	1	2	1	2
169:	1	1	3	1	3	0	1	0
177:	0	1	2	1	0	2	2	0
185:	4	1	1	0	0	2	0	0
193:	1	5	4	2	4	2	3	3
201:	2	0	0	1	3	2	1	4
209:	2	4	7	3	4	5	3	7
217:	4	2	1	2	2	2	5	1
225:	3	1	5	1	5	2	3	1
233:	3	4	2	5	6	7	6	4
241:	5	9	6	9	5	7	10	5
249:	11	8	5	3	10	7	12	6
257:	4	16	8	19	8	13	12	8
265:	8	17	7	21	25	23	20	19
273:	28	27	25	22	22	23	30	26
281:	26	25	38	36	33	26	30	33
289:	29	27	28	25	17	22	12	10
297:	1	2	1	1	0	0	0	0
305:	0	1	0	1	0	2	0	0
313:	1	3	1	1	0	1	0	1
321:	2	0	1	0	0	0	1	1
329:	1	0	0	1	0	0	2	0
337:	2	1	2	1	2	4	1	2
345:	0	1	3	0	0	2	0	2
353:	0	3	3	1	2	2	2	4
361:	5	1	2	2	4	2	5	4
369:	1	3	1	3	0	1	1	1
377:	1	0	2	0	1	0	0	1
385:	0	0	2	2	0	1	1	1
393:	1	2	2	1	2	0	1	3
401:	4	2	2	2	0	2	0	2
409:	1	0	0	1	1	2	1	1
417:	2	1	2	1	3	3	3	2
425:	2	2	4	2	7	2	0	1

433:	3	4	4	4	2	2	1	2
441:	2	3	6	2	7	3	2	5
449:	6	5	3	6	7	5	2	5
457:	7	8	10	4	7	10	8	5
465:	10	5	11	11	9	10	14	10
473:	9	7	14	16	16	6	16	7
481:	16	11	16	18	20	30	19	16
489:	25	27	16	22	20	30	27	21
497:	28	17	18	20	27	33	30	28
505:	30	33	23	20	22	17	14	14
513:	4	3	1	1	1	0	0	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	1	0	0	0
537:	0	0	0	1	0	0	0	1
545:	0	0	0	0	0	0	1	0
553:	0	0	0	0	1	1	0	0
561:	0	1	0	0	0	0	0	0
569:	0	0	0	1	0	0	0	0
577:	0	1	0	2	0	0	0	0
585:	0	0	1	0	0	0	1	0
593:	0	0	0	1	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	0	1	0	0	2	1	0
617:	0	0	2	0	0	3	0	0
625:	1	2	0	1	0	1	0	0
633:	0	0	0	0	0	1	0	2
641:	1	0	1	2	1	0	1	1
649:	0	0	0	0	1	0	1	2
657:	2	1	0	0	1	0	0	0
665:	0	1	1	1	0	0	2	3
673:	1	2	2	2	7	5	3	3
681:	0	2	3	3	3	3	6	3
689:	5	1	4	3	3	4	8	7
697:	2	6	4	4	2	3	1	5
705:	7	4	10	6	5	8	7	7
713:	2	2	4	3	1	2	0	0
721:	1	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	1	0
737:	0	0	0	0	1	0	0	0
745:	0	0	0	0	0	0	1	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	1	0	0	0
825:	0	0	0	1	0	0	0	0
833:	0	0	0	0	0	0	0	1
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	1	0
897:	0	0	0	1	0	0	0	0
905:	0	0	0	0	0	0	1	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 09:05:20.57

Detector ID: 10 Acquisition Start: 3-OCT-1995 06:49:30.10
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: 9369-004
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4152.83	1024	0	69.64	274.15	230	87	1.71E-01	3.1	
2	0	4406.84	118	0	159.55	369.73	330	81	1.97E-02	9.2	
3	0	4723.92	995	0	70.98	488.82	447	87	1.66E-01	3.2	
4	0	5274.39	196	0	94.56	694.95	651	87	3.27E-02	7.1	

Background Counts Within Peak Regions Generated: 3-OCT-1995 09:05:32.79

Acquisition Start: 29-SEP-1995 11:42:13.10
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4146.94	6	0	0.00	273.00	230	87	2.50E-05	40.8	
2	0	4406.42	9	0	3.92	370.00	330	81	3.76E-05	33.3	
3	0	4727.55	14	0	2.67	490.00	447	87	5.84E-05	26.7	
4	0	5273.77	12	0	184.38	694.00	651	87	5.01E-05	28.9	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 08:55:15

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Spectral File: ND_AMS_ARCHIVE_C:C_78772$LCS_UU.CNF

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RELEASE/BATCH #	78772	SAMPLE ID:	LCS
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	001
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	28.9%
ELAPSED LIVE TIME:	5989.	RECOVERY:	57.34%
TRACER ID:	U-232	TRACER FWHM (kev):	74.98
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_001_29SEP95		

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NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	371.75	0.25	99.8	1.014E+01	1.473E+00	1.374E-01	1.057E-01
U-234	4761.5	250.78	0.22	99.8	6.842E+00	1.489E+00	1.341E-01	1.040E-01
U-235	4385.5	11.95	0.05	80.9	4.022E-01	2.439E-01	1.262E-01	1.087E-01
U-238	4184.4	290.95	0.05	100.2	7.905E+00	1.680E+00	1.019E-01	8.775E-02

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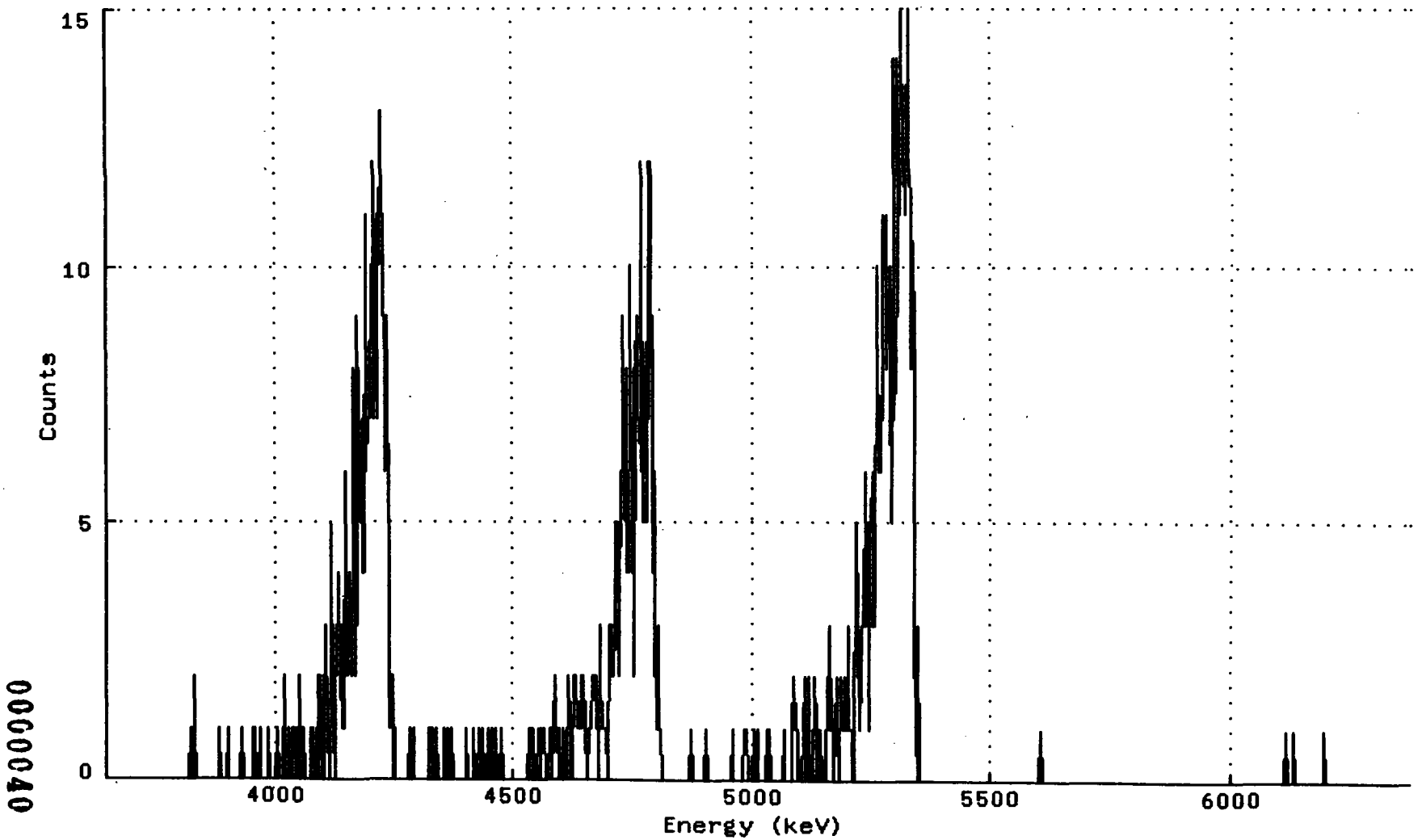
*** POSITIVE ***

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.C]C_78772$LCS_UU.CNF;1
Title : 001
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.63739E+03
Real Time : 0 01:39:48.99 Sample ID : LCS Energy Slope : 2.53920E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 1.23052E-04



00000040

Channel Contents for ND_AMS_ARCHIVE_C:C_78772$LCS_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	1
73:	0	0	2	1	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	1
97:	0	0	0	0	0	0	1	0
105:	0	0	0	0	0	0	0	0
113:	0	1	0	0	0	0	0	0
121:	0	0	0	1	1	0	0	0
129:	1	0	0	0	0	0	0	1
137:	0	0	0	0	0	0	1	0
145:	0	0	0	0	2	0	0	0
153:	1	0	1	0	1	1	0	0
161:	2	0	1	0	1	0	0	0
169:	0	0	1	1	0	0	0	2
177:	0	2	1	0	2	0	3	1
185:	1	0	2	5	1	0	1	3
193:	3	4	2	1	3	1	6	2
201:	2	4	3	2	5	8	2	9
209:	3	8	8	5	7	4	4	11
217:	6	7	7	7	10	7	12	9
225:	7	11	10	13	12	10	8	6
233:	9	4	1	2	0	2	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	1	0	0	1	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	1	1	0	1	0	0
273:	1	0	0	0	0	0	1	0
281:	1	0	0	0	1	0	0	0
289:	0	0	0	0	0	0	0	0
297:	1	0	0	0	0	0	1	0
305:	0	0	1	0	0	1	0	0
313:	0	1	1	0	0	1	0	1
321:	0	0	0	0	1	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	1	0	1	0	1	0
353:	0	0	1	1	0	1	1	1
361:	0	0	0	1	1	0	1	2
369:	1	1	0	1	0	0	1	0
377:	1	0	2	1	0	0	2	2
385:	2	1	1	1	2	1	2	1
393:	1	0	1	1	1	2	2	2
401:	1	2	0	3	2	1	1	1
409:	1	0	0	3	3	2	2	3
417:	5	5	2	4	5	7	9	6
425:	4	8	4	8	10	4	8	2

433:	8	9	7	7	6	12	5	7
441:	8	5	12	7	12	4	9	3
449:	1	3	1	1	0	0	0	0
457:	0	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	1	0	0	0	0
481:	0	0	0	0	0	0	0	1
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	1	0	0	0	0
513:	0	0	0	0	1	1	1	0
521:	0	0	0	0	1	0	1	0
529:	0	0	0	0	0	0	1	0
537:	1	0	0	0	0	0	0	0
545:	0	0	0	1	0	0	0	0
553:	0	0	1	2	1	1	0	0
561:	0	0	1	2	0	0	2	0
569:	0	1	0	2	1	0	1	0
577:	1	0	0	0	0	2	1	3
585:	1	1	0	1	2	1	0	2
593:	2	1	1	2	1	3	1	1
601:	1	0	0	5	2	4	1	2
609:	3	3	6	3	5	1	5	5
617:	6	3	3	10	9	6	6	8
625:	11	10	11	8	9	10	8	5
633:	14	7	8	10	14	11	15	15
641:	12	11	13	12	15	8	11	10
649:	9	3	1	0	3	0	0	0
657:	0	0	0	0	0	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0
681:	0	0	0	0	0	0	0	0
689:	0	0	0	0	0	0	0	0
697:	0	0	0	0	0	0	0	0
705:	0	0	0	0	0	0	0	0
713:	0	0	0	0	0	0	0	0
721:	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	1	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	0	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	0	0	0	0	0	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	1	0	0	0	0
937:	0	1	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	1	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	0	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 08:54:35.04

Detector ID: 1 Acquisition Start: 3-OCT-1995 06:49:30.01
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: LCS
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4190.57	291	0	71.01	215.60	175	65	4.86E-02	5.9	
2	0	4421.98	12	0	119.34	304.50	277	58	2.00E-03	28.9	
3	0	4753.42	251	0	66.01	430.54	396	63	4.19E-02	6.3	
4	0	5291.31	372	0	74.98	632.00	600	63	6.21E-02	5.2	

Background Counts Within Peak Regions Generated: 3-OCT-1995 08:54:48.79

Acquisition Start: 29-SEP-1995 11:42:13.01
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4169.77	2	0	63.09	207.00	175	65	8.35E-06	70.7	
2	0	4425.14	2	0	2.52	305.50	277	58	8.35E-06	70.7	
3	0	4743.72	9	0	0.00	427.00	396	63	3.76E-05	33.3	
4	0	5287.56	10	0	0.00	631.00	600	63	4.17E-05	31.6	

QUANTERRA
St. Louis

ALPHA SPECTROSCOPY REPORT
3-OCT-1995 08:53:41

****

Spectral File: ND_AMS_ARCHIVE_R:R_78772$BLK_UU.CNF

****

RELEASE/BATCH #	78772	SAMPLE ID:	BLK
SAMPLE DATE:	3-OCT-1995 00:00:00.	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:		DETECTOR NUMBER:	003
ACQ DATE:	3-OCT-1995 06:49:30.	AVERAGE EFFICIENCY:	28.4%
ELAPSED LIVE TIME:	5989.	RECOVERY:	57.00%
TRACER ID:	U-232	TRACER FWHM (kev):	50.60
LAMBDA VALUE:	1000.	ROI TYPE:	STANDARD
CORRECTED TRACER DPM:	22.518	MDA MULTIPLIER:	4.65
SAMPLE MATRIX:	SOIL	MDA CONSTANT:	2.71
BKG FILENAME:	B_003_29SEP95		

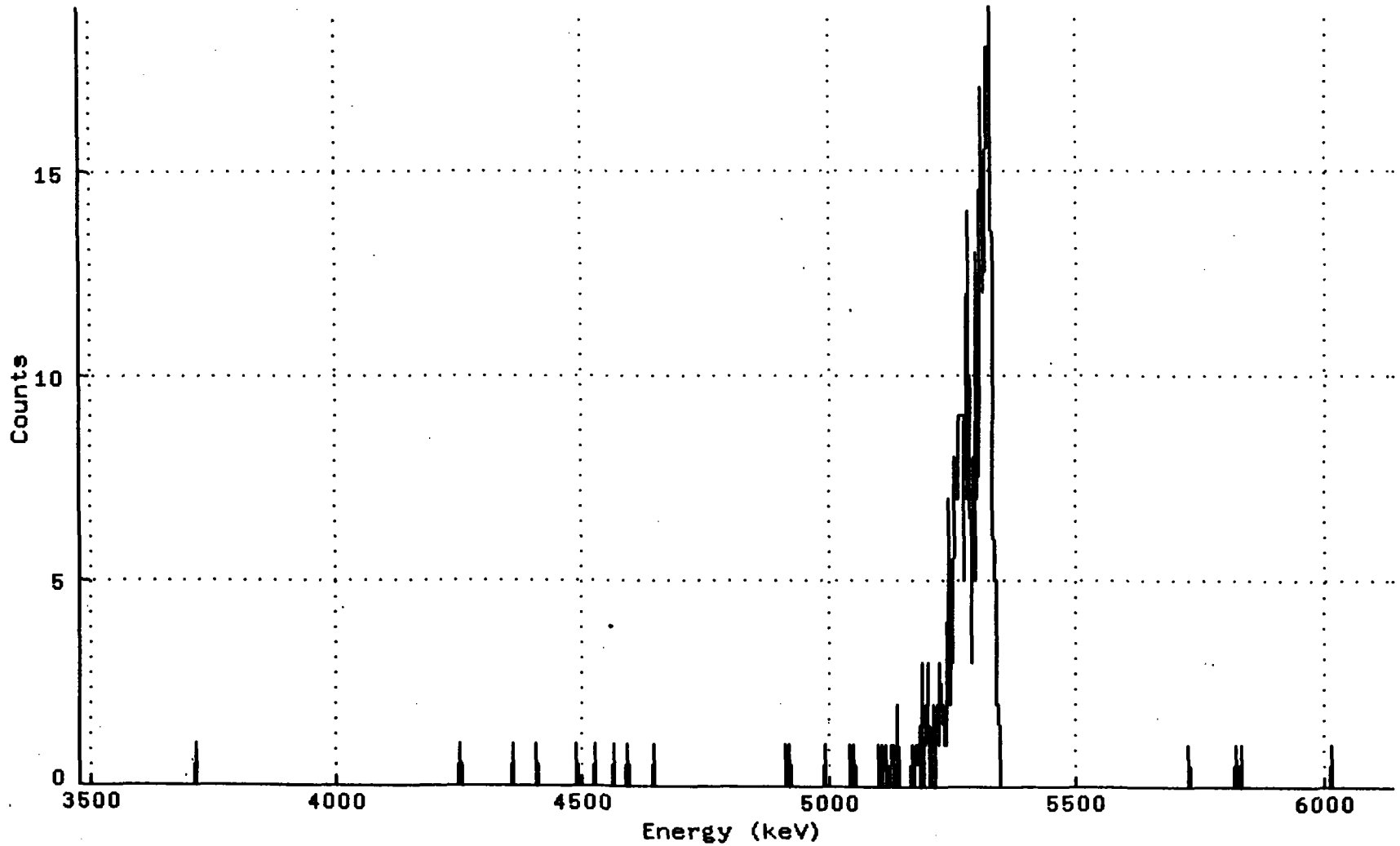
****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/gram	TPU/ERROR 2-SIGMA	MDA pCi/gram	CRIT LEVEL pCi/gram
U-232	5302.5	362.78	0.22	99.8	1.014E+01	1.479E+00	1.374E-01	1.066E-01
U-234	4761.5	-0.05	0.05	99.8	-1.398E-03	1.993E-03	1.048E-01	9.031E-02
U-235	4385.5	2.93	0.07	80.9	1.009E-01	1.209E-01	1.374E-01	1.154E-01
U-238	4184.4	-0.02	0.02	100.2	-6.960E-04	1.397E-03	9.592E-02	8.568E-02

****

Spectrum : 1DIA3:[ALPHA.ALUSR.ARCHIVE.R]R_78772$BLK_UU.CNF;1
Title : 003
Sample Title:
Start Time: 3-OCT-1995 06:49: Sample Time: 3-OCT-1995 00:00: Energy Offset: 3.46759E+03
Real Time : 0 01:39:48.99 Sample ID : BLK Energy Slope : 2.54929E+00
Live Time : 0 01:39:48.99 Sample Type: UU Energy Quad : 5.37548E-05



0000046

Channel Contents for ND_AMS_ARCHIVE_R:R_78772$BLK_UU

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0
65:	0	0	0	0	0	0	0	0
73:	0	0	0	0	0	0	0	0
81:	0	0	0	0	0	0	0	0
89:	0	0	0	0	0	0	0	1
97:	0	0	0	0	0	0	0	0
105:	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0
121:	0	0	0	0	0	0	0	0
129:	0	0	0	0	0	0	0	0
137:	0	0	0	0	0	0	0	0
145:	0	0	0	0	0	0	0	0
153:	0	0	0	0	0	0	0	0
161:	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0
177:	0	0	0	0	0	0	0	0
185:	0	0	0	0	0	0	0	0
193:	0	0	0	0	0	0	0	0
201:	0	0	0	0	0	0	0	0
209:	0	0	0	0	0	0	0	0
217:	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0
233:	0	0	0	0	0	0	0	0
241:	0	0	0	0	0	0	0	0
249:	0	0	0	0	0	0	0	0
257:	0	0	0	0	0	0	0	0
265:	0	0	0	0	0	0	0	0
273:	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0
289:	0	0	0	0	0	0	0	0
297:	0	0	0	0	0	0	0	0
305:	0	1	0	0	0	0	0	0
313:	0	0	0	0	0	0	0	0
321:	0	0	0	0	0	0	0	0
329:	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0
345:	0	0	1	0	0	0	0	0
353:	0	0	0	0	0	0	0	0
361:	0	0	0	0	0	1	0	0
369:	0	0	0	0	0	0	0	0
377:	0	0	0	0	0	0	0	0
385:	0	0	0	0	0	0	0	0
393:	0	0	0	0	1	0	0	0
401:	0	0	0	0	0	0	0	0
409:	0	0	1	0	0	0	0	0
417:	0	0	0	0	0	0	0	0
425:	0	1	0	0	0	0	0	0

433:	0	0	0	0	1	0	0	0
441:	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0
457:	1	0	0	0	0	0	0	0
465:	0	0	0	0	0	0	0	0
473:	0	0	0	0	0	0	0	0
481:	0	0	0	0	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0
513:	0	0	0	0	0	0	0	0
521:	0	0	0	0	0	0	0	0
529:	0	0	0	0	0	0	0	0
537:	0	0	0	0	0	0	0	0
545:	0	0	0	0	0	0	0	0
553:	0	0	0	0	0	0	0	1
561:	0	0	1	0	0	0	0	0
569:	0	0	0	0	0	0	0	0
577:	0	0	0	0	0	0	0	0
585:	0	0	0	0	0	1	0	0
593:	0	0	0	0	0	0	0	0
601:	0	0	0	0	0	0	0	0
609:	0	1	0	0	1	0	0	0
617:	0	0	0	0	0	0	0	0
625:	0	0	0	0	0	0	0	1
633:	0	1	0	0	0	1	0	0
641:	0	1	0	1	0	0	2	0
649:	0	0	0	0	0	0	0	0
657:	0	1	0	0	1	1	1	0
665:	3	0	0	2	1	3	0	1
673:	0	2	0	1	2	1	3	2
681:	2	2	1	1	1	7	2	4
689:	3	8	7	7	7	9	9	9
697:	9	5	10	14	7	10	3	5
705:	8	5	13	7	8	12	17	13
713:	12	13	18	17	17	19	8	7
721:	5	5	2	2	1	0	0	0
729:	0	0	0	0	0	0	0	0
737:	0	0	0	0	0	0	0	0
745:	0	0	0	0	0	0	0	0
753:	0	0	0	0	0	0	0	0
761:	0	0	0	0	0	0	0	0
769:	0	0	0	0	0	0	0	0
777:	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0
793:	0	0	0	0	0	0	0	0
801:	0	0	0	0	0	0	0	0
809:	0	0	0	0	0	0	0	0
817:	0	0	0	0	0	0	0	0
825:	0	0	0	0	0	0	0	0
833:	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0
849:	0	0	0	0	0	0	0	0
857:	0	0	0	0	0	0	0	0
865:	0	0	0	0	1	0	0	0
873:	0	0	0	0	0	0	0	0
881:	0	0	0	0	0	0	0	0
889:	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0
905:	1	0	0	0	1	0	0	0

913:	0	0	0	0	0	0	0	0
921:	0	0	0	0	0	0	0	0
929:	0	0	0	0	0	0	0	0
937:	0	0	0	0	0	0	0	0
945:	0	0	0	0	0	0	0	0
953:	0	0	0	0	0	0	0	0
961:	0	0	0	0	0	0	0	0
969:	0	0	0	0	0	0	0	0
977:	1	0	0	0	0	0	0	0
985:	0	0	0	0	0	0	0	0
993:	0	0	0	0	0	0	0	0
1001:	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0
1017:	0	0	0	0	0	0	0	0

QUANTERRA
St. Louis

Gross Sample Counts Within Peak Regions Generated: 3-OCT-1995 08:52:42.00

Detector ID: 3 Acquisition Start: 3-OCT-1995 06:49:30.03
Live Time: 0 01:39:48.99 Real Time: 0 01:39:48.99
Batch Id: 78772 Sample Id: BLK
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4167.55	0	0	0.00	273.00	241	65	0.00E+00	0.0	
2	0	4418.19	3	0	130.01	370.00	344	59	5.01E-04	57.7	
3	0	4743.96	0	0	0.00	495.50	464	64	0.00E+00	0.0	
4	0	5292.27	363	0	50.60	705.27	672	64	6.06E-02	5.2	

Background Counts Within Peak Regions Generated: 3-OCT-1995 08:52:54.61

Acquisition Start: 29-SEP-1995 11:42:13.03
Live Time: 2 18:32:49.99 Real Time: 2 18:32:49.99

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4167.83	1	0	2.53	273.00	241	65	4.17E-06	100.0	
2	0	4425.26	3	0	111.51	373.00	344	59	1.25E-05	57.7	
3	0	4742.32	2	0	20.27	495.50	464	64	8.35E-06	70.7	
4	0	5284.92	9	0	152.06	703.50	672	64	3.76E-05	33.3	

Quanterra
Environmental
Services

INITIAL ENERGY AND FWHM CALIBRATION

Review of QA results (Secondary Calibration Check) 5-DEC-1994 15

Detector	Parameter	Flag	Filename
1	ALL	Passed	SECOND_001_10nov94
2	ALL	Passed	SECOND_002_10nov94
3	ALL	Passed	SECOND_003_10nov94
4	ALL	Passed	SECOND_004_10nov94
5	ALL	Passed	SECOND_005_10nov94
6	ALL	Passed	SECOND_006_10nov94
7	ALL	Passed	SECOND_007_10nov94
8	ALL	Passed	SECOND_008_10nov94
9	ALL	Passed	SECOND_009_10nov94
10	ALL	Passed	SECOND_010_10nov94
11	ALL	Passed	SECOND_011_10nov94
12	ALL	Passed	SECOND_012_10nov94
13	ALL	Passed	SECOND_013_10nov94
14	ALL	Passed	SECOND_014_10nov94
15	ALL	Passed	SECOND_015_10nov94
16	ALL	Passed	SECOND_016_10nov94
17	ALL	Passed	SECOND_017_10nov94
18	ALL	Passed	SECOND_018_10nov94
19	ALL	Passed	SECOND_019_10nov94
20	ALL	Passed	SECOND_020_10nov94
21	ALL	Passed	SECOND_021_10nov94
22	ALL	Passed	SECOND_022_10nov94
23	ALL	Passed	SECOND_023_10nov94
24	ALL	Passed	SECOND_024_10nov94
25	ALL	Passed	SECOND_025_10nov94
26	ALL	Passed	SECOND_026_10nov94
27	ALL	Passed	SECOND_027_10nov94
28	ALL	Passed	SECOND_028_10nov94
29	ALL	Passed	SECOND_029_10nov94
30	ALL	Passed	SECOND_030_10nov94
31	ALL	Passed	SECOND_031_10nov94
32	ALL	Passed	SECOND_032_10nov94

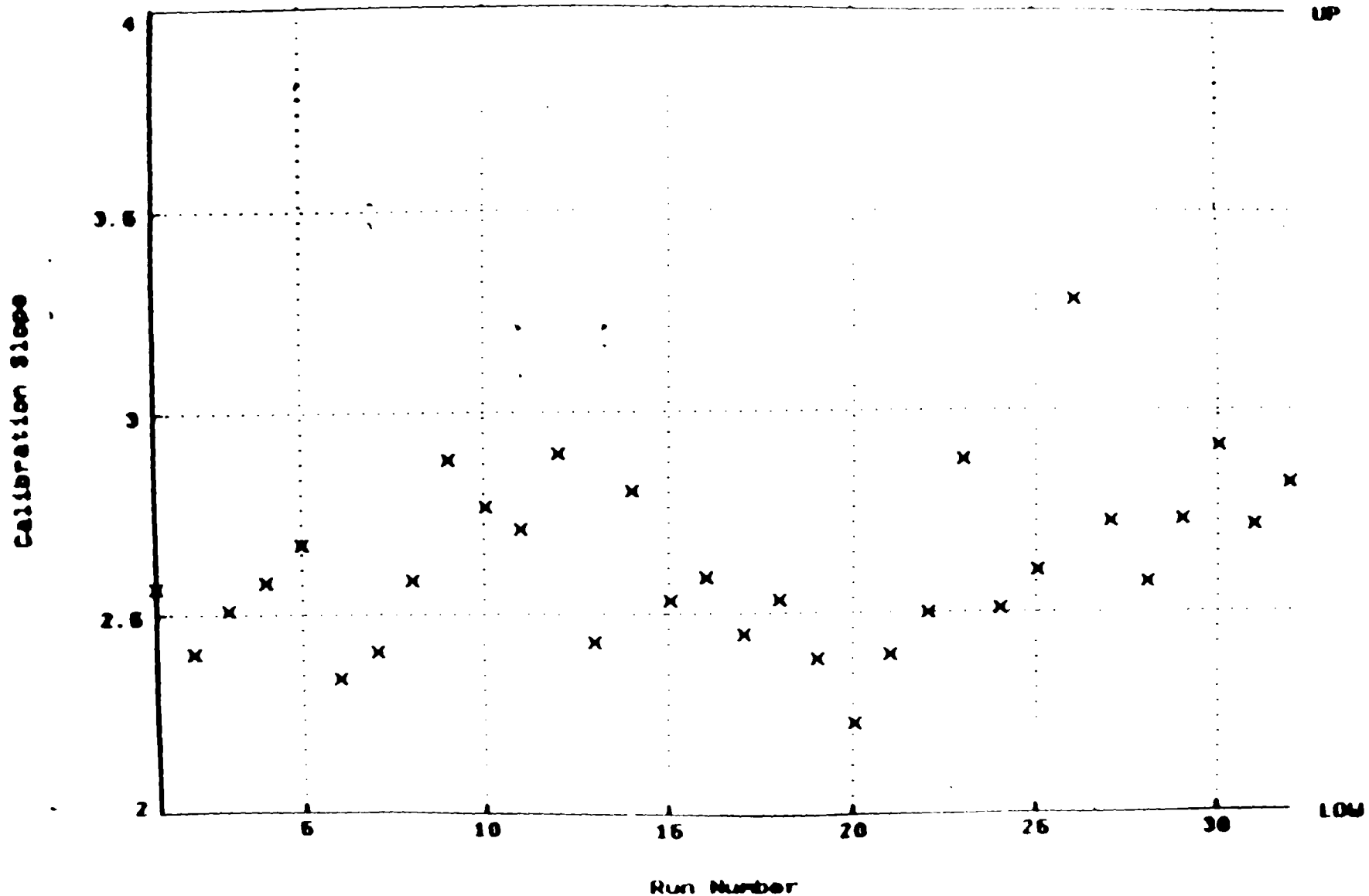
APPROVAL DATE: 12-9-94 APPROVAL TIME: 0900

APPROVED BY: [signature] PROCEDURE #: UA

Report completed at 5-DEC-1994 15:39:43.52

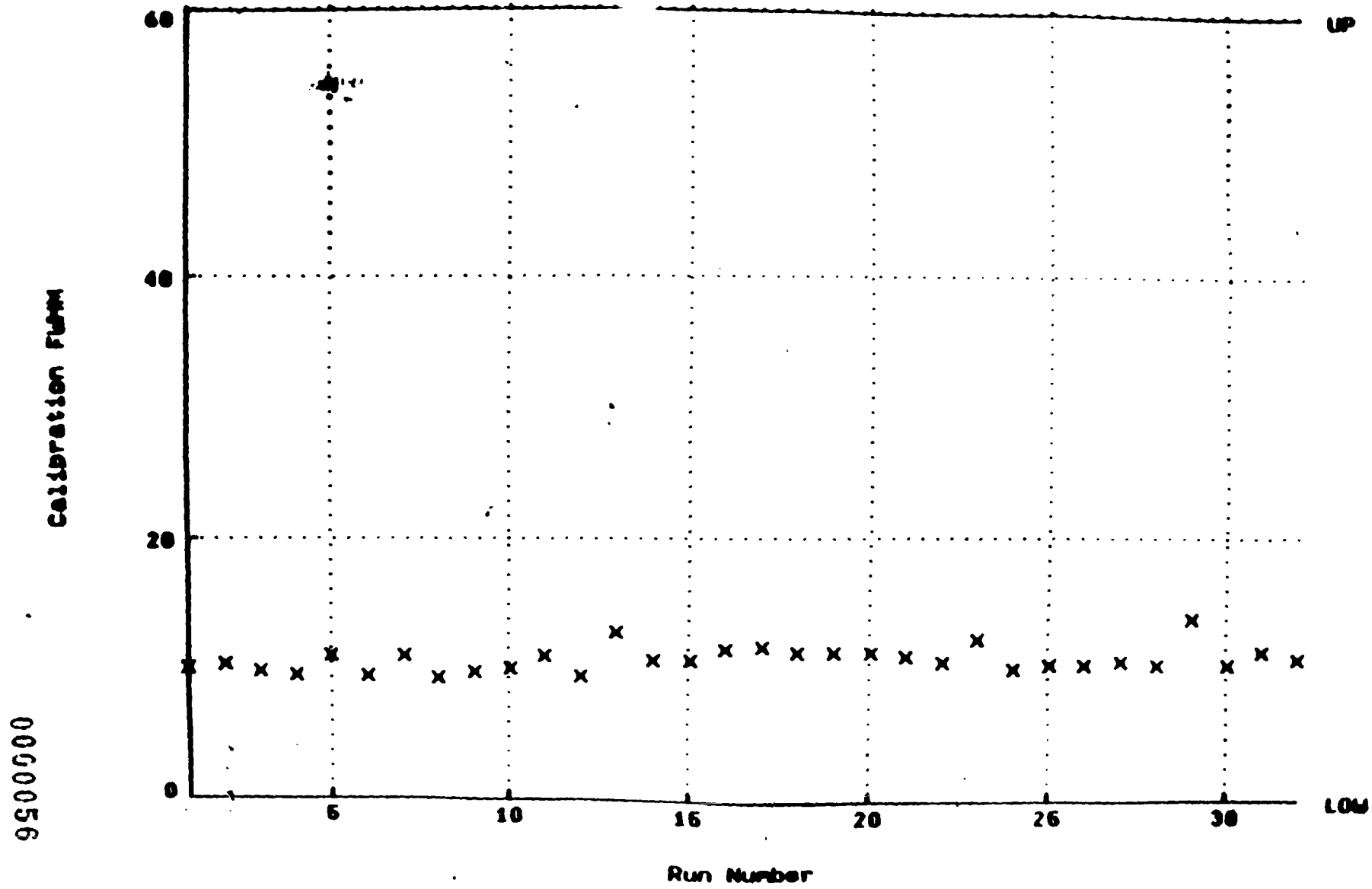
Det	Offset	Energy Slope	Quad	PMBM Const	Avg %Eff	Calibration D
1	3628.	2.87	1.031E-04	10.94	30.97	10-NOV-1994 16:
2	3572.	2.40	1.292E-04	10.53	31.64	10-NOV-1994 16:
3	3477.	2.82	7.193E-05	10.22	30.60	10-NOV-1994 16:
4	3516.	2.89	7.270E-05	10.09	31.09	10-NOV-1994 16:
5	3379.	2.68	-3.779E-05	10.69	34.13	10-NOV-1994 16:
6	3531.	2.35	1.404E-04	9.86	32.32	10-NOV-1994 16:1
7	3446.	2.42	8.361E-05	10.73	30.03	10-NOV-1994 16:1
8	3562.	2.59	4.148E-05	10.27	29.71	10-NOV-1994 16:1
9	3314.	2.89	-1.021E-04	10.04	30.83	10-NOV-1994 16:1
10	3379.	2.77	-5.994E-05	10.46	32.61	10-NOV-1994 16:1
11	3314.	2.72	-1.196E-05	10.13	29.67	10-NOV-1994 16:1
12	3362.	2.91	-7.894E-05	10.50	31.26	10-NOV-1994 16:1
13	3416.	2.44	8.269E-05	10.52	28.62	10-NOV-1994 16:1
14	3241.	2.81	-5.851E-05	10.07	30.95	10-NOV-1994 16:1
15	3495.	2.54	5.403E-05	10.17	31.51	10-NOV-1994 16:1
16	3579.	2.60	4.300E-05	10.35	30.62	10-NOV-1994 16:1
17	3276.	2.45	1.946E-04	11.12	39.19	10-NOV-1994 16:3
18	3254.	2.53	2.098E-04	10.90	39.50	10-NOV-1994 16:3
19	3460.	2.39	1.982E-04	11.47	38.95	10-NOV-1994 16:3
20	3474.	2.23	2.831E-04	11.38	40.03	10-NOV-1994 16:3
21	3398.	2.40	1.572E-04	10.75	41.34	10-NOV-1994 16:33
22	3511.	2.51	9.217E-05	10.40	37.76	10-NOV-1994 16:33
23	3157.	2.89	-5.735E-05	10.54	34.32	10-NOV-1994 16:33
24	3386.	2.52	9.413E-05	10.25	40.20	10-NOV-1994 16:33
25	3215.	2.61	1.114E-04	10.78	39.33	10-NOV-1994 16:33
26	2979.	3.29	-3.434E-04	9.97	41.64	10-NOV-1994 16:33
27	3173.	2.74	-8.031E-06	9.55	39.04	10-NOV-1994 16:33
28	3279.	2.58	3.511E-05	10.56	42.14	10-NOV-1994 16:33
29	3158.	2.74	-4.982E-06	10.58	39.07	10-NOV-1994 16:33
30	2837.	2.93	8.810E-05	9.42	40.84	10-NOV-1994 16:33
31	3160.	2.72	4.575E-05	10.34	42.01	10-NOV-1994 16:33
32	3142.	2.83	4.556E-05	9.58	38.07	10-NOV-1994 16:33
33	3464.	3.00	0.000E+00	15.00	30.00	
34	3464.	3.00	0.000E+00	15.00	30.00	
35	3464.	3.00	0.000E+00	15.00	30.00	
36	3464.	3.00	0.000E+00	15.00	30.00	
37	3464.	3.00	0.000E+00	15.00	30.00	
38	3464.	3.00	0.000E+00	15.00	30.00	
39	3464.	3.00	0.000E+00	15.00	30.00	
40	3464.	3.00	0.000E+00	15.00	30.00	
41	3464.	3.00	0.000E+00	15.00	30.00	
42	3464.	3.00	0.000E+00	15.00	30.00	
43	3464.	3.00	0.000E+00	15.00	30.00	
44	3464.	3.00	0.000E+00	15.00	30.00	
45	3464.	3.00	0.000E+00	15.00	30.00	
46	3464.	3.00	0.000E+00	15.00	30.00	
47	3464.	3.00	0.000E+00	15.00	30.00	
48	3464.	3.00	0.000E+00	15.00	30.00	

QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;1
Parameter Name : ECSLOPE (Calibration Slope)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 2.00000 through 4.00000



0000055

QA filename : 018DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;1
Parameter Name : FWHMCONST (Calibration FWHM)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 0.000000E+00 through 60.0000



00000056

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Amersha
The Health Science C

CERTIFICATE

No. 6088-1

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 920
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.63E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

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Amersham
The Health Science C

CERTIFICATE

No. 6088-2

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 921
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.57E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

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The Health Science C

CERTIFICATE

No. 6088-3

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 922
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.28E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

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0000059

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Amersha
The Health Science G

CERTIFICATE

No. 6088-4

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 923
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.25E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

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0000060

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CERTIFICATE

No. 6088-5

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 924
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.36E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buch

0000061

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CERTIFICATE

No. 6088-6

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 925
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.40E03 1/s ± 5 % in 2 π steradian.

* see page 2 for explanation

Amersham Buchler

0000062

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CERTIFICATE

No. 6088-7

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 926
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.42E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buch

0000063

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Amersha
The Health Science Gr

CERTIFICATE

No. 6088-8

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 927
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.40E03 1/s ± 5 % in 2 π steradian.

* see page 2 for explanation

Amersham Buchler

0000064

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Amersha
The Health Sciences G

CERTIFICATE

No. 6088-9

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 928
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.30E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buchler

0000065

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Amersham
The Health Sciences Gr

CERTIFICATE

No. 6088-10

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 929
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.43E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buchler

0000066

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CERTIFICATE

No. 6088-11

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 930
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.40E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buchler

0000067

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Amersha
The Health Science G.

CERTIFICATE

No. 6088-12

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 931
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.24E03 1/s ± 5 % in 2 π steradian.

* see page 2 for explanation

Amersham Buchler

0000068

11 October 1994 Mon/wo
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CERTIFICATE

No. 6088-13

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 932
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.42E03 1/s ± 5 % in 2 π steradian.

* see page 2 for explanation

Amersham Buchler

0000069

11 October 1994 Mon/wo
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CERTIFICATE

No. 6088-14

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 933
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.39E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buchler

0000070

11 October 1994 Mon/wo
Page 1 of 2 pages, Issue 6/93

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The Health Science Group

CERTIFICATE

No. 6088-15

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 934
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.41E03 1/s ± 5 % in 2 ϕ steradian.

* see page 2 for explanation

Amersham Buchler

0000071

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The Health Science G

CERTIFICATE

No. 6088-16

for an Unsealed Radioactive Source

Source Type: Checking Source

Product Code	QCRB2500
Drawing	VZ-1679
Quantity	1 off
Source No(s).	EA 935
Nuclide(s)	Plutonium-239, Americium-241, Curium-244

Measurement Data

Nominal Activity	1 kBq Pu-239, 1 kBq Am-241, 1 kBq Cm-244
Reference Date	22 September 1994
Traceability*	Not applicable

Contamination Test

Test Method*	—
Test passed on	—

Additional Information

Remark	Alpha surface emission rate: 1.44E03 1/s ± 5 % in 2 ¶ steradian.

* see page 2 for explanation

Amersham Buchler

0000072

Quanterra
Environmental
Services

EFFICIENCY CALIBRATION

0000073

ALSPCD5.DOC

Detector	Parameter	Flag	Filename
1	ALL	Passed	PRIME_001_10NOV94.C
2	ALL	Passed	PRIME_002_10NOV94.C
3	ALL	Passed	PRIME_003_10NOV94.C
4	ALL	Passed	PRIME_004_10NOV94.C
5	ALL	Passed	PRIME_005_10NOV94.C
6	ALL	Passed	PRIME_006_10NOV94.C
7	ALL	Passed	PRIME_007_10NOV94.C
8	ALL	Passed	PRIME_008_10NOV94.C
9	ALL	Passed	PRIME_009_10NOV94.C
10	ALL	Passed	PRIME_010_10NOV94.C
11	ALL	Passed	PRIME_011_10NOV94.C
12	ALL	Passed	PRIME_012_10NOV94.C
13	ALL	Passed	PRIME_013_10NOV94.C
14	ALL	Passed	PRIME_014_10NOV94.C
15	ALL	Passed	PRIME_015_10NOV94.C
16	ALL	Passed	PRIME_016_10NOV94.C
17	ALL	Passed	PRIME_017_10NOV94.CNT
18	ALL	Passed	PRIME_018_10NOV94.CNT
19	ALL	Passed	PRIME_019_10NOV94.CNT
20	ALL	Passed	PRIME_020_10NOV94.CNT
21	ALL	Passed	PRIME_021_10NOV94.CNT
22	ALL	Passed	PRIME_022_10NOV94.CNT
23	ALL	Passed	PRIME_023_10NOV94.CNT
24	ALL	Passed	PRIME_024_10NOV94.CNT
25	ALL	Passed	PRIME_025_10NOV94.CNT
26	ALL	Passed	PRIME_026_10NOV94.CNT
27	ALL	Passed	PRIME_027_10NOV94.CNT
28	ALL	Passed	PRIME_028_10NOV94.CNT
29	ALL	Passed	PRIME_029_10NOV94.CNT
30	ALL	Passed	PRIME_030_10NOV94.CNT
31	ALL	Passed	PRIME_031_10NOV94.CNT
32	ALL	Passed	PRIME_032_10NOV94.CNT

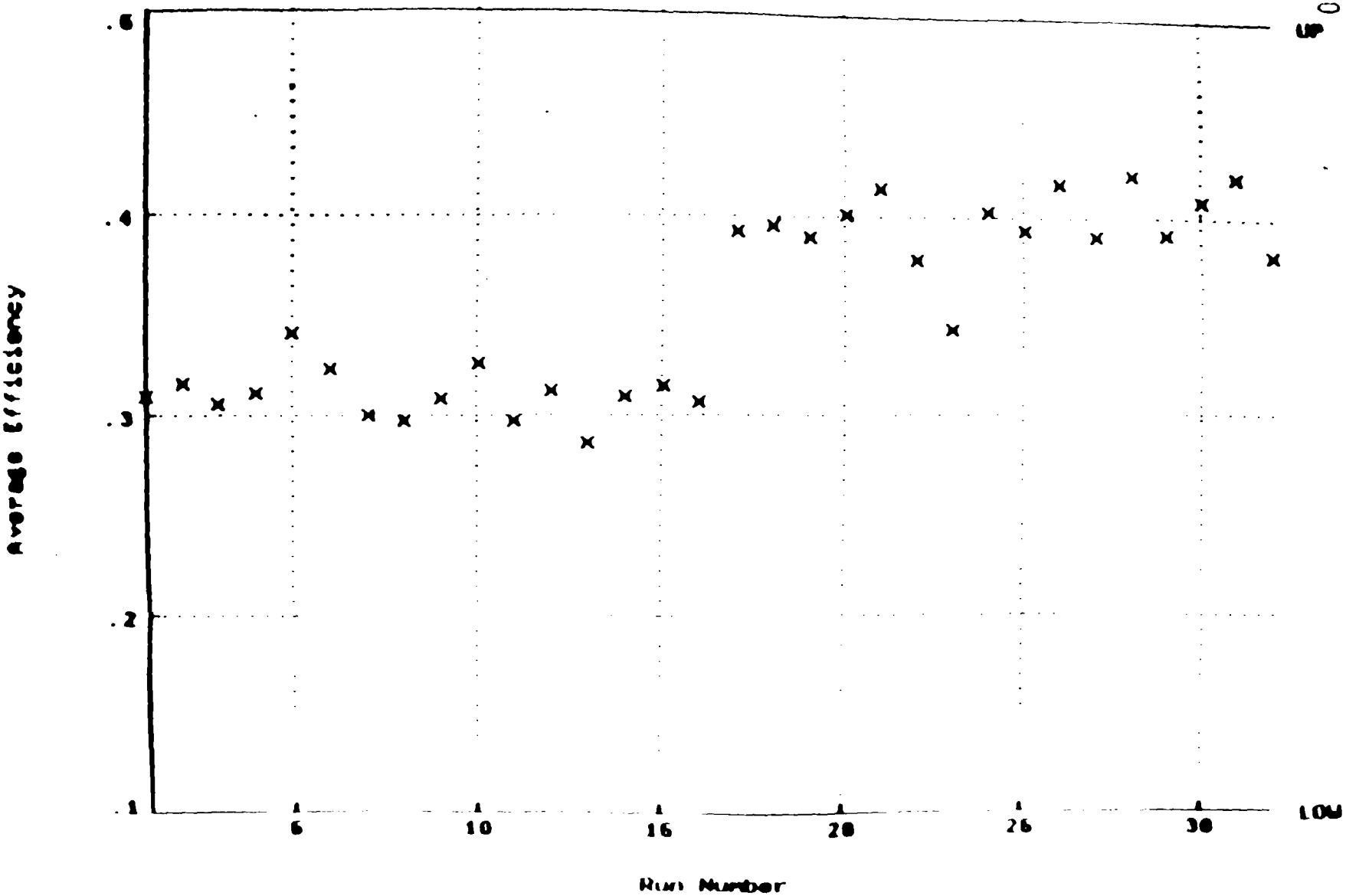
APPROVAL DATE: 12-9-94 APPROVAL TIME: 0900

APPROVED BY: [signature] PROCEDURE #: N/A

Report completed at 5-DEC-1994 11:38:05.10

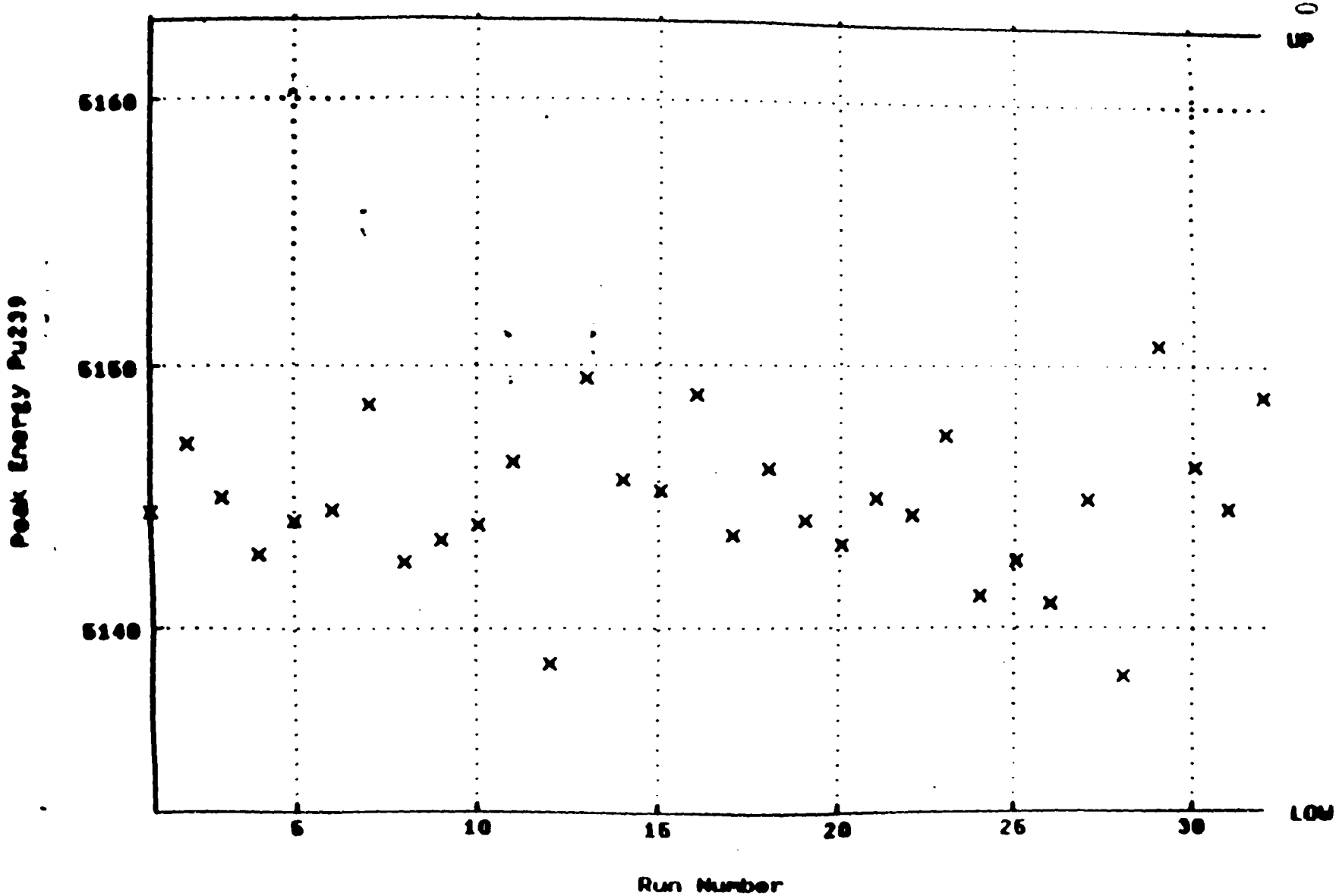
Det	Offset	Energy Slope	Quad	PMBM Const	Avg %Eff	Calibration Dat
1	3626.	2.86	1.089E-04	10.00	32.31	10-NOV-1994 12:57
2	3572.	2.40	1.268E-04	10.25	32.26	10-NOV-1994 12:57
3	3479.	2.81	7.854E-05	9.75	31.78	10-NOV-1994 12:57
4	3518.	2.58	7.862E-05	9.50	32.33	10-NOV-1994 12:57:
5	3382.	2.67	-3.062E-05	11.00	31.53	10-NOV-1994 12:57:
6	3534.	2.34	1.469E-04	9.50	32.46	10-NOV-1994 12:57:
7	3449.	2.41	8.979E-05	11.00	32.19	10-NOV-1994 12:57:
8	3564.	2.58	4.722E-05	9.25	31.76	10-NOV-1994 12:57:
9	3317.	2.88	-9.599E-05	9.75	32.11	10-NOV-1994 12:57:
10	3381.	2.76	-5.366E-05	10.00	31.85	10-NOV-1994 12:57:
11	3317.	2.71	-3.197E-06	11.00	32.03	10-NOV-1994 12:57:
12	3364.	2.89	-7.144E-05	9.50	31.99	10-NOV-1994 12:57:
13	3419.	2.43	8.911E-05	12.75	31.22	10-NOV-1994 12:57:
14	3245.	2.80	-4.975E-05	10.75	31.78	10-NOV-1994 15:41:
15	3497.	2.53	6.135E-05	10.75	32.10	10-NOV-1994 12:57:
16	3581.	2.59	5.111E-05	11.50	32.25	10-NOV-1994 12:57:1
17	3278.	2.45	1.978E-04	11.75	43.78	10-NOV-1994 13:34:(
18	3254.	2.53	2.051E-04	11.25	44.09	10-NOV-1994 13:34:(
19	3461.	2.39	2.002E-04	11.25	43.84	10-NOV-1994 13:34:(
20	3475.	2.23	2.874E-04	11.25	43.47	10-NOV-1994 13:34:(
21	3400.	2.39	1.620E-04	11.00	43.47	10-NOV-1994 13:34:(
22	3512.	2.50	9.735E-05	10.50	44.56	10-NOV-1994 13:34:(
23	3160.	2.88	-5.177E-05	12.25	43.19	10-NOV-1994 13:34:(
24	3388.	2.51	9.847E-05	10.00	43.65	10-NOV-1994 13:34:(
25	3219.	2.60	1.186E-04	10.25	44.95	10-NOV-1994 13:34:(
26	2982.	3.28	-3.373E-04	10.25	43.94	10-NOV-1994 13:34:(
27	3177.	2.72	-1.396E-06	10.50	44.49	10-NOV-1994 13:34:0
28	3282.	2.57	4.137E-05	10.25	44.53	10-NOV-1994 13:34:0
29	3161.	2.73	-7.154E-07	13.75	43.84	10-NOV-1994 13:34:0
30	2843.	2.91	9.787E-05	10.25	43.98	10-NOV-1994 13:34:0
31	3162.	2.71	4.952E-05	11.25	44.79	10-NOV-1994 13:34:0
32	3146.	2.82	5.364E-05	10.75	42.03	10-NOV-1994 13:34:0
33	3464.	3.00	0.000E+00	15.00	30.00	
34	3464.	3.00	0.000E+00	15.00	30.00	
35	3464.	3.00	0.000E+00	15.00	30.00	
36	3464.	3.00	0.000E+00	15.00	30.00	
37	3464.	3.00	0.000E+00	15.00	30.00	
38	3464.	3.00	0.000E+00	15.00	30.00	
39	3464.	3.00	0.000E+00	15.00	30.00	
40	3464.	3.00	0.000E+00	15.00	30.00	
41	3464.	3.00	0.000E+00	15.00	30.00	
42	3464.	3.00	0.000E+00	15.00	30.00	
43	3464.	3.00	0.000E+00	15.00	30.00	
44	3464.	3.00	0.000E+00	15.00	30.00	
45	3464.	3.00	0.000E+00	15.00	30.00	
46	3464.	3.00	0.000E+00	15.00	30.00	
47	3464.	3.00	0.000E+00	15.00	30.00	
48	3464.	3.00	0.000E+00	15.00	30.00	

QA Filename : 810DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;1
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 0.100000 through 0.600000

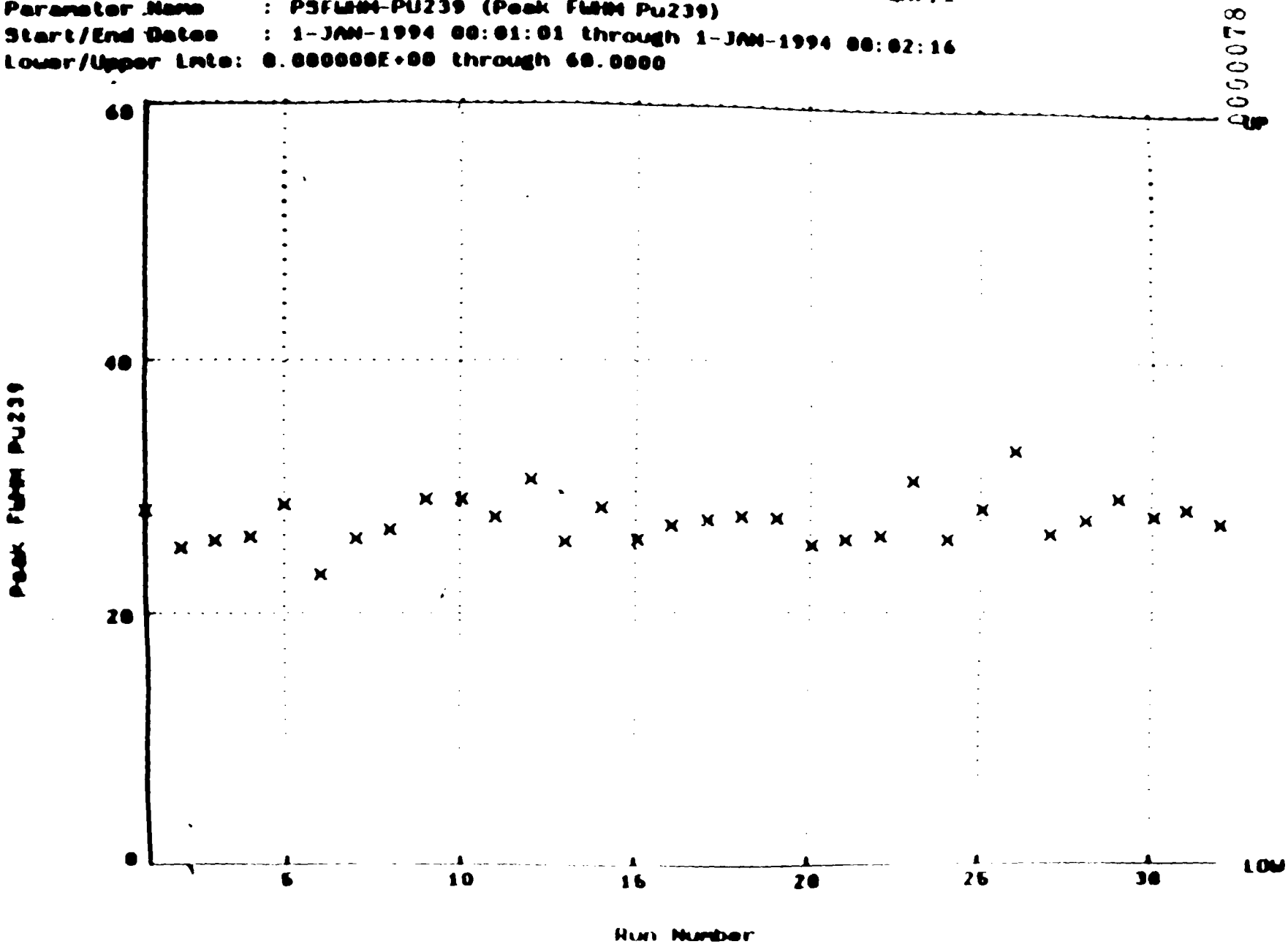


00000076

QA filename : 818DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;1
Parameter Name : PSENERGY-PU239 (Peak Energy Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 5133.00 through 5163.00

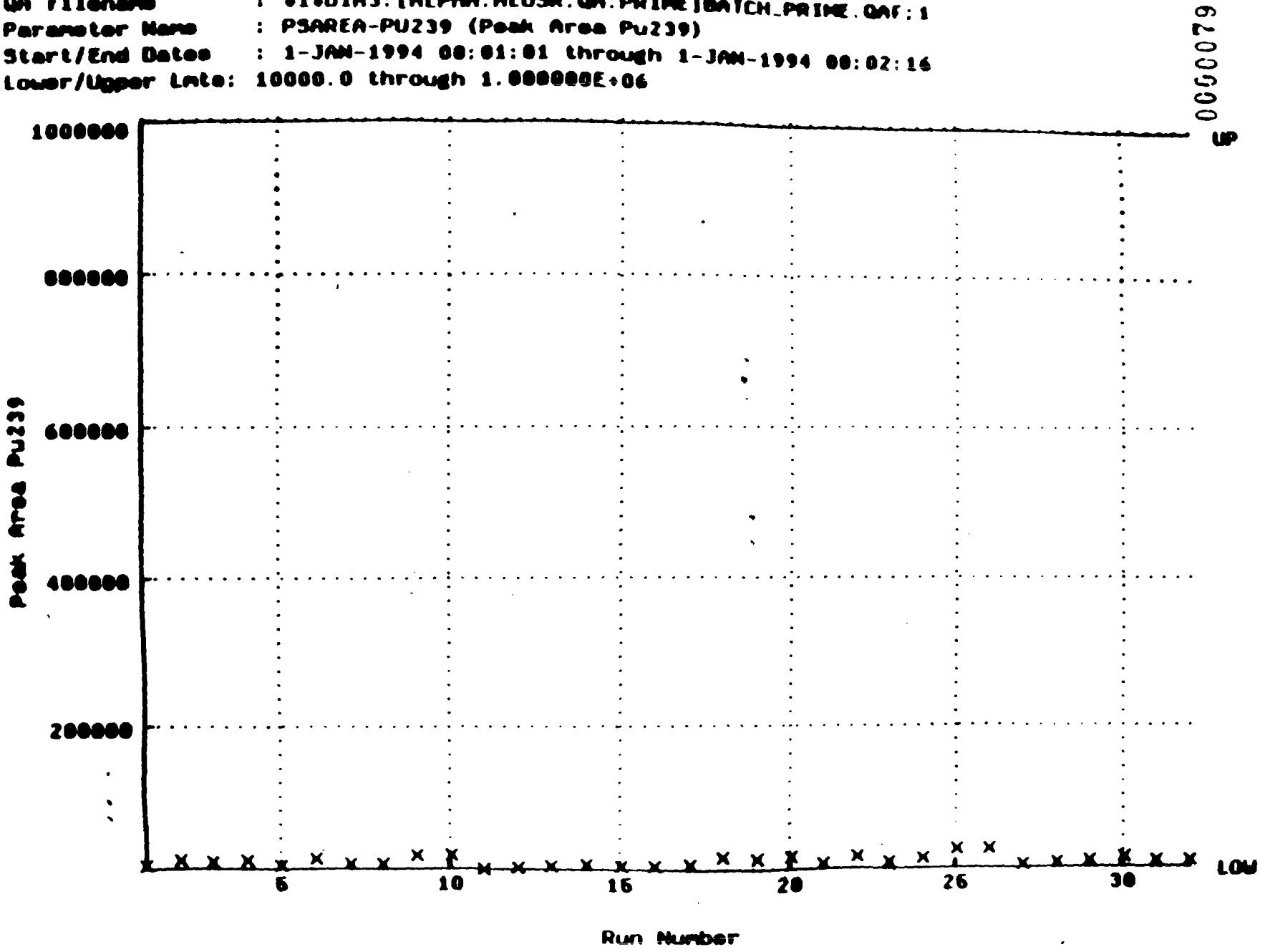


QA filename : $10DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;1
Parameter Name : P3FLWM-PU239 (Peak FLWM Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 0.000000E+00 through 60.0000



0000078

QA filename : 1DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;1
Parameter Name : PSAREA-PU239 (Peak Area Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 10000.0 through 1.000000E+06



[redacted]
[redacted]
[redacted]
[redacted]

SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS

"This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package - limited quantity of material, UN 2910 and 49 CFR 173.422 for radioactive material, excepted package - instruments or articles, UN 2910."

I hereby certify that this package also conforms to all packaging requirements of the U.S. Department of Transportation and the International Air Transport Association (IATA) Rules and Regulations regarding the shipment of radioactive materials.

The materials are packed in strong, tight packages that will not leak during normal transport conditions, the radiation level on the exterior surface of the package does not exceed 0.5 mrem/hr., nonfixed (removable) contamination does not exceed applicable limits, and the outside of the inner container bears the marking "Radioactive".

No other labels are required.

SOURCE INFORMATION

Model No.	Isotope	Total Activity	Total Quantity	Serial No.
DMS-10	^{239}Pu ^{230}Th ^{241}Am	0.196uCi	48	1918-94 Through 1933-94 1934-94 Through 1949-94 C7271 Through 1964-94

Customer: [redacted], Inc.
[redacted] City, MO 63045

PO# 130552

SO# 8-02900

Authorized Signature

Date 10/11/94

0000081

[redacted]

CUSTOMER: Quanterra, Inc.

ADDRESS: 13715 Rider Trail North
Earth City, MO 63045

[redacted]
Quality Control & Inspection

P.O. NUMBER: 130552

TMA/EBERLINE S.O. NUMBER: S-02900

DATE SHIPPED: 10/19/94

CERTIFICATE OF COMPLIANCE

The radioactive sources or services comprising this order have been subjected to and have passed all examinations, inspections, tests and calibrations of the TMA/Eberline quality assurance procedures, and, as applicable, are in compliance with specifications imposed by the above referenced contract/ purchase order number.

Calibration has been accomplished in accordance with TMA/Eberline calibration procedures. Sources for calibration and/or dose rates have calibration traceable to National Institute of Standards and Technology.

The undersigned as the authorized representative of TMA/Eberline warrants the information contained within this document to be a true statement of fact.

[redacted]

Quality Assurance Manager

0000082

[illegible] Albuquerque Laboratory
7621 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3401 • FAX # (505) 761-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DNS-10 Serial No. 1918-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 c

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,210 ± 89

The total disintegration rate (dpm) assuming 1.9% backscatter of alpha particles from the surface of the disc, was

[illegible],430 ± 177 (0.00199 µCi)

The unc[illegible] of the measurement is 4 % which is the sum of random counting error at the 99% confidence [illegible], and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Q.A. Representative: [signature]

Calibration date: 9/30/94 Reviewed date: 10-18-94

0000083

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DRS-10 Serial No. 1919-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 c

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91

Measurement Results:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

3,400 ± 102

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc was

[redacted] ± 204 (0.00306 µCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/27/94 Reviewed date: 10.18.94

0000084

TRA/Eberline Albuquerque Laboratory
7021 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX # (505) 761-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DMS-10 Serial No. 1920-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cr

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N <393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

3,140 ± 126

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc, was

6,290 ± 252 (0.00283 µCi)

The uncertainty of the measurement is 4 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by:

Calibration technician: Arlene Gutierrez Representative:

Calibration date: 9/27/94 Reviewed date: 10-18-94

0000085

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DES-10 Serial No. 1921-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cr

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Results:

The observed alpha particles emitted from the surface of the disc per minute (dpm) on the calibration dat was

3,320 ± 166

The total disintegration rate (dpm) assuming 1.8% backscatter of alpha particles from the surface of the disc was

[redacted] 690 ± 332 (0.00299 µCi)

The uncertainty of the measurement is 5 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Q.A. Representative: [signature]

Calibration date: 9/26/94 Reviewed date: 10.4.94

0000086

[redacted]
7021 Pan American Hwy. NE
Albuquerque, [redacted]
(505) 345-3407 • FAX # (505) 761-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DRS-10 Serial No. 1922-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thick

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,140 ± 107

The total disintegration rate (dpm) assuming 1.9% backscatter of alpha particles from the surface of the disc, was

[redacted] ± 218 (0.00193 μCi)

The uncertainty of the measurement is 5 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/27/94 Reviewed date: 10-18-94

0000087

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 30552

Description of Standard:

Model No. 269-10 Serial No. 1923-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cr

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration dat was

3,630 ± 109

The total disintegration rate (dpm) assuming 1.9% backscatter of alpha particles from the surface of the disc was

[redacted] ± 218 (0.00327 µCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gallegos Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/27/94 Reviewed date: 10-18-94

0000088

(SNL/Eberline Albuquerque Laboratory
7021 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX # (505) 761-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DMS-10 Serial No. 1924-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cr

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,800 ± 84

The total disintegration rate (dpm) assuming 1.8% backscatter of alpha particles from the surface of the disc. was

[redacted]638 ± 168 (0.00253 µCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by:

Calibration technician: Arlene Gutierrez Representative:

Calibration date: 9/28/94 Reviewed date: 10-18-94

0000089

[illegible] Albuquerque Laboratory
[illegible] Pan American Hwy. NE
Albuquerque, NM [illegible]
(505) 345-3407 • FAX # (505) 781-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DMS-10 Serial No. 1925-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,890 ± 115

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc was

[illegible]770 ± 231 (0.00260 µCi)

The uncertainty of the measurement is 4 % which is the sum of random counting error at the 95% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/28/94 Reviewed date: 10-18-94

0000090

TMA/Eberline Albuquerque Laboratory
7051 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX # (505) 761-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DNS-10 Serial No. 1926-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 c

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolu counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration dat was

4,560 ± 137

The total disintegration rate (dpm) assuming 1.8π backscatter of alpha particles from the surface of the disc was

7,130 ± 274 (0.00411 μCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/27/94 Reviewed date: 10-18-94

0000091

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DES-10 Serial No. 1927-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the activ surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 2393/91.

Measurement Results:

The observed alpha particles emitted from the surface of the disc per minute (dpm) on the calibration date was

4,390 ± 132

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc, was

[redacted] ± 264 (0.00399 µCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Ariana Gutierrez Reviewed by:

Calibration technician: Supervisor:

Calibration date: 9/27/94 Review date: 10.8.94

TMA/Eberline Albuquerque Laboratory
7021 Pan American Blvd. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX # (505) 761-8416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DKS-10 Serial No. 1928-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thick

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrated alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (dpm) on the calibration date was

1,880 ± 56

The total disintegration rate (dpm) assuming 1.9% backscatter of alpha particles from the surface of the disc, was

[redacted]770 ± 113 (0.00170 µCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/27/94 Reviewed date: 10-6-94

0000093

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DES-10 Serial No. 1929-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thick

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the active surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolute counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above, below and at the operative voltage. The calibration is traceable to NBST by reference to an NIST calibrated alpha source S/N 2393/91

Measurement Results:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,130 ± 64

The total disintegration rate (dpm) assuming 1.8% backscatter of alpha particles from the surface of the disc was

[redacted] ± 128 (0.00192 µCi)

The uncertainty of this measurement is 3 % which is the sum of random counting error at the 99% confidence level and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/30/94 Reviewed date: 10-19-94

0000094

TSA/Eberline Albuquerque Laboratory
7021 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 345-3461 • FAX # (505) 781-6416

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DNS-10 Serial No. 1930-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thi

Total diameter of 2.23 cm and an active diameter of 1.91 c

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the act surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolu counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration dat was

2,600 ± 78

The total disintegration rate (dpm) assuming 1.9π backscatter of alpha particles from the surface of the disc was

[redacted] ± 156 (0.00234 μCi)

The uncertainty of the measurement is 3 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by:

Calibration technician: QA Representative:

Calibration date: 9/28/94 Reviewed date: 10-6-94

0000095

[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 30552

Description of Standard:

Model No. DES-10 Serial No. 1931-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thi

Total diameter of 2.23 cm and an active diameter of 1.91 c

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the act surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolu counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrat alpha source S/N 2393/91

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration dat was

2,850 ± 114

The total disintegration rate (dpm) assuming 1.9% backscatter of alpha particles from the surface of the disc was

5,710 ± 228 (0.00257 µCi)

The uncertainty of the measurement is 4 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: [redacted] Reviewed by: [redacted]

Calibration technician: [redacted] QA Representative: [redacted]

Calibration date: 9/28/94 Reviewed date: 10-8-94

0000096

TBA/Eberline Albuquerque Laboratory
7021 Pan American Hwy. NE
Albuquerque, NM 87109
(505) 346-3401 FAX # (505) 761-8410

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DMS-10 Serial No. 1932-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc, 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cm

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolut counting of alpha particles emitted in the hemisphere above the active surface was verified by counting above below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Result:

The observed alpha particles emitted from the surface of the disc per minute (cpm) on the calibration date was

2,360 ± 94

The total disintegration rate (dpm) assuming 1.5% backscatter of alpha particles from the surface of the disc, was

[illegible] ± 189 (0.00212 µCi)

The uncertainty of the measurement is 4 % which is the sum of random counting error at the 99% confidence level and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/28/94 Reviewed date: 10-18-94

0000097

[redacted]
[redacted]
[redacted]
[redacted]

CERTIFICATE OF CALIBRATION

Electroplated Alpha Standard

S.O.# S-02900
P.O.# 130552

Description of Standard:

Model No. DMS-10 Serial No. 1933-94 Isotope Plutonium-239

Electroplated on polished Stainless Steel disc 0.79 mm thic

Total diameter of 2.23 cm and an active diameter of 1.91 cr

The radioactive material is permanently fixed to the disc by heat treatment without any covering over the acti surface.

Measurement Method:

The 2 pi alpha emission rate was measured using an internal gas flow proportional chamber. Absolu counting of alpha particles emitted in the hemisphere above the active surface was verified by counting abov below and at the operative voltage. The calibration is traceable to NIST by reference to an NIST calibrate alpha source S/N 2393/91.

Measurement Results:

The observed alpha particles emitted from the surface of the disc per minute (dpm) on the calibration dat was

2,410 ± 96

The total disintegration rate (dpm) assuming 1.8π backscatter of alpha particles from the surface of the disc was

4,818 ± 193 (0.00217 μCi)

The uncertainty of the measurement is 4 % which is the sum of random counting error at the 99% confidence level, and the estimated upper limit of systematic error in this measurement.

Calibrated by: Arlene Gutierrez Reviewed by: [signature]

Calibration technician: [signature] Representative: [signature]

Calibration date: 9/28/94 Reviewed date: 10-18-94

0000098

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Environmental
Services

INSTRUMENT CHECKS

ALSPIC1 DOC

0000099

Review of QA results (Daily Pulser Check) 3-OCT-1995 06:25:12.65

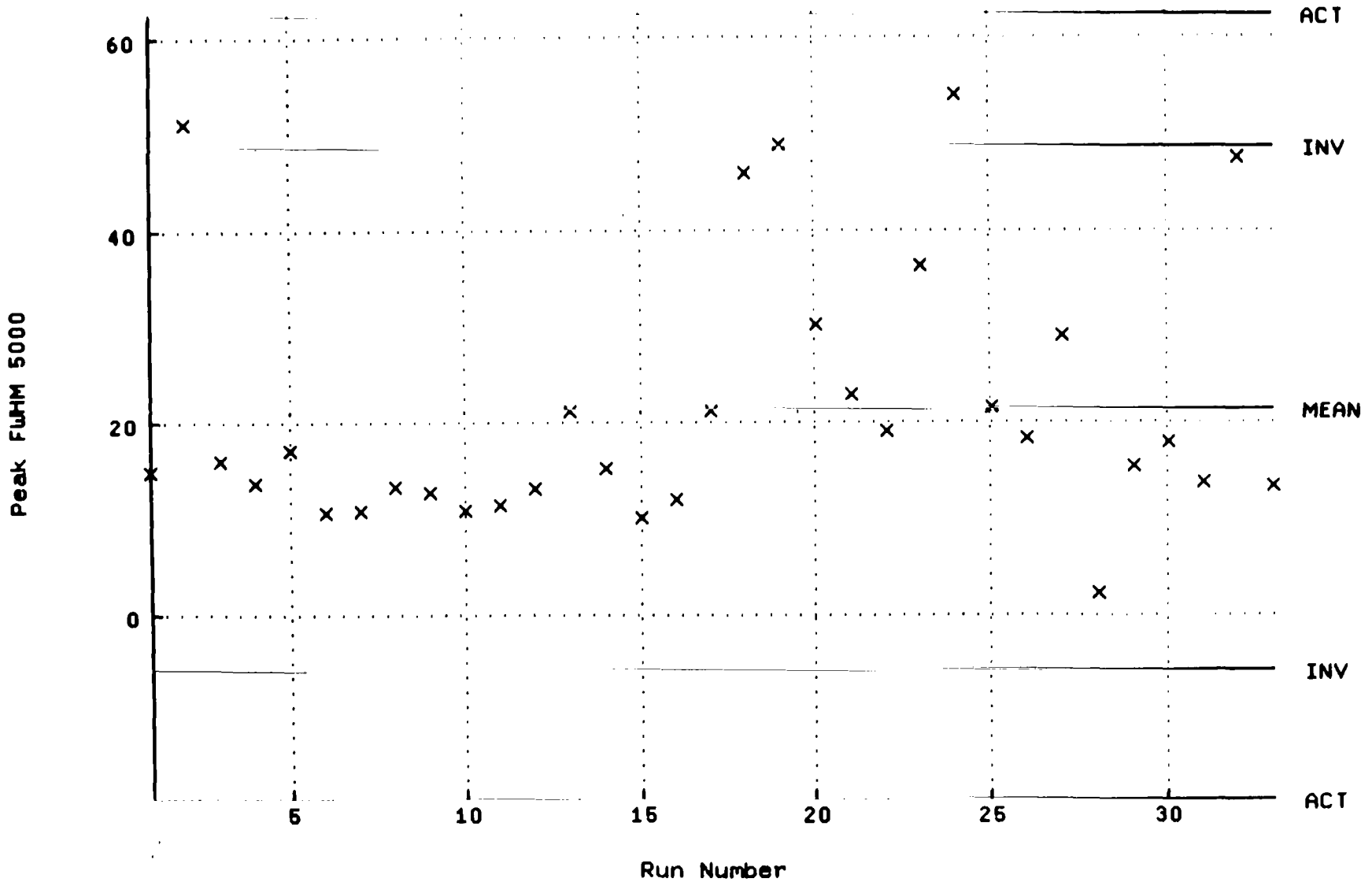
Detector	Parameter	Flag	Filename
1	ALL	Passed	D_001_NONE
2	PSENERGY-5000	Action	D_002_NONE
3	ALL	Passed	D_003_NONE
4	ALL	Passed	D_004_NONE
5	ALL	Passed	D_005_NONE
6	ALL	Passed	D_006_NONE
7	ALL	Passed	D_007_NONE
8	ALL	Passed	D_008_NONE
9	ALL	Passed	D_009_NONE
10	ALL	Passed	D_010_NONE
11	ALL	Passed	D_011_NONE
12	ALL	Passed	D_012_NONE
13	ALL	Passed	D_013_NONE
14	ALL	Passed	D_014_NONE
15	ALL	Passed	D_015_NONE
16	ALL	Passed	D_016_NONE
17	ALL	Passed	D_017_NONE
18	ALL	Passed	D_018_NONE
19	ALL	Passed	D_019_NONE
20	ALL	Passed	D_020_NONE
21	ALL	Passed	D_021_NONE
22	ALL	Passed	D_022_NONE
23	ALL	Passed	D_023_NONE
24	ALL	Passed	D_024_NONE
25	ALL	Passed	D_025_NONE
26	ALL	Passed	D_026_NONE
27	ALL	Passed	D_027_NONE
28	ALL	Passed	D_028_NONE
29	ALL	Passed	D_029_NONE
30	ALL	Passed	D_030_NONE
31	ALL	Passed	D_031_NONE
32	PSFWHM-5000	Action	D_032_NONE

APPROVAL DATE: 10-3-95 APPROVAL TIME: 1050

APPROVED BY: _____ PROCEDURE # 13067

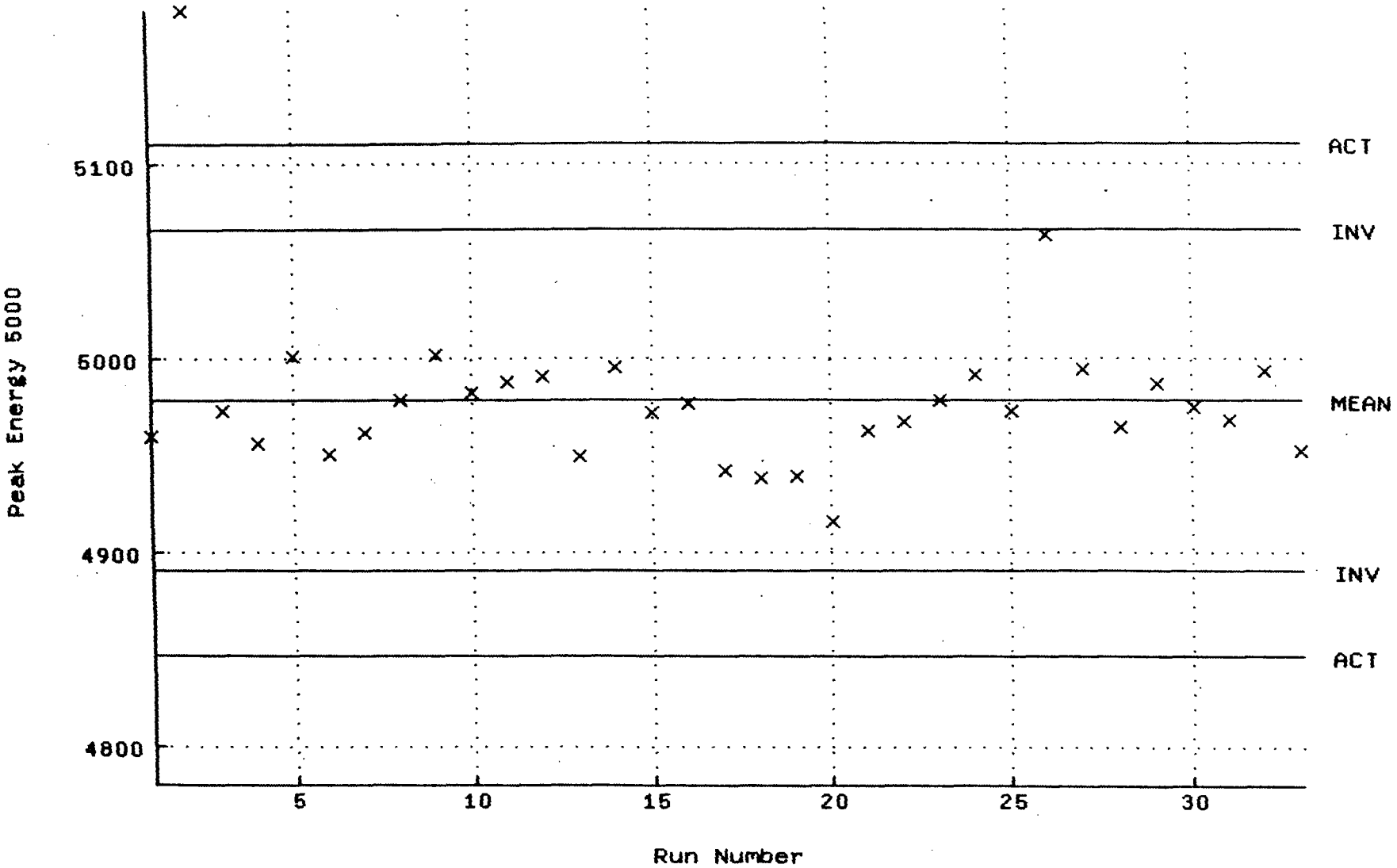
Report completed at 3-OCT-1995 06:30:20.91

QA filename : 1DIA3:[ALPHA.ALUSR.QA.D]BATCH_D.QAF;1
Parameter Name : PSFWHM-5000 (Peak FWHM 5000)
Start/End Dates : 1-JAN-1994 00:01:01 through 24-JAN-1995 08:35:41
Mean +- Std Dev : 21.5105 +- 13.5914 (63.18 %)



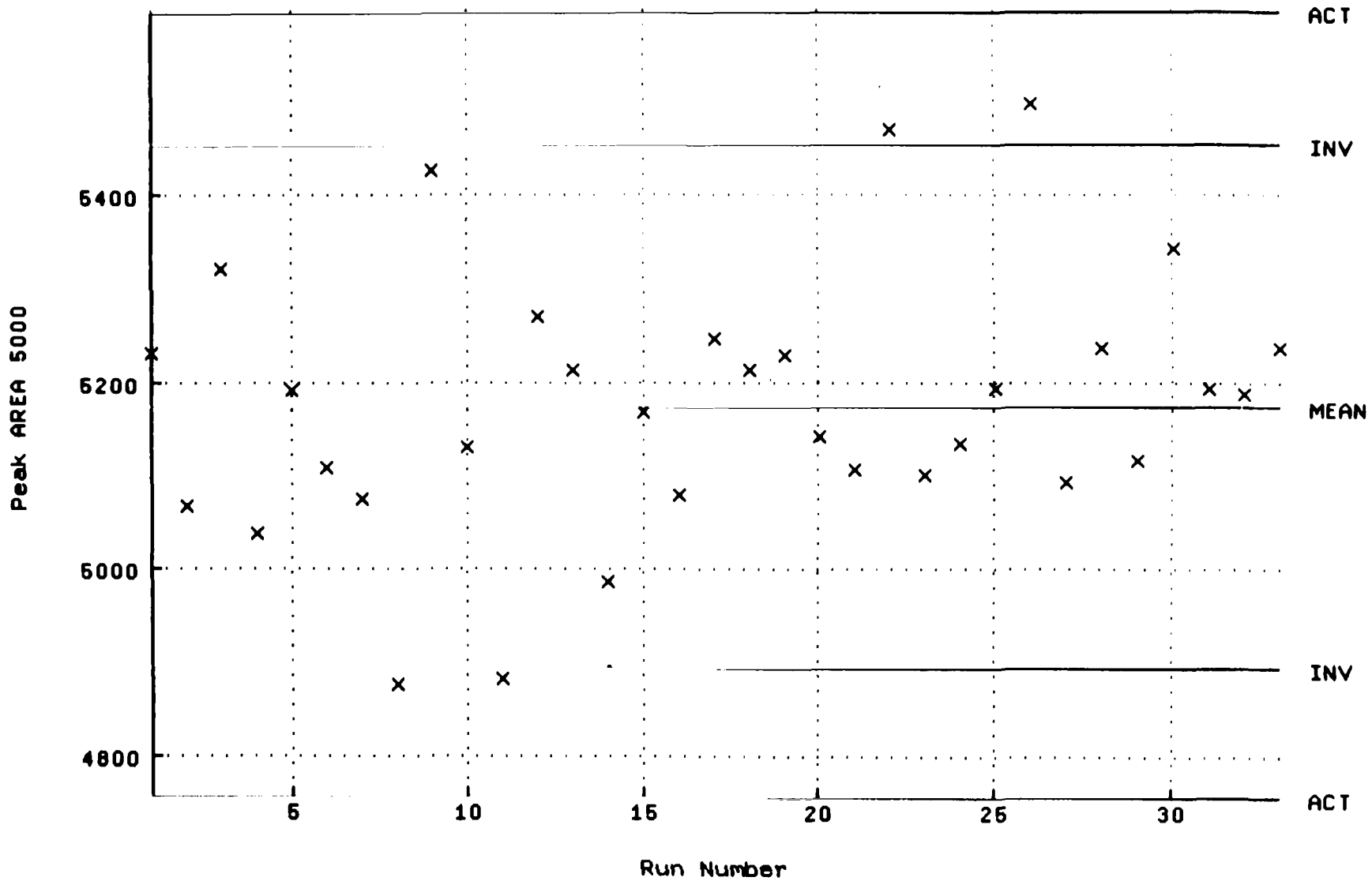
0690152

filename : 1DIA3:[...
arameter Name : PSENERGY-5000 (Peak ...
tart/End Dates : 1-JAN-1994 00:01:01 through ...
lean +- Std Dev : 4978.80 +- 43.9110 (0.88 %)



000153

QA filename : 1DIA3:[ALPHA.ALUSR.QA.D]BATCH_D.QAF;1
Parameter Name : PSAREA-5000 (Peak AREA 5000)
Start/End Dates : 1-JAN-1994 00:01:01 through 24-JAN-1995 08:35:41
Mean +- Std Dev : 5174.73 +- 139.102 (2.69 %)



0050134

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WEEKLY CALIBRATION UPDATE

Review of QA results (Energy Calibration Check) 2-OCT-1995 12:20:00.

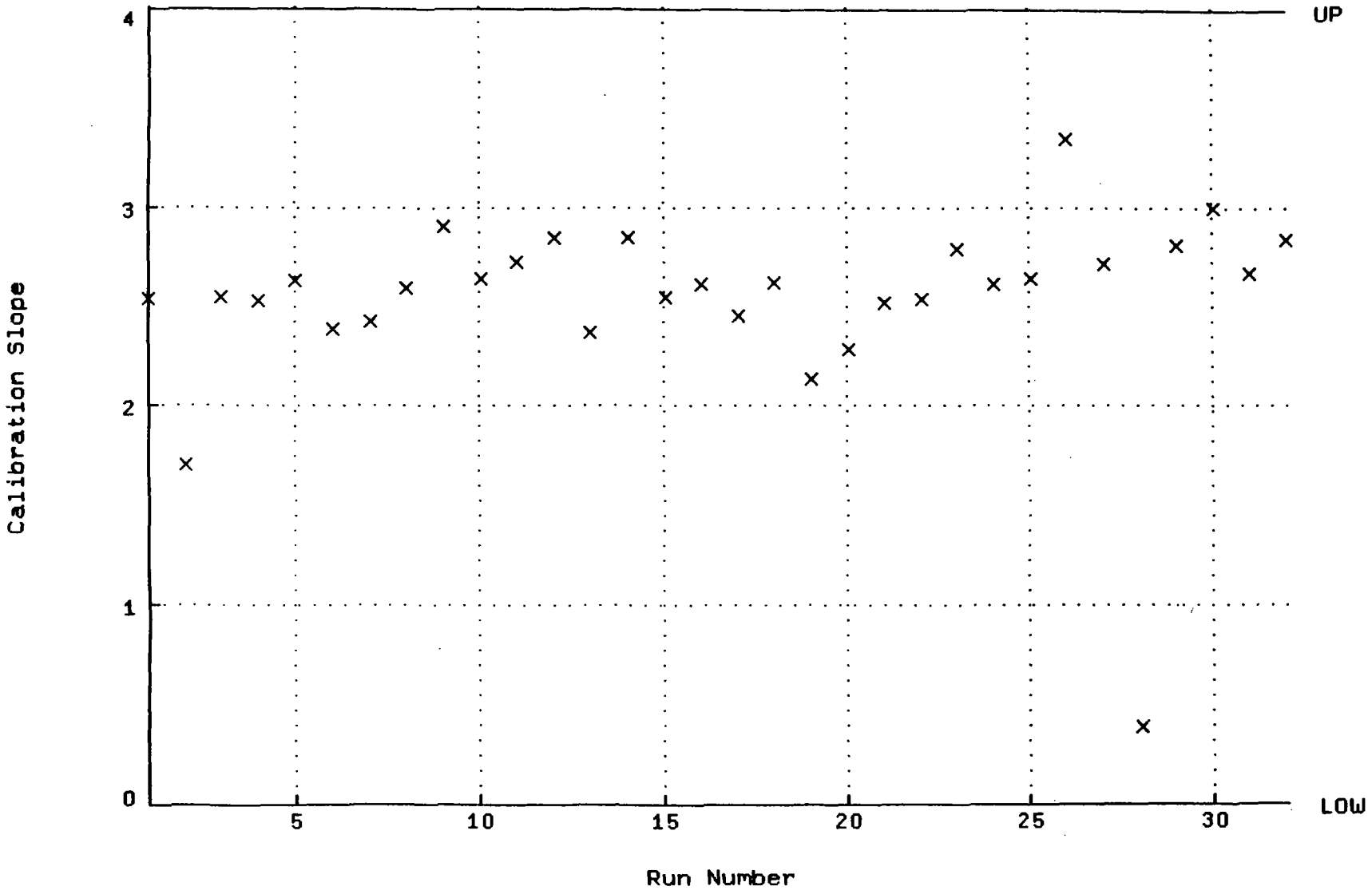
Detector	Parameter	Flag	Filename
1	ALL	Passed	SECOND_001_2oct95
2	ECSLOPE	Below	SECOND_002_2oct95
2	PSENERGY-CM244	Below	SECOND_002_2oct95
3	ALL	Passed	SECOND_003_2oct95
4	ALL	Passed	SECOND_004_2oct95
5	ALL	Passed	SECOND_005_2oct95
6	ALL	Passed	SECOND_006_2oct95
7	ALL	Passed	SECOND_007_2oct95
8	ALL	Passed	SECOND_008_2oct95
9	ALL	Passed	SECOND_009_2oct95
10	ALL	Passed	SECOND_010_2oct95
11	ALL	Passed	SECOND_011_2oct95
12	ALL	Passed	SECOND_012_2oct95
13	ALL	Passed	SECOND_013_2oct95
14	ALL	Passed	SECOND_014_2oct95
15	ALL	Passed	SECOND_015_2oct95
16	ALL	Passed	SECOND_016_2oct95
17	ALL	Passed	SECOND_017_2oct95
18	ALL	Passed	SECOND_018_2oct95
19	ALL	Passed	SECOND_019_2oct95
20	ALL	Passed	SECOND_020_2oct95
21	ALL	Passed	SECOND_021_2oct95
22	ALL	Passed	SECOND_022_2oct95
23	ALL	Passed	SECOND_023_2oct95
24	ALL	Passed	SECOND_024_2oct95
25	ALL	Passed	SECOND_025_2oct95
26	ALL	Passed	SECOND_026_2oct95
27	ALL	Passed	SECOND_027_2oct95
28	ALL	Passed	SECOND_028_2oct95
29	ALL	Passed	SECOND_029_2oct95
30	ALL	Passed	SECOND_030_2oct95
31	ALL	Passed	SECOND_031_2oct95
32	ALL	Passed	SECOND_032_2oct95

APPROVAL DATE: 10-2-95 APPROVAL TIME: 1710

APPROVED BY: [signature] PROCEDURE # NA

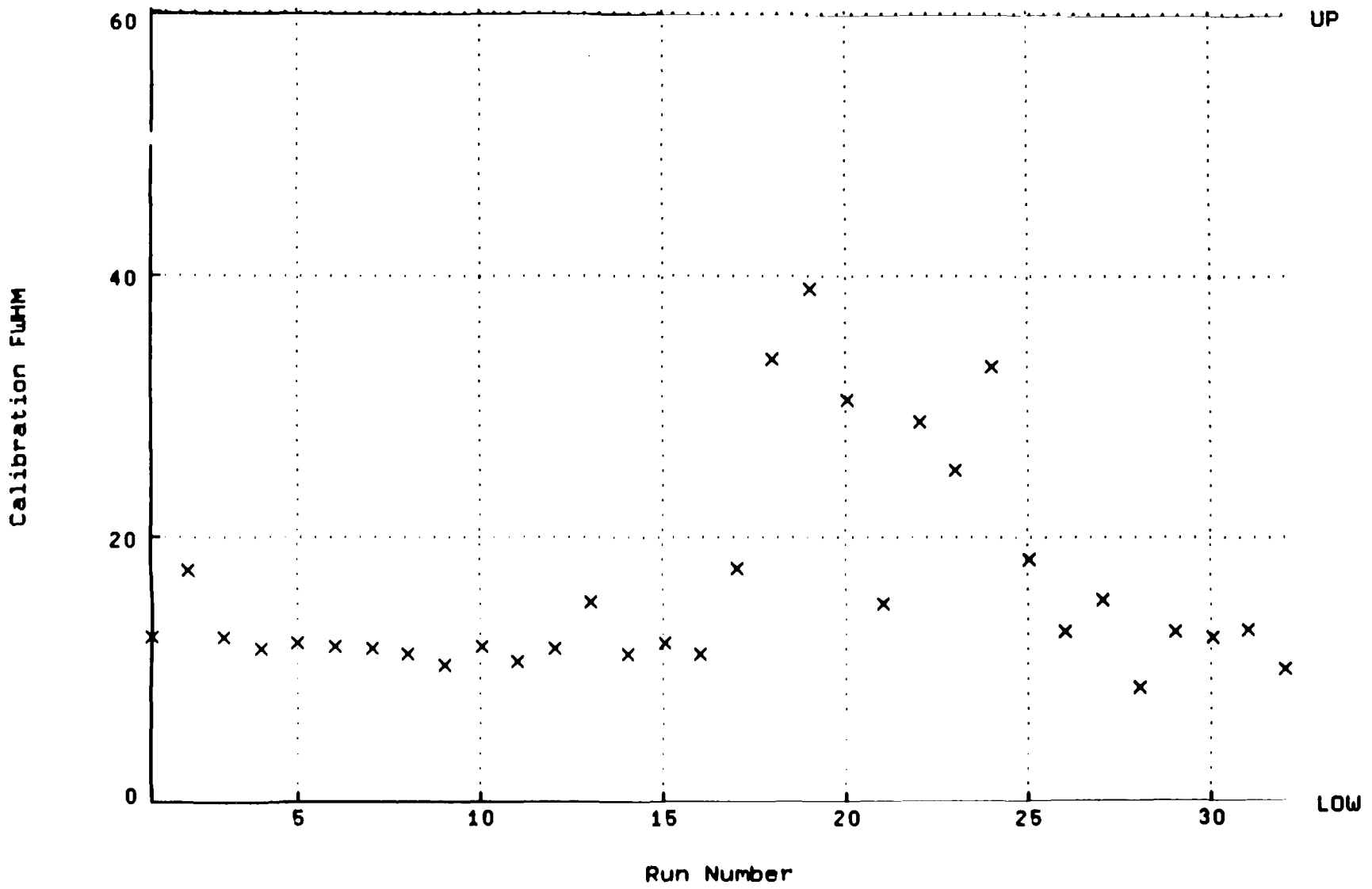
Report completed at 2-OCT-1995 12:23:12.93

QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : ECSLOPE (Calibration Slope)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 0.000000E+00 through 4.00000



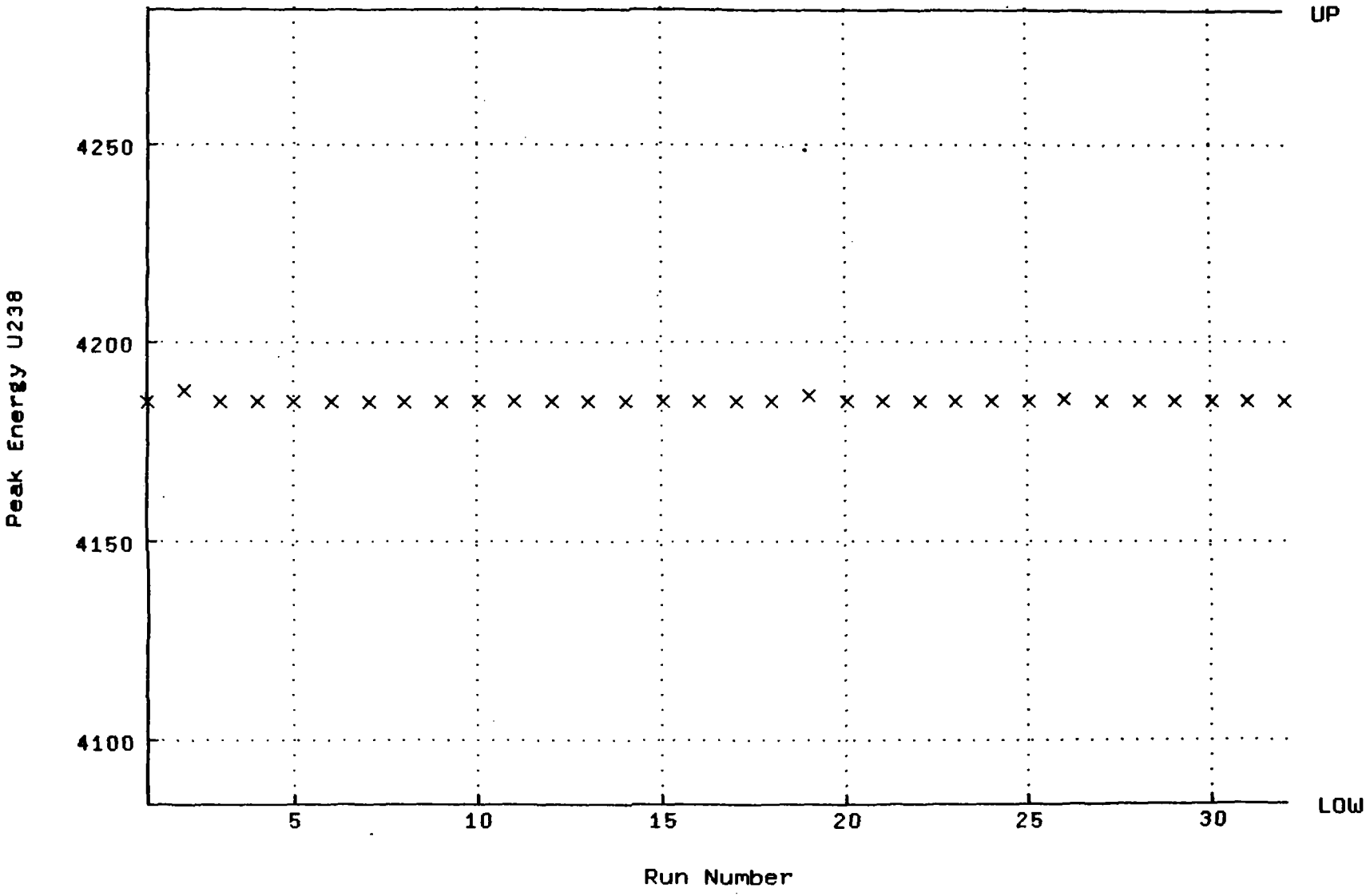
00001.7

QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : FWHMCONST (Calibration FWHM)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 0.000000E+00 through 60.0000



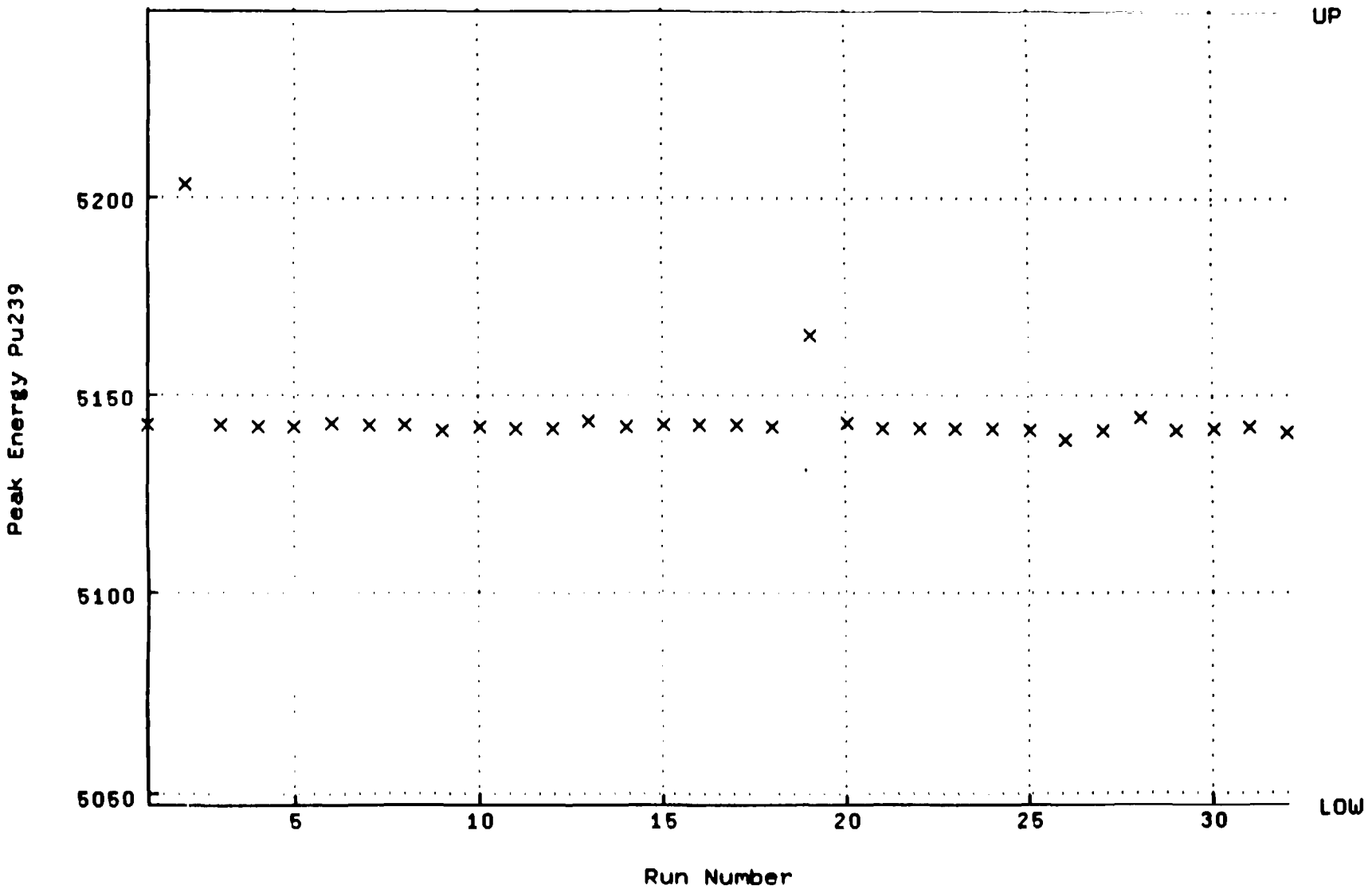
8-10500

QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : PSENERGY-U238 (Peak Energy U238)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 4084.00 through 4284.00



0000109

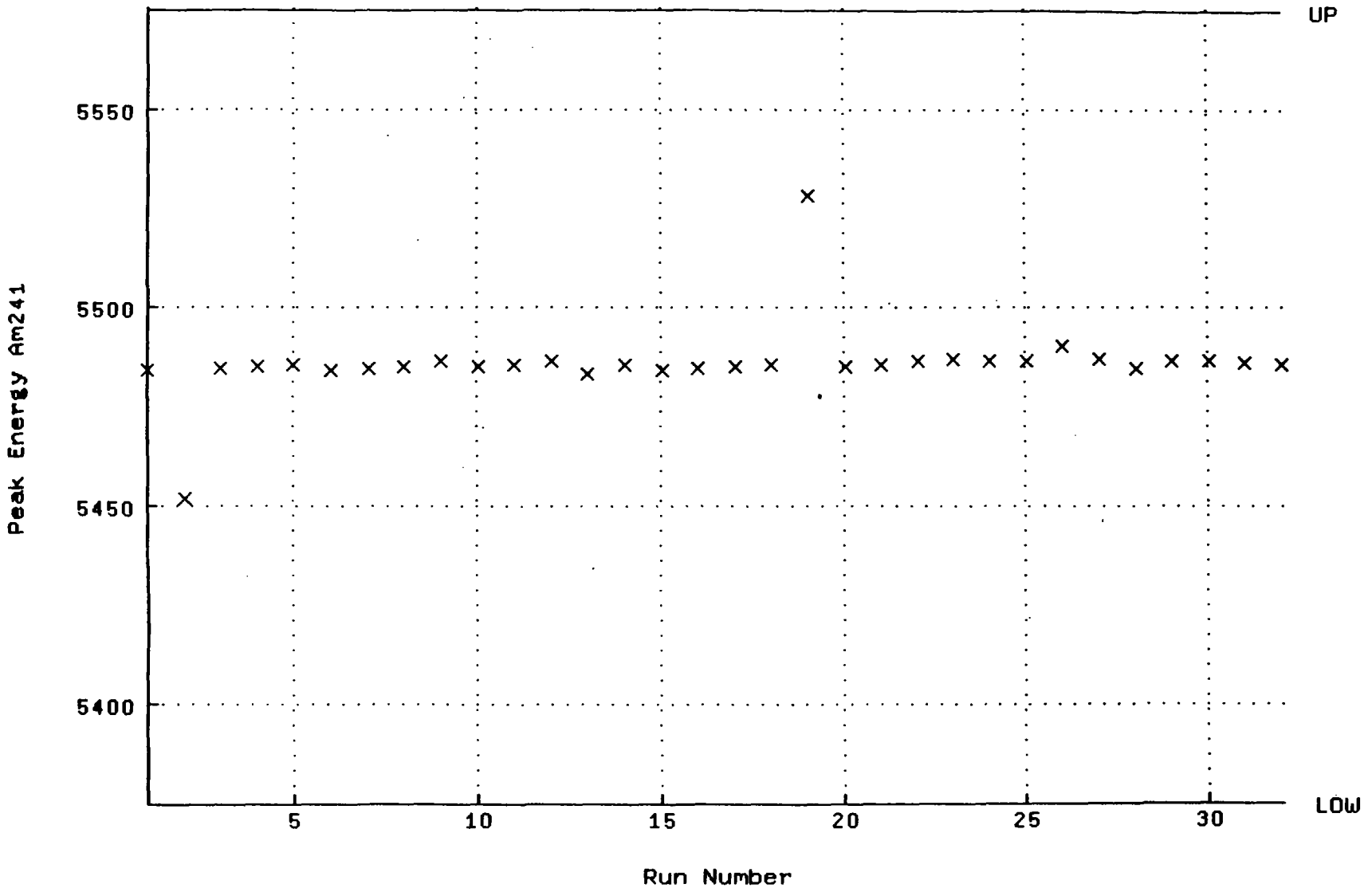
QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : PSENERGY-PU239 (Peak Energy Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 5047.00 through 5247.00



0110590

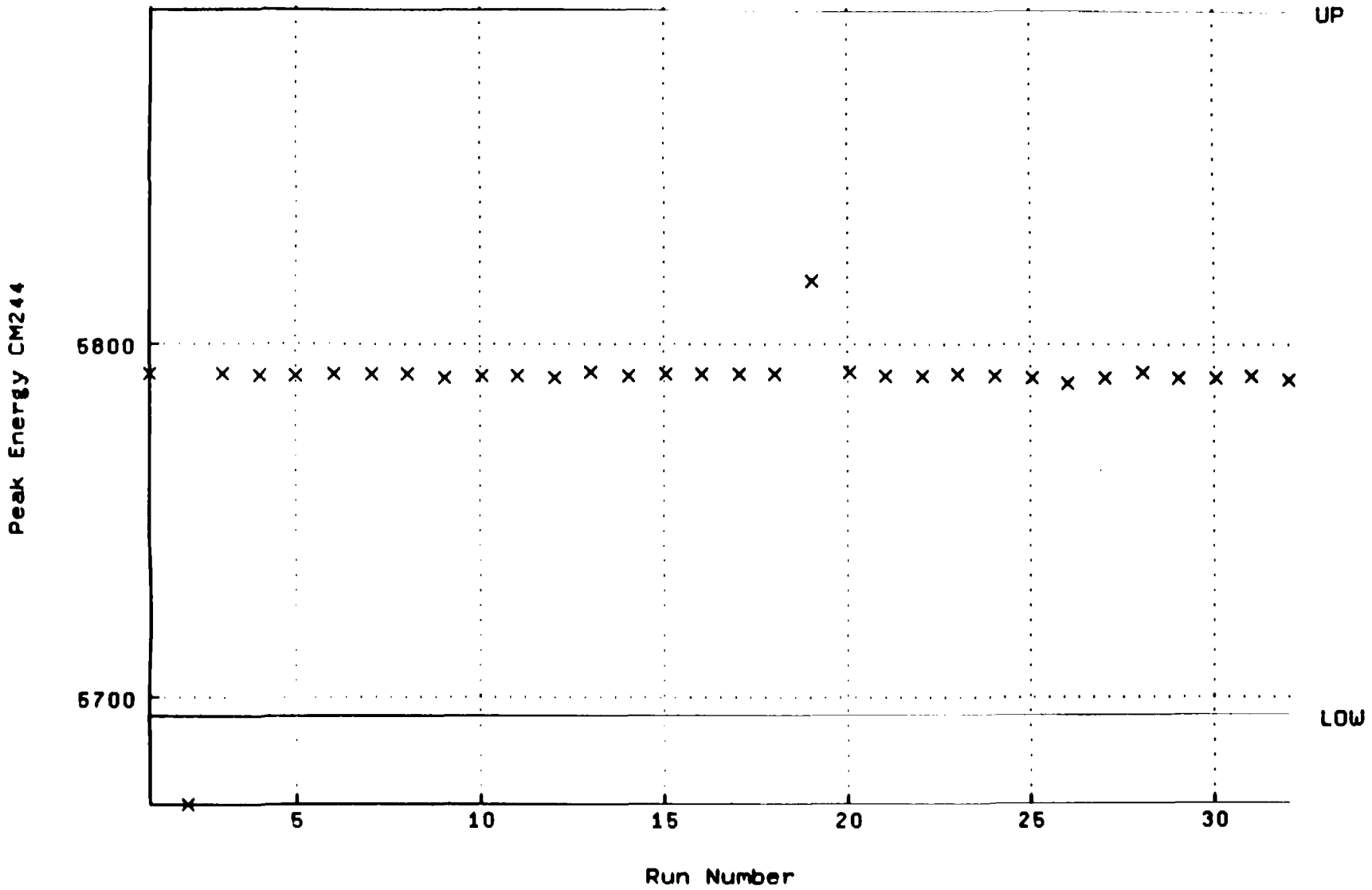
QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : PSENERGY-AM241 (Peak Energy Am241)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 5375.00 through 5575.00

0660111



QA filename : 1DIA3:[ALPHA.ALUSR.QA.SECOND]BATCH_SECOND.QAF;3
Parameter Name : PSENERGY-CM244 (Peak Energy CM244)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 5695.00 through 5895.00

0650112



Review of QA results (Efficiency Calibration Check) 2-OCT-1995 11:52:

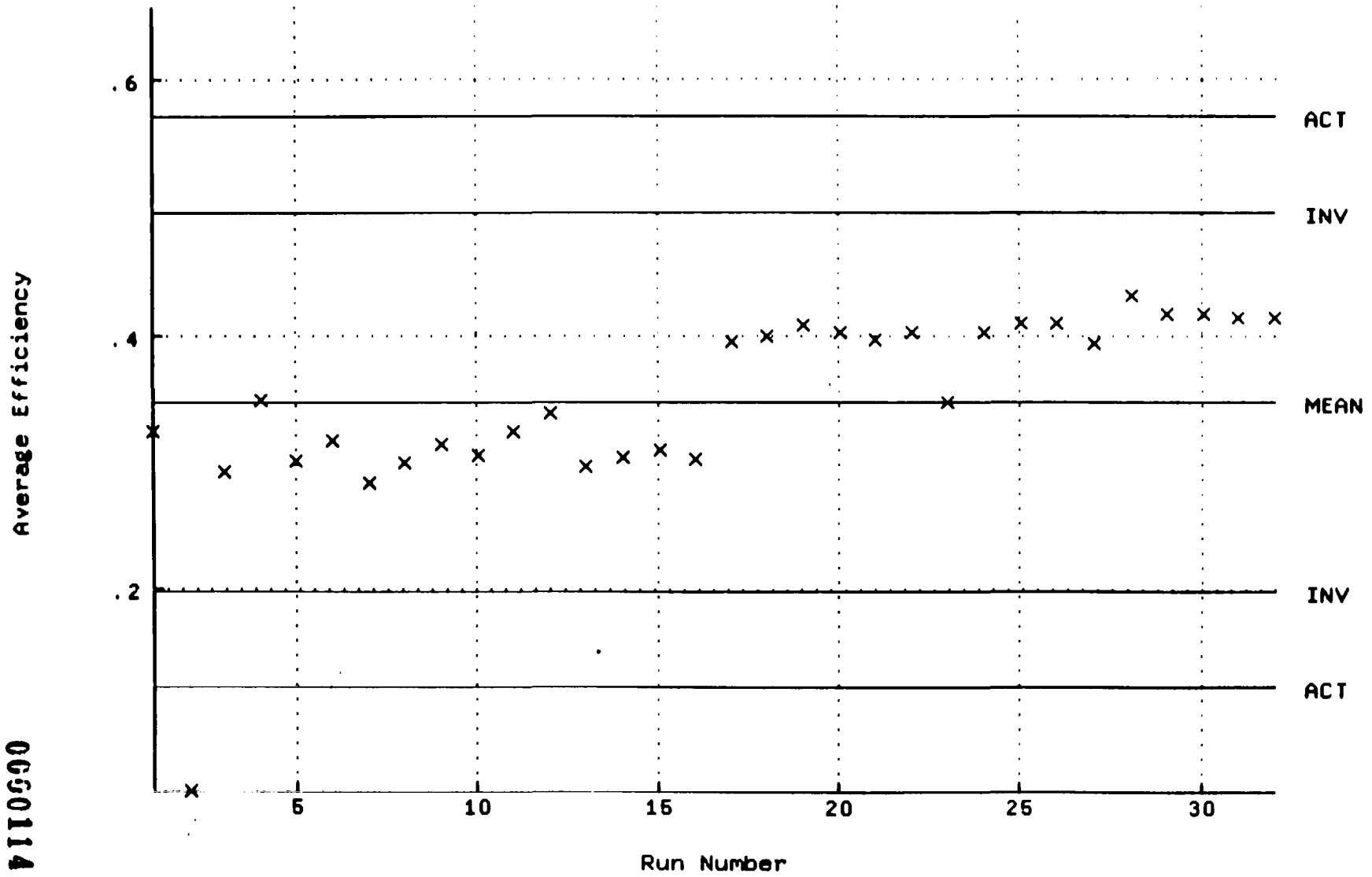
Detector	Parameter	Flag	Filename
1	ALL	Passed	PRIME_001_2oct95
2	PSAREA-PU239	Below	PRIME_002_2oct95
2	AVRGEFF	Action	PRIME_002_2oct95
2	PSFWHM-PU239	Action	PRIME_002_2oct95
3	ALL	Passed	PRIME_003_2oct95
4	AVRGEFF	Action	PRIME_004_2oct95
4	PSFWHM-PU239	Action	PRIME_004_2oct95
5	PSFWHM-PU239	Investigate	PRIME_005_2oct95
6	ALL	Passed	PRIME_006_2oct95
7	ALL	Passed	PRIME_007_2oct95
8	ALL	Passed	PRIME_008_2oct95
9	ALL	Passed	PRIME_009_2oct95
10	ALL	Passed	PRIME_010_2oct95
11	ALL	Passed	PRIME_011_2oct95
12	ALL	Passed	PRIME_012_2oct95
13	ALL	Passed	PRIME_013_2oct95
14	ALL	Passed	PRIME_014_2oct95
15	ALL	Passed	PRIME_015_2oct95
16	ALL	Passed	PRIME_016_2oct95
17	ALL	Passed	PRIME_017_2oct95
18	ALL	Passed	PRIME_018_2oct95
19	ALL	Passed	PRIME_019_2oct95
20	ALL	Passed	PRIME_020_2oct95
21	ALL	Passed	PRIME_021_2oct95
22	PSFWHM-PU239	Investigate	PRIME_022_2oct95
23	ALL	Passed	PRIME_023_2oct95
24	ALL	Passed	PRIME_024_2oct95
25	ALL	Passed	PRIME_025_2oct95
26	ALL	Passed	PRIME_026_2oct95
27	ALL	Passed	PRIME_027_2oct95
28	ALL	Passed	PRIME_028_2oct95
29	ALL	Passed	PRIME_029_2oct95
30	ALL	Passed	PRIME_030_2oct95
31	ALL	Passed	PRIME_031_2oct95
32	ALL	Passed	PRIME_032_2oct95

APPROVAL DATE: 10-2-95 APPROVAL TIME: 1710

APPROVED BY: [signature] PROCEDURE # MA

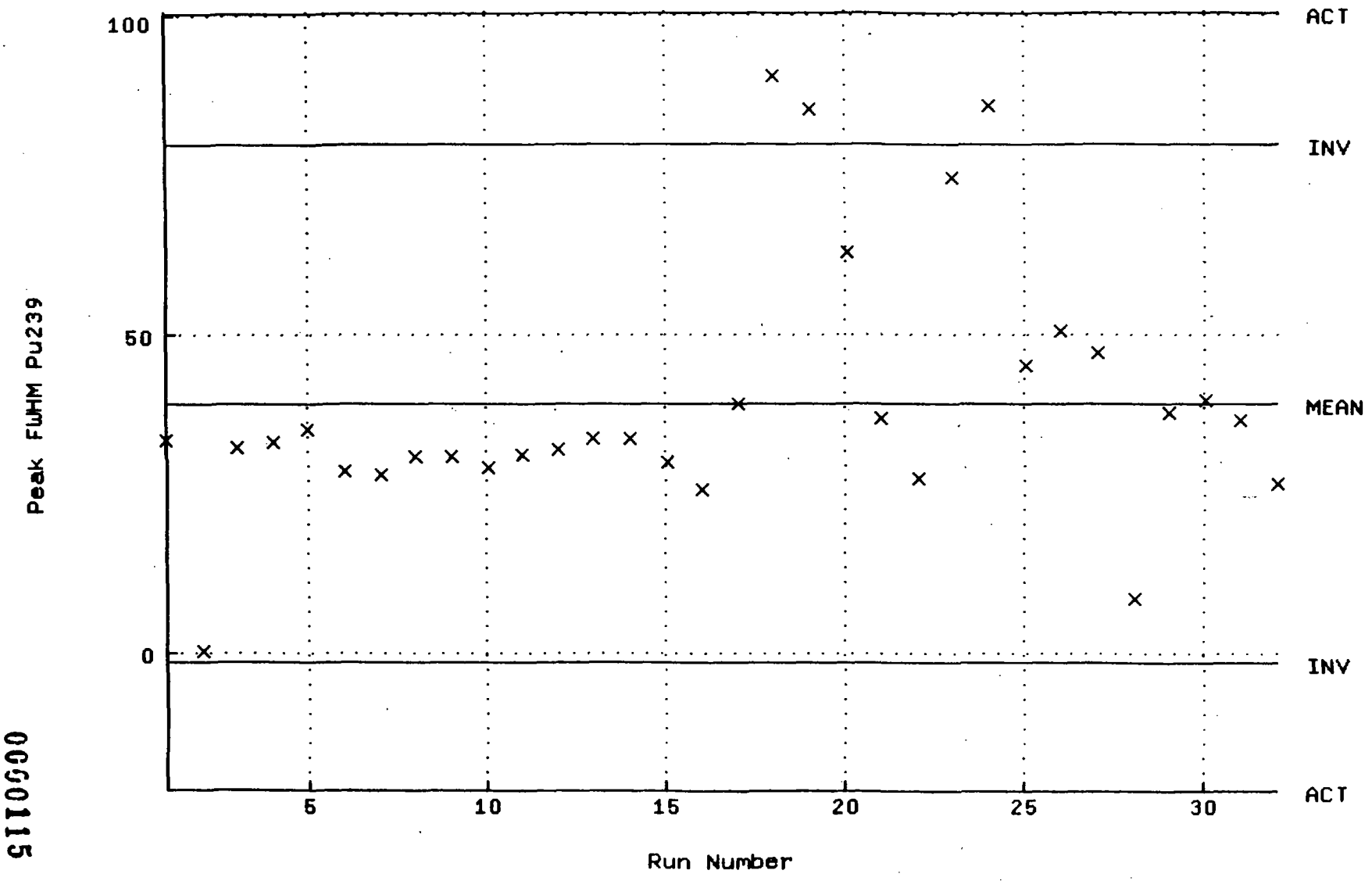
Report completed at 2-OCT-1995 11:55:32.90

QA filename : 1DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;5
Parameter Name : AVRGEFF (Average Efficiency)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Mean +- Std Dev : 0.348127 +- 7.475668E-02 (21.47 %)



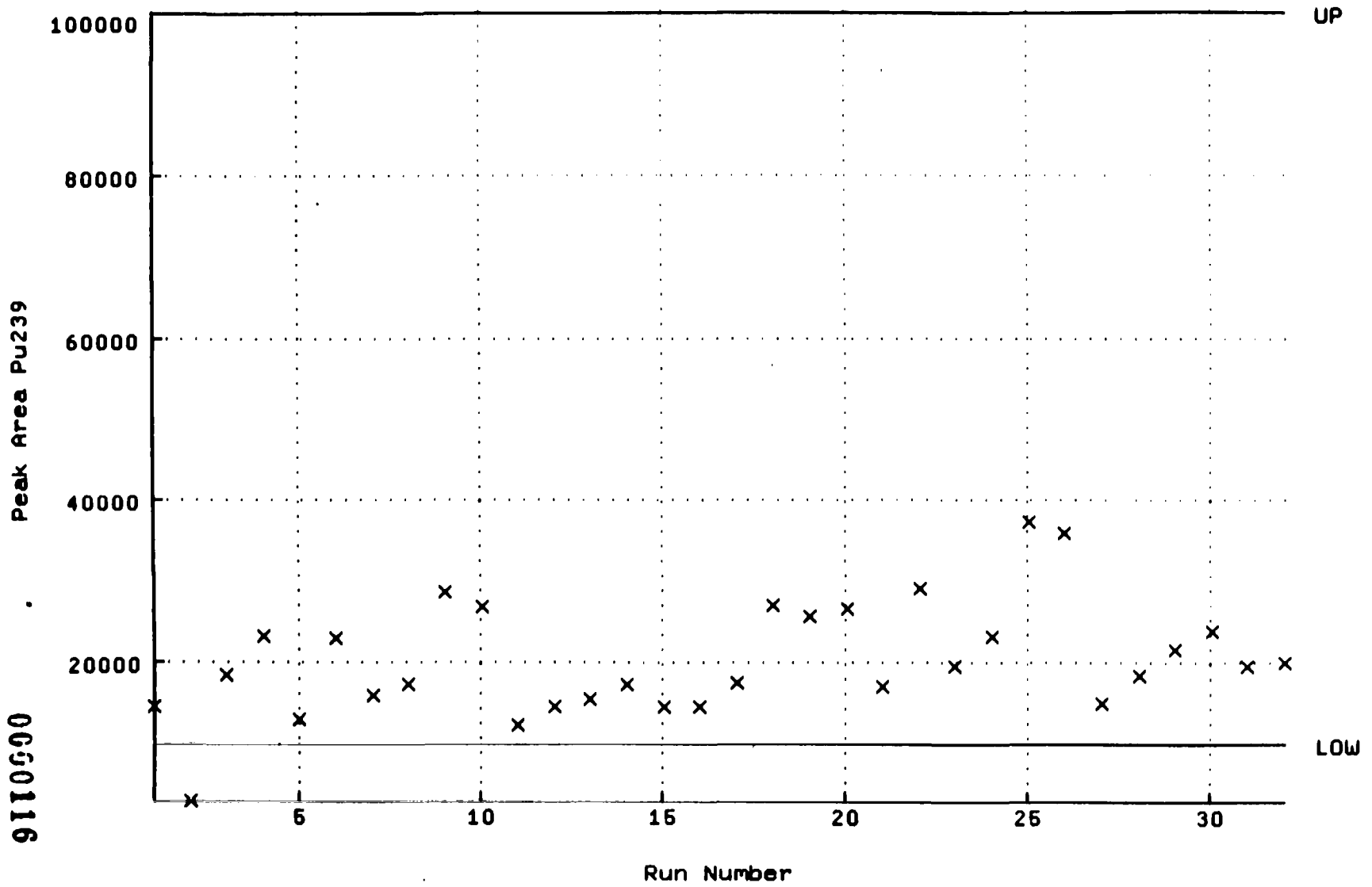
066011A

QA filename : 1DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;5
Parameter Name : PSFWHM-PU239 (Peak FWHM Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Mean +- Std Dev : 39.3506 +- 20.3196 (51.64 %)



0050115

QA filename : 1DIA3:[ALPHA.ALUSR.QA.PRIME]BATCH_PRIME.QAF;5
Parameter Name : PSAREA-PU239 (Peak Area Pu239)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: 10000.0 through 100000.



0110690

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MONTHLY BACKGROUND

ALSPIC4.DOC

0000117

Review of QA results (Backgrounds UU) 2-OCT-1995 08:34:50.28

Detector	Parameter	Flag	Filename
1	ALL	Passed	B_001_29sep95
2	ALL	Passed	B_002_29sep95
3	ALL	Passed	B_003_29sep95
4	ALL	Passed	B_004_29sep95
5	ALL	Passed	B_005_29sep95
6	ALL	Passed	B_006_29sep95
7	ALL	Passed	B_007_29sep95
8	ALL	Passed	B_008_29sep95
9	ALL	Passed	B_009_29sep95
10	ALL	Passed	B_010_29sep95
11	ALL	Passed	B_011_29sep95
12	ALL	Passed	B_012_29sep95
13	ALL	Passed	B_013_29sep95
14	ALL	Passed	B_014_29sep95
15	ALL	Passed	B_015_29sep95
16	ALL	Passed	B_016_29sep95
17	ALL	Passed	B_017_29sep95
18	ALL	Passed	B_018_29sep95
19	ALL	Passed	B_019_29sep95
20	ALL	Passed	B_020_29sep95
21	ALL	Passed	B_021_29sep95
22	ALL	Passed	B_022_29sep95
23	ALL	Passed	B_023_29sep95
24	ALL	Passed	B_024_29sep95
25	ALL	Passed	B_025_29sep95
26	ALL	Passed	B_026_29sep95
27	ALL	Passed	B_027_29sep95
28	PSCTSS-U234	Above	B_028_29sep95
29	ALL	Passed	B_029_29sep95
30	ALL	Passed	B_030_29sep95
31	ALL	Passed	B_031_29sep95
32	ALL	Passed	B_032_29sep95

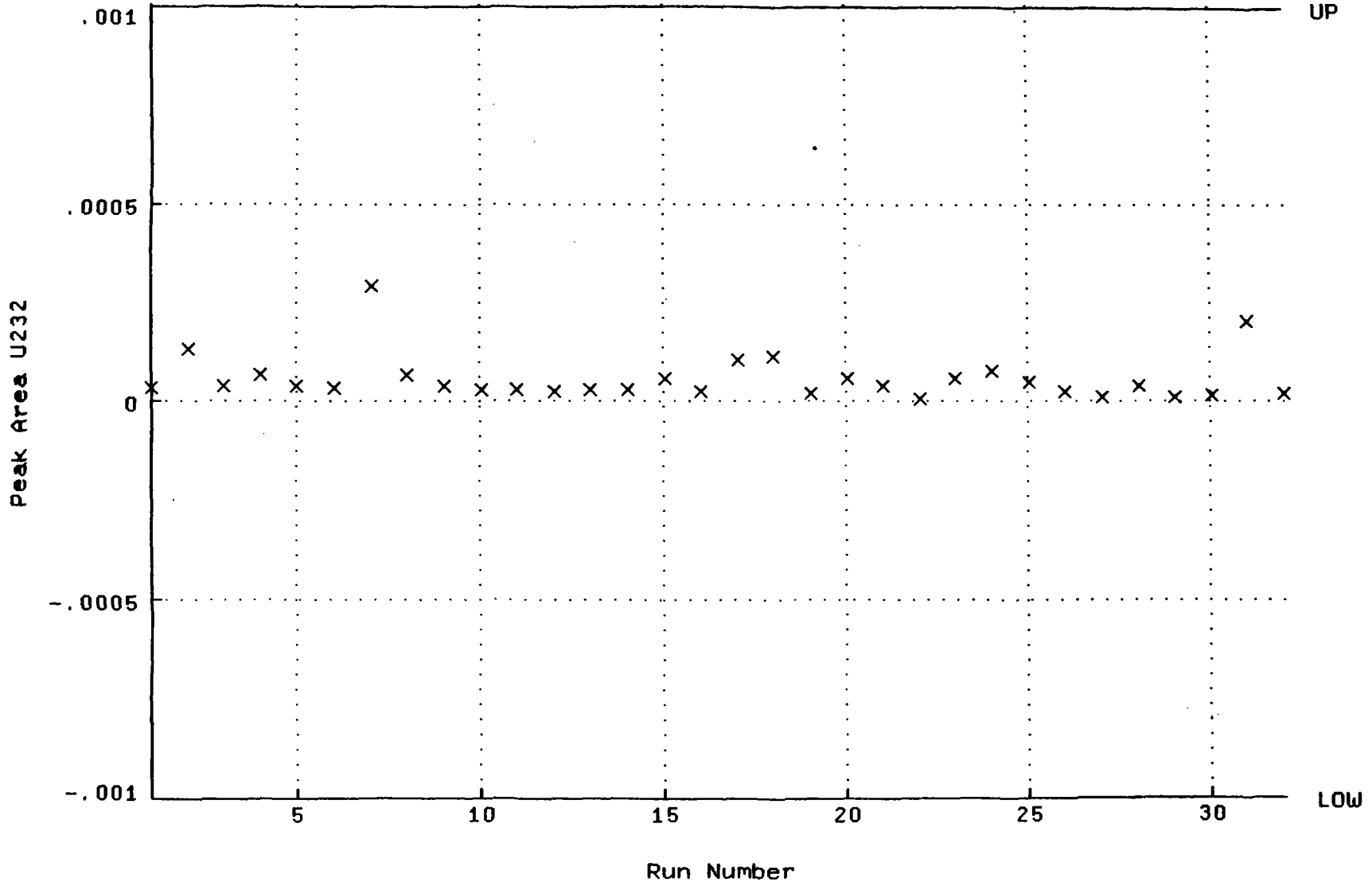
APPROVAL DATE: 10-2-95 APPROVAL TIME: 1730

APPROVED BY: [signature] PROCEDURE # N4

Report completed at 2-OCT-1995 08:37:55.47

Det 28 to be used for CCS, MS only.

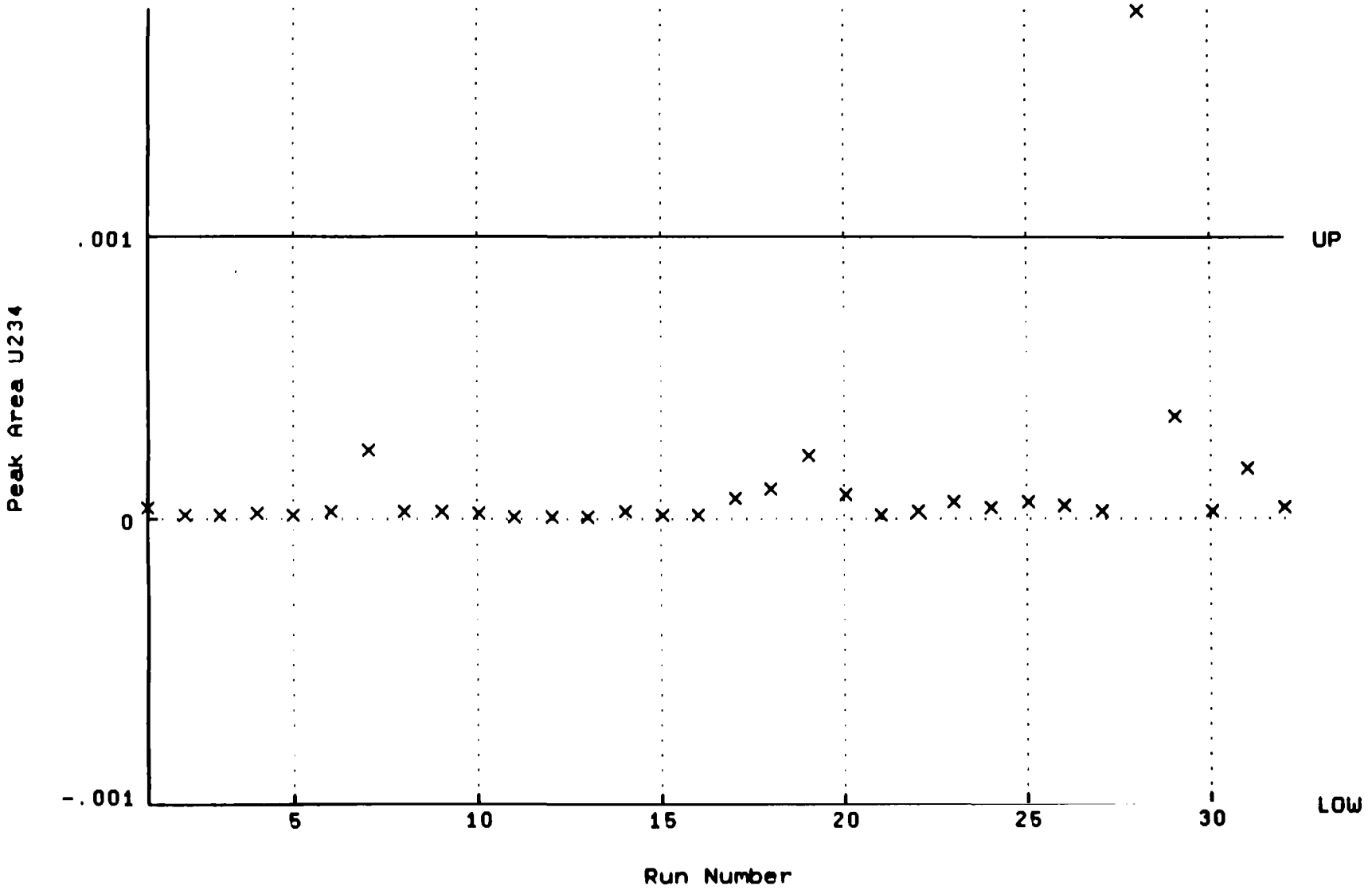
QA filename : 1DIA3:[ALPHA.ALUSR.QA.B]BATCH_B_UU.QAF;1
Parameter Name : PSCTSS-U232 (Peak Area U232)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: -1.000000E-03 through 1.000000E-03



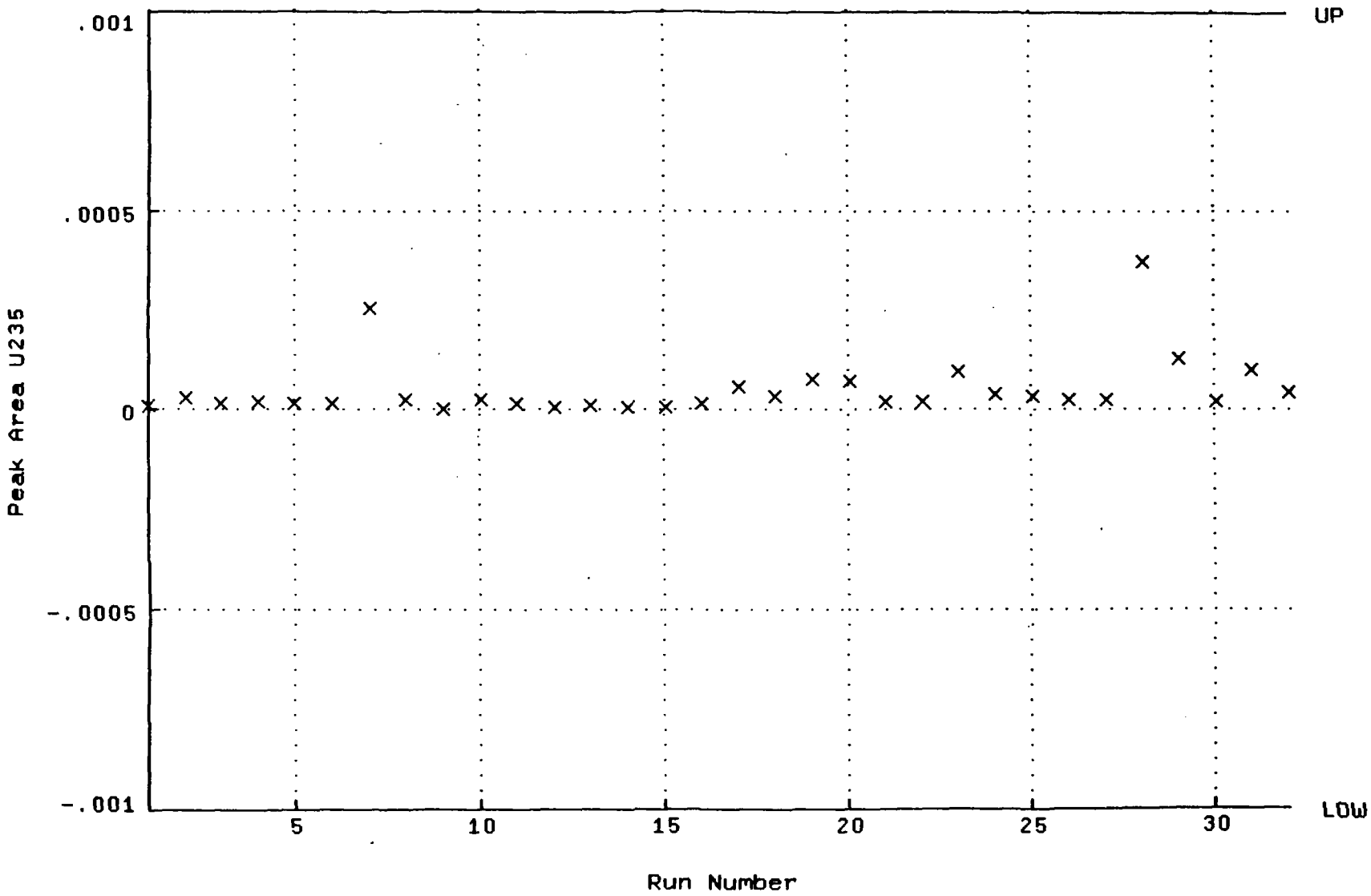
0660119

QA filename : 1DIA3:[ALPHA.ALUSR.QA.B]BATCH_B_UU.QAF;1
Parameter Name : PSCTSS-U234 (Peak Area U234)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: -1.000000E-03 through 1.000000E-03

0650120

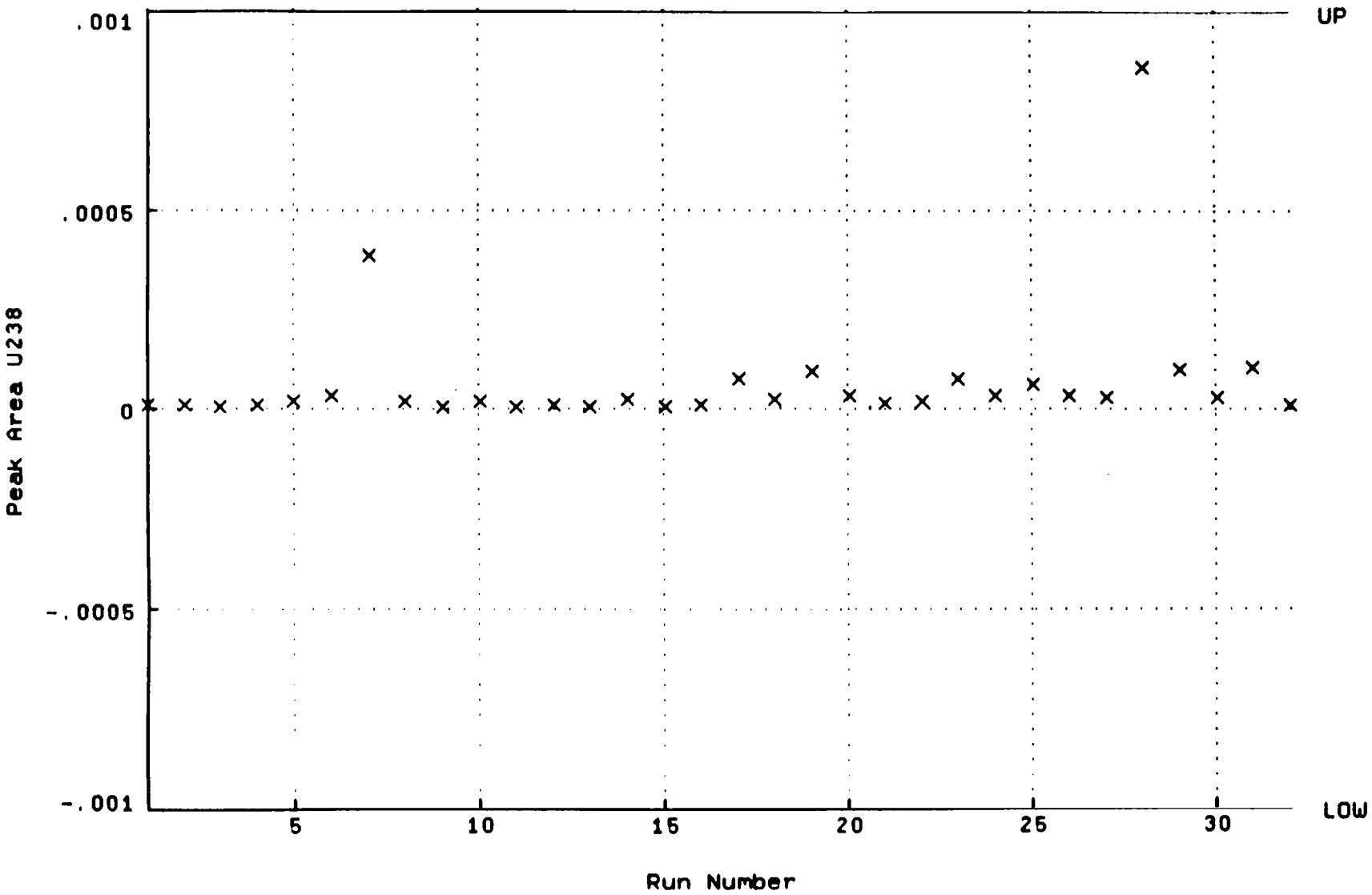


QA filename : 1DIA3:[ALPHA.ALUSR.QA.B]BATCH_B_UU.QAF;1
Parameter Name : PSCTSS-U235 (Peak Area U235)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: -1.000000E-03 through 1.000000E-03



0000121

QA filename : 1DIA3:[ALPHA.ALUSR.QA.B]BATCH_B_UU.QAF;1
Parameter Name : PSCTSS-U238 (Peak Area U238)
Start/End Dates : 1-JAN-1994 00:01:01 through 1-JAN-1994 00:02:16
Lower/Upper Lmts: -1.000000E-03 through 1.000000E-03



0050132

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BATCH SUMMARY SHEETS

VMS Quality Assurance Report V1.3 Generated 3-OCT-1995 09:07:45

QA filename : 1DIA3:[ALPHA.ALUSR.QA.Y]78772_Y_UU_SOIL.QAF;1

Parameter Name	: NCLSP1-U232		
Description	: Yield U232		
Parameter Units	: %	Parameter Type	: CONFIGURATION
Num Points Used	: 8	Num Records Read	: 8
Start Date	: 3-OCT-1995 06:49:30	End Date	: 3-OCT-1995 06:49:30
Minimum Value	: 28.1041	Minimum Date	: 3-OCT-1995 06:49:30
Maximum Value	: 57.3432	Maximum Date	: 3-OCT-1995 06:49:30
Out-of-range Test	: BOUNDARY	Test Source	: PARAMETER-DEPENDENT
Lower Limit	: 20	Upper Limit	: 110

Measurement Time	Sample ID	Value	Flags
3-OCT-1995 06:49:30	LCS	57.3432	
3-OCT-1995 06:49:30	BLK	56.9984	
3-OCT-1995 06:49:30	9369-001	42.2519	
3-OCT-1995 06:49:30	9369-001MS	33.4352	
3-OCT-1995 06:49:30	9369-001MSD	44.0689	
3-OCT-1995 06:49:30	9369-002	28.7704	
3-OCT-1995 06:49:30	9369-003	28.1041	
3-OCT-1995 06:49:30	9369-004	28.2870	

Review of QA results (Tracer Yields/FWHM) 3-OCT-1995 09:07:50.47

Detector	Parameter	Flag	Filename
3	ALL	Passed	R_78772$BLK_UU
1	ALL	Passed	C_78772$LCS_UU
7	ALL	Passed	S_78772$9369-001MSD_UU
6	ALL	Passed	S_78772$9369-001MS_UU
5	ALL	Passed	S_78772$9369-001_UU
8	ALL	Passed	S_78772$9369-002_UU
9	ALL	Passed	S_78772$9369-003_UU
10	ALL	Passed	S_78772$9369-004_UU

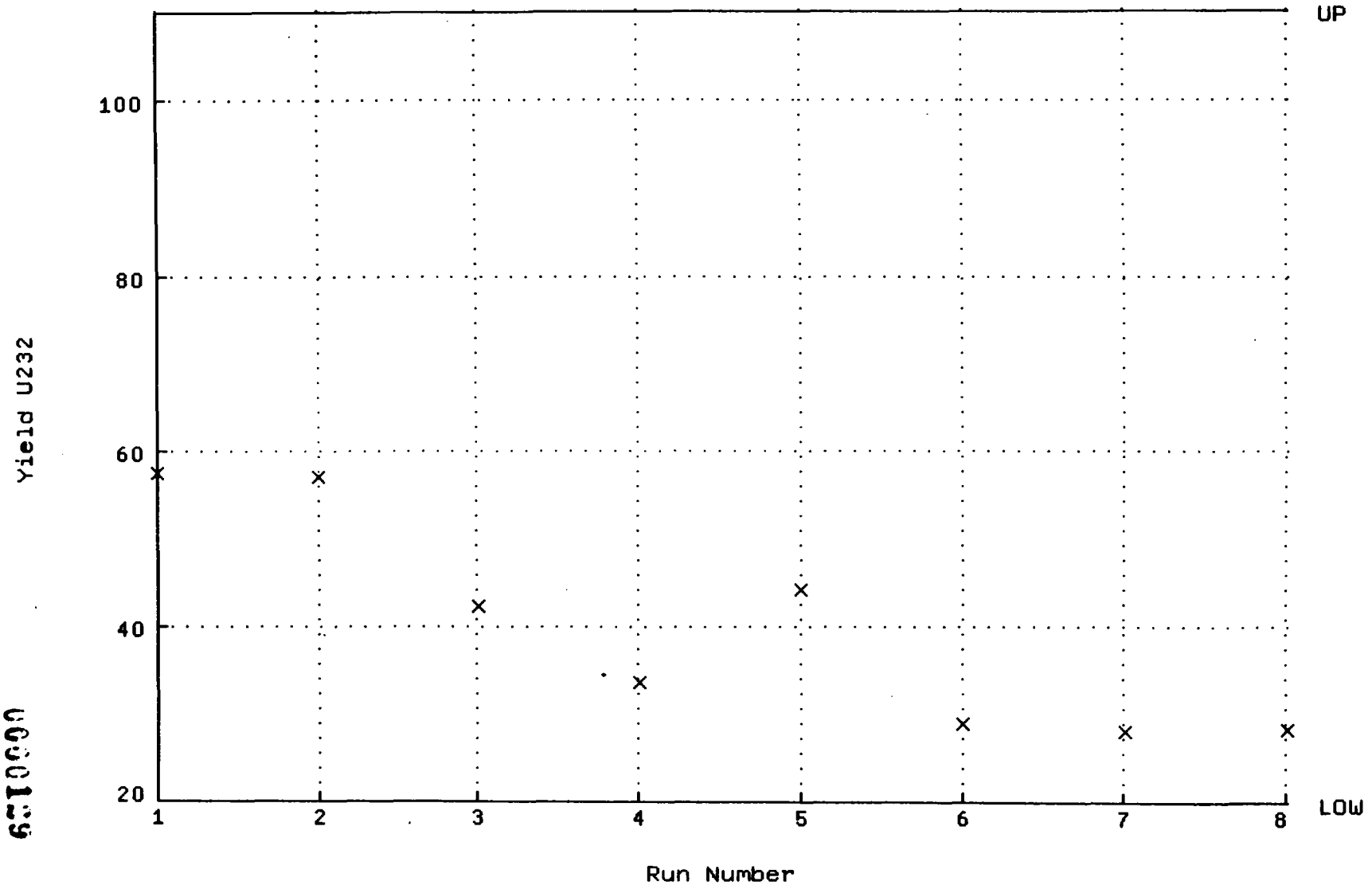
ND_AMS_QA_Y:78772_Y_UU_SOIL.QAF

APPROVAL DATE: 10-3-95 APPROVAL TIME: 1030

APPROVED BY: [signature] PROCEDURE # 13007

Report completed at 3-OCT-1995 09:08:39.87

QA filename : 1DIA3:[ALPHA.ALUSR.QA.Y]78772_Y_UU_SOIL.QAF;1
Parameter Name : NCLSP1-U232 (Yield U232)
Start/End Dates : 3-OCT-1995 06:49:30 through 3-OCT-1995 06:49:30
Lower/Upper Lmts: 20.0000 through 110.000



Quanterra
Environmental
Services

PREP DATA SHEET

Quanterra
Environmental Services

St Louis Laboratory
13715 Rider Trail North
Earth City, MO 63045-1205

Isotopic Uranium Analysis

Batch No. : 78772
Project No : 579.03

Prep Date 09-27-95

	Sample Number	Aliquot (GL)	Tracer Added	Tracer Verified	Spike Added	Spike Verified	Container Emptied
1	LCS - 78772	1.0000	KS	KS	KS	KS	NA
2	BLK - 78772	↓	↓	↓	NO	NO	↓
3	9369-001	1.0262	↓	↓	↓	↓	NO
4	-001MS	1.0211	↓	↓	KS	KS	↓
5	-001MSD	1.0100	↓	↓	↓	↓	↓
6	-002	1.0246	↓	↓	NO	NO	↓
7	-003	1.0431	↓	↓	↓	↓	↓
8	-004	1.0085	↓	↓	↓	↓	↓
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

10-02-95

Tracer

Isotope :	U232
Std Sol'n No. :	388-37A-1B
Vol (mL) :	1.0
Ref Activity (~~pCi/mL~~) :	22.82 dpm/mL
Act Ref Date :	04-01-92

Standard

Isotope :	U234/U238	U235	NA
Std Sol'n No. :	1843-1B		NA
Vol (mL) :	1.0		NA
Ref Activity (~~pCi/mL~~) :	12.945 dpm/mL		NA
Act Ref Date :	05-1985		NA

Comments:

Prepared By : KS
Date : 10-02-95

Reviewed and received by:
Date : 10-03-95

00000132

Quanterra
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Services

QC ACCEPTANCE SHEETS

VMS Quality Assurance Report V1.3 Generated 3-OCT-1995 08:55:45

QA filename : 1DIA3:[ALPHA.ALUSR.QA.C]BATCH_C_UU_SOIL.QAF;1

Sample ID : LCS Sample quantity : 1.00 gram
Sample date : 3-OCT-1995 00:00:00 Acquisition date : 3-OCT-1995 06:49:30
Elapsed live time: 0 01:39:48.99 Elapsed real time: 0 01:39:48.99

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Control Bias U238 [0.36+/-0.12]	0.46	0.75	
*Control Bias U234 [0.35+/-0.12]	0.26	-0.73	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: _____ Approval Date: 10 / 3 / 95

	LCS Spike	%Rec
^{238}U	5.437 cc/g	146%
^{234}U	↓	126%

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Services

LCS STANDARD SHEETS

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory-Las Vegas
Nuclear Radiation Assessment Division

Calibration Certificate

Description

Principal radionuclide: NATURAL URANIUM — Half-life: 4.5×10^9 years

Nominal activity: 11 nano (curies)

Nominal volume: 5 — ml in ampoule/bottle number: 1843-1

Measurement Activity of principal radionuclide

Activity per gram of this solution:

1.07 nano (curies) of Uranium-238 *Accompanied by 49 picoCuries of Uranium-235 per gram of solution.

at 0600 hours PST on May 1989

Activity of daughter radionuclide

The principal activity was accompanied at the quoted time by

1.07 nano (curies) Per gram

of the daughter nuclides Th-234, Pa-234, and U-234 assuming secular equilibrium.

Total mass of this solution

APPROX. 5.0 grams

Method of measurement

The solution was prepared gravimetrically by dissolving a known quantity of the National Bureau of Standards' SRM 950b which was 99.97 ± 0.02 percent Uranium Oxide (U_3O_8) in Nitric acid and diluting to a known weight. Natural Uranium was assumed to consist of 99.28 percent U-238 and 0.711 percent U-235 with specific activities of 3.36×10^2 and 2.16×10^3 nanoCuries per gram respectively.

Useful Life

This radionuclide has decayed through [ ] half lives since it was obtained by EMSL-LV

We recommend that this solution should not be used after INDEFINITE

0060136

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
GAITHERSBURG, MD 20899

REPORT OF TRACEABILITY

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory
Las Vegas, Nevada

Radionuclide	Uranium-238
Source identification	1843-1, prepared by EMSL
Source description	Liquid in 5-ml flame-sealed glass ampoule
Source mass	Approximately 5.0 grams
Source composition	Natural uranium in 0.6-molar nitric acid
Reference time	0700 EST, 15 May 1989

	NBS DATA	EMSL DATA
Radioactivity concentration	40.05 Bq g^{-1}	39.6 Bq g^{-1}
Overall uncertainty	1.47 percent(1)*	5.0 percent(2)
Photon-emitting impurities (Activities at reference time)	None detected(3)	None detected(4)
Measuring instrument	4πα liquid-scintillation counter calibrated using NBS SRM 4321 natural uranium solution	Quantitative dissolution of NBS SRM 950b natural uranium oxide
Half life	^{238}U : (4.468 ± 0.005) x 10^9 years(5) ^{234}Th: 24.10 ± 0.03 days ^{234}Pa: 6.70 ± 0.05 hours ^{234}U : (2.454 ± 0.006) x 10^5 years	
Difference from NBS		-1.16 percent(6)

For the Director,

Orlie D. Hoppes, Group Leader
Radioactivity Group
Center for Radiation Research

Gaithersburg, MD 20899
19 September 1989

*Notes on next page

0000137

NOTES

(1) Individual uncertainties have the significance of one standard deviation of the mean, or an approximation thereof. The combined uncertainty is the individual uncertainties shown below added in quadrature. The overall uncertainty is taken to be three times the combined uncertainty.

Source of uncertainty	Uncertainty (%)
a) liquid-scintillation measurements	0.12
b) gravimetric measurements	0.05
c) deadtime	0.05
d) background	0.10
e) original calibration of SRM 4321	0.13
f) count-rate-vs-energy extrapolation to zero energy	0.11
g) half life	0.00
h) photon-emitting impurities	0.43
Combined uncertainty	0.49
	* 3
Overall uncertainty	1.47

(2) Overall uncertainty reported by EMSL.

(3) The limit of detection for photon-emitting impurities is 0.01 $ys^{-1}g^{-1}$ for energies between 90 and 1900 keV , provided that the impurity photons are separated in energy by 5 keV or more from photons emitted in the decay of uranium-235 and uranium-238 and progeny.

(4) The limit of detection for ^{226}Ra is less than 0.24 Bq g^{-1}.

(5) Proposed Recommended List of Heavy Element Radionuclide Decay Data, INDC(NDS)-149/NE, International Atomic Energy Agency, December 1983.

(6) This result demonstrates the traceability of EMSL to NBS, for this measurement, to within five percent as specified in the appendix, Traceability Studies, of the EPA-NBS interagency agreement of April 1976, as amended.

For further information call Larry Lucas at (301) 975-5546 or FTS 879-5546.

$$A = \lambda N \qquad \lambda = \frac{-\ln(0.5)}{T_{1/2}}$$

$$\frac{\text{Wt of U-238}}{\text{g soln}} = \frac{(N)(AW)}{Ao} = \frac{(A)(AW)}{(\lambda)(Ao)} = \frac{(A)(AW)(T_{1/2})}{-\ln(0.5)(Ao)}$$

$$\frac{(40.05)(238\ g)(4.468\ E09\ yr)(3.154E07\ sec/yr)}{(sec*g)\ (mol)\quad (-\ln(0.5))\quad (6.023E23/mol)} = \frac{(3.22\ E\text{-}03\ g)}{g\ soln}$$

$$= \frac{3.22\ mg\ U\text{-}238}{g\ soln} * \frac{1}{0.9928} = \frac{3.24\ mg\ U\ nat}{g\ soln}$$

A = Activity (sec^{-1})

λ = Decay constant (sec^{-1})

$T_{1/2}$ = Halflife (sec)

N = Number of atoms

AW = Atomic weight

Ao = Avogadro's number ($mols^{-1}$)

PROJECT [illegible] Continued From Page 2

NATURAL URANIUM STD FROM Log Book 356 ON PG #26. STD # 1843-1-2. Concentration of 240 dpm/ml was converted to ng/ml. The STD Dilutions for KPA are listed below

$$\left(\frac{240.06\ dpm}{1\ ml}\right)\left(\frac{1\ Ci}{2.22^{E12}\ dpm}\right)\left(\frac{1.0\ g}{3.37^{E-7}\ Ci}\right) = 3.21^{E-4}\ g/ml = 3.21^{E5}\ ng/ml$$

$3.21^{E5} \times \frac{1.0\ ml}{100\ ml} = 3210$ ng/ml TOTAL U # 1843-1-3A

$3210 \times \frac{6.3\ ml}{100\ ml} = 202$ ng/ml TOTAL U # 1843-1-3B

$3210 \times \frac{4.7\ ml}{100\ ml} = 150.7$ ng/ml TOTAL U # 1843-1-3C

$3210 \times \frac{3.1\ ml}{100\ ml} = 99.5$ ng/ml TOTAL U # 1843-1-3D

$3210 \times \frac{1.6\ ml}{100\ ml} = 51.4$ ng/ml TOTAL U # 1843-1-3E

$202.2 \times \frac{5.0\ ml}{100\ ml} = 10.1$ ng/ml TOTAL U # 1843-1-3F

$202.2 \times \frac{3.5\ ml}{100\ ml} = 7.1$ ng/ml TOTAL U # 1843-1-3G

$202.2 \times \frac{2.5\ ml}{100\ ml} = 5.1$ ng/ml TOTAL U # 1843-1-3H

$202.2 \times \frac{1.0\ ml}{100\ ml} = 2.0$ ng/ml TOTAL U 1843-1-3I

$10.1 \times \frac{10.0}{100\ ml} = 1.0$ ng/ml TOTAL U 1843-1-3J

[signature] 07-08-94

Continued on Page

Read and Understood By

0000140

[signature] 07-08-94 07-08-94 A.C. [signature] 07-08-94

Signed Date Signed Date

Obtained U-238 (Natural U) from EPA-LV activity concentration of 1.07 nCi/g. Reference date: May 1989

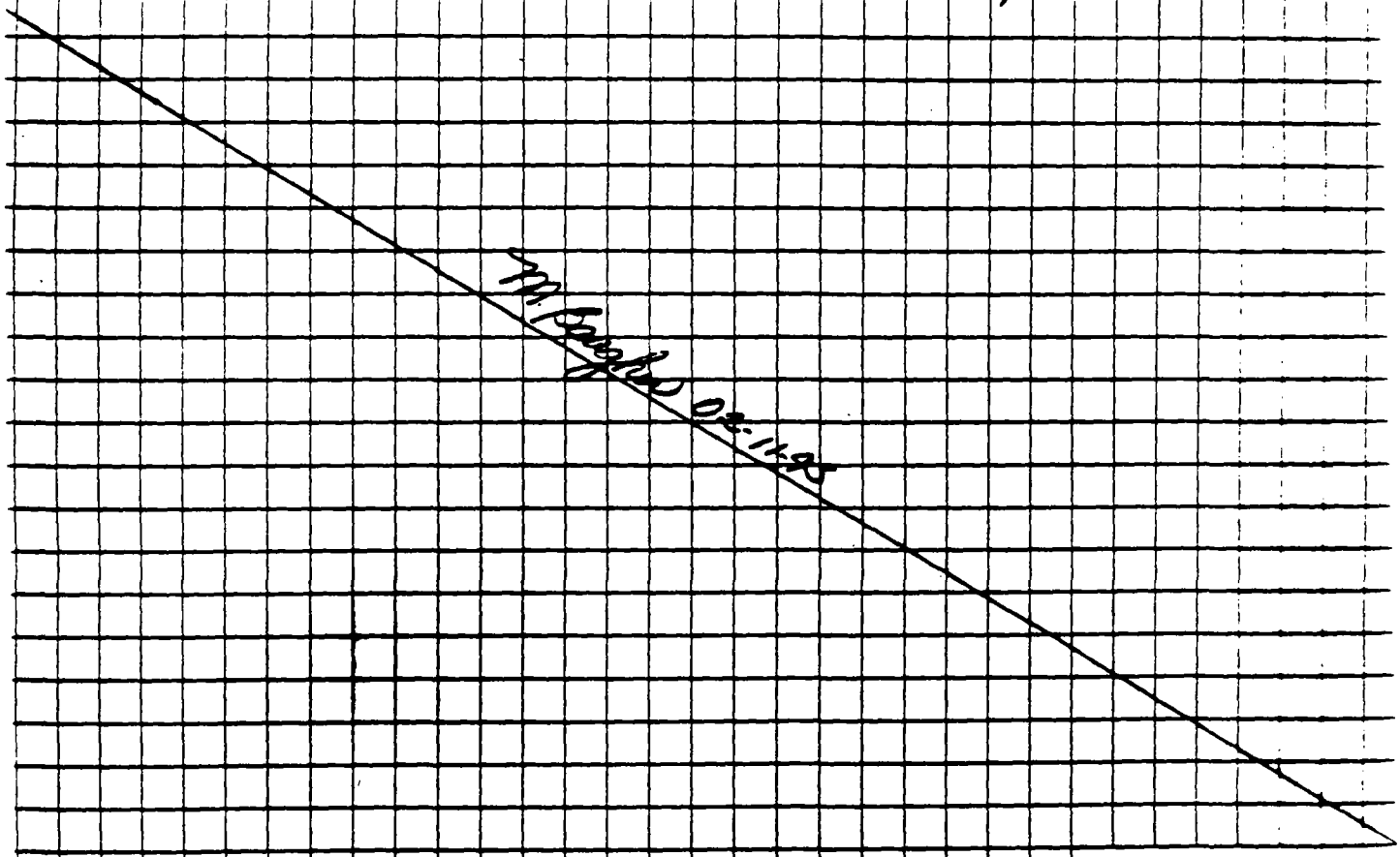
The half life for U-238 is 4.468E9 years. There is no significant decay correction at this time.

Gross Wt.	42.7086 g.
Tare Wt.	37.6556 g
Amount Transferred	5.0530 g.

$$\frac{\left(1.07\,\frac{nCi}{g}\right)\left(5.053\,g\right)\left(\frac{2.22E3\ dpm}{nCi}\right)}{50\ mL\ (in\ HNO_3)} \cdot 240.06\ \frac{dpm}{mL}\ U\text{-}238\ \#1843\text{-}1\text{-}2$$

as of May 1989

M. Baughen 02-11-93



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Read and Understood By

M. Baughen — Signed — 02-11-93 — Date

Br. Thurs — Signed — 2-17-93 — Date

0000141

Notebook No. [illegible]

Continued From Page

:CT Natural Uranium #1843-1

FF EMSLV

Natural uranium solution obtained through EMSLV was prepared as described below.

42.6137 g Wt of flask plus standard sol'n
37.5446 g Wt of flask
5.0691 g Amount transferred

nCi / gram		%
1.07	U-238	48.9
1.07	U-234	48.9
0.049	U-235	2.2

$\Sigma = 2.189$ nCi/g.

$$\left(\frac{2.189\ nCi}{g}\right)(5.0691\ g)\left(\frac{2.22E3\ dpm}{nCi}\right) = \boxed{492.7\ \frac{dpm}{ml}\ \text{Total U. \#1843-1}}$$

50 ml. 1 g HNO_3

Note: Total U contains following isotopes:

U238 492.7 * 0.489 = 240.9 dpm

U234 492.7 * 0.489 = 240.9 dpm

Bethmann
2-23-93

R. Patterson 09-23-92

Continued on Page

0000142

Read and Understood By

[illegible]	09-21-92	R. Patterson	09-23-92
Signed	Date	Signed	Date

PROJECT Natural U Solution #1643-1B

Continued From Page

Natural Uranium Solution obtained from EMSL with an activity concentration of 2.189 nCi/g was given std. soln # 1643-1.

References: From Std. Lot Book #356, pg. 9.

A Dilution of Std #1643-1 is shown below.

$$\frac{(492.7\ \text{dpm/ml})(5.0\ \text{ml})}{100.0\ \text{ml}} = 24.69\ \text{dpm/ml}$$

Standard Soln # 1643-1B Total U

$U_{238} = 12.345$ dpm/ml

$U_{234} = 12.345$ dpm/ml

Continued on Page

Signed

02-27-95
Date

Read and Understood By

Signed

0000143

02-27-95
Date

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide	U-232	Customer:	IT CORPORATION
Half Life:	68.9 ± 1.0 years	P.O.No.:	047870
Catalog No.:	7232-2	Reference Date:	September 1 1991 12:00 PST.
Source No.:	388-37	Contained Radioactivity:	1.039 µCi.

Description of Solution

a. Mass of solution:	5.2693	grams.
b. Chemical form:	UO2Cl2 in 2N HCl	
c. Carrier content:	None added	
d. Solution density:	1.0330	gram/ml @ 20°C.

Radioimpurities

See attached technical data sheet

Radioactive Daughters

See attached technical data sheet

Radionuclide Concentration

0.1974 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using alpha spectrometry with a surface barrier detector.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±1.3%
b. Random uncertainty in assay:	±1.0%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.3%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

0000145

Isotope Products Laboratories solution # 383-5A was prepared as follows

39.8628 g wt of ampule plus broken
34.6256 g wt of empty ampule plus broken
5.2372 g wt amount transferred

$$\frac{(5.2372\,g)\left(\frac{0.1494\,mCi}{4}\right)\left(2.2256\,\frac{dpm}{mCi}\right)}{50\,mL\ (\text{in } HNO_3)} = 45401.8\,\frac{dpm}{mL}\ U\text{-}232\ \#\ 383\text{-}37$$

$A = A_0 e^{-\lambda t}$

$t = 0.583\,yrs$ (04-01-91 to 04-01-92)

$\lambda = 0.693/72\,yrs$

$\lambda t = 0.0056$

$$45401.8\,\frac{dpm}{mL}\ e^{-\left(\frac{0.693}{72\,yrs}\times 0.583\,yrs\right)} = \boxed{45645\,\frac{dpm}{mL}\ U\text{-}232\ \#\ 383\text{-}37\ \text{as of } 04\text{-}01\text{-}92}$$

$$\frac{(45645\,\frac{dpm}{mL})(5\,mL)}{50\,mL} = \boxed{4564.5\,\frac{dpm}{mL}\ U\text{-}232,\ \#\ 383\text{-}37A}$$

$$\frac{(4564.5\,\frac{dpm}{mL})(5\,mL)}{50\,mL} = \boxed{456.4\,\frac{dpm}{mL}\ U\text{-}232\ \#\ 383\text{-}37B}$$

$$\frac{(456.4\,\frac{dpm}{mL})(10\,mL)}{100\,mL} = \boxed{45.6\,\frac{dpm}{mL}\ U\text{-}232\ \#\ 383\text{-}37B\text{-}1\ \text{in } 1\text{ in } HNO_3}$$

Continued on Page

Read and Understood By

M. Baughn 04-01-92 B Thimm

ECT U-232 #388-37A-1B

Notebook No. _____

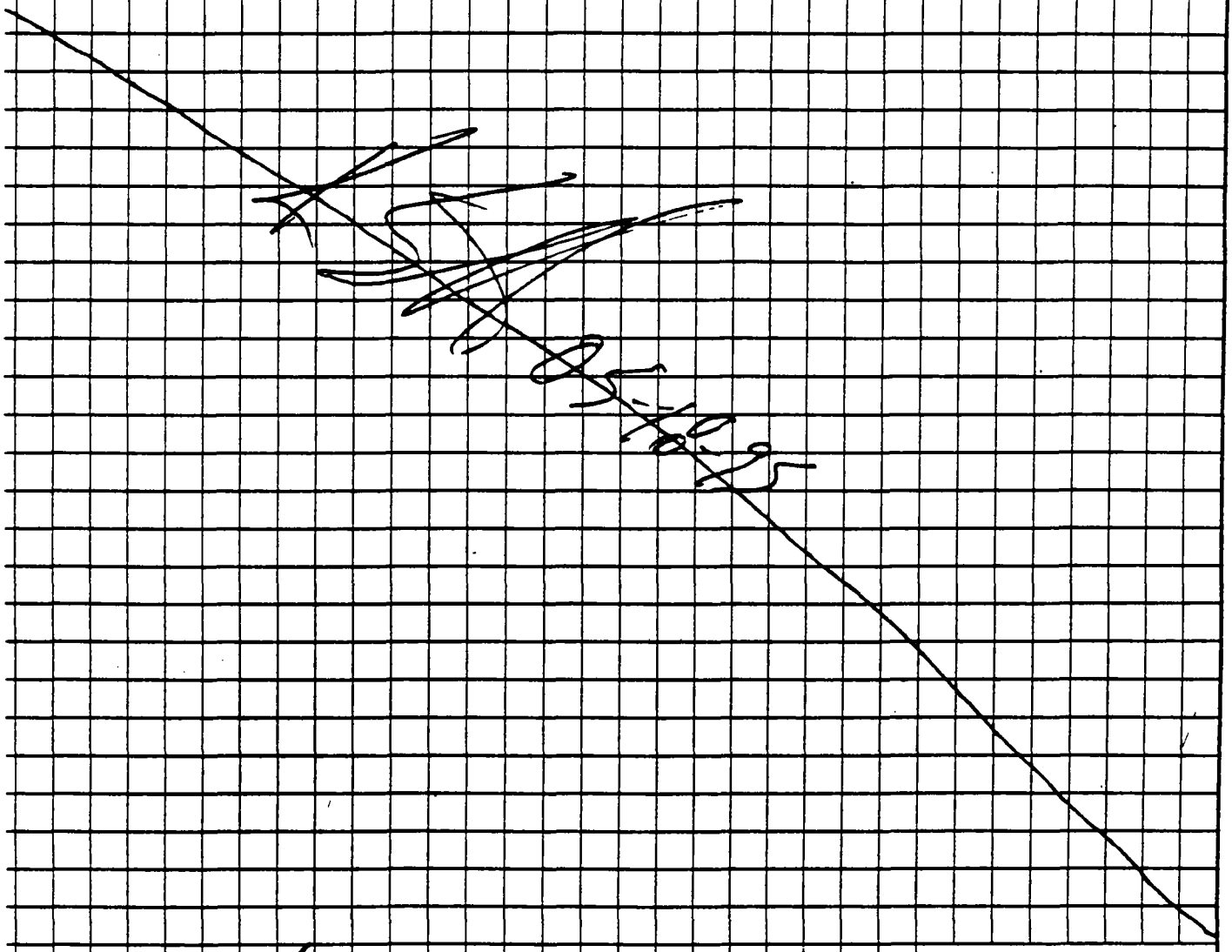
Continued From Page _____

PREPARED FROM U-232 SOLUTION #388-37A WITH A CONCENTRATION OF 4564.5 dpm/mL FROM STANDARD LOG BOOK #43, pg. 92.

$$\frac{(4564.5\ \text{dpm/mL})(2.5\ \text{mL})}{500\ \text{mL}} = 22.82\ \text{dpm/mL}$$

U-232 AS OF 04-01-92

STD. SOLUTION #388-37A-1B



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0050147

Signed _____ Date 05-18-95

Read and Understood By

Signed _____ Date 05-18-95

Quanterra

CHAIN-OF-CUSTODY SHEETS

0650148

Quanterra September 28, 1995 03:47 pm
Account: 11111 Project: 578.03 Kerr McGee QAS No. 578.03 Rev. 0
Master Sample Login: 9369

Project Manager: D. Mueller

Draft: Final: Entered and Reviewed by: Kathy A Stanfield Review: Diane W Mueller 9/28/95

Sample Header Template:

Sample No. / # / Comments / Data:	Client ID / Container Type	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Site	Rad Category / (Container Numbers:% Filled)	Rad Sample No.
9369-001	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179516:25)	
9369-001DUP	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179516:25)	
9369-001MS	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	04-OCT-95	IN HOUSE	2	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179516:25)	
9369-002	CD-S78E18N-2-3	Soil	22-MAY-94 16:00	24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179517:25)	
9369-003	CD-S81E5N-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179518:25)	
9369-004	CD-S81E5N-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	04-OCT-95	IN HOUSE	3	Screening not Required	
1	AN - Amber Glass-500ml	RAD/ISOU/Q4	S	COLD	02-OCT-95	20-NOV-94	R19D	(179519:25)	

0600146

3*=Sample has not been rad screened.

Quanterra St. Louis
Isotopic Thorium Analysis

Project: 537.01
Batch: 38993

SAMPLE NUMBER	PREP DATE	ALIQUOT (g)	COUNT DATE	COUNT TIME (MIN)	BKGD TIME (MIN)	DET NO.	EFF.	(COUNTS) ROI #1 Th-232	BKGD	(COUNTS) ROI #2 Th-230	BKGD	(COUNTS) ROI #3 Th-229	BKGD	(COUNTS) ROI #4 Th-228	BKGD
LCS 38993	6/7/94	2.0000	6/8/94	200	4000	1	0.310	1018	71	1002	176	777	63	1138	94
BLK 38993	6/7/94	2.0000	6/8/94	200	4000	2	0.317	3	41	106	86	691	43	31	105
5179-001	6/7/94	2.0891	6/8/94	200	4000	3	0.307	58	141	212	208	658	121	86	108
5179-001DUP	6/7/94	2.0208	6/8/94	100	4000	8	0.310	36	62	59	114	389	32	51	102
5179-005	6/7/94	0.0104	6/8/94	200	4000	5	0.311	288	138	228	234	1425	59	334	122
5179-011	6/7/94	0.0101	6/8/94	200	4000	6	0.311	327	153	131	222	967	107	417	127
5179-012	6/7/94	0.0101	6/8/94	200	4000	7	0.308	227	89	105	153	903	59	260	91

TRACER pCi added: 9.01
LCS Th-232 pCi/matrix: 5.15
LCS Th-230 pCi/matrix: 4.20

CALCULATED BY: LEG DATE: 6/27/94

REVIEWED BY: DATE: 6/27/94

Quanterra Environmental Services

Quanterra St. Louis
Revision Number 3
Start Date: 07/07/94

ITAS St. LOUIS
Isotopic Thorium Analysis

PROJ: 537.01

BATCH: 36993

SAMPLE NUMBER	CY	TH-229 pCi	TH-232 pCi/aliq	ERROR	MDA	TH-230 pCi/aliq	ERROR	MDA	TH-228 pCi/aliq	ERROR	MDA
LCS 36993	0.62	5.62E+00	5.91E+00	6.84E-01	6.66E-02	5.12E+00	5.99E-01	9.61E-02	6.60E+00	7.53E-01	7.45E-02
BLK 36993	0.54	4.69E+00	6.21E-03	2.68E-02	6.13E-02	2.87E-03	6.46E-04	8.08E-02	1.68E-01	7.69E-02	8.74E-02
5179-001	0.63	4.78E+00	3.37E-01	1.10E-01	9.96E-02	7.00E-01	1.22E-01	1.17E-01	5.33E-01	1.35E-01	8.94E-02
5179-001DUP	0.63	5.64E+00	3.66E-01	1.43E-01	9.76E-02	-1.06E-02	3.06E-03	1.21E-01	5.56E-01	1.74E-01	1.16E-01
5179-005	0.57	1.03E+01	3.42E+02	5.29E+01	1.81E+01	8.83E+00	1.51E+00	2.26E+01	3.99E+02	5.88E+01	1.73E+01
5179-011	0.77	6.96E+00	2.97E+02	4.43E+01	1.45E+01	-2.00E+01	4.36E+00	1.69E+01	3.62E+02	5.30E+01	1.34E+01
5179-012	0.73	6.56E+00	2.22E+02	3.66E+01	1.25E+01	-3.46E+01	8.18E+00	1.55E+01	2.54E+02	4.03E+01	1.26E+01

	Th-228	Th-230	Th-232
SPIKE% RECOVERY:	126	122	115
BLK ACT:	1.66E-01	< 0.061	< 0.061
DUP RPD:			

CALCULATED BY: LEG

DATE: 6/27/95

REVIEWED BY: [signature]

DATE: 6/27/95

ACT=(SCpm-BCpm)/(CF*EFF*ALIQ*CY)
ERROR = 1.96*ACT*SQRT((SC+BC)/(SC-BC)^2+.0025)
MDA = (4.65*SQRT(BC)+2.71)/(CF*EFF*ALIQ*CY*SCT)

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

Kerr - McGee Corporation
3301 N.W. 150th Street
Oklahoma City, OK 73134

September 25, 1995

ATTENTION: Garet E. Van De Steeg

On May 24, 1994, twelve (12) soil samples were received at Quanterra, St. Louis laboratory (formerly ITAS - St. Louis) from STS Consultants. The original data was reported on June 10, 1994. The following is a list of the samples and the Quanterra (ITAS) identification numbers:

CLIENT ID	QUANTERRA (ITAS) ID
CD-S156E49N-2-3	5179-001
CD-S156E49N-2-3	5179-001DUP
CD-S156E49N-3-4	5179-002
CD-S-82E25N2-3	5179-003
CD-S82E25N-3-4	5179-004
CD-S78E18N-2-3	5179-005
CD-S89E16N-2-3	5179-006
CD-S89E16N-3-4	5179-007
CD-S78E18N-3-4-9	5179-008
CD-S78E18N-3-4	5179-009
CD-S81E5N-2-3-9	5179-010
CD-S81E5N-3-4	5179-011
CD-S81E5N-2-3	5179-012

On September 18, 1995, a request was made by Kerr - McGee and STS Consultants for Quanterra to re - evaluate the data generated for Gamma Spectroscopy analysis regarding the detected Ra^{223} results. The results of this data review of Gamma Spectroscopy analysis by method HASL 300 4.5.2.3 follows in the enclosed Revised Case Narrative and corrected data sheets, which reflect the outcome of this data review. Attached are copies of all correspondence and Conversation Records.

If you have any questions or comments, please call me at (314) 298-8566.

Reviewed and approved:

Diane W. Mueller

Diane W. Mueller
Project Manager

Quanterra
Environmental
Services

[illegible]

REVISED CASE NARRATIVE

September 25, 1995

PURCHASE ORDER NUMBER:	27313-ZH
PROJECT NUMBER:	537.01
DATE RECEIVED BY LAB:	May 24, 1994
NUMBER OF SAMPLES:	Twelve (12)
SAMPLE TYPE(S):	Soil

I. Introduction

On May 24, 1994, twelve (12) soil samples were received at Quanterra, St. Louis laboratory (formerly ITAS) from STS Consultants. The following is a list of the samples and the Quanterra (ITAS) identification:

CLIENT ID	QUANTERRA (ITAS) ID
CD-S156E49N-2-3	5179-001
CD-S156E49N-2-3	5179-001DUP
CD-S156E49N-3-4	5179-002
CD-S-82E25N2-3	5179-003
CD-S82E25N-3-4	5179-004
CD-S78E18N-2-3	5179-005
CD-S89E16N-2-3	5179-006
CD-S89E16N-3-4	5179-007
CD-S78E18N-3-4-9	5179-008
CD-S78E18N-3-4	5179-009
CD-S81E5N-2-3-9	5179-010
CD-S81E5N-3-4	5179-011
CD-S81E5N-2-3	5179-012

A complete data package was sent on June 10, 1994. At the clients request on September 18, 1995, the gamma spec analyses was re - evaluated regarding the detect Ra^{223} results. The revised data sheets are attached and comments follow.

II. Analytical Results and Methodology

The analytical results for this report are presented by analytical tests. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits.

The analyses requested include: Gamma spectroscopy by method HASL 3004.5.2.3, Isotopic Thorium and Isotopic Uranium by method U-NAS-NS-3-5-, TCLP Semivolatiles by EPA method 8270, TCLP ICAP Metals, cyanide by EPA method 9010, Flashpoint by EPA method 1010, Paint Filter Test by EPA method 9095, pH by EPA method 9045, Percent Moisture by ITAS SOP PM, Sulfide by EPA method 9030, TOX by EPA method 9020, Total Organic Carbon by EPA method 9060, and TCLP Volatiles.

III. Quality Control

The QA/QC information can be found immediately following the analytical data. This QA/QC data are used to assess the laboratory's accuracy and precision during the analytical procedure.

IV. Comments/Nonconformances

GAMMA SPECTROSCOPY

At the request of the client, a review of the gamma spectroscopy report for ^{223}Ra was performed. For the samples which had ^{223}Ra, the sample spectrums were checked for the presence of the ^{223}Ra reported, all but one sample had the report based on gamma peaks at 270.12 keV and 154.02 keV. Sample 5179-004 only identified the 270.12 keV line.

Since the client did not suspect ^{223}Ra was present, the sample spectrums were checked for the presence of ^{219}Rn (the first daughter of ^{223}Ra) which has energy lines at 401.81 keV and 271.23 keV. The presence of the daughter ^{211}Bi was also checked at energy line of 351.07. None of the samples had ^{219}Rn or ^{211}Bi present.

The sample spectrums were checked for the presence of ^{227}Th and ^{227}Ac which are the precursors for ^{223}Ra. The energy lines checked were 236.0 keV and 329.7 keV for ^{227}Th and 256.2 keV for ^{227}Ac. Neither ^{227}Th nor ^{227}Ac were present.

A search of the gamma library and the spectra indicate that ^{228}Ac (daughter of ^{228}Ra) has an energy line at 270.23 keV and 154.2 keV. Since the samples contained ^{228}Ra, the 270 keV and 154 keV peak appears to be due to ^{228}Ra, not ^{223}Ra.

Therefore, since no ^{223}Ra daughter or precursor was identified, and ^{228}Ra may have interfered with the ^{223}Ra energy lines, it is concluded that ^{223}Ra is not present and has been deleted from report.

ISOTOPIC URANIUM

Sample CD-S156E49N-2-3 (5179-001) was selected for batch QC. Both the sample and the duplicate had chemical yields less than 20% for Uranium indicating a possible matrix effect. Both sets of data are reported.

Reviewed and approved:

Diane W Mueller

Diane W. Mueller
Project Manager

IT ANALYTICAL -- ST. LOUIS
GAMMA SPECTROSCOPY

BATCH DATE: 1994-May-31 PROJECT NUMBER: 537.01 BATCH NUMBER: 38537

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-001	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 09:46:57

ISOTOPE:	K-40	PB-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	1.39E+01	1.56E+00	1.24E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.45E+00	1.40E-01	1.15E-01						
MIN DET ACT:	6.97E+00	2.01E-01	1.89E-01	1.12E+00	6.49E+00	1.86E+01	1.76E+00	5.72E+01	6.98E-01

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-001DUP	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 09:46:57

ISOTOPE:	K-40	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	7.53E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.36E+00							
MIN DET ACT:	3.47E+00	3.34E-01	1.62E+00	1.74E+01	8.29E+01	3.61E+00	7.23E+02	1.18E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-002	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 09:46:56

ISOTOPE:	K-40	PB-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	1.20E+01	1.84E+00	1.78E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.89E+00	1.60E-01	2.12E-01						
MIN DET ACT:	6.47E+00	1.55E-01	2.35E-01	1.14E+00	5.70E+00	1.57E+01	1.92E+00	5.51E+01	6.14E-01

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-003	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 10:52:02

ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	6.72E+00	1.51E+01	1.31E+02	5.30E+01	3.22E+02	2.71E+02	6.76E+01	3.93E+02	6.07E+01	4.18E+02
2 SIGMA ERROR:	4.83E-01	2.23E+00	3.92E+00	8.45E+00	1.19E+01	1.12E+01	3.27E+00	4.39E+01	1.85E+00	1.22E+01
MIN DET ACT:	8.98E-01	1.53E+00	7.93E-01	9.68E+00	1.15E+00	7.10E+00	3.57E+00	1.26E+01	1.48E+00	1.92E+00

ISOTOPE:	TH-228	TH-230	TH-234	PA-234	U-234	U-235
ACTIVITY(pCi/G):	5.43E+02	NON-DETECT	6.59E+01	5.92E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.14E+01		6.60E+00	3.80E+01		
MIN DET ACT:	3.87E+01	1.49E+02	8.17E+00	7.15E+01	3.92E+02	4.61E+00

0000001

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
5137.01	5179-004	SOLID	4.500E+01 G	1994 May 22 12:00:00	DETECT2	1994 Jun 06 10:52:01

ISOTOPE	TL-208	PB-212	BI-212	RA-223	RA-226	RA-228	TH-228	TH-230	TH-234	U-234
ACTIVITY(pCi/G)	1.75E+01	4.85E+01	3.41E+01	1.33E+01	9.78E+00	5.39E+01	1.06E+02	NON-DETECT	3.59E+01	NON-DETECT
2 SIGMA ERROR	7.01E-01	2.10E+00	2.82E+00	1.01E+00	5.54E-01	2.02E+00	2.13E+01		4.65E+00	
MIN DET ACT	4.83E-01	8.17E-01	3.80E+00	1.02E+00	8.72E-01	1.15E+00	3.74E+01	2.48E+02	6.90E+00	1.85E+03

ISOTOPE	U-235
ACTIVITY(pCi/G)	NON-DETECT
2 SIGMA ERROR	
MIN DET ACT	2.83E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
5137.01	5179-005	SOLID	4.500E+01 G	1994 May 22 12:00:00	DETECT4	1994 Jun 06 10:52:02

ISOTOPE	K-40	I-129	CE-139	CE-141	EU-155	TL-208	PB-212	BI-212	RA-224	RA-226
ACTIVITY(pCi/G)	1.49E+02	2.81E+02	2.73E+00	5.59E+00	4.54E+01	5.44E+02	1.25E+01	1.16E+01	1.66E+01	1.62E+02
2 SIGMA ERROR	2.08E+01	1.19E+02	5.07E-01	1.08E+00	1.35E+01	3.07E+01	6.06E+01	8.12E+01	2.44E+02	9.18E+00
MIN DET ACT	1.55E+01	2.38E+00	9.05E-01	1.47E+00	2.61E+00	1.66E+00	1.93E+00	1.41E+01	2.14E+01	2.65E+00

ISOTOPE	RA-228	TH-228	TH-230	TH-234	PA-231	PA-234	U-234	U-235
ACTIVITY(pCi/G)	1.85E+03	2.04E+03	NON-DETECT	1.59E+02	5.14E+02	5.79E+02	NON-DETECT	NON-DETECT
2 SIGMA ERROR	1.22E+02	2.03E+02		1.99E+01	2.54E+02	1.05E+02		
MIN DET ACT	4.47E+00	6.45E+01	2.52E+02	1.36E+01	1.81E+01	2.36E+02	6.79E+02	7.96E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
5137.01	5179-006	SOLID	4.500E+01 G	1994 May 22 12:00:00	DETECT1	1994 Jun 06 12:05:50

ISOTOPE	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G)	1.06E+00	2.11E+00	2.01E+01	1.83E+01	5.63E+01	4.18E+01	1.17E+01	4.85E+01	1.51E+01	6.55E+01
2 SIGMA ERROR	2.71E-01	4.09E-01	6.81E-01	3.04E+00	1.98E+00	2.41E+00	8.23E-01	9.63E+00	5.68E-01	2.29E+00
MIN DET ACT	3.39E-01	6.44E-01	3.61E-01	4.13E+00	5.29E-01	3.06E+00	1.48E+00	5.80E+00	6.15E-01	8.66E-01

ISOTOPE	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G)	8.65E+01	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR	1.32E+01				
MIN DET ACT	1.64E+01	6.86E+01	3.59E+00	1.73E+02	1.93E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
5137.01	5179-007	SOLID	4.500E+01 G	1994 May 22 12:00:00	DETECT2	1994 Jun 06 12:05:50

ISOTOPE	TL-208	PB-212	BI-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G)	1.96E+01	5.53E+01	4.06E+01	1.39E+01	5.96E+01	NON DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR	8.38E-01	2.42E+00	3.13E+00	6.07E-01	2.10E+00					
MIN DET ACT	5.43E-01	8.92E-01	4.68E+00	9.29E-01	1.47E+00	5.31E+01	2.69E+02	7.20E+00	2.04E+03	3.12E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-008	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 12:05:49

ISOTOPE:	K-40	I-129	EU-155	TL-208	PB-210	PB-212	BI-212	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	3.51E+01	5.78E+01	5.34E+00	1.34E+02	3.39E+01	3.52E+02	2.64E+02	4.06E+02	4.72E+01	4.43E+02
2 SIGMA ERROR:	5.97E+00	2.43E+01	4.88E+00	7.83E+00	7.94E+00	1.59E+01	2.16E+01	7.01E+01	2.74E+00	2.95E+01
MIN DET ACT:	7.79E+00	1.61E+00	1.35E+00	8.15E-01	8.40E+00	9.55E-01	6.99E+00	1.05E+01	1.32E+00	1.97E+00

ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	4.38E+02	NON-DETECT	8.03E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.31E+01		9.75E+00		
MIN DET ACT:	3.37E+01	1.42E+02	6.97E+00	3.61E+02	4.10E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-009	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 13:25:47

ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	6.58E+00	1.47E+01	1.27E+02	3.06E+01	3.19E+02	2.57E+02	8.03E+01	3.84E+02	4.14E+01	4.12E+02
2 SIGMA ERROR:	5.57E-01	2.31E+00	3.82E+00	7.23E+00	1.19E+01	1.23E+01	3.84E+00	3.69E+01	1.32E+00	1.18E+01
MIN DET ACT:	6.48E-01	1.47E+00	7.98E-01	9.56E+00	1.09E+00	6.73E+00	3.40E+00	1.20E+01	1.45E+00	2.06E+00

ISOTOPE:	TH-228	TH-230	TH-234	PA-231	U-234	U-235
ACTIVITY(pCi/G):	5.28E+02	NON-DETECT	7.38E+01	5.09E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.26E+01		6.76E+00	3.33E+01		
MIN DET ACT:	3.71E+01	1.47E+02	7.96E+00	2.15E+01	3.81E+02	4.53E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-010	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 13:25:47

ISOTOPE:	K-40	EU-155	TL-208	PB-212	BI-212	RA-223	RA-226	RA-228	TH-228	TH-230
ACTIVITY(pCi/G):	4.21E+01	2.41E+01	1.68E+02	3.61E+02	2.99E+02	7.58E+01	9.26E+01	4.75E+02	7.60E+02	NON-DETECT
2 SIGMA ERROR:	7.17E+00	2.36E+00	4.13E+00	1.55E+01	1.26E+01	4.31E+00	2.72E+00	1.17E+01	7.13E+01	
MIN DET ACT:	1.21E+01	1.94E+00	1.43E+00	2.31E+00	1.14E+01	5.90E+00	2.46E+00	3.70E+00	1.07E+02	6.79E+02

ISOTOPE:	TH-234	PA-231	U-234	U-235
ACTIVITY(pCi/G):	NON-DETECT	1.35E+02	NON-DETECT	NON-DETECT
2 SIGMA ERROR:		5.28E+01		
MIN DET ACT:	1.95E+01	3.62E+01	5.22E+03	8.14E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-011	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 13:25:47

ISOTOPE:	K-40	CE-141	EU-155	TL-208	PB-210	PB-212	BI-212	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	8.51E+01	3.44E+00	2.33E+01	2.88E+02	3.93E+01	7.54E+02	5.79E+02	9.64E+02	3.91E+01	9.65E+02
2 SIGMA ERROR:	4.02E+01	8.21E-01	8.41E+00	1.65E+01	9.48E+00	3.26E+01	4.81E+01	1.17E+02	2.88E+00	6.32E+01
MIN DET ACT:	1.07E+01	1.04E+00	1.91E+00	1.15E+00	1.16E+01	1.28E+00	9.75E+00	1.40E+01	1.84E+00	2.88E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
		SOLID	4.500E+01 G	1994 May-22 12:00:00	DETECT1	1994 Jun-06 14:35:55

	ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235
	ACTIVITY(pCi/G):	1.14E+03	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
	2 SIGMA ERROR:	1.47E+02				
	MIN DET ACT:	4.70E+01	1.95E+02	1.25E+01	4.92E+02	5.75E+00

	ISOTOPE:	MN-54	EU-154	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
	ACTIVITY(pCi/G):	1.19E+01	2.80E+01	2.30E+02	1.04E+02	5.74E+02	4.66E+02	1.21E+02	6.31E+02	1.31E+02	7.41E+02
	2 SIGMA ERROR:	7.74E-01	6.05E+00	6.64E+00	1.66E+01	2.10E+01	1.86E+01	5.71E+00	8.64E+01	3.49E+00	2.12E+01
	MIN DET ACT:	3.60E-01	1.08E+00	1.14E+00	1.26E+01	1.54E+00	9.11E+00	3.74E+00	1.71E+01	1.96E+00	3.09E+00

	ISOTOPE:	TH-228	TH-230	TH-234	PA-231	U-234	U-235
	ACTIVITY(pCi/G):	9.16E+02	NON-DETECT	1.21E+02	9.92E+01	NON-DETECT	NON-DETECT
	2 SIGMA ERROR:	7.91E+01		1.20E+01	6.85E+01		
	MIN DET ACT:	5.05E+01	1.96E+02	1.07E+01	4.86E+01	5.14E+02	6.18E+00

	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
137.04	5187-001	SOLID	4.500E+01 G	1994-May-23 12:00:00	DETECT2	1994-Jun-06 14:35:55

	ISOTOPE:	EU-154	TL-208	PB-212	BI-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234
	ACTIVITY(pCi/G):	3.71E+00	1.92E+01	5.43E+01	3.81E+01	1.70E+01	8.34E+01	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
	2 SIGMA ERROR:	6.26E-01	8.35E-01	2.65E+00	3.58E+00	7.01E-01	3.12E+00				
	MIN DET ACT:	1.64E+00	5.86E-01	9.70E-01	5.15E+00	1.01E+00	1.40E+00	5.19E+01	2.82E+02	7.36E+00	2.11E+03

	ISOTOPE:	U-235
	ACTIVITY(pCi/G):	NON-DETECT
	2 SIGMA ERROR:	
	MIN DET ACT:	3.14E+00

	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
000.01	BLK38537	SOLID	4.500E+01 G	1994-May-31 12:00:00	DETECT4	1994-Jun-06 14:59:19

	ISOTOPE:	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
	ACTIVITY(pCi/G):	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
	2 SIGMA ERROR:							
	MIN DET ACT:	3.18E-01	6.06E-01	3.68E+00	1.13E+01	1.37E+00	3.95E+01	4.88E-01

	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO	COUNT DATE/TIME
000.01	LCS38537	SOLID	4.500E+01 G	1994-Oct-01 12:00:00	DETECT1	1994-Jun-06 16:06:15

	ISOTOPE:	CO-57	CO-60	Y-88	CD-109	SN-113	CS-137	CE-139	HG-203	RA-226	RA-228
	ACTIVITY(pCi/G):	8.43E+02	1.86E+03	1.06E+03	3.31E+04	6.99E+02	1.51E+03	4.12E+02	6.78E+01	NON-DETECT	NON-DETECT
	2 SIGMA ERROR:	3.27E+01	5.83E+01	4.27E+01	1.72E+03	3.56E+01	7.74E+01	2.27E+01	3.92E+00		
	MIN DET ACT:	2.53E+00	6.72E+00	5.42E+00	7.74E+01	5.06E+00	6.41E+00	2.60E+00	3.28E+00	8.81E+00	2.83E+01

	ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235	AM-241
	ACTIVITY(pCi/G):	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	3.52E+03
	2 SIGMA ERROR:						3.19E+02
	MIN DET ACT:	2.70E+02	9.14E+02	4.83E+01	3.23E+03	2.23E+01	8.22E+00

0000004

RADIOLOGICAL QA REVIEW FORMS

AND MEMORANDA

Quanterra
Environmental
Services

Memorandum

TO: Larry Taake, Chris Weathington, Project Management, Quality Assurance

FROM: Don Dihel

DATE: August 18, 1994

SUBJECT: Matrix Spikes for Gamma Scans

In the past, matrix spikes have been requested for Gamma Spectroscopy for soil samples. It is not possible for the radiochemistry group to add a spike to the surface of the soil and have a homogeneous mixture.

Therefore, matrix spikes for gamma spectroscopy in a soil matrix can not be performed which is the same policy at Richland.

STS CONSULTANTS, LTD.
QUALITY ASSURANCE PROGRAM PROJECT AUDIT
FORM P.4-1

1. Project Audited (Project Manager and STS Contract Lindsay Light II Site Characterization (R. Berggren, 27313-ZH

2. Assigned Project Auditor (QAO Completes) D. A. DOOLEY

3. Scope and Focus of Audit (QAO Completes) Review and verification of analytical lab results, calibrations, chain of custody forms and instrument printouts for Rn-222 and lab U, Th

Assigned Auditor understands the purpose, scope and focus of the audit.

Name: D. A. Dooley Date: 9/22/94

4. Applicable Documentation (Completed by Auditor): List documents (manuals, procedures, etc.) used to implement QA requirements for this project.

STS QAM dated: _____ STS QAP-1.1 dated: _____

STS Quality Assurance Procedures and Dates: (list each Procedure applicable to the project being audited.)

Procedure Name or Number	Effective Date
§ 5.0 of QAPP	
§ 9.0 of QAPP	
Procedure No. 4 - Quality Assurance Audits Procedures	

Other Applicable Documents (list titles and effective dates)

Title	Effective Date
IT Analytical Services Division - Operation Specific QAMP;	9/1/93
QAMP for Oak Ridge Laboratory; Oak Ridge Lab Standard	9/1/93, 4/2/92
Operating Procedure: Sequential Determination of Selected Alpha	
Emitting Isotopes; IT ORL SOP Sequential Determination of Ra-226/228	4/30/92

STS CONSULTANTS, LTD.
QUALITY ASSURANCE PROGRAM PROJECT AUDIT (continued)
FORM P.A-1

5. Audit Record (Completed by Auditor)

a. Project Files and Other Materials reviewed (list and date when reviewed)

Lab & space data (Summary, logs, printouts & CofCs) Reviewed 9/23/94
Lab isotopic U data (summary, logs, printouts & CofCs) Reviewed 9/23/94
Lab isotopic Th data (" " " ") Reviewed 9/23/94

b. Interviews conducted (Individuals interviewed and interview date)

N/A

c. Other Audit Activities (Specify activity conducted)

6. Audit Observations and Conclusions

(2) CofC continuation sheets not signed (all) - Cover sheet is signed OK

STS CONSULTANTS, LTD.
QUALITY ASSURANCE PROGRAM PROJECT AUDIT (continued)
FORM P.4-1

7. Specific Audit Findings N/A (OK)	Non-Conformance Yes	Non-Conformance No	Non-Conformance Time Period ____ to ____	Client Data, Reports, Conclusions Affected Yes	Client Data, Reports, Conclusions Affected No	Client Data, Reports, Conclusions Affected Uncertain	Corrective Action Yes	Corrective Action No
a.	☐	☐		☐	☐	☐	☐	☐
b.	☐	☐		☐	☐	☐	☐	☐
c.	☐	☐		☐	☐	☐	☐	☐
d.	☐	☐		☐	☐	☐	☐	☐
e.	☐	☐		☐	☐	☐	☐	☐
f.	☐	☐		☐	☐	☐	☐	☐
g.	☐	☐		☐	☐	☐	☐	☐
h.	☐	☐		☐	☐	☐	☐	☐
i.	☐	☐		☐	☐	☐	☐	☐

STS CONSULTANTS, LTD.
QUALITY ASSURANCE PROGRAM PROJECT AUDIT (continued)
FORM P.4-1

8. Audit Completed By (Date): _____

9. Audit Accepted By QAO: _____ Date: _____

10. Audit observations and findings presented and discussed with Project Manager:

Date: _____ QAO Signature: _____

11. Planned Corrective Actions (Columns 1-3 completed by Project Manager; Column 4 completed by Auditor)

(1) Finding (Refer to Item 7)	(2) Planned Corrective Action	(3) Date Corrective Action to be Complete	(4) Corrective Action Complete	
			Initials	Date
a.				
b.				
c.				
d.				
e.				
f.				
g.				
h.				
i.				

12. Planned Corrective Actions Approved:

Auditor: D A Dooley Date: 9/23/94

QAO: D. A. Dooley Date: 9/23/94

13. Audit Closure

All Corrective Actions Completed, no further action required. Audit Satisfactory.

QAO Signature: D. A. Dooley Date: 9/23/94

PM Signature: Richard G. Bye Date: 9/27/94

14. Date the Project Audit Form filed in Project Files: 9/27/94

WET CHEM

DATA SUMMARY

STRIP CHART

RUN SHEET

537-01
5179
CD-5156

ITAS-ST. LOUIS

CYANIDE REPORT

Pg. 1 of 1

PROP DATE: 05-27-94

Analyst: J. CORRO
Project No.: 388.01, 537.01
Reviewed by: R. Patterson

Batch No.: 38525

Analysis Date: 05-31-94
Method No.: 9010
Date: 05-31-94

TRUE VALUE	LAB ID	STANDARD ID	RAW VALUE x	DILUTION ÷	SAMPLE VOLUME (L or g) =	CYANIDE x	EXTRACT VOLUME (L) ÷	FRACTION SOLID =	CYANIDE FINAL CONCENTRATION (ug/L) (ug/g)	% RECOVERY	RPD
	QCBLK38525-1		~~<10~~ 1.655		0.5L		0.25		<5 ug/L		
50	CHK STD LOW QCLCS38525-1	AL2252-94	88.69						44.3	89	
	S181-010		177.6	X10					888		
	S192-004		254.3	X10					1270		
	QCBLK38525-2		-0.1815		5.068 g				<0.493 ug/g		
12.4	CHK STD LOW QCLCS38525-2	AL2254-94	241.1		5.021				12.0	97	
	S179-005		3.061		5.021			0.8446	<0.590		
	012		3.061		5.265			0.8649	<0.549		
150	CHK STD #10H	AL2256-94	281.9		0.5L				141 ug/L	94	

0000001

SL-91-INORG-0037

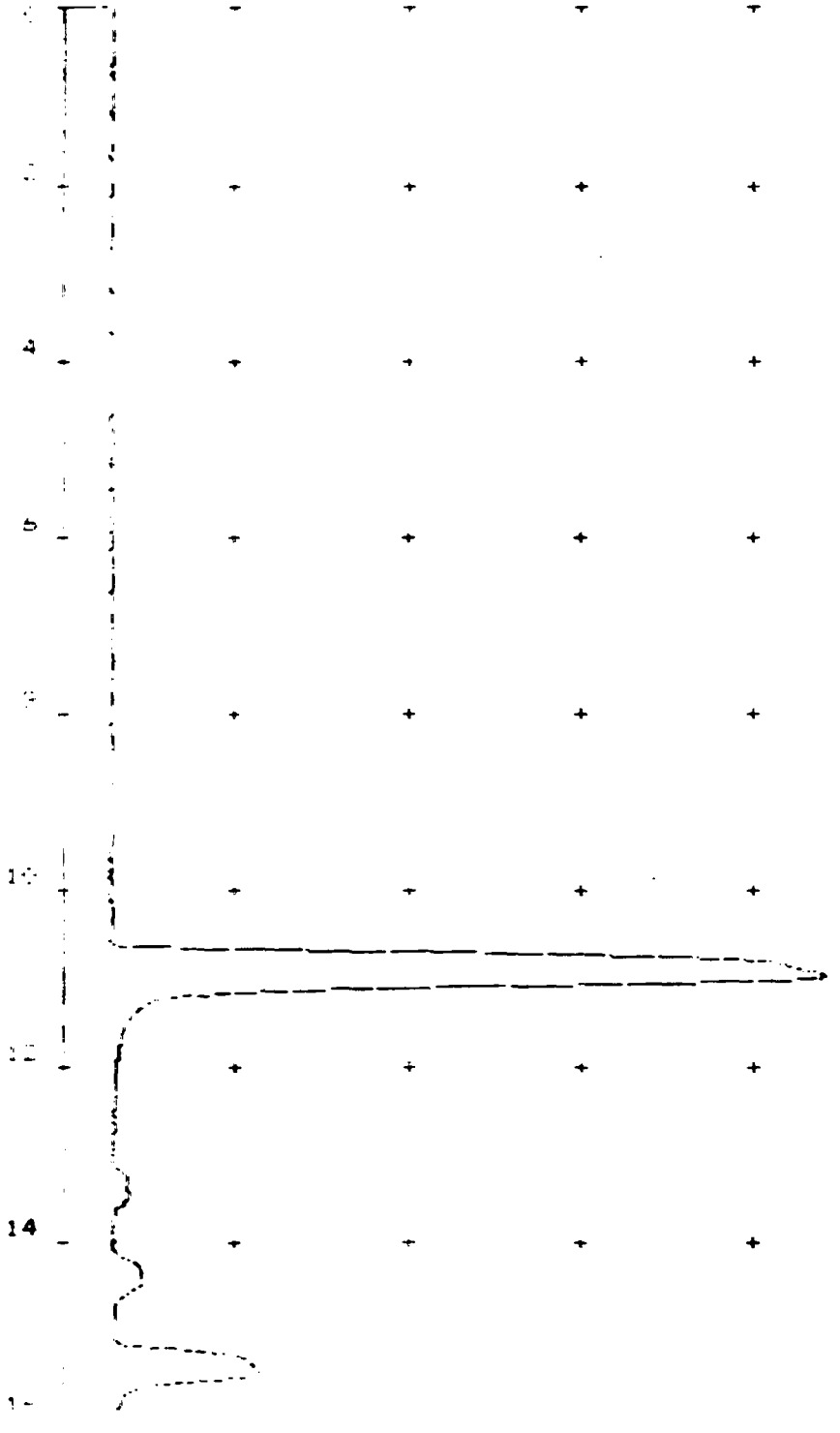
J. CARRIO
05-31-94
#38525
R. Patterson
05-31-94

Chart minimum: 0%, maximum 100%
Active analyses: 2

Input Filename: B:CN.INP
Time: 14:19: Date: 05-31-94
Operator: J.CARRIO

Comment: CYANIDE 05-31-94

There are 7458816 (bytes) free on disk.
File B:A0531CN.CHR will take approximately 7760 (bytes).

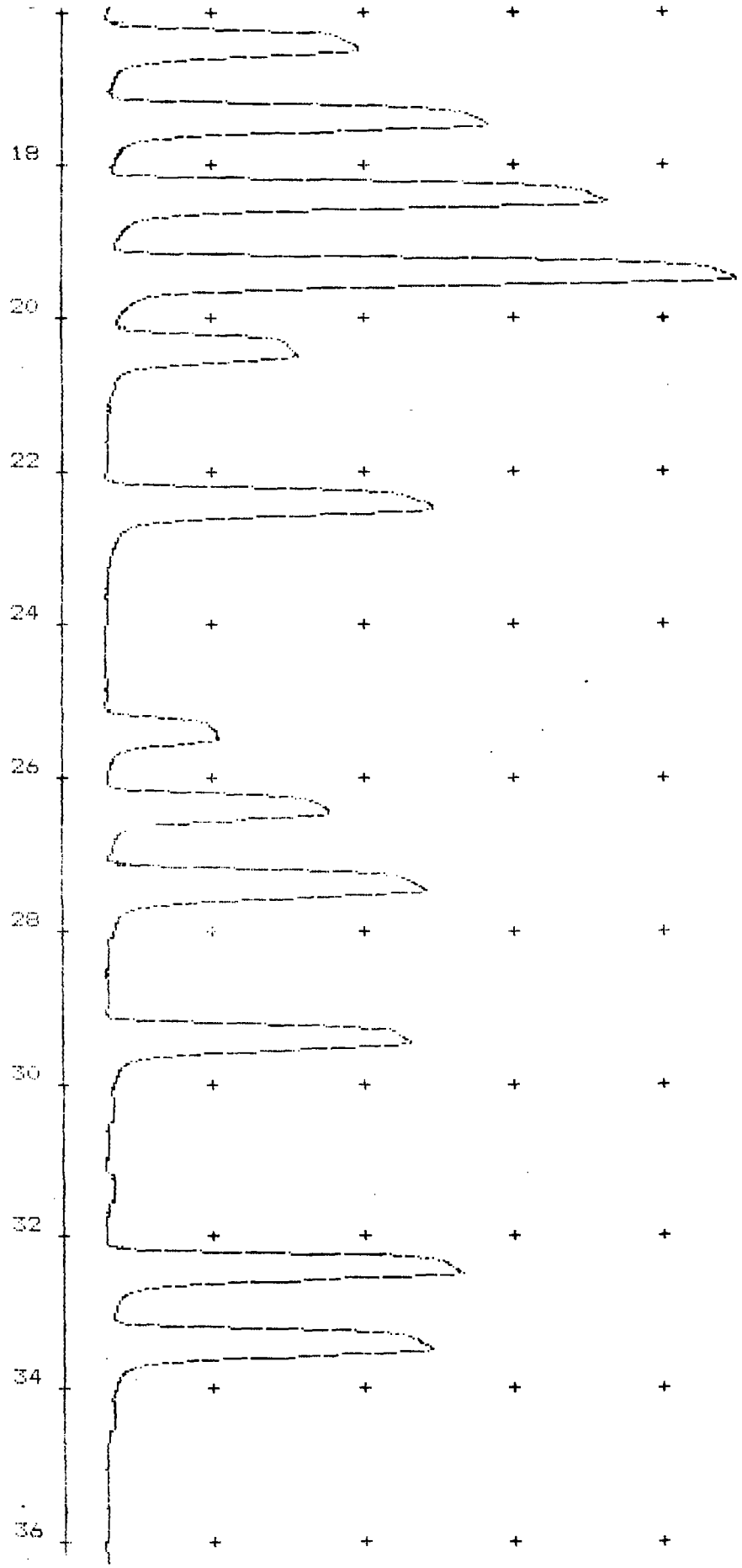


Channels 2
Base: 59
Gain: 34
CYANIDE
UG/L

Init base 234

Pk 1 CP 1 typ P
Rel Abs 0.31
Pk 2 CP 2 typ N
Pk 3 CP 3 typ N
Pk 4 CP 4 typ C
Pk 5 CP 5 typ N
Pk 6 CP 6 typ C
Pk 7 CP 7 typ N
Pk 8 CP 8 typ C
Pk 9 CP 9 typ N
Pk 10 CP 10 typ C

0000002



PK	11	CP 11	typ N	
PK	12	CP 12	typ C	
PK	13	CP 13	typ N	
PK	14	CP 14	typ C	
PK	15	CP 15	typ N	
PK	16	CP 16	typ C	
PK	17	CP 17	typ N	
PK	18	CP 18	typ C	495.9M
	Corr Coeff(R) =			0.9999
PK	19	CP 19	typ S	12.49M
PK	20	CP 20	typ S	150.9
PK	21	CP 21	typ S	5.124M
PK	22	CP 22	typ S	0.7028M
PK	23	CP 23	typ S	-0.03414
PK	24	CP 24	typ S	260.2
PK	25	CP 25	typ S	6.745M
PK	26	CP 26	typ S	0.7028M
PK	27	CP 27	typ S	0.2606M
PK	28	CP 28	typ S	-1.655M
PK	29	CP 29	typ S	-1.655M
PK	30	CP 30	typ S	88.69
PK	31	CP 31	typ S	0.7028M
PK	32	CP 32	typ S	177.6
PK	33	CP 33	typ S	3.061M
PK	34	CP 34	typ S	254.3
PK	35	CP 35	typ S	5.419M
PK	36	CP 36	typ S	-0.1815M
PK	37	CP 37	typ S	0.4080
PK	38	CP 38	typ S	241.1
PK	39	CP 39	typ S	5.419M
PK	40	CP 40	typ S	3.061M
PK	41	CP 41	typ S	-0.03414M
PK	42	CP 42	typ S	3.061
PK	43	CP 43	typ S	-1.655M
PK	44	CP 44	typ S	281.9M
PK	45	CP 45	typ S	5.566M
PK	46	CP 46	typ S	258.6
PK	47	CP 47	typ S	6.893M
PK	48	CP 48	typ S	3.061M
Last base				234

000003

Time: 14:19: Date: 05-31-94
Operator: J CARTER

Comment: CyANIDE 05-31-94

Channels 1
Base: 59
Gain: 34

PR.	CUP	TYP	SAMPLE ID	CyANIDE UG/L	
	Init base Conc.			234 -2.392	
1	1	P	P 500	494.3	
Rel Abs				0.31	
2	2	N	N	12.05	
3	3	N	N	0.7028	
4	4	C	CAL BLK	-0.1815	
5	5	N	N	-1.655	
6	6	C	CAL 10 UG/L	9.104	
7	7	N	N	-1.213	
8	8	C	CAL 20 UG/L	17.95	
9	9	N	N	0.1132	
10	10	C	CAL 100 UG/L	100.8	
11	11	N	N	2.029	
12	12	C	CAL 200 UG/L	201.1	
13	13	N	N	4.829	
14	14	C	CAL 300 UG/L	301.7	
15	15	N	N	7.040	
16	16	C	CAL 400 UG/L	401.6	
17	17	N	N	10.14	
18	18	C	CAL 500 UG/L ✓	495.9	
19	19	S	R	12.49	
20	20	S	ICVS 150 UG/L	153.9	101% ✓
21	21	S	R	5.124	
22	22	S	ICB	0.7028	<10 ✓
23	23	S	R	-0.03414	
24	24	S	CCVS 250 UG/L	260.2	104% ✓
25	25	S	R	5.745	
26	26	S	CCB	0.7028	<10 ✓
27	27	S	R	0.3606	
28	28	S	QCBLK38525-1	-1.655	
29	29	S	R	-1.655	
30	30	S	QCLCS38525-1	88.69	
31	31	S	R	0.7028	
32	32	S	5181-010 X10	177.6	
33	33	S	R	3.061	
34	34	S	5192-004 X10	254.3	
35	35	S	R	5.419	
36	36	S	QCBLK38525-2	-0.1815	
37	37	S	R	0.4080	
38	38	S	QCLCS38525-2	241.1	
39	39	S	R	5.419	
40	40	S	5179-005	3.061	
41	41	S	R	-0.03414	
42	42	S	5179-012	3.061	
43	43	S	R	-1.655	
44	44	S	CHK STD HIGH	281.9	
45	45	S	R	5.566	
46	46	S	CCVS 250 UG/L ✓	258.6	103% ✓
47	47	S	R	6.893	
48	48	S	CCB	3.061	<10 ✓
Last base Conc.				234 -2.392	

Sample statistics

0000004

Sample Statistics

Anal	level	cups	avg	std dev	cv
1	all	30	59.03	101	171%

Anal 1: linear fit
Correlation coefficient (R) 0.9999 ✓

Chart saved to file B:A0531CN.CHR.

text file B:A0531CN.TXT has been saved to disk.

Input Filename: B:CN.INP
Chart Filename: B:A0531CN.CHR
Time: 14:19; Date: 05-31-94
Operator: J.CAPPIO

Comment: CYANIDE 05-31-94

Channels 2
Base: 59
Gain: 34

				CYANIDE UG/L
Init base				234
Pt	1 CP	1 typ	P	3604
Rel Abs				0.31
Pt	2 CP	2 typ	N	332
Pt	3 CP	3 typ	N	255
Pt	4 CP	4 typ	C	249
Pt	5 CP	5 typ	N	239
Pt	6 CP	6 typ	C	312
Pt	7 CP	7 typ	N	243
Pt	8 CP	8 typ	C	772
Pt	9 CP	9 typ	N	251
Pt	10 CP	10 typ	C	934
Pt	11 CP	11 typ	N	264
Pt	12 CP	12 typ	C	1615
Pt	13 CP	13 typ	N	283
Pt	14 CP	14 typ	C	2711
Pt	15 CP	15 typ	N	298
Pt	16 CP	16 typ	C	2975
Pt	17 CP	17 typ	N	319
Pt	18 CP	18 typ	C	3615
Corr Coeff(R) =				0.9999
Pt	19 CP	19 typ	S	335
Pt	20 CP	20 typ	S	1274
Pt	21 CP	21 typ	S	285
Pt	22 CP	22 typ	S	255
Pt	23 CP	23 typ	S	259
Pt	24 CP	24 typ	S	2016
Pt	25 CP	25 typ	S	296
Pt	26 CP	26 typ	S	255
Pt	27 CP	27 typ	S	252
Pt	28 CP	28 typ	S	239
Pt	29 CP	29 typ	S	239
Pt	30 CP	30 typ	S	852
Pt	31 CP	31 typ	S	255
Pt	32 CP	32 typ	S	1455
Pt	33 CP	33 typ	S	271
Pt	34 CP	34 typ	S	1976
Pt	35 CP	35 typ	S	287
Pt	36 CP	36 typ	S	249
Pt	37 CP	37 typ	S	253
Pt	38 CP	38 typ	S	1886
Pt	39 CP	39 typ	S	287
Pt	40 CP	40 typ	S	271
Pt	41 CP	41 typ	S	259
Pt	42 CP	42 typ	S	271
Pt	43 CP	43 typ	S	239
Pt	44 CP	44 typ	S	2163

0000006

PK	45	CP	45 typ S	288
PK	46	CP	46 typ S	2005
PK	47	CP	47 typ S	297
PK	48	CP	48 typ S	271
	Last base			234

Time: 14:19; Date: 05-31-94
Operator: J.CARPIO

Comment: CYANIDE 05-31-94

Channels	2
Base:	59
Gain:	34

PK	CUP	TYP	SAMPLE ID	CYANIDE UG/L
	Init base			234
	Conc.			-2.392
1	1	P	P 500	3604
	Rel	Abs		0.31
2	2	N	N	332
3	3	N	N	255
4	4	C	CAL BLK	249
5	5	N	N	239
6	6	C	CAL 10 UG/L	312
7	7	N	N	242
8	8	C	CAL 20 UG/L	372
9	9	N	N	251
10	10	C	CAL 100 UG/L	934
11	11	N	N	264
12	12	C	CAL 200 UG/L	1615
13	13	N	N	283
14	14	C	CAL 300 UG/L	2311
15	15	N	N	298
16	16	C	CAL 400 UG/L	2975
17	17	N	N	319
18	18	C	CAL 500 UG/L	3615
19	19	S	R	335
20	20	S	ICVS 150 UG/L	1274
21	21	S	R	285
22	22	S	ICB	255
23	23	S	R	250
24	24	S	CCVS 250 UG/L	2016
25	25	S	R	296
26	26	S	CCB	255
27	27	S	R	252
28	28	S	QCBLK38525-1	239
29	29	S	R	239
30	30	S	QCLCS38525-1	852
31	31	S	R	255
32	32	S	5181-010 X10	1455
33	33	S	R	271
34	34	S	5192-004 X10	1976
35	35	S	R	287
36	36	S	QCBLK38525-2	249
37	37	S	R	253
38	38	S	QCLCS38525-2	1886
39	39	S	R	287
40	40	S	5179-005	271
41	41	S	R	250
42	42	S	5179-012	271
43	43	S	R	239
44	44	S	CHK STD HIGH	2163

0000007

45	45	S	R			288
46	46	S	CCVS 250 UG/L		✓	2005
47	47	S	R			297
48	48	S	CCB			271
	Last base					234
	Conc.					-2.392

Sample statistics

Anal	level	cups	a.c	std dev	cv
1	all	30	650.7	684	105%

dBASE text file will not be generated

000008

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38525

ANALYSIS: OT

PROJECT NO.: 388.01, 537.01

ANALYSIS DATE: 05-31-94

ANALYST: JCARR

METHOD NO.: 9010

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
1	P 500	AL2264-94			
2	N				
3	N				
4	CAL BLK				
5	N				
6	10	AL2258-94			
7	N				
8	20	59-			
9	N				
10	100	60-			
11	N				
12	200	61-			
13	N				
14	300	62-			
15	N				
16	400	63-			
17	N				
18	500	64-			
19	R				
20	ICVS ISO	67-			
21	R				
22	ICB				
23	R				
24	CCVS 250	AL2265-94			
25	R				

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	✓	05-31-94	JMF
Samples unloaded from auto sampler in correct sequence?	✓	05-31-94	JMF

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38525

ANALYSIS: W

ANALYST: JCARR

PROJECT NO.: 3860', 537.0'

ANALYSIS DATE: 05-31-94

METHOD NO.: 8010

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
26	CCB				
27	R				
28	QCBLK 38525-1		W		
29	R				
30	QCLCS 38525-1	AL2252-94			50 ug/L
31	R				
32	S181-010			X10	
33	R				
34	S192-004			X10	
35	R				
36	QCBLK 38525-2		S		
37	R				
38	QCLCS 38525-2	AL2254-94			12.4 ug/g
39	R				
40	S179-005				
41	R				
42	012				
43	R				
44	CHK STD HIGH	AL2256-94			150 ug/L
45	R				
46	MS 250	65-V			
47	R				
48	CCB				
49					
50					

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	✓	05-31-94	JMF
Samples unloaded from auto sampler in correct sequence?	✓	05-31-94	JMF

DOD0010

ITAS - ST. LOUIS

FLASHPOINT

CHECKED BY R. Patterson DATE 06-01-94 PROJECT NO.: 537.01, 504.04

BATCH NO. 38668 METHOD NO.: 1010

PROJECT	LAB ID	ANALYST	TEST DATE	FLASHPOINT C°
P Xylene	IP0307-94 QCLCS38668-1	R Hunt	06-01-94	27.0
537.01	5179-005	↓	↓	>60.0
↓	↓ 012	↓	↓	>60.0
504.04	5171-001	↓	↓	21.0
True value P-xylene check standard is 27.2°C.				
		R Hunt 06-01-94		

0000111

SL-91-INORG-0002

ITAS - ST. LOUIS

SOIL PH

ANALYST M. Ahrst
BATCH NO. 38985
PREP AND ANALYSIS DATE 06-07-94

REVIEWED BY R. Patterson/06-08-94
REVIEWED BY R. Patterson/06-08-94
PROJECT NO. 362.03, 519.40, 537.01
METHOD NO. CLP 9045

LAB ID	SAMPLE WEIGHT, g	VOLUME OF WATER OR $CaCl_2$, ml	TEMP °C	pH
Cal buffer 4.0 IP0140-94	-	-	25	3.98
Cal buffer 10.0 IP0001-94	-	-	25	10.00
Chk. buffer 7.0 IP0002-94	-	-	25	7.03
QC Blk 38985-1	-	50 mL of H_2O	27	5.88
5210-001	50.47		24	8.15
002	50.28		24	8.41
003	50.04		24	8.55
004	50.14		24	7.66
005	50.55		24	8.24
006	50.04		23	7.94
007	50.41		24	7.90
008	50.46		23	7.24
009	50.52		24	7.66
010	50.55		23	7.56
011	50.15		24	7.68
↓ 011	50.45	↓	24	8.36
5224-001	20.76	20 mL of H_2O	25	7.04
↓ 001DUP	20.74	↓	25	6.99
5179-005	10.03	20 mL of 0.01M $CaCl_2$	23	8.47
↓ 012	10.05	↓	23	7.26

M. Ahrst 06-07-94

SL-91-INORG 30-C

ITAS - St. Louis
June 1, 1994 04:03 pm
Non-Decanted % Solids and % Moisture

Analyst: N.HURT NNH
Chk'd By: R. Patterson
Date: 01-JUN-94
Date: 06-01-94
Project: 537.01
In Date: 31-MAY-94
Out Date: 01-JUN-94
Method: SL 4005
Oven Temp: 103 C.
Batch No.: 38667
Units = grams

Sample No.	Pan Weight	Wet Soil+Pan	Dry 1 Soil+Pan	Dry 2 Soil+Pan	Differ	Dry 3 Soil+Pan	Differ	% Solids	% Moist	RPD
5179-005	1.5833	12.9206	11.1589					84.46	15.54	
5179-012	1.5824	12.0897	10.6697					86.49	13.51	0.035
5179-012DUP1	1.5710	12.2490	10.8036					86.46	13.54	

Calculation: $\frac{\text{Dry-Pan Weight}}{\text{Wet-Pan Weight}} * 100 = \%\ \text{Solids}$

0000013

ITAS - ST. LOUIS

NON-DECANTED % SOLIDS/% MOISTURE

% Solids

Analyst: [illegible] Date: 05-31-94
Chk'd By: [illegible] Date: 06-01-94
Batch No: 38667
Method No: SL4005

Project: 531 01
In Date: 05-31-94 Time: 4:15 pm
Out Date: 06-01-94 Time: 8:10 am
Oven Temp: 103°C
Balance #: AC200

Sample No.	Pan No.	Pan/A Weight	Wet/B Soil+Pan	Dry/C Soil+Pan	Dry/C1 Soil+Pan	Diff C1-C	Dry/C2 Soil+Pan	Diff C2-C1	Dry/C3 Soil+Pan	Diff C3-C2	% Solids
5179-005	A	1.5833	12.9206	11.1589							
012	B	1.5824	12.0897	10.6697							
012DUP	C	1.5710	12.2490	10.8036							

[illegible] 06-01-94

Calculation: $\frac{C-A}{B-A} \times 100 = \%$ SOLIDS

0000014

SL-91-INORG-0005

PROJECT 537.01 Continued From Page

BATCH # 38661

Prep & Analysis Date: 06-01-94 ANALYST: N. Hunt
METHOD: 9095

Sample	Wt (g)	Pass/Fail	Time
5179-005	100.040	PASS	5 MIN.
005DUP	100.095	PASS	↓
012	100.074	PASS	

PASS = No free liquids present
FAIL = Free liquids pass through ~~fabric~~ filter before 5 mins
NNH 06-01-94

N. Hunt 06-01-94

Continued on Page

Read and Understood By R. Patterson / 06-01-94

0000015

ITAS - ST LOUIS
SULFIDES
(SOIL)

PREP DATE: 05-27-94
ANALYSIS DATE: 05-27-94
ANALYST: [illegible]
BATCH NO.: 38436

REVIEWED BY: R. Patterson/06-08-94
REVIEWED BY: R. Patterson/06-08-94
PROJECT NO.: 537.01
METHOD NO.: 9030

LAB I.D.	SAMPLE VOLUME ml or gram	ACTUAL VOLUME TITRATED	SOLID FRACTION	IODINE ml of Iodine	BURET READING ml of $Na_2S_2O_3$ final	initial	net	SULFIDE CONC. mg/L - µg/g
GCBIN 38436-1	20.17/200 ml	188	N/A	10	9.90	0	9.90	<10.5
IPC 252-94 GELCS 38436-1	20.10/		N/A		6.00		6.00	84.7
5179-005	20.34/		0.8446		9.95		9.95	<12.4
0.12	20.38/		0.8649		9.90		9.90	<12.1

[illegible] 05-27-94

Iodine Normality 0.0250 N

$Na_2S_2O_3$ Normality 0.0250

$$\text{SULFIDE mg/L or } (\mu g/g) = \frac{[(\text{mL Iodine} \times \text{N Iodine}) - (\text{mL } Na_2S_2O_3 \times \text{N } Na_2S_2O_3)] \times 16{,}000}{(\text{ml or (gram) of SAMPLE titrated})(\text{SOLID Fraction})}$$

LCS True Value = 99.9 µg/g
Percent Recovery = 85%
Dup RPD = N/A

MS True Value = N/A
Percent Recovery = N/A

SL-91-INORG 0026

0000016

ITAS - ST. LOUIS

TOC ANALYSIS

PREP DATE: 06-02-94
DATE OF ANALYSIS: 06-02-94
ANALYST: J. Flandreau
BATCH #: 38731

PAGE 1 OF 1

REVIEWED BY: R. Patterson/06-08-94
REVIEWED BY: R. Patterson/06-08-94
METHOD #: 9060
PROJECT #: 537.01

ANALYSIS TIME	LAB ID	STANDARD CONC.	VOLUME/ WEIGHT mg USED	DILUTION	FRACTION SOLID	INSTRUMENT PRINTOUT PPM C	CONC (MG/L OR UG/G)	SAMPLE AVERAGE & ~~RPD~~ Range
	QCBLK 38731-1		80.0 ✓	1.00 ✓	N/A	23.81 ✓	<25.0 ✓	RP 06-08-94
	AC2276-94 QCLCS38731-1	604 ug/g	79.5 ✓	~~1.00~~ 1.01 SMF ✓	N/A	597. ✓	597 ✓	
	5179-005		10.3 ✓	7.77 ✓	0.8446 ✓	37080 ✓	>18400 ✓	$\bar{x}$ = >18600 ✓
	005		10.3 ✓	7.77 ✓		43820 ✓	>18400 ✓	range = >18400 ↓ >18900 ✓
	005		10.0 ✓	8.00 ✓		38060 ✓	>18900 ✓	
	005		10.1 ✓	7.92 ✓	↓	41840 ✓	>18800 ✓	

0000017

J. Flandreau 06-08-94

LCS True Value = 604 ug/g ✓
Percent Recovery = 99 ✓

MS True Value = N/A
Percent Recovery = ↓

MSD True Value = N/A
Percent Recovery = ↓
RPD = ↓

mg/L TOC (water) = Instr. Printout (PPMC) x Dil Factor
ug/g TOC (soil) = Instr. Printout (PPMC) / Fraction Solid

SL 91 INORG 0013 WESTON

Operating Parameters

Empty-Sparger	45.
Pick-up Loop fill	210.
Loop to Sparger Xfer	30.
Acid Addition	10.
Sparging time	150.
Inj. loop fill time	5.
Injection time	120.
POC trap desorb time	60.
Delay btwn repeats	5.
Delay btwn modes	60.
Integ. time-out(min)	6.
Number of repeats	1
# of NPOC injections	3
Analysis Mode:	Boat Inlet
Multi-Sampler used	No
Flush bet. Samples	0
Rinse with sample	No
Calibration mode:	Syringe Calibration

J. Flanders 06-02-94

Batch# 38731

R. Patterson 06-08-94

Calibration Factors

NPOC w/Inj.Loop	7.8E-05	System Blank =	0.
NPOC direct inject	7.8E-05	System Blank =	0.
IC & POC Calibration	7.8E-05	System Blank =	0.
Syringe Inj.Calib.	7.8E-05	System Blank =	0.

Pickup Loop Volume: 10.
Inj.Loop Volume(ml) 0.2

1. Boat 1937000.ppmC	Sample weight (mg)	80.
2. Boat 2003000.ppmC	Sample weight (mg)	80.
3. Boat 1996000.ppmC	Sample weight (mg)	80.
4. Boat 2000000.ppmC	Sample weight (mg)	80.

CALSTD 2000 mg/L AL1736-94

AVG +/- Std.Dev: 1983000. +/- 31210. % std dev: 1.573 ✓

15:40:00 Thu Jun 2, 1994

Calibration Factors

NPOC w/Inj.Loop	7.8E-05	System Blank =	0.
NPOC direct inject	7.8E-05	System Blank =	0.
IC & POC Calibration	7.8E-05	System Blank =	0.
Syringe Inj.Calib.	7.6632718E-05	System Blank =	0.

Pickup Loop Volume: 10.
Inj.Loop Volume(ml) 0.2

1. Boat 956.6ppmC	Sample weight (mg)	80. 96% ✓
2. Boat 7.956ppmC	Sample weight (mg)	80. <25 ✓
3. Boat 23.8ippmC	Sample weight (mg)	80.
4. Boat 557.ppmC	Sample weight (mg)	79.5

810000

4. Boat [illegible]ppmC Sample weight (mg) [illegible]
5. Boat 37080.ppmC Sample weight (mg) 10.3
6. Boat 43820.ppmC Sample weight (mg) 10.3
7. Boat 38060.ppmC Sample weight (mg) 10.
8. Boat 41840.ppmC Sample weight (mg) 10.1
9. Boat 918.9ppmC Sample weight (mg) 80. 92% ✓
10. Boat 13.85ppmC Sample weight (mg) 80. <25 ✓

AVG +/- Std.Dev: 16332. +/- 20630. % std dev: 126.3

17:16:12 Thu Jun 2, 1994

0000019

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38731

ANALYSIS: TOC

ANALYST: J. Flanders

PROJECT NO.: 537.01

ANALYSIS DATE: 06-02-94

METHOD NO.: 9060

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
1	ICVS	AL2274-94			1000 mg/L
2	ICB				
3	~~QCBK~~ 38731-1		S		
4	~~QCBK~~ QCLCS 38731-1	AL2276-94			604 ug/L
5	5179-005				
6	005				
7	005				
8	005				
9	CCVS	AL2273-94			1000 mg/L
10	CCB				
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

000020

230 [illegible] 06-09-94

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	N/A	___	___
Samples unloaded from auto sampler in correct sequence?	N/A	___	___

ITAS - ST. LOUIS

TOC ANALYSIS

PREP DATE: 06-07-94
DATE OF ANALYSIS: 06-07-94
ANALYST: J.F Landreau
BATCH #: 38984

PAGE 1 OF 1

REVIEWED BY: R. Patterson/06-08-94
REVIEWED BY: R. Patterson/06-08-94
METHOD #: 9060
PROJECT #: 519.40, 537.01

ANALYSIS TIME	LAB ID	STANDARD CONC.	VOLUME/ WEIGHT mg USED	DILUTION	FRACTION SOLID	INSTRUMENT PRINTOUT PPM C	CONC (MG/L OR UG/G)	SAMPLE AVERAGE & ~~RPD~~ Range
	QCBLK 38984-1		80.9	0.989		JMF 06-07-94 ~~5.686~~ 15.66	<24.7	RP 06-08-94
	QCLCS 38984-1	599 ug/g	80.1	0.999		595.8	596	
	5224-001		10.1	7.92		47930	>15800	JMF 06-07-94 $\bar{x}$ = ~~>15950~~ >16000 range = >15800 ↓ >16000
	001		10.0	8.00		46620	>16000	
	001		10.0	8.00		47120	>16000	
	001		10.0	8.00		47000	>16000	
	001DUP		10.0	8.00		47770	>16000	$\bar{x}$ = >16000 range = >15800 ↓ >16000
	001DUP		10.0	8.00		48060	>16000	
	001DUP		10.1	7.92		47430	>15800	
	001DUP		10.0	8.00		47890	>16000	
	001MS	20000 ug/g	10.0	8.00		55580	>16000	$\bar{x}$ = >16000 range = >16000 ↓ >16000
	001MS	↓	10.0	8.00		55750	>16000	
	001MS		10.0	8.00		54270	>16000	
	001MS	↓	10.0	8.00		53690	>16000	
	5179-012		10.0	8.00	0.8649	JMF 06-07-94 ~~>16000~~ >18500		$\bar{x}$ = >18400 range = >18300 ↓ >18500
	012		10.1	7.92	↓	42360	>18300	
	012		10.0	8.00		53630	>18500	
	012		10.0	8.00		42960	>18500	

LCS True Value = 599 ug/g
Percent Recovery = 99
SL 91 INORG 0013 WESTON

MS True Value = 20000 ug/g
Percent Recovery = can't calculate

MSD True Value = N/A
Percent Recovery = ↓
RPD = can't calculate

mg/L TOC (water) = Instr. Printout (PPMC) x Dil Factor
ug/g TOC (soil) = Instr. Printout (PPMC) / Fraction Solid

Operating Parameters

Empty-Sparger	45.
Pick-up Loop fill	210.
Loop to Sparger Xfer	30.
Acid Addition	10.
Sparging time	150.
Inj. loop fill time	5.
Injection time	120.
POC trap desorb time	60.
Delay btwn repeats	5.
Delay btwn modes	60.
Integ. time-out(min)	6.
Number of repeats	1
# of NPOC injections	3
Analysis Mode:	Boat Inlet
Multi-Sampler used	No
Flush det. Samples	2
Rinse with sample	No
Calibration mode:	Syringe Calibration

J. Flanders
06-07-94

Batch #38984

R. Patterson
06-08-94

Calibration Factors

NPOC w/Inj.Loop	7.8E-05	System Blank =	0.
NPOC direct inject	7.8E-05	System Blank =	0.
IC & POC Calibration	7.8E-05	System Blank =	0.
Syringe Inj.Calib.	7.8E-02	System Blank =	0.

Pickup Loop Volume: 10.
Inj.Loop Volume(ml) 0.2

1. Boat 1922000.ppmC	Sample weight (mg)	80.	CAL STD 2000 mg/L
2. Boat 1853000.ppmC	Sample weight (mg)	80.	AL #2327-94
3. Boat 1915000.ppmC	Sample weight (mg)	80.	
4. Boat 1923000.ppmC	Sample weight (mg)	80.	

AVG +/- Std.Dev: 1913200. +/- 13990. % std dev: 0.731 ✓

0000022

10:15:26 Tue Jun 7, 1994

Calibration Factors

NPOC w/Inj.Loop	7.8E-05	System Blank =	0.
NPOC direct inject	7.8E-05	System Blank =	0.
IC & POC Calibration	7.8E-05	System Blank =	0.
Syringe Inj.Calib.	8.154039E-05	System Blank =	0.

Pickup Loop Volume: 10.
Inj.Loop Volume(ml) 0.2

1. Boat 372.4ppmC	Sample weight (mg)	60.	97%

Pickup Loop Volume: 10.
Inj.Loop Volume(ml) 0.2

1. Boat 972.4ppmC	Sample weight (mg)	80.	97%
2. Boat 5.686ppmC	Sample weight (mg)	80.	<25
3. Boat 15.66ppmC	Sample weight (mg)	80.9	
4. Boat 595.8ppmC	Sample weight (mg)	80.1	
5. Boat 47930.ppmC	Sample weight (mg)	10.1	
6. Boat 46620.ppmC	Sample weight (mg)	10.	
7. Boat 47120.ppmC	Sample weight (mg)	10.	
8. Boat 47000.ppmC	Sample weight (mg)	10.	
9. Boat 47770.ppmC	Sample weight (mg)	10.	
10. Boat 48060.ppmC	Sample weight (mg)	10.	
11. Boat 47430.ppmC	Sample weight (mg)	10.1	
12. Boat 47890.ppmC	Sample weight (mg)	10.	
13. Boat 966.7ppmC	Sample weight (mg)	80.	97%
14. Boat 5.407ppmC	Sample weight (mg)	80.	<25
15. Boat 55580.ppmC	Sample weight (mg)	10.	
16. Boat 55750.ppmC	Sample weight (mg)	10.	
17. Boat 54270.ppmC	Sample weight (mg)	10.	
18. Boat 53690.ppmC	Sample weight (mg)	10.	
19. Boat 47280.ppmC	Sample weight (mg)	10.	
20. Boat 42360.ppmC	Sample weight (mg)	10.1	
21. Boat 53630.ppmC	Sample weight (mg)	10.	
22. Boat 42960.ppmC	Sample weight (mg)	10.	
23. Boat 977.3ppmC	Sample weight (mg)	80.	98%
24. Boat 4.479ppmC	Sample weight (mg)	80.	<25

AVG +/- Std.Dev: 30637. +/- 24150. % std dev: 78.82

16:13:47 Tue Jun 7, 1994

0000023

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38984
ANALYSIS: TOC
ANALYST: J. Flandreau

PROJECT NO.: 519.40, 537.01
ANALYSIS DATE: 06-07-94
METHOD NO.: 9060

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
1	ICV5	AL2330-94			1000 mg/L
2	ICB				
3	QC3L38984-1				
4	QCLCS 38984-1	AL2386-94			599 ug/g
5	5224-001		OIL		
6	001				
7	001				
8	001				
9	001 DUP				
10	001 DUP				
11	001 DUP				
12	001 DUP				
13	CCV5	AL2329-94			1000 mg/L
14	CCB				
15	5224-001 MS	AL2387-94	OIL		2000 mg/L mg/kg INF 06-07-94
16	001 MS	AL2388-94			
17	001 MS	AL2389-94			
18	001 MS	AL2390-94			
19	5179-012		S		
20	012				
21	012				
22	012				
23	CCV5	AL2329-94			1000 mg/L
24	CCB				
25					J. Flandreau 06-07-94

0000024

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	N/A	—	—
Samples unloaded from auto sampler in correct sequence?	N/A	—	—

ITAS - ST. LOUIS

EOX ANALYSIS

PrepD
ANALYSIS DATE: 06-01-94
ANALYST: J. Patton
BATCH #: 38612

APPROVED: R. Patterson/06-08-94
METHOD: 9022
PROJECT #: 519.28, 537.01

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL, G A	VOLUME ETHYL ACETATE + REAGENT WATER, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	AVG. BLK ~~DILUTION~~ 6/6/94	FRACTION SOLID G	EOX FINAL CONC UG/G CL	$\overline{X}$
QCBLK38612-1		1.002	5.0	50	0.01	0.99	0.00		<50.4	
↓					0.00				<50.4	<50.4
QCLCS38612-1	99.5	1.005			1.05				106	
↓	AL2392-94				1.06				107	106 **
S088-001		1.011			0.09			0.9878	<50.6	*
↓					0.10				<50.6	<50.6
S088-001 DUP		1.018			0.11				<50.2	**
↓					0.09				<50.2	<50.2
S088-001 MS	101	1.005			1.05				107	
↓	AL2393-94				1.07			↓	109	108 **
S088-002		1.004			0.12			0.9770	<51.5	
↓					0.11			↓	<51.5	<51.5
S179-005		1.020			0.13			0.8446	<58.6	
↓					0.12			↓	<58.6	<58.6
S179-012		1.014			0.17			0.8649	<57.6	
↓			↓	↓	0.18	↓	↓	↓	<57.6	<57.6

CALCULATION: $\frac{B \times D \times F}{A \times C \times E \times G} \times 1000 = UG/G\ CL$

* CORRECTED FOR % MOISTURE
** ANY CALCULATED RPD DUE TO VALUES BELOW DETECTION LIMITS

SL-91-INORG-0041

(10)
~~+0.21 uG ◆~~
PULLED SEPTUM OUT
WHEN RETRACTING NEEDLE
RE DOJECT JUN 08-94

(9)
QCLCS 50ul
+1.05 uG ◆

(8)
+1.06 uG ◆

(7)
QCBK 50ul
+0.00 uG ◆

(6)
+0.01 uG ◆

100% (5)
CAL CHK 5ul
+0.50 uG ◆

98% (4)
+0.49 uG ◆

(3)
BLK 5ul
+0.01 uG ◆

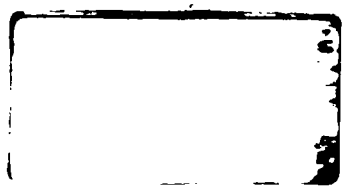
(2)
+0.00 uG ◆

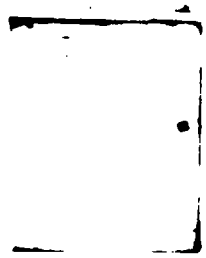
99% (1)
CCC CHECK
+4.96 uG ◆

BOX
06-08-94
#38612
J. [illegible]

R. Patterson
06-08-94

0000026





SOBB 001 04 50 ul

(14) +0.11 uG

(12) +0.09 uG

SOBB 001 50 ul

(12) +0.09 uG

(11) +0.10 uG

(10) ~~+0.21 uG~~

PULLED SEPTUM OUT WHEN RETRACTING NEEDLE RE INJECT JUDGLY

QCLCS 50 ul

(9) +1.05 uG

(8) +1.06 uG

QCBK 50 ul

(7) +0.00 uG

(6) +0.01 uG

CAL CHK 5 ul

100% (5) +0.50 uG

98% (4) +0.49 uG

(3) +0.01 uG

0000027

CAL CHK 5ul 90% (26) +0.45 uG ♦

BLK 5ul (25) +0.00 uG ♦

5179-012 50ul (24) +0.17 uG ♦

(23) +0.18 uG ♦

5179-005 50ul (22) +0.13 uG ♦

(21) +0.12 uG ♦

5088-002 50ul (20) +0.12 uG ♦

(19) +0.11 uG ♦

5088-001 ms 50ul (18) +1.05 uG ♦

(17) +1.07 uG ♦

CAL CHK 5ul 98% (16) +0.49 uG ♦

BLK 5ul (15) -0.00 uG ♦

0000028

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38612

ANALYSIS: EOX

PROJECT NO.: 519.28, 537.0

ANALYSIS DATE: 06-04-94

ANALYST: J. CARRO

METHOD NO.: 9020

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
1	CCVL CHK	AL2318-94			5ug
2	BLK				
3	↓				
4	CAL CHK	AL1802-94			0.50 ug
5	↓				↓
6	QCBLK38612-1				
7	↓				
8	QCLCS38612-1	AL2392-94			
9	↓				
10	5088-001	-	S		PULLED SEPTA OUT WITH PIPETTING NEEDLE TO VIAL
11	↓		↓		
12	↓				
13	5088-001 DUP				
14	↓		↓		
15	BLK				
16	CAL CHK	AL1802-94			0.50 ug
17	5088-001 MS	AL2393-94	S		
18	↓		↓		
19	5098-002				
20	↓				
21	5179-005				
22	↓				
23	5179-012				
24	↓		↓		
25	BLK				

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	—	06-08-94	—
Samples unloaded from auto sampler in correct sequence?	—	—	—

0000029

ITAS-ST. LOUIS

RUN SHEET

BATCH #: 38612

ANALYSIS: 60X

ANALYST: J-CARBO

PROJECT NO.: 519.28, 537.01

ANALYSIS DATE: 06OCT94

METHOD NO.: 9020

	LAB ID	STD NO.	MATRIX	DIL.	COMMENTS
26	CAL CHK	ALIQ2-94			0.50 ug
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

000030

RP 06-08-94

	Yes	Date	Initial
Samples loaded into auto sampler in correct sequence?	—	10/6-08-94	
Samples unloaded from auto sampler in correct sequence?	—	—	—

STANDARDS PREP/EXTRACTION

CHAIN OF CUSTODY

ITAS - ST. LOUIS

EXTRACT CHAIN OF CUSTODY

Analysis: CN^- Project: 388.01, 537.01

Prep Date: 05-27-94 Batch No.: 38525 Method No.: 9010

Analyst: J. Flandreau

SEQUENCE NO.	SAMPLE NO.	SAMPLE WT/VOL	FINAL VOL	COMMENTS
1	QCBLK38525-1	.500 L	.250 L	
2	QCLCS 38525-1	↓	↓	AL2252-94
3	5181-010	↓	↓	pH~6 Cl- & Sulfide Not Detected
4	5192-004	↓	↓	pH~9 ↓
5	QCBLK38525-2	5.068 g	↓	
6	QCLCS 38525-2	5.021 ↓	↓	AL2254-94
7	5179-005	5.021 ↓	↓	Cl- & Sulfide Not Detected
8	↓ 012	5.265 ↓	↓	↓
9	CHK STD HIGH	.500 L	↓	AL2256-94
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

J. Flandreau 05-31-94

DATE	RELEASED BY	RECEIVED BY
05-31-94	J. Flandreau	

00000031

SL-91-INORG-0001

QUALITY ASSURANCE SUMMARY

Client: STS Consultants
Project Code: 537.01
QAS No.: 563 Revision No.: ∅

Number of Samples Expected by Matrix:
Air (A) Water (W)
20 Soil (S) Other (O):

Analysis/Product Code	Matrix (circle)	Method Prep/Analysis	QC Samples Type (circle)	QC Samples Frequency	Required Reporting Limit/Units/ Report as*	Holding Time (Days)	TAT** (Days)	Radiochemical-Specific Count Time	Radiochemical-Specific Sample Size
TOC/9060/Q4	A W (S) O		(B) (LCS) DUP MS MSD	1 per Prep Batch	PQL ND	28	21	–	–
TOX/9020/Q4	A W (S) O		(B) (LCS) DUP MS MSD	1 per Prep Batch	PQL ND	28	21	–	–
RAD/GAMMA/Q4	A W (S) O		(B) (LCS) DUP MS MSD	1 per Prep Batch	2 pCi/g	180	21	–	–
CN/9010/Q4	A W (S) O		(B) (LCS) DUP MS MSD	1 per Prep Batch	PQL ND	14	21	–	–
S/9030/Q4	A W S O		(B) (LCS) DUP MS MSD	1 per Prep Batch	PQL ND	7	21	–	–
FLPT/1010/Q4	A W (S) O		B LCS DUP MS MSD	– per –	to 60°C	180	21	–	–
PM/IT/Q4	A W (S) O		B LCS DUP MS MSD	– per –	–	–	21	–	–
PH/9045/Q4	A W (S) O		B LCS DUP MS MSD	– per –	–	–	21	–	–
PAINT/9095/Q4	A W (S) O		B LCS DUP MS MSD	– per –	Free Liquid After 5 Min.	–	21	–	–
EXT/TCLP/Q4	A W (S) O		(B) LCS DUP MS MSD	1 per TCLP Ext Batch	–	–	21	–	–

* A = "As Is" or D = Dry Weight Basis

**TAT = Turn Around Time

SAFETY HAZARDS: Chemical? X No Yes: Define:
Radioactive? ___ No X Yes:
Isotopes Expected: Unknown

Rad Officer Approval (sign): [signature] for JDK

Special Instructions: GAMMA = U, Th, Ra 226/228 + report any other nucleides found

Comments

0000032

0080-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil Vol	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
05-27-94	AL2256-94	CN- (CAL STD HIGH) ICVS	AL2251-94	10mg/L	7.5ml	0.5L	150ug/L	DI	JMF	06-10-94	
05-31-94	AL2257-94	CN- ~~IAT~~ STD	AL1713-94	1000mg/L	1.0ml	100ml	10mg/L	.25NNaOH	JRC	05-31-94	
	58	10 CAL STD	AL2257-94	10mg/L	0.1		10ug/L				
	59	20			0.2		20				
	60	100			1.0		100				
	61	200			2.0		200				
	62	300			3.0		300				
	63	400			4.0		400				
	64	500			5.0		500				
	65	ICVS 250			2.5		250				
05-31-94	AL2266-94	CN- ~~IAT~~ STD	AL1891-94	1000mg/L	1.0ml	100ml	10mg/L	.25NNaOH	JRC	05-31-94	
	67	ICVS 150	AL2266-94	10mg/L	1.5ml		150ug/L				

0000033

0019.94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05-26-94	AL2227-94	T.PHOS CAL STD 1000	AL2221-94	10 mg/L	10.0 ml	100 ml	1000 ug/L P	2% H_2SO_4	JMF	05-26-94	x 3263 to convert PO_4 to P
	AL2228-94	CCVS			6.0 ml		600 ug/L P				
05-26-94	AL2229-94	CN - INT STD for CAL, CCVS	AL1811-94 ~~AL1891-94~~ JMF 05-27-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25 N NaOH	JMF	05-26-94	
	AL2230-94	CAL STD 10	AL2229-94	10 mg/L	.1 ml		10 ug/L				
	AL2231-94	20			.2 ml		20 ug/L				
	AL2232-94	100			1.0 ml		100 ug/L				
	AL2233-94	200			2.0 ml		200 ug/L				
	AL2234-94	300			3.0 ml		300 ug/L				
	AL2235-94	400			4.0 ml		400 ug/L				
	AL2236-94	500			5.0 ml		500 ug/L				
	AL2237-94	CCVS 250			2.5 ml		250 ug/L				
05-27-94	AL2238-94	NH_3-N INT STD	AL1712-94	1000 mg/L N	1.0 ml	100 ml	10 mg/L N	2% H_2SO_4	JMF	05-27-94	
	39-	30 CAL STD	AL2238-94	10 mg/L N	0.3		30 ug/L N				
	40-	100			1.0		100				
	41-	300			3.0		300				
	42-	500			5.0		500				
	43-	700			7.0		700				
	44-	1000			10.0		1000				
	45-	CCVS 400			4.0		400				
	46-	NH_3-N INT STD	AL0354-94	1000 mg/L N	1.0 ml	10.0 ml	100 mg/L N				
	47-	ICVS 400	AL2246-94	100 mg/L N	0.4	100 ml	400 ug/L N				
	48-	LCS 500			0.5		500				
	49-	MS 500			0.5		500	S103-10			
05-27-94	AL2250-94	IC LCS	AL2213-94	[illegible] 4/4/94	1.0 ml	5.0 ml	[illegible]	DI			
05-27-94	AL2251-94	CN - INT STD (CHK STD LOW)	AL1891-94	1000 mg/L	1.0 ml	0.1 L ~~0.5 L~~ 05-27-94	10 mg/L	.25 N NaOH	JMF	05-27-94	
	52	LCS	AL2251-94	10 mg/L	2.5	0.5 L	50 mg/L	DI		06-16-94	0000034
	53-	MS			2.5	0.25 L	100				
	54-	(CHK STD LOW) LCS			6.25	5.02 g/250 ml	12.4 mg/L				WT WT
	55-	MS (S193-008)			12.5	5.26 g/500 ml	23.7				

0067-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
05-05-94	AL1879-94	TKN LCS 500	AL1877-94	10 mg/L N	5.0 ml	100 ml	500 µg/L N	DI	JRC	06-02-94	
↓	80-	TKN INT STD	AS805-93	1000 mg/L N	1.0 ml	↓	10 mg/L N	↓	↓	↓	
	81-	50 CAL STD	AL1880-94	10 mg/L N	0.5		50 µg/L N				
	82-	100	↓	↓	1.0		100				
	83-	300			3.0		300				
	84-	500			5.0		500				
	85-	700			7.0		700				
	86-	1000			10.0		1000				
↓	87-	CCVS 600	↓	↓	6.0	↓	600	↓	↓	↓	
05-11-94	AL1888-94	CN- INT STD CHK STD 600	AL1891-94	1000 mg/L	10 mL	100 mL	10 mg/L	DI H_2O	NNH	05-12-94	
↓	AL1889-94	LCS	AL1888-94	10 mg/L	2.5 mL	500 mL	50 µg/L	DI H_2O	↓	↓	
↓	AL1890-94	CHK STD H16H	↓	↓	7.5 mL	↓	150 µg/L	↓	↓	↓	
05-11-94	AL1891-94	$C_4Au \cdot OS$ STOCK STD	LOT # 430426				1000 mg/L		JRC	07-25-94	RSD BIRD SERVICE
05-11-94	AL1892-94	TOC CCVS	AL1736-94	1000 mg/L	12.5 ml	25.0 ml	1000 mg/L	HPLC H_2O	JMF	05-12-94	
↓	AL1893-94	ICVS	AL1737-94	↓	↓	↓	↓	↓	↓	↓	
	AL1894-94	INT STD FOR LCS	↓	↓	7.5 ml	↓	600 mg/L	↓			
	AL1895-94	LCS	AL1894-94	600 mg/L	80 ul	80.4 mg	597 ug/g	Sand			
	AL1896-94	MS	AL1737-94	1000 mg/L	20 ul	20.8	1920 ug/g	4817-001			Wet value
	AL1897-94	MS	↓	↓	20 ul	20.7	1930 ug/g	↓			↓
	AL1898-94	MS			20 ul	20.4	1960 ug/g				
↓	AL1899-94	MS	↓	↓	20 ul	20.4	↓	↓	↓	↓	
05-11-94	AL1900-94	T.PHOS INT STD for LCS, MS	AL1435-93	1000 mg/L	3.066 ml	10 ml	100 mg/L P	DI H_2O	JMF	05-11-94	x.3263 to convert P2O5 to P
↓	AL1901-94	LCS (H_2O)	AL1900-94	100 mg/L P	.200 ml	50 ml	400 ug/L P	↓	↓	05-27-94	
	AL1902-94	MS	↓	↓	.250 ml	↓	500 ug/L P	SD30-014		↓	
	AL1903-94	MS			.250 ml	↓	500 ug/L P	SD36-021			
↓	AL1904-94	LCS (Soil)	↓	↓	.400 ml	.508 g	78.7 ug/g P	DI H_2O	↓	↓	
05-11-94	AL1905-94	TPH LCS	AL0901-94	1.5 mg/ml	1.0 ml	50.018 g	29.9 mg/kg	Sand	D. Nuske	06-10-94	
05-09-94	AL1906-94	CN- MS	AL1855-94	10 mg/L	2.5 ml	250 ml	100 ug/L	500500 1	JRC	05-23-94	

0000035

0061-94

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
04-29-94	AL1707-94	TOC CAL STD 100	AL1203-94	2000 mg/L	5 ml	100 ml	100 mg/L	HPLC H2O	IMF	[illegible] 04-29-94	
	AL1708-94	CCVS 80			4 ml		80 mg/L				
	AL1709-94	ICVS 80	AL1204-94				80 mg/L				
	AL1710-94	LCS 60			3 ml		60 mg/L				
04-29-94	AL1711-94	NITRATE STOCK STD	940415				1000 mg/LN		JRC	10-15-94	SOLUTIONS PLUS
	12-	NITROGEN STOCK STD	940415				1000 mg/LN			10-15-94	
	13-	CYANIDE STOCK STD	940415				1000 mg/L			10-15-94	
	14-	BROMIDE STOCK STD	940415				1000 mg/L			04-15-95	
05-02-94	AL1715-94	CN - INT STD for LCS, MS, HIGH CHK STD	AL1532-94	1000 mg/L	10 ml	100 ml	10 mg/L	.25 N NaOH	IMF	05-05-94	
	AL1716-94	HIGH CHK STD 150	AL1715-94	10 mg/L	3.5 [illegible] ml	500 ml	150 ug/L	DI H2O			
	AL1717-94	LCS			6.25 ml	5.0133/250 ml	12.5 ug/g				
05-03-94	AL1718-94	CN INT STD for ICVS	AL1532-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25 N NaOH	IMF	05-03-94	
	AL1719-94	ICVS 150	AL1718-94	10 mg/L	7.5 ml	500 ml	150 ug/L	DI H2O			
	AL1720-94	INT STD for CAL, CCVS	AL3804-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25 N NaOH			
	AL1721-94	CCVS 350	AL1720-94	10 mg/L	3.5 [illegible] ml	[illegible] ml	350 ug/L				
	AL1722-94	CAL STD 10			.100 ml		10				
	AL1723-94	20			.200		20				
	AL1724-94	100			1.00		100				
	AL1725-94	200			2.00		200				
	AL1726-94	300			3.00		300				
	AL1727-94	400			4.00		400				
	AL1728-94	500			5.00		500				
	AL1729-94	CN MS	AL1715-94	10 mg/L	12.5 ml	5.8388/500 ml	24.8 ug/g	4955-001		05-05-94	heat value
05-03-94	AL1730-94	CN - CHK STD LOW LCS	AL1715-94	10 mg/L	2.5 ml	0.5L	50 ug/L	DI	JRC	05-17-94	
	31-	CHK STD HIGH ICVS 150			7.5 ml		150	DI			
	32-	ICVS	AL2383-93	9 mg/L	5.0 ml	0.5L	90 ug/L				
	33-	MS (5008-005)	AL1715-94	10 mg/L	12.5 ml	5.0455/250 ml	24.8 ug/g				WET WT
	34-	MS			5.0	0.5L	100 ug/L	5008-004			
05-03-94	AL1735-94	CN CCVS 250	AL1720-94	10 mg/L	2.5 ml	100 ml	250 ug/L	.25 N NaOH	IMF	05-03-94	

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0012-13

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Ind	Expiration Date	Comments/ Recommendations
12-24-93	IP0332-93	Silica MDL #2	IP0310-93	100 mg/L	[illegible]	[illegible]	[illegible]	[illegible]	JMF	12-30-93	
	IP0333-93	#3									
	IP0334-93	#4									
	IP0335-93	#5									
	IP0336-93	#6									
	IP0337-93	#7									
01-03-94	IP0001-94 ~~IP0334-93~~	pH 10 Buffer Solution	Lot # 275	PH=10	—	—	PH=10	—	JMF	05-12-95	VWR
01-03-94	IP0002-94	pH 7 Buffer Solution	Lot # F078	PH=7	—	—	PH=7	—	JMF	2-95	BAXTER
01-04-94	IP0003-94	HARDNESS STD CALCIUM SOLN	IP0227-92	Pure Solid	1.0000g	1000 ml	1000 mg/L	DI H_2O	JMF	04-04-94	
01-05-94	IP0004-94	COD LCS (LOW RANGE)	IP0312-93	500 mg/L	5 ml	50 ml	50 mg/L	DI H_2O	JMF	JMF 01-05-94 ~~02~~ 04-05-94	
01-05-94	IP0005-94	Oil and Grease LCS SOLN.	IP0244-93	Pure Oil	5.0024g	50 ml	100,048 mg/L	Acetone	JMF	07-04-94	
01-14-94	IP0006-94	Sulfide Stock Sodium Sulfide	Lot # F46712	Pure $Na_2S \cdot 9H_2O$	—	—	Pure	—	JMF	01-14-96	BAKER
01-20-94	IP0007-94	p-Xylene	Pure Liquid	Lot # 911212	—	—	Pure	—	JMF	01-20-~~95~~ 95	JMF 01-20-94 FLASHPOINT CHECK STD. 27.2°C Flashpoint
01-24-94	IP0008-94	BORON STOCK STANDARD	Lot # H507 KL68-P	1000 ppm	—	—	1000 ppm	—	JMF	04-95	Mallinckrodt
01-24-94	IP0009-94	BORON STOCK STANDARD	Lot # 931209	100 JMF 01-24-94 ~~1000~~ ppm	—	—	100 JMF 01-24-94 ~~1000~~ PPM	—	JMF	12-94	Solutions Plus
	IP0010-94	BORON INT. STD for ICVS, LCS	IP0009-94	100 JMF 01-24-94 ~~1000~~ mg/L	~~10.0~~ JMF 01-24-94 ~~1.0~~ ml	100 ml ~~1000 ml~~ JMF 01-24-94	10 PPM	DI H_2O	JMF	01-25-94	
	IP0011-94	BORON INT. STD for CAL, CCVS	IP0008-94	1000 mg/L	~~1.0~~ ml 100 JMF 01-24-94		10 PPM				
	IP0012-94	BORON CAL STD 0.25	IP0011-94	1.0 mg/L	0.25 ml	1.0 ~~0.75~~ ml	0.25 mg/L	DI H_2O			
	IP0013-94	0.50			0.50 ml	1.0 ~~0.50~~ ml	0.50 mg/L				
	IP0014-94	0.75			0.75 ml	1.0 ~~0.25~~ ml	0.75 mg/L				
	IP0015-94	1.00			1.00 ml	1.0 ~~0~~ ml	1.00 mg/L				
	IP0016-94	JMF 01-24-94 ICVS		JMF 01-24-94 ~~0.60~~	0.6 ml	1.0 ~~0.4~~ ml	0.600 mg/L				
	IP0017-94	LCS	IP0010-94		0.4 ml	1.0 ~~0.6~~ ml	0.400 mg/L				
	IP0018-94	JMF 01-24-94 ICVS			0.6 ml	1.0 ~~0.4~~ ml	0.600 mg/L				
	IP0019-94	MDL #1			0.25 ml	1.0 ~~0.75~~ ml	0.25 mg/L				
	IP0020-94	#2									
	IP0021-94	#3									
	IP0022-94	#4									
	IP0023-94	#5									

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pH

0005 - 14

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
04 04 94	IP0140-94	pH Buffer 4	Lot N098	Pink Buffer Soln			pH - 4	—	NNH	11/95	Buffer
04 05 94	IP0141 94	Celite 545 - TSS Stock Std	Lot 8 [illegible]	Pure Solid			Pure Solid	—	JMF	04-05-96	Fisher
04 05 94	IP0142-94	TSS Working Soln	IP0141 94	Pure Solid	0.1001 g	1000 mL	100 mg/L	DI H2O	NNH	10-06 94	
04 06 94	IP0143 94	COD High Range LCS	IP0320 94	Pure Solid	0.0850 g	200 mL	500 mg/L	DI H2O	↓	09 09 94	
↓	IP0144 94	COD Low Range LCS	IP0143 94	500 mg/L	5 mL	50 mL	50 mg/L	DI H2O	↓	↓	
04-08 94	IP0145-94	Sulfide LCS (Water)	IP0236 93	Pure Solid	0.1020 g	1000 mL	13.6 mg/L	DI H2O	NNH	04 09 94	Sulfide factor = 0.133508
04 08 94	IP0146 94	O+G LCS (Soil)	IP0005 94	100,048 mg/L	1 mL	20.006 g	0.500%	Sand	NNH	04-08-94	
↓	IP0147-94	↓	↓	↓	↓	20.086 g	0.498%	↓	↓	↓	
04 11 94	IP0148-94	Sulfide Int. Std for LCS	IP0006 94	Pure Solid	0.7513 g	100 mL	1003 mg/L	DI H2O	NNH	04-12-94	Sulfide factor = 0.133508
04 11 94	IP0149-94	↓ LCS	IP0148-94	1003 mg/L	2 mL	20.137 g	99.6 mg/g	Sand	NNH	04-12-94	~~Sulfide fa~~ [illegible]
04 11 94	IP0150 94	Sulfide Int Std for MS	IP0236 93	Pure Solid	0.7558 g	100 mL	1009 mg/L	DI H2O	NNH	04-12-94	Sulfide factor = .133508
04 11 94	IP0151 94	↓ MS	IP0150 94	1004 mg/L	2 mL	20.112 g	100 mg/g	4836-001	NNH	04-12 94	Wet value
04 12 94	IP0152 94	OG LCS (Soil)	IP0005 94	100,048 mg/L	1 mL	20.041 g	0.499%	Sand	NNH	04-13 94	
04 13 94	IP0153 94	OG LCS (Soil)	IP0005 94	100,048 mg/L	1 mL	20.062 g	0.499%	Sand	NNH	04-14 94	
04-14-94	IP0154-94	Fluoride Int Std for CAL, CCVS	AL3490-93	1000 mg/L	10 mL	100 mL	100 mg/L	DI H2O	JMF	04-14-94	
	IP0155 94	Int Std for LCS, MS, ICVS	AL1430-93	↓	↓	↓	100 mg/L	DI H2O			
	IP0156-94	.100 CAL STD	IP0154-94	100 mg/L	.1 mL	100 mL	.100 mg/L				
	IP0157-94	1.00			1 mL		1.00				
	IP0158-94	5.00			5 mL		5.00				
	IP0159 94	10.0			10 mL		10.0				
	IP0160-94	CCVS			6 mL		6 mg/L				
	IP0161-94	ICVS	IP0155-94		6 mL		6 mg/L				
	IP0162-94	LCS			4 mL		4 mg/L				
	IP0163-94	MS						4791-004			
	IP0164-94	MSD									
04 14 94	IP0165-94	OG LCS (Soil)	IP0005-94	100,048 mg/L	1 mL	20.007 g	0.500%	Sand	NNH	04-15-94	
04-18-94	IP0166-94	Sulfide Int Std for LCS, MS	IP0236-93	Pure Solid	.7730 g	100 mL	1032 mg/L	DI H2O	JMF	04-18-94	Sulfide factor = .133508
↓	IP0167-94	↓ Int Std for MS	IP0006-94	↓	.7586 g	↓	1013 mg/L	↓	↓	↓	
04-19-94	IP0168-94	Sulfide Int Std for LCS	IP0006 94	Pure Std	0.7494 g	100 mL	1001 mg/L	DI H2O	NNH	04-20 94	Sulfide factor = .133508

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Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
12-29-93	IP0332-93	Silica MDL #2	IP0326-93	100 mg/L	2.0 mL	100 mL	2.00 mg/L	DI H_2O	JMF	12-30-93	
	IP0333-93	#3									
	IP0334-93	#4									
	IP0335-93	#5									
	IP0336-93	#6									
	IP0337-93	#7									
01-03-94	IP0001-94	pH 10 Buffer Solution	Lot # 275	pH = 10	—	—	pH = 10	—	JMF	05-12-95	VWR
01-03-94	IP0002-94	pH 7 Buffer Solution	Lot # F078	pH = 7	—	—	pH = 7	—	JMF	2-95	BAXTER
01-04-94	IP0003-94	Hardness Std Calcium Soln	IP0227-92	Pure Solid	1.0030 g	1000 mL	1000 mg/L	DI H_2O	JMF	04-04-94	
01-05-94	IP0004-94	COD LCS (Low Range)	IP0312-93	600 mg/L	5 mL	50 mL	50 mg/L	DI H_2O	JMF	04-05-94	
01-05-94	IP0005-94	0:1 and Grease LCS Soln.	IP0244-93	Pure 0.1	5.0024 g	50 mL	100,048 mg/L	Acetone	JMF	07-04-94	
01-14-94	IP0006-94	Sulfide Stock Sodium Sulfide	Lot # E46712	Pure $Na_2S \cdot 9H_2O$	—	—	Pure	—	JMF	01-14-96	BAKER
01-20-94	IP0007-94	p-Xylene	Pure Liquid	Lot # 911212	—	—	Pure	—	JMF	01-20-95	FLASHPOINT CHECK STD. 27.2°C
01-24-94	IP0008-94	Boron Stock Standard	Lot # N507	1000 ppm	—	—	1000 ppm	—	JMF	04-95	Mallinckrodt
01-24-94	IP0009-94	Boron Stock Standard	Lot # 931209	1000 ppm	—	—	1000 PPM	—	JMF	12-94	Solutions Plus
	IP0010-94	Boron Int. Std for ICVS, LCS	IP0009-94	1000 mg/L	10.0 mL	100 mL	100 PPM	DI H_2O	JMF	01-25-94	
	IP0011-94	Boron Int. Std for CAL, CCVS	IP0008-94	1000 mg/L	10 mL	100 mL	100 PPM				
	IP0012-94	Boron CAL STD 0.25	IP0011-94	1.0 mg/L	0.25 mL	1.0 mL	0.25 mg/L	DI H_2O			
	IP0013-94	0.50			0.50 mL	1.0 mL	0.50 mg/L				
	IP0014-94	0.75			0.75 mL	1.0 mL	0.75 mg/L				
	IP0015-94	1.00			1.00 mL	1.0 mL	1.00 mg/L				
	IP0016-94	ICVS			0.6 mL	1.0 mL	0.600 mg/L				
	IP0017-94	LCS	IP0010-94		0.4 mL	1.0 mL	0.400 mg/L				
	IP0018-94	CCVS			0.6 mL	1.0 mL	0.600 mg/L				
	IP0019-94	MDL #1			0.25 mL	1.0 mL	0.25 mg/L				
	IP0020-94	#2									
	IP0021-94	#3									
	IP0022-94	#4									
	IP0023-94	#5									

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0208-94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05 18 94	IP0227 94	Fluoride LCS 4 00	IP0127 94	100 mg/L	4 0 ml	100 ml	4 00 mg/L	DI H2O	JMF	05-18 94	
05 06 94	IP0228 94	BOD LCS	IP0348 92 IP0348 92	Pure Solid	.075 g each	500 ml	300 mg/L	DI H2O	JMF	05 06 94	
05 18 94	IP0229 94	TSS Working Soln	IP0141 94	Pure Solid	0 1005 g	1000 mL	100 mg/L	DI H2O	NNH	05 13 94	
05 17 94	IP0230 94	Oil + Grease LCS (Soil)	IP0187 94	100,066 mg/L	1 mL	20.40 g	0 491%	Sand	NNH	05 18 94	
↓	IP0231 94	Sulfide LCS (H2O)	IP0006 94	Pure Solid	0 1004 g	1000 mL	13 4 mg/L	DI H2O	↓	↓	Sulfide factor - 133508
05 20 94	IP0232 94	COD High Range LCS	IP0320 92	Pure Solid	0 0851 g	200 mL	500 mg/L	↓	NNH	09 09 94	
↓	IP0233 94	↓ Low Range LCS	IP0232 94	500 mg/L	5 mL	50 mL	50 mg/L	↓	↓	↓	
05 20 94	IP0234 94	Sulfide LCS (H2O)	IP0236 94	Pure Solid	0.1002 g	1000 mL	13 4 mg/L	DI H2O	NNH	05-21 94	Sulfide factor - 133508
05 24 94	IP0235 94	Sulfide LCS (H2O)	IP0006 94	Pure Solid	0 1011 g	1000 mL	13 5 mg/L	DI H2O	NNH	05-25 94	↓
05 25 94	IP0236 94	Oil + Grease LCS (Soil)	IP0187 94	100,066 mg/L	1 mL	20 09 g	0 498%	Sand	NNH	05-26 94	
05 11 94	IP0237 94	Silica Int Std for ICVS, LCS, MS	IP0319 93	1000 mg/L	10.0 ml	100 ml	100 mg/L	DI H2O	JMF	05-11 94	
	IP0238 94	Int Std for CAL, CCVS	IP0318 93	↓	↓	↓	↓				
	IP0239 94	CAL STD 2 00	IP0238 94	100 mg/L	2.0 ml		2 00 mg/L				
	IP0240 94	5.00			5.0 ml		5.00				
	IP0241 94	10 0			10 0 ml		10 0				
	IP0242 94	15.0			15 0 ml		15.0				
	IP0243 94	20.0			20 0 ml		20.0				
	IP0244 94	25.0			25 0 ml		25.0				
	IP0245 94	CCVS			15 0 ml		15.0				
	IP0246 94	ICVS	IP0237 94		15.0 ml		15.0				
	IP0247 94	LCS I			12.0 ml		12.0				
	IP0248 94	LCS II			12.0 ml		12.0				
↓	IP0249 94	MS	↓	↓	12.0 ml	↓	12 0	4917.001	↓	↓	
05 27 94	IP0250 94	Sulfide LCS (H2O)	IP0006 94	Pure Solid	0 1001 g	1000 mL	13.4 mg/L	DI H2O	NNH	05-28 94	Sulfide factor - 133508
↓	IP0251 94	Int Std for LCS	IP0236 93	Pure Solid	0.7522 g	100 mL	1004 mg/L	↓	↓	↓	↓
↓	IP0252 94	LCS (Soil)	IP0251 94	1004 mg/L	2 mL	20.10 g	99.9 mg/g	Sand	↓	↓	Wet Value.
05 31 94	IP0253 94	Sulfide LCS (H2O)	IP0006 94	Pure Solid	0 1024 g	1000 mL	13 7 mg/L	DI H2O	NNH	06-01 94	Sulfide factor = 133508
05 31 94	IP0254 94	Oil + Grease (Soil)	IP0187 94	100,066 mg/L	1 0 mL	20.71 g	0.483%	Sand	NNH	06-01 94	

0000040

0008-93

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
07-27-93	IP0216-93	Fluoride CAL STD 10 0	AL3130-92	1000 mg/l	2 ml	200 ml	10.0 mg/l	DI H_2O	JMF	07-28-93	
	IP0217-93	LCS	AL1430-93	1000 mg/l	1 ml	200 ml	5.00 mg/l				
	IP0218-93	INT STD for MDL's			1 ml	100 ml	10.0 mg/l				
	IP0219-93	MDL #1	IP0218-93	10.0 mg/l	2 ml	200 ml	.100 mg/l				
	IP0220-93	#2									
	IP0221-93	#3									
	IP0222-93	#4									
	IP0223-93	#5									
	IP0224-93	#6									
	IP0225-93	#7									
07-30-93	IP0226-93	COLOR RETENTION SOLN.	IP0234-92	Pure Crystals	.158 g	500 ml	.316 g/l	DI H_2O	JMF	03-18-94 ~~07-30-94~~	JMF 11-29-93
08-09-93	IP0227-93	COD LCS (HIGH RANGE)	IP0320-92	Pure Solid	.425 g	1000 ml	500 mg/l	DI H_2O	JMF	08-08-94	
08-09-93	IP0228-93	COD LCS (LOW RANGE)	IP0227-93	500 mg/l	10 ml	100 ml	50 mg/l			08-08-94	
08-9-93	IP0229-93	~~Pot~~ Potassium Phosphate (KH_2PO_4)	Lot # 7100KLMH	Pure Solid					JMF	08-09-95	Mallinckrodt
08-10-93	IP0230-93	Sulfide INT STD for LCS	IP0005-92	Pure Solid	.8018 g	100 ml	1070 mg/l	DI H_2O	JMF	08-11-93	Sulfide factor = .133508
08-10-93	IP0231-93	LCS	IP0230-93	1070 mg/l	2 ml	20.24/200 ml	103 ug/g	Sand & DI H_2O	JMF		
08-10-93	IP0232-93	INT STD for MS	IP0034-91	Pure Solid	.7470 g	100 ml	997 mg/l	DI H_2O			
08-10-93	IP0233-93	MS	IP0232-93	997 mg/l	2 ml	20.29 g/200 ml	98.3 ug/g wet	3292-001 & DI H_2O			conc. dry wt = 668 ug/g
08-25-93	IP0234-93	BOD LCS	IP0347-92 IP0348-92	Pure Solid	.150 g each	1000 ml	300 mg/l	DI H_2O	JMF	08-26-93	
08-26-93	IP0235-93	TSS working std	IP0191-92	Pure solid	0.1000 g	1000 ml	100 mg/l		JBD	02-25-94	
08-26-93	IP0236-93	Sulfide Stock	Lot # 8044KLJP	Pure Solid		$Na_2S \cdot 9H_2O$			JMF	08-26-95	Mallinckrodt
08-26-93	IP0237-93	TDS STOCK SOLUTION	IP0229-93	Pure Solid	58.660 g	1000 ml	58,660 mg/l	DI H_2O	JMF	02-26-94	
08-26-93	IP0238-93	TDS WORKING STD	IP0237-93	58,660 mg/l	6 ml	1000 ml	352 mg/l	DI H_2O	JMF	02-26-94	EMPTY 12-01-93 JMF
09-02-93	IP0239-93	Sulfide INT STD for LCS	IP0005-92	Pure Solid	.7445 g	100 ml	994 mg/l ~~700 ml~~	DI H_2O	JMF	09-03-93	Sulfide factor = .133508
	IP0240-93	LCS	IP0239-93	994 mg/l	2 ml	20.18 g/200 ml	98.5 ug/g	Sand & DI H_2O			
	IP0241-93	INT STD for MS	IP0236-93	Pure Solid	.7509 g	100 ml	1003 mg/l ~~100 ml~~	DI H_2O			
	IP0242-93	MS	IP0241-93	1003 mg/l	2 ml	20.29 g/200 ml	98.9 ug/g	3422-001			wet weight
09-02-93	IP0243-93	BOD LCS	IP0347-92 IP0348-92	Pure Solid	.150 g each	1000 ml	300 mg/l	DI H_2O	JMF	09-03-93	
09-09-93	IP0244-93	Oil & GREASE STOCK STD	ID#61295-BAF-7743	Pure Oil			Pure Oil		JMF	09-09-94	WESSON VEGETABLE OIL

KPatterson 09-09-93

0000041

TOC

139-93

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
12-01-93	AL3940-93	CN- ICVS 150 STD	AL3851-93	10 mg/L	7.5 ml	0.5 L	150 ug/L	DI	JRC	12-15-93	
	41-	CN- INT STD	AL3804-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25N NaOH		12-01-93	
	42-	10 CAL STD	AL3941-93	10 mg/L	0.1 ml		10 mg/L				
	43-	20			0.2		20				
	44-	100			1.0		100				
	45-	200			2.0		200				
	46-	300			3.0		300				
	47-	400			4.0		400				
	48-	500			5.0		500				
	49-	CCVS 250			2.5		250				
12-06-93	AL3950-93	NH_3-N INT STD	AL3450-93	1000 mg/L N	1.0 ml	100 ml	10 mg/L N	2% H_2SO_4	JRC	12-06-93	
	51-	ICVS 400	AL3950-93	10 mg/L N	4.0		400 ug/L N				
	52-	LCS 500			5.0		500				
	53-	NH_3-N INT STD	AL3805-93	1000 mg/L N	1.0 ml	100 ml	10 mg/L N				
	54-	30 CAL STD	AL3953-93	10 mg/L N	0.3 ml		30 ug/L N				
	55-	100			1.0		100				
	56-	300			3.0		300				
	57-	500			5.0		500				
	58-	700			7.0		700				
	59-	1000			10.0		1000				
	60-	CCVS 400			6.0		600				
12-06-93	AL3961-93	TOC ICVS	AL3676-93	2000 mg/L	12.5 ml	25 ml	1000 mg/L	HPLC H_2O	JMF	12-09-93	
	AL3962-93	INT STD for LCS			7.5 ml		600				
	AL3963-93	CCVS	AL3676-93		12.5 ml		1000				
	AL3964-93	LCS	AL3962-93	600 mg/L	80 ml	80.1 mg	599 ug/g	Sand			
12-07-93	AL3965-93	Potassium Acid Phthalate	Lot # 6704 KLLS	Pure Solid			Pure		JMF	12-07-95	Mallinckrodt
11-19-93	AL3966-93	TOX LCS	AL3546-93	10 ug/ml Cl	10 ml	1000 ml	100 mg/ml Cl	DI	JRC	11-17-93	
11-17-93	67-	NaCl CHK STD	Lot # 7554HBL	PURE	0.16 Mg	100 ml	1 ug/ml Cl	DI	JRC	11-23-93	
11-24-93	AL3968-93	CN- INT STD	AL3451-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25N NaOH	JRC	11-24-93	

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0024-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
02-25-94	AL0668-94	EDX INT (CAL CHK)	AL0667-94	1000 ng/ul	1.0 ml	100 ml	100 ng/ul	MTBE Acetate	JRC	03-25-94	
	69-	EDX STOCK	AL3545-93	PURE	1.85g	100 ml	10 ug/ul	meOH	JRC	03-25-94	
	70-	EDX INT	AL0669-94	10 ug/ul	5.0 ml	100 ml	0.5 ug/ul	meOH	JRC	03-25-94	
	71-	EDX LCS	AL0670-94	0.5 ug/ul	200 ul	1.0 g/5 ml	99.5 ug/g	MTBE Acetate	JRC	03-25-94	
	72-	EDX MS (4357-002)			200 ul	1.0 g/5 ml	99.1				WET WT
02-25-94	AL0673-94	NaCl CAL CHK	AL3497-93	PURE	0.164g	100 ml	1 ug/ul	DI	JRC	03-01-96 04-01-94	
03-01-94	AL0674-94	Acid Potassium Phthalate	#392004	Pure Solid			Pure		JMF	03-01-96 04-01-94	NIST STANDARD REFERENCE MATERIAL
02-22-94	AL0675-94	TOX STOCK SOLUTION	AL3545-93	PURE	1.86g	100 ml	10 ug/ul	meOH	JRC	03-22-94	
	76-	LCS	AL0675-94	10 ug/ul	10 ml	1000 ml	100 ng/ul	DI		02-22-94	
	77-	TOX STOCK SOLUTION	AL3587-92	PURE	1.86g	100 ml	10 ug/ul	meOH		03-22-94	
	78	INT SOLUTION	AL0677-94	10 ug/ul	5.0 ml	100 ml	500 ng/ul				
03-01-94	AL0679-94	CN- INT STD	AL3804-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	25% NH4OH	JRC	03-01-94	
	80-	10 CAL STD	AL0674-94	10 mg/L	0.1 ml		10 ug/L				
	81-	20			0.2		20				
	82-	100			1.0		100				
	83-	200			2.0		200				
	84-	300			3.0		300				
	85-	400			4.0		400				
	86-	500			5.0		500				
	87-	CCVS 250			2.5		250				
03-04-94	AL0688-94	CN- INT STD	AL0685-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	25% NH4OH	JRC	03-04-94	
	89-	ICVS ISO	AL0688-94	10 mg/L	1.5		150 ug/L				
	90-	ICVS ISO CAL STD HIGH			7.5	500 ml	150	DI		03-15-94	
	91-	LCS CAL STD LOW			2.5		50				
03-02-94	AL0692-94	TOX LCS	AL0675-94	10 ug/ul	10 ml	1000 ml	100 ug/L	DI	JRC	03-02-94	
03-03-94	AL0693-94	TOC CALIBRATION STD	AL0694-94	PURE	PURE 3 mg	200 ml	2000 mg/L	HPLC H2O + 2 ml H3PO4	JMF	04-03-94	0000043
							2000 mg/L				
							100 mg/L	HPLC H2O	JMF	03-04-94	
		CCVS 80			4.0 ml		80 mg/L				

0062-94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
[illegible] 94	AL1736-94	TOC CAL STD 2000	AL0634-94	Pure Solid	8.0 mg	100 ml	1000 mg/L	HPLC H_2O [illegible]	JMF	06-04-94	x0.4706
	AL1737-94	SPK STD 2000	AL1765-93				1000 mg/L				x0.4706
	AL1738-94	CCVS	AL1736-94	1000 mg/L	12.5 ml	25.0 ml	1000 mg/L	HPLC H_2O		05-05-94	
	AL1739-94	ICVS	AL1737-94				1000				
	AL1740-94	INT STD for LCS			7.5 ml		600				
	AL1741-94	LCS	AL1740-94	600 mg/L	80 ul	79.9 mg	601 ug/g	Sand			
	AL1742-94	MS	AL1737-94	2000 mg/L	10 ul	10 mg	2000 ug/g	4934-001			Wet value
	AL1743-94	MS									
	AL1744-94	MS									
	AL1745-94	MS									
	AL1746-94	MS			10 ul	10.0 mg		5001-001			
	AL1747-94	MS									
	AL1748-94	MS									
	AL1749-94	MS									
05-03-94	AL1750-94	T PHOS INT STD for LCS, MS	AL	1000 mg/L	3.066 ml	10 ml	100 mg/L P	DI H_2O	JMF	05-10-94	x.3263 to convert PO4 to P
	AL1751-94	LCS	AL1750-94	100 mg/L	.200 ml	50 ml	400 ug/L P	DI H_2O			
	AL1752-94	MS			.250 ml	50 ml	500 ug/L P	4991-014			
05-04-94	AL1753-94	NO_3-N INT STD	AL3806-93	1000 mg/L N	1.0 ml	100 ml	10 mg/L N	2% H_2SO_4	JMC	05-04-94	
	54	50 CAL STD	AL1753-94	10 mg/L N	0.5		50 ug/L N				
	55	100			1.0		100				
	56	300			3.0		300				
	57	500			5.0		500				
	58	700			7.0		700				
	59	1000			10.0		1000				
	60	CCVS 600			6.0		600				
	61	NO_2-N INT STD	AL1434-93	1000 mg/L	4.43 ml		10 mg/L N				x.2258 to convert NO_2 to N
	62	ICVS 600	AL1761-94	10 mg/L N	6.0		600 ug/L N				
	63	LCS	AL1434-93	1000 mg/L	0.125 ml	5.025/50 ml	5.62 ug/g N				
	64	MS (5001-001)				5.023/50 ml	5.61				

0000044

0080-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
05-27-94	AL2256-94	CN- ICVS (CHK STD HIGH)	AL2251-94	10 mg/L	7.5 ml	0.5L	150 ug/L	DI	JMF	06-10-94	
05-31-94	AL2257-94	CN- INT STD	AL1713-94	1000 mg/L	1.0 ml	100 ml	10 ug/L	.25N NaOH	JRC	05-31-94	
↓	58-	10 CAL STD	AL2257-94	10 mg/L	0.1	↓	10 ug/L	↓	↓	↓	
	59-	20			0.2		20				
	60-	100			1.0		100				
	61-	200			2.0		200				
	62-	300			3.0		300				
	63-	400			4.0		400				
	64-	500			5.0		500				
↓	65-	ICVS 250	↓	↓	2.5	↓	250	↓	↓	↓	
05-31-94	AL2266-94	CN- INT STD	AL1891-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25N NaOH	JRC	05-31-94	
↓	67-	ICVS 150	AL2266-94	10 mg/L	1.5 ml	↓	150 ug/L	↓	↓	↓	
05-31-94	AL2268-94	TPH LCS	ML0901-94	1.6 mg/ml (Batch #97)	1.0 ml	50.021 g	30.0 mg/kg	Sand	IMF	07-11-94	
06-01-94	AL2269-94	TPH LCS	↓	↓	↓	50.012 g	30.0 mg/kg	↓	↓	↓	
06-02-94	AL2270-94	CN- INT. STD	AL1891-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	DI H2O	NNH	06-02-94	
↓	AL2271-94	LCS (CHK STD. LOW)	AL2270-94	10 mg/L	2.5 ml	500 ml	50 ug/L	↓	↓	↓	
↓	AL2272-94	ICVS (CHK. STD. HIGH)	AL2270-94	10 mg/L	7.5 ml	500 ml	150 ug/L	↓	↓	↓	
06-02-94	AL2273-94	TOC CCVS	AL1736-94	2000 mg/L	12.5 ml	25.0 ml	1000 mg/L	HNO3 H2O	IMF	06-02-94	
↓	AL2274-94	ICVS	AL1737-94	↓	↓	↓	↓	↓	↓	↓	
↓	AL2275-94	INT. STD for LCS	↓	↓	7.5 ml	↓	600 mg/L	↓	↓	↓	
↓	AL2276-94	LCS	AL2275-94	600 mg/L	80 ml	79.5 mg	604 ug/g	Sand	↓	↓	
06-03-94	~~AL2277-94~~ AL2277-94	CN- INT STD	AL1713-94	1000 mg/L	1.0 ml	100 ml	10 mg/L	.25N NaOH	JRC	06-03-94	
↓	78-	10 CAL STD	AL2277-94	10 mg/L	0.1	↓	10 ug/L	↓	↓	↓	
	79-	20			0.2		20				
	80-	100			1.0		100				
	81-	200			2.0		200				
	82-	300			3.0		300				
	83-	400			4.0		400				
↓	84-	500	↓	↓	5.0	↓	500	↓	↓	↓	

0000045

0082-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05-24-94	AL2314-94	NBS/SM INT STD	AL2314-94	1000 mg/kg	1.0 ml	10.0 ml	100 mg/kg	DCE	JMC	06-23-94	
↓	15-	LCS	AL2314-94	100 mg/kg	0.5 ml	100 ml	500 ug/kg	↓	↓	↓	
↓	16-	MS	↓	↓	↓	↓	↓	S10340.0	↓	↓	
05-27-94	AL2317-94	TOX LCS	AL2316-94	10 ug/mL	10 mL	1000 ml	100 ug/L	DI	JMC	05-27-94	
06-01-94	AL2318-94	TITRATION QC CHECK	AL2317-93	PURE	0.1648 g	100 ml	1 mg/mL	DI	JMC	06-08-94	
06-03-94	AL2319-94	TX MS	AL2291-94	1000 ug/mL	2 mL	2 mL	1000 ug/ml	S218.001	JMC	06-03-94	
↓	20-	TX MS	↓	↓	↓	↓	↓	S219.001	↓	↓	
↓	21-	TX MS	↓	↓	↓	↓	↓	S220.001	↓	↓	
↓	22-	TX MS	↓	↓	↓	↓	↓	S221.001	↓	↓	
06-06-94	AL2323-94	TPH LCS (C,E)	AL0901-94	15 mg/mL	10 mL	50.041 g	30.0 mg/kg	Sand	JMF	07-06-94	
↓	AL2324-94	TPH LCS (OIL)	↓	↓	↓	1.005 g	1490 mg/kg	Freon	↓	↓	
↓	AL2325-94	MS	↓	↓	↓	1.005 g	1490 mg/kg	S224.001	↓	06-09-94	
↓	AL2326-94	MSD	↓	↓	↓	1.002 g	1500 mg/kg	↓	↓	↓	
06-07-94	AL2327-94	TOC CAL STD 2000	AL0674-94	Pure Solid	850.0 mg	200 mL	2000 mg/L	HPLC H2O + Lead (NaPb)	JMF	07-07-94	R 0.4706
↓	AL2328-94	SPK STD 2000	AL2965-93	↓	↓	↓	2000 mg/L	↓	↓	↓	R 0.4706
↓	AL2329-94	TOC CCVS	AL2327-94	2000 mg/L	12.5 mL	25.0 mL	1000 mg/L	HPLC H2O	JMF	06-07-94	
↓	AL2330-94	ICVS	AL2328-94	↓	12.5 mL	↓	1000 mg/L	↓	↓	↓	
↓	AL2331-94	INT STD for LCS	↓	↓	7.5 mL	↓	600 mg/L	↓	↓	↓	
06-06-94	AL2332-94	TOX LCS	AL1804-94	0.5 ug/mL	200 mL	1 mg/5 ml	99.5 ug/L	WATER MILLIPORE	JMC	06-07-94	
↓	33-	MS (S217.001)	↓	↓	↓	1 mg/5 ml	99.5 ug/L	↓	↓	↓	
06-03-94	AL2334-94	IC INT LOW	See Worksheet # BJ 05-94	→	See Worksheet # BJ 05-94	200 ml	See Worksheet # BJ 05-94	DI	JMC	06-94	
	35-	AUTOCAL 2R (AUTOCAL 3R)	AL0834-94	See Worksheet # BJ 05-94	5.0 ml	100 ml					
	36-	IC INT HIGH	See Worksheet # BJ 01-94	→	See Worksheet # BJ 01-94	200 ml					
	37-	AUTOCAL 3R	AL2336-94	See Worksheet # BJ 05-94	10.0 ml	100 ml					
	38-	↓ 2R			20.0						
	39-	↓ 3R			50.0						
	40-	CCVS			10.0						0000046
	41-	IC INT HIGH	See Worksheet # BJ 01-94		See Worksheet # BJ 01-94	200 ml					
↓	42-	ICVS	AL2340-94	See Worksheet # BJ 01-94	10.0 ml	100 ml	↓	↓	↓	↓	

008S-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
06-07-94	AL2372-94	IC LCS	AL2341-94	See note C: Pg 83-94	10.0 ml	5.01 g/50 ml	See note C: Pg 83-94	DI	JRC	06-10-94	
↓	↓ 73- ↓	↓ MS (5224-001)	See note A: Pg 83-94	→	See note B: Pg 83-94	5.02 g/50 ml	↓	↓	↓	↓	
06-08-94	AL2374-94	NH_3-N INT STD									
↓	75-	30 CAL STD									
	76-	100									
	77-	300									
	78-	500									
	79-	700									
	80-	1000									
	81-	CCVS 400									
	82-	NH_3-N INT STD									
	83-	ICVS 400									
	84-	LCS 500									
↓	↓ 85- ↓	↓ MS 400									
06-07-94	AL2386-94	TOC LCS	AL2331-94 ~~AL2328-94~~	600 ~~2000~~ mg/L	80 ul	80.1 mg	599 ug/g	Sand	JMF	06-08-94	
↓	AL2387-94	MS	JMF 06-08-94 AL2328-94	2000 mg/L	10 ul	10 mg	2000 ug/g	5224-001	↓	↓	wet value
	AL2388-94	MS	↓	↓	↓	↓	↓	↓	↓	↓	↓
	AL2389-94	MS									
↓	AL2390-94	↓ MS	↓	↓	↓	↓	↓	↓	↓	↓	↓

0000047

ITAS - ST. LOUIS

EXTRACT CHAIN OF CUSTODY

Analysis: EOX Project: 519.28, 537.01

Prep Date: 06-01-94 Batch No.: 38612 Method No.: 9020

Analyst: J. Capra

SEQUENCE NO.	SAMPLE NO.	SAMPLE (g)/VOL	FINAL VOL	COMMENTS
1	QCBK38612-1	1.002	5.0 ml	
2	QCLCS38612-1	1.005		AL2392-94
3	S088-001	1.011		
4	001DUP	1.018		
5	001MS	1.005		AL2393-94
6	002	1.004		
7	S179-005	1.020		
8	012	1.014		
9				
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21				
22				
23				
24				
25				

DATE	RELEASED BY	RECEIVED BY
6-1-94		

00048

SL-91-INORG-0001

0082-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
05-26-94	AL2314-94	NH_3-N INT STD	AL0354-94	1000 mg/kN	1.0 ml	10.0 ml	100 mg/kN	DI	JERC	06-23-94	
↓	15-	↓ LCS	AL2314-94	100 mg/kN	0.5 ml	100 ml	500 ug/kN	↓	↓	↓	
↓	16-	↓ MS	↓	↓	↓	↓	↓	S103-010	↓	↓	
05-27-94	AL2317-94	TOX LCS	AL1966-94	10 ug/ml Cl^-	10 ml	1000 ml	100 ug/L Cl^-	DI	JERC	05-27-94	
06-01-94	AL2318-94	TITRATION CELL CHECK	AL3997-93	PURE	0.1648 g	100 ml	1 mg/ml Cl^-	DI	JERC	06-08-94	
06-03-94	AL2319-94	TX MS	AL1991-94	1000 mg/ml Cl^-	2 ml	2 ml	1000 ug/ml	S218-001	JERC	06-03-94	
↓	20-	TX MS	↓	↓	↓	↓	↓	S219-001	↓	↓	
↓	21-	TX MS	↓	↓	↓	↓	↓	S220-001	↓	↓	
↓	22-	TX MS	↓	↓	↓	↓	↓	S224-001	↓	↓	
06-06-94	AL2323-94	TPH LCS (C.E)	AL0901-94	1.5 mg/ml	1.0 ml	50.041 g	30.0 mg/kg	Sand	JMF	07-06-94	
↓	AL2324-94	TPH LCS (OIL)	↓	↓	↓	.100 g FREON	1.5 mg ~~15.0 mg/kg~~	Freon	↓	↓	
↓	AL2325-94	↓ MS	↓	↓	↓	1.005 g	1490 mg/kg	S224-001	↓	06-09-94	
↓	AL2326-94	↓ MSD	↓	↓	↓	1.002 g	1500 mg/kg	↓	↓	↓	
06-07-94	AL2327-94	TOC CAL STD 2000	AL0674-94	Pure Solid	850.0 mg	200 ml	2000 mg/L	HPLC H_2O + 2 ml $HgPO_4$	JMF	07-07-94	
↓	AL2328-94	↓ SPK STD 2000	AL3965-93 ↓ JMF 06-07-94	↓	↓	↓	2000 mg/L	↓	↓	↓	
↓	AL2329-94	TOC CCVS	AL2327-94	2000 mg/L	12.5 ml	25.0 ml	1000 mg/L	HPLC H_2O	JMF	06-07-94	
↓	AL2330-94	↓ ICVS	AL2328-94	↓	12.5 ml	↓	1000 mg/L	↓	↓	↓	
↓	AL2331-94	↓ INT STD for LCS	↓	↓	7.5 ml	↓	600 mg/L	↓	↓	↓	
06-06-94	AL2332-94	EOX LCS	AL1804-94	0.5 ug/ml Cl^-	200 ml	1.00 g/5 ml	99.5 ug/g Cl^-	[illegible]	JERC	06-07-94	
↓	33-	↓ MS (S217-001)	↓	↓	↓	1.00 g/5 ml	99.5 ug/g Cl^-	↓	↓	↓	
06-03-94	AL2334-94	IC INT LOW	See note A: Pg 83-94	→	See note B: Pg 83-94	200 ml	See note C: Pg 83-94	DI	JERC	06-10-94	
↓	35-	↓ AUTOCAL 2R	AL2334-94	See note C: Pg 83-94	5.0 ml	100 ml	↓	↓	↓	↓	
↓	36-	(AUTOCAL 2R) IC INT HIGH	See note A: Pg 83-94	→	See note B: Pg 83-94	200 ml	↓	↓	↓	↓	
↓	37-	↓ AUTOCAL 3R	AL2336-94	See note C: Pg 83-94	10.0 ml	100 ml	↓	↓	↓	↓	
↓	38-	↓ YR	↓	↓	20.0	↓	↓	↓	↓	↓	
↓	39-	↓ SR	↓	↓	50.0	↓	↓	↓	↓	↓	
↓	40-	↓ CCVS	↓	↓	40.0	↓	↓	↓	↓	↓	
↓	41-	IC INT HIGH	See note A: Pg 83-94	→	See note B: Pg 83-94	200 ml	↓	↓	↓	↓	
↓	42-	↓ ICVS	AL2341-94	See note C: Pg 83-94	40.0 ml	100 ml	↓	↓	↓	↓	

0000049

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Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
0506-94	AL1799-94	NH_3-N 700 CAL STD	AL1799-94	10 mg/L N	7.0 ml	100 ml	700 ug/L N	2% H_2SO_4	JRC	0506-94	
	95-	1000			10.0		1000				
	96-	CCVS 400			4.0		400				
	97-	NH_3-N INT STD	AL0354-94	1000 mg/L N	1.0 ml		10 mg/L N				
	98-	ICVS 400	AL1799-94	10 mg/L N	4.0		400 ug/L N				
	99-	LCS 500			5.0		500				
0509-94	~~AL1800-94~~	~~IC [illegible] 1000 [illegible]~~		~~[illegible]~~							
		ACTOPAL 2R									
05-6-94	AL1801-94	NaCl CALL CHK	AL1797-93	PURE	0.1648g	100 ml	1 mg/ml Cl^-	DI	JRC	05-17-94	
	01-	EOX STOCK	~~AL1801-94~~	PURE	3.175g	100 ml	10000 mg/ml Cl^-	ETHYL ACETATE	JRC	06-07-94	
	02	EOX INT (CAL CHK)	AL1801-94	10000 mg/ml Cl^-	1.0 ml	100 ml	100 mg/ml Cl^-				
	03-	EOX STOCK	AL3545-93	PURE	1.856g	100 ml	10 mg/ml Cl^-	MeOH			
	04-	EOX INT	AL1803-94	10 mg/ml Cl^-	5.0 ml	100 ml	0.5 mg/ml Cl^-				
	05-	EOX LCS	AL1804-94	0.5 mg/ml Cl^-	200 ml	1.000g/3 ml	100 mg/g Cl^-	ETHYL ACETATE			
	06-	EOX MS (5001-001)				1.000g/3 ml	99.4				
0505-94	AL1807-94	NO_3-N INT STD	AL1433-93	1000 mg/L	3.29 ml	100 ml	10 mg/L N	2% H_2SO_4	JRC	0505-94	X .3043 TO CONVERT NO_3 TO N
	08-	ICVS 600	AL1807-94	10 mg/L N	6.0		600 ug/L N				
	09-	NO_3-N INT STD	AL1003-94	1000 mg/L N	1.0 ml		10 mg/L N				
	10-	50 CAL STD	AL1809-94	10 mg/L N	0.5		50 ug/L N				
	11-	100			1.0		100				
	12-	300			3.0		300				
	13-	500			5.0		500				
	14-	700			7.0		700				
	15-	1000			10.0		1000				
	16-	CCVS 600			6.0		600				
0505-94	AL1817-94	NO_3-N INT STD	AL1434-93	1000 mg/L	4.43 ml		10 mg/L N				X .2258 TO CONVERT NO_3 TO N
	18-	ICVS 600	AL1817-94	10 mg/L N	6.0		600 ug/L N				
	19-	LCS	AL1414-93	1000 mg/L	0.25 ml		564 ug/L N				
	20-	MS						5013-001			

0000050

R. Patterson 05 23 94

0085-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
06-07-94	AL2392-94	IC LCS	AL2341-94	See note C: AJ 83-94	10.0 ml	5.013g/50ml	See note C: AJ 83-94	DI	JRC	06-10-94	
↓	↓ 95 ↓	↓ MS (S224-001)	See note A: AJ 83-94	→	See note A: AJ 83-94	5.03g/50ml	↓	↓	↓	↓	
06-08-94	AL2374-94	NH_3-N INT STD	AL1712-94	1000 mg/L N	1.0 ml	100 ml	10 mg/L N	2% H_2SO_4	JRC	06-08-94	
	75-	30 CAL STD	AL2374-94	10 mg/L N	0.3 ml		30 ug/L N				
	76-	100			1.0		100				
	77-	300			3.0		300				
	78-	500			5.0		500				
	79-	700			7.0		700				
	80-	1000			10.0		1000				
	81-	CCVS 400			4.0		400				
	82-	NH_3-N INT STD	AL2288-94	100 mg/L N	1.0 ml	10.0 ml	100 mg/L N				
	83-	ICVS 400	AL2382-94	100 mg/L N	0.4	100 ml	400 ug/L N				
	84	LCS 500			0.5		500				
↓	85- ↓	↓ MS 400	↓	↓	0.4	↓	400 ↓	S238-001	↓	↓	
06-07-94	AL2386-94	TOC LCS	AL2351-94 ~~AL2328-94~~ See note 06-08-94	600 ~~1000~~ mg/L	80 ml	80.1 mg	599 mg/g	Sand	JMF	06-08-94	
	AL2387-94	MS	AL2328-94	2000 mg/L	10 ml	10 mg	2000 mg/g	S224-001			wet value
	AL2388-94	MS									
	AL2389-94	MS									
↓	AL2390-94	↓ MS	↓	↓	↓	↓	↓	↓	↓	↓	↓
06-01-94	AL2394-94	TX MS	AL1991-94	1000 mg/L	2 ml	2 ml	1000 mg/L	S971-003	JRC	06-01-94	
06-01-94	AL2392-94	EOX LCS	AL1604-94	0.5 mg/L Cl⁻	200 ml	100g/5ml	99.5 mg/L Cl⁻	~~DI~~ ACETONE	JRC	06-07-94	
↓	↓ 93 ↓	↓ MS (S088-001)	↓	↓	↓	100g/5ml	99.5 mg/L Cl⁻	↓	↓	↓	use lot.
											0000051

125-93

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
11-11-93	AL3534-93	7. PBDS EXT	AL3132-92	1000 mg/L	3.066 ml	100 ml	10 mg/L P	H_2SO_4	JRC	11-11-93	X. 3463 TO CONVERT P_2O_5 TO P
	5-	50 CAL STD	AL3534-93	10 mg/L P	0.3 ml		30 mg/L P				
	6-	100			1.0		100				
	7-	300			3.0		300				
	8-	500			5.0		500				
	9-	700			7.0		700				
	10-	1000			10.0		1000				
	11-	CONS 600			6.0		600				
11-11-93	AL3542-93	T. PBS EXT	AL3135-93	1000 mg/L	3.066 ml	100 ml	10 mg/L P	H_2SO_4	JRC	11-11-93	
	12-	ICVS 600	AL3542-93	10 mg/L P	6.0		600 µg/L				
10-27-93	AL3544-93	NaCl (HR VP)	LOT # 93H2486	PURE	0.1648g	100 ml	1 g/L	DI	JRC	11-02-93	
10-27-93	AL3545-93	2,4,6 TRICHLOROPHENOL	LOT # 93H2495	PURE	100 mg/L	100 ml	1000 µg/L	MeOH	JRC	10/95	SIGMA
	15-	TOX STOCK SOLUTION	AL3545-93	PURE	1.86g	100 ml	10 mg Cl/L	MeOH	JRC	11-23-93	
	16-	TOX LCS	AL3546-93	10 µg Cl/mL	10 ml	1000 ml	100 µg/ml	DI		10-27-93	
	17-	TOX MS			2nd Source	100 ml		3787-001			
11-27-93	AL3547-93	TOX STOCK SOLUTION	AL3545-92	PURE	1.86g	100 ml	10 mg Cl/L	MeOH	JRC	11-23-93	
	20-	TOX INT SOLUTION	AL3549-93	10 mg Cl/L	5.0 ml	100 ml	STOCK/ml				
11-09-93	AL3551-93	TKN EXT STD	AL3450-93	1000 mg-N/L	1.0 ml	10 ml	100 mg/L N	DI	JRC	11-09-93	
	22-	ICVS 600	AL3551-93	100 mg/L N	0.6	100 ml	600 µg/L N			12-09-93	
	23-	LCS 500			0.5		500				
	24-	MS 500			0.5		500	3787-001			
	25-	TKN EXT STD	AL3816-93	100 mg/L N	1.0 ml	100 ml	10 mg/L N	DI	JRC	11-09-93	
	26-	50 CAL STD	AL3555-93	10 mg/L N	0.5		50 mg/L N			12-07-93	
	27-	100			1.0		100				
	28	300			3.0		300				
	29-	500			5.0		500				
	30-	700			7.0		700				
	31-	1000			10.0		1000				
	62-	CONS 600			6.0		600				

0000052

0031-94

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations
03-14-94	AL0870-94	TOC LCS	AL0869-94	600 mg/L	80 ul	80.3 mg	598 ug/g	Sand	JMF	03-15-94	
	AL0871-94	MS	AL0694-94	2000 mg/L	20 ul	20.5 mg	1950 ug/g	4599-001			
	AL0872-94	MS			20 ul	20.4 mg	1960 ug/g				
	AL0873-94	MS			20 ul	20.4 mg	1960 ug/g				
	AL0874-94	MS			20 ul	20.5 mg	1950 ug/g				
03-15-94	AL0875-94	NO_3-N INT STD	AL1434-93	1000 mg/L	4.43 ml	100 ml	10 mg/LN	.2% H_2SO_4	JRC	03-15-94	X .2258 to CONVERT NO_3 to N
	76-	ICWS 600	AL0875-94	10 mg/LN	6.0 ml		600 ug/LN				
	77-	LCS	AL1434-93	1000 mg/L	0.25 ml		564				
	78-	MS					564	4552-007			
	79-	NO_3-N INT STD	AL3806-93	1000 mg/LN	1.0 ml		10 mg/LN	.2% H_2SO_4			
	80-	20 CAL STD	AL0879-94	10 mg/LN	0.2		20 ug/LN				
	81-	100			1.0		100				
	82-	300			3.0		300				
	83-	500			5.0		500				
	84-	700			7.0		700				
	85-	1000			10.0		1000				
	86-	CCWS 600			6.0		600				
03-15-94	AL0887-94	NO_2-N INT STD	AL1433-93	1000 mg/L	3.29 ml	100 ml	10 mg/LN	.2% H_2SO_4	JRC	03-15-94	X .3043 to CONVERT NO_2 to N
	88-	ICWS 600	AL0887-94	10 mg/LN	6.0 ml		600 ug/LN				
	89-	NO_2-N INT STD	AL3386-93	1000 mg/LN	1.0 ml		10 mg/LN				
	90-	20 CAL STD	AL0889-94	10 mg/LN	0.2		20 ug/LN				
	91-	100			1.0		100				
	92-	300			3.0		300				
	93-	500			5.0		500				
	94-	700			7.0		700				
	95	1000			10.0		1000				
	96-	CCWS 600			6.0		600				
03-16-94	AL0897-94	Chlorobenzene	Lot # 601621	Neat	—	—	—	—	JMF	03-15-95	J.T. BAKER
	AL0898-94	Hexadecane	Lot # 32105		—	—	—	—	JMF		EM SCIENCE

0000053

1/41-93

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
11-09-93	AL3777-93	SODIUM CHLORIDE	LOT # 7332 HOAC	PURE					JRC	11-09-94	MALLINCKRODT
	-01	Titration cell perf. check	AL3497-93	PURE	0.1648g	100 ml	1g/l as Cl	DI	JRC	11/6-93	
	-01	TX STOCK SOLUTION	AL0911-93	PURE	5.175g	100 ml	1000 mg/l as Cl	5% HNO3	JRC	11/7-93	
	11/09-93	TX STANDARD	AL3498-93	1000 mg/l as Cl	10 ml	100 ml	100 mg/l as Cl	5% HNO3	JRC	11/7-93	
11/09-93	AL4001-93	CL- INT STD	AL3456-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	2% HNO3	JRC	12-09-93	
	-02	ICVS 150/CCC STD 150	AL4001-93	10 mg/L	7.5 ml	0.5 L	150 mg/L	DI		11/23-93	
	-03	LCS /CCC STD 50			2.5		50				
	-04	MS			2.5	0.25 L	100	5% HNO3			
	-05	LCS /CCC STD 50			6.25	500 ml	12.5 mg/L	DI			
	-06	MSD #1			1.0	500 ml	1.99 0.006				
	-07	#2			1.0	500 ml	1.99 0.008				
	-08	#3			1.0	500 ml	1.99 0.007				
12-09-93	AL4009-93	NH3-N INT STD	AL3450-93	1000 mg/L N	10 ml	100 ml	100 mg/L N	2% H2SO4	JRC	12-10-93	
	-10	ICVS 400	AL4001-93	100 mg/L N	0.4	100 ml	400 mg/L N				
	-11	LCS 500			0.5		500				
	-12	MS 500			0.5		500	5% H2SO4			
	-13	NH3-N INT STD	AL3803-93	1000 mg/L N	1.0 ml	100 ml	10 mg/L N	2% H2SO4	JRC	12-10-93	
	-14	30 CCC STD	AL4012-93	10 mg/L N	0.3		30 mg/L N				
	-15	100			1.0		100				
	-16	300			3.0		300				
	-17	500			5.0		500				
	-18	700			7.0		700				
	-19	1000			10.0		1000				
	-20	ICVS 400			4.0		400				
12-10-93	AL4021-93	CN- INT STD	AL3804-93	1000 mg/L	1.0 ml	100 ml	10 mg/L	2.5% NaOH	JRC	12-6-93	
	-22	10 CCC STD	AL4022-93	10 mg/L	0.1		10 mg/L				0000054
	-23	20			0.2		20				
	-24	100			1.0		100				
	-25	200			2.0		200				

R. Pottinger 12-14-93

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: ~~Final~~ Entered and Reviewed by: V.R.Shaw PM Review:

Sample Header Template: due dates

Sample No. / # / Container Type	Client ID	C-Matrix / Analysis	Class	Preservative	Date: Collected / Anal. Due Date	Received / Hold Date	Due / Site	Shipper	Rad Category	Rad Sample No. (Container Numbers:% Filled)
5179-001	CD-S156E49N-2-3	Soil			22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79580:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79580:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79580:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79580:100)
5179-001DUP	CD-S156E49N-2-3	Soil			22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79580:100)
5179-002	CD-S156E49N-3-4	Soil			22-MAY-94 12:50	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-011
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79581:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79581:100)
5179-003	CD-S-82E25N2-3	Soil			22-MAY-94 13:45	24-MAY-94 09:10	14-JUN-94	FED-EX	3*	R2312-010
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79584:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79584:100)
5179-004	CD-S82E25N-3-4	Soil			22-MAY-94 14:05	24-MAY-94 09:10	14-JUN-94	FED-EX	3*	R2312-009
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79585:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79585:100)
5179-005	CD-S78E18N-2-3	Soil			22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3*	R2312-008
1 AN - Amber Glass-500ml		BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D			(79595:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D			(79595:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D			(79595:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D			(79595:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79596:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79596:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79596:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D			(79596:100)
1 AN - Amber Glass-250ML		CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D			(79594:100)

3*=Sample has not been rad screened.

0000055

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:

Sample No. / Comments #	Container Type	Client ID / Analysis	C-Matrix / Class	Date: Collected / Preservative	Received / Anal. Due Date	Due / Hold Date	Shipper / Site	Rad Category	Rad Sample No. (Container Numbers:% Filled)
Date:									
1		PLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79594:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D		(79594:100)
1		TCH/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
2	AN - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79590:100 79591:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	1098		(79592:100 79593:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	1098		(79592:100 79593:100)
5179-006	CD-SB9E16M-2-3	Soil		22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-007
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
5179-007	CD-SB9E16M-3-4	Soil		22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-006
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
5179-008	CD-S7BE18M-3-4-9	Soil		22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-005
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
5179-009	CD-S7BE18M-3-4	Soil		22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-004
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
5179-010	CD-SB1E5M-2-3-9	Soil		22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-003
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
5179-011	CD-SB1E5M-3-4	Soil		22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-002
1	AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)

3**Sample has not been rad screened.

0000056

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Comments / Container Type		Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
5179-012	CD-S81ESH-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-001
1 AM - Amber Glass-500ml		BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79644:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1 AM - Amber Glass-250ML		CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D	(79645:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
2 AM - Amber Glass-120ML		TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B	(79646:100 79647:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B	(79646:100 79647:100)

0000057

3*=Sample has not been rad screened.

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CLA 340

Reference Document No. 502240
Page 1 of 2

Project Name/No. [1] LINSAY LIGHT II
Samples Shipment Date [7] 5/23/94
Bill to: [5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R G BERGGREEN

Sample Team Members [2] RAWLINSON, BERGGREEN
Lab Destination [8] ST. LOUIS
~~Profit Center No.~~ [3]
Lab Contact [9] John Powell
Project Manager [4] BERGGREEN
Project Contact/Phone [12]
Report to: [10] (SAME)
Purchase Order No. [6] 27313-ZH
Carrier/Waybill No. [13]
Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Preservative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12:40	500 ml amber	500 ml	NONE	γ SPEC	100	
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500 ml amber	500 ml	NONE	γ SPEC	100	
CD-S-82E25N2-3	SS-SOIL	5/22/94 1345	500 ml amber	500 ml	None	γ SPEC	100	
CD SB2E25N-3-4	SS-SOIL	5/22/94 1405	500 ml amber	500 ml	None	γ SPEC	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml amber	500 ml	None	TCLP Metals & SVOAs	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml amber	500 ml	None	γ SPEC	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml amber	250 ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml amber	120 ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: [23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th Isotope. Also ~~[illegible]~~ CD-S156E49N-2-3 FOR U & Th Isotope

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) [signature]	Date: 5/23/94 Time: 1045	1. Received by [28] (Signature/Affiliation) [signature]	Date: 05-24-94 Time: 0910
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

0000058

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions

CLK 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC=2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD-SB9E16N-2-3	SS SOIL	5/22/94 1430	500 ML AMBER	500ML	NONE	& SPEC	90	
CD-SB9E16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD-S78E18N-3-4?	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metal & SVOA	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD-SB1E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDSB1E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CDSB1E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ML	NONE	TOC	100	
CDSB1E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-SB1E5N-2-3-?	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-SB1E5N-3-4	SS SOIL	5/22/94 1500	500 ml AMBER	400ml	NONE	& SPEC	9070	

0000059

White: To accompany samples Yellow: Field copy

*See back of form for special instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: [signature]

DATE: 05-24-94

TIME: 0945

BY: Bob Cowart

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II

Date: 05-24-94 0910

Project No: 537.01

Initiated by: B Cowart

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: 502240

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1	NA	Not enough sample received for proper analysis. Received approximately:	8.	☑	Custody tape disturbed/broken/missing. Mic seals
2	☐	Sample received broken/leaking.	9.	NA	Sample splits performed by lab.
3	☐	Sample received without proper preservative.	10	NA	Volatile sample received with approximately _____ mm headspace.
		☐ Cooler temperature not within 4°C ± 2°C Record temperature: 6°C	11	☐	Sample ID on container does not match sample ID on paperwork. Explain:
		☐ pH			
		☐ other:			
4	☐	Sample received in improper container.	12	☐	All coolers on airbill not received with shipment.
5	☐	Sample received without proper paperwork. Explain:	13	☐	Other (explain below): Shipping containers not rad surveyed
6	☐	Paperwork received without sample.			
7	☐	No sample ID on sample container.			

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review (or designate) _____ Date: _____

Project Management Review: [signature] Date: 05-24-94

0000060

ISOTOPIC URANIUM

DATA SUMMARY

CALIBRATION/STANDARDS LOGS

INSTRUMENT PRINTOUTS

CHAIN OF CUSTODIES

537-01
5179
CD-5156

DATA SUMMARY

INTERNATIONAL TECHNOLOGY CORPORATION

ITAS St. LOUIS
Isotopic Uranium Analysis

PROJ: 537.01

BATCH: 38993

SAMPLE NUMBER	CY	U-232 pCi	U-238 pCi/aliq	ERROR	MDA	U-235, U-236 pCi/aliq	ERROR	MDA	U-234 pCi/aliq	ERROR	MDA
LCS 38993	0.49	5.05E+00	3.00E+00	5.11E-01	1.42E-01	1.01E-01	9.73E-02	1.41E-01	3.22E+00	5.35E-01	1.45E-01
BLK 38993	0.42	4.31E+00	-5.50E-03	5.06E-02	1.37E-01	4.23E-03	4.39E-02	1.14E-01	1.90E-02	7.33E-02	1.54E-01
5179-001	**0.03	2.80E-01	2.14E+00	2.02E+00	3.02E+00	5.17E-02	1.22E+00	2.71E+00	1.12E+00	1.74E+00	3.01E+00
5179-001DUP	**0.02	2.37E-01	5.02E-01	1.29E+00	2.57E+00	-6.27E-02	9.11E-01	2.45E+00	1.89E+00	1.95E+00	2.90E+00
5179-005	0.46	4.68E+00	5.23E+01	3.02E+01	3.60E+01	1.28E+01	1.87E+01	3.20E+01	7.15E+01	3.27E+01	3.09E+01
5179-011	0.45	4.61E+00	5.38E+01	3.08E+01	3.55E+01	-7.22E+00	1.30E+01	3.56E+01	6.44E+01	3.26E+01	3.42E+01
5179-012	0.47	4.78E+00	5.00E+01	2.78E+01	2.90E+01	-3.28E+00	1.07E+01	2.93E+01	6.14E+01	2.96E+01	2.53E+01

** CHEMICAL YIELD < 20%*

	U-238	U-234
SPIKE% RECOVERY:	111	119
BLK ACT:	< 0.137	< 0.154
DUP RPD:	< MDA	< MDA

CALCULATED BY: LEG DATE: 6/9/94

REVIEWED BY: Donald L Dell

DATE: 6-9-94

ACT=(SCpm-BCpm)/(CF*EFF*ALIQ*CY)
ERROR = 1.96*ACT*SQRT((SC+BC)/(SC-BC)^2+.0025)
MDA = (4.65*SQRT(BC)+2.71)/(CF*EFF*ALIQ*CY*SCT)

Quanterra St. Louis
Isotopic Uranium Analysis

Project: 537.01
Batch: 38993

SAMPLE NUMBER	PREP DATE	ALIQUOT (g)	COUNT DATE	COUNT TIME (MIN)	BKGD TIME (MIN)	DET NO.	EFF.	(COUNTS) ROI #1 U-238 (COUNTS)	BKGD	ROI #2 U-235, U-236	BKGD	ROI #3 U-234 (COUNTS)	BKGD	ROI #4 U-232 (COUNTS)	BKGD
LCS 38993	6/7/94	2.0000	6/9/94	100	4000	1	0.310	205	87	9	88	220	93	349	84
BLK 38993	6/7/94	2.0000	6/9/94	100	4000	2	0.317		53	1	3	30	75	305	57
5179-001	6/7/94	2.0891	6/9/94	100	4000	3	0.307	12	149	3	112	8	147	22	119
5179-001DUP	6/7/94	2.0208	6/9/94	100	4000	4	0.308	3	58	1	49	8	79	19	111
5179-005	6/7/94	0.0104	6/9/94	100	4000	5	0.311	21	153	7	112	26	102	326	91
5179-011	6/7/94	0.0101	6/9/94	100	4000	6	0.311	20	129	1	130	23	117	321	101
5179-012	6/7/94	0.0101	6/9/94	100	4000	7	0.308	18	80	1	62	21	54	329	69

TRACER pCi added: 10.28
LCS U-238 pCi/matrix: 2.71

CALCULATED BY: LEG DATE: 6/9/94

REVIEWED BY: _____ DATE: 6/9/94

INTERNATIONAL TECHNOLOGY CORPORATION

St. Louis Laboratory
13715 Rider Trail North
Earth City, MO 63045-1205

Isotopic Uranium Analysis

Batch No. : 38993
Project No. : 537.01

Prep Date 06-07-94

	Sample Number	Aliquot (GFL)	Tracer Added	Tracer Verified	Spike Added	Spike Verified	Container Emptied
1	LCS * 38993	2.0000	ACV	✓	HCl	✓	
2	BLK * 38993	2.0000					
3	517900 1	2.0981					no
4	001 Dup	2.0208					
#5	005	1.0420					
#6	011	1.0063					
#7	012	1.0058					
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

Tracer

Isotope :	U232
Std Sol'n No. :	* 38 31C-1AB
Vol (mL) :	1.0 mL
Ref Activity (pCi/mL) :	22.82 dpm/mL
Act Ref Date :	04-01-91

Standard

Isotope :	U234/U238	U235	NA
Std Sol'n No. :	*1843-1		NA
Vol (mL) :	0.050 mL		NA
Ref Activity (pCi/mL) :	240.9 dpm/mL		NA
Act Ref Date :	05-1987		NA

Comments:

* Modified to 100 mL volume -- 1 mL aliquot taken for analysis

Prepared By : ACV
Date : 06-07-94

Reviewed and received by:
Date : 06-09-94

0000003

CALIBRATION/STANDARDS LOGS

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory-Las Vegas
Nuclear Radiation Assessment Division

Calibration Certificate

Description

Principal radionuclide: NATURAL URANIUM — Half-life: 4.5×10^9 years

Nominal activity: 11 nano curies

Nominal volume: 5 ml in ampoule/bottle number: 1843-1

Measurement

Activity of principal radionuclide

Activity per gram of this solution

1.07 nano curies of Uranium-238 *Accompanied by 49 picoCuries of Uranium-235 per gram of solution.

at 0400 hours PST on May 1989

Activity of daughter radionuclide

The principal activity was accompanied at the quoted time by

1.07 nano curies per gram

of the daughter nuclide: Th-234, Pa-234, and U-234 assuming secular equilibrium.

Total mass of this solution

APPROX. 5.0 grams

Method of measurement

The solution was prepared gravimetrically by dissolving a known quantity of the National Bureau of Standards' SRM 950b which was 99.97 ± 0.02 percent Uranium Oxide (U_3O_8) in Nitric acid and diluting to a known weight. Natural Uranium was assumed to consist of 99.28 percent U-238 and 0.711 percent U-235 with specific activities of 3.36×10^2 and 2.16×10^3 nanoCuries per gram respectively.

0000004

Useful Life

This radionuclide has decayed through [ ] half lives since it was obtained by EMSL-LV

We recommend that this solution should not be used after INDEFINITE

Purity

The manufacturer states that activities other than that of the principal nuclide and of its daughter nuclides, if any, were estimated/known to be:

(1) Radium-226	less than equal to	0.6 %	of the principal activity
(2)	less than equal to	%	of the principal activity
(3)	less than equal to	%	of the principal activity

The activity of impurity (1) is not (2) is not (3) is not included in the quoted figures of the principal activity.

Random Errors

The precision of this standard was such that the certified value of the radioactive concentration of the principal activity had a standard error (sm) not greater than ± [ ] %
(The 99.7% confidence limits are given by t(sm) where t is obtained from the student t factor for the degree of freedom (n-1)).

The maximum uncertainty due to the assessable systematic errors (dilution, counting, and known uncertainty of the standard) is obtained by the separate arithmetic summation of the positive and negative systematic error (+ δ − δ'). These have been estimated not to exceed

[+ 5 %] or [− 5 %]

the overall uncertainty (often called accuracy) is an estimate of the possible divergence of the quoted result from the true value. It is a combination of random error [t(sm)] at the 99.7% confidence limits and the worst case estimate of the systematic errors (+ δ , − δ')
The overall uncertainty is therefore calculated on the basis of + [t(sm) + δ] , − [t(sm) + δ']
and is [+ 5 %] , [− 5 %] of the quoted radioactive concentration.

Decay Schemes

This standardization is based on the following assumptions of the principle nuclide, its daughter nuclides and impurities (no allowance for error in these assumptions or the assumption of quoted half-life have been included in the statement of accuracy above).

Uranium-238 decays by alpha emission to Thorium-234 which decays by two successive beta emissions to Uranium-234. Uranium-234 is assumed to be in secular equilibrium with Uranium-238.

0000005

Chemical Composition of Solution

Carrier content per gram of solution:

Other components:
0.[illegible] nitric acid

Preservative:

Remarks

The overall uncertainty in the quoted values is due primarily to the uncertainty in igniting the U_3O_8 to stoichiometric weight.

Date Certificate Prepared June 15, 1989

Approval Signature Paul B. Tahn

Revised 1/84

NOTEBOOK NO. _____

OJECT Natural Uranium # 1843-1

Continued From Page _____

EPA EMSLV

Natural uranium solution obtained through EMSLV was prepared as described below:

42.6137 g Wt of flask plus standard sol'n
37.5446 g. Wt of flask
5.0691 g. Amount transfered

nCi / gram		%
1.07	U-238	48.9
1.07	U-234	48.9
0.049	U-235	2.2

Σ = 2.189 nCi/g.

$$\frac{\left(\frac{2.189\ nCi}{g}\right)(5.0691\ g)\left(\frac{2.22E3\ dpm}{nCi}\right)}{50\ ml\ \ 1\ \alpha\ HNO_3} = \boxed{492.7\ \frac{dpm}{ml}\ \text{Total U. \#1843-1}}$$

Note: Total U contains following isotopes:

U238 492.7 * 0.489 = 240.9 d

U234 492.7 * 0.489 = 240.9 d

B. Thomas
2-23-93

R. Patterson 09-23-92

0000006

Continued on Page

Read and Understood By

M Faughn — Signed — 09-21-92 — Date

R. Patterson — Signed — 09-23-92 — Date

PROJECT U-238 (NATURAL U.) # 1843-1-2

Notebook No. 32

Continued From Page

EPA U-238 (NATURAL U) Standard # 1843-1-2 The initial Standard dilution is in Log ~~Bang~~ Book # 356 Pg # 26

Conversion From dpm/ml To ng/ml

Standard # 1843-1-2 = 240.06 dpm/ml U-238

$$\left(\frac{240.06\ dpm}{10\ ml}\right)\left(\frac{1\ Ci}{2.22^{E12}\ dpm}\right)\left(\frac{1\ g}{3.37^{E-7}\ Ci_{U-238}}\right) = 3.21^{E-7}\ g/ml = 3.21^{E5}\ ng/ml\ \text{TOTAL U}$$

Using This STANDARD a Series of dilutions were made and listed below

3.21^{E5} ng/ml x $\frac{1.0\ ml}{100.0\ ml}$ = 3210 ng/ml TOTAL U # 1843-1-2A

3210 ng/ml x $\frac{6.3\ ml}{100.0\ ml}$ = 202.2 ng/ml TOTAL U # 1843-1-2B

3210 ng/ml x $\frac{4.8\ ml}{100.0\ ml}$ = 150.9 ng/ml TOTAL U # 1843-1-2C

3210 ng/ml x $\frac{3.1\ ml}{100.0\ ml}$ = 99.5 ng/ml TOTAL U # 1843-1-2D

3210 ng/ml x $\frac{1.6\ ml}{100.0\ ml}$ = 51.4 ng/ml TOTAL U # 1843-1-2E

202.2 ng/ml x $\frac{5.0\ ml}{100.0\ ml}$ = 10.1 ng/ml TOTAL U # 1843-1-2F

202.2 ng/ml x $\frac{3.5\ ml}{100.0\ ml}$ = 7.1 ng/ml TOTAL U # 1843-1-2G

202.2 ng/ml x $\frac{2.5\ ml}{100.0\ ml}$ = 5.1 ng/ml TOTAL U # 1843-1-2H

202.2 ng/ml x $\frac{1.0\ ml}{100.0\ ml}$ = 2.0 ng/ml TOTAL U # 1843-1-2I

10.1 ng/ml x $\frac{10.0\ ml}{100.0\ ml}$ = 1.0 ng/ml TOTAL U # 1843-1-2J

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	03-03-93	[signature]	3-3-93

0000007

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide	U-232	Customer:	IT CORPORATION
Half Life:	68.9 ± 1.0 years	P.O.No.:	047870
Catalog No.:	7232-2	Reference Date:	September 1 1991 12:00 PST.
Source No.:	388-37	Contained Radioactivity:	1.039 µCi.

Description of Solution

a. Mass of solution:	5.2693	grams.
b. Chemical form:	UO2Cl2 in 2N HCl	
c. Carrier content:	None added	
d. Solution density:	1.0330	gram/ml @ 20°C.

Radioimpurities

See attached technical data sheet

Radioactive Daughters

See attached technical data sheet

Radionuclide Concentration

0.1974 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using alpha spectrometry with a surface barrier detector.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±1.3%
b. Random uncertainty in assay:	±1.0%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.3%

0000008

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

PROJECT U-232 # 383-37

NOTEBOOK NO. 000043

Continued From Page

Isotope Products Laboratories solution # 383-37 was prepared as follows:

39.8628 g wt of ampule plus beaker
34.6256 g wt of empty ampule plus beaker
5.2372 g wt amount transferred

$$\frac{(5.2372\,g)\left(\frac{0.1474\,\mu Ci}{g}\right)\left(2.2E6\,\frac{dpm}{\mu Ci}\right)}{50\,ml.\ (1N\ HNO_3)} = 45401.8\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37$$

$A = A_0 e^{-\lambda t}$

$t = 0.583\,yrs$ (04-01-91 to 04-01-92)

$\lambda = 0.693/72\,yrs$

$\lambda t = 0.0056$

$$45401.8\,\frac{dpm}{ml.}\ e^{-\left(\frac{0.693}{72\,yrs}\times 0.583\,yrs\right)} = \boxed{45645\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37\ \text{as of } 04\text{-}01\text{-}92}$$

$$\frac{(45645\,\frac{dpm}{ml.})(5\,ml)}{50\,ml.} = \boxed{4564.5\,\frac{dpm}{ml.}\ U\text{-}232,\ \#\ 383\text{-}37A}$$

$$\frac{(4564.5\,\frac{dpm}{ml.})(5\,ml)}{50\,ml.} = \boxed{456.4\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37B}$$

$$\frac{(456.4\,\frac{dpm}{ml.})(10\,ml.)}{100\,ml.} = \boxed{45.6\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37B\text{-}1\ \text{in } 1N\ HNO_3}$$

0000009

Continued on Page

Read and Understood By

M. Baughn 04-01-92 B Thirnt

PROJECT U-232

Notebook No. 356

Continued From Page

Prepared U-232 #388-37C from stock solution #388-37, Std Prep log book #43, page 92, at 45645 dpm/ml. Ref. date: 09-01-91

Gross Wt.	Container + Solution	136.9160
Tare Wt.	Wt. of Container	32.0936
Net Wt.	Total Solution	104.8224 g.

Added 1.0299g of U-232 #388-37

$$\frac{(45645 \frac{dpm}{ml})(1.0299g)}{104.8224g} = \boxed{448.5 \frac{dpm}{ml} \text{ U-232 \#388-37C as of } \overset{\text{ON}}{\cancel{09}}\text{-01-92}}$$

M Baughan 11-17-92

0000010

Continued on Page

Read and Understood By

M. Baughan 11-17-92 BR [illegible] 12-29-92

PROJECT U 232 #388-37D

Continued From Page

Prepared U-232 #388-37D from Stock Solution #388-37B, Std Prep log Book #43, page 92, at 456.4 dpm/ml, Ref date: 09-01-91

$$\frac{(456.4\ dpm/ml)(10\ ml)}{200\ ml} = 22.82\ dpm/ml \quad \#388\text{-}37D$$

A.C. Vitatoe 03-01-94

Continued on Page

Read and Understood By

A.C. Vitatoe	03-01-94	[signature]	03-01-94
Signed	Date	Signed	Date

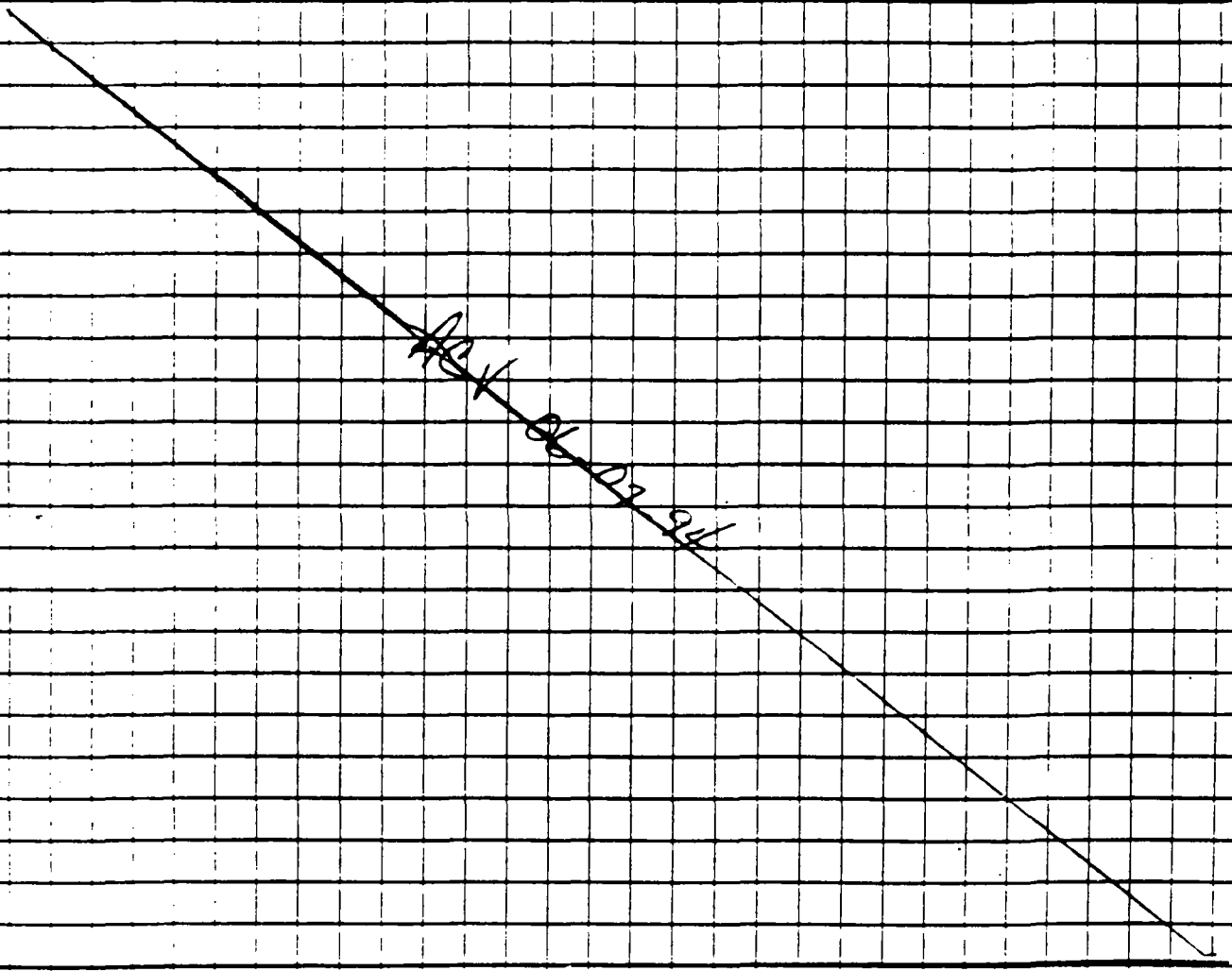
0000011

Prepared from U-232 Solution # 388-37A Std Prep. log book #43, page 92 with a Concentration of 45645 dpm/ml, Ref. Date 09-01-91

$$\frac{45645 \text{ dpm/ml}) \ (5 \text{ ml})}{50 \text{ ml } 1 \text{ N } HNO_3} = 456.4 \text{ dpm/ml} \quad \text{U-232} \ \# 388\text{-}37C\text{-}1$$

ACV 06-07-94

0000012



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Read and Understood By

Signed	Date	Signed	Date
[illegible]	06-~~06~~ 07-94 ACV		

PROJECT U-232 388-37C-1-A

Notebook No. 627

Continued From Page

Prepared from U-232, Solution # 388-37C

with a Concentration of 456.4 dpm/ml from

Standard Log Book # 627, Page # 3

$$\frac{(456.4\ dpm/ml)(25.0\ ml)}{500\ ml} = 22.82\ dpm/ml$$

U 232
388-37C-1AB

$$\frac{(456.4\ dpm/ml)(25.0\ ml)}{500\ ml} = 22.82\ dpm/ml$$

U 232
388-37C-2AB

F.C.V

0000013

Continued on Page

Read and Understood By

[signature] 06-07-94

Signed Date Signed Date

FORM NBS 259
(REV 12-78)

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D.C. 20234

REPORT OF TEST
for

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory
Las Vegas, Nevada

Radionuclide	Thorium-230 (1)*
Source description	Liquid in 5-ml flame-sealed glass ampoule
Solution composition	Thorium-230 in 1 M HNO_3
Solution mass	5.21 ± 0.02 grams
Reference time	1200 EST, 1 January 1983
Radioactivity concentration	490.1 Bq g^{-1} ($s^{-1}g^{-1}$) (2)
Random uncertainty	0.29 percent (3)
Systematic uncertainty	1.41 percent (4)
Total uncertainty (Random plus systematic)	1.70 percent
Photon-emitting impurities	None detected (5)
Half life	7.7 ± 0.3 x 10^4 years (6)
Measuring instrument	NBS "0.1π" defined-solid-angle (7) alpha-particle counter with scintillation detector

For the Director,

Dale D. Hoppes

Dale D. Hoppes, Group Leader
Radioactivity Group
Center for Radiation Research

Washington, D.C. 20234
April 22, 1983

*Notes on next page

0000014

EPA EMSLVQAD ^{230}Th Solution, AMPOULE # 7509-87

NBS ^{230}Th solution in ampoule was obtained through EPA QAD in Las Vegas, NV. It was prepared into 2 solutions, as shown below.

8.7990 g ampoule prior to transfer
3.6225 g ampoule after transfer

5.1765 grams transferred

5.1765 grams were transferred to a 50 mL Volumetric flask, and brought to volume c̄ ~ 1N HNO_3. Activity of this solution is:

$$5.1765 \text{ grams} \times \frac{490.1 \text{ Bq/gram}}{} \times 60 \frac{\text{sec}}{\text{min}} \times \frac{1}{50 \text{ mL}} =$$

SOLN # 7509 TH 01A
3044.4 dpm/mL

As of 1 January 1983, $\frac{^{230}Ra}{^{230}Th} < 1E-5$

$\frac{^{232}Th}{^{230}Th} < 1E-5$

000015

5.0 mL of soln # 7509 TH 01A were taken and diluted to 1000 mL c̄ ~1N HNO_3 and transferred to a Wheaton Bottle

SOLN # 7509 TH01A1

$$\frac{5.0 \text{ mL}}{\text{mL}} \times \frac{3044.4 \text{ dpm/mL}}{} \times \frac{1}{1000 \text{ mL}} = 15.2 \frac{\text{dpm}}{\text{mL}}$$

Continued on Page

Read and Understood By
R Patterson
10-23-93

Signed Date Signed Date

PRELIMINARY INFORMATION FOR STANDARD REFERENCE MATERIAL 4328A

Dear Customer:

Because of your urgent need, Standard Reference Material (SRM) 4328A, Thorium-229, is being sent to you before the Certificate is ready. Below is preliminary information that can be used until the Certificate is issued. The numbers below are not expected to change significantly, but this is not guaranteed. Only the numbers that appear on the Certificate are considered "official". The Certificate will be mailed to you as soon as it is issued, probably during the month of March 1994.

For further information, contact:
Dr. Larry Lucas
Radioactivity Group, Building 245, Room C114
National Institute of Standards and Technology
Gaithersburg, MD 20899-0001 USA
Phone: 1-301-975-5546
FAX: 1-301-926-7416

Radionuclide: Thorium-229

Source Identification: Standard Reference Material 4328A

Source Description: Liquid in 5-mL borosilicate-glass ampoule

Solution Composition: Thorium-229 plus progeny in 1-molar nitric acid

Solution Density: 1.032 ± 0.002 (two standard deviations) at 22.6 °C

Solution Mass: Approximately 5.1 grams

Reference Time: January 1994

Radioactivity Concentration: 32.8 Bq g^{-1}

Expanded Uncertainty: 1.5 percent (two standard deviations)

Radionuclidic Impurities: None detected

0000016

PROJECT [illegible] Continued From Page

Th 229 obtained from NIST #4328A, activity concentration 32.8 Bq/g as of Jan 01, 1994. The halflive for Th 229 is 7340 yrs.

Amount transfered 5.0851g into a 50ml Volumetric flask Diluted to volume with 1M HNO_3

$$\frac{32.8\ Bq/g \times 60\ \frac{dpm}{Bq} \times 5.0851g}{50.0\ ml} = 200.0\ dpm/ml$$

~~[illegible]~~ 4328-A-2
[illegible] 03-30-94

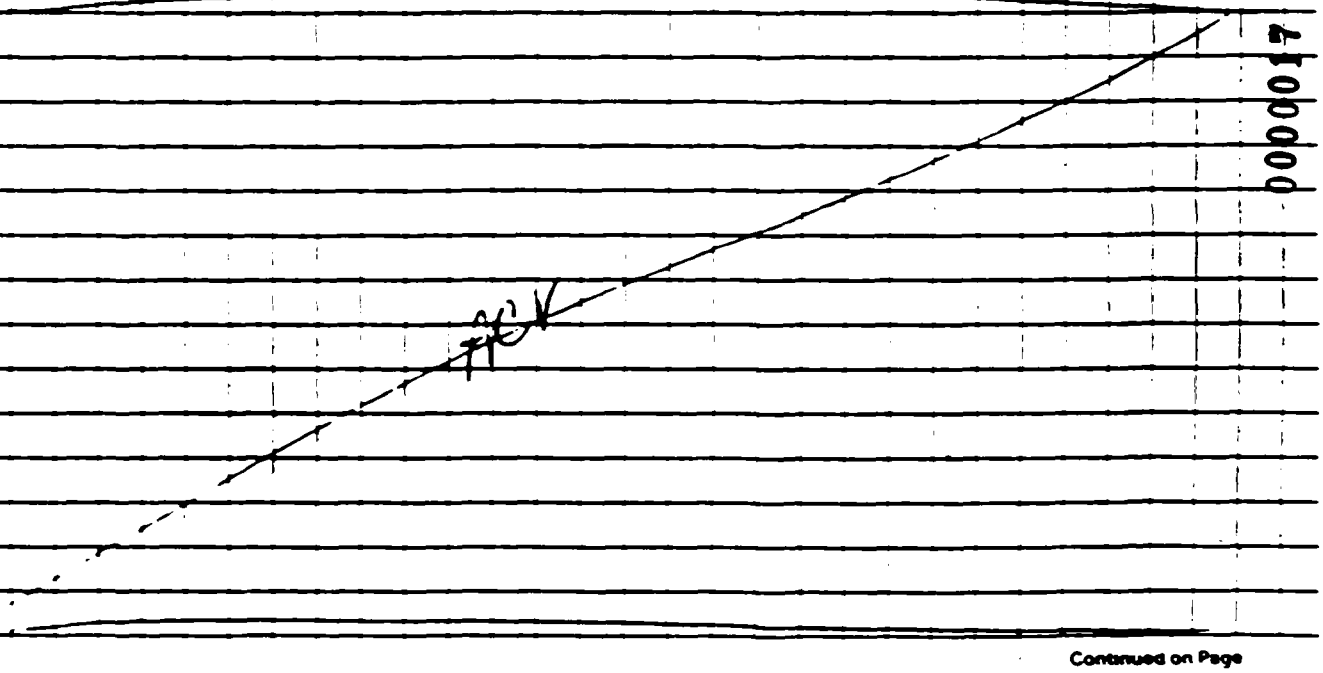
Transfered 10.0ml of Th 229 #4328A-2 above to a 100ml Volumetric and diluted to volume with 1M HNO_3

$$\frac{10.0\ ml \times 200.0\ dpm/ml}{100.0\ ml} = 20.0\ dpm$$

4328 E

4328 E

000017



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Read and Understood By

[illegible] 03-30-94 [illegible] 03-30-93

Signed Date Signed Date

PROJECT [illegible] 4328-F

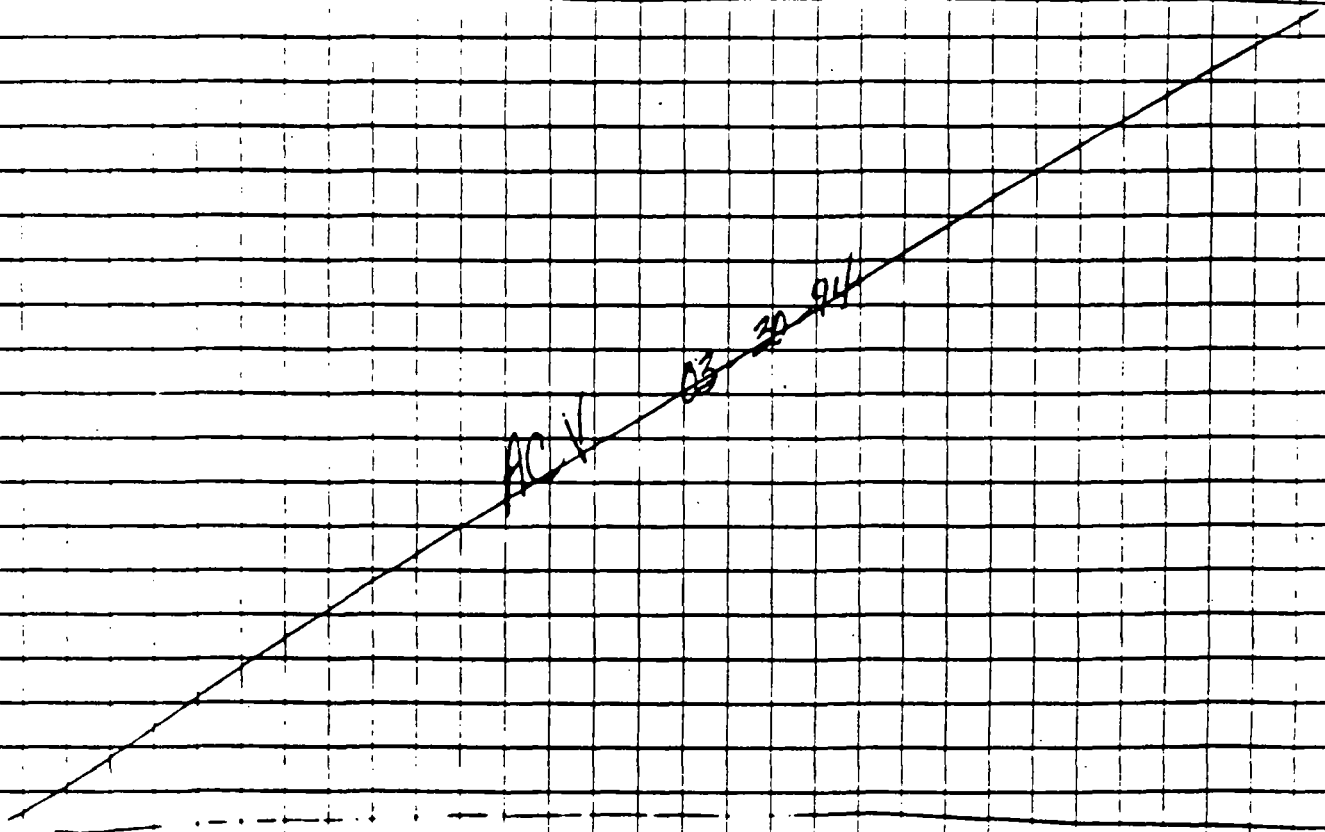
Continued From Page

Transfered 10.0 ml of Th 229 # 4328-A-2
to a 100 ml Volumetric and diluted
to volume with 1M HNO_3 - #4328-F

$$\frac{10.0\ ml \times 200.0}{100.0} = 20.0\ dpm/ml$$

4328-F

AC V 03-30-94



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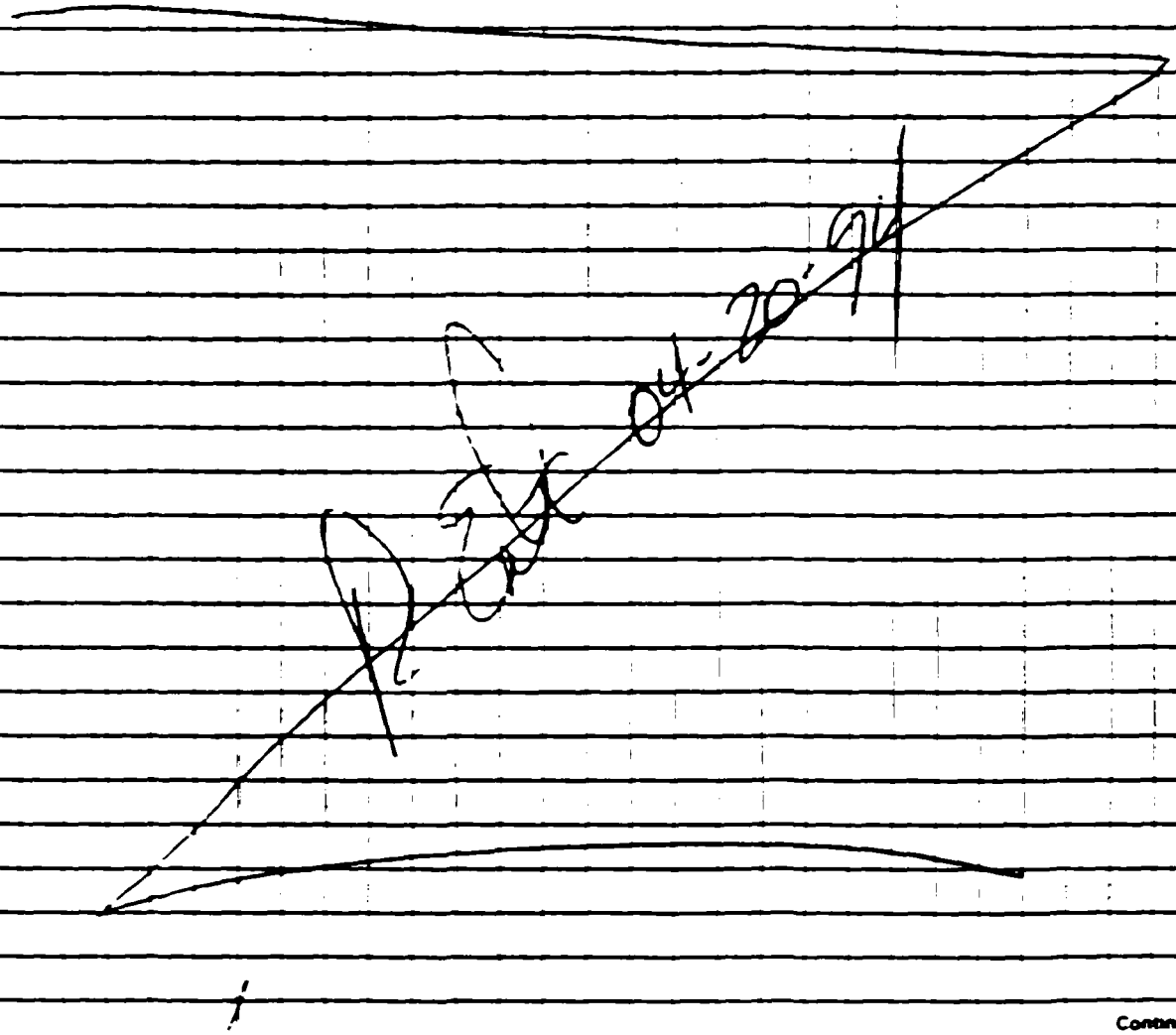
Read and Understood By

[illegible]	03-30-94	[illegible]	03-30-94
Signed	Date	Signed	Date

TRANSFERRED 10.0 ml OF TI-4328-A-2 TO A 100.0 ml VOL. FLASK and diluted To 100.0 ml WITH 1.0 N. HNO_3 = 4328-G

$$\frac{10.0\ ml \times 200.0\ dpm/ml}{100.0\ ml} = 20.0\ dpm/ml$$

4328-G



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Continued on Page

Read and Understood By

Signed	Date	Signed	Date
	04-20-94		04-20-94

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 A1 06/08/94 119 LEG 4919.00 1.36 0.13 0.38 1718.00 0.76 1.07 -0.90 0.00

ALPHA COUNT MEAN & SIGMA: 4831 / 65
ALPHA BKG. MEAN & SIGMA: 0.10 / 0.08
BETA COUNT MEAN & SIGMA: 1710 / 15
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 A2 06/08/94 119 LEG 5635.00 -1.17 0.03 -0.13 3003.00 -0.10 1.40 1.14 0.00

ALPHA COUNT MEAN & SIGMA: 5669 / 29
ALPHA BKG. MEAN & SIGMA: 0.04 / 0.08
BETA COUNT MEAN & SIGMA: 3018 / 92
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 12

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 A3 06/08/94 119 LEG 5384.00 0.84 0.07 0.13 2568.00 -0.16 1.00 -0.87 0.00

ALPHA COUNT MEAN & SIGMA: 5347 / 44
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 2586 / 80
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 A4 06/08/94 120 LEG 5892.00 2.83 0.13 0.88 3468.00 0.47 1.20 -0.65 0.00

ALPHA COUNT MEAN & SIGMA: 5809 / 41
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 3451 / 51
BETA BKG. MEAN & SIGMA: 1 / 0
***TOTAL DATA POINTS (N) = 14*

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 B1 06/08/94 120 LEG 6283.00 0.78 0.13 0.00 3835.00 1.36 1.93 2.13 0.00

ALPHA COUNT MEAN & SIGMA: 6253 / 40
ALPHA BKG. MEAN & SIGMA: 0.13 / 0.08
BETA COUNT MEAN & SIGMA: 3784 / 44
BETA BKG. MEAN & SIGMA: 1 / 0
***TOTAL DATA POINTS (N) = 14*

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 B2 06/08/94 121 LEG 7060.00 1.02 0.13 0.50 8441.00 1.94 1.17 0.28 0.00

ALPHA COUNT MEAN & SIGMA: 7017 / 42
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 8354 / 54
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 B3 06/08/94 120 LEG 6390.00 0.90 0.07 0.13 3428.00 -0.82 1.37 0.46 0.00

ALPHA COUNT MEAN & SIGMA: 6358 / 36
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 5742 / 2820
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

0000020

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 121 LBG 7779.00 -0.97 3.07 -0.25 9097.00 0.96 1.10 -0.02 0.00

ALPHA COUNT MEAN & SIGMA: 7833 / 56
ALPHA REG. MEAN & SIGMA: 0.05 / 0.08
BETA COUNT MEAN & SIGMA: 6541 / 2851
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 14

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 125 LBG 4267.00 -1.58 3.01 -0.75 1474.00 -1.31 0.73 -1.02 0.00

ALPHA COUNT MEAN & SIGMA: 4371 / 65
ALPHA REG. MEAN & SIGMA: 0.07 / 0.08
BETA COUNT MEAN & SIGMA: 1512 / 27
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 13

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 123 LBG 5324.00 1.57 0.07 -0.13 2859.00 1.78 0.77 -1.12 0.00

ALPHA COUNT MEAN & SIGMA: 5268 / 36
ALPHA REG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 2793 / 43
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 14

**NOTE "B" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
LB48[illegible] 06/07/94 125 LBG 4719.00 -0.58 0.13 0.58 2271.00 -0.28 1.30 2.33 0.00

ALPHA COUNT MEAN & SIGMA: 4824 / 180
ALPHA REG. MEAN & SIGMA: 0.09 / 0.06
BETA COUNT MEAN & SIGMA: 2654 / 1317
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 15*

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 126 LBG 5268.83 -1.70 0.01 -1.13 3139.00 -0.57 1.30 0.63 0.00

ALPHA COUNT MEAN & SIGMA: 5317 / 34
ALPHA REG. MEAN & SIGMA: 0.13 / 0.08
BETA COUNT MEAN & SIGMA: 3183 / 61
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 14

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 121 LBG 5185.00 -1.81 0.18 -0.50 3215.00 -0.13 0.97 -0.07 0.00

ALPHA COUNT MEAN & SIGMA: 5276 / 169
ALPHA REG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 3278 / 89
BETA REG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (B) = 15

**NOTE "B" less than 20...
[illegible] DATE SERIES OPERATOR ALPHA_CTS AC_HDEV ALPHA_REG AB_HDEV BETA_CTS BC_HDEV BETA_REG BB_HDEV XTALK
[illegible] 06/08/94 122 LBG 5089.00 -0.75 0.23 1.88 6834.00 -0.72 1.40 -0.72 0.00

ALPHA COUNT MEAN & SIGMA: 5991 / 135
ALPHA REG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 6968 / 169
BETA REG. MEAN & SIGMA: 2 / 1
**TOTAL DATA POINTS (B) = 10

0000021

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	D3	06/08/94	121	LEG	5366.00	0.09	0.03	-0.50	2752.00	-0.74	0.90	0.50	0.00

ALPHA COUNT MEAN & SIGMA: 5359 / 75
ALPHA BKG. MEAN & SIGMA: 0.07 / 0.08
BETA COUNT MEAN & SIGMA: 4511 / 2333
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	D4	06/08/94	121	LEG	6369.00	-1.21	0.23	1.63	7173.00	0.81	1.23	1.05	0.00

ALPHA COUNT MEAN & SIGMA: 6549 / 149
ALPHA BKG. MEAN & SIGMA: 0.10 / 0.08
BETA COUNT MEAN & SIGMA: 5329 / 2298
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB40002	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB40003	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB5100	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	C14_CTS	SC_NDEV	C14_BKG	SB_NDEV	ENTRY_LOG
LSC1	****	06/08/94	***			0.00		0.00	

REMARKS: No IQC data in system this instrument this date

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	*AS01*	*06/08/94*	*113*	*LEG*	*4950*	*0.34*	*06/08/94.08:57*

PULSE COUNTS MEAN & SIGMA: 4942 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT_DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS02	06/08/94	111	LEG	5035	0.13	06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 5032 / 25
** TOTAL DATA POINTS (N) = 3

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS03     06/08/94   111    LEG          5088    -0.01 06/08/94.08:57

            PULSE COUNTS MEAN & SIGMA: 5088 / 25
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS04     06/08/94   112    LEG          5358    0.21 06/08/94.08:57

            PULSE COUNTS MEAN & SIGMA: 5352 / 27
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS05     06/08/94   111    LEG          5090    0.09 06/08/94.08:57

            PULSE COUNTS MEAN & SIGMA: 5088 / 25
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS06     06/08/94   112    LEG          5018    0.45 06/08/94.08:57

            PULSE COUNTS MEAN & SIGMA: 4999 / 25
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS07     06/08/94   113    LEG          4995    0.52 06/08/94.08:58

            PULSE COUNTS MEAN & SIGMA: 4982 / 25
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE CTS PC_NDEV ENTRY LOG
ALPHAS  AS08     06/08/94   111    LEG          5019    0.53 06/08/94.08:58

            PULSE COUNTS MEAN & SIGMA: 5006 / 25
            ** TOTAL DATA POINTS (N) = 3
```

0000023

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS09 06/08/94 112 LEG 5429 -0.51 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5443 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS10 06/08/94 112 LEG 5375 -0.25 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5382 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS11 06/08/94 113 LEG 5092 -0.38 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5102 / 26
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS12 06/08/94 111 LEG 5396 -0.42 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5407 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS13 06/08/94 111 LEG 3608 -0.24 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 3612 / 18
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS14 06/08/94 111 LEG 3601 -0.02 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 3601 / 18
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20

DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_RDEV	ENTRY_LOG
ALPHA1	06/08/94	112	LEG	3601	0.02	06/08/94.08:59

PULSE COUNTS MEAN & SIGMA: 3601 / 18
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20

DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_RDEV	ENTRY_LOG
ALPHA1	06/08/94	111	LEG	3602	0.02	06/08/94.08:59

PULSE COUNTS MEAN & SIGMA: 3602 / 18
** TOTAL DATA POINTS (N) = 3

DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_RDEV	ENTRY_LOG
ALPHA1	**	06/08/94	***		0.00	

REMARKS NOTE: 1 or more detector(s) missing or OOS this date.

DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_RDEV	ALPHA_BKG	AB_RDEV	ENTRY_LOG
184ALPHA	**	06/08/94	***		0.00		0.00	

REMARKS N: IQC data in system this instrument this date

DETECTOR	COUNT DATE	SERIES	OPERATOR	SOURCE_CTS	SC_RDEV	BACKGD_CTS	SB_RDEV	ENTRY_LOG
[illegible]	***	06/08/94	***		0.00			

REMARKS N: IQC data in system this instrument this date

0000025

REMARKS: _____

REVIEWED BY: _____ DATE: 06-08-94

0000026

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**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A1	06/09/94	119	LEG	4911.00	-1.15	0.17	-0.75	1700.00	-0.43	1.50	-0.55	0.00

ALPHA COUNT MEAN & SIGMA: 4836 / 66
ALPHA BKG. MEAN & SIGMA: 0.11 / 0.08
BETA COUNT MEAN & SIGMA: 1710 / 14
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A2	06/09/94	119	LEG	5696.00	-0.88	0.17	-1.50	3012.00	-0.00	1.67	-1.85	0.00

ALPHA COUNT MEAN & SIGMA: 5671 / 29
ALPHA BKG. MEAN & SIGMA: 0.05 / 0.08
BETA COUNT MEAN & SIGMA: 3018 / 88
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 13

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A3	06/09/94	119	LEG	5292.00	-1.13	0.03	-0.38	2573.00	-0.09	1.23	-0.14	0.00

ALPHA COUNT MEAN & SIGMA: 5343 / 45
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 2585
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A4	06/09/94	120	LEG	5886.00	-1.63	0.03	-0.25	3334.00	-1.81	1.63	-1.08	0.00

ALPHA COUNT MEAN & SIGMA: 5814 / 44
ALPHA BKG. MEAN & SIGMA: 0.05 / 0.08
BETA COUNT MEAN & SIGMA: 3443 / 57
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B1	06/09/94	120	LEG	6238.00	-0.54	0.07	-0.75	3848.00	-1.47	1.03	-1.58	0.00

ALPHA COUNT MEAN & SIGMA: 6251 / 39
ALPHA BKG. MEAN & SIGMA: 0.13 / 0.08
BETA COUNT MEAN & SIGMA: 3788 / 46
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B2	06/09/94	121	LEG	7068.00	-1.12	0.03	-0.63	8364.00	-0.49	1.13	-0.06	0.00

ALPHA COUNT MEAN & SIGMA: 7020 / 43
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 8356 / 52
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B3	06/09/94	120	LEG	6429.00	-1.70	0.07	-0.13	3446.00	-0.77	0.90	-1.32	0.00

ALPHA COUNT MEAN & SIGMA: 6362 / 39
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 5589 / 2781
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

0000027

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	B4	06/09/94	121	LEG	7875.00	0.71	0.17	1.38	8868.00	0.78	0.93	-0.92	0.00

ALPHA COUNT MEAN & SIGMA: 7836 / 55
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 6697 / 2814
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	C1	06/09/94	125	LEG	4286.00	-1.18	0.01	-0.75	1529.00	-0.71	1.87	-1.39	0.00

ALPHA COUNT MEAN & SIGMA: 4365 / 67
ALPHA BKG. MEAN & SIGMA: 0.07 / 0.08
BETA COUNT MEAN & SIGMA: 1513 / 26
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	C2	06/09/94	123	LEG	5346.00	1.83	0.07	-0.13	2764.00	-0.55	0.87	-0.68	0.00

ALPHA COUNT MEAN & SIGMA: 5273 / 40
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 2791 / 39
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	C3	06/09/94	125	LEG	4686.00	-0.73	0.07	-0.25	2264.00	-0.28	0.90	-0.36	0.00

ALPHA COUNT MEAN & SIGMA: 4815 / 177
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 2630 / 1276
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	C4	06/09/94	126	LEG	5251.00	-1.68	0.03	-0.75	3240.00	1.01	1.20	-0.11	0.00

ALPHA COUNT MEAN & SIGMA: 5313 / 37
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 3185 / 61
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	D1	06/09/94	121	LEG	5092.00	-1.02	0.07	-0.13	3203.00	-0.26	1.03	-0.38	0.00

ALPHA COUNT MEAN & SIGMA: 5265 / 170
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 3277 / 87
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC NDEV	ALPHA BKG	AB NDEV	BETA CTS	BC NDEV	BETA BKG	BB NDEV	XTALK
LB40001	D2	06/09/94	122	LEG	5878.00	-0.77	0.07	-0.13	6929.00	-0.15	1.43	-0.63	0.00

ALPHA COUNT MEAN & SIGMA: 5981 / 133
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 6966 / 160
BETA BKG. MEAN & SIGMA: 2 / 1
**TOTAL DATA POINTS (N) = 11

```
**NOTE  "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
1840000 03       06/09/94   121    LEG        5312.00   -0.60      0.03   -0.50  2782.00   -0.69     0.67   -0.72  0.00

          ALPHA COUNT MEAN & SIGMA: 5356 / 73
          ALPHA BKG.  MEAN & SIGMA: 0.07 / 0.08
          BETA  COUNT MEAN & SIGMA: 4399 / 2290
          BETA  BKG.  MEAN & SIGMA: 1 / 0
          **TOTAL DATA POINTS (N) = 15
```

```
**NOTE  "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
1840000 04       06/09/94   121    LEG        6497.00   -0.34      0.07   -0.38  7166.00    0.76     0.97   -0.14  0.00

          ALPHA COUNT MEAN & SIGMA: 6546 / 144
          ALPHA BKG.  MEAN & SIGMA: 0.10 / 0.08
          BETA  COUNT MEAN & SIGMA: 5452 / 2266
          BETA  BKG.  MEAN & SIGMA: 1 / 0
          **TOTAL DATA POINTS (N) = 15
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
1840000 **       06/09/94   ***                        0.00              0.00              0.00              0.00

     REMARKS: No IQC data in system this instrument this date
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
1840000 **       06/09/94   ***                        0.00              0.00              0.00              0.00

     REMARKS: No IQC data in system this instrument this date
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
1850000 **       06/09/94   ***                        0.00              0.00              0.00              0.00

     REMARKS: No IQC data in system this instrument this date
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR C14_CTS SC_NDEV C14_BKG SB_NDEV ENTRY_LOG
1850000 ****     06/09/94   ***                        0.00              0.00

          REMARKS: No IQC data in system this instrument this date
```

```
**NOTE  "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS01     06/09/94   113    LEG          4945    0.10 06/09/94.09:21

              PULSE COUNTS MEAN & SIGMA: 4943 / 25
              ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE  "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS02     06/09/94   111    LEG          5038    0.19 06/09/94.09:21

              PULSE COUNTS MEAN & SIGMA: 5033 / 25
              ** TOTAL DATA POINTS (N) = 4
```

0000029

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS03     06/09/94   111    LEG          5107    0.55 06/09/94.09:21

            PULSE COUNTS MEAN & SIGMA: 5093 / 25
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS04     06/09/94   112    LEG          5357    0.13 06/09/94.09:21

            PULSE COUNTS MEAN & SIGMA: 5354 / 27
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS05     06/09/94   111    LEG          5089    0.04 06/09/94.09:22

            PULSE COUNTS MEAN & SIGMA: 5088 / 25
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS06     06/09/94   112    LEG          5023    0.73 06/09/94.09:22

            PULSE COUNTS MEAN & SIGMA: 5005 / 25
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS07     06/09/94   110    LEG          4985    0.09 06/09/94.09:22

            PULSE COUNTS MEAN & SIGMA: 4983 / 25
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_RDEV ENTRY_LOG
ALPHAS  AS08     06/09/94   111    LEG          5016    0.31 06/09/94.09:22

            PULSE COUNTS MEAN & SIGMA: 5008 / 25
            ** TOTAL DATA POINTS (N) = 4
-------------------------------------------------------------------------------
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS09     06/09/94   112    LEG          5426   -0.47 06/09/94.09:22

            PULSE COUNTS MEAN & SIGMA: 5439 / 27
            ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS10     06/09/94   112    LEG          5362   -0.55 06/09/94.09:23

            PULSE COUNTS MEAN & SIGMA: 5377 / 27
            ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS11     06/09/94   113    LEG          5107    0.16 06/09/94.09:23

            PULSE COUNTS MEAN & SIGMA: 5103 / 26
            ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS12     06/09/94   111    LEG          5388   -0.54 06/09/94.09:23

            PULSE COUNTS MEAN & SIGMA: 5403 / 27
            ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS13     06/09/94   111    LEG          3607   -0.22 06/09/94.09:23

            PULSE COUNTS MEAN & SIGMA: 3611 / 18
            ** TOTAL DATA POINTS (N) = 4
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS14     06/09/94   111    LEG          3602    0.03 06/09/94.09:23

            PULSE COUNTS MEAN & SIGMA: 3602 / 18
            ** TOTAL DATA POINTS (N) = 4
```

0000031

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS15 06/09/94 112 LEG 3601 -0.01 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3601 / 18
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS16 06/09/94 111 LEG 3601 -0.06 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3602 / 18
** TOTAL DATA POINTS (N) = 4

COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS ** 06/09/94 *** 0.00

REMARKS: NOTE: 1 or more detector(s) missing or OOS this date.

COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV ENTRY_LOG
LB4ALPHA ** 06/09/94 *** 0.00 0.00

REMARKS: No IQC data in system this instrument this date

COUNTER DETECTOR COUNT DATE SERIES OPERATOR SOURCE_CTS SC_NDEV BACKGD_CTS SB_NDEV ENTRY_LOG
GDETECTS *** 06/09/94 *** 0.00

REMARKS: No IQC data in system this instrument this date

0000032

Notebook No. 326

PROJECT

Continued From Page

DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Init
04-25-94	5.027	5.048	5.028	5.025	5.033	5.025	4.936	5.024	5.006	4.979	5.010	5.049	4.999	5.012	4.984	4.997	CEG
04-26-94	5.027	5.048	5.028	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.012	4.984	4.992	CEG
04-27-94	5.027	5.049	5.028	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.008	4.974	4.997	CEG
04-28-94	5.027	5.048	5.026	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.008	4.979	4.997	CEG
04-29-94	5.027	5.048	5.028	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.004	5.049	4.995	5.008	4.984	4.997	CEG
05-02-94	5.027	5.046	5.028	5.025	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.012	4.979	4.997	CEG
05-03-94	5.027	5.046 *	5.036 *	5.028	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.003	4.979	4.997	CEG
05-04-94	5.029	5.043	5.027	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.008	4.979	4.997	CEG
05-05-94	5.027	5.046	5.027	5.020	5.033	5.020	4.936	5.019	—	4.979	5.004	5.049	4.995	5.003	4.979	4.992	CEG
05-06-94	5.027	5.046	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.010	5.049	4.995	5.003	4.971	4.997	CEG
05-09-94	5.027	5.043	5.017	5.020	5.033	5.020	4.936	5.019	—	4.974	5.004	5.049	4.999	5.008	4.974	4.997	CEG
05-10-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.974	5.010	5.049	4.995	5.008	4.979	4.992	CEG
05-11-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.010	5.049	4.999	5.008	4.979	4.997	CEG
05-17-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.010	5.049	4.995	5.008	4.979	4.997	CEG
05-19-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.974	4.992	5.049	4.999	5.003	4.984	4.992	CEG
05-24-94	5.027	5.049	5.031	5.020	5.033	5.020	4.936	5.031	5.001	4.978	—	5.049	4.999	5.003	4.979	4.997	CEG
05-25-94	5.027	5.048	5.036	5.028	5.033	5.020	4.936	5.036	5.006	4.978	4.992	5.049	4.995	5.003	4.984	5.002	CEG
05-26-94	5.027	5.048	5.031	5.023	5.033	5.020	4.936	5.031	5.001	4.978	4.992	5.049	4.999	5.008	4.984	5.007	CEG
05-31-94	5.027	5.048	5.046	—	5.033	5.020	4.936	5.036	5.006	4.978	4.992	5.049	4.995	5.008	4.979	5.002	CEG
06-02-94	5.027	5.048	5.031	5.028	5.033	5.020	4.936	5.036	5.001	4.983	4.992	5.049	4.999	5.012	4.979	5.007	CEG
06-03-94	5.027	5.048	5.036	5.028	5.033	5.020	4.941	5.036	5.006	4.983	4.992	5.049	4.999	5.008	4.979	5.007	CEG
06-06-94	5.028	5.048	5.031	5.018	5.033	5.020	4.936	5.031	5.001	4.978	4.992	5.043	5.004	5.003	4.984	5.007	CEG
06-07-94	5.022	5.043	5.031	5.023	5.033	5.020	4.936	5.031	5.001	4.977	4.986	5.043	5.009	5.008	4.984	5.012	CEG
06-08-94	5.022	5.048	5.031	5.028	5.033	5.020	4.936	5.031	5.006	4.983	4.992	5.049	4.999	5.008	4.984	5.002	CEG
06-09-94	5.027	5.048	5.036	5.029	5.033	5.020	4.936	5.019	5.001	4.979	4.992	5.247	4.999	5.008	4.984	5.002	CEG

Continued on Page

* New Det's

Read and Understood By

Signed | Date | Signed | Date

0000034

BACKGROUND FOR ALPHA SPECTROSCOPY DETECTORS

URANIUM:

	REGION OF INTEREST			
DETECTOR	**1**	**2**	**3**	**4**
1	87	86	93	64
2	53	30	75	57
3	149	112	147	119
4	56	48	79	111
5	153	112	102	91
6	129	130	117	101
7	80	82	54	69
8	62	58	72	59
9	11	6	24	68
10	22	5	25	35
11	3	4	9	61
12	9	11	61	55
13	7	8	24	70
14	21	17	37	72
15	13	16	17	35
16	86	20	73	79

REGION 1: U-238
REGION2 U-235,236
REGION3 U-234
REGION4: U-232

Background measured for 4000 min. JUNE 03, 1994

0000035

BACKGROUND FOR ALPHA SPECTROSCOPY DETECTORS

THORIUM

	REGION OF INTEREST			
DETECTOR	**1**	**2**	**3**	**4**
1	71	176	63	94
2	41	86	43	105
3	141	208	121	108
4	66	99	88	104
5	138	234	59	122
6	153	222	107	127
7	89	153	59	91
8	62	114	32	102
9	12	23	33	60
10	10	26	32	30
11	3	8	20	81
12	4	45	37	59
13	16	28	40	91
14	24	42	30	51
15	30	20	25	35
16	61	69	57	69

REGION 1: TH-232
REGION2: TH-230
REGION3: TH-229
REGION4: TH-228

Background measured for 4000 min. JUNE 03, 1994

0000036

COUNTER EFFECIENCY FOR ALPHA SPECTROSCOPY DETECTORS

DETECTOR	MEAN EFF.	06-08-94	05-10-94	04-12-94	03-29-94	03-03-94	02-14-94	02-07-94	01-24-94
1	0.310	0.354	0.323	0.309	0.296	0.316	0.321	0.309	0.313
2	0.317	0.353	0.320	0.309	0.305	0.325	0.324	0.313	0.316
3	0.307	0.351	0.320	0.300	0.292	0.316	0.291	0.294	0.309
4	0.308	0.348	0.318	0.302	0.298	0.32	0.283	0.308	0.316
5	0.311	0.351	0.319	0.290	0.309	0.315	0.286	0.302	0.32
6	0.311	0.347	0.322	0.301	0.298	0.32	0.287	0.299	0.318
7	0.308	0.348	0.316	0.295	0.295	0.323	0.292	0.306	0.315
8	0.310	0.354	0.321	0.291	0.308	0.322	0.289	0.305	0.314
9	0.224	0.225	0.225	0.226	0.235	0.217	0.232	0.217	0.235
10	0.293	0.287	0.295	0.299	0.298	0.291	0.291	0.301	0.294
11	0.217	0.209	0.225	0.227	0.217	0.214	0.213	0.207	0.233
12	0.292	0.286	0.302	0.295	0.288	0.288	0.295	0.278	0.293
13	0.227	0.234	0.219	0.232	0.227	0.224	0.227	0.216	0.223
14	0.191	0.192	0.196	0.187	0.193	0.193	0.184	0.188	0.187
15	0.170	0.151	0.168	0.158	0.169	0.178	0.179	0.167	0.179
16	0.219	0.226	0.223	0.218	0.214	0.203	0.206	0.221	0.205

EFFECIENCY WAS DETERMINED USING A PU-239 ELECTROPLATED SOURCE
(11800 dpm) SERIAL #1277/92

INSTRUMENT PRINTOUTS

MCA #1 - Canberra S100 - SD6042.MCA - BLK 38993 U

Tag Number: 561
Report Group: 2/16
Input: 2 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:09
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.636e-006*Ch^2 + 0.004104*Ch + 3.516 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000039

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.068	1	1	4.251
	4.317	0.00	165.00	0.1190
2	4.331	1	-2	4.345
	4.454	0.00	165.00	0.1190
3	4.546	3	-4	4.713
	4.828	0.00	248.78	0.1190
4	5.033	305	230	5.262
	5.343	0.05	19.22	0.0698

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

128				0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	0	0	0	0
150	0	0	0	0	0
155	0	0	0	0	0
160	0	0	0	0	0
165	0	0	0	1	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0		

ROI # 2
Channel # **** Data ****

185	0	0	0	1	0
190	0	0	0	0	0
195	0	0	0	0	0
200	0	0	0	0	0
205	0	0	0	0	0
210	0	0			

ROI # 3
Channel # **** Data ****

230	0	0	0	1	0
235	0	0	0	0	0
240	0	0	0	0	0
245	0	0	0	0	0
250	0	0	0	0	0
255	0	0	0	0	0

0000040

REGION OF INTEREST DATA

ROI # 3

Channel #			**** Data ****		
260	1	0	0	0	1
265	0	0	0	0	0
270	0	0	0	0	0
275	0	0	0	0	0
280	0	0	0	0	0
285	0	0	0		

ROI # 4

Channel #			**** Data ****		
327			3	1	1
330	0	0	1	2	0
335	0	2	2	1	0
340	1	2	0	2	3
345	1	2	1	4	4
350	2	4	5	5	3
355	4	3	9	9	1
360	5	8	7	12	14
365	4	12	8	11	9
370	15	11	12	13	11
375	8	15	14	14	7
380	4	7	1	2	2
385	0	1			

0000041

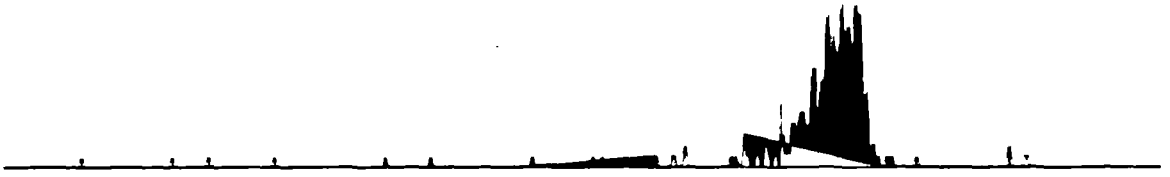
MCA #1 - Canberra S100 - SD6042.MCA - BLK 38993 U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:15:37

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

2/16 :VFS= 64

Inp:2 Grp:A



Cursor=5.116MeV From 5.033MeV To 5.343MeV Pset(Lm)= 100.00

Counts=2 Int=305 Area=230+-19.22% Elap(Lm)= 100.00

0000042

MCA #1 - Canberra S100 - SD6041.MCA - LCS 38993 U

Tag Number: 561
Report Group: 1/16
Input: 1 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:01
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.613e-006*Ch^2 + 0.004020*Ch + 3.586 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000043

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.136	205	158	4.233
	4.302	0.03	19.19	0.0591
2	4.311	9	9	4.389
	4.464	0.00	55.00	0.0040
3	4.624	220	165	4.759
	4.813	0.04	19.62	0.0174
4	5.108	349	296	5.260
	5.346	0.06	13.11	0.0476

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
130	0	3	2	4	2
135	7	1	2	7	5
140	3	5	4	4	6
145	9	8	9	12	10
150	6	9	12	10	12
155	6	9	10	12	6
160	1	3	1	4	1
165	0	0	0		

ROI # 2

Channel #	**** Data ****				
169					0
170	0	0	0	0	1
175	1	0	0	1	0
180	1	1	0	1	0
185	0	2	0	0	0
190	0	1	0	0	0
195	0	0	0	0	0
200	0	0	0		

ROI # 3

Channel #	**** Data ****				
236		3	4	0	1
240	3	2	4	2	3
245	4	3	5	9	1
250	4	9	4	9	10
255	10	10	11	13	7
260	5	8	8	9	15
265	10	11	4	6	3
270	5	2	1	2	0
275	0				

0000044

ROI # 4
Channel # **** Data ****

334					2
335	1	1	5	4	0
340	2	7	3	3	3
345	4	7	4	14	5
350	6	9	10	11	14
355	11	11	9	14	11
360	15	11	11	18	15
365	22	14	7	19	12
370	6	14	6	3	4
375	1	0	0	0	0
380	0				

0000045

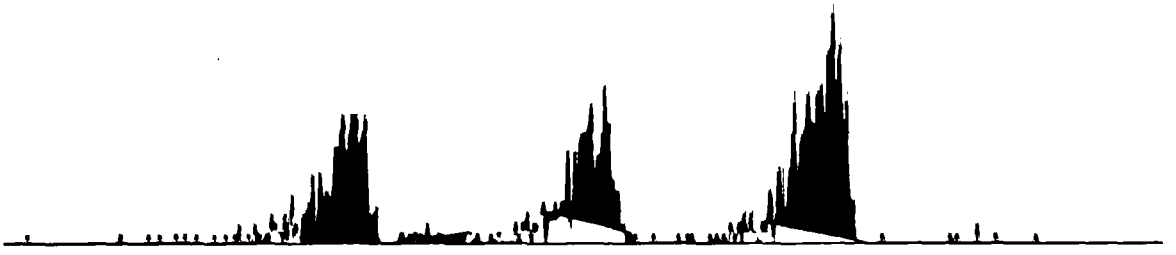
MCA #1 - Canberra S100 - SD6041.MCA - LCS 38993 U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:14:39

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

1/16 :VFS= 64

Inp:1 Grp:A



Cursor=5.154MeV From 5.108MeV To 5.346MeV Pset(Lm)= 100.00

Counts=3 Int=349 Area=296+-13.11% Elap(Lm)= 100.00

0000046

MCA #1 - Canberra S100 - SD6043.MCA - 5179-001 U

Tag Number: 561
Report Group: 3/16
Input: 3 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:18
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.671e-006*Ch^2 + 0.004188*Ch + 3.577 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000047

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.076	12	12	4.244
	4.309	0.00	47.63	0.0042
2	4.323	3	3	4.404
	4.472	0.00	95.26	0.0042
3	4.579	8	8	4.687
	4.835	0.00	58.34	0.0063
4	5.036	22	14	5.255
	5.361	0.00	94.47	0.0070

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
114					0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	1	1
130	0	0	1	1	0
135	0	0	1	0	0
140	0	0	0	1	0
145	0	1	0	0	0
150	2	1	0	0	0
155	1	0	0	1	0
160	0	0	0	0	0

ROI # 2

Channel #	**** Data ****				
167			0	0	0
170	0	0	0	0	0
175	0	1	0	0	1
180	0	0	0	0	1
185	0	0	0	0	0
190	0	0	0	0	0
195	0	0	0	0	

ROI # 3

Channel #	**** Data ****				
220	0	0	0	0	1
225	0	1	0	0	0
230	1	0	0	0	0
235	0	0	0	0	0
240	0	1	2	0	0
245	0	0	0	0	0

0000048

REGION OF INTEREST DATA

ROI # 3

Channel #		**** Data ****		
250	0	0	0	0
255	0	1	0	0	1
260	0	0	0	0	0
265	0	0	0	0	0
270	0	0			

ROI # 4

Channel #		**** Data ****		
310	0	1	0	0	0
315	0	1	0	0	0
320	0	0	1	0	0
325	0	1	0	0	1
330	0	0	0	0	0
335	0	0	0	0	1
340	0	0	0	0	1
345	1	2	0	1	0
350	1	1	3	0	0
355	2	1	1	0	0
360	1	0	0	0	0
365	0	0	1	0	0
370	0	0			

0000049

MCA #1 - Canberra S100 - SD6043.MCA - 5179-001 U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:17:09

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

3/16 :VFS= 64

Inp:3 Grp:A

Cursor=5.210MeV From 5.036MeV To 5.361MeV Pset(Lm)= 100.00

Counts=0 Int=22 Area=14+-94.47% Elap(Lm)= 100.00

000050

MCA #1 - Canberra S100 - SD6044.MCA - 5179-001DUP U

Tag Number: 561
Report Group: 4/16
Input: 4 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:26
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.214e-006*Ch^2 + 0.004315*Ch + 3.467 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000051

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.072	3	3	4.118
	4.288	0.00	95.26	0.0043
2	4.302	1	1	4.326
	4.456	0.00	165.00	0.0043
3	4.597	8	8	4.805
	4.830	0.00	58.34	0.0043
4	5.079	19	12	5.309
	5.361	0.00	98.62	0.0065

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

135	0	0	0	0	0
140	0	0	0	0	0
145	2	0	0	0	0
150	0	0	0	0	0
155	0	1	0	0	0
160	0	0	0	0	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0			

ROI # 2
Channel # **** Data ****

184					0
185	0	0	0	0	1
190	0	0	0	0	0
195	0	0	0	0	0
200	0	0	0	0	0
205	0	0	0	0	0
210	0	0	0	0	0
215	0	0			

ROI # 3
Channel # **** Data ****

245	0	0	0	0	1
250	0	0	1	1	0
255	0	0	0	0	0
260	0	0	0	0	0
265	0	0	0	0	0
270	0	0	0	1	0
275	1	0	0	0	0

0000052

REGION OF INTEREST DATA

ROI # 3
Channel # **** Data ****

280	0	1	0	0	0
285	1	0	1	0	0
290	0	0	0		

ROI # 4
Channel # **** Data ****

341		0	0	0	1
345	0	2	0	0	0
350	0	1	0	0	0
355	0	0	0	2	0
360	0	0	0	0	0
365	0	0	0	1	0
370	0	2	0	1	1
375	1	0	0	0	1
380	0	1	0	0	1
385	1	2	0	1	0
390	0	0	0	0	0
395	0				

000053

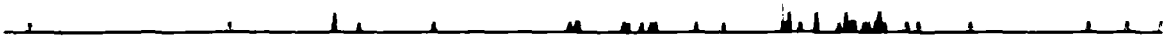
MCA #1 - Canberra S100 - SD6044.MCA - 5179-001DUP U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:17:26

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

4/16 :VFS= 64

Inp:4 Grp:A



Cursor=5.090MeV From 5.079MeV To 5.361MeV Pset(Lm)= 100.00

Counts=0 Int=19 Area=12+-98.62% Elap(Lm)= 100.00

0000054

MCA #1 - Canberra S100 - SD6045.MCA - 5179-005 U]

Tag Number: 561
Report Group: 5/16
Input: 5 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:36
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.541e-006*Ch^2 + 0.004180*Ch + 3.579 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000055

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.053	21	8	4.266
	4.287	0.00	183.90	0.0042
2	4.301	7	-5	4.441
	4.443	0.00	191.45	0.0042
3	4.568	26	13	4.716
	4.825	0.00	120.90	0.0056
4	5.043	326	297	5.270
	5.347	0.05	12.25	0.0585

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

109					0
110	0	0	1	0	0
115	1	0	0	0	0
120	1	0	0	0	1
125	0	0	0	0	0
130	0	0	0	0	0
135	0	0	0	1	0
140	0	0	1	3	0
145	1	2	1	2	0
150	1	1	0	0	0
155	3	0	1	0	0
160	0				

ROI # 2
Channel # **** Data ****

163				1	0
165	0	0	0	0	0
170	0	1	1	0	0
175	0	0	0	1	0
180	0	0	0	0	0
185	1	0	0	0	0
190	0	0	1	1	

ROI # 3
Channel # **** Data ****

219					0
220	0	0	0	0	0
225	0	0	0	0	0
230	0	1	0	0	1
235	1	0	1	0	0

0000056

REGION OF INTEREST DATA

ROI # 3

Channel #		**** Data ****			
240	2	0	0	0	0
245	2	0	0	0	4
250	1	1	2	1	1
255	0	2	1	0	0
260	0	1	1	1	0
265	0	0	0	1	0
270	0	1			

ROI # 4

Channel #		**** Data ****			
314					3
315	0	0	0	2	1
320	0	0	2	0	1
325	3	0	3	2	0
330	0	1	3	2	3
335	4	3	2	9	2
340	3	1	2	0	8
345	7	6	6	8	9
350	9	12	12	15	13
355	15	13	16	13	13
360	21	13	14	11	13
365	8	10	2	6	0
370	0	1	0		

0000057

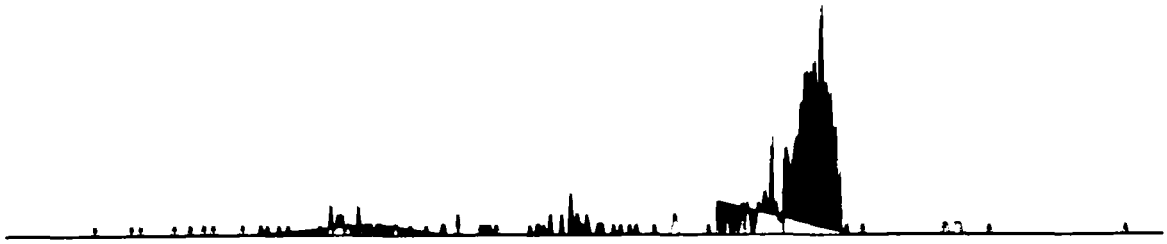
MCA #1 - Canberra S100 - SD6045.MCA - 5179-005 U]

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:18:29

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

5/16 :VFS= 64

Inp:5 Grp:A



Cursor=5.194MeV From 5.043MeV To 5.347MeV Pset(Lm)= 100.00

Counts=0 Int=326 Area=297+-12.25% Elap(Lm)= 100.00

0000058

MCA #1 - Canberra S100 - SD6046.MCA - 5179-011 U

Tag Number: 561
Report Group: 6/16
Input: 6 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:46
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.657e-006*Ch^2 + 0.004128*Ch + 3.611 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000059

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.072	20	8	4.240
	4.287	0.00	170.08	0.0041
2	4.305	1	1	4.328
	4.456	0.00	165.00	0.0041
3	4.576	23	23	4.752
	4.822	0.00	34.40	0.0055
4	5.035	321	313	5.274
	5.350	0.05	10.04	0.0351

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
107			0	1	0
110	0	0	0	1	0
115	0	0	0	1	1
120	1	0	0	0	0
125	0	0	1	2	1
130	0	1	1	0	1
135	0	0	0	2	2
140	0	0	1	0	2
145	0	0	0	0	0
150	0	1	0	0	0

ROI # 2

Channel #	**** Data ****				
158				0	0
160	0	0	0	1	0
165	0	0	0	0	0
170	0	0	0	0	0
175	0	0	0	0	0
180	0	0	0	0	0
185	0	0	0	0	0
190	0				

ROI # 3

Channel #	**** Data ****				
215	0	0	0	0	0
220	0	0	0	0	1
225	0	0	0	0	0
230	2	0	0	1	1
235	0	0	0	0	0
240	0	0	0	1	2
245	0	2	2	2	0

0000060

REGION OF INTEREST DATA

ROI # 3

Channel #		**** Data ****		
250	0	3	0	0	1
255	2	1	2	0	0
260	0	0	0	0	0
265	0				

ROI # 4

Channel #		**** Data ****		
307			0	0	1
310	0	0	0	0	0
315	2	1	0	0	2
320	0	2	2	3	2
325	1	3	3	4	1
330	1	4	1	5	2
335	5	6	8	5	6
340	8	6	8	9	8
345	18	18	9	12	11
350	19	15	15	19	24
355	9	16	12	8	4
360	3	0	0	0	0
365	0	0	0		

0000061

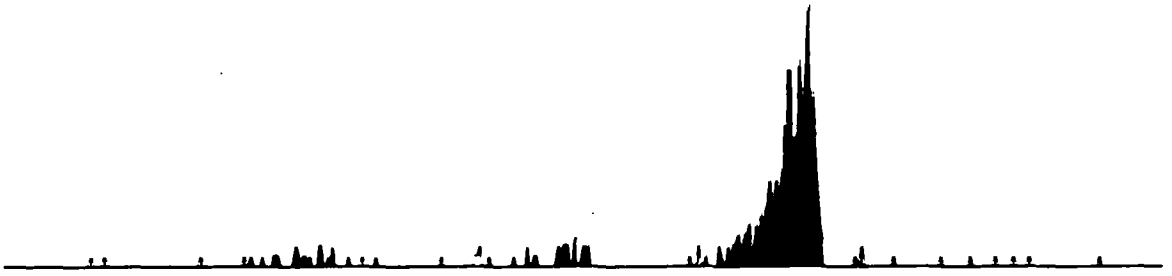
MCA #1 - Canberra S100 - SD6046.MCA - 5179-011 U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:19:12

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

6/16 :VFS= 64

Inp:6 Grp:A



Cursor=5.222MeV From 5.035MeV To 5.350MeV Pset(Lm)= 100.00

Counts=9 Int=321 Area=313+-10.04% Elap(Lm)= 100.00

0000062

MCA #1 - Canberra S100 - SD6047.MCA - 5179-012 U

Tag Number: 561
Report Group: 7/16
Input: 7 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:23:59
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:U238ROI2:U235,236ROI3:U234ROI4:U232
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 1.580e-006*Ch^2 + 0.004109*Ch + 3.530 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000063

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	4.051	18	18	4.207
	4.279	0.00	38.89	0.0068
2	4.298	1	-4	4.312
	4.477	0.00	165.00	0.0068
3	4.598	21	10	4.715
	4.810	0.00	127.27	0.0164
4	5.053	329	296	5.243
	5.325	0.05	12.25	0.0415

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
121		0	0	0	0
125	0	0	0	0	0
130	0	1	0	0	0
135	1	0	0	0	0
140	0	0	0	1	0
145	1	0	0	1	0
150	0	2	0	1	1
155	2	4	0	0	1
160	1	0	0	0	1
165	0	0	0	0	0
170	0	0			

ROI # 2

Channel #	**** Data ****				
175	0	0	0	1	0
180	0	0	0	0	0
185	0	0	0	0	0
190	0	0	0	0	0
195	0	0	0	0	0
200	0	0	0	0	0
205	0	0	0	0	0
210	0	0	0	0	

ROI # 3

Channel #	**** Data ****				
238				0	0
240	1	1	0	0	0
245	0	0	0	1	0
250	0	0	1	0	2
255	0	1	2	0	1

0000064

REGION OF INTEREST DATA

ROI # 3

Channel #	**** Data ****			
260	1	1	1	3	0
265	1	0	1	0	0
270	1	2	0	0	0
275	0	0	0	0	0
280	0	0			

ROI # 4

Channel #	**** Data ****			
329				1
330	0	1	2	0	4
335	1	0	1	1	1
340	0	5	4	2	5
345	5	3	5	5	3
350	4	6	8	7	4
355	11	10	16	8	8
360	4	14	18	15	13
365	17	15	18	17	10
370	12	8	7	8	13
375	4	3	1	1	0
380	0	0			

0000065

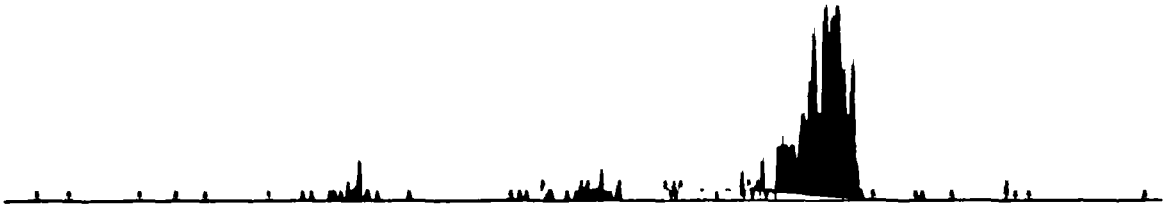
MCA #1 - Canberra S100 - SD6047.MCA - 5179-012 U

Tag Number : 561 Plotted On : Thu 09 Jun 1994 @ 11:20:12

Dead Time : 0.00% Acquire Started : Thu 09 Jun 1994 @ 08:58:51

7/16 :VFS= 64

Inp:7 Grp:A



Cursor=5.126MeV From 5.053MeV To 5.325MeV Pset(Lm)= 100.00

Counts=2 Int=329 Area=296+-12.25% Elap(Lm)= 100.00

990000

CHAIN OF CUSTODIES

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by: VLShaw PM Review: [signature]

Sample Header Template: due dates

Sample No. / # Data:	Comments / Container Type	Client ID	C-Matrix / Analysis	Date: Collected / Class	Preservative	Received / Anal. Due Date	Due / Hold Date	Shipper / Site	Rad Category	Rad Sample No. (Container Numbers:% Filled)
5179-001		CD-S156E49N-2-3	Soil	22-MAY-94 12:40		24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1	AN - Amber Glass-500ml		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1			RAD/ISOTH/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1			RAD/ISOU/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1			RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
5179-001DUP		CD-S156E49N-2-3	Soil	22-MAY-94 12:40		24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1	AN - Amber Glass-500ml		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
5179-002		CD-S156E49N-3-4	Soil	22-MAY-94 12:50		24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-011
1	AN - Amber Glass-500ml		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79581:100)
1			RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79581:100)
5179-003		CD-S-82E25N2-3	Soil	22-MAY-94 13:45		24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-010
1	AN - Amber Glass-500ml		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79584:100)
1			RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79584:100)
5179-004		CD-S82E25N-3-4	Soil	22-MAY-94 14:05		24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-009
1	AN - Amber Glass-500ml		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79585:100)
1			RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79585:100)
5179-005		CD-S78E18N-2-3	Soil	22-MAY-94 16:00		24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-008
1	AN - Amber Glass-500ml		BNA/TCLP/Q4	S	COLD	09-JUN-94	01-JUN-94	R19D		(79595:100)
1			EXT/TCLP/Q4	S	COLD	09-JUN-94	05-JUN-94	R19D		(79595:100)
1			HG/TCLP/Q4	S	COLD	09-JUN-94	22-JUN-94	R19D		(79595:100)
1			ICAP/TCLP/Q4	S	COLD	09-JUN-94	21-NOV-94	R19D		(79595:100)
1			RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1			RAD/ISOTH/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1			RAD/ISOU/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1			RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1	AN - Amber Glass-250ML		CN/9010/Q4	S	COLD	09-JUN-94	05-JUN-94	R19D		(79594:100)

3*=Sample has not been rad screened.

0000067

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Comments	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		PLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R190	(79594:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79594:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79594:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R190	(79594:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R190	(79594:100)
1		TCH/9020/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79594:100)
2	AN - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R190	(79590:100 79591:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	1098	(79592:100 79593:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	1098	(79592:100 79593:100)
5179-006	CD-SB9E16N-2-3	Soil	22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-007
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79613:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79613:90)
5179-007	CD-SB9E16N-3-4	Soil	22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-006
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79624:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79624:90)
5179-008	CD-SB8E18N-3-4-9	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-005
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79625:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79625:90)
5179-009	CD-SB8E18N-3-4	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-004
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79630:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79630:90)
5179-010	CD-SB1ESN-2-3-9	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-003
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79635:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79635:90)
5179-011	CD-SB1ESN-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-002
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79636:90)

3**=Sample has not been rad screened.

0000068

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / #	Client ID / Container Type / Comments	C-Matrix / Analysis	Class	Preservative	Date: Collected / Anal. Due Date	Received / Hold Date	Due / Site	Shipper	Rad Category / (Container Numbers:% Filled)	Rad Sample No.
Date:										
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)	
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)	
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)	
5179-012	CD-S81ESH-2-3	Soil			22-MAY-94 15:00 24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-001	
1	AN - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D		(79644:100)	
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79644:100)	
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D		(79644:100)	
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D		(79644:100)	
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79643:100)	
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79643:100)	
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79643:100)	
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79643:100)	
1	AN - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79645:100)	
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79645:100)	
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79645:100)	
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79645:100)	
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79645:100)	
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D		(79645:100)	
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79645:100)	
2	AN - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79648:100 79651:100)	
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B		(79646:100 79647:100)	
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B		(79646:100 79647:100)	

*=Sample has not been rad screened.

000069

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CLP $40

Reference Document No. 502240
Page 1 of 2

Project Name/No.[1] LINSAY LIGHT II
Sample Team Members[2] RAWLINSON, BERGGREN
~~Profit Center No.~~[3]
Project Manager[4] BERGGREN
Purchase Order No[6] 27313-2H
Required Report Date[11]

Samples Shipment Date[7] 5/23/94
Lab Destination[8] ST LOUIS
Lab Contact[9] John Powell
Project Contact/Phone[12]
Carrier/Waybill No[13]

Bill to:[5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R C BERGGREEN

Report to:[10] (SAME)

Where To accompany samples — Yellow Field copy

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Preservative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12 40	500 ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S-B2E25N2-3	SS-SOIL	5/22/94 13 45	500 ML AMBER	500 ML	None	γ SPEC	100	
CD SB2E25N-3-4	SS-SOIL	5/22/94 1405	500ML AMBER	500ML	NONE	γ SPEC	100	
CD-S7BE1BN-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ML	None	TCLP Metals & SVOAs	100	
CD S7BE1BN-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ML	None	γ SPEC	100	
CD S7BE1BN-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250 ml	None	Reactivity Corrosivity Ignitability	100	
CD S7BE1BN-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120 ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions:[23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th ISOTOPE. ALSO ~~COMPOSITE~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required:[26]
Normal ☒ Rush ☐

QC Level:[27]
I ☐ II ☐ III ☐ Project Specific (specify):

1. Relinquished by[28] (Signature/Affiliation) Rick Bgg	Date: 5/23/94 Time: 10 45	1. Received by[28] (Signature/Affiliation) Bob Cawood	Date: 05-24-94 Time: 0911
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

0000070

*See back of form for special instructions

CLP 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC=2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	None	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ML AMBER	500ML	NONE	& SPEC	90	
CD-S84E16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD-S78E18N-3-4D	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metal & SVOA	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ml	NONE	TOC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-S81E5N-2-3-9	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-S81E5N-3-4	SS SOIL	5/22/94 1500	500 ML AMBER	400ml	NONE	& SPEC	9070	
	0000071							

White: To accompany samples Yellow: Field copy

*See back of form for special instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: J Powell
DATE: 05-24-94
TIME: 0945
BY: Bob Conner

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II
Date: 05-24-94 0910
Project No: 537.01
Initiated by: B Conner
Analyses Requested: Refer to RFA/COC
RFA/COC Numbers: 502210
Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

(1)	NA	Not enough sample received for proper analysis. Received approximately: _____	8.	☑	Custody tape disturbed/broken/missing. MC Seals
			9.	NA	Sample splits performed by lab.
(2)	☐	Sample received broken/leaking.	(10)	NA	Volatile sample received with approximately _____ mm headspace.
(3)	☐	Sample received without proper preservative.			
		☐ Cooler temperature not within 4°C ± 2°C Record temperature: 6°C	(11)	☐	Sample ID on container does not match sample ID on paperwork. Explain:
		☐ pH _____			
		☐ other _____			
(4)	☐	Sample received in improper container.	(12)	☐	All coolers on airbill not received with shipment.
(5)	☐	Sample received without proper paperwork. Explain: _____	(13)	☐	Other (explain below): Shipping containers not rad surveyed
(6)	☐	Paperwork received without sample.			
(7)	☐	No sample ID on sample container.			

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review (or designate) _____ Date: _____

Project Management Review: J Powell Date: 05-24-94

000072

SEMI-VOLATILE QC SUMMARY

537-01
5179
CD-5156

2C
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	OTHER	TOT OUT
01	CD-S78E18N23	90	88	82	23	38	67	0	0
02	CD-S81E5N23	88	88	80	22	37	70	0	0
03	SEXTBLK01	94	88	80	38	58	78	0	0
04	SSPK01	95	89	78	47	66	87	0	0
05	SBLK01	99	88	82	48	68	88	0	0

	QC LIMITS
S1 (NBZ) = Nitrobenzene-d5	(35-114)
S2 (FBP) = 2-Fluorobiphenyl	(43-116)
S3 (TPH) = Terphenyl	(33-141)
S4 (PHL) = Phenol-d5	(10-94)
S5 (2FP) = 2-Fluorophenol	(21-100)
S6 (TBP) = 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

0000001

4B

SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Lab File ID: A4881 Lab Sample ID: QCBLK38543

Date Extracted: 05/31/94 Extraction:(SepF/Cont/Sonc) SEPF

Date Analyzed: 05/31/94 Time Analyzed: 1813

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: MSA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	CD-S78E18N23	5179-005	A4906	06/01/94
02	CD-S81E5N23	5179-012	A4907	06/01/94
03	SEXTBLK01	QCBLK38267EXT	A4905	06/01/94
04	SSPK01	QCSPK38543	A4882	05/31/94

COMMENTS:

000002

5B

SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Lab File ID: AA614 DFTPP Injection Date: 05/31/94

Instrument ID: MSA DFTPP Injection Time: 1440

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	39.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	61.5
70	Less than 2.0% of mass 69	0.0 (0.0)1
127	40.0 - 60.0% of mass 198	48.2
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 30.0% of mass 198	17.6
365	Greater than 1.00% of mass 198	1.13
441	Present, but less than mass 443	10.4
442	Greater than 40.0% of mass 198	62.8
443	17.0 - 23.0% of mass 442	12.2 (19.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD050	A4876	05/31/94	1456
02	SSTD020	SSTD020	A4878	05/31/94	1456
03	SSTD160	SSTD160	A4877	05/31/94	1535
04	SSTD080	SSTD080	A4879	05/31/94	1654
05	SSTD120	SSTD120	A4880	05/31/94	1733
06	SBLK01	QCBLK38543	A4881	05/31/94	1813
07	SSPK01	QCSPK38543	A4882	05/31/94	1852

000003

5B

SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Lab File ID: AA615 DFTPP Injection Date: 06/01/94

Instrument ID: MSA DFTPP Injection Time: 1331

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	36.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	58.6
70	Less than 2.0% of mass 69	0.9 (1.5)1
127	40.0 - 60.0% of mass 198	46.2
197	Less than 1.0% of mass 198	0.0
198	Base peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	5.9
275	10.0 - 30.0% of mass 198	15.5
365	Greater than 1.00% of mass 198	1.33
441	Present, but less than mass 443	8.7
442	Greater than 40.0% of mass 198	58.7
443	17.0 - 23.0% of mass 442	10.6 (18.0)2

1-Value is % mass 69 2-Value is % mass 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	SSTD050	SSTD050	A4894	06/01/94	1346
02	SEXTBLK01	QCBLK38267EXT	A4905	06/01/94	2114
03	CD-S78E18N23	5179-005	A4906	06/01/94	2153
04	CD-S81E5N23	5179-012	A4907	06/01/94	2232

000004

SEMI-VOLATILE DATA

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CD-S81E5N23

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: 5179-012

Sample wt/vol: 250.0 (g/mL) ML Lab File ID: A4907

Level: (low/med) LOW Date Received: 05/24/94

% Moisture: not dec. dec. Date Extracted: 05/31/94

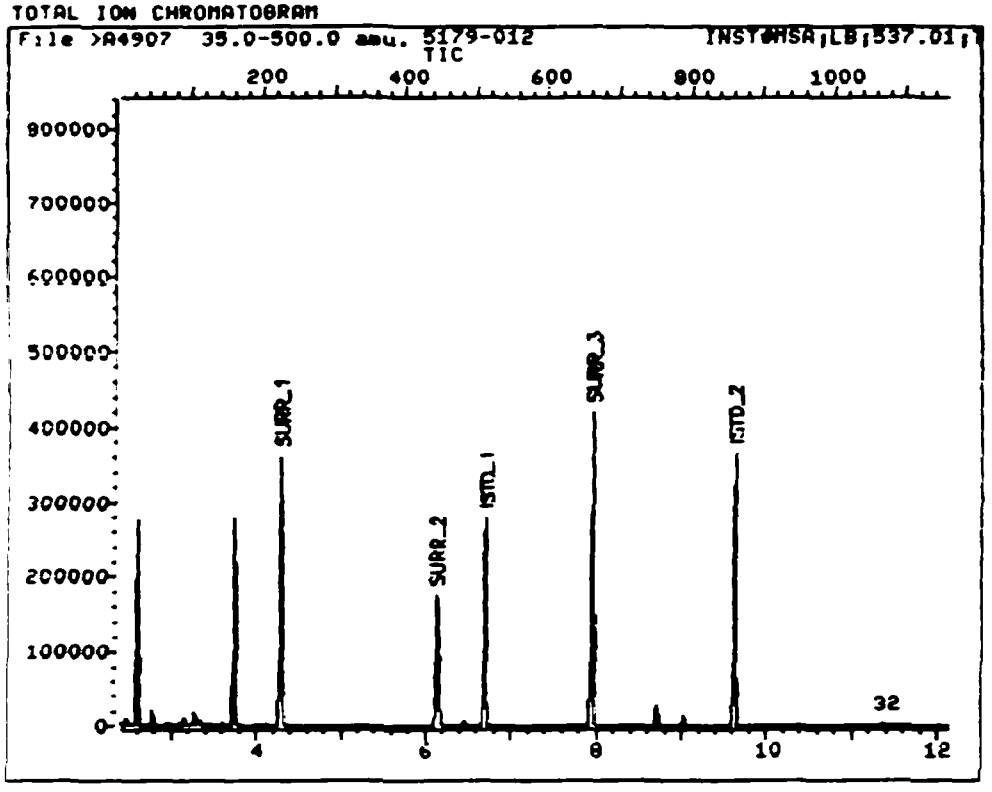
Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 06/01/94

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	40	U
106-46-7	1,4-Dichlorobenzene	40	U
95-48-7	2-Methylphenol	40	U
106-44-5	4-Methylphenol	40	U
67-72-1	Hexachloroethane	40	U
98-95-3	Nitrobenzene	40	U
87-68-3	Hexachlorobutadiene	40	U
88-06-2	2,4,6-Trichlorophenol	40	U
95-95-4	2,4,5-Trichlorophenol	40	U
121-14-2	2,4-Dinitrotoluene	40	U
118-74-1	Hexachlorobenzene	40	U
87-86-5	Pentachlorophenol	200	U

0000005

TOTAL ION CHROMATOGRAM



Data File: >A4907::A1 Quant Output File: ^A4907::D3
Name: 5179-012 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#13

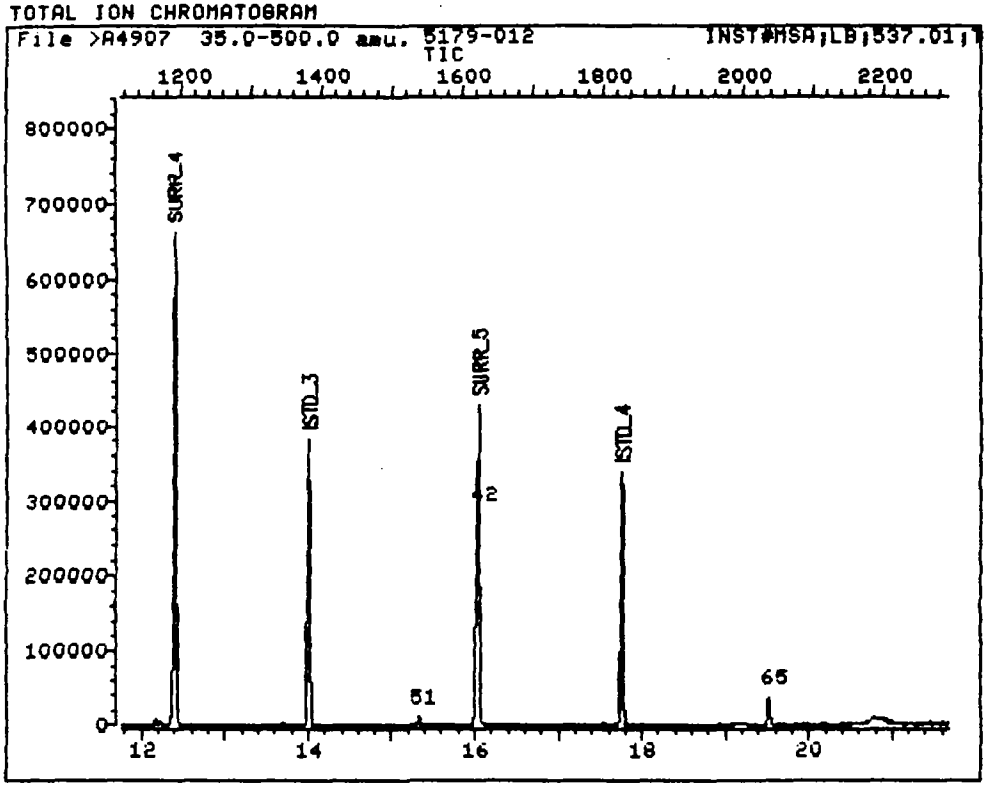
Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 23:04
Injected at: 940601 22:32

Page 1 of 3

000006

TOTAL ION CHROMATOGRAM



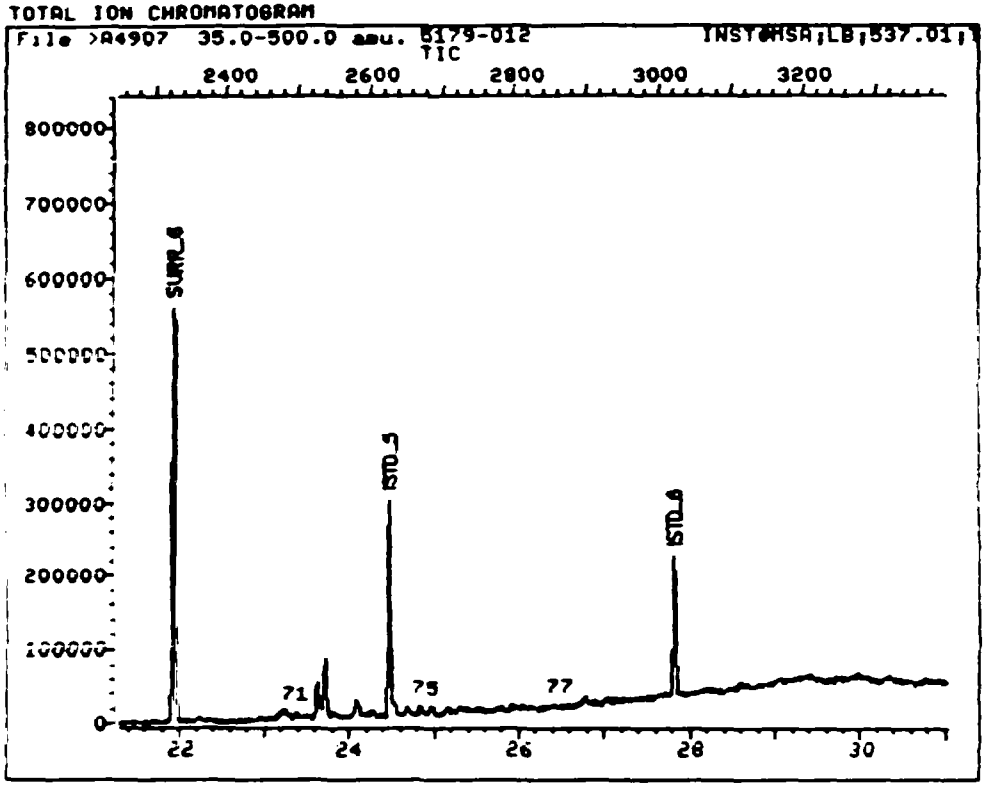
Data File: >A4907::A1 Quant Output File: ^A4907::D3
Name: 5179-012 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#13

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 23:04
Injected at: 940601 22:32

4000000

TOTAL ION CHROMATOGRAM



Data File: >A4907::A1 Quant Output File: ^A4907::D3
Name: 5179-012 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#13

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 23:04
Injected at: 940601 22:32

000008

Operator ID: MSA Quant Rev: 7 Quant Time: 940601 23:04
Output File: ^A4907::D3 Injected at: 940601 22:32
Data File: >A4907::A1 Dilution Factor: 4.00000
Name: 5179-012 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#13

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.70	152.0	91844	20.00	UG/ML	91
4)	2-Fluorophenol	4.29	112.0	203125	146.71	UG/ML	82
6)	Phenol-d5	6.13	99.0	160031	89.12	UG/ML	56
19)	*d8-Naphthalene	9.63	136.0	350796	20.00	UG/ML	96
20)	Nitrobenzene-d5	7.96	82.0	279694	175.91	UG/ML	73
32)	4-Chloro-3-Methylphenol	11.36	107.0	2035	1.63	UG/ML	81
34)	*d10-Acenaphthene	14.01	164.0	170159	20.00	UG/ML	95
39)	2-Fluorobiphenyl	12.41	172.0	479497	176.13	UG/ML	97
42)	AZOBENZENE	16.06	76.9	144	.0449	UG/ML	21
51)	Diethylphthalate	15.33	149.0	5537	1.99	UG/ML	97
55)	2,4,6-Tribromophenol	16.05	329.9	117185	280.14	UG/ML	84
56)	*d10-Phenanthrene	17.76	188.0	254472	20.00	UG/ML	99
65)	Di-n-Butylphthalate	19.53	149.0	49201	9.51	UG/ML	98
68)	*d12-Chrysene	24.48	240.0	187454	20.00	UG/ML	100
70)	Terphenyl-d14	21.95	244.0	387898	160.68	UG/ML	99
71)	Butylbenzylphthalate	23.30	149.0	3745	1.76	UG/ML	72
75)	bis(2-Ethylhexyl)Phthalate	24.86	149.0	10679	3.51	UG/ML	86
76)	*d12-Perylene	27.83	264.0	112348	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.43	149.0	3400	.614	UG/ML	100

* Compound is ISTD

600000

REVIEWED FOR TCLP COMPOUNDS ONLY

6.2.94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CD-S78E18N23

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: 5179-005

Sample wt/vol: 250.0 (g/mL) ML Lab File ID: A4906

Level: (low/med) LOW Date Received: 05/24/94

% Moisture: not dec. dec. Date Extracted: 05/31/94

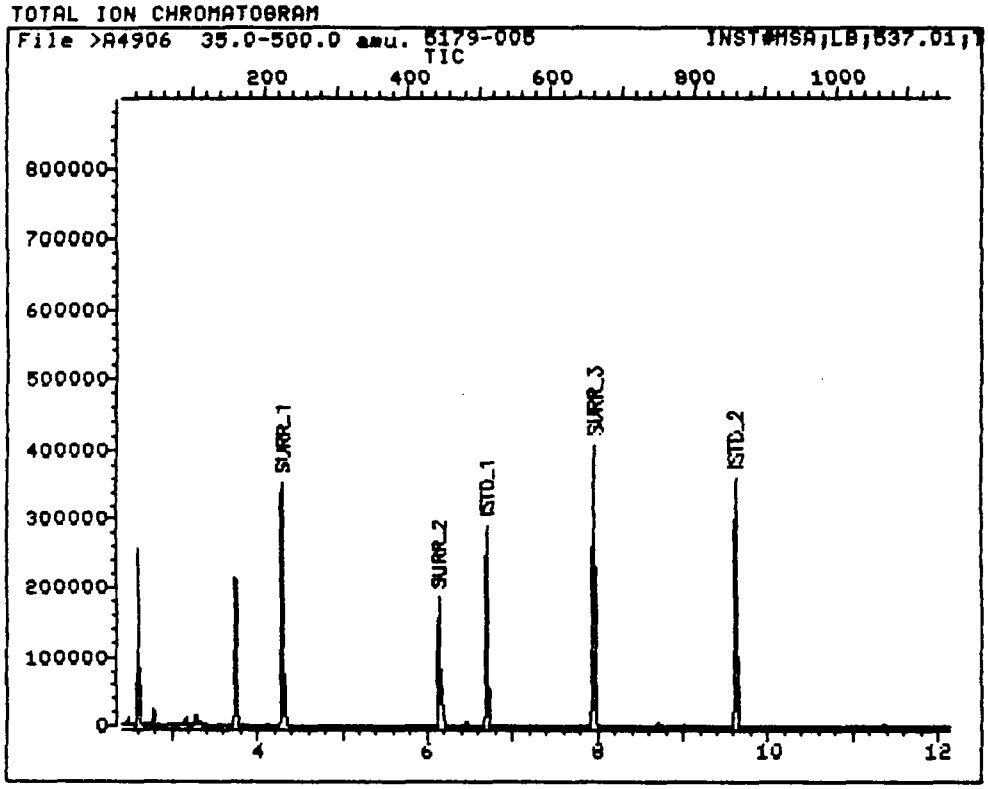
Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 06/01/94

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	40	U
106-46-7	1,4-Dichlorobenzene	40	U
95-48-7	2-Methylphenol	40	U
106-44-5	4-Methylphenol	40	U
67-72-1	Hexachloroethane	40	U
98-95-3	Nitrobenzene	40	U
87-68-3	Hexachlorobutadiene	40	U
88-06-2	2,4,6-Trichlorophenol	40	U
95-95-4	2,4,5-Trichlorophenol	40	U
121-14-2	2,4-Dinitrotoluene	40	U
118-74-1	Hexachlorobenzene	40	U
87-86-5	Pentachlorophenol	200	U

010000

TOTAL ION CHROMATOGRAM



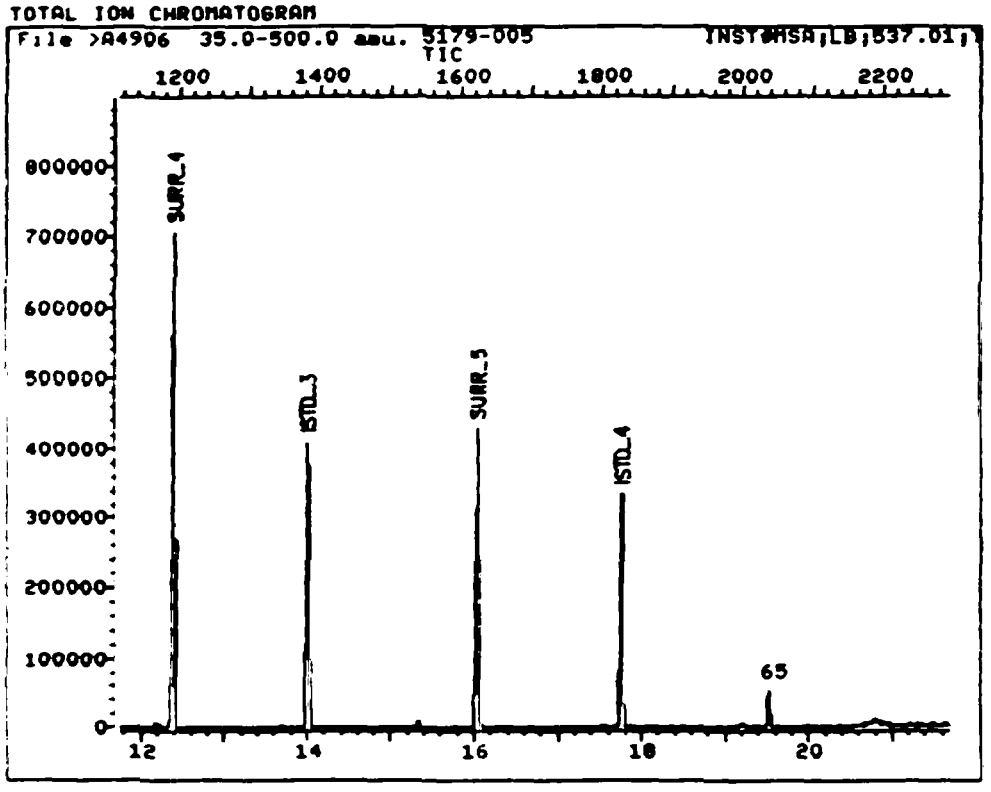
Data File: >A4906::A1 Quant Output File: ^A4906::D3
Name: 5179-005 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#12

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 22:25
Injected at: 940601 21:53

110000

TOTAL ION CHROMATOGRAM



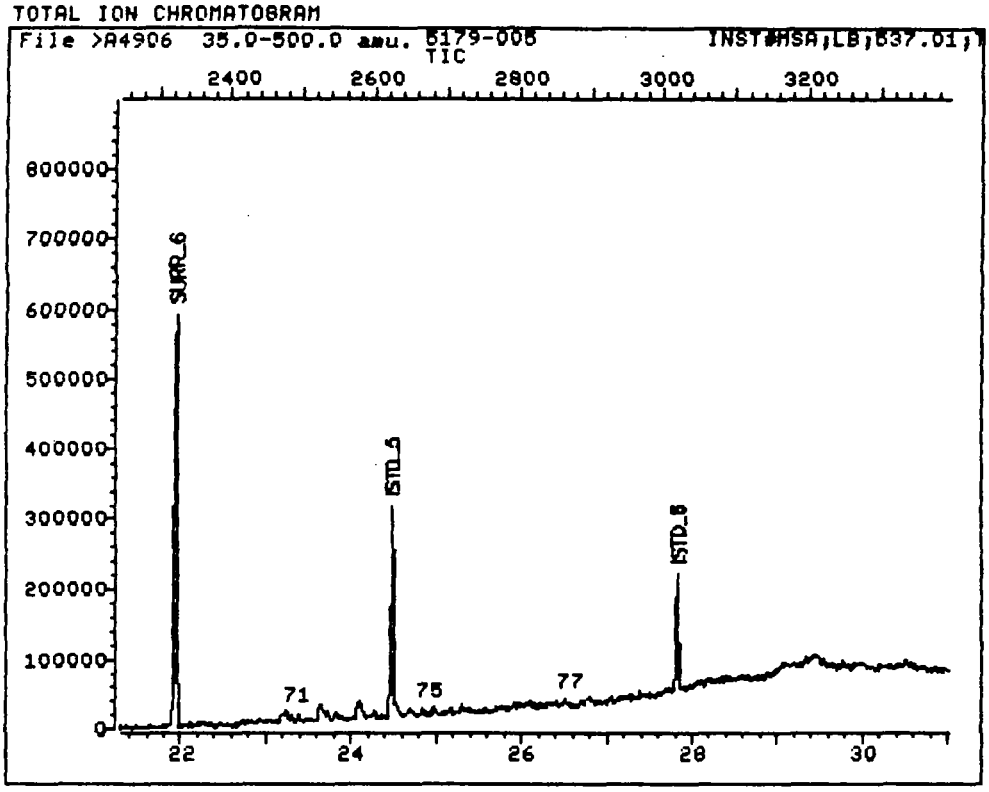
Data File: >A4906::A1 Quant Output File: ^A4906::03
Name: 5179-005 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#12

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 22:25
Injected at: 940601 21:53

0000012

TOTAL ION CHROMATOGRAM



Data File: >A4906::A1 Quant Output File: ^A4906::D3
Name: 5179-005 Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#12

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 22:25
Injected at: 940601 21:53

Page 3 of 3

0000013

QUANT REPORT Page 1

Operator ID: MSA Quant Rev: 7 Quant Time: 940601 22:25
Output File: ^A4906::D3 Injected at: 940601 21:53
Data File: >A4906::A1 Dilution Factor: 4.00000
Name: 5179-005 Instrument ID: MSA
Misc: INST$MSA;LB;537.01;TCLP BTL$12

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.70	152.0	93457	20.00	UG/ML	90
4)	2-Fluorophenol	4.30	112.0	212751	151.01	UG/ML	85
6)	Phenol-d5	6.14	99.0	171594	93.90	UG/ML	57
19)	*d8-Naphthalene	9.63	136.0	351797	20.00	UG/ML	98
20)	Nitrobenzene-d5	7.96	82.0	286096	179.43	UG/ML	74
34)	*d10-Acenaphthene	14.01	164.0	182259	20.00	UG/ML	94
39)	2-Fluorobiphenyl	12.42	172.0	513250	176.01	UG/ML	98
55)	2,4,6-Tribromophenol	16.05	329.9	119519	266.75	UG/ML	82
56)	*d10-Phenanthrene	17.76	188.0	260132	20.00	UG/ML	99
65)	Di-n-Butylphthalate	19.53	149.0	66319	12.53	UG/ML	99
68)	*d12-Chrysene	24.49	240.0	191177	20.00	UG/ML	100
70)	Terphenyl-d14	21.95	244.0	404010	164.10	UG/ML	97
71)	Butylbenzylphthalate	23.30	149.0	5567	2.57	UG/ML	92
75)	bis(2-Ethylhexyl)Phthalate	24.86	149.0	7773	2.50	UG/ML	77
76)	*d12-Perylene	27.84	264.0	111242	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.51	149.0	2934	.535	UG/ML	100

* Compound is ISTD

0000014

REVIEWED FOR TCLP
COMPOUNDS ONLY

6-2-94

STANDARDS DATA

6B

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Instrument ID: MSA Calibration Date(s): 05/31/94 05/31/94

Min $\overline{RRF}$ for SPCC(#) = 0.050 Max %RSD for CCC(*) = 30.0%

S1000015

LAB FILE ID: RRF20 = A4878 RRF50 = A4876
RRF80 = A4879 RRF120= A4880 RRF160= A4877

COMPOUND		RRF20	RRF50	RRF80	RRF120	RRF160	$\overline{RRF}$	% RSD
Pyridine		1.262	1.097	1.038	1.145	1.132	1.135	7.3
Phenol	*	1.764	1.749	1.724	1.750	1.812	1.760	1.8*
1,4-Dichlorobenzene	*	1.500	1.454	1.439	1.357	1.337	1.417	4.8*
2-Methylphenol		1.246	1.241	1.209	1.213	1.158	1.213	2.9
4-Methylphenol		1.304	1.312	1.342	1.214	1.113	1.257	7.4
N-Nitroso-Di-n-Propylamine	#	0.887	0.912	0.952	0.931	0.853	0.907	4.2#
Hexachloroethane		0.661	0.639	0.635	0.552	0.529	0.603	9.7
Nitrobenzene		0.355	0.344	0.350	0.337	0.349	0.347	2.0
2-Nitrophenol	*	0.273	0.272	0.283	0.274	0.283	0.277	2.0*
2,4-Dichlorophenol	*	0.296	0.302	0.302	0.296	0.300	0.299	1.0*
Hexachlorobutadiene	*	0.144	0.139	0.136	0.126	0.130	0.135	5.3*
4-Chloro-3-Methylphenol	*	0.292	0.299	0.308	0.309	0.309	0.303	2.5*
Hexachlorocyclopentadiene	#	0.332	0.353	0.347	0.332	0.341	0.341	2.7#
2,4,6-Trichlorophenol	*	0.343	0.366	0.370	0.358	0.359	0.359	2.9*
2,4,5-Trichlorophenol			0.445	0.452	0.444	0.448	0.447	0.8
Acenaphthene	*	1.228	1.280	1.252	1.187	1.167	1.223	3.8*
2,4-Dinitrophenol	#		0.246	0.286	0.296	0.299	0.282	8.7#
4-Nitrophenol	#		0.270	0.286	0.297	0.294	0.287	4.2#
2,4-Dinitrotoluene		0.508	0.539	0.534	0.519	0.516	0.523	2.5
N-Nitrosodiphenylamine (1)	*	0.548	0.554	0.539	0.537	0.530	0.542	1.7*
Hexachlorobenzene		0.246	0.246	0.237	0.229	0.227	0.237	3.8
Pentachlorophenol	*		0.124	0.148	0.160	0.157	0.147	11.1*
Fluoranthene	*	1.259	1.286	1.258	1.206	1.189	1.240	3.3*
Di-n-Octyl Phthalate	*	3.637	3.981	4.086	3.912	3.855	3.894	4.3*
Benzo(a)Pyrene	*	1.849	1.920	1.948	1.880	1.903	1.900	2.0*
Nitrobenzene-d5		0.358	0.351	0.355	0.347	0.357	0.354	1.3
2-Fluorobiphenyl		1.204	1.245	1.230	1.178	1.159	1.203	3.0
Terphenyl-d14		0.968	1.015	1.062	1.109	1.103	1.051	5.7
Phenol-d5		1.553	1.551	1.556	1.538	1.482	1.536	2.0
2-Fluorophenol		1.172	1.154	1.160	1.111	1.106	1.141	2.6
2,4,6-Tribromophenol		0.200	0.215	0.213	0.202	0.198	0.206	3.8

QUANT REPORT Page 1

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 16:47
Output File: ^A4878::D3 Injected at: 940531 16:15
Data File: >A4878::A3 Dilution Factor: 1.00000
Name: SSTD020 Instrument ID: MSA
Misc: INST$MSA;LB;SV0144-94 BTL$ 3

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.72	152.0	94227	20.00	UG/ML	92
2)	N-NITROSODIMETHYLAMINE	2.45	74.0	32582	10.20	UG/ML	97
3)	Pyridine	2.50	79.0	59449	11.50	UG/ML	92
4)	2-Fluorophenol	4.25	112.0	55225	10.15	UG/ML	82
5)	ANILINE	6.03	93.0	97322	9.70	UG/ML	75
6)	Phenol-d5	6.07	99.0	73158	10.01	UG/ML	56
7)	Phenol	6.09	94.0	83086	10.08	UG/ML	64
8)	bis(-2-Chloroethyl)Ether	6.23	93.0	69513	10.28	UG/ML	79
9)	2-Chlorophenol	6.27	128.0	67176	10.05	UG/ML	86
10)	1,3-Dichlorobenzene	6.58	146.0	70475	10.18	UG/ML	97
11)	1,4-Dichlorobenzene	6.75	146.0	70691	10.32	UG/ML	92
12)	Benzyl Alcohol	7.08	108.0	38980	9.94	UG/ML	58
13)	1,2-Dichlorobenzene	7.06	146.0	68991	10.19	UG/ML	96
14)	2-Methylphenol	7.40	108.0	58710	10.05	UG/ML	92
15)	bis(2-chloro2propyl)Ether	7.47	45.0	14806	10.40	UG/ML	66
16)	4-Methylphenol	7.77	108.0	61421	9.94	UG/ML	60
17)	N-Nitrosodi-n-Propylamine	7.70	70.0	41798	9.73	UG/ML	99
18)	Hexachloroethane	7.81	117.0	31133	10.34	UG/ML	99
19)	*d8-Naphthalene	9.64	136.0	375578	20.00	UG/ML	97
20)	Nitrobenzene-d5	7.95	82.0	67199	10.19	UG/ML	72
21)	Nitrobenzene	8.00	77.0	66636	10.30	UG/ML	84
22)	Isophorone	8.60	82.0	126613	9.77	UG/ML	87
23)	2-Nitrophenol	8.75	139.0	51193	10.03	UG/ML	67
24)	2,4-Dimethylphenol	9.00	107.0	53752	9.99	UG/ML	85
26)	bis(2-Chloroethoxy)Methane	9.22	93.0	87782	10.05	UG/ML	85
27)	2,4-Dichlorophenol	9.37	162.0	55601	9.80	UG/ML	91
28)	1,2,4-Trichlorobenzene	9.53	180.0	59736	10.38	UG/ML	98
29)	Naphthalene	9.68	128.0	190529	10.04	UG/ML	98
30)	4-Chloroaniline	9.90	127.0	90481	9.97	UG/ML	83
31)	Hexachlorobutadiene	10.06	225.0	27111	10.41	UG/ML	97
32)	4-Chloro-3-Methylphenol	11.24	107.0	54851	9.75	UG/ML	72
33)	2-Methylnaphthalene	11.42	141.1	102459	9.98	UG/ML	92
34)	*d10-Acenaphthene	14.02	164.0	208979	20.00	UG/ML	95
35)	Hexachlorocyclopentadiene	11.85	237.0	34714	9.41	UG/ML	98
36)	2,4,6-Trichlorophenol	12.19	196.0	35790	9.36	UG/ML	99
38)	2-Chloronaphthalene	12.62	162.0	124272	9.50	UG/ML	96
39)	2-Fluorobiphenyl	12.41	172.0	125817	9.67	UG/ML	99
41)	Dimethyl Phthalate	13.52	163.0	146021	9.37	UG/ML	95
42)	AZOBENZENE	15.90	76.9	168695	9.74	UG/ML	73
43)	Acenaphthylene	13.65	152.0	202752	9.57	UG/ML	96

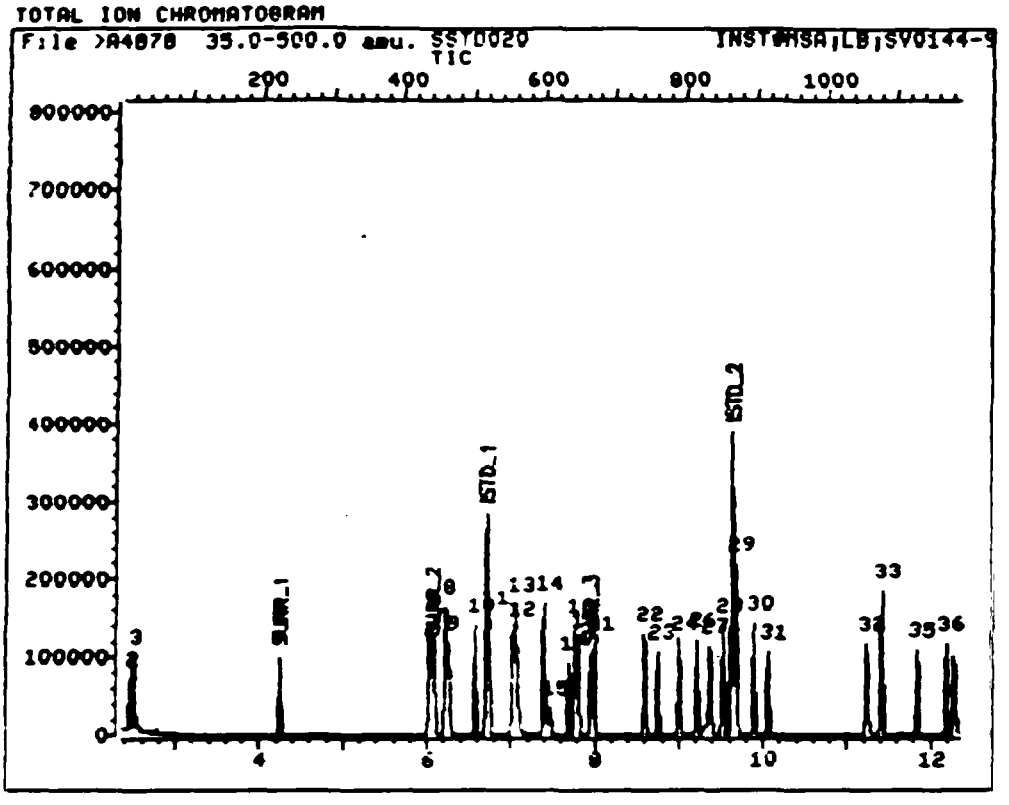
Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 16:47
Output File: ^A4878::D3 Injected at: 940531 16:15
Data File: >A4878::A3 Dilution Factor: 1.00000
Name: SSTD020 Instrument ID: MSA
Misc: INST#MSA;LB;SV0144-94 BTL# 3

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000017

	Compound	R.T.	Q ion	Area	Conc	Units	q
44)	2,6-Dinitrotoluene	13.62	165.0	38622	9.49	UG/ML	78
46)	Acenaphthene	14.10	153.0	128347	9.60	UG/ML	96
49)	Dibenzofuran	14.55	168.0	173501	9.60	UG/ML	93
50)	2,4-Dinitrotoluene	14.61	165.0	53045	9.41	UG/ML	61
51)	Diethylphthalate	15.35	149.0	146270	9.57	UG/ML	92
52)	4Chlorophenyl-phenylether	15.51	204.0	63663	9.58	UG/ML	74
53)	Fluorene	15.41	166.0	141509	9.63	UG/ML	96
55)	2,4,6-Tribromophenol	16.03	329.9	20853	9.27	UG/ML	84
56)	*d10-Phenanthrene	17.77	188.0	357177	20.00	UG/ML	99
58)	N-Nitrosodiphenylamine	15.83	169.0	97916	9.90	UG/ML	97
59)	4-Bromophenyl-phenylether	16.73	248.0	37269	9.93	UG/ML	97
60)	Hexachlorobenzene	16.78	283.7	43999	10.00	UG/ML	98
62)	Phenanthrene	17.82	178.0	213445	9.85	UG/ML	98
63)	Anthracene	17.95	178.0	217828	9.94	UG/ML	98
64)	Carbazole	18.42	167.0	214590	9.64	UG/ML	90
65)	Di-n-Butylphthalate	19.53	149.0	297224	9.61	UG/ML	98
66)	Fluoranthene	20.83	202.0	224862	9.79	UG/ML	99
67)	BENZIDINE	21.30	184.0	91412	9.98	UG/ML	100
68)	*d12-Chrysene	24.49	240.0	308857	20.00	UG/ML	100
69)	Pyrene	21.38	202.0	237366	9.33	UG/ML	99
70)	Terphenyl-d14	21.94	244.0	149563	9.54	UG/ML	99
71)	Butylbenzylphthalate	23.30	149.0	129073	9.24	UG/ML	82
72)	3,3'-Dichlorobenzidine	24.49	252.0	76362	9.45	UG/ML	85
73)	Benzo(a)Anthracene	24.46	228.0	200694	9.43	UG/ML	99
74)	Chrysene	24.54	228.0	180076	9.49	UG/ML	98
75)	bis(2-Ethylhexyl)Phthalate	24.86	149.0	191775	9.39	UG/ML	86
76)	*d12-Perylene	27.82	264.0	178510	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.42	149.0	324603	9.14	UG/ML	100
78)	Benzo(b)Fluoranthene	27.00	252.0	180479	9.55	UG/ML	98
79)	Benzo(k)Fluoranthene	27.07	252.0	177055	9.59	UG/ML	98
80)	Benzo(a)Pyrene	27.70	252.0	165001	9.63	UG/ML	99
81)	Indeno(1,2,3-cd)Pyrene	29.96	276.2	138721	8.99	UG/ML	93
82)	Dibenz(a,h)Anthracene	30.03	278.0	141503	9.18	UG/ML	97
83)	Benzo(g,h,i)Perylene	30.51	276.0	147012	9.49	UG/ML	100

* Compound is ISTD



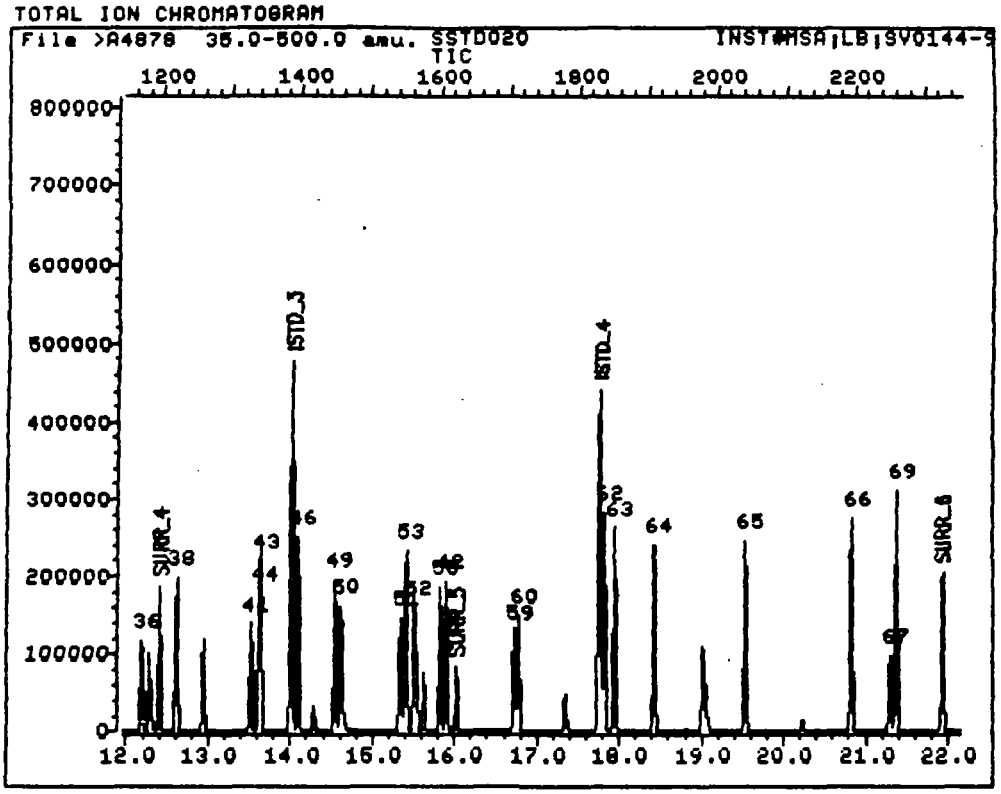
0000018

Data File: >A4878::A3 Quant Output File: ^A4878::D3
Name: SSTD020 Instrument ID: MSA
Misc: INST$MSA;LB;SV0144-94 BTL# 3

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:47
Injected at: 940531 16:15

TOTAL ION CHROMATOGRAM



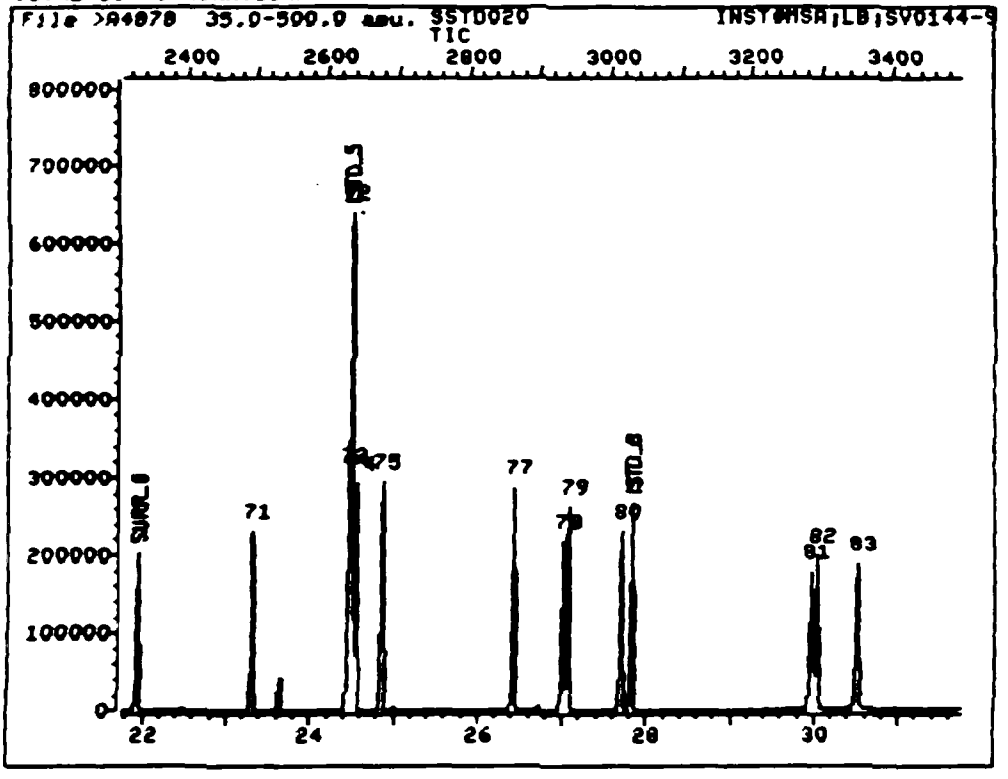
Data File: >A4878::A3 Quant Output File: ^A4878::D3
Name: SSTD020 Instrument ID: MSA
Misc: INST#MSA;LB;SV0144-94 BTL# 3

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:47
Injected at: 940531 16:15

0000019

TOTAL ION CHROMATOGRAM



Data File: >A4878::A3 Quant Output File: ^A4878::D3
Name: SSTD020 Instrument ID: MSA
Misc: INST#MSA;LB;SV0144-94 BTL# 3

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:47
Injected at: 940531 16:15

0000020

QUANT REPORT Page 1

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 15:29
Output File: ^A4876::D3 Injected at: 940531 14:56
Data File: >A4876::A3 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST$MSA;LB;SV0143-94 BTL# 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

0000021

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.71	152.0	85505	20.00	UG/ML	91
2)	N-NITROSODIMETHYLAMINE	2.45	74.0	72498	23.99	UG/ML	96
3)	Pyridine	2.49	79.0	117242	25.69	UG/ML	94
4)	2-Fluorophenol	4.25	112.0	123398	23.90	UG/ML	81
5)	ANILINE	6.04	93.0	227713	25.84	UG/ML	72
6)	Phenol-d5	6.07	99.0	165744	23.58	UG/ML	55
7)	Phenol	6.11	94.0	186909	21.56	UG/ML	62
8)	bis(-2-Chloroethyl)Ether	6.23	93.0	153327	23.92	UG/ML	76
9)	2-Chlorophenol	6.28	128.0	151655	24.39	UG/ML	86
10)	1,3-Dichlorobenzene	6.59	146.0	157106	24.82	UG/ML	93
11)	1,4-Dichlorobenzene	6.75	146.0	155459	24.47	UG/ML	94
12)	Benzyl Alcohol	7.09	108.0	88970	21.47	UG/ML	65
13)	1,2-Dichlorobenzene	7.06	146.0	153609	25.44	UG/ML	96
14)	2-Methylphenol	7.40	108.0	132592	24.31	UG/ML	90
15)	bis(2-chloro2propyl)Ether	7.48	45.0	32295	20.33	UG/ML	65
16)	4-Methylphenol	7.78	108.0	140209	23.84	UG/ML	62
17)	N-Nitrosodi-n-Propylamine	7.71	70.0	97447	22.87	UG/ML	99
18)	Hexachloroethane	7.81	117.0	68324	23.23	UG/ML	98
19)	*d8-Naphthalene	9.64	136.0	343693	20.00	UG/ML	97
20)	Nitrobenzene-d5	7.97	82.0	150932	23.30	UG/ML	72
21)	Nitrobenzene	8.02	77.0	147975	23.48	UG/ML	83
22)	Isophorone	8.61	82.0	296353	24.13	UG/ML	87
23)	2-Nitrophenol	8.76	139.0	116798	24.19	UG/ML	67
24)	2,4-Dimethylphenol	9.02	107.0	123040	24.05	UG/ML	89
25)	Benzoic Acid	9.45	122.0	68324	18.23	UG/ML	94
26)	bis(2-Chloroethoxy)Methane	9.23	93.0	199747	23.52	UG/ML	82
27)	2,4-Dichlorophenol	9.38	162.0	129854	25.59	UG/ML	92
28)	1,2,4-Trichlorobenzene	9.54	180.0	131603	25.31	UG/ML	99
29)	Naphthalene	9.69	128.0	434232	24.92	UG/ML	98
30)	4-Chloroaniline	9.91	127.0	207541	25.66	UG/ML	82
31)	Hexachlorobutadiene	10.07	225.0	59563	25.81	UG/ML	98
32)	4-Chloro-3-Methylphenol	11.25	107.0	128641	25.24	UG/ML	73
33)	2-Methylnaphthalene	11.43	141.1	234843	25.99	UG/ML	93
34)	*d10-Acenaphthene	14.02	164.0	187229	20.00	UG/ML	94
35)	Hexachlorocyclopentadiene	11.85	237.0	82623	24.52	UG/ML	98
36)	2,4,6-Trichlorophenol	12.20	196.0	85658	24.61	UG/ML	99
37)	2,4,5-Trichlorophenol	12.29	196.0	104126	25.28	UG/ML	93
38)	2-Chloronaphthalene	12.63	162.0	292863	25.12	UG/ML	95
39)	2-Fluorobiphenyl	12.42	172.0	291303	24.99	UG/ML	98
40)	2-Nitroaniline	12.96	65.0	84760	23.06	UG/ML	93

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 15:29
Output File: ^A4876::D3 Injected at: 940531 14:56
Data File: >A4876::A3 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST$MSA;LB;SV0143-94 BTL$ 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

0000022

	Compound	R.T.	Q ion	Area	Conc	Units	q
41)	Dimethyl Phthalate	13.54	163.0	348992	25.80	UG/ML	94
42)	AZOBENZENE	15.91	76.9	387815	25.27	UG/ML	72
43)	Acenaphthylene	13.65	152.0	474578	25.41	UG/ML	96
44)	2,6-Dinitrotoluene	13.64	165.0	91198	26.39	UG/ML	77
45)	3-Nitroaniline	14.02	138.0	115690	26.31	UG/ML	78
46)	Acenaphthene	14.11	153.0	299470	25.35	UG/ML	94
47)	2,4-Dinitrophenol	14.29	184.0	57555	24.99	UG/ML	72
48)	4-Nitrophenol	14.62	65.0	63167	23.49	UG/ML	84
49)	Dibenzofuran	14.55	168.0	404686	25.14	UG/ML	93
50)	2,4-Dinitrotoluene	14.63	165.0	126226	26.19	UG/ML	66
51)	Diethylphthalate	15.37	149.0	342471	25.97	UG/ML	94
52)	4Chlorophenyl-phenylether	15.51	204.0	148818	26.24	UG/ML	74
53)	Fluorene	15.42	166.0	329053	26.26	UG/ML	97
54)	4-Nitroaniline	15.57	138.0	130310M	27.42	UG/ML	63
55)	2,4,6-Tribromophenol	16.04	329.9	50358	27.02	UG/ML	81
56)	*d10-Phenanthrene	17.77	188.0	327547	20.00	UG/ML	98
57)	4,6-Dinitro-2-Methylphenol	15.65	198.0	82563	24.27	UG/ML	73
58)	N-Nitrosodiphenylamine	15.83	169.0	226690	24.98	UG/ML	97
59)	4-Bromophenyl-phenylether	16.73	248.0	86007	24.77	UG/ML	99
60)	Hexachlorobenzene	16.79	283.7	100919	24.95	UG/ML	99
61)	Pentachlorophenol	17.35	266.0	50759	21.21	UG/ML	99
62)	Phenanthrene	17.84	178.0	496646	25.51	UG/ML	98
63)	Anthracene	17.96	178.0	502336	25.32	UG/ML	99
64)	Carbazole	18.44	167.0	510456	26.50	UG/ML	90
65)	Di-n-Butylphthalate	19.54	149.0	709158	25.98	UG/ML	98
66)	Fluoranthene	20.85	202.0	526336	27.36	UG/ML	98
67)	BENZIDINE	21.31	184.0	209954	54.11	UG/ML	100
68)	*d12-Chrysene	24.50	240.0	270065	20.00	UG/ML	100
69)	Pyrene	21.39	202.0	556029	25.63	UG/ML	98
70)	Terphenyl-d14	21.94	244.0	342567	26.06	UG/ML	98
71)	Butylbenzylphthalate	23.31	149.0	305374	24.66	UG/ML	85
72)	3,3'-Dichlorobenzidine	24.51	252.0	176658	29.61	UG/ML	89
73)	Benzo(a)Anthracene	24.47	228.0	465062	26.44	UG/ML	98
74)	Chrysene	24.56	228.0	414739	26.56	UG/ML	97
75)	bis(2-Ethylhexyl)Phthalate	24.86	149.0	446365	24.93	UG/ML	83
76)	*d12-Perylene	27.83	264.0	153580	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.43	149.0	764266	40.04	UG/ML	100
78)	Benzo(b)Fluoranthene	27.02	252.0	406578	41.86	UG/ML	98
79)	Benzo(k)Fluoranthene	27.09	252.0	397069	41.66	UG/ML	98
80)	Benzo(a)Pyrene	27.72	252.0	368494	41.52	UG/ML	99
81)	Indeno(1,2,3-cd)Pyrene	29.99	276.2	331919	43.54	UG/ML	89

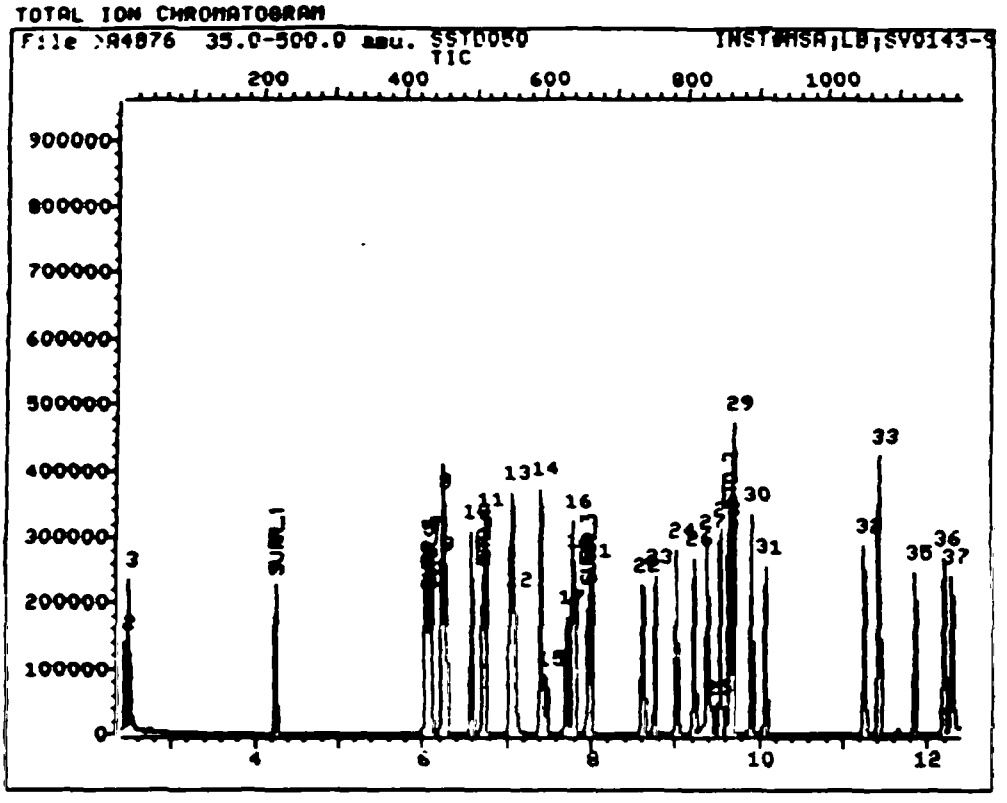
Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 15:29
Output File: ^A4876::D3 Injected at: 940531 14:56
Data File: >A4876::A3 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

0000023

	Compound	R.T.	Q ion	Area	Conc	Units	q
82)	Dibenz(a,h)Anthracene	30.05	278.0	331681	45.00	UG/ML	98
83)	Benzo(g,h,i)Perylene	30.54	276.0	333111	43.15	UG/ML	100

* Compound is ISTD



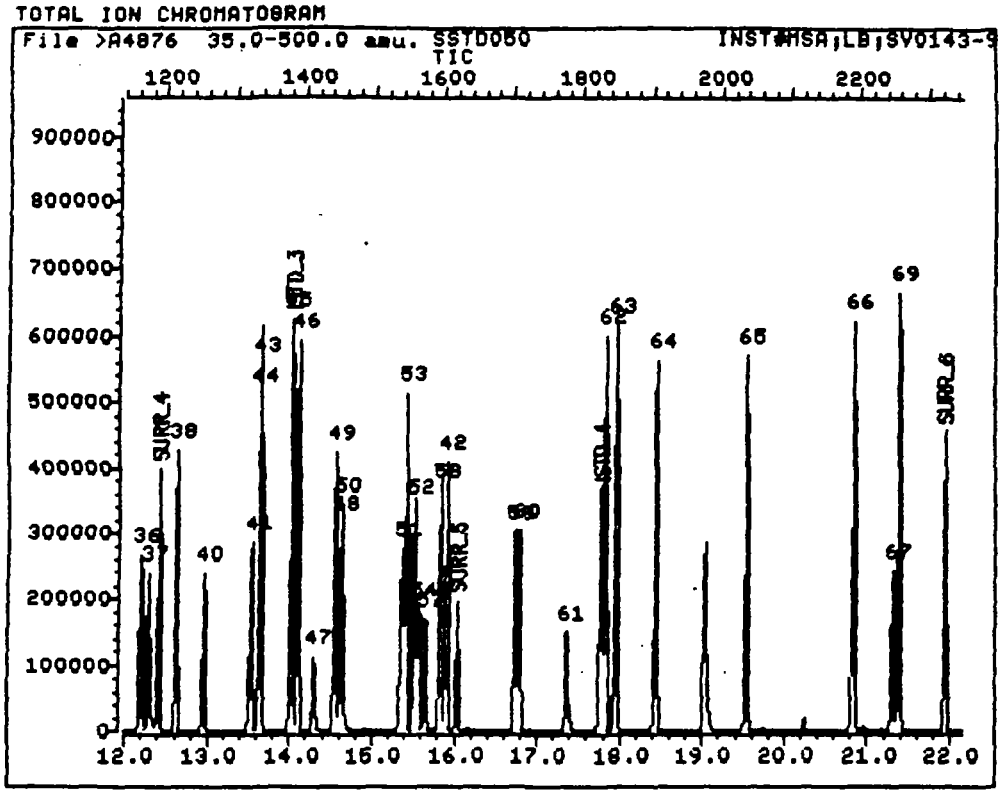
Data File: >A4876::A3 Quant Output File: ^A4876::D3
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

Operator ID: MSJ
Quant Time : 940531 15:29
Injected at: 940531 14:56

0000024

TOTAL ION CHROMATOGRAM



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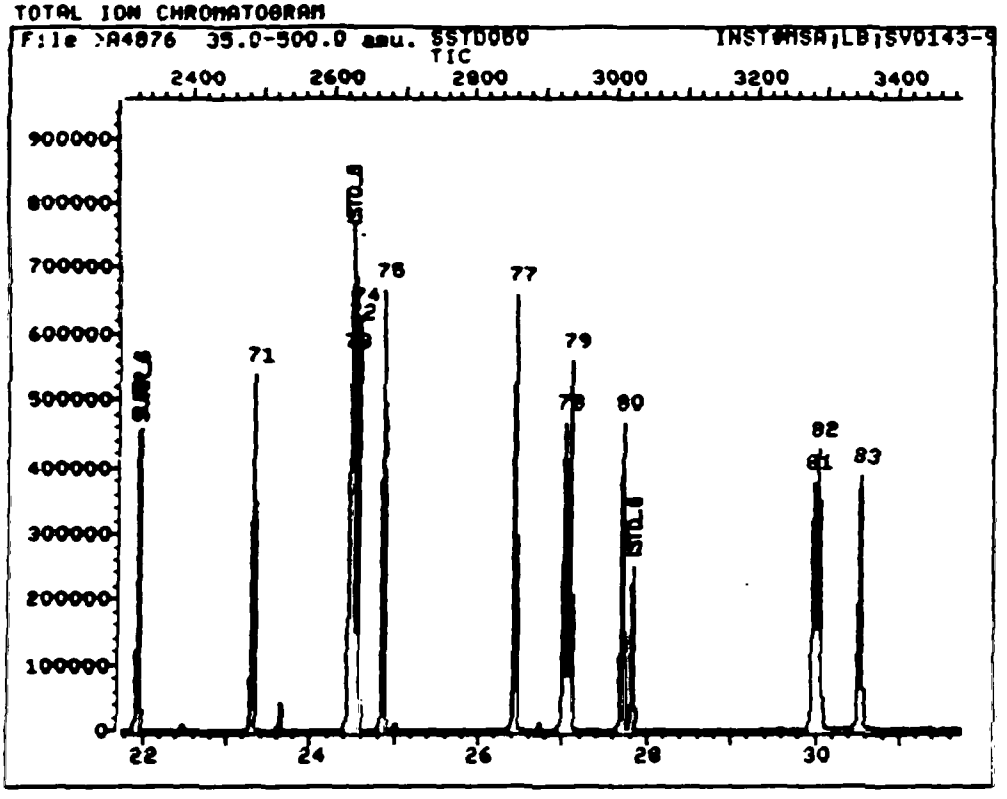
Data File: >A4876::A3 Quant Output File: ^A4876::D3
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

Operator ID: MSJ
Quant Time : 940531 15:29
Injected at: 940531 14:56

TOTAL ION CHROMATOGRAM



Data File: >A4876::A3 Quant Output File: ^A4876::D3
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940524 11:37

Operator ID: MSJ
Quant Time : 940531 15:29
Injected at: 940531 14:56

0000026

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 17:27
Output File: ^A4879::D3 Injected at: 940531 16:54
Data File: >A4879::A3 Dilution Factor: 1.00000
Name: SSTD080 Instrument ID: MSA
Misc: INST#MSA;LB;SV0145-94 BTL# 4

0000027

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.72	152.0	98095	20.00	UG/ML	91
2)	N-NITROSODIMETHYLAMINE	2.46	74.0	144405	43.41	UG/ML	97
3)	Pyridine	2.50	79.0	203612	37.84	UG/ML	90
4)	2-Fluorophenol	4.25	112.0	227584	40.19	UG/ML	81
5)	ANILINE	6.05	93.0	421049	40.29	UG/ML	75
6)	Phenol-d5	6.10	99.0	305343	40.15	UG/ML	56
7)	Phenol	6.12	94.0	338290	39.44	UG/ML	64
8)	bis(-2-Chloroethyl)Ether	6.25	93.0	273380	38.85	UG/ML	79
9)	2-Chlorophenol	6.29	128.0	278874	40.07	UG/ML	84
10)	1,3-Dichlorobenzene	6.59	146.0	284839	39.51	UG/ML	94
11)	1,4-Dichlorobenzene	6.76	146.0	282300	39.57	UG/ML	94
12)	Benzyl Alcohol	7.11	108.0	175136	42.90	UG/ML	64
13)	1,2-Dichlorobenzene	7.07	146.0	275749	39.12	UG/ML	94
14)	2-Methylphenol	7.41	108.0	237175	38.98	UG/ML	92
15)	bis(2-chloro2propyl)Ether	7.49	45.0	59932	40.44	UG/ML	63
16)	4-Methylphenol	7.80	108.0	263307	40.92	UG/ML	60
17)	N-Nitrosodi-n-Propylamine	7.74	70.0	186844	41.78	UG/ML	99
18)	Hexachloroethane	7.81	117.0	124585	39.74	UG/ML	98
19)	*d8-Naphthalene	9.65	136.0	402153	20.00	UG/ML	97
20)	Nitrobenzene-d5	7.98	82.0	285258	40.38	UG/ML	73
21)	Nitrobenzene	8.03	77.0	281554	40.65	UG/ML	83
22)	Isophorone	8.64	82.0	573146	41.32	UG/ML	88
23)	2-Nitrophenol	8.77	139.0	227987	41.71	UG/ML	66
24)	2,4-Dimethylphenol	9.03	107.0	237501	41.24	UG/ML	90
25)	Benzoic Acid	9.55	122.0	167069	52.24	UG/ML	91
26)	bis(2-Chloroethoxy)Methane	9.24	93.0	382838	40.95	UG/ML	86
27)	2,4-Dichlorophenol	9.39	162.0	243169	40.01	UG/ML	91
28)	1,2,4-Trichlorobenzene	9.54	180.0	243854	39.59	UG/ML	96
29)	Naphthalene	9.70	128.0	799780	39.35	UG/ML	98
30)	4-Chloroaniline	9.92	127.0	392388	40.40	UG/ML	81
31)	Hexachlorobutadiene	10.07	225.0	109370	39.23	UG/ML	97
32)	4-Chloro-3-Methylphenol	11.25	107.0	247954	41.18	UG/ML	72
33)	2-Methylnaphthalene	11.43	141.1	435903	39.66	UG/ML	92
34)	*d10-Acenaphthene	14.03	164.0	219910	20.00	UG/ML	97
35)	Hexachlorocyclopentadiene	11.85	237.0	152818	39.37	UG/ML	98
36)	2,4,6-Trichlorophenol	12.21	196.0	162694	40.43	UG/ML	98
37)	2,4,5-Trichlorophenol	12.29	196.0	198969	40.67	UG/ML	91
38)	2-Chloronaphthalene	12.64	162.0	532906	38.73	UG/ML	95
39)	2-Fluorobiphenyl	12.43	172.0	540836	39.52	UG/ML	98
40)	2-Nitroaniline	12.98	65.0	167326	42.02	UG/ML	95

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 17:27
Output File: ^A4879::D3 Injected at: 940531 16:54
Data File: >A4879::A3 Dilution Factor: 1.00000
Name: SSTD080 Instrument ID: MSA
Misc: INST$MSA;LB;SV0145-94 BTL$ 4

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

000028

	Compound	R.T.	Q ion	Area	Conc	Units	q
41)	Dimethyl Phthalate	13.55	163.0	657060	40.07	UG/ML	95
42)	AZOBENZENE	15.92	76.9	722603	39.66	UG/ML	72
43)	Acenaphthylene	13.66	152.0	861640	38.64	UG/ML	94
44)	2,6-Dinitrotoluene	13.66	165.0	167854	39.18	UG/ML	80
45)	3-Nitroaniline	14.04	138.0	217510	40.02	UG/ML	73
46)	Acenaphthene	14.12	153.0	550824	39.15	UG/ML	95
47)	2,4-Dinitrophenol	14.30	184.0	125802	46.52	UG/ML	72
48)	4-Nitrophenol	14.64	65.0	125718	42.36	UG/ML	86
49)	Dibenzofuran	14.57	168.0	753588	39.64	UG/ML	90
50)	2,4-Dinitrotoluene	14.65	165.0	234894	39.61	UG/ML	68
51)	Diethylphthalate	15.38	149.0	647677	40.25	UG/ML	92
52)	4Chlorophenyl-phenylether	15.53	204.0	271305	38.80	UG/ML	75
53)	Fluorene	15.43	166.0	602496	38.97	UG/ML	96
54)	4-Nitroaniline	15.61	138.0	237481	38.79	UG/ML	61
55)	2,4,6-Tribromophenol	16.05	329.9	93580	39.55	UG/ML	83
56)	*d10-Phenanthrene	17.77	188.0	380474	20.00	UG/ML	98
57)	4,6-Dinitro-2-Methylphenol	15.68	198.0	159882	41.68	UG/ML	75
58)	N-Nitrosodiphenylamine	15.86	169.0	410174	38.94	UG/ML	95
59)	4-Bromophenyl-phenylether	16.74	248.0	154292	38.61	UG/ML	98
60)	Hexachlorobenzene	16.81	283.7	180639	38.52	UG/ML	99
61)	Pentachlorophenol	17.36	266.0	112704	47.79	UG/ML	99
62)	Phenanthrene	17.84	178.0	904159	39.18	UG/ML	99
63)	Anthracene	17.98	178.0	918641	39.36	UG/ML	98
64)	Carbazole	18.46	167.0	937286	39.52	UG/ML	90
65)	Di-n-Butylphthalate	19.55	149.0	1324197	40.19	UG/ML	98
66)	Fluoranthene	20.85	202.0	957137	39.14	UG/ML	98
67)	BENZIDINE	21.32	184.0	363579	37.27	UG/ML	100
68)	*d12-Chrysene	24.50	240.0	286164	20.00	UG/ML	100
69)	Pyrene	21.41	202.0	1000451	42.45	UG/ML	97
70)	Terphenyl-d14	21.96	244.0	607942	41.87	UG/ML	96
71)	Butylbenzylphthalate	23.32	149.0	569333	43.99	UG/ML	84
72)	3,3'-Dichlorobenzidine	24.52	252.0	296583	39.61	UG/ML	90
73)	Benzo(a)Anthracene	24.49	228.0	822897	41.75	UG/ML	98
74)	Chrysene	24.58	228.0	719636	40.94	UG/ML	98
75)	bis(2-Ethylhexyl)Phthalate	24.87	149.0	825970	43.66	UG/ML	81
76)	*d12-Perylene	27.84	264.0	173209	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.44	149.0	1415638	41.06	UG/ML	100
78)	Benzo(b)Fluoranthene	27.04	252.0	749733	40.88	UG/ML	99
79)	Benzo(k)Fluoranthene	27.10	252.0	680841	38.01	UG/ML	98
80)	Benzo(a)Pyrene	27.74	252.0	674687	40.59	UG/ML	97
81)	Indeno(1,2,3-cd)Pyrene	30.01	276.2	642577	42.91	UG/ML	91

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 17:27
Output File: ^A4879::D3 Injected at: 940531 16:54
Data File: >A4879::A3 Dilution Factor: 1.00000
Name: SSTD080 Instrument ID: MSA
Misc: INST#MSA;LB;SV0145-94 BTL# 4

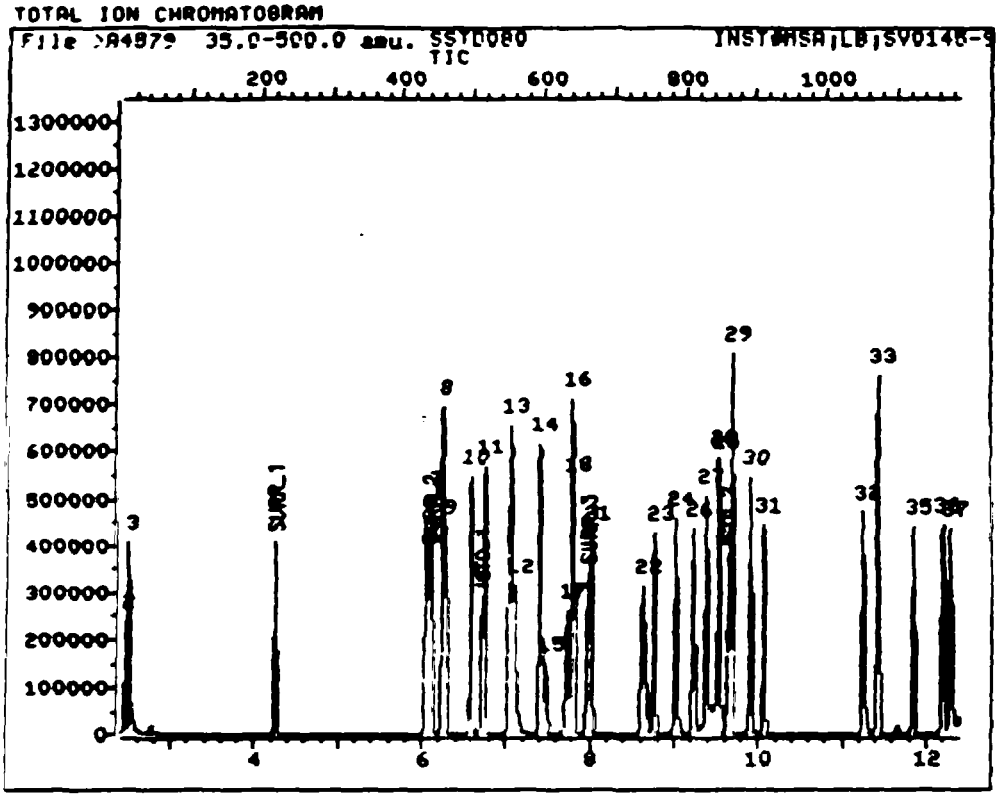
ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

	Compound	R.T.	Q ion	Area	Conc	Units	q
82)	Dibenz(a,h)Anthracene	30.07	278.0	609716	40.75	UG/ML	97
83)	Benzo(g,h,i)Perylene	30.57	276.0	630087	41.93	UG/ML	100

* Compound is ISTD

0000029

TOTAL ION CHROMATOGRAM



Data File: >A4879::A3 Quant Output File: ^A4879::D3
Name: SSTD080 Instrument ID: MSA
Misc: INST$MSA;LB;SV0145-94 BTL# 4

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 17:27
Injected at: 940531 16:54

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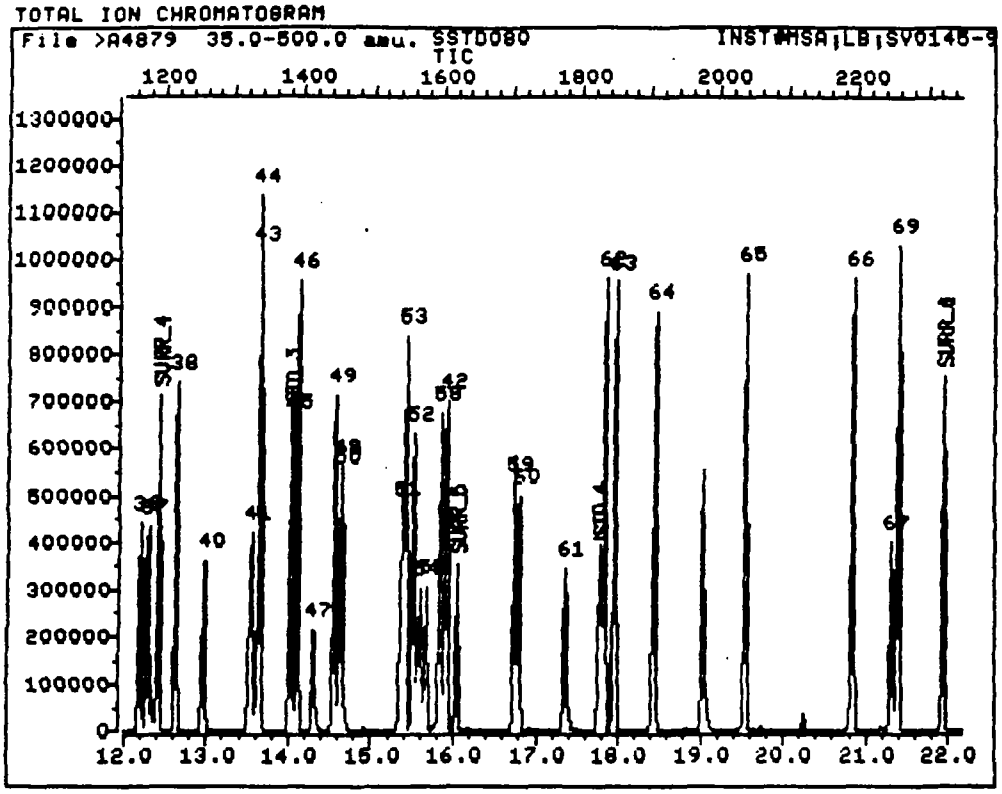
TOTAL ION CHROMATOGRAM

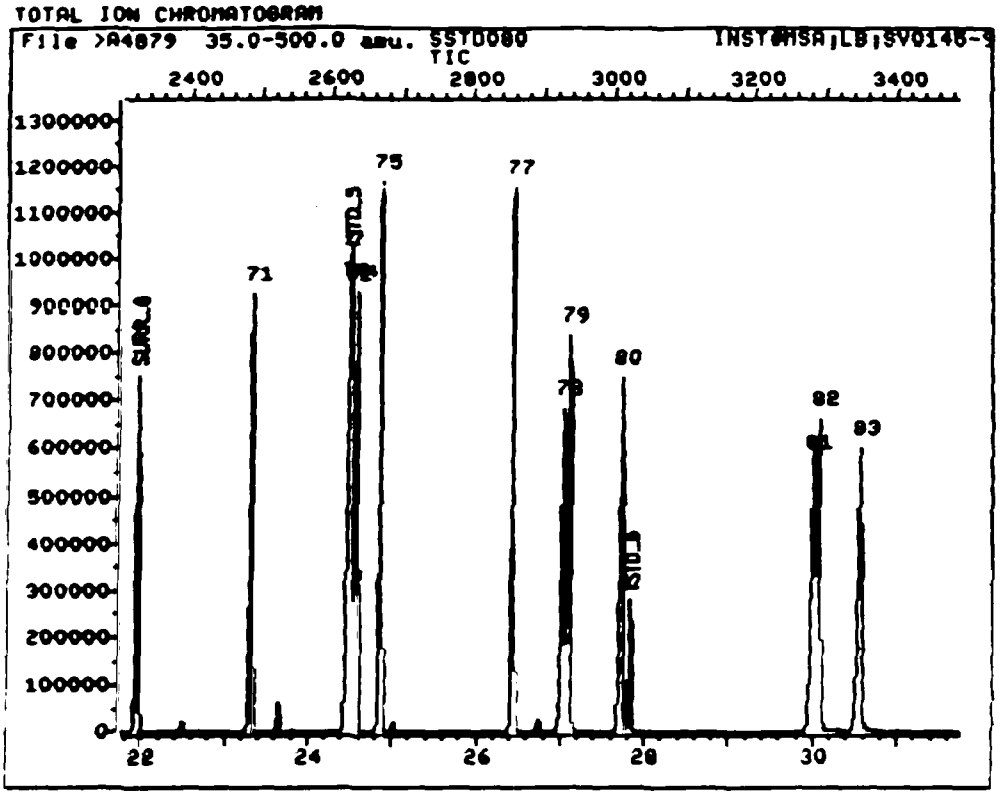


Data File: >A4879::A3 Quant Output File: ^A4879::D3
Name: SSTD080 Instrument ID: MSA
Misc: INST#MSA;LB;SV0145-94 BTL# 4

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 17:27
Injected at: 940531 16:54

0000031



Data File: >A4879::A3 Quant Output File: ^A4879::D3
Name: SSTD080 Instrument ID: MSA
Misc: INST#MSA;LB;SV0145-94 BTL# 4

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 17:27
Injected at: 940531 16:54

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Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 18:06
Output File: ^A4880::D3 Injected at: 940531 17:33
Data File: >A4880::A3 Dilution Factor: 1.00000
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL# 5

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000033

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.72	152.0	102657	20.00	UG/ML	90
2)	N-NITROSODIMETHYLAMINE	2.46	74.0	217811	62.56	UG/ML	99
3)	Pyridine	2.50	79.0	352744	62.65	UG/ML	93
4)	2-Fluorophenol	4.26	112.0	342092	57.73	UG/ML	81
5)	ANILINE	6.06	93.0	662464	60.58	UG/ML	74
6)	Phenol-d5	6.11	99.0	473804	59.53	UG/ML	57
7)	Phenol	6.15	94.0	538832	60.03	UG/ML	64
8)	bis(-2-Chloroethyl)Ether	6.27	93.0	416176	56.52	UG/ML	79
9)	2-Chlorophenol	6.31	128.0	429651	58.99	UG/ML	86
10)	1,3-Dichlorobenzene	6.59	146.0	416041	55.14	UG/ML	95
11)	1,4-Dichlorobenzene	6.76	146.0	418048	56.00	UG/ML	93
12)	Benzyl Alcohol	7.12	108.0	284607	66.61	UG/ML	62
13)	1,2-Dichlorobenzene	7.08	146.0	404458	54.83	UG/ML	96
14)	2-Methylphenol	7.42	108.0	373508	58.66	UG/ML	93
15)	bis(2-chloro2propyl)Ether	7.49	45.0	91782	59.18	UG/ML	61
16)	4-Methylphenol	7.82	108.0	373970	55.54	UG/ML	60
17)	N-Nitrosodi-n-Propylamine	7.76	70.0	286642	61.25	UG/ML	96
18)	Hexachloroethane	7.82	117.0	169997	51.81	UG/ML	96
19)	*d8-Naphthalene	9.66	136.0	433619	20.00	UG/ML	97
20)	Nitrobenzene-d5	8.00	82.0	451961	59.34	UG/ML	73
21)	Nitrobenzene	8.04	77.0	437885	58.64	UG/ML	82
22)	Isophorone	8.66	82.0	920263	61.53	UG/ML	87
23)	2-Nitrophenol	8.78	139.0	355834	60.37	UG/ML	67
24)	2,4-Dimethylphenol	9.04	107.0	369785	59.55	UG/ML	88
25)	Benzoic Acid	9.64	122.0	309866M	89.87	UG/ML	85
26)	bis(2-Chloroethoxy)Methane	9.26	93.0	612072	60.72	UG/ML	85
27)	2,4-Dichlorophenol	9.41	162.0	385213	58.78	UG/ML	93
28)	1,2,4-Trichlorobenzene	9.55	180.0	370978	55.86	UG/ML	98
29)	Naphthalene	9.72	128.0	1213736	55.39	UG/ML	97
30)	4-Chloroaniline	9.93	127.0	625119	59.68	UG/ML	81
31)	Hexachlorobutadiene	10.08	225.0	163506	54.40	UG/ML	99
32)	4-Chloro-3-Methylphenol	11.26	107.0	402090	61.94	UG/ML	71
33)	2-Methylnaphthalene	11.44	141.1	675397	56.99	UG/ML	93
34)	*d10-Acenaphthene	14.04	164.0	239567	20.00	UG/ML	97
35)	Hexachlorocyclopentadiene	11.86	237.0	238462	56.39	UG/ML	99
36)	2,4,6-Trichlorophenol	12.21	196.0	257550	58.75	UG/ML	98
37)	2,4,5-Trichlorophenol	12.30	196.0	319219	59.90	UG/ML	92
38)	2-Chloronaphthalene	12.65	162.0	838815	55.96	UG/ML	96
39)	2-Fluorobiphenyl	12.44	172.0	846558	56.78	UG/ML	98
40)	2-Nitroaniline	13.00	65.0	275988	63.62	UG/ML	92

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 18:06
Output File: ^A4880::D3 Injected at: 940531 17:33
Data File: >A4880::A3 Dilution Factor: 1.00000
Name: SSTD120 Instrument ID: MSA
Misc: INST$MSA;LB;SV0146-94 BTL$ 5

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000034

	Compound	R.T.	Q ion	Area	Conc	Units	q
41)	Dimethyl Phthalate	13.58	163.0	1061525	59.43	UG/ML	94
42)	AZOBENZENE	15.94	76.9	1262595	63.61	UG/ML	72
43)	Acenaphthylene	13.67	152.0	1298240	53.45	UG/ML	95
44)	2,6-Dinitrotoluene	13.68	165.0	264378	56.64	UG/ML	82
45)	3-Nitroaniline	14.06	138.0	356430	60.20	UG/ML	78
46)	Acenaphthene	14.13	153.0	852972	55.65	UG/ML	98
47)	2,4-Dinitrophenol	14.33	184.0	212803	72.24	UG/ML	70
48)	4-Nitrophenol	14.66	65.0	213141	65.93	UG/ML	85
49)	Dibenzofuran	14.58	168.0	1175729	56.76	UG/ML	93
50)	2,4-Dinitrotoluene	14.67	165.0	373360	57.79	UG/ML	69
51)	Diethylphthalate	15.40	149.0	1006615	57.43	UG/ML	93
52)	4Chlorophenyl-phenylether	15.53	204.0	427854	56.17	UG/ML	74
53)	Fluorene	15.45	166.0	915766	54.38	UG/ML	95
54)	4-Nitroaniline	15.65	138.0	378507M	56.75	UG/ML	66
55)	2,4,6-Tribromophenol	16.06	329.9	145281	56.37	UG/ML	80
56)	*d10-Phenanthrene	17.79	188.0	397583	20.00	UG/ML	99
57)	4,6-Dinitro-2-Methylphenol	15.71	198.0	258651	64.52	UG/ML	74
58)	N-Nitrosodiphenylamine	15.88	169.0	640898	58.23	UG/ML	95
59)	4-Bromophenyl-phenylether	16.75	248.0	234739	56.21	UG/ML	99
60)	Hexachlorobenzene	16.82	283.7	273587	55.84	UG/ML	98
61)	Pentachlorophenol	17.37	266.0	191079	77.53	UG/ML	98
62)	Phenanthrene	17.86	178.0	1365165	56.61	UG/ML	99
63)	Anthracene	17.99	178.0	1353911	55.51	UG/ML	98
64)	Carbazole	18.47	167.0	1427154	57.58	UG/ML	90
65)	Di-n-Butylphthalate	19.56	149.0	2012319	58.44	UG/ML	98
66)	Fluoranthene	20.87	202.0	1438622	56.29	UG/ML	97
67)	BENZIDINE	21.33	184.0	559433	54.88	UG/ML	100
68)	*d12-Chrysene	24.52	240.0	269596	20.00	UG/ML	100
69)	Pyrene	21.43	202.0	1477197	66.53	UG/ML	99
70)	Terphenyl-d14	21.97	244.0	896613	65.55	UG/ML	97
71)	Butylbenzylphthalate	23.33	149.0	876631	71.89	UG/ML	84
72)	3,3'-Dichlorobenzidine	24.54	252.0	418887	59.38	UG/ML	85
73)	Benzo(a)Anthracene	24.50	228.0	1202389	64.75	UG/ML	99
74)	Chrysene	24.60	228.0	1068349	64.51	UG/ML	99
75)	bis(2-Ethylhexyl)Phthalate	24.88	149.0	1237737	69.44	UG/ML	82
76)	*d12-Perylene	27.85	264.0	181824	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.45	149.0	2133980	58.96	UG/ML	100
78)	Benzo(b)Fluoranthene	27.06	252.0	1198784	62.26	UG/ML	99
79)	Benzo(k)Fluoranthene	27.13	252.0	960253	51.07	UG/ML	98
80)	Benzo(a)Pyrene	27.76	252.0	1025351	58.76	UG/ML	97
81)	Indeno(1,2,3-cd)Pyrene	30.03	276.2	1017147	64.71	UG/ML	93

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 18:06
Output File: ^A4880::D3 Injected at: 940531 17:33
Data File: >A4880::A3 Dilution Factor: 1.00000
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL# 5

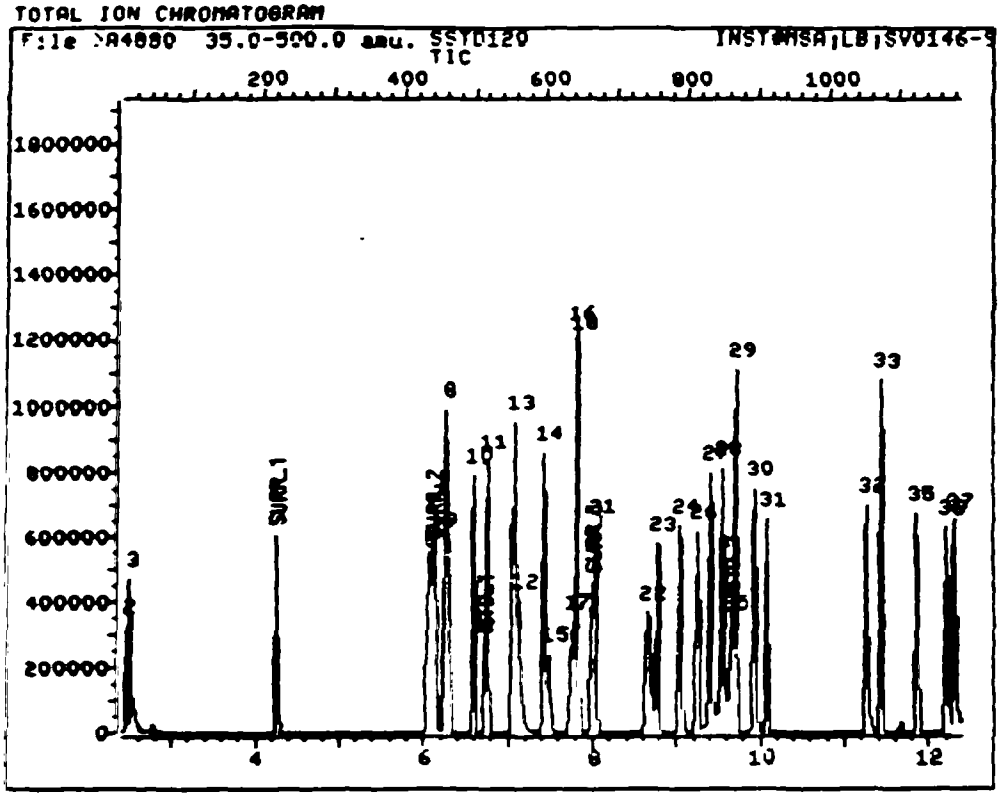
ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000035

	Compound	R.T.	Q ion	Area	Conc	Units	q
82)	Dibenz(a,h)Anthracene	30.10	278.0	929039	59.15	UG/ML	97
83)	Benzo(g,h,i)Perylene	30.60	276.0	969195	61.44	UG/ML	100

* Compound is ISTD

TOTAL ION CHROMATOGRAM



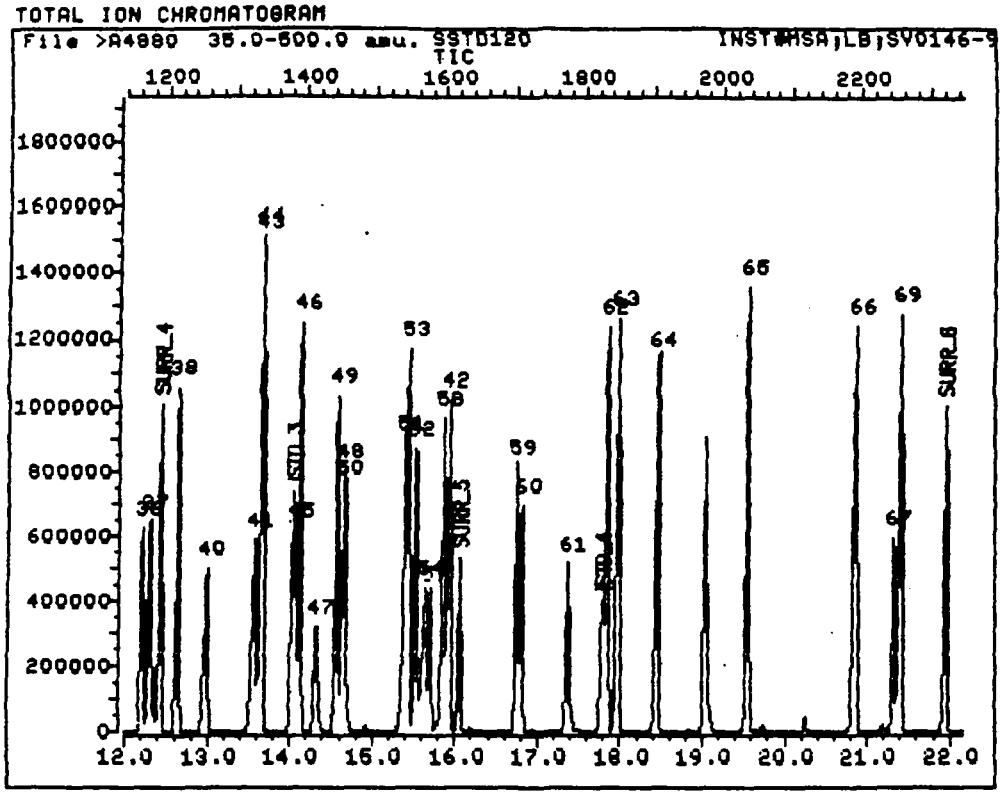
0000036

Data File: >A4880::A3 Quant Output File: ^A4880::D3
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL# 5

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:06
Injected at: 940531 17:33

TOTAL ION CHROMATOGRAM



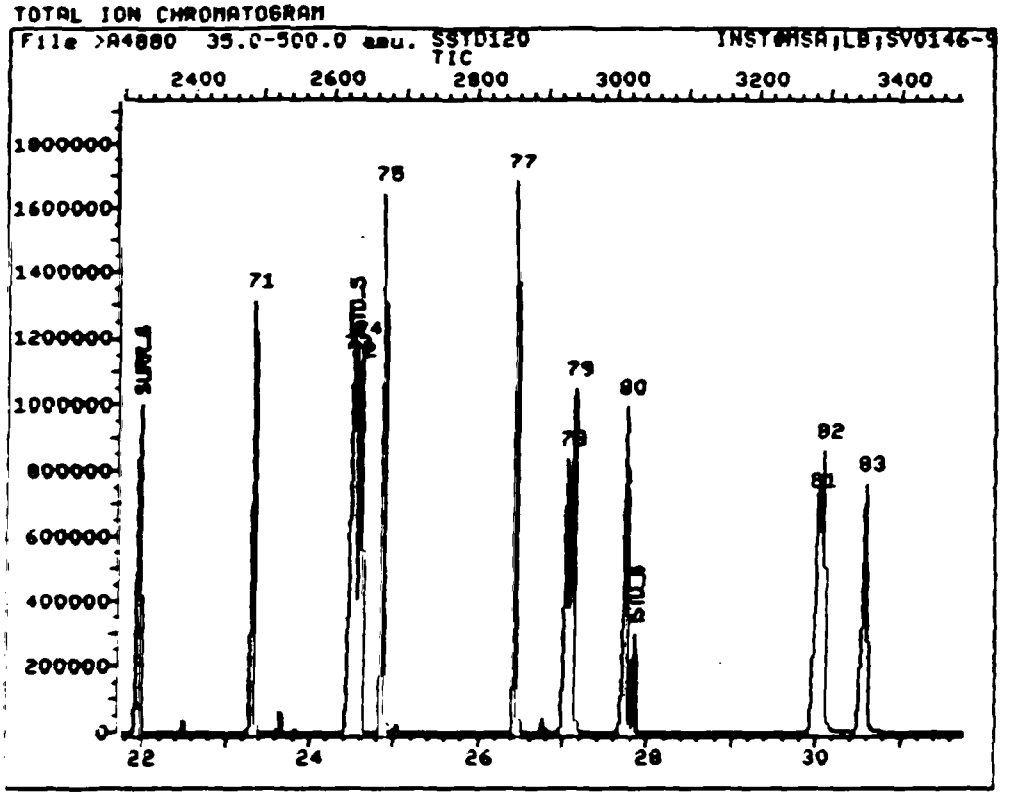
Data File: >A4880::A3 Quant Output File: ^A4880::D3
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL# 5

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:06
Injected at: 940531 17:33

0000037

TOTAL ION CHROMATOGRAM



Data File: >A4880::A3 Quant Output File: ^A4880::D3
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL# 5

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:06
Injected at: 940531 17:33

0000038

QUANT REPORT Page 1

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 16:27
Output File: ^A4877::D3 Injected at: 940531 15:35
Data File: >A4877::A3 Dilution Factor: 1.00000
Name: SSTD160 Instrument ID: MSA
Misc: INST#MSA;LB;SV0147-94 BTL# 2

0000039

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.73	152.0	94699	20.00	UG/ML	89
2)	N-NITROSODIMETHYLAMINE	2.46	74.0	259981	80.95	UG/ML	98
3)	Pyridine	2.50	79.0	428751	82.55	UG/ML	92
4)	2-Fluorophenol	4.26	112.0	419039	76.65	UG/ML	80
5)	ANILINE	6.07	93.0	801569	79.46	UG/ML	74
6)	Phenol-d5	6.12	99.0	561261	76.44	UG/ML	56
7)	Phenol	6.15	94.0	686267	82.88	UG/ML	64
8)	bis(-2-Chloroethyl)Ether	6.27	93.0	495458	72.94	UG/ML	79
9)	2-Chlorophenol	6.31	128.0	512738	76.32	UG/ML	84
10)	1,3-Dichlorobenzene	6.60	146.0	507082	72.86	UG/ML	94
11)	1,4-Dichlorobenzene	6.77	146.0	506547	73.55	UG/ML	94
12)	Benzyl Alcohol	7.13	108.0	336268	85.32	UG/ML	67
13)	1,2-Dichlorobenzene	7.08	146.0	480368	70.59	UG/ML	96
14)	2-Methylphenol	7.43	108.0	438806	74.70	UG/ML	93
15)	bis(2-chloro2propyl)Ether	7.49	45.0	117759	82.31	UG/ML	62
16)	4-Methylphenol	7.83	108.0	421439	67.85	UG/ML	60
17)	N-Nitrosodi-n-Propylamine	7.77	70.0	323282	74.89	UG/ML	99
18)	Hexachloroethane	7.82	117.0	200234	66.15	UG/ML	96
19)	*d8-Naphthalene	9.66	136.0	372441	20.00	UG/ML	97
20)	Nitrobenzene-d5	8.01	82.0	532574	81.41	UG/ML	72
21)	Nitrobenzene	8.05	77.0	519358	80.97	UG/ML	81
22)	Isophorone	8.67	82.0	1076142	83.77	UG/ML	87
23)	2-Nitrophenol	8.79	139.0	422307	83.42	UG/ML	66
24)	2,4-Dimethylphenol	9.05	107.0	437469	82.03	UG/ML	90
25)	Benzoic Acid	9.67	122.0	359258M	121.31	UG/ML	82
26)	bis(2-Chloroethoxy)Methane	9.26	93.0	717756	82.90	UG/ML	84
27)	2,4-Dichlorophenol	9.42	162.0	447169	79.45	UG/ML	91
28)	1,2,4-Trichlorobenzene	9.56	180.0	438812	76.92	UG/ML	99
29)	Naphthalene	9.72	128.0	1436057	76.30	UG/ML	97
30)	4-Chloroaniline	9.94	127.0	724854	80.57	UG/ML	82
31)	Hexachlorobutadiene	10.08	225.0	194334	75.27	UG/ML	98
32)	4-Chloro-3-Methylphenol	11.27	107.0	460732	82.63	UG/ML	70
33)	2-Methylnaphthalene	11.45	141.1	783864	77.00	UG/ML	93
34)	*d10-Acenaphthene	14.04	164.0	205823	20.00	UG/ML	95
35)	Hexachlorocyclopentadiene	11.86	237.0	280833	77.30	UG/ML	99
36)	2,4,6-Trichlorophenol	12.22	196.0	295969	78.58	UG/ML	98
37)	2,4,5-Trichlorophenol	12.31	196.0	368811	80.55	UG/ML	91
38)	2-Chloronaphthalene	12.65	162.0	950395	73.80	UG/ML	95
39)	2-Fluorobiphenyl	12.44	172.0	954564	74.52	UG/ML	97
40)	2-Nitroaniline	13.01	65.0	311961	83.70	UG/ML	91

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 16:27
Output File: ^A4877::D3 Injected at: 940531 15:35
Data File: >A4877::A3 Dilution Factor: 1.00000
Name: SSTD160 Instrument ID: MSA
Misc: INST$MSA;LB;SV0147-94 BTL$ 2

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000040

	Compound	R.T.	Q ion	Area	Conc	Units	q
41)	Dimethyl Phthalate	13.59	163.0	1221787	79.62	UG/ML	94
42)	AZOBENZENE	15.95	76.9	1425508	83.59	UG/ML	72
43)	Acenaphthylene	13.68	152.0	1465134	70.21	UG/ML	94
44)	2,6-Dinitrotoluene	13.69	165.0	301720	75.24	UG/ML	82
45)	3-Nitroaniline	14.07	138.0	413358	81.25	UG/ML	74
46)	Acenaphthene	14.14	153.0	960583	72.95	UG/ML	98
47)	2,4-Dinitrophenol	14.34	184.0	246345	97.34	UG/ML	70
48)	4-Nitrophenol	14.67	65.0	241898	87.09	UG/ML	86
49)	Dibenzofuran	14.58	168.0	1331884	74.85	UG/ML	93
50)	2,4-Dinitrotoluene	14.68	165.0	425196	76.61	UG/ML	69
51)	Diethylphthalate	15.42	149.0	1140594	75.74	UG/ML	92
52)	4Chlorophenyl-phenylether	15.53	204.0	480944	73.50	UG/ML	75
53)	Fluorene	15.45	166.0	1013004	70.01	UG/ML	95
54)	4-Nitroaniline	15.67	138.0	426745M	74.47	UG/ML	63
55)	2,4,6-Tribromophenol	16.08	329.9	163224	73.71	UG/ML	81
56)	*d10-Phenanthrene	17.78	188.0	341170	20.00	UG/ML	98
57)	4,6-Dinitro-2-Methylphenol	15.73	198.0	289579	84.18	UG/ML	77
58)	N-Nitrosodiphenylamine	15.88	169.0	722842	76.53	UG/ML	96
59)	4-Bromophenyl-phenylether	16.77	248.0	263168	73.44	UG/ML	99
60)	Hexachlorobenzene	16.82	283.7	309749	73.67	UG/ML	97
61)	Pentachlorophenol	17.37	266.0	214433	101.40	UG/ML	99
62)	Phenanthrene	17.87	178.0	1537824	74.32	UG/ML	99
63)	Anthracene	18.00	178.0	1553682	74.24	UG/ML	98
64)	Carbazole	18.48	167.0	1614778	75.93	UG/ML	91
65)	Di-n-Butylphthalate	19.56	149.0	2308162	78.12	UG/ML	98
66)	Fluoranthene	20.87	202.0	1622858	74.00	UG/ML	98
67)	BENZIDINE	21.33	184.0	641160	73.30	UG/ML	100
68)	*d12-Chrysene	24.53	240.0	224784	20.00	UG/ML	100
69)	Pyrene	21.43	202.0	1677980	90.64	UG/ML	98
70)	Terphenyl-d14	21.97	244.0	992032	86.98	UG/ML	98
71)	Butylbenzylphthalate	23.33	149.0	977341	96.13	UG/ML	84
72)	3,3'-Dichlorobenzidine	24.54	252.0	473661	80.53	UG/ML	87
73)	Benzo(a)Anthracene	24.50	228.0	1353281	87.40	UG/ML	98
74)	Chrysene	24.61	228.0	1178139	85.32	UG/ML	97
75)	bis(2-Ethylhexyl)Phthalate	24.88	149.0	1392276	93.69	UG/ML	80
76)	*d12-Perylene	27.84	264.0	153492	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.45	149.0	2367082	77.47	UG/ML	100
78)	Benzo(b)Fluoranthene	27.07	252.0	1429517	87.95	UG/ML	98
79)	Benzo(k)Fluoranthene	27.14	252.0	1036856	65.32	UG/ML	98
80)	Benzo(a)Pyrene	27.76	252.0	1168446	79.32	UG/ML	97
81)	Indeno(1,2,3-cd)Pyrene	30.03	276.2	1191260	89.78	UG/ML	92

Operator ID: MSJ Quant Rev: 7 Quant Time: 940531 16:27
Output File: ^A4877::D3 Injected at: 940531 15:35
Data File: >A4877::A3 Dilution Factor: 1.00000
Name: SSTD160 Instrument ID: MSA
Misc: INST#MSA;LB;SV0147-94 BTL# 2

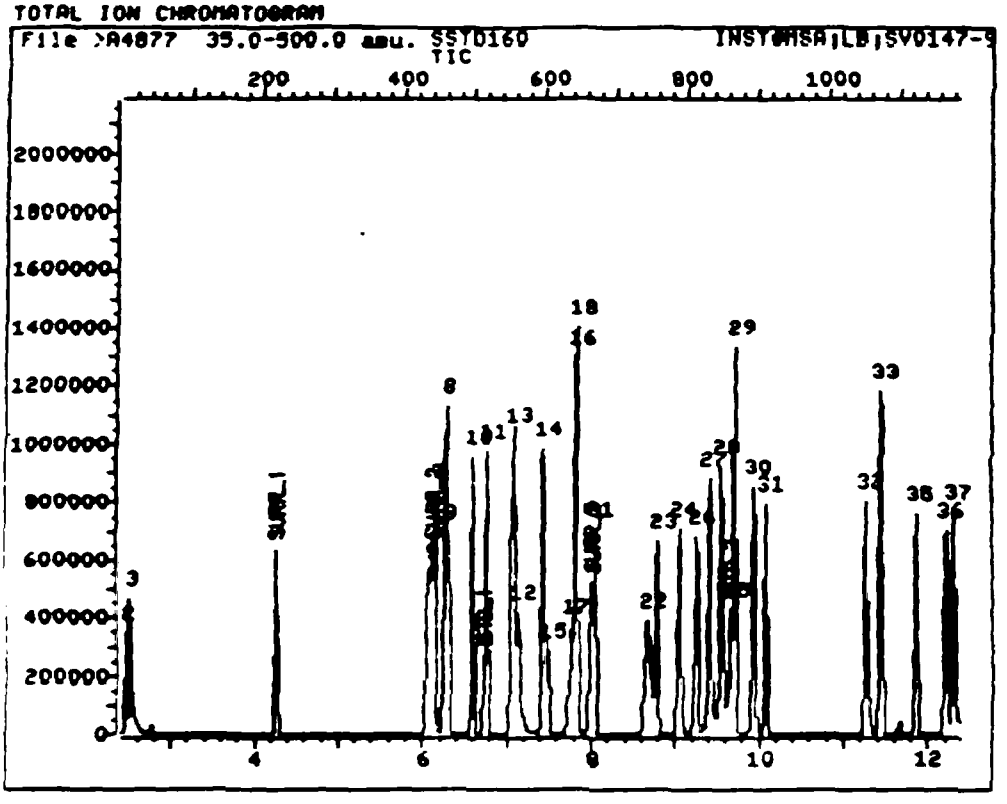
ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000041

	Compound	R.T.	Q ion	Area	Conc	Units	q
82)	Dibenz(a,h)Anthracene	30.11	278.0	1059848	79.93	UG/ML	96
83)	Benzo(g,h,i)Perylene	30.61	276.0	1096214	82.32	UG/ML	100

* Compound is ISTD

TOTAL ION CHROMATOGRAM



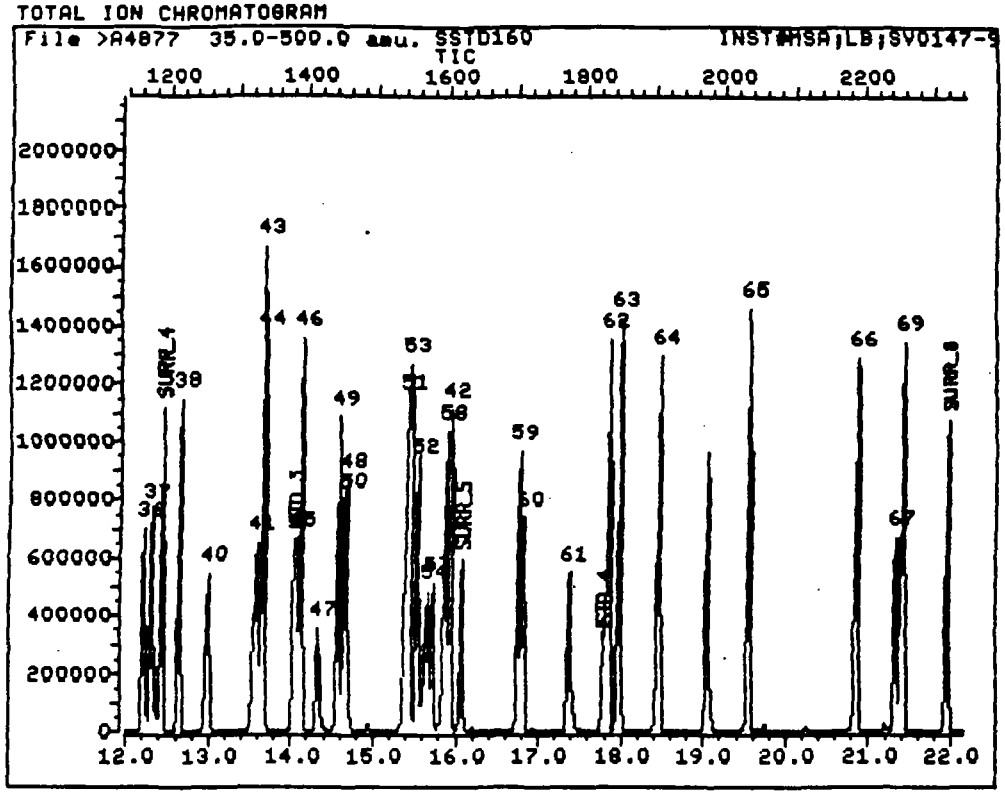
Data File: >A4877::A3 Quant Output File: ^A4877::D3
Name: SSTD160 Instrument ID: MSA
Misc: INST#MSA;LB;SV0147-94 BTL# 2

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:27
Injected at: 940531 15:35

0000042

TOTAL ION CHROMATOGRAM



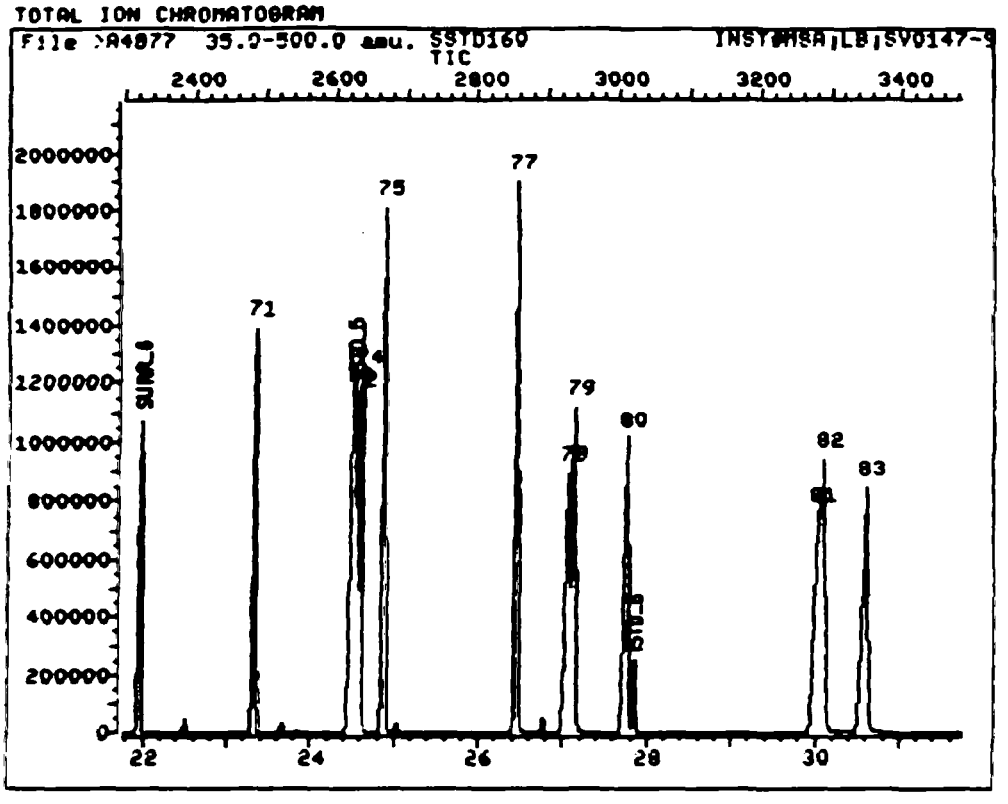
0000043

Data File: >A4877::A3 Quant Output File: ^A4877::D3
Name: SSTD160 Instrument ID: MSA
Misc: INST#MSA;LB;SV0147-94 BTL# 2

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:27
Injected at: 940531 15:35

TOTAL ION CHROMATOGRAM



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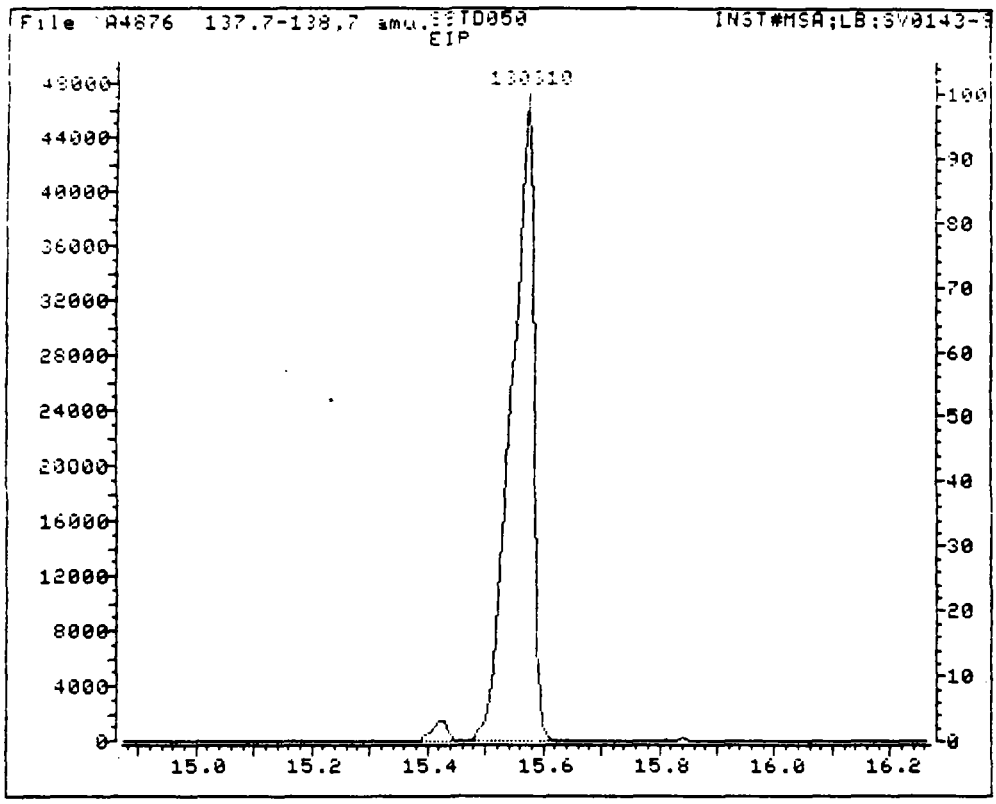
Data File: >A4877::A3 Quant Output File: ^A4877::D3
Name: SSTD160 Instrument ID: MSA
Misc: INST$MSA;LB;SV0147-94 BTL# 2

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 16:27
Injected at: 940531 15:35



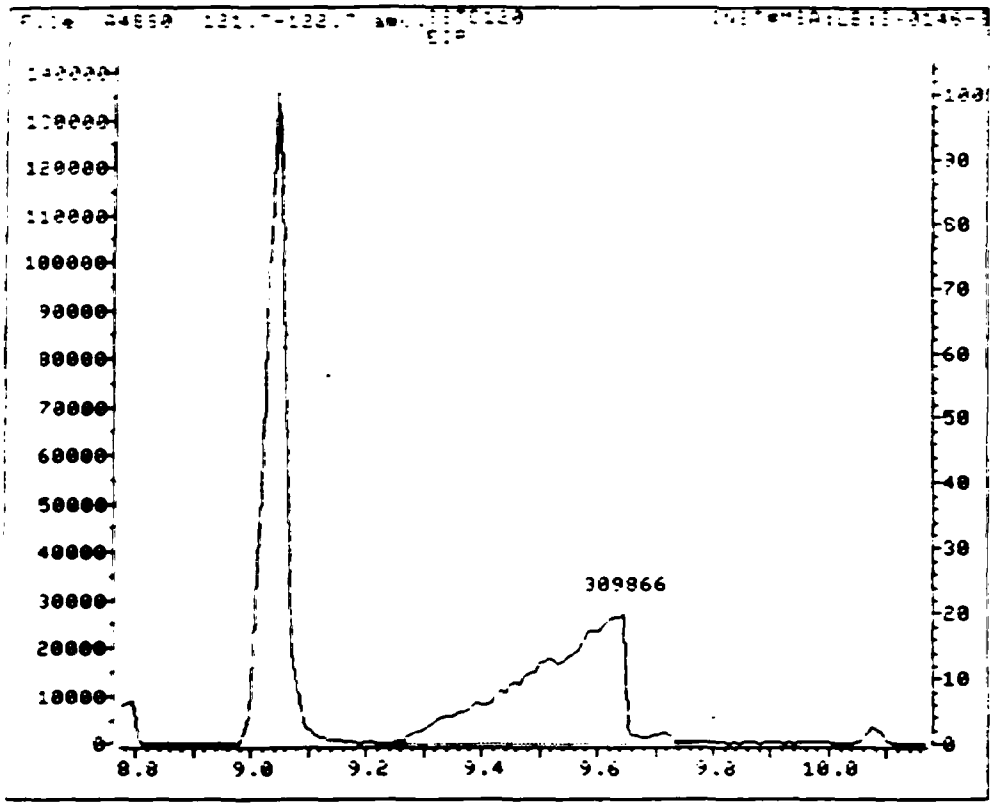
Data File: >A4876::A3 Quant Output File: ^A4876::D3
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1
Quant Time: 940531 15:29 Quant ID File: I_ACLP::QT
Injected at: 940531 14:56 Last Calibration: 940523 14:49

Compound No: 54
Compound Name: 4-Nitroaniline
Scan Number: 1565
Retention Time: 15.57 min.
Quant Ion: 138.0
Area: 130310M
Concentration: 27.42 UG/ML
q-value: 63

This report was produced by QAREA on: 940601 08:31

0000045

B060194



Data File: >A4880::A3
Name: SSTD120
Misc: INST#MSA:LB:SV0146-94
Quant Time: 940531 18:06
Injected at: 940531 17:33

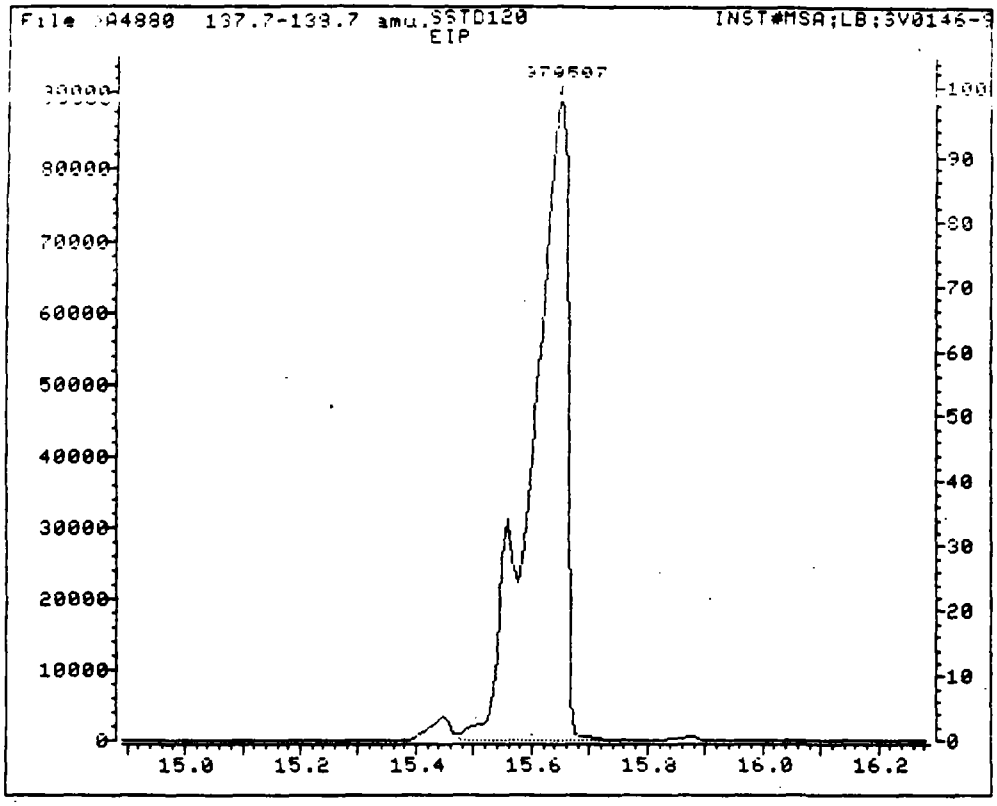
Quant Output File: ^A4880::D3
Instrument ID: MSA
BTL# 5
Quant ID File: I_ACLP::QT
Last Calibration: 940523 14:49

Compound No: 25
Compound Name: Benzoic Acid
Scan Number: 860
Retention Time: 9.64 min.
Quant Ion: 122.0
Area: 309866M
Concentration: 89.87 UG/ML
q-value: 85

This report was produced by QAREA on: 940601 08:20

0000046

LB 060194



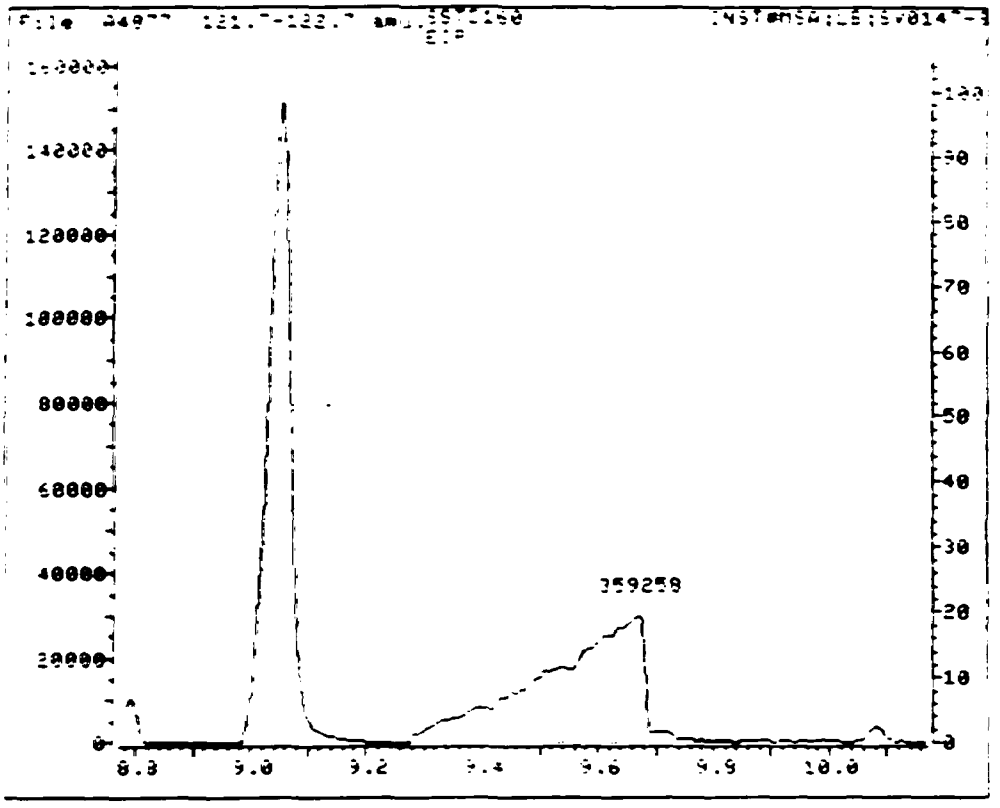
Data File: >A4880::A3 Quant Output File: ^A4880::D3
Name: SSTD120 Instrument ID: MSA
Misc: INST#MSA;LB;SV0146-94 BTL#
Quant Time: 940531 18:06 Quant ID File: I_ACLP::QT
Injected at: 940531 17:33 Last Calibration: 940523 14:49

Compound No: 54
Compound Name: 4-Nitroaniline
Scan Number: 1573
Retention Time: 15.65 min.
Quant Ion: 138.0
Area: 378507M
Concentration: 56.75 UG/ML
q-value: 66

This report was produced by QAREA on: 940601 08:24

0000047

LB 060194



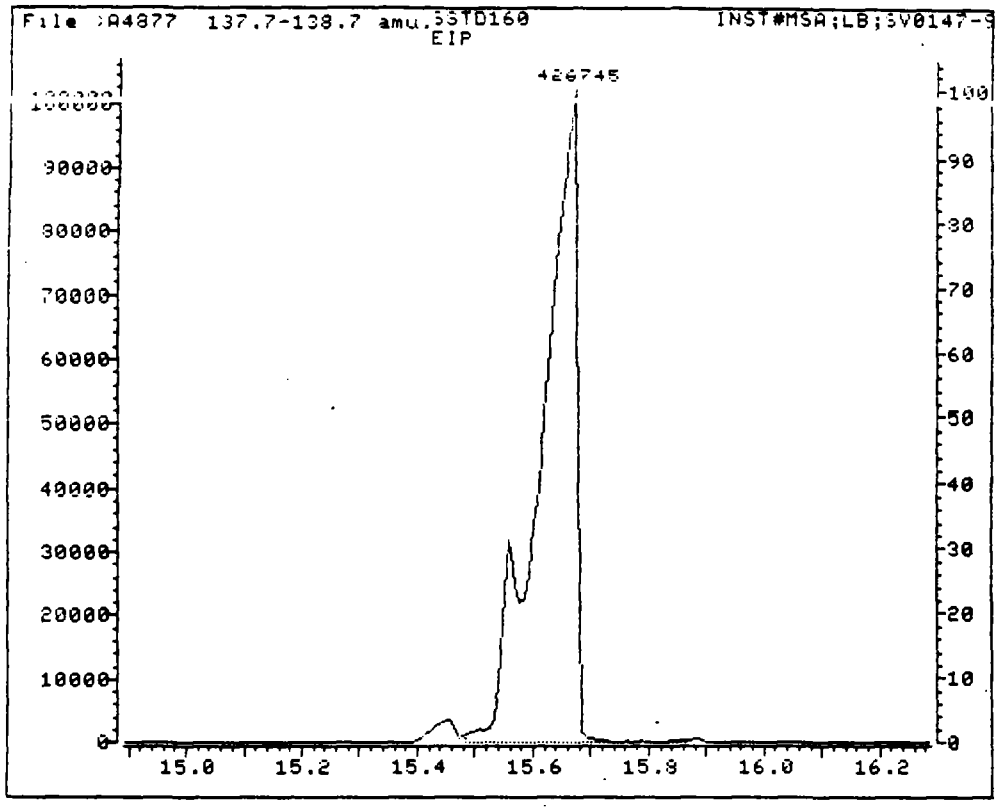
Data File: A4877::A3
Name: SSTD160
Misc: INST#MSA:LB:SV0147-94
Quant Time: 940531 16:27
Injected at: 940531 15:35

Quant Output File: ^A4877::D3
Instrument ID: MSA
BTL# 2
Quant ID File: I_ACLP::QT
Last Calibration: 940523 14:49

Compound No: 25
Compound Name: Benzoic Acid
Scan Number: 863
Retention Time: 9.67 min
Quant Ion: 122.0
Area: 359258M
Concentration: 121.31 UG/ML
q-value: 82

This report was produced by QAREA on: 940601 08:26

0000048



Data File: >A4877::A3 Quant Output File: ^A4877::D3
Name: SSTD160 Instrument ID: MSA
Misc: INST#MSA;LB;SV0147-94 BTL# 2
Quant Time: 940531 16:27 Quant ID File: I_ACLP::QT
Injected at: 940531 15:35 Last Calibration: 940523 14:49

Compound No: 54
Compound Name: 4-Nitroaniline
Scan Number: 1575
Retention Time: 15.67 min.
Quant Ion: 138.0
Area: 426745M
Concentration: 74.47 UG/ML
q-value: 63

This report was produced by QAREA on: 940601 08:28

0000049

UB060194

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Instrument ID: MSA Calibration date: 06/01/94 Time: 1346

Lab File ID: A4894 Init. Calib. Date(s): 05/31/94 05/31/94

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		$\overline{RRF}$	RRF50	%D	
Pyridine		1.135	1.104	2.7	
Phenol	*	1.760	1.747	0.7	*
1,4-Dichlorobenzene	*	1.417	1.476	-4.2	*
2-Methylphenol		1.213	1.179	2.8	
4-Methylphenol		1.257	1.232	2.0	
N-Nitroso-Di-n-Propylamine	#	0.907	0.839	7.5	#
Hexachloroethane		0.603	0.648	-7.5	
Nitrobenzene		0.347	0.356	-2.6	
2-Nitrophenol	*	0.277	0.278	-0.4	*
2,4-Dichlorophenol	*	0.299	0.307	-2.7	*
Hexachlorobutadiene	*	0.135	0.144	-6.7	*
4-Chloro-3-Methylphenol	*	0.303	0.285	5.9	*
Hexachlorocyclopentadiene	#	0.341	0.389	-14.1	#
2,4,6-Trichlorophenol	*	0.359	0.378	-5.3	*
2,4,5-Trichlorophenol		0.447	0.448	-0.2	
Acenaphthene	*	1.223	1.234	-0.9	*
2,4-Dinitrophenol	#	0.282	0.228	19.2	#
4-Nitrophenol	#	0.287	0.123	57.1	#
2,4-Dinitrotoluene		0.523	0.465	11.1	
N-Nitrosodiphenylamine (1)	*	0.542	0.585	-7.9	*
Hexachlorobenzene		0.237	0.260	-9.7	
Pentachlorophenol	*	0.147	0.134	8.8	*
Fluoranthene	*	1.240	1.214	2.1	*
Di-n-Octyl Phthalate	*	3.894	3.946	-1.3	*
Benzo(a)Pyrene	*	1.900	1.930	-1.6	*
Nitrobenzene-d5		0.354	0.363	-2.5	
2-Fluorobiphenyl		1.203	1.280	-6.4	
Terphenyl-d14		1.051	1.030	2.0	
Phenol-d5		1.536	1.564	-1.8	
2-Fluorophenol		1.141	1.206	-5.7	
2,4,6-Tribromophenol		0.206	0.197	4.4	

0000050

Operator ID: MSA Quant Rev: 7 Quant Time: 940601 15:25
Output File: ^A4894::D1 Injected at: 940601 13:46
Data File: >A4894::A2 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000051

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.63	152.0	104402	20.00	UG/ML	92
3)	Pyridine	2.47	79.0	144126	25.17	UG/ML	99
4)	2-Fluorophenol	4.20	112.0	157383	26.11	UG/ML	81
5)	ANILINE	5.97	93.0	274770	24.71	UG/ML	74
6)	Phenol-d5	6.01	99.0	204132	25.22	UG/ML	55
7)	Phenol	6.05	94.0	228034	24.98	UG/ML	63
8)	bis(-2-Chloroethyl)Ether	6.16	93.0	186609	24.92	UG/ML	79
9)	2-Chlorophenol	6.21	128.0	184535	24.91	UG/ML	86
10)	1,3-Dichlorobenzene	6.50	146.0	192872	25.14	UG/ML	94
11)	1,4-Dichlorobenzene	6.67	146.0	192635	25.37	UG/ML	93
12)	Benzyl Alcohol	7.01	108.0	114982	26.46	UG/ML	69
13)	1,2-Dichlorobenzene	6.98	146.0	185535	24.73	UG/ML	96
14)	2-Methylphenol	7.32	108.0	153808	23.75	UG/ML	92
15)	bis(2-chloro2propyl)Ether	7.39	45.0	40702	25.80	UG/ML	63
16)	4-Methylphenol	7.70	108.0	160828	23.49	UG/ML	61
17)	N-Nitrosodi-n-Propylamine	7.63	70.0	109444	23.00	UG/ML	95
18)	Hexachloroethane	7.72	117.0	84511	25.33	UG/ML	98
19)	*d8-Naphthalene	9.55	136.0	378554	20.00	UG/ML	96
20)	Nitrobenzene-d5	7.88	82.0	171577	25.80	UG/ML	73
21)	Nitrobenzene	7.92	77.0	168404	25.83	UG/ML	81
22)	Isophorone	8.53	82.0	319141	24.44	UG/ML	87
23)	2-Nitrophenol	8.67	139.0	131682	25.59	UG/ML	66
24)	2,4-Dimethylphenol	8.94	107.0	140721	25.96	UG/ML	90
25)	Benzoic Acid	9.39	122.0	95039	31.57	UG/ML	86
26)	bis(2-Chloroethoxy)Methane	9.14	93.0	223887	25.44	UG/ML	82
27)	2,4-Dichlorophenol	9.30	162.0	145144	25.37	UG/ML	93
28)	1,2,4-Trichlorobenzene	9.45	180.0	151712	26.17	UG/ML	98
29)	Naphthalene	9.61	128.0	477711	24.97	UG/ML	97
30)	4-Chloroaniline	9.82	127.0	219767	24.03	UG/ML	81
31)	Hexachlorobutadiene	9.98	225.0	68132	25.96	UG/ML	99
32)	4-Chloro-3-Methylphenol	11.17	107.0	135086	23.83	UG/ML	73
33)	2-Methylnaphthalene	11.34	141.1	244778	23.66	UG/ML	93
34)	*d10-Acenaphthene	13.94	164.0	191154	20.00	UG/ML	97
35)	Hexachlorocyclopentadiene	11.76	237.0	92834	27.51	UG/ML	99
36)	2,4,6-Trichlorophenol	12.11	196.0	90423	25.85	UG/ML	96
37)	2,4,5-Trichlorophenol	12.20	196.0	107015	25.17	UG/ML	90
38)	2-Chloronaphthalene	12.54	162.0	298378	24.95	UG/ML	95
39)	2-Fluorobiphenyl	12.33	172.0	305833	25.71	UG/ML	96
40)	2-Nitroaniline	12.88	65.0	85587	24.73	UG/ML	89
41)	Dimethyl Phthalate	13.45	163.0	333358	23.39	UG/ML	95

Operator ID: MSA Quant Rev: 7 Quant Time: 940601 15:25
Output File: ^A4894::D1 Injected at: 940601 13:46
Data File: >A4894::A2 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST$MSA;LB;SV0143-94 BTL$ 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000052

	Compound	R.T.	Q ion	Area	Conc	Units	q
42)	AZOBENZENE	15.82	76.9	360050	22.73	UG/ML	74
43)	Acenaphthylene	13.56	152.0	476003	24.56	UG/ML	96
44)	2,6-Dinitrotoluene	13.55	165.0	87260	23.43	UG/ML	76
45)	3-Nitroaniline	13.94	138.0	107496	22.75	UG/ML	73
46)	Acenaphthene	14.01	153.0	294740	24.10	UG/ML	97
47)	2,4-Dinitrophenol	14.20	184.0	54371	23.13	UG/ML	72
48)	4-Nitrophenol	14.55	65.0	59648	23.12	UG/ML	84
49)	Dibenzofuran	14.47	168.0	398603	24.12	UG/ML	90
50)	2,4-Dinitrotoluene	14.54	165.0	111202	21.57	UG/ML	66
51)	Diethylphthalate	15.28	149.0	312686	22.36	UG/ML	94
52)	4Chlorophenyl-phenylether	15.43	204.0	140141	23.06	UG/ML	75
53)	Fluorene	15.33	166.0	309053	23.00	UG/ML	97
54)	4-Nitroaniline	15.49	138.0	108712	20.43	UG/ML	64
55)	2,4,6-Tribromophenol	15.94	329.9	46993	22.85	UG/ML	81
56)	*d10-Phenanthrene	17.68	188.0	274060	20.00	UG/ML	99
57)	4,6-Dinitro-2-Methylphenol	15.55	198.0	69393	25.11	UG/ML	74
58)	N-Nitrosodiphenylamine	15.75	169.0	200312	26.40	UG/ML	94
59)	4-Bromophenyl-phenylether	16.64	248.0	78372	27.23	UG/ML	99
60)	Hexachlorobenzene	16.70	283.7	89185	26.41	UG/ML	97
61)	Pentachlorophenol	17.25	266.0	45957	27.05	UG/ML	98
62)	Phenanthrene	17.73	178.0	430342	25.89	UG/ML	98
63)	Anthracene	17.87	178.0	434439	25.84	UG/ML	98
64)	Carbazole	18.35	167.0	420986	24.64	UG/ML	90
65)	Di-n-Butylphthalate	19.45	149.0	557437	23.49	UG/ML	98
66)	Fluoranthene	20.75	202.0	416051	23.62	UG/ML	98
67)	BENZIDINE	21.21	184.0	156511	22.27	UG/ML	100
68)	*d12-Chrysene	24.40	240.0	205157	20.00	UG/ML	100
69)	Pyrene	21.30	202.0	438205	25.94	UG/ML	99
70)	Terphenyl-d14	21.85	244.0	264203	25.38	UG/ML	99
71)	Butylbenzylphthalate	23.22	149.0	232345	25.04	UG/ML	86
72)	3,3'-Dichlorobenzidine	24.42	252.0	130807	24.37	UG/ML	86
73)	Benzo(a)Anthracene	24.38	228.0	337299	23.87	UG/ML	97
74)	Chrysene	24.46	228.0	305170	24.22	UG/ML	98
75)	bis(2-Ethylhexyl)Phthalate	24.78	149.0	333354	24.58	UG/ML	83
76)	*d12-Perylene	27.73	264.0	111363	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.34	149.0	549271	24.78	UG/ML	100
78)	Benzo(b)Fluoranthene	26.92	252.0	289173	24.52	UG/ML	98
79)	Benzo(k)Fluoranthene	26.99	252.0	291435	25.31	UG/ML	98
80)	Benzo(a)Pyrene	27.62	252.0	268591	25.13	UG/ML	95
81)	Indeno(1,2,3-cd)Pyrene	29.87	276.2	240609	24.99	UG/ML	92
82)	Dibenz(a,h)Anthracene	29.93	278.0	239736	24.92	UG/ML	98

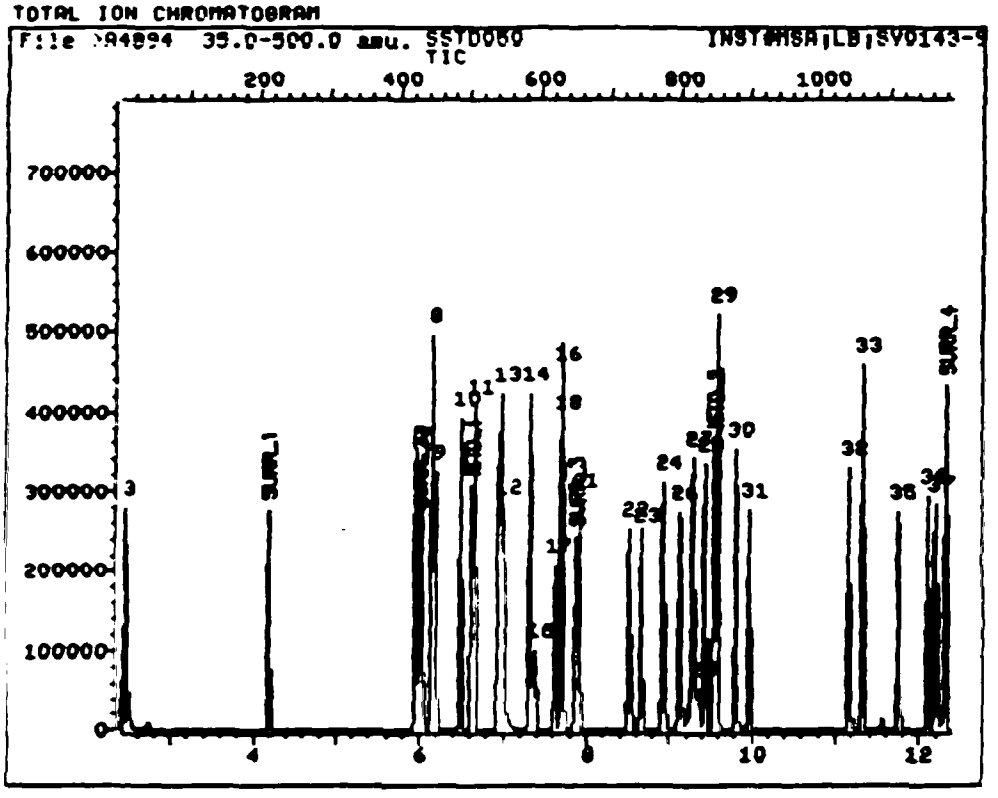
Operator ID: MSA Quant Rev: 7 Quant Time: 940601 15:25
Output File: ^A4894::D1 Injected at: 940601 13:46
Data File: >A4894::A2 Dilution Factor: 1.00000
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000053

	Compound	R.T.	Q ion	Area	Conc	Units	q
83)	Benzo(g,h,i)Perylene	30.42	276.0	245144	25.37	UG/ML	100

* Compound is ISTD



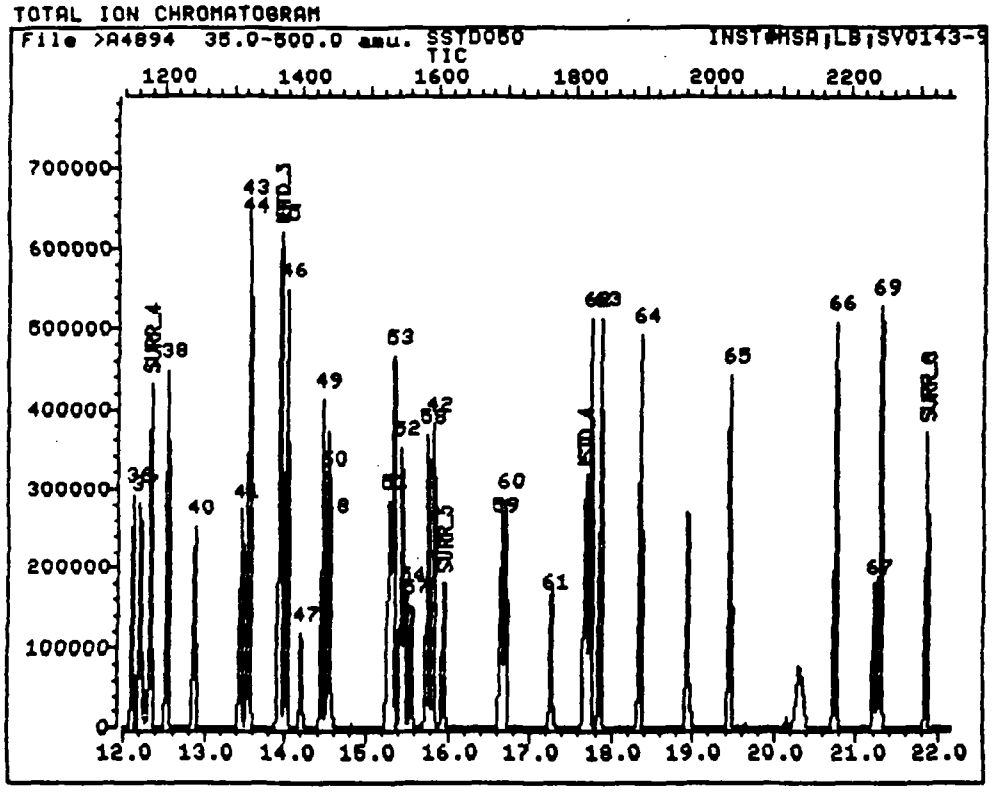
0000054

Data File: >A4894::A2 Quant Output File: ^A4894::D1
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSA
Quant Time : 940601 15:25
Injected at: 940601 13:46

TOTAL ION CHROMATOGRAM



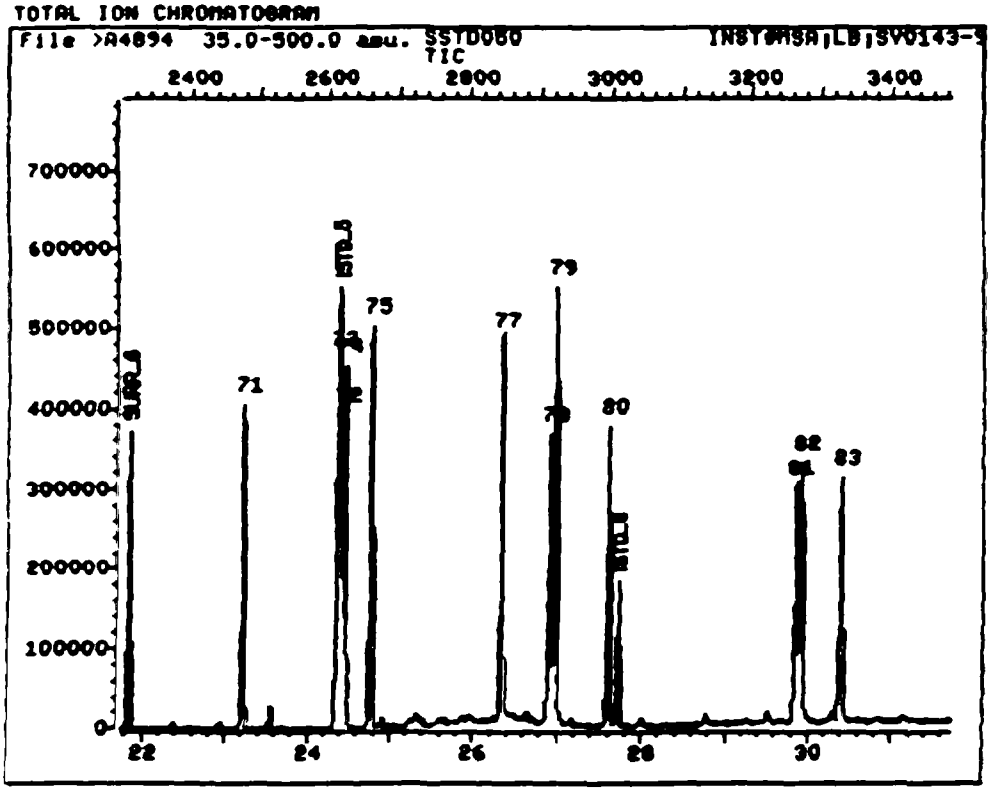
0000055

Data File: >A4894::A2 Quant Output File: ^A4894::D1
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSA
Quant Time : 940601 15:25
Injected at: 940601 13:46

TOTAL ION CHROMATOGRAM



Data File: >A4894::A2 Quant Output File: ^A4894::D1
Name: SSTD050 Instrument ID: MSA
Misc: INST#MSA;LB;SV0143-94 BTL# 1

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSA
Quant Time : 940601 15:25
Injected at: 940601 13:46

0000056

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Lab File ID (Standard): A4894 Date Analyzed: 06/01/94

Instrument ID: MSA Time Analyzed: 1346

		IS1(DCB) AREA #	RT	IS2(NPT) AREA #	RT	IS3(ANT) AREA #	RT
	12 HOUR STD	104402	6.63	378554	9.56	191154	13.94
	UPPER LIMIT	208804		757108		382308	
	LOWER LIMIT	52201		189277		95577	
	EPA SAMPLE NO.						
01	CD-S78E18N23	93457	6.70	351797	9.63	182259	14.01
02	CD-S81E5N23	91844	6.70	350796	9.63	170159	14.01
03	SEXTBLK01	88177	6.70	336383	9.63	171553	14.02

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

0000057

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Lab File ID (Standard): A4894 Date Analyzed: 06/01/94

Instrument ID: MSA Time Analyzed: 1346

		IS4(PHN) AREA #	RT	IS5(CRY) AREA #	RT	IS6(PRY) AREA #	RT
	12 HOUR STD	274060	17.68	205157	24.40	111363	27.74
	UPPER LIMIT	548120		410314		222726	
	LOWER LIMIT	137030		102578		55682	
	EPA SAMPLE NO.						
01	CD-S78E18N23	260132	17.76	191177	24.49	111242	27.85
02	CD-S81E5N23	254472	17.76	187454	24.48	112348	27.84
03	SEXTBLK01	253621	17.77	187155	24.49	109188	27.85

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

000058

RAW QC

GC/MS PERFORMANCE STANDARD
2.0 SOW, 8270 and 625
Decafluorotriphenylphosphine (DFTPP)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	39.91	39.91	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	61.46	61.46	Ok
70	Less than 2% of mass 69	0.00	0.00	Ok
127	40-60% of mass 198	48.23	48.23	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	6.50	6.50	Ok
275	10-30% of mass 198	17.55	17.55	Ok
365	Greater than 1% of mass 198	1.13	1.13	Ok
441	0-100% of mass 443	10.36	84.74	Ok
442	Greater than 40% of mass 198	62.79	62.79	Ok
443	17-23% of mass 442	12.23	19.48	Ok

Injection Date: 05/31/94
Injection Time: 14:40
Data File: >AA614
Scan: 164

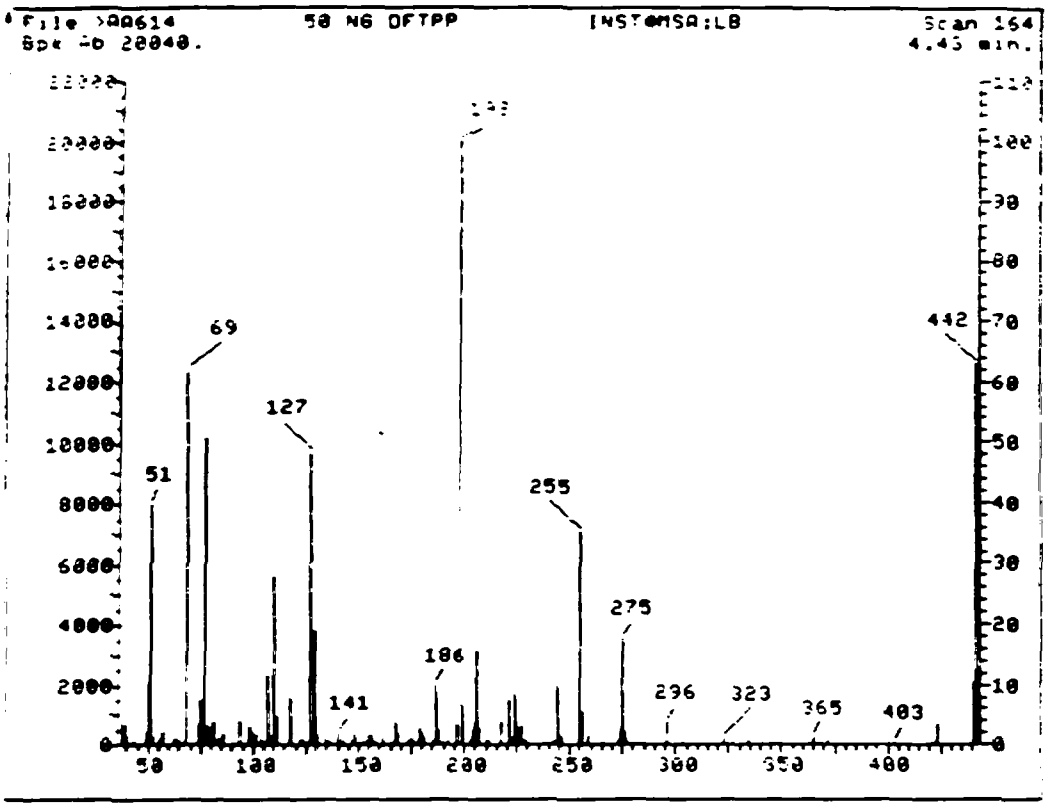
0000059

MS data file header from : >AA614::A3

Sample: 50 NG DFTPP Operator: MSA MS 5/31/94
Misc : INST#MSA:LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MS
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. :

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

RAA614/R——



00000060

MS data file header from : >AA614::A3

Sample: 50 NG DFTPP Operator: MSA MS 5/31/94 14:40
Misc : INST#MSA:LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MSA
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

>AA614 50 NG DFTPP INST#MSA:LB
164 NRM

File: >AA614 Scan #: 164 Retn. time: 4.43

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.05	.364	83.90	1.118	127.00	48.233	175.00	1.243	233.95	.195
37.45	.304	85.15	.584	128.00	3.528	175.75	.439	241.80	.529
38.95	3.378	85.90	1.796	129.00	19.137	177.00	.579	242.95	.499
39.95	1.472	91.00	.504	130.00	1.662	179.00	2.655	243.95	10.020
41.05	.419	93.00	4.122	130.75	.374	180.00	1.627	244.95	1.417
42.80	.225	93.90	.369	132.40	.130	181.00	1.018	245.95	1.098
43.80	.609	94.25	.394	135.00	1.203	185.15	.883	246.95	.095
46.30	.185	94.65	.354	136.00	.314	186.00	10.030	254.95	35.165
47.20	.245	97.15	.369	136.75	.409	187.00	2.445	255.95	5.434
48.95	2.181	98.00	3.029	138.75	.060	188.90	.469	257.95	1.392
49.95	10.254	98.90	2.270	140.90	2.006	190.00	.110	265.05	.299
50.95	39.905	100.00	.394	142.00	.888	192.00	.838	272.95	.798
51.95	1.472	100.90	1.811	145.90	.245	196.15	3.333	274.05	2.580
54.95	.384	101.90	.105	147.00	.908	198.00	100.000	274.95	17.555
55.95	1.123	103.15	.549	148.00	1.881	199.00	6.502	275.95	2.011
56.95	2.246	104.00	1.173	150.90	.274	200.00	.235	277.05	.883
59.20	.225	105.00	.464	151.15	.254	203.00	.624	296.05	3.752
62.95	1.218	107.00	11.587	152.75	.549	204.15	2.410	303.05	.464
64.05	.329	108.00	1.282	154.00	.284	205.15	3.658	323.05	1.083
64.30	.299	110.00	27.794	155.00	1.442	206.00	15.664	334.05	.744
65.05	.923	111.00	4.815	156.00	1.602	207.00	2.730	335.05	.170
67.05	.339	111.75	.569	156.65	.374	208.00	.439	352.05	.205
68.95	61.462	112.00	.574	156.90	.404	210.90	.863	364.90	1.133
73.90	3.563	114.40	.115	157.65	.284	211.15	.798	372.00	.669
74.90	7.425	117.00	7.904	157.90	.299	216.95	4.182	402.90	.379
76.00	2.730	118.00	.459	161.15	.953	220.95	7.395	422.00	.404
77.00	50.678	121.40	.120	165.00	.544	222.95	.958	423.00	3.468
77.90	3.084	122.00	.609	167.00	3.747	223.95	8.443	424.15	.220
78.90	2.630	122.90	1.073	168.00	1.737	224.95	2.665	441.00	10.364
80.00	2.290	124.00	.534	169.25	.220	225.95	.264	442.00	62.794
81.00	3.802	125.00	.469	173.00	.579	226.95	3.059	443.00	12.231
82.00	.813	125.65	.195	174.00	.898	228.95	.863	443.90	.644
83.00	.783								

MS data file header from : >AA614::A3

Sample: 50 NG DFTPP Operator: MSA MS 5/31/94 14:40
Misc : INST#MSA:LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MSA
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

0000061

GC/MS PERFORMANCE STANDARD
2/88 SOW, 8270 and 625
Decafluorotriphenylphospine (DFTPP)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
51	30-60% of mass 198	36.65	36.65	Ok
68	Less than 2% of mass 69	0.00	0.00	Ok
69	(reference only)	58.63	58.63	Ok
70	Less than 2% of mass 69	.87	1.48	Ok
127	40-60% of mass 198	46.17	46.17	Ok
197	Less than 1% of mass 198	0.00	0.00	Ok
198	Base peak, 100% relative abundance	100.00	100.00	Ok
199	5-9% of mass 198	5.92	5.92	Ok
275	10-30% of mass 198	15.46	15.46	Ok
365	Greater than 1% of mass 198	1.33	1.33	Ok
441	0-100% of mass 443	8.72	82.64	Ok
442	Greater than 40% of mass 198	58.67	58.67	Ok
443	17-23% of mass 442	10.55	17.98	Ok

MS 6-10-94 2000062

Injection Date: 06/01/94
Injection Time: 13:31
Data File: >AA615
Scan: 154

MS data file header from : >AA615::A2

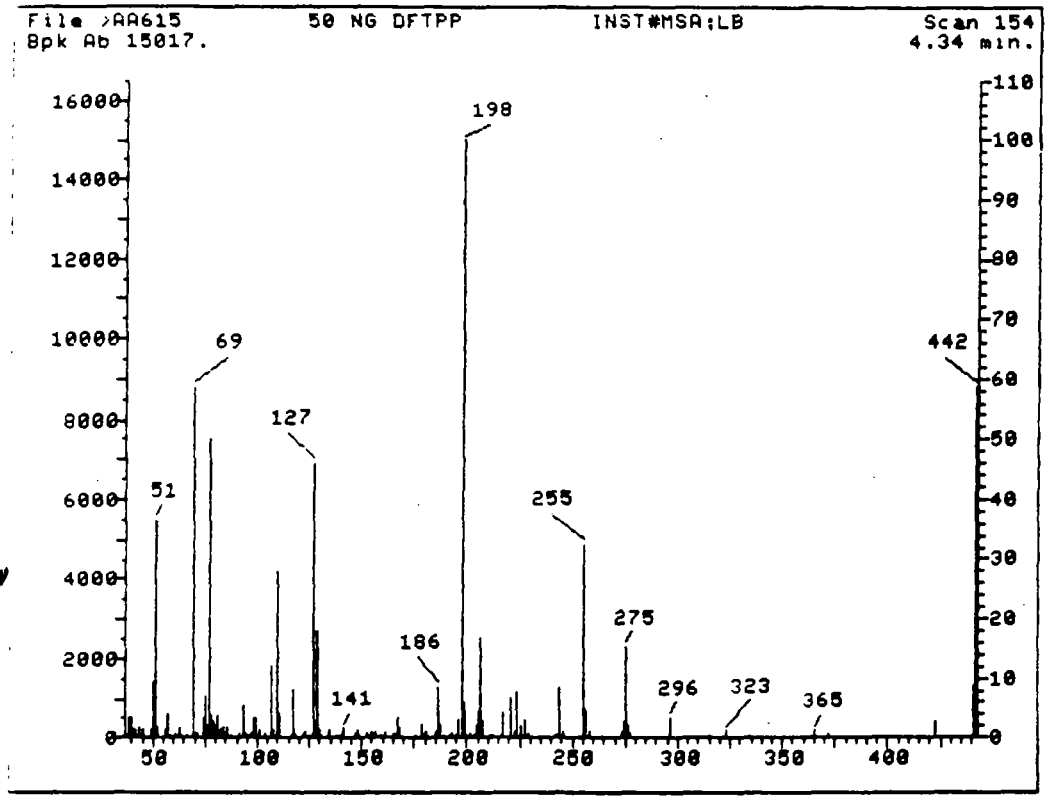
Sample: 50 NG DFTPP Operator: MSA - MS 6/01/94 13:31
Misc : INST#MSA;LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MSA
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

2000062

RAA615 / RA4894

IS ~~[illegible]~~ within
-50% → 100% of SSD050 from Cal



00000063

MS data file header from : >AA615::A2

Sample: 50 NG DFTPP Operator: MSA MS 6/01/94 13:31
Misc : INST#MSA;LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MSA
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

00000063

>AA615 50 NG DFTPP INST#MSA;LB
154 NRM

File: >AA615 Scan #: 154 Retn. time: 4.34

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.05	.266	77.00	50.196	115.90	.579	173.15	.213	222.80	1.012
37.80	.519	78.00	3.696	117.00	8.184	175.75	.340	223.95	8.004
39.05	3.310	78.90	2.757	117.90	.719	176.25	.180	224.95	2.078
39.95	3.496	79.90	2.271	122.15	.786	178.15	.406	226.95	2.997
40.95	1.385	80.90	3.689	122.90	1.252	178.90	2.391	227.95	.346
41.95	1.299	81.75	.986	124.90	.446	180.00	.946	228.95	.792
43.05	1.878	82.90	1.425	127.00	46.168	180.90	.566	241.95	.293
43.95	1.552	83.90	1.685	128.00	2.923	185.15	1.252	242.45	.260
45.05	1.412	85.00	.866	129.00	17.973	186.00	8.650	244.05	8.384
48.95	1.498	85.90	1.918	129.90	1.319	187.00	2.231	245.05	1.012
49.95	9.403	87.15	.546	130.90	.333	189.15	.453	254.95	32.616
51.05	36.645	91.00	.879	134.90	1.472	192.00	.493	255.95	4.681
52.05	1.698	91.75	.766	137.90	.306	193.00	.832	257.95	1.099
55.95	1.452	92.90	5.594	140.00	.499	195.00	.400	272.95	1.212
56.95	4.275	94.00	.646	141.00	1.718	196.00	3.130	273.95	2.637
57.95	.333	94.50	.473	147.00	.759	198.00	100.000	275.05	15.456
58.70	.533	95.15	.453	148.00	1.478	199.00	5.920	276.05	2.264
59.55	.213	96.90	.593	149.00	.373	199.90	.313	276.95	.812
61.05	.733	97.90	3.429	153.00	.906	201.50	.646	295.95	3.576
62.95	1.651	99.00	3.350	155.00	1.219	203.15	.400	314.95	.320
64.05	.273	101.00	1.325	156.00	.939	204.15	1.978	323.05	1.312
66.20	.080	102.15	.226	156.90	.533	205.00	4.355	334.05	.400
66.95	.326	103.90	.906	159.75	.513	206.00	17.027	364.90	1.332
68.95	58.634	107.00	12.113	161.00	1.052	207.00	2.624	372.00	.713
70.20	.866	108.00	1.558	165.00	.892	210.90	.559	423.00	2.950
71.15	.693	110.00	28.241	165.90	.466	211.65	.473	441.00	8.717
74.00	3.389	111.00	4.169	167.00	3.589	216.95	4.155	442.00	58.667
74.90	7.179	111.90	.246	167.75	1.885	220.95	6.932	443.00	10.548
75.90	2.191								

MS data file header from : >AA615::A2

Sample: 50 NG DFTPP Operator: MSA MS 6/01/94 13:31
Misc : INST#MSA;LB BTL# 1
Sys. #: 1 MS model: 88 SW/HW rev.: LF ALS # : 1 Equip ID: MSA
Method file: M_AA Tuning file: T_A No. of extra records: 2
Source temp.: 200 Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	200.	300.	0.	0.	0.
Chromatographic times, min. :	2.0	12.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	10.0	0.0	0.0	0.0	0.0

0000064

~~0000000~~
KS 6-10-94

METHOD BLANK

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SBLK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCBLK38543

Sample wt/vol: 250.0 (g/mL) ML Lab File ID: A4881

Level: (low/med) LOW Date Received:

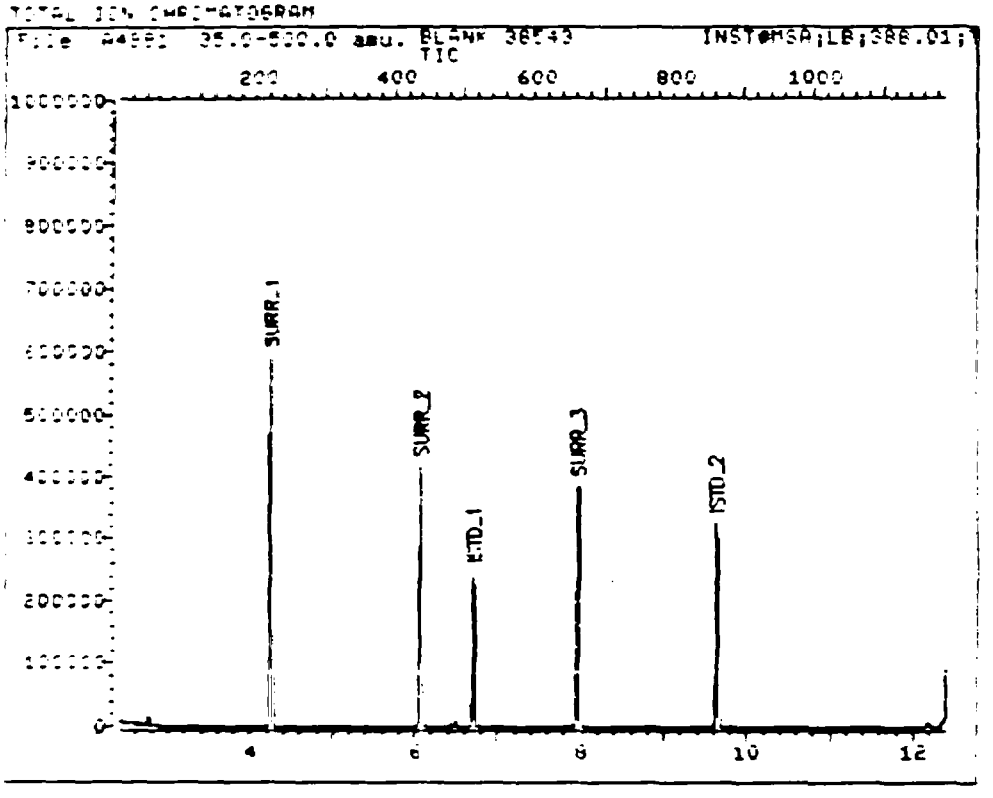
% Moisture: not dec. dec. Date Extracted: 05/31/94

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 05/31/94

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

000065

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	40	U
106-46-7	1,4-Dichlorobenzene	40	U
95-48-7	2-Methylphenol	40	U
106-44-5	4-Methylphenol	40	U
67-72-1	Hexachloroethane	40	U
98-95-3	Nitrobenzene	40	U
87-68-3	Hexachlorobutadiene	40	U
88-06-2	2,4,6-Trichlorophenol	40	U
95-95-4	2,4,5-Trichlorophenol	40	U
121-14-2	2,4-Dinitrotoluene	40	U
118-74-1	Hexachlorobenzene	40	U
87-86-5	Pentachlorophenol	200	U



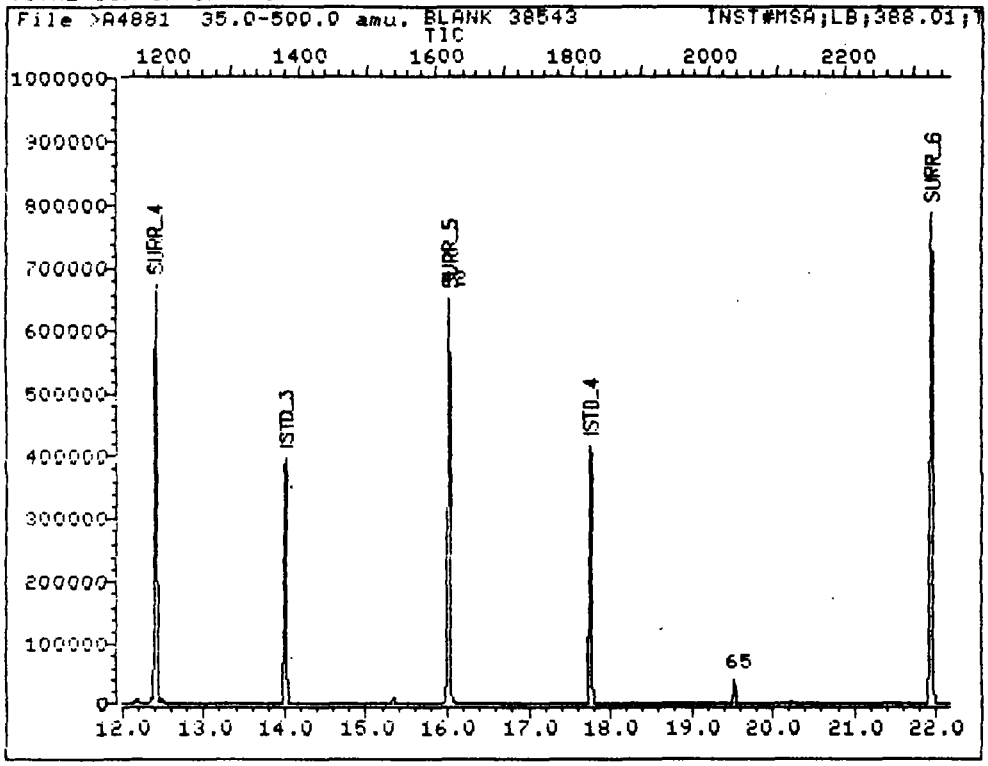
Data File: >A4881::A3 Quant Output File: ^A4881::D3
Name: BLANK 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 6

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:46
Injected at: 940531 18:13

0000086

TOTAL ION CHROMATOGRAM

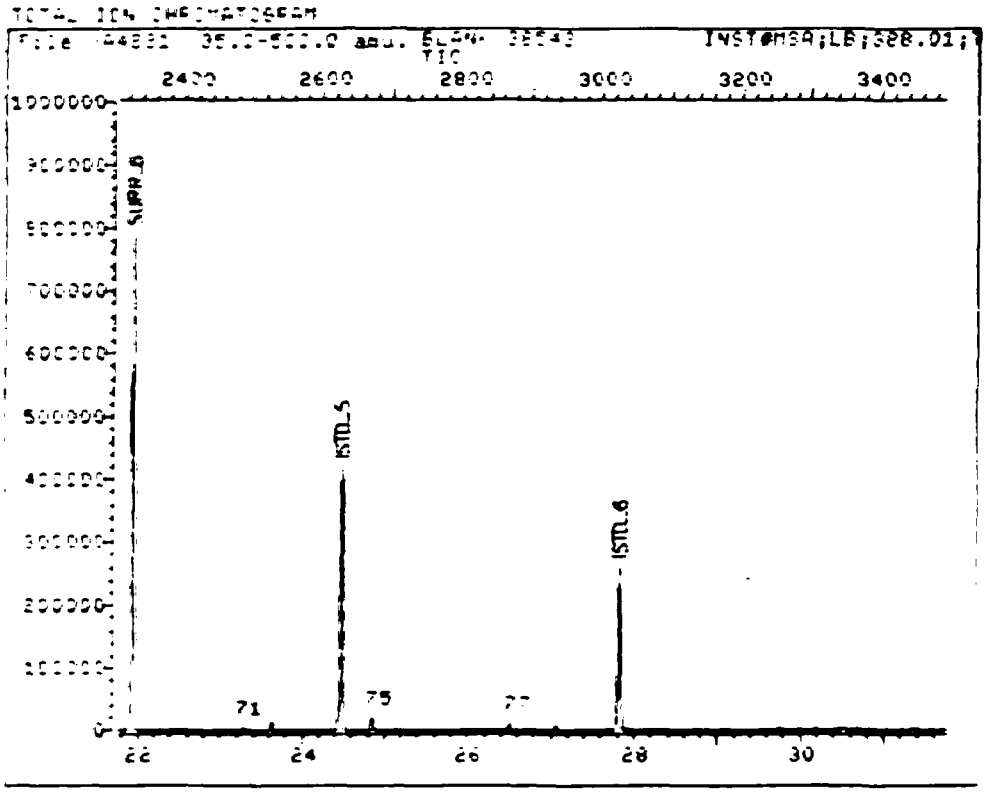


0000067

Data File: >A4881::A3 Quant Output File: ^A4881::D3
Name: BLANK 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 6

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:46
Injected at: 940531 18:13



Data File: >A4881::A3 Quant Output File: ^A4881::D3
Name: BLANK 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 6

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 18:4c
Injected at: 940531 18:13

0000068

QUANT REPORT Page 1

erator ID: MSJ Quant Rev: 7 Quant Time: 940531 18:46
tput File: ^A4881::D3 Injected at: 940531 18:13
ta File: >A4881::A3 Dilution Factor: 4.00000
me: BLANK 38543 Instrument ID: MSA
sc: INST#MSA;LB;388.01;TCLP BTL# 6

File: I_ACLP::QT
tle: SEMIVOLATILE BNA'S 2UL INJECTION
st Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

00000069

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.71	152.0	79617	20.00	UG/ML	90
4)	2-Fluorophenol	4.25	112.0	313862	273.16	UG/ML	81
6)	Phenol-d5	6.07	99.0	296127	191.88	UG/ML	57
9)	*d8-Naphthalene	9.63	136.0	310246	20.00	UG/ML	96
0)	Nitrobenzene-d5	7.97	82.0	269285	197.65	UG/ML	73
4)	*d10-Acenaphthene	14.02	164.0	179794	20.00	UG/ML	92
9)	2-Fluorobiphenyl	12.42	172.0	489478	174.98	UG/ML	96
2)	~~AZOBENZENE~~	~~16.04~~	~~76.9~~	~~413~~	~~.111~~	~~UG/ML~~	~~53~~
5)	2,4,6-Tribromophenol	16.04	329.9	170176	351.91	UG/ML	81
6)	*d10-Phenanthrene	17.76	188.0	315949	20.00	UG/ML	98
5)	Di-n-Butylphthalate	19.53	149.0	52372	7.66	UG/ML	97
8)	*d12-Chrysene	24.48	240.0	282724	20.00	UG/ML	100
0)	Terphenyl-d14	21.95	244.0	585429	163.24	UG/ML	98
1)	Butylbenzylphthalate	23.30	149.0	3467	1.08	UG/ML	68
5)	bis(2-Ethylhexyl)Phthalate	24.85	149.0	16994	3.64	UG/ML	83
)	*d12-Perylene	27.82	264.0	163875	20.00	UG/ML	100
)	Di-n-Octyl Phthalate	26.52	149.0	2295	.281	UG/ML	100

Compound is ISTD

REVIEWED FOR TCLP COMPOUNDS ONLY

J. Orlando 6-2-94

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SEXTBLK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCBLK38267EXT

Sample wt/vol: 250.0 (g/mL) ML Lab File ID: A4905

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 05/31/94

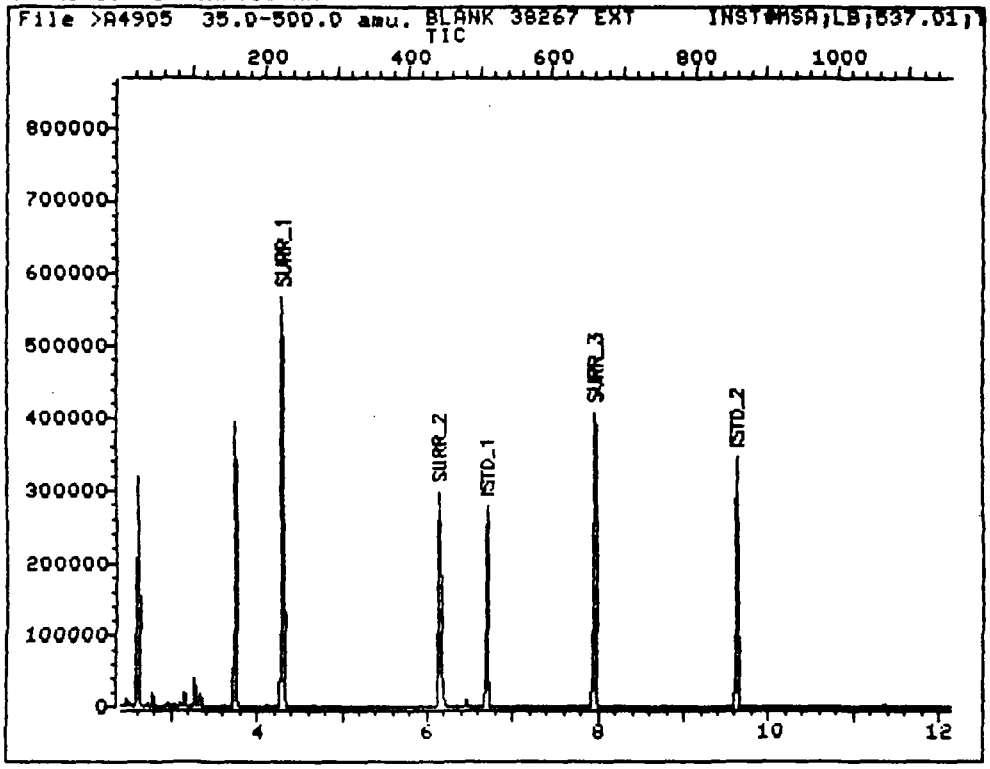
Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 06/01/94

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

0000070

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	40	U
106-46-7	1,4-Dichlorobenzene	40	U
95-48-7	2-Methylphenol	40	U
106-44-5	4-Methylphenol	40	U
67-72-1	Hexachloroethane	40	U
98-95-3	Nitrobenzene	40	U
87-68-3	Hexachlorobutadiene	40	U
88-06-2	2,4,6-Trichlorophenol	40	U
95-95-4	2,4,5-Trichlorophenol	40	U
121-14-2	2,4-Dinitrotoluene	40	U
118-74-1	Hexachlorobenzene	40	U
87-86-5	Pentachlorophenol	200	U

TOTAL ION CHROMATOGRAM



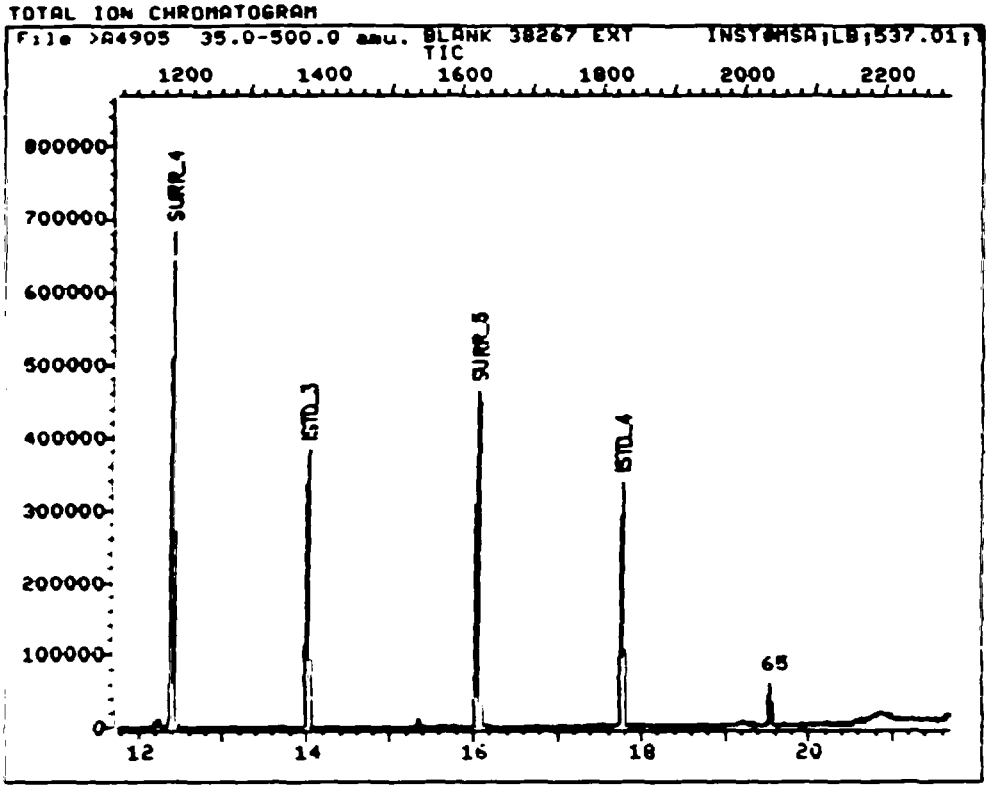
Data File: >A4905::A1 Quant Output File: ^A4905::D3
Name: BLANK 38267 EXT Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#11

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 21:46
Injected at: 940601 21:14

0000071

TOTAL ION CHROMATOGRAM



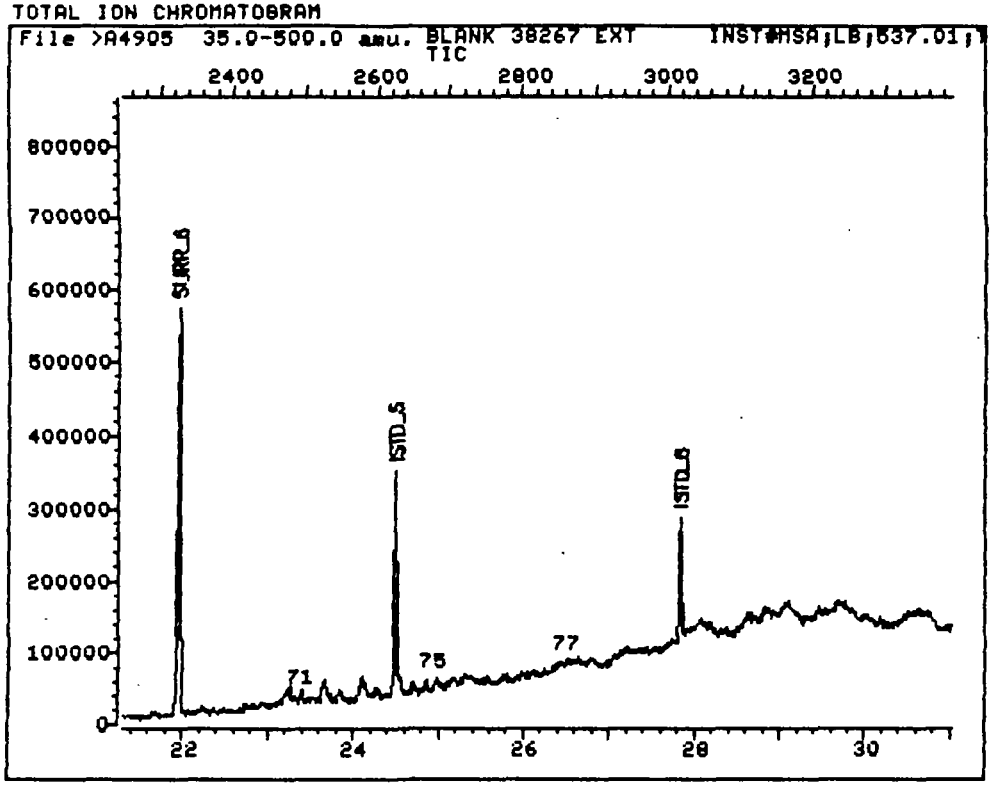
0000072

Data File: >A4905::A1 Quant Output File: ^A4905::D3
Name: BLANK 38267 EXT Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#11

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 21:46
Injected at: 940601 21:14

TOTAL ION CHROMATOGRAM



0000073

Data File: >A4905::A1 Quant Output File: ^A4905::D3
Name: BLANK 38267 EXT Instrument ID: MSA
Misc: INST#MSA;LB;537.01;TCLP BTL#11

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

Operator ID: MSA
Quant Time : 940601 21:46
Injected at: 940601 21:14

QUANT REPORT Page 1

Operator ID: MSA Quant Rev: 7 Quant Time: 940601 21:46
Output File: ^A4905::D3 Injected at: 940601 21:14
Data File: >A4905::A1 Dilution Factor: 4.00000
Name: BLANK 38267 EXT Instrument ID: MSA
Misc: INST$MSA;LB;537.01;TCLP BTL$11

ID File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940601 13:46

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.70	152.0	88177	20.00	UG/ML	92
4)	2-Fluorophenol	4.29	112.0	306580	230.64	UG/ML	85
6)	Phenol-d5	6.14	99.0	261865	151.89	UG/ML	58
19)	*d8-Naphthalene	9.63	136.0	336383	20.00	UG/ML	97
20)	Nitrobenzene-d5	7.96	82.0	287829	188.79	UG/ML	74
34)	*d10-Acenaphthene	14.02	164.0	171553	20.00	UG/ML	94
39)	2-Fluorobiphenyl	12.42	172.0	484034	176.35	UG/ML	98
55)	2,4,6-Tribromophenol	16.05	329.9	131730	312.35	UG/ML	83
56)	*d10-Phenanthrene	17.77	188.0	253621	20.00	UG/ML	98
65)	Di-n-Butylphthalate	19.54	149.0	69665	13.50	UG/ML	98
68)	*d12-Chrysene	24.49	240.0	187155	20.00	UG/ML	100
70)	Terphenyl-d14	21.95	244.0	386447	160.34	UG/ML	98
71)	Butylbenzylphthalate	23.31	149.0	6501	3.07	UG/ML	92
75)	bis(2-Ethylhexyl)Phthalate	24.86	149.0	10780	3.54	UG/ML	76
76)	*d12-Perylene	27.84	264.0	109188	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.43	149.0	5976	1.11	UG/ML	100

* Compound is ISTD

4000074

REVIEWED FOR TCLP
COMPOUNDS ONLY

6-2-94

SPIKES

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SSPK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCSPK38543

Sample wt/vol: 250.0 (g/mL) ML Lab File ID: A4882

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 05/31/94

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 05/31/94

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	140	
106-46-7	1,4-Dichlorobenzene	230	
95-48-7	2-Methylphenol	220	
106-44-5	4-Methylphenol	350	E
67-72-1	Hexachloroethane	200	
98-95-3	Nitrobenzene	250	
87-68-3	Hexachlorobutadiene	240	
88-06-2	2,4,6-Trichlorophenol	250	
95-95-4	2,4,5-Trichlorophenol	240	
121-14-2	2,4-Dinitrotoluene	55	
118-74-1	Hexachlorobenzene	59	
87-86-5	Pentachlorophenol	300	

0000075

9B-LCS
BNA WATER LCS RECOVERY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: S17905 SAS No.: SDG No.: CD-S156

EPA Sample No.: SSPK01 Level:(low/med) LOW

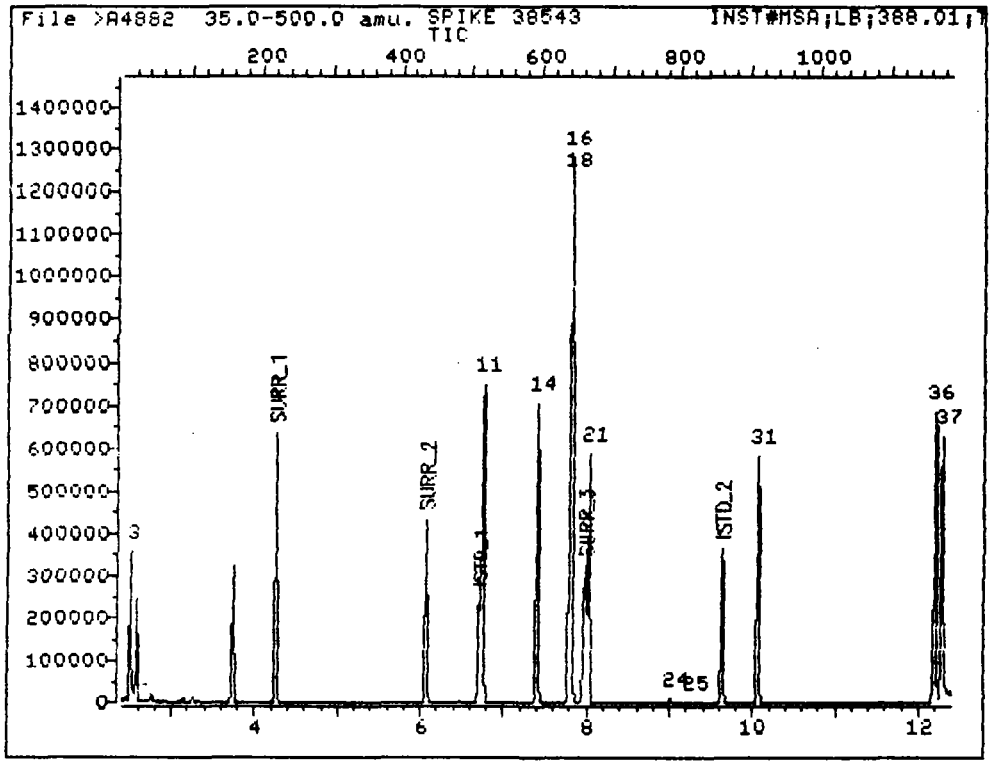
COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
Pyridine	250	140	54	15- 90
1,4-Dichlorobenzene	250	230	92	19-121
2-Methylphenol	250	220	90	48-108
4-Methylphenol (1)	500	350	71	36- 95
Hexachloroethane	250	200	82	40-113
Nitrobenzene	250	250	100	35-180
Hexachlorobutadiene	250	240	95	24-116
2,4,6-Trichlorophenol	250	250	101	37-144
2,4,5-Trichlorophenol	250	240	95	51-106
2,4-Dinitrotoluene	65	55	84	33-132
Hexachlorobenzene	65	59	91	1-152
Pentachlorophenol	250	300	121	14-176

0000076

Column to be used to flag recovery values with an asterisk.
* Values outside of QC limits.
D Detected.
NG: Not Given. Determined by QC Charting Procedures.

(1) 4-Methylphenol and 3-Methylphenol co-elute; spike added is the total of equal concentrations of each.

TOTAL ION CHROMATOGRAM

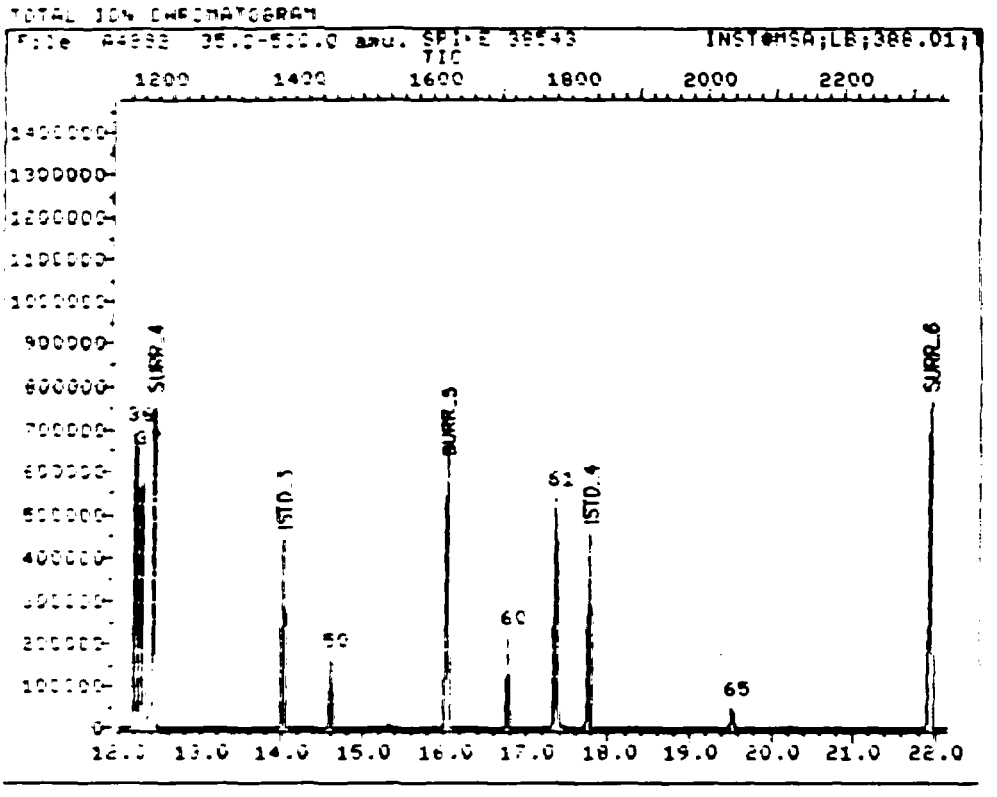


0000077

Data File: >A4882::A3 Quant Output File: ^A4882::D3
Name: SPIKE 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 7

Id File: I_ACLP::QT
Title: SEMIVOLATILE BNA'S 2UL INJECTION
Last Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

Operator ID: MSJ
Quant Time : 940531 19:25
Injected at: 940531 18:52



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Data File: >A4882::A3 Quant Output File: ^A4882::D3
Name: SPIKE 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 7

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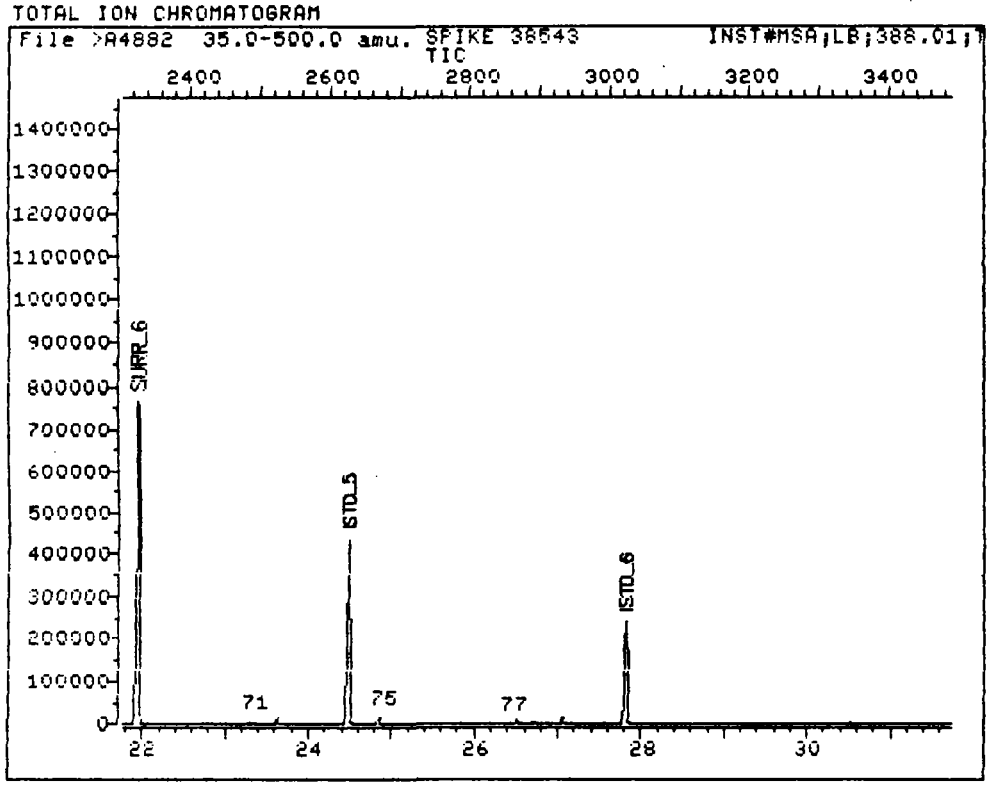

0000079

Data File: >A4882::A3 Quant Output File: ^A4882::D3
Name: SPIKE 38543 Instrument ID: MSA
Misc: INST#MSA;LB;388.01;TCLP BTL# 7

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Operator ID: MSJ
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Injected at: 940531 18:52

QUANT REPORT Page 1

perator ID: MSJ Quant Rev: 7 Quant Time: 940531 19:25
utput File: ^A4882::D3 Injected at: 940531 18:52
ata File: >A4882::A3 Dilution Factor: 4.00000
ame: SPIKE 38543 Instrument ID: MSA
isc: INST$MSA;LB;388.01;TCLP BTL$ 7

D File: I_ACLP::QT
itle: SEMIVOLATILE BNA'S 2UL INJECTION
ast Calibration: 940523 14:49 Last Qcal Time: 940531 14:56

0000080

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*d4-1,4-Dichlorobenzene	6.72	152.0	89676	20.00	UG/ML	91
3)	Pyridine	2.51	79.0	167820	136.48	UG/ML	92
4)	2-Fluorophenol	4.26	112.0	339631	262.43	UG/ML	81
6)	Phenol-d5	6.07	99.0	327665	188.50	UG/ML	55
11)	1,4-Dichlorobenzene	6.76	146.0	374880	229.93	UG/ML	94
14)	2-Methylphenol	7.41	108.0	311246	223.82	UG/ML	88
16)	4-Methylphenol	7.81	108.0	521487	354.64	UG/ML	79
18)	Hexachloroethane	7.82	117.0	146105	203.90	UG/ML	99
19)	*d8-Naphthalene	9.64	136.0	345336	20.00	UG/ML	97
20)	Nitrobenzene-d5	7.98	82.0	287914	189.85	UG/ML	71
21)	Nitrobenzene	8.03	77.0	371212	249.67	UG/ML	81
24)	2,4-Dimethylphenol	9.01	107.0	7513	6.08	UG/ML	87
25)	Benzoic Acid	9.27	122.0	1048	1.53	UG/ML	94
31)	Hexachlorobutadiene	10.07	225.0	142570	238.22	UG/ML	98
34)	*d10-Acenaphthene	14.02	164.0	194109	20.00	UG/ML	95
5)	2,4,6-Trichlorophenol	12.20	196.0	223813	252.03	UG/ML	98
7)	2,4,5-Trichlorophenol	12.28	196.0	255676	236.84	UG/ML	92
9)	2-Fluorobiphenyl	12.43	172.0	534930	177.12	UG/ML	98
1)	2,4-Dinitrotoluene	14.61	165.0	71472	54.62	UG/ML	58
3)	2,4,6-Tribromophenol	16.03	329.9	181371	347.40	UG/ML	82
5)	*d10-Phenanthrene	17.77	188.0	345027	20.00	UG/ML	98
60)	Hexachlorobenzene	16.78	283.7	63078	59.34	UG/ML	98
61)	Pentachlorophenol	17.35	266.0	161439	301.94	UG/ML	99
65)	Di-n-Butylphthalate	19.53	149.0	60532	8.10	UG/ML	98
68)	*d12-Chrysene	24.48	240.0	295200	20.00	UG/ML	100
70)	Terphenyl-d14	21.95	244.0	587807	156.98	UG/ML	97
71)	Butylbenzylphthalate	23.30	149.0	4608	1.38	UG/ML	75
75)	bis(2-Ethylhexyl)Phthalate	24.85	149.0	13655	2.80	UG/ML	76
76)	*d12-Perylene	27.82	264.0	170308	20.00	UG/ML	100
77)	Di-n-Octyl Phthalate	26.42	149.0	2900	.342	UG/ML	100

* Compound is ISTD

REVIEWED FOR TCLP
COMPOUNDS ONLY

J. Orlando 6-7-94

CHAIN OF CUSTODY
SAMPLE LOG-IN/RECEIPT RECORDS
PREP/EXTRACTION/BENCH SHEETS
INSTRUMENT RUN LOGS

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Comments / Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Date:								
1	FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1	PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
1	PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79594:100)
1	PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1	S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D		(79594:100)
1	TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
2 AN - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79590:100 79591:100)
2	VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B		(79592:100 79593:100)
2	ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B		(79592:100 79593:100)
5179-006	CD-S89E16N-2-3	Soil	22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-007
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
5179-007	CD-S89E16N-3-4	Soil	22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-006
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
5179-008	CD-S78E18N-3-4-9	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-005
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
5179-009	CD-S78E18N-3-4	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-004
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
5179-010	CD-S81E5N-2-3-9	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-003
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
5179-011	CD-S81E5N-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-002
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)

3*=Sample has not been rad screened.

0000081

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
Comments								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1		RAD/ISOTH/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/ISOU/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)

5179-012 CD-SB1E5N-2-3 Soil 22-MAY-94 15:00 24-MAY-94 09:10 14-JUN-94 FED-EX 3 RZ312-001

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	AN - Amber Glass-500ml	BNA/TCLP/Q4	S	COLD	09-JUN-94	01-JUN-94	R19D	(79644:100)
1		EXT/TCLP/Q4	S	COLD	09-JUN-94	05-JUN-94	R19D	(79644:100)
1		HG/TCLP/Q4	S	COLD	09-JUN-94	22-JUN-94	R19D	(79644:100)
1		ICAP/TCLP/Q4	S	COLD	09-JUN-94	21-NOV-94	R19D	(79644:100)
1		RAD/GAMMA/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOTH/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOU/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/SCREEN/Q4	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1	AN - Amber Glass-250ML	CN/9010/Q4	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		FLPT/1010/Q4	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		PAINT/9095/Q4	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
1		PH/9045/Q4	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		PM/IT/Q4	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		S/9030/Q4	S	COLD	09-JUN-94	29-MAY-94	R19D	(79645:100)
1		TOX/9020/Q4	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
2	AN - Amber Glass-120ML	TOC/9060/Q4	S	COLD	09-JUN-94	19-JUN-94	R19D	(79648:100 79651:100)
2		VOA/TCLP/Q4	S	COLD	09-JUN-94	08-JUN-94	109B	(79646:100 79647:100)
2		ZERO/TCLP/Q4	S	COLD	09-JUN-94	05-JUN-94	109B	(79646:100 79647:100)

*=Sample has not been rad screened.

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CLP 3540

Reference Document No. 502240
Page 1 of 2

Project Name/No.[1] LINSAY LIGHT II
Sample Team Members[2] RAULINSON, BERGGREEN
~~Profit Center No.~~[3]
Project Manager[4] BERGGREEN
Purchase Order No.[6] 27313-2H
Required Report Date[11]

Samples Shipment Date[7] 5/23/94
Lab Destination[8] ST LOUIS
Lab Contact[9] John Powell
Project Contact/Phone[12]
Carrier/Waybill No.[13]

Bill to:[5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R G BERGGREEN

Report to:[10] (SAME)

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Preservative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12:40	500ml AMBER	500ml	NONE	✓ SPEC	100	
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500ml AMBER	500ml	NONE	✓ SPEC	100	
CD-S-B2E25N2-3	SS-SOIL	5/22/94 1345	500 ML AMBER	500 ML	None	✓ SPEC	100	
CD-SB2E25N-3-4	SS-SOIL	5/22/94 1405	500ML AMBER	500ML	NONE	✓ SPEC	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ML	None	TCLP Metals & SVOAs	100	
CD S78E 18N 2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500ml	None	✓ SPEC	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions:[23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th Isotope. Also ~~CD-S156E49N~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☒ Archive ☐ (mos.)

Turnaround Time Required:[26]
Normal ☒ Rush ☐

QC Level:[27]
I ☐ II ☐ III ☐ Project Specific (specify):

1. Relinquished by[28] (Signature/Affiliation) Richard Berggreen	Date: 5/23/94 Time: 1045	1. Received by[28] (Signature/Affiliation) Bob Cawood	Date: 05-24-94 Time: 0910
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

0000083

White: To accompany samples Yellow: Field copy *See back of form for special instructions

CCK 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[10] 27313ZM-COC-2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No 27313 ZM

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S7BE1BN-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CD S7BG 1BN-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120 ml	NONE	TCLP VOAs	100	
CD S7EG1BN-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD S89E1GN 2-3	SS SOIL	5/22/94 1430	500 ML AMBER	500ML	NONE	& SPLC	90	
CD SBAE1GN 3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD S7BE1BN-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD S7EC	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD S8IE5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPLC	100	
CD SBIE SN 2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP METALS & SVOA	100	
CD SBIESN 2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD SBIESN-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDSBIE SN-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CD SBIE SN-2-3	SS SOIL	5/22/94 1500	125 ML AMBER	100 ML	NONE	TOC	100	
CDSBIE SN 2 3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-SBIESN-2-3 4	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD SBIE SN-3 4	SS SOIL	5/22/94 1500	500 ML AMBER	400ml	NONE	& SPLC	90 70	

0000084

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: G Powell
DATE: 05-24-94
TIME: 0945
BY: Bob Cawood

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II
Project No: 537.01
Analysis Requested: Refer to RFA/COC

Date: 05-24-94 0910
Initiated by: B Cawood
RFA/COC Numbers: 502210

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

(1)	NA	Not enough sample received for proper analysis. Received approximately: _____	8.	☑	Custody tape disturbed/broken/missing N/A seals
(2)	☐	Sample received broken/leaking.	9.	NA	Sample splits performed by lab.
(3)	☐	Sample received without proper preservative.	(10)	NA	Volatile sample received with approximately _____ mm headspace.
	☐	Cooler temperature not within 4°C ± 2°C. Record temperature: 6°C	(11)	☐	Sample ID on container does not match sample ID on paperwork. Explain:
	☐	pH _____			
	☐	other: _____			
(4)	☐	Sample received in improper container.	(12)	☐	All coolers on airbill not received with shipment
(5)	☐	Sample received without proper paperwork. Explain:	(13)	☐	Other (explain below): Shipping containers not rad surveyed
(6)	☐	Paperwork received without sample.			
(7)	☐	No sample ID on sample container.			

Notes: _____

Corrective Actions:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: JR Powell Date: 05-24-94

0000085

ITAS-ST.LOUIS TCLP Extraction Record/Chain of Custody

SOP No SL4065, Rev 0

Reviewed By/Date:

	Fluid #1	Fluid #2
Daily pH Check	4.88 (4.88 - 4.98)	[illegible] (2.83 - 2.93)
Lot #	940516	

	Date	Time	Temp (°C)
Rotation Started	052594	15:30	30
Rotation Ended	052694	9:30	27

Batch #	38267
Project #	53701
Page #	1 of 1

Sample	Percent Solids Determination: Filter Tare	Sample Wt.	Wt. Filtrate	Wt. Dried Solids and Filter	% Solids	Fluid Determination: pH #1	pH #2	Fluid #	Leachate Preparation: Sample Wt	Wt. Filtrate*	Volume Fluid Added	Wt. Leachate*	Final pH	Analyst	Requested Analyses[b]
Blk 38267								1			2000		4.88	SNS	
5179-005	N/A				100	7.50	1.80	1	100.5		2000		5.58		B
5179-010	N/A				100	7.70	2.02	1	100.7		2000		5.27		B

* Required for Immiscible Multi-Phasic Samples Only

[b] B = BNA, H = Herbicides, P = Pesticides, M = Metals

Metals Preserved By	Date

Type	Standard Number(s) and Volume(s)

What[b]	From	To	Date	Dept.
B	Scott Kewell		[illegible]	[illegible]

0000086

Due 6-9

Reviewed D Williams 05-31-94

Tray W VI

QC #38543

ITAS - St. Louis

Extract Chain-of-Custody

Project # 537-01 Analysis BNA / TCLP

Sample No	Wt/Vol	Extract Volume	Date	Initials	Conc To	Date	Initials	Clean-up	Date	Initials	Conc To	Date	Initials	Comments
Blk 38543	250 ml	2×3×60 ml	053194	KF	1 ml	053194	LW							
Spk 38543	↓	↓	↓	↓	↓	↓	↓							Ext Fluid #2
Blk 38267														TCLP Blk
5179-005														
12	↓	↓	↓	↓	↓	↓	↓							

D Williams 053194

Spike Compounds	Amounts	Surrogate Compounds	Amounts	From	Date	Received	Date
BNA TCLP Spike #OP0047-94 65/250 mg/ml exp 020195	250 ml	BNA Surrogate #OP0082-94 100/200 mg/ml exp 050395	500 ml 0000087	D Williams	05-31-94		060194

Analysis Date:

* All samples diluted to 1000 ml with DI H_2O

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00071
01-27-94	[illegible]	[illegible]									
		[illegible]	[illegible]	[illegible]	5 ml	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]			[illegible]				
[illegible]	[illegible]	245 Trichlorophenol	[illegible]	[illegible]	2 ml	10 ml	10 ug/ml	Hexane	VS	02-01-95	
[illegible]	[illegible]	Florisil Test Mix	—	—	—	—	—	Hexane	VS	08-01-94	
		245 Trichlorophenol	[illegible]	10 ug/ml	2 ml	2.02 ml	0.1 ug/ml				
		α BHC	[illegible]	0.02 ug/ml	2.0 ml		0.02 ug/ml				
		Heptachlor									
		g BHC									
		Endo I									
		Dieldrin		0.04 ug/ml			0.04 ug/ml				
		Endrin									
		4,4' DDD									
		4,4'-DDT									
		Methoxychlor		0.2 ug/ml			0.2 ug/ml				
		TCMX		0.02 ug/ml			0.02 ug/ml				
		DCB		0.04 ug/ml			0.04 ug/ml				
02-01-94	[illegible]	245 Trichlorophenol	CPA [illegible]	—	—	—	5000 ug/ml	MeOH	VS	02-01-95	CPA Standard
02-01-94	[illegible]	TCLP BNA Spike									
		TCLP-BNA-S SV Spiking Mix Varied conc in CH_2Cl_2	[illegible]	[illegible]	[illegible]	[illegible]	See Identity Column for Std Conc	CH_2Cl_2	LW	[illegible]	Accu-Std
		13 components									

Component	mg/mL
2,4 Dinitrotoluene	65
Hexachlorobenzene	65
o Cresol	250
m Cresol	250
p Cresol	250
1,4 Dichlorobenzene	250
Hexachlorobutadiene	250
Hexachloroethane	250
Nitrobenzene	250
Pentachlorophenol	250
Pyridine	250
2,4,5 Trichlorophenol	250
2,4,6 Trichlorophenol	250

[illegible]

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc.	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05-11-94	OP0078-94	Aroclor 1660	[illegible]	—	250ul	25ml	—	MEOH	VS	05-11-95 ~~11-11-94~~	VS051194
		Ar 1016	OP0076-94	5000 ug/ml			50ug/ml			05-11-95	
		Ar 1260	OP0077-94	5000 ug/ml						05-11-95	
	OP0079-94	GPC Aroclor Check	OP0078-94	50 ug/ml	400ul	100ml	0.2 ug/ml	CH_2Cl_2	VS	05-11-95 ~~11-11-94~~	VS051194
		Ar 1016								05-11-95	
		Ar 1260								05-11-95	
	OP0080-94	GPC MS Check	OP0074-94	—	20ml	100ml		CH_2Cl_2	VS	05-11-95	
		g-BHC		0.5 ug/ml			0.1 ug/ml				
		Heptachlor									
		Aldrin									
		Endrin		1 ug/ml			0.2 ug/ml				
		Dieldrin									
		4,4'-DDT									
05-19-94	OP0081-94	HMX	Lot # 044032	1000 ug/ml	1.0 ml	5.05 ml	198 ug/ml	MeOH	OH	05-19-95	Accu Standard
05-23-94	OP0082-94	BNA Surrogate									
		BN Surrogate	Lot # 063-328	1000 ug/ml	40 ml	400 ml	100 ug/ml	MeOH	LW	05-23-95	Accu Standard
		Acid Surrogate	Lot # 093-248	2000 ug/ml			200 ug/ml				" "
05-26-94	OP0083-94	DBC/TCMX									
		DBC	~~Lot #~~ OP0084-94	100 ug/ml	4 ml	400 ml	1 ug/ml	Acetone	LW	11-26-94 ~~12-26-94~~	
		TCMX	OP0085-94	200 ug/ml	400 ul		0.2 ug/ml				
05-26-94	OP0084-94	DBC	Lot # 122-189	100 ug/ml	—	—	—	MeOH	LW	11-26-94 ~~12-26-94~~	Accu-Standard
	OP0085-94	TCMX	Lot # 072-152	200 ug/ml	—	—	—				" "
	OP0086-94	BNA 3/90 Spike Mix BN	Lot # 122-028	1000 ug/ml	10 ml	100 ml	100 ug/ml	MeOH	LW	05-26-95	Accu-Std
		Acid	Lot # 092-243	1500 ug/ml			150 ug/ml				" "
	OP0087-94	BNA 3/90 Surrogate	~~Lot #~~ 05-26-94								
		BN	Lot # 123-370	1000 ug/ml	20 ml	200 ml	100 ug/ml	MeOH	LW	05-26-95	Accu-Std
		Acid	Lot # 014-091	1500 ug/ml			150 ug/ml				" "

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
											00052
05 OCT 93	SVOOHH-93	25 BNA HSLSS									
		200 BNA HSLSS	SVOOH9-93	200 ug/ml	125 ul	1025 ul	25 ug/ml	CH_2Cl_2	UB	12 09 93	
		2 Benzyl 4 Chlorophenol	SVOH99-92	1000	25 ul						
		ISTD Mix	SVOOH2-93	800	25 ul		20 ug/ml				
	SVOOH5-93	40 BNA HSLSS									
		200 BNA HSLSS	SVOOH9-93	200 ug/ml	200 ul	1025 ul	40 ug/ml	CH_2Cl_2	UB	120993	
		2 Benzyl 4 Chlorophenol	SVOH99-92	1000	40 ul						
		ISTD Mix	SVOOH2-93	800	26 ul		20 ug/ml				
	SVOOH6-93	60 BNA HSLSS									
		200 BNA HSLSS	SVOOH9-93	200 ug/ml	300 ul	1025 ul	60 ug/ml	CH_2Cl_2	UB	120993	
		2 Benzyl 4 Chlorophenol	SVOH99-92	1000	60 ul						
		ISTD Mix	SVOOH2-93	800	25 ul		20 ug/ml				
	SVOOH7-93	80 BNA HSLSS									
		200 BNA HSLSS	SVOOH9-93	200 ug/ml	400 ul	1025 ul	80 ug/ml	CH_2Cl_2	UB	120993	
		2 Benzyl 4 Chlorophenol	SVOH99-92	1000	80 ul						
		ISTD Mix	SVOOH2-93	800	25 ul		20 ug/ml				
05-06-93	SVOOH8-93	Internal Std Mix	Lot F-0572	4000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		Ultra Scientific 2 vials
	SVOOH9-93	DFTPP	Lot F-0221	1000 ug/ml	1 ml	—	—	Acetone	UB		Ultra Scientific 4 vials
	SVOO50-93	Acid Surrogates	Lot G 0309	2000 ug/ml	1 ml	—	—	Methanol	UB		Ultra Scientific 4 vials
	SVOO51-93	B/N Surrogates	Lot F-0420	1000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		Ultra Scientific 4 vials
	SVOO52-93	B/N Mix #1	Lot F-0014	2000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		
	SVOO53-93	B/N Mix #2	Lot E-0928	2000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		
	SVOO54-93	Toxic Substance Mix #1	Lot E-0846	2000 ug/ml	1 ml	—	—	Dichloromethane	UB		
	SVOO55-93	PAH Mix	Lot F-0066	2000 ug/ml	1 ml	—	—	CH_2Cl_2/Benzene	UB		
	SVOO56-93	Phenol Mix	Lot F-0446	2000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		
	SVOO57-93	Internal Std Mix	Lot E0512	4000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		
	SVOO58-93	Toxic Substance Mix #2	Lot 0651	2000 ug/ml	1 ml	—	—	CH_2Cl_2	UB		
											UB 10/5/93

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00070
02-01-94	SV0031-94	DFTPP	SV0049-93	1000 ug/ml	125 ul	5 ml	25 ug/ml	CH_2Cl_2	LB	11-4-94	
02-01-94	SV0032-94	200 BNA HSLSS									
↓	↓	BN Mix #1	SV0134-93	2000 ug/ml	600 ul	5 ml	200 ug/ml	CH_2Cl_2	LB	11-10-94	
		BN Mix #2	SV0135-93	↓	↓	↓	↓	↓	↓	↓	
		Toxic Substance Mix #1	SV0136-93								
		Toxic Substance Mix #2	SV0140-93								
		Benzidines Mix	SV0007G-93								
		PAH Mix	SV0136-93								
		Phenol Mix	SV0138-93								
		Acid Surrogate Mix	SV0050-93	↓	↓						
↓	↓	BN Surrogate Mix	SV0141-93	1000 ug/ml	1 ml	↓	↓	↓	↓	↓	
02-01-94	SV0033-94	10 BNA HSLSS									
		200 BNA HSLSS	SV0032-94	200 ug/ml	50 ul	1025 ul	10 ug/ml	CH_2Cl_2	LB	08-05-94	
		Aniline	SV0109-93	1000	10		↓				
	↓	ISTD Mix	SV0030-94	800	25	↓	20 ug/ml	↓	↓	↓	
	SV0034-94	25 BNA HSLSS									
		200 BNA HSLSS	SV0032-94	200 ug/ml	125 ul	1025 ul	25 ug/ml	CH_2Cl_2	LB	08-05-94	
		Aniline	SV0109-93	1000	25		↓				
	↓	ISTD Mix	SV0030-94	800	25	↓	20 ug/ml	↓	↓	↓	
	SV0035-94	40 BNA HSLSS									
		200 BNA HSLSS	SV0032-94	200 ug/ml	200 ul	1025 ul	40 ug/ml	CH_2Cl_2	LB	08-05-94	
		Aniline	SV0109-93	1000	40		↓				
	↓	ISTD Mix	SV0030-94	800	25	↓	20 ug/ml	↓	↓	↓	
	SV0036-94	60 BNA HSLSS									
		200 BNA HSLSS	SV0032-94	200 ug/ml	300 ul	1025 ul	60 ug/ml	CH_2Cl_2	LB	08-05-94	
		Aniline	SV0109-93	1000	60		↓				
↓	↓	ISTD Mix	SV0030-94	800	25	↓	20 ug/ml	↓	↓	↓	
											LB 02-01-94

0000091

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
032394	SV0088-94	PAH Mixture	Lot G-07915	2000 ug/ml	—	—		MeCl2/Benzene	LB	04 95	Ultra Scientific
↓	SV0088-94	Phenol Mixture	Lot E 0180	2000 ug/ml	—	—	—	CH_2Cl_2	↓	↓	↓
	SV0089-94	Internal Std Mix	Lot G-1105	4000 ug/ml	—	—	—	CH_2Cl_2			
032394	SV0090-94	BN Surrogate Mix	Lot G-1042	1000 ug/ml	—	—	—	CH_2Cl_2	LB	2-95	4x1 ml Ultra
↓	SV0091-94	Acid Surrogate Mix	Lot G-1043	2000 ug/ml	—	—	—	methanol	LB	2-95	4x1 ml ↓
032794	SV0092-94	25 BNA Mix								04 95	
		625 BNA Mix	SV0092-94	2000 ug/ml	125 ml	10 ml	25 ug/ml	CH_2Cl_2	JD	↓	1 ml CLP 1119
		Aniline	SV0093-94	1000	25		25				
		ISTD Mix	SV0094-94	2000	25	↓	50	↓	↓	↓	
040794	SV0073-94	25 BNA Mix									
		625 BNA Mix	SV0111-94	2000 ug/ml	125 ml	10 ml	25 ug/ml	CH_2Cl_2	JD	04 [illegible]-94	
		ISTD Mix	SV0114-94	200 ug/ml	25 ml	↓	10 ug/ml	↓	↓		
040794	SV0074-94	1-Chloronaphthalene	Lot# SV0-0180	10 mg/ml	—	—	—	CH_2Cl_2	JD	—	
040794	SV0075-94	2-Dimethyl-4-chlorophenol	ORGEVI 92	neat	100 mg	100 ml	1000 ug/ml	CH_2Cl_2	JD	04-08 95	
040894	SV0076-94	1-Chloronaphthalene	SV0094-94	2 mg/ml	1 ml	2 ml	10 mg/ml	CH_2Cl_2	JD	04-08 95	
040894	SV0097-94	200 BNA Mixes							JD	04-08 95	
		BN Mix #1	SV0081-94	2000 ug/ml	500 ml	5 ml	200 ug/ml	CH_2Cl_2			
		BN Mix #2	SV0082-94								
		Toxic Substance Mix #1	SV0084-94								
		Toxic Substance Mix #2	SV0085-94								
		Benzidines Mix	SV0086-94								
		PAH Mix	SV0087-94								
		Phenols Mix	SV0091-94								
		Acid Surrogate Mix	SV0093-93								
		Base Surrogate Mix	SV0111-93	1000 ug/ml	1 ml						
040894	SV0098-94	ISTD Mix	SV0089-94	4000 ug/ml	1 ml	5 ml	800 ug/ml	CH_2Cl_2	JD	040895	

Not for Std or Surr Tech's initials

JD 04-08-94

0000092

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
04/12/94	SV0134-94	10 BNAHSLSS							JD	8-5-94	
		100 BNAHSLSS	SV0032-94	2000 ug/ml	50 ml	1025 ml	10 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	10						
		2-benzyl-4-chlorophenol	SV0095-94	1000	10						
		1-chloronaphthalene	SV0094-94	1000	10						
		ISTD Mix	SV0118-94	800	25		20 ug/ml				
04/12/94	SV0135-94	25 BNAHSLSS							JD	8-5-94	
		100 BNAHSLSS	SV0032-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	25						
		2-benzyl-4-chlorophenol	SV0095-94	1000	25						
		1-chloronaphthalene	SV0094-94	1000	25						
		ISTD Mix	SV0118-94	800	25		20 ug/ml				
04/12/94	SV0136-94	40 BNAHSLSS							JD	8-5-94	
		100 BNAHSLSS	SV0032-94	200 ug/ml	200 ml	1025 ml	40 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	40						
		2-benzyl-4-chlorophenol	SV0095-94	1000	40						
		1-chloronaphthalene	SV0094-94	1000	40						
		ISTD Mix	SV0118-94	800	25		20 ug/ml				
04/12/94	SV0137-94	60 BNAHSLSS							JD	8-5-94	
		100 BNAHSLSS	SV0032-94	200 ug/ml	300 ml	1025 ml	60 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	60						
		2-benzyl-4-chlorophenol	SV0095-94	1000	60						
		1-chloronaphthalene	SV0094-94	1000	60						
		ISTD Mix	SV0118-94	800	25		20 ug/ml				
04/12/94	SV0138-94	80 BNAHSLSS							JD	8-5-94	
		100 BNAHSLSS	SV0032-94	200 ug/ml	400 ml	1025 ml	80 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	80						
		2-benzyl-4-chlorophenol	SV0095-94	1000	80						
		1-chloronaphthalene	SV0094-94	1000	80						
		ISTD Mix	SV0118-94	800	25		20 ug/ml				

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
~~4-13-94~~	~~SV0[illegible]-94~~	~~B/N Mix #1~~	Lot # B 0457	~~[illegible]~~			-	~~CH_2Cl_2~~	~~JS~~		~~[illegible]~~
~~4-13-94~~	~~SV0110-94~~	~~B/N Mix #2~~	Lot # B 0768	~~[illegible]~~							
4-13-94	SV0109-94	Toxic Substance Mix #3	Lot # G 0359	~~[illegible]~~				CH_2Cl_2	JS	-	
4-19-94	SV0110-94	25 BNA HSLSS								8-5-94	[illegible] 4-27-94
		210 BNA HSLSS	SV0032-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2	LB		
		Aniline	SV0119-93	1000	25						
		2-Benzyl-4-chlorophenol	SV0075-94	1000	25						
		1-Chloronaphthalene	SV0094-94	1000	25						
		ISTD MIX	SV0098-94	800	25		20 ug/ml				
04-25-94	SV0111-94	DFTPP	SV0049-93	1000 ug/ml	250 ml	10 ml	25 ug/ml	CH_2Cl_2	LB		
04-26-94	SV0112-94	200 BNA HSLSS							JS	4-26-95	
		BN Mix #1	SV0086-94	2000 ug/ml	500 ml	5 ml	200 ug/ml	CH_2Cl_2			
		BN Mix #2	SV0033-94								
		Toxic Substance Mix #1	SV0084-94								
		Toxic Substance Mix #3	SV0109-94								
		Custom Standard	SV0076-93								
		PAH Mix	SV0087-94								
		Phenols Mix	SV0036-94								
		Acid Surrogate Mix	SV0050-93								
		Base Surrogate Mix	SV0141-93	1000 ug/ml	1 ml						
04-26-94	SV0113-94	10 BNA HSLSS							JS	11-10-94	
		200 BNA HSLSS	SV0112-94	200 ug/ml	50 ml	1025 ml	10 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	10						
		2-benzyl-4-chlorophenol	SV0075-94	1000	10						
		1-chloronaphthalene	SV0094-94	1000	10						
		ISTD Mix	SV0098-94	800	25		20 ug/ml				

JS 04-27-94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
04-28-94	SV0114-94	25 BNA HSLSS							JD	11-10-94	
		200 BNAHSLSS	SV0112-94	200 mg/ml	125 ml	1025 ml	25 mg/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	25						
		2-benzyl-4-chlorophenol	SV0095-94	1000	25						
		1-chloronaphthalene	SV0094-94	1000	25						
		ISTD Mix	SV0098-94	800	25		20 mg/ml				
04-20-94	SV0115-94	40 BNAHSLSS							JD	11-10-94	
		200 BNAHSLSS	SV0112-94	200 mg/ml	200 ml	1025ml	40 mg/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	40						
		2-benzyl-4-chlorophenol	SV0095-94	1000	40						
		1-chloronaphthalene	SV0094-94	1000	40						
		ISTD Mix	SV0098-94	800	25		20 mg/ml				
04-26-94	SV0116-94	60 BNAHSLSS							JD	11-10-94	
		200 BNAHSLSS	SV0112-94	200 mg/ml	300 ml	1025 ml	60 mg/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	60						
		2-benzyl-4-chlorophenol	SV0095-94	1000	60						
		1-chloronaphthalene	SV0094-94	1000	60						
		ISTD Mix	SV0098-94	800	25		20 mg/ml				
04-26-94	SV0117-94	80 BNAHSLSS							JD	11-10-94	
		200 BNAHSLSS	SV0112-94	200 mg/ml	400 ml	1025 ml	80 mg/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	80						
		2-benzyl-4-chlorophenol	SV0095-94	1000	80						
		1-chloronaphthalene	SV0094-94	1000	80						
		ISTD Mix	SV0098-94	800	25		20 mg/ml				
05-04-94	SV0118-94	25 BNAHSLSS							JD	05-11-94	
		200 BNAHSLSS	SV0112-94	200 mg/ml	125 ml	1025 ml	25 mg/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	25						
		2-benzyl-4-chlorophenol	SV0095-94	1000	25						
		ISTD Mix	SV0098-94	800	25		20 mg/ml				

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
											00081
05-11-94	SV0119-94	25 BNA HSLSS	—	—	—	—	—	—	LPJ	05-18-94	
		200 BNA HSLSS	SV0112-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2			no good
		Aniline	SV0109-93	1000	25						
		2 Benzyl-4 Chlorophenol	SV0095-94	1000	25						
		ISTD Mix	SV0098-94	800	25		20 ug/ml				
05-12-94	SV0120-94	25 BNA HSLSS	—	—	—	—	—	—	LPJ	05-19-94	disposed 05-16-94
		200 BNA HSLSS	SV0112-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	25						
		2-Benzyl-4-chlorophenol	SV0095-94	1000	25						
		ISTD Mix	SV0098-94	800	25		20 ug/ml				
05-16-94	SV0121-94	25 BNA HSLSS	—	—	—	—	—	—	JO	05-23-94	disposed 05-23-94
		200 BNA HSLSS	SV0112-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2			
		Aniline	SV0109-93	1000	25 ml						
		ISTD Mix	SV0098-94	800	25 ml		20 ug/ml				
05-16-94	SV0117-94	ISTD Mix	SV0098-94	800 ug/ml	1 ml	5 ml	100 ug/ml	CH_2Cl_2	JO	05-23-95	Added to SV0098-94
05-20-94	SV0133-94	10 Appendix 9 Pt I								02-21-95	
		App 9 Pt I Parent	SV0058-94	200 ug/ml	50 ml	1025 ml	10 ug/ml	CH_2Cl_2	JO		
		ISTD Mix	SV0089-94	800	25		20				
05-20-94	SV0134-94	25 Appendix 9 Pt I								02-21-95	
		App 9 Pt I Parent	SV0058-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2	JO		
		ISTD Mix	SV0089-94	800	25		20				
05-20-94	SV0135-94	40 Appendix 9 Pt I								02-21-95	
		App 9 Pt I Parent	SV0058-94	200 ug/ml	200 ml	1025 ml	40 ug/ml	CH_2Cl_2	JO		
		ISTD Mix	SV0089-94	800	25		20				0000096
05-20-94	SV0136-94	60 Appendix 9 Pt I								02-21-95	
		Appendix 9 Pt I Parent	SV0058-94	200 ug/ml	300 ml	1025 ml	60 ug/ml	CH_2Cl_2	JO		
		ISTD Mix	SV0089-94	800	25		20				

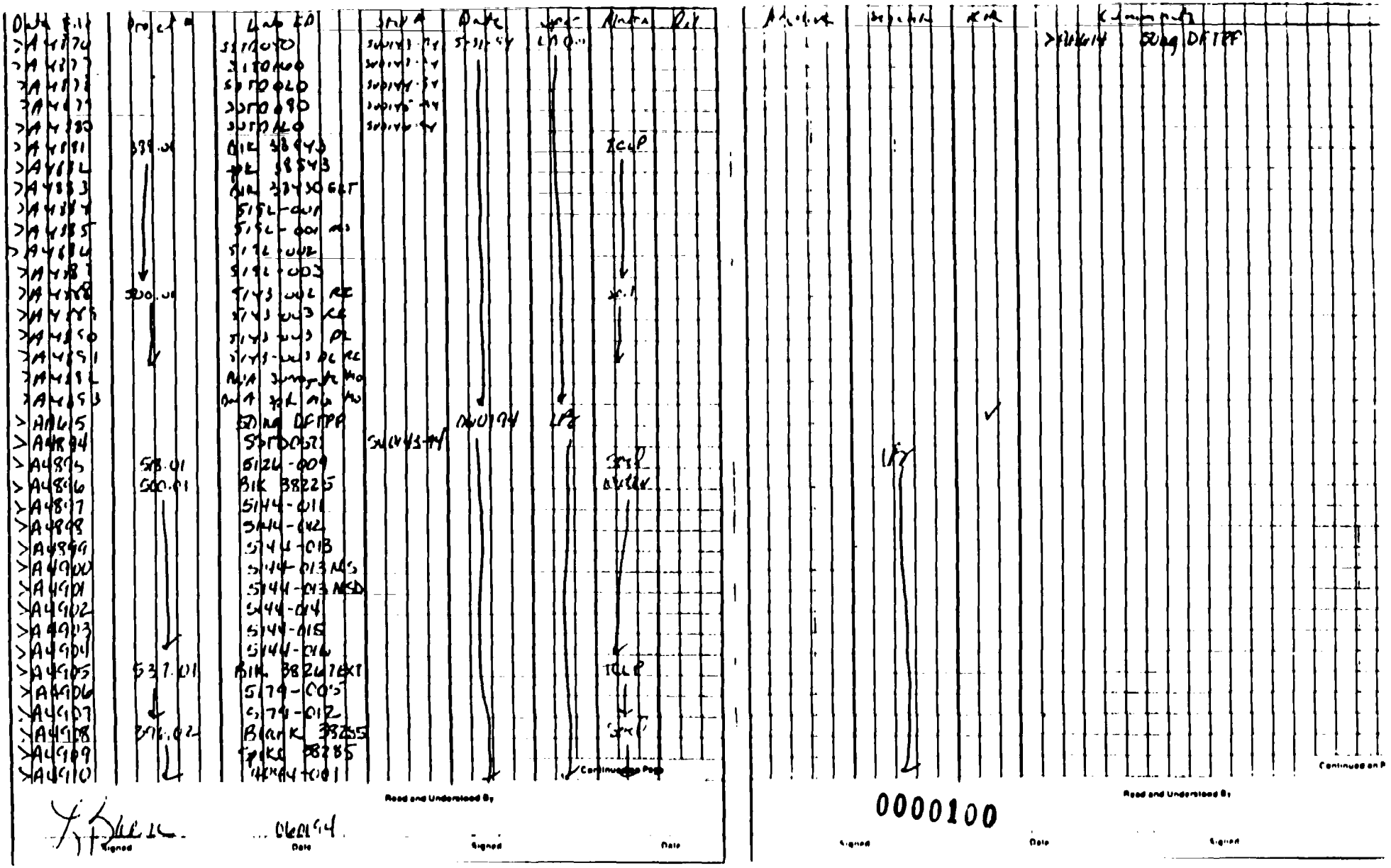
10-05-20-94

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc.	Aliquot	Dil. Vol.	Final Conc.	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00082
05-26-94	SV0127-94	80 Appendix 9 Pt I - w.							JD	02-21-95	
		App 9 Pt I Parent	SV0053-94	200 ng/ml	400 ml	1025 ml	80 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 ↓	25 ml	↓	20 ↓	↓			
	SV0128-94	10 App 9 Pt II							JD	02-11-95	
		App 9 Pt II Parent	SV0060-94	200 ng/ml	50 ml	1025 ml	10 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 ↓	25 ↓	↓	20 ↓	↓			
	SV0129-94	25 App 9 Pt II							JD	02-11-95	
		App 9 Pt II Parent	SV0060-94	200 / 125 ng/ml	125 ml	1025 ml	25 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 / 20 ↓	25 ↓	↓	20 ↓	↓			
	SV0130-94	40 App 9 Pt II							JD	02-21-95	
		App 9 Pt II Parent	SV0060-94	200 / 800 ng/ml	200 ml	1025 ml	40 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 / 25 ↓	25 ↓	↓	20 ↓	↓			
	SV0131-94	60 App 9 Pt II							JD	02-21-95	
		App 9 Pt II Parent	SV0060-94	200 / 300 ng/ml	300 ml	1025 ml	60 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 / 25 ↓	25 ↓	↓	20 ↓	↓			
	SV0132-94	80 App 9 Pt I							JD	02-21-95	
		App 9 Pt I Parent	SV0053-94	200 / 400 ng/ml	400 ml	1025 ml	80 ng/ml	CH_2Cl_2			
		ISTD Mix	SV0089-94	800 / 25 ↓	25 ↓	↓	20 ↓	↓			
06-23-94	SV0133-94	25 BNA HSLSS	—	—	—	—	—	—	LB	05-30-94	disposed 5-31-94
↓	↓	200 BNA HSLSS	SV0112-94	200 ng/ml	125 ml	1025 ml	25 ng/ml	CH_2Cl_2	↓	↓	
		Aniline	SV0109-93	1000	25						
		2-Benzyl-4-chlorophenol	SV0095-94	1000	25						
↓	↓	ISTD Mix	~~SV0089-94~~	800 ↓	25 ↓	↓	20ug/ml ↓	↓	↓	↓	
05-25-94	SV0134-94	ISTD Mix	SV0122-94 / SV0089-94	Y000 mg/ml	1 ml	5 ml	800 mg/ml	CH_2Cl_2	JD	05-25-95	
05-26-94	SV0135-94	[illegible]	Lot # OSY-264	2000 mg/ml	—	—	—	CH_2Cl_2	JD	—	
05-26-94	SV0136-94	[illegible]	Lot # OSY-261	2000 mg/ml	—	—	—	CH_2Cl_2	JD	—	0000097

JD 05-26-94

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	DB Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00083
05-26-94	SV0137-94	Aqueous 268.07 Stds (200 ug/ml)							JS	05-26-95	
		Dinitrobenzene Mix	SV0135-94	2000 ug/ml	500 ml	5 ml	200 ug/ml	CH_2Cl_2			
		Diaminotoluene Mix	SV0136-94	2000 ↓	↓	↓	↓	↓			
05-26-94	SV0138-94	10 ug/ml 268.07 Std							JS	05-26-95	
		200 268.07 Std	SV0137-94	200 ug/ml	50 ml	1025 ml	10 ug/ml	CH_2Cl_2			
		ISTD Mix	SV0134-94	800 ↓	25 ↓	↓	20 ↓	↓			
05-26-94	SV0139-94	25 ug/ml 268.07 Std							JS	05-26-95	
		200 268.07 Std	SV0137-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2			
		ISTD Mix	SV0134-94	800 ↓	25 ↓	↓	20 ↓	↓			
05-26-94	SV0140-94	40 ug/ml 268.07 Std							JS	05-26-95	
		200 268.07 Std	SV0137-94	200 ug/ml	200 ml	1025 ml	40 ug/ml	CH_2Cl_2			
		ISTD Mix	SV0134-94	800 ↓	25 ↓	↓	20 ↓	↓			
05-26-94	SV0141-94	60 ug/ml 268.07 Std							JS	05-26-95	
		200 268.07 Std	SV0137-94	200 ug/ml	300 ml	1025 ml	60 ug/ml	CH_2Cl_2			
		ISTD Mix	SV0134-94	800 ↓	25 ml	↓	20 ↓	↓			
05-26-94	SV0142-94	80 ug/ml 268.07 Std							JS	05-26-95	
		200 268.07 Std	SV0137-94	200 ug/ml	400 ml	1025 ml	80 ug/ml	CH_2Cl_2			
		ISTD Mix	SV0134-94	800 ↓	25 ↓	↓	20 ↓	↓			
05-31-94	SV0143-94	25 BNA HSLSS	—	—	—	—	—	—	LB	6-7-94	
↓	↓	200 BNA HSLSS	SV0112-94	200 ug/ml	125 ml	1025 ml	25 ug/ml	CH_2Cl_2	↓	↓	
		Aniline	SV0109-93	1000	25	↓	↓	↓			
		2-Benzyl-4-Chlorophenol	SV0095-94	1000	25						
		ISTD Mix	SV0134-94	800	25		20 ug/ml				
05-31-94	SV0144-94	10 BNA HSLSS					solvent	LB	conc.	8-5-94	
↓	↓	200 BNA HSLSS	SV0112-94	200 ug/ml	50 ml	1025 ml	CH_2Cl_2	↓	10 ug/ml	↓	0000098
		Aniline	SV0109-93	1000	10	↓	↓	↓	↓		
		2-Benzyl-4-Chlorophenol	SV0095-94	1000	10						
		ISTD Mix	SV0134-94	800	25				20 ug/ml		
											LB 053194

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc.	Aliquot	Dil. Vol	Final Conc	Solvent	Analyst Init.	Expiration Date	Comments/ Recommendations 00084
05-31-94	SV0145-94	40 BNA HSLSS							VK	080594	
	↓	200 BNA HSLSS	SV0112-94	200 ug/ml	200 ul	1025 ul	40 ug/ml	CH_2Cl_2	↓	↓	
		Aniline	SV0109-93	1000	40	↓	↓	↓			
		2-Benzyl-4-Chlorophenol	SV0095-94	1000	40						
		ISTD Mix	SV0134-94	800	25		20 ug/ml				
	SV0146-94	60 BNA HSLSS							VK	080594	
	↓	200 BNA HSLSS	SV0112-94	200 ug/ml	300 ul	1025 ul	60 ug/ml	CH_2Cl_2	↓	↓	
		Aniline	SV0109-93	1000	60	↓	↓	↓			
		2-Benzyl-4-Chlorophenol	SV0095-94	1000	60						
		ISTD Mix	SV0134-94	800	25		20 ug/ml				
	SV0147-94	80 BNA HSLSS							VK	080594	
	↓	200 BNA HSLSS	SV0112-94	200 ug/ml	400 ul	1025 ul	80 ug/ml	CH_2Cl_2	↓	↓	
		Aniline	SV0109-93	1000	80	↓	↓	↓			
		2-Benzyl-4-Chlorophenol	SV0095-94	1000	80						
		ISTD Mix	SV0134-94	800	25		20 ug/ml				
											000093



Read and Understood By

Signed

Date

Signed

Date

0000100

Signed

Date

Signed

Read and Understood By

VOLATILE QC SUMMARY

537-01
5179
CD-5156

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SAS No.: SDG No.: CD-S156

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
01	CD-S78E18N23	100	94	89	0	0
02	CD-S81E5N23	101	99	95	0	0
03	VEXTBLK01	102	98	92	0	0
04	VSPK01	99	98	97	0	0
05	VBLK01	97	95	91	0	0

	QC LIMITS
S1 (TOL) = Toluene-d8	(88-110)
S2 (BFB) = Bromofluorobenzene	(86-115)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

100000

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Lab File ID: E9148 Lab Sample ID: QCBLK38799

Date Analyzed: 06/03/94 Time Analyzed: 1310

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: MSE

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	CD-S78E18N23	5179-005	E9158	1947
02	CD-S81E5N23	5179-012	E9159	2019
03	VEXTBLK01	QCBLK38268EXT	E9153	1635
04	VSPK01	QCSPK38799	E9152	1540

COMMENTS:

000002

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Lab File ID: EE056 BFB Injection Date: 05/28/94

Instrument ID: MSE BFB Injection Time: 0216

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	28.0
75	30.0 - 60.0% of mass 95	58.7
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.0
173	Less than 2.0% of mass 174	0.9 (1.2)1
174	Greater than 50.0% of mass 95	70.9
175	5.0 - 9.0% of mass 174	5.7 (8.0)1
176	Greater than 95.0%, but less than 101.0% of mass 174	67.9 (95.7)1
177	5.0 - 9.0% of mass 176	4.8 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	E9043	05/28/94	0318
02	VSTD020	VSTD020	E9045	05/28/94	0442
03	VSTD100	VSTD100	E9046	05/28/94	0515
04	VSTD150	VSTD150	E9047	05/28/94	0548
05	VSTD200	VSTD200	E9048	05/28/94	0620

000003

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Lab File ID: EE066 BFB Injection Date: 06/03/94

Instrument ID: MSE BFB Injection Time: 1039

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.0
75	30.0 - 60.0% of mass 95	50.8
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	75.4
175	5.0 - 9.0% of mass 174	5.7 (7.6)1
176	Greater than 95.0%, but less than 101.0% of mass 174	73.3 (97.2)1
177	5.0 - 9.0% of mass 176	4.7 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	E9146	06/03/94	1103
02	VBLK01	QCBLK38799	E9148	06/03/94	1310
03	VSPK01	QCSPK38799	E9152	06/03/94	1540
04	VEXTBLK01	QCBLK38268EXT	E9153	06/03/94	1635
05	CD-S78E18N23	5179-005	E9158	06/03/94	1947
06	CD-S81E5N23	5179-012	E9159	06/03/94	2019

000004

VOLATILE SAMPLE DATA

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CD-S81E5N23

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: 5179-012

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E9159

Level: (low/med) LOW Date Received: 05/24/94

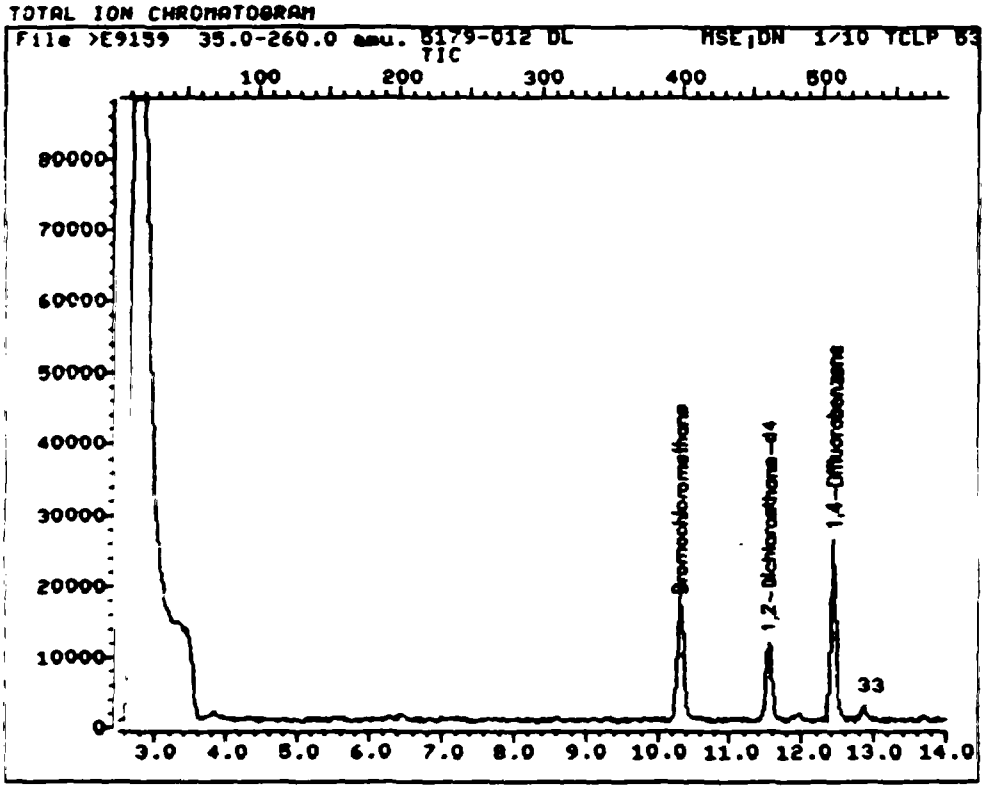
% Moisture: not dec. Date Analyzed: 06/03/94

Column: (pack/cap) CAP Dilution Factor: 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	100	U
75-35-4	1,1-Dichloroethene	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	100	U
56-23-5	Carbon Tetrachloride	50	U
79-01-6	Trichloroethene	290	
71-43-2	Benzene	50	U
127-18-4	Tetrachloroethene	50	U
108-90-7	Chlorobenzene	50	U

000005

TOTAL ION CHROMATOGRAM



Data File: >E9159::D7
Name: 5179-012 DL
Misc: MSE;DN 1/10 TCLP 537.01

Quant Output File: ^E9159::D1
Instrument ID: MSE

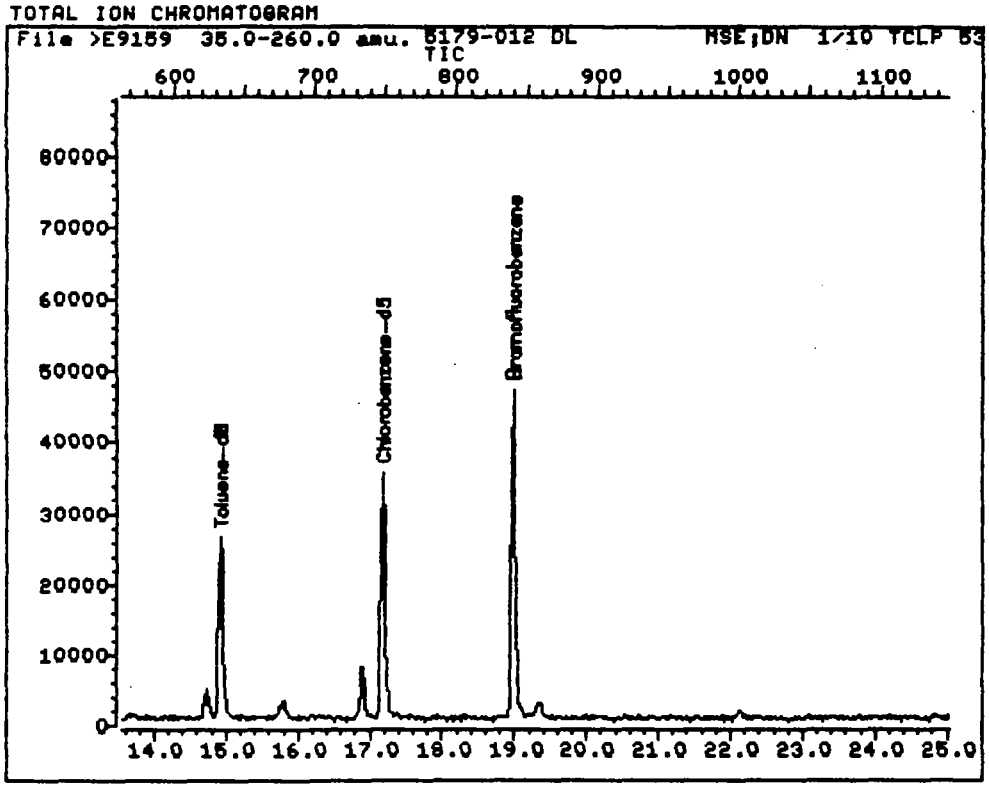
Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940603 11:03

Operator ID: MS8
Quant Time : 940603 20:47
Injected at: 940603 20:19

000006

TOTAL ION CHROMATOGRAM



Data File: >E9159::D7 Quant Output File: ^E9159::D1
Name: 5179-012 DL Instrument ID: MSE
Misc: MSE;DN 1/10 TCLP 537.01

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 20:47
Injected at: 940603 20:19

0000007

QUANT REPORT Page 1

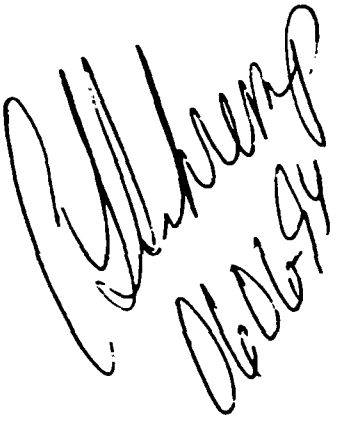
Operator ID: MSB Quant Rev: 7 Quant Time: 940603 20:47
Output File: ^E9159::D1 Injected at: 940603 20:19
Data File: >E9159::D7 Dilution Factor: 1.00000
Name: 5179-012 DL Instrument ID: MSE
Misc: MSE;DN 1/10 TCLP 537.01

ID File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

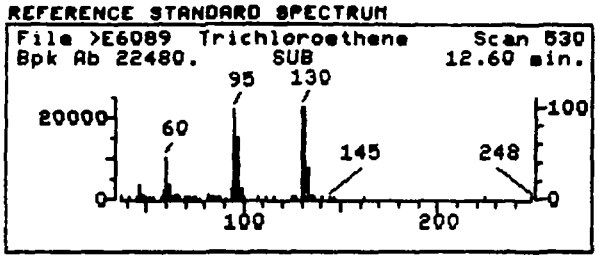
	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	10.31	128.0	13394	50.00	UG/L	97
27)	*1,4-Difluorobenzene	12.44	114.0	44714	50.00	UG/L	92
33)	Trichloroethene	12.88	130.0	1303	2.87	UG/L	83
43)	*Chlorobenzene-d5	17.17	117.0	37711	50.00	UG/L	95
82)	Toluene-d8	14.92	98.0	36854	50.33	UG/L	97
83)	Bromofluorobenzene	18.98	95.0	37780	49.27	UG/L	92
84)	*Chlorobromomethane	10.31	128.0	13394	50.00	UG/L	97
85)	1,2-Dichloroethane-d4	11.54	65.0	24165	47.57	UG/L	88

* Compound is ISTD

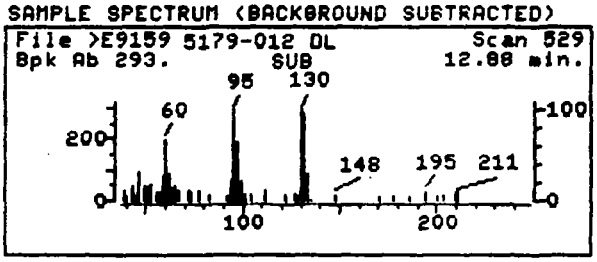
00000008



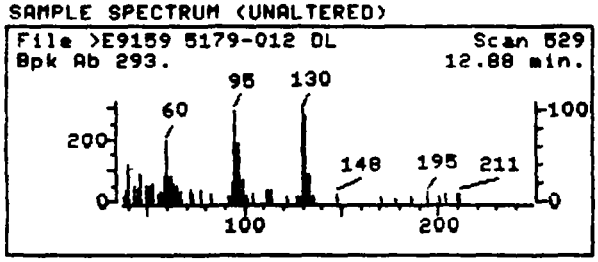
REFERENCE STANDARD SPECTRUM

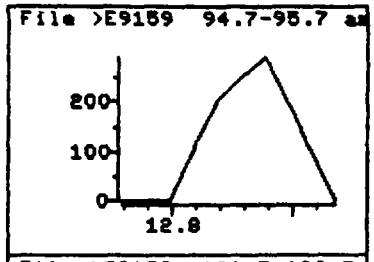


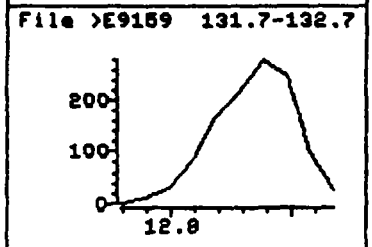
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)

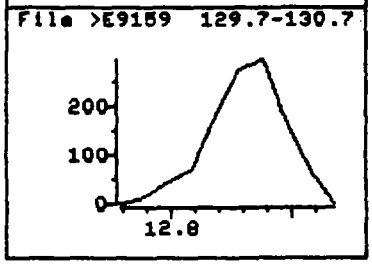


SAMPLE SPECTRUM (UNALTERED)









Data File: >E9159::D7
Name: 5179-012 DL
Misc: MSE;DN 1/10 TCLP 537.01
Quant Time: 940603 20:47
Injected at: 940603 20:19
Last Qcal Time: 940603 11:03

Quant Output File: ^E9159::D1
Instrument ID: MSE

Quant ID File: @E9146::D5
Last Calibration: 940401 12:05

Compound No : 33
Compound Name : Trichloroethene
Scan Number : 529
Retention Time: 12.88 min.
Quant Ion : 130.0
Area : 1303
Concentration : 2.87 UG/L
q-value : 83

6000000

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CD-S78E18N23

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: 5179-005

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E9158

Level: (low/med) LOW Date Received: 05/24/94

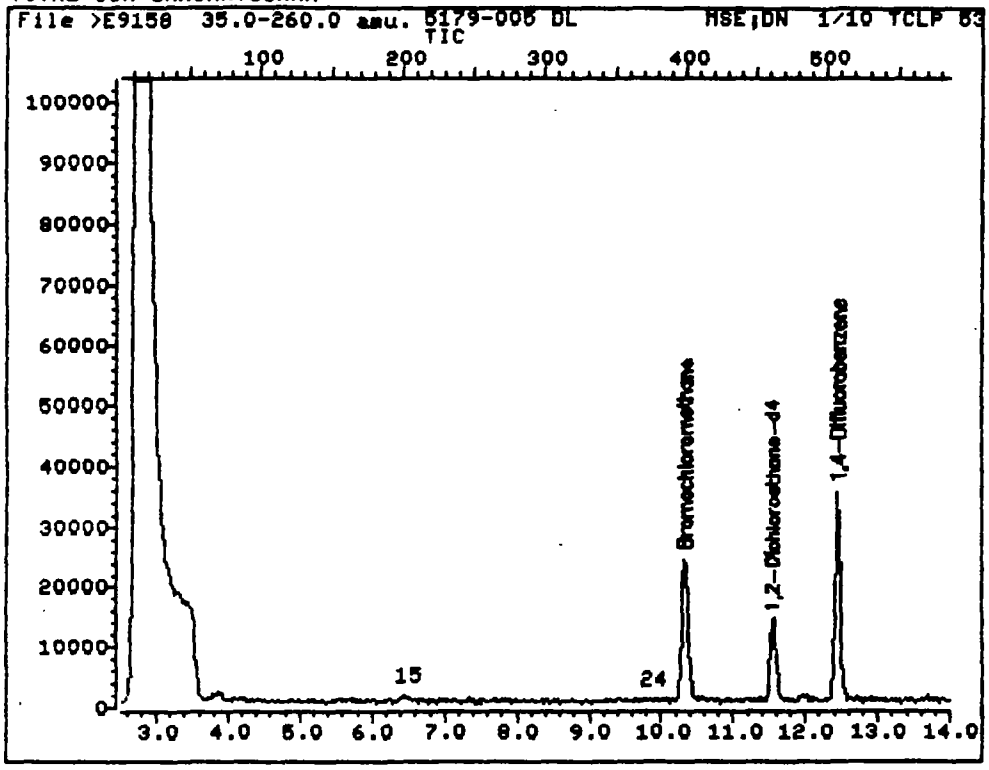
% Moisture: not dec. Date Analyzed: 06/03/94

Column: (pack/cap) CAP Dilution Factor: 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	100	U
75-35-4	1,1-Dichloroethene	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	100	U
56-23-5	Carbon Tetrachloride	50	U
79-01-6	Trichloroethene	50	U
71-43-2	Benzene	50	U
127-18-4	Tetrachloroethene	50	U
108-90-7	Chlorobenzene	50	U

000010

TOTAL ION CHROMATOGRAM



Data File: >E9158::D7
Name: 5179-005 DL
Misc: MSE;DN 1/10 TCLP 537.01

Quant Output File: ^E9158::D1
Instrument ID: MSE

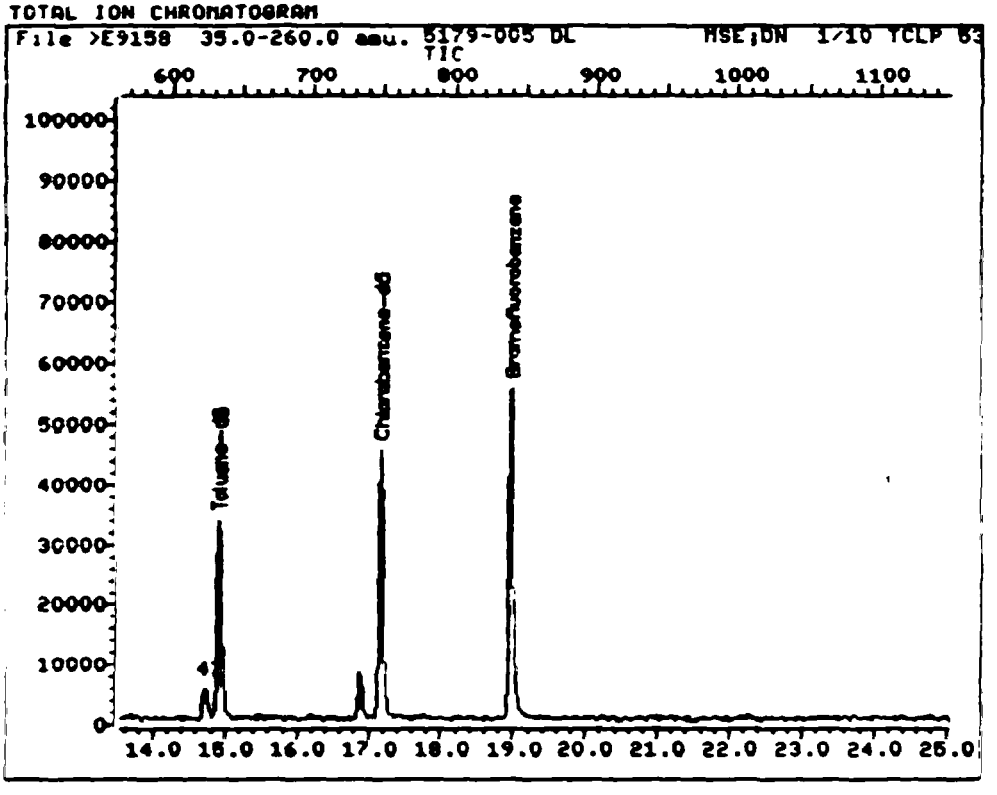
Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 20:15
Injected at: 940603 19:47

0000011

TOTAL ION CHROMATOGRAM



Data File: >E9158::D7
Name: 5179-005 DL
Misc: MSE;DN 1/10 TCLP 537.01

Quant Output File: ^E9158::D1
Instrument ID: MSE

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 20:15
Injected at: 940603 19:47

210012

QUANT REPORT Page 1

Operator ID: MSB Quant Rev: 7 Quant Time: 940603 20:15
Output File: ^E9158::D1 Injected at: 940603 19:47
Data File: >E9158::D7 Dilution Factor: 1.00000
Name: 5179-005 DL Instrument ID: MSE
Misc: MSE;DN 1/10 TCLP 537.01

ID File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	10.33	128.0	17725	50.00	UG/L	89
~~15)~~	~~Methylene Chloride~~	~~6.42~~	~~84.0~~	~~1770~~	~~3.64~~	~~UG/L~~	~~82~~
~~24)~~	~~2-Butanone (90)~~	~~9.84~~	~~43.0~~	~~101~~	~~.990~~	~~UG/L~~	~~41~~
27)	*1,4-Difluorobenzene	12.45	114.0	60619	50.00	UG/L	92
43)	*Chlorobenzene-d5	17.18	117.0	48963	50.00	UG/L	97
~~47)~~	~~4-Methyl-2-Pentanone~~	~~14.72~~	~~43.0~~	~~5263~~	~~18.40~~	~~UG/L~~	~~40~~
82)	Toluene-d8	14.92	98.0	47592	50.06	UG/L	96
83)	Bromofluorobenzene	18.98	95.0	46723	46.93	UG/L	91
84)	*Chlorobromomethane	10.33	128.0	17725	50.00	UG/L	89
85)	1,2-Dichloroethane-d4	11.54	65.0	29906	44.49	UG/L	88

* Compound is ISTD

0000013

6/06-94

STANDARDS DATA

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Instrument ID: MSE Calibration Date(s): 05/28/94 05/28/94

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

Min $\overline{RRF}$ for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = E9045 RRF50 = E9043
RRF100= E9046 RRF150= E9047 RRF200= E9048

COMPOUND		RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Chloromethane	#	0.773	0.668	0.602	0.643	0.635	0.664	9.8#
Vinyl Chloride	*	0.920	0.764	0.770	0.785	0.782	0.804	8.1*
1,1-Dichloroethene	*	2.323	2.118	2.331	2.313	2.334	2.284	4.1*
1,1-Dichloroethane	#	2.307	2.071	2.287	2.334	2.373	2.274	5.2#
Chloroform	*	3.212	3.202	3.379	3.353	3.397	3.309	2.8*
1,2-Dichloroethane		2.408	2.133	2.339	2.241	2.332	2.291	4.6
2-Butanone		0.064	0.074	0.059	0.052	0.065	0.063	12.9
Carbon Tetrachloride		1.205	1.024	0.982	1.017	0.958	1.037	9.4
1,2-Dichloropropane	*	0.296	0.284	0.307	0.320	0.326	0.307	5.6*
Trichloroethene		0.521	0.457	0.473	0.483	0.485	0.484	4.9
Benzene		0.811	0.692	0.749	0.771	0.765	0.758	5.7
Bromoform	#	0.727	0.652	0.681	0.614	0.667	0.668	6.2#
Tetrachloroethene		0.695	0.657	0.764	0.874	0.921	0.782	14.5
1,1,2,2-Tetrachloroethane	#	0.780	0.688	0.732	0.644	0.721	0.713	7.1#
Toluene	*	0.666	0.592	0.645	0.644	0.683	0.646	5.3*
Chlorobenzene	#	0.989	0.870	0.940	0.934	0.987	0.944	5.2#
Ethylbenzene	*	0.405	0.362	0.380	0.367	0.386	0.380	4.5*
Toluene-d8		1.118	1.050	1.138	1.093	1.151	1.110	3.6
Bromofluorobenzene		1.254	1.080	1.097	0.971	1.043	1.089	9.6
1,2-Dichloroethane-d4		2.138	2.034	2.011	1.814	1.914	1.982	6.2

000014

QUANT REPORT Page 1

Operator ID: MSE Quant Rev: 7 Quant Time: 940528 05:10
Output File: ^E9045::D1 Injected at: 940528 04:42
Data File: >E9045::D5 Dilution Factor: 1.00000
Name: USTD020 Instrument ID: MSE
Misc: MSE,CLS,H20

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

	Compound	R.T.	Q ion	Area	Conc	Units	q
1	•Bromochloromethane	10.30	128.0	13338	50.00	UG/L	93
2	Dichlorodifluoromethane	3.04	85.0	12448	52.59	UG/L	90
3	Chloromethane	3.23	50.0	4324	21.17	UG/L	99
4	Vinyl Chloride	3.41	62.0	4907	21.58	UG/L	91
5	Bromomethane	3.88	94.0	7840	28.77	UG/L	93
6	Chloroethane	4.06	64.0	3521	22.36	UG/L	87
7	Trichlorofluoromethane	4.45	101.0	23073	38.67	UG/L	97
11	1,1-Dichloroethene	5.35	61.0	12394	22.69	UG/L	93
12	1,1,2-Trichlorotrifluoroethane	5.45	101.0	16486	20.33	UG/L	90
13	Carbon Disulfide	5.75	76.0	12353	14.11	UG/L	97
14	Acetone	5.53	43.0	3288	34.56	UG/L	79
15	Methylene Chloride	6.39	84.0	6978	16.53	UG/L	97
16	1,2-Dichloroethene (total)	7.06	96.0	6661	18.34	UG/L	75
17	trans-1,2-Dichloroethene	7.06	96.0	6661	18.34	UG/L	75
20	1,1-Dichloroethane	8.22	63.0	12307M	20.37	UG/L	
21	cis-1,2-Dichloroethene	9.77	96.0	6806	18.50	UG/L	87
23	2-Butanone	9.95	72.0	341M	23.05	UG/L	55
24	2-Butanone (90)	9.89	43.0	1348M	18.83	UG/L	97
25	Chloroform	10.56	83.0	17137	23.32	UG/L	93
26	1,2-Dichloroethane	11.67	62.0	12845	36.26	UG/L	93
27	•1,4-Difluorobenzene	12.42	114.0	39440	50.00	UG/L	89
28	Vinyl Acetate	8.53	43.0	6602	18.74	UG/L	65
29	1,1,1-Trichloroethane	10.85	97.0	17476	33.36	UG/L	88
31	Carbon Tetrachloride	11.18	117.0	19011	31.66	UG/L	97
32	Benzene	11.62	78.0	12789	18.34	UG/L	99
33	Trichloroethene	12.85	130.0	8212	20.94	UG/L	90
34	1,2-Dichloropropane	13.23	63.0	4676	17.34	UG/L	96
36	Bromodichloromethane	13.74	83.0	15648	27.20	UG/L	99
37	2-Chloroethyl vinyl ether	14.29	63.0	1918	20.74	UG/L	93
38	cis-1,3-Dichloropropene	14.48	75.0	7484	21.05	UG/L	90
39	trans-1,3-Dichloropropene	15.40	75.0	5894	26.70	UG/L	84
40	1,1,2-Trichloroethane	15.66	97.0	4863	22.60	UG/L	89
41	Dibromochloromethane	16.27	129.0	13587	26.00	UG/L	96
42	Bromoform	18.45	173.0	11476	25.50	UG/L	94
43	•Chlorobenzene-d5	17.15	117.0	31263	50.00	UG/L	96
44	1,1,2,2-Tetrachloroethane	19.19	83.0	9758	20.82	UG/L	97
45	Toluene	15.01	92.0	8334	19.17	UG/L	90
46	Toluene (90)	15.01	91.0	13940	19.16	UG/L	92
47	4-Methyl-2-Pentanone	14.78	43.0	3429	19.00	UG/L	67
48	Tetrachloroethene	15.86	164.0	8692	21.64	UG/L	83

000015

Operator ID: MSE
Output File: ^E9045::D1
Data File: >E9045::D5
Name: VSTD020
Misc: MSE,CLS,H20

Quant Rev: 7 Quant Time: 940528 05:10
Injected at: 940528 04:42
Dilution Factor: 1.00000
Instrument ID: MSE

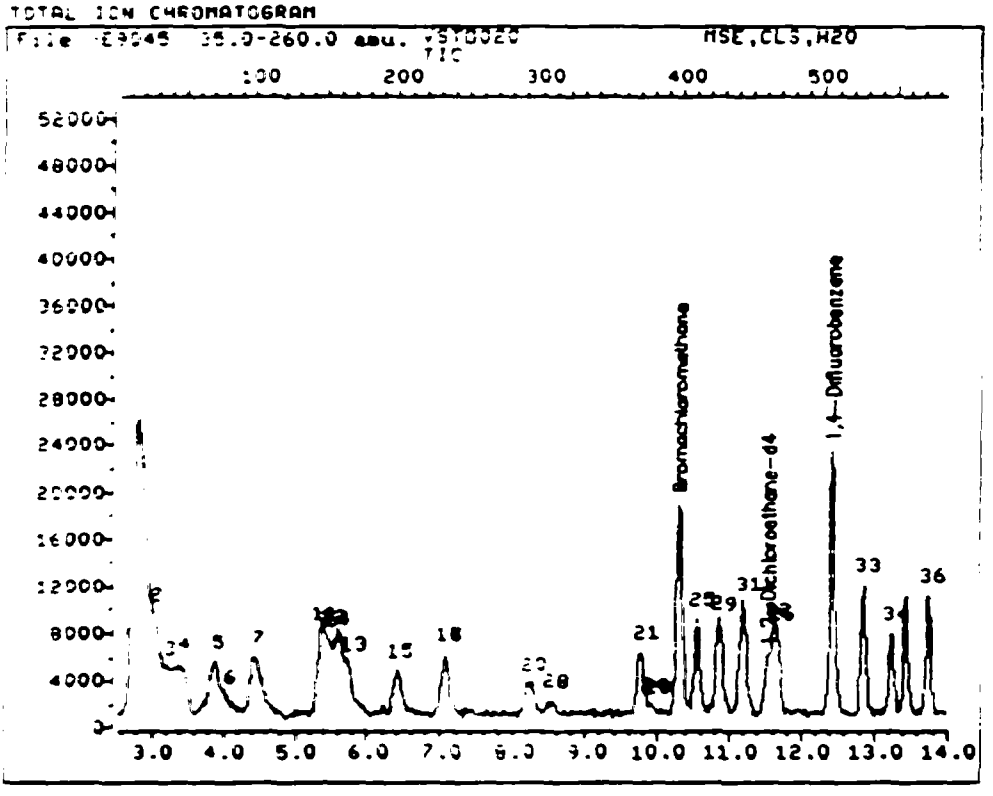
ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.09	43.0	2386	23.97	UG/L	87
53)	Chlorobenzene	17.19	112.0	12369	19.45	UG/L	99
54)	1,1,1,2-Tetrachloroethane	17.33	131.0	9618	21.51	UG/L	92
55)	Ethylbenzene	17.39	106.0	5063	19.64	UG/L	89
56)	Xylene (total)	18.17	106.0	6290	18.38	UG/L	95
57)	o-Xylene	18.17	106.0	6290	18.38	UG/L	95
58)	m,p-Xylenes	17.56	106.0	11765	36.78	UG/L	95
59)	Styrene	18.19	104.0	11291	20.54	UG/L	75
72)	1,3-Dichlorobenzene	20.60	146.0	14288	21.20	UG/L	96
74)	1,4-Dichlorobenzene	20.74	146.0	14370	19.59	UG/L	96
75)	1,2-Dichlorobenzene	21.29	146.0	14084	21.12	UG/L	95
82)	Toluene-d8	14.91	98.0	13979	20.10	UG/L	93
83)	Bromofluorobenzene	18.96	95.0	15682	28.11	UG/L	97
84)	*Chlorobromomethane	10.30	128.0	13338	50.00	UG/L	93
85)	1,2-Dichloroethane-d4	11.54	65.0	11405	38.35	UG/L	82

* Compound is ISTD

000018

TOTAL ION CHROMATOGRAM



Data File: >E9045::D5
Name: VSTD020
Misc: MSE,CLS,H20

Quant Output File: ^E9045::D1
Instrument ID: MSE

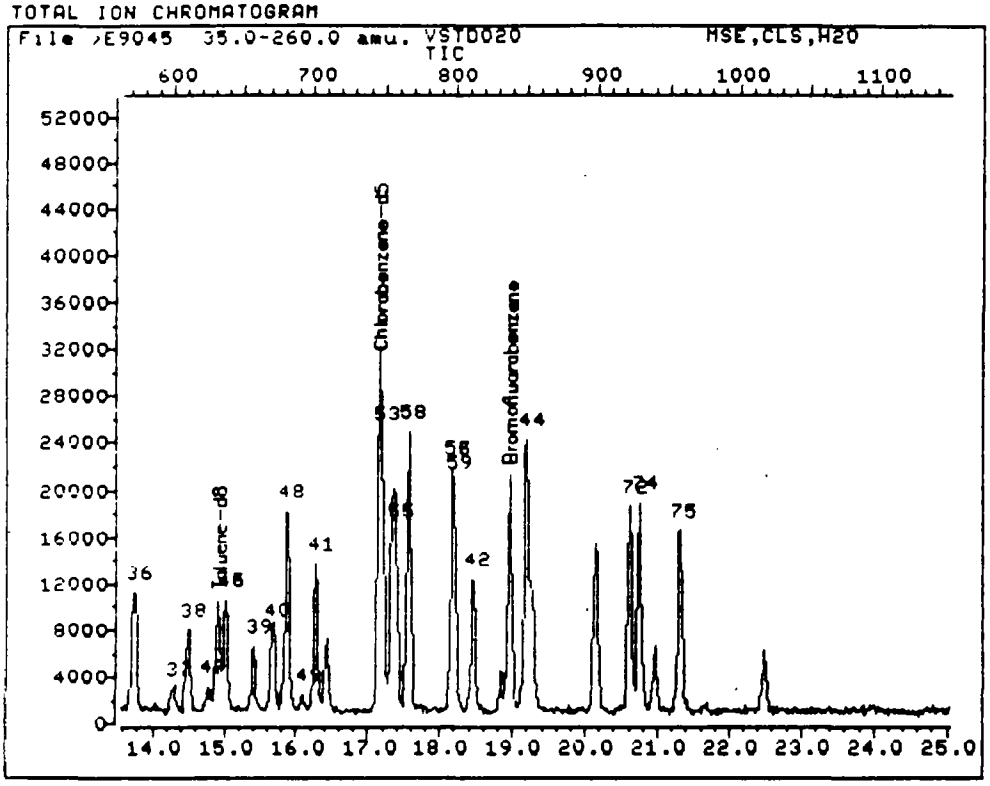
Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 05:10
Injected at: 940528 04:42

0000017

TOTAL ION CHROMATOGRAM



Data File: >E9045::D5
Name: VSTD020
Misc: MSE,CLS,H20

Quant Output File: ^E9045::D1
Instrument ID: MSE

Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H20
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 05:10
Injected at: 940528 04:42

0000018

QUANT REPORT Page 1

Operator ID: MSB Quant Rev: 7 Quant Time: 940528 03:47
Output File: E9043::D1 Injected at: 940528 03:18
Data File: E9043::05 Dilution Factor: 1.00000
Name: VSTD050 Instrument ID: MSE
Misc: MSE;CLS WATER

ID File: @E8921::D7
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

	Compound	R.T.	Q ion	Area	Conc	Units	q
1	•Bromochloromethane	10.31	128.0	17712	50.00	UG/L	96
2	Dichlorodifluoromethane	3.03	85.0	39088	124.35	UG/L	98
3	Chloromethane	3.24	50.0	11825	45.71	UG/L	98
4	Vinyl Chloride	3.44	62.0	13529	44.81	UG/L	90
5	Bromomethane	3.89	94.0	23183	64.07	UG/L	89
6	Chloroethane	4.07	64.0	10530	50.36	UG/L	90
7	Trichlorofluoromethane	4.44	101.0	72194	91.11	UG/L	99
11	1,1-Dichloroethene	5.36	61.0	37509	51.72	UG/L	83
12	1,1,2-Trichlorotrifluoroethane	5.46	101.0	49930	46.36	UG/L	97
13	Carbon Disulfide	5.76	76.0	37855	32.57	UG/L	98
14	Acetone	5.56	43.0	6666	52.76	UG/L	82
15	Methylene Chloride	6.42	84.0	20114	35.88	UG/L	93
16	1,2-Dichloroethene (total)	7.09	96.0	19348	40.11	UG/L	83
17	trans-1,2-Dichloroethene	7.09	96.0	19348	40.11	UG/L	83
20	1,1-Dichloroethane	8.23	63.0	36675	45.71	UG/L	92
21	cis-1,2-Dichloroethene	9.78	96.0	20755	42.49	UG/L	88
23	2-Butanone	9.90	72.0	1317M	67.04	UG/L	91
24	2-Butanone (90)	9.90	43.0	4501	47.34	UG/L	79
25	Chloroform	10.56	83.0	56709	58.11	UG/L	97
26	1,2-Dichloroethane	11.68	62.0	37786	80.33	UG/L	93
27	•1,4-Difluorobenzene	12.43	114.0	56264	50.00	UG/L	89
28	Vinyl Acetate	8.54	43.0	22655	45.09	UG/L	57
29	1,1,1-Trichloroethane	10.88	97.0	49376	66.07	UG/L	98
31	Carbon Tetrachloride	11.21	117.0	57624	67.26	UG/L	95
32	Benzene	11.62	78.0	38922	39.13	UG/L	96
33	Trichloroethene	12.86	130.0	25734	46.00	UG/L	92
34	1,2-Dichloropropane	13.25	63.0	15984	41.55	UG/L	97
36	Bromodichloromethane	13.74	83.0	52573	64.06	UG/L	94
37	2-Chloroethyl vinyl ether	14.29	63.0	6724	50.96	UG/L	99
38	cis-1,3-Dichloropropene	14.49	75.0	25689	50.64	UG/L	86
39	trans-1,3-Dichloropropene	15.41	75.0	18957	60.20	UG/L	93
40	1,1,2-Trichloroethane	15.69	97.0	14784	48.16	UG/L	95
41	Dibromochloromethane	16.27	129.0	43914	58.92	UG/L	95
42	Bromoform	18.45	173.0	36707	57.16	UG/L	98
43	•Chlorobenzene-d5	17.16	117.0	41193	50.00	UG/L	99
44	1,1,2,2-Tetrachloroethane	19.20	83.0	28356	45.93	UG/L	98
45	Toluene	15.02	92.0	24380	42.56	UG/L	99
46	Toluene (90)	15.02	91.0	42512	44.34	UG/L	99
47	4-Methyl-2-Pentanone	14.78	43.0	11430	48.06	UG/L	80
48	Tetrachloroethene	15.86	164.0	27080	51.16	UG/L	90

0000019

Operator ID: MSB
Output File: ^E9043::D1
Data File: >E9043::D5
Name: VSTD050
Misc: MSE;CLS WATER

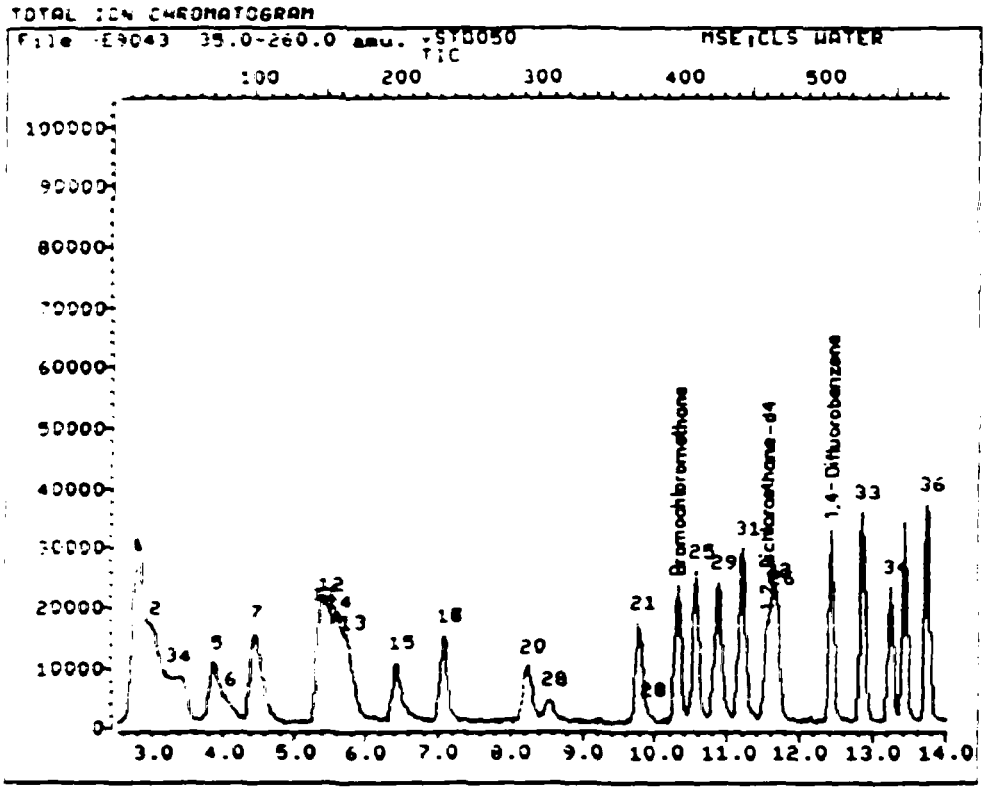
Quant Rev: 7 Quant Time: 940528 03:47
Injected at: 940528 03:18
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E8921::D7
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.10	43.0	6616	50.45	UG/L	79
53)	Chlorobenzene	17.20	112.0	35850	42.79	UG/L	98
54)	1,1,1,2-Tetrachloroethane	17.33	131.0	30098	51.10	UG/L	90
55)	Ethylbenzene	17.37	106.0	14893	43.85	UG/L	94
56)	Xylene (total)	18.16	106.0	19408	43.05	UG/L	95
57)	o-Xylene	18.16	106.0	19408	43.05	UG/L	95
58)	m,p-Xylenes	17.57	106.0	37555	89.09	UG/L	96
59)	Styrene	18.20	104.0	33000	45.55	UG/L	84
72)	1,3-Dichlorobenzene	20.59	146.0	40459	45.56	UG/L	97
74)	1,4-Dichlorobenzene	20.73	146.0	42394	43.87	UG/L	98
75)	1,2-Dichlorobenzene	21.30	146.0	40056	45.59	UG/L	96
82)	Toluene-d8	14.92	98.0	43253	47.21	UG/L	92
83)	Bromofluorobenzene	18.96	95.0	44487	60.51	UG/L	94
84)	*Chlorobromomethane	10.31	128.0	17712	50.00	UG/L	96
85)	1,2-Dichloroethane-d4	11.54	65.0	36023	91.21	UG/L	87

* Compound is ISTD

0000020



Data File: >E9043::D5
Name: STD050
Misc: MSE;CLS WATER

Quant Output File: ^E9043::D1
Instrument ID: MSE

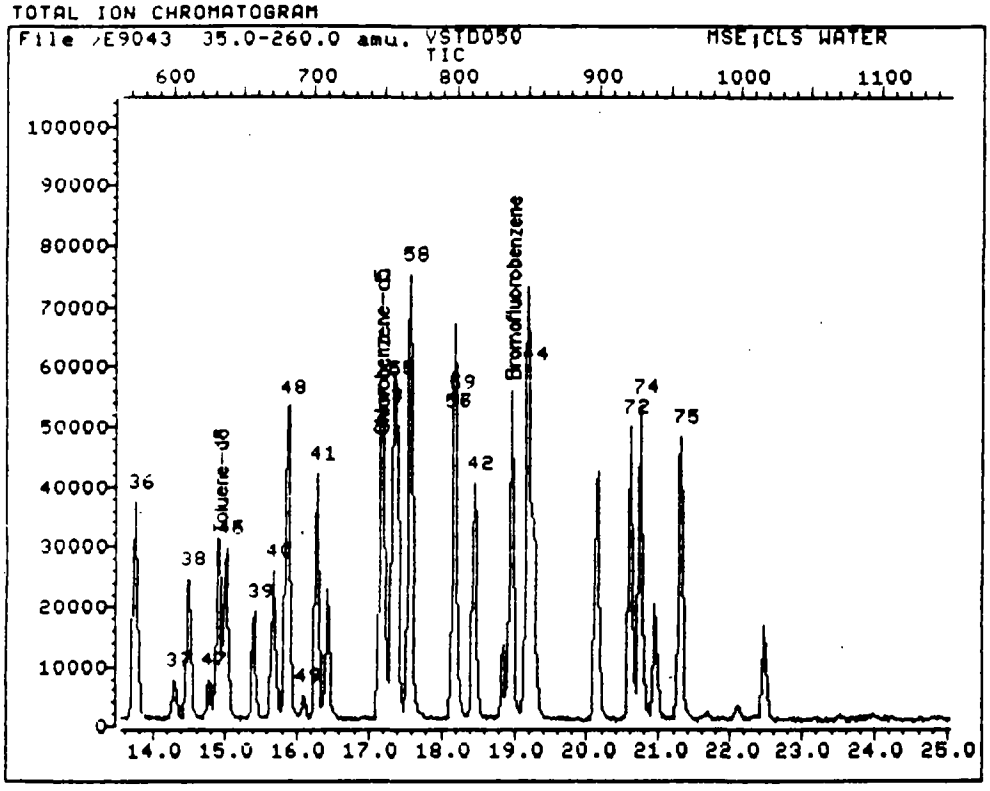
Id File: @E8921::D7
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSB
Quant Time : 940528 03:47
Injected at: 940528 03:18

0000021

TOTAL ION CHROMATOGRAM



Data File: >E9043::D5
Name: VSTD050
Misc: MSE;CLS WATER

Quant Output File: ^E9043::D1
Instrument ID: MSE

Id File: @E8921::D7
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSB
Quant Time : 940528 03:47
Injected at: 940528 03:18

0000022

Operator ID: MSE
Output File: >E9046::01
Data File: >E9046::D5
Name: USTD100
Misc: MSE,CLS,H20

Quant Rev: 7 Quant Time: 940528 05:43
Injected at: 940528 05:15
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

0000023

	Compound	R.T.	Q ion	Area	Conc	Units	q
1.	•Bromochloromethane	10.30	128.0	15837	50.00	UG/L	85
2)	Dichlorodifluoromethane	3.04	85.0	62842	223.59	UG/L	94
3)	Chloromethane	3.27	50.0	19063	82.41	UG/L	86
4)	Vinyl Chloride	3.41	62.0	24388	90.34	UG/L	86
5)	Bromomethane	3.86	94.0	38921	120.29	UG/L	97
6)	Chloroethane	4.04	64.0	18023M	96.40	UG/L	
7)	Trichlorofluoromethane	4.43	101.0	120310	169.81	UG/L	98
11)	1,1-Dichloroethene	5.36	61.0	73820	113.84	UG/L	82
12)	1,1,2-Trichlorotrifluoroethane	5.46	101.0	91374M	94.88	UG/L	93
13)	Carbon Disulfide	5.75	76.0	71538	68.84	UG/L	93
14)	Acetone	5.53	43.0	11058	97.88	UG/L	79
15)	Methylene Chloride	6.40	84.0	37040	73.89	UG/L	94
16)	1,2-Dichloroethene (total)	7.05	96.0	36687	85.06	UG/L	81
17)	trans-1,2-Dichloroethene	7.05	96.0	36687	85.06	UG/L	81
20)	1,1-Dichloroethane	8.22	63.0	72439	100.98	UG/L	92
21)	cis-1,2-Dichloroethene	9.75	96.0	39724	90.95	UG/L	84
23)	2-Butanone	9.89	72.0	1877	106.85	UG/L	86
24)	2-Butanone (90)	9.89	43.0	9181M	108.00	UG/L	99
25)	Chloroform	10.56	83.0	107025	122.65	UG/L	99
26)	1,2-Dichloroethane	11.68	62.0	74086	176.15	UG/L	93
27)	•1,4-Difluorobenzene	12.42	114.0	53009	50.00	UG/L	89
28)	Vinyl Acetate	8.52	43.0	42354	89.47	UG/L	56
29)	1,1,1-Trichloroethane	10.85	97.0	92505	131.38	UG/L	98
31)	Carbon Tetrachloride	11.19	117.0	104124	129.01	UG/L	97
32)	Benzene	11.62	78.0	79452	84.79	UG/L	99
33)	Trichloroethene	12.86	130.0	50179	95.20	UG/L	94
34)	1,2-Dichloropropane	13.25	63.0	32591	89.92	UG/L	95
36)	Bromodichloromethane	13.74	83.0	103898	134.38	UG/L	96
37)	2-Chloroethyl vinyl ether	14.29	63.0	14746	118.61	UG/L	98
38)	cis-1,3-Dichloropropene	14.51	75.0	54607	114.25	UG/L	86
39)	trans-1,3-Dichloropropene	15.41	75.0	39940	134.63	UG/L	88
40)	1,1,2-Trichloroethane	15.68	97.0	30347	104.93	UG/L	96
41)	Dibromochloromethane	16.27	129.0	87281	124.29	UG/L	95
42)	Bromoform	18.47	173.0	72239	119.41	UG/L	96
43)	•Chlorobenzene-d5	17.16	117.0	38386	50.00	UG/L	99
44)	1,1,2,2-Tetrachloroethane	19.20	83.0	56196	97.67	UG/L	97
45)	Toluene	15.02	92.0	49539	92.80	UG/L	97
46)	Toluene (90)	15.02	91.0	86157	96.42	UG/L	97
47)	4-Methyl-2-Pentanone	14.78	43.0	23714	107.01	UG/L	82
48)	Tetrachloroethene	15.86	164.0	58624	118.86	UG/L	87

Operator ID: MSE
Output File: ^E9046::D1
Data File: >E9046::D5
Name: VSTD100
Misc: MSE,CLS,H20

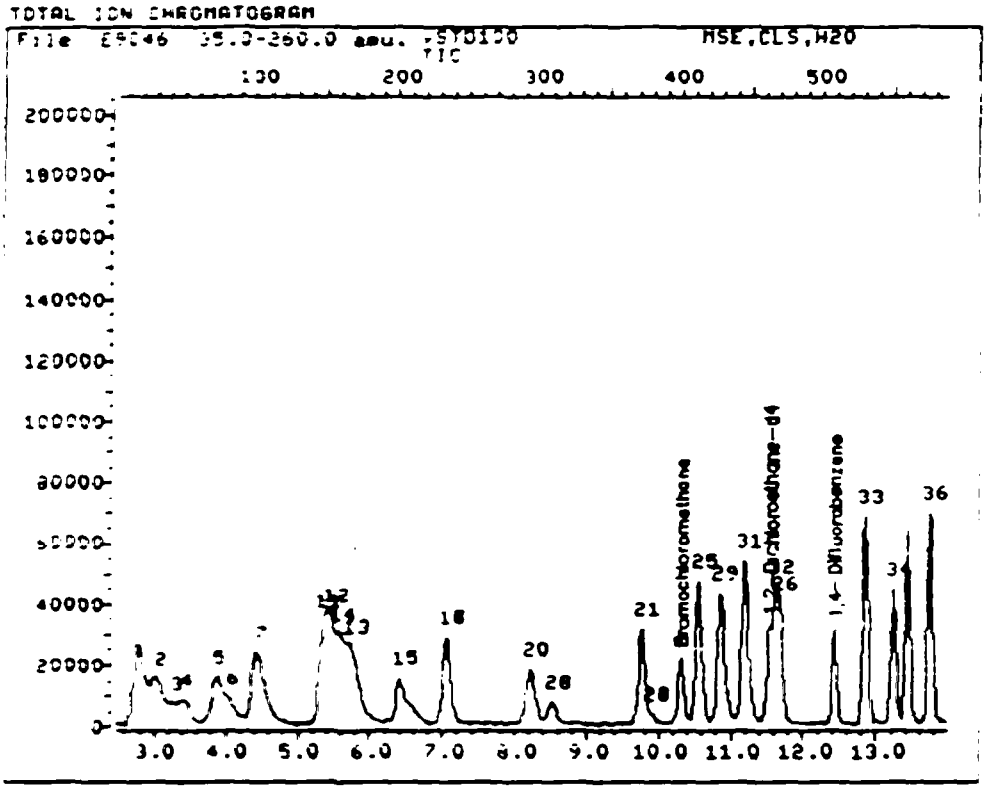
Quant Rev: 7 Quant Time: 940528 05:43
Injected at: 940528 05:15
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

0000024

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.12	43.0	13608	111.35	UG/L	80
53)	Chlorobenzene	17.22	112.0	72153	92.42	UG/L	99
54)	1,1,1,2-Tetrachloroethane	17.35	131.0	58488	106.56	UG/L	89
55)	Ethylbenzene	17.39	106.0	29189	92.23	UG/L	91
56)	Xylene (total)	18.18	106.0	38081	90.65	UG/L	93
57)	o-Xylene	18.18	106.0	38081	90.65	UG/L	93
58)	m,p-Xylenes	17.57	106.0	71833	182.88	UG/L	90
59)	Styrene	18.20	104.0	64427	95.43	UG/L	79
72)	1,3-Dichlorobenzene	20.61	146.0	77640	93.82	UG/L	99
74)	1,4-Dichlorobenzene	20.73	146.0	83838	93.11	UG/L	95
75)	1,2-Dichlorobenzene	21.30	146.0	75880	92.68	UG/L	98
82)	Toluene-d8	14.92	98.0	87369	102.34	UG/L	95
83)	Bromofluorobenzene	18.96	95.0	84209	122.92	UG/L	98
84)	*Chlorobromomethane	10.30	128.0	15837	50.00	UG/L	85
85)	1,2-Dichloroethane-d4	11.54	65.0	63687	180.34	UG/L	84

* Compound is ISTD



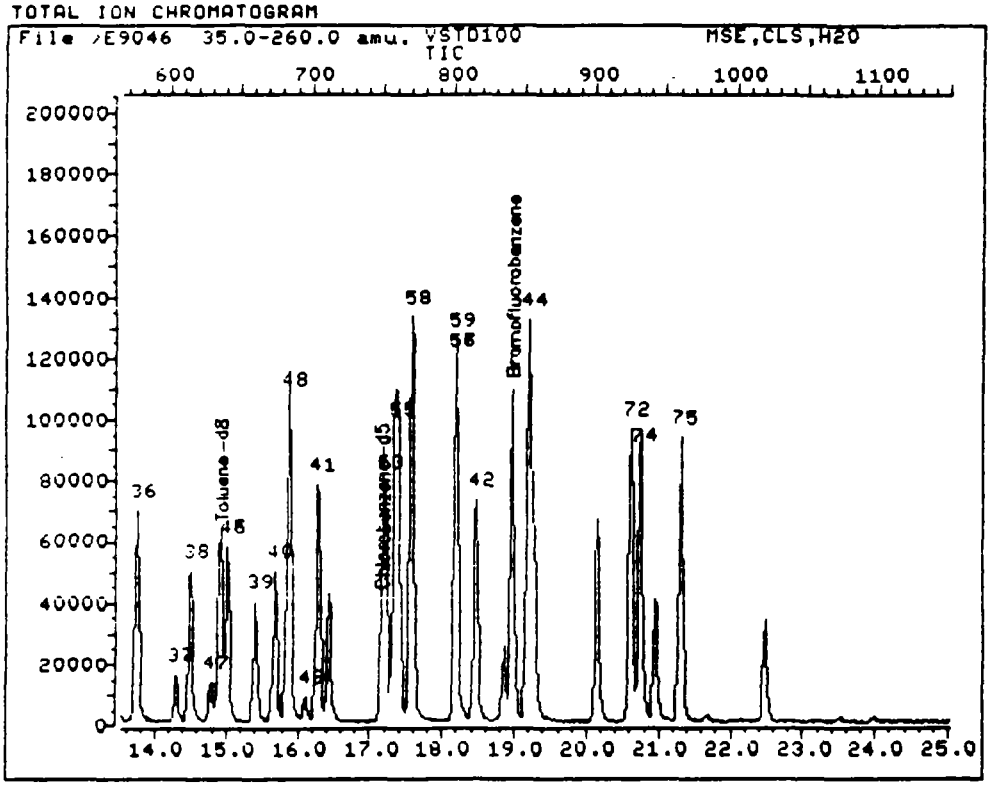
Data File: >E9046::D5 Quant Output File: ^E9046::D1
Name: >STD100 Instrument ID: MSE
Misc: MSE,CLS,H20

Id File: BE9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 05:43
Injected at: 940528 05:15

0000025

TOTAL ION CHROMATOGRAM



Data File: >E9046::D5
Name: VSTD100
Misc: MSE,CLS,H20

Quant Output File: ^E9046::D1
Instrument ID: MSE

Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 05:43
Injected at: 940528 05:15

0000026

Operator ID: MSE
Output File: E9047::D1
Data File: E9047::D5
Name: USTD150
Misc: MSE,CLS,H20

Quant Rev: 7 Quant Time: 940528 06:15
Injected at: 940528 05:48
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

0000027

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	10.31	128.0	18028	50.00	UG/L	96
2)	Dichlorodifluoromethane	3.02	85.0	104616	326.99	UG/L	96
3)	Chloromethane	3.26	50.0	34761	132.01	UG/L	88
4)	Vinyl Chloride	3.41	62.0	42472	138.21	UG/L	96
5)	Bromomethane	3.85	94.0	64294	174.56	UG/L	94
6)	Chloroethane	4.03	64.0	28611M	134.44	UG/L	
7)	Trichlorofluoromethane	4.40	101.0	197947	245.44	UG/L	97
11)	1,1-Dichloroethene	5.34	61.0	125081	169.45	UG/L	85
12)	1,1,2-Trichlorotrifluoroethane	5.44	101.0	157235	143.43	UG/L	91
13)	Carbon Disulfide	5.76	76.0	126753	107.15	UG/L	98
14)	Acetone	5.56	43.0	15421	119.91	UG/L	80
15)	Methylene Chloride	6.40	84.0	64697	113.37	UG/L	95
16)	1,2-Dichloroethene (total)	7.05	96.0	63663	129.67	UG/L	77
17)	trans-1,2-Dichloroethene	7.05	96.0	63663	129.67	UG/L	77
20)	1,1-Dichloroethane	8.23	63.0	126259	154.62	UG/L	94
21)	cis-1,2-Dichloroethene	9.78	96.0	68514	137.80	UG/L	82
23)	2-Butanone	9.90	72.0	2786	139.32	UG/L	77
24)	2-Butanone (90)	9.90	43.0	14770	152.63	UG/L	73
25)	Chloroform	10.57	83.0	181327	182.54	UG/L	98
26)	1,2-Dichloroethane	11.68	62.0	121209	253.17	UG/L	93
27)	*1,4-Difluorobenzene	12.43	114.0	60138	50.00	UG/L	91
28)	Vinyl Acetate	8.52	43.0	58283	108.53	UG/L	54
29)	1,1,1-Trichloroethane	10.86	97.0	161817	202.57	UG/L	99
31)	Carbon Tetrachloride	11.19	117.0	183526	200.43	UG/L	97
32)	Benzene	11.63	78.0	139134	130.88	UG/L	99
33)	Trichloroethene	12.84	130.0	87081	145.62	UG/L	93
34)	1,2-Dichloropropane	13.24	63.0	57781	140.53	UG/L	92
36)	Bromodichloromethane	13.75	83.0	172059	196.15	UG/L	94
37)	2-Chloroethyl vinyl ether	14.30	63.0	24502	173.72	UG/L	97
38)	cis-1,3-Dichloropropene	14.49	75.0	93188	171.86	UG/L	86
39)	trans-1,3-Dichloropropene	15.40	75.0	67922	201.81	UG/L	90
40)	1,1,2-Trichloroethane	15.67	97.0	48700	148.42	UG/L	99
41)	Dibromochloromethane	16.28	129.0	139087	174.58	UG/L	96
42)	Bromoform	18.46	173.0	110786	161.41	UG/L	97
43)	*Chlorobenzene-d5	17.16	117.0	42660	50.00	UG/L	98
44)	1,1,2,2-Tetrachloroethane	19.19	83.0	82358	128.80	UG/L	96
45)	Toluene	15.00	92.0	82416	138.92	UG/L	97
46)	Toluene (90)	15.00	91.0	146781	147.81	UG/L	97
47)	4-Methyl-2-Pentanone	14.79	43.0	35556	144.38	UG/L	75
48)	Tetrachloroethene	15.87	164.0	111801	203.97	UG/L	86

Operator ID: MSE
Output File: ^E9047::D1
Data File: >E9047::D5
Name: VSTD150
Misc: MSE,CLS,H20

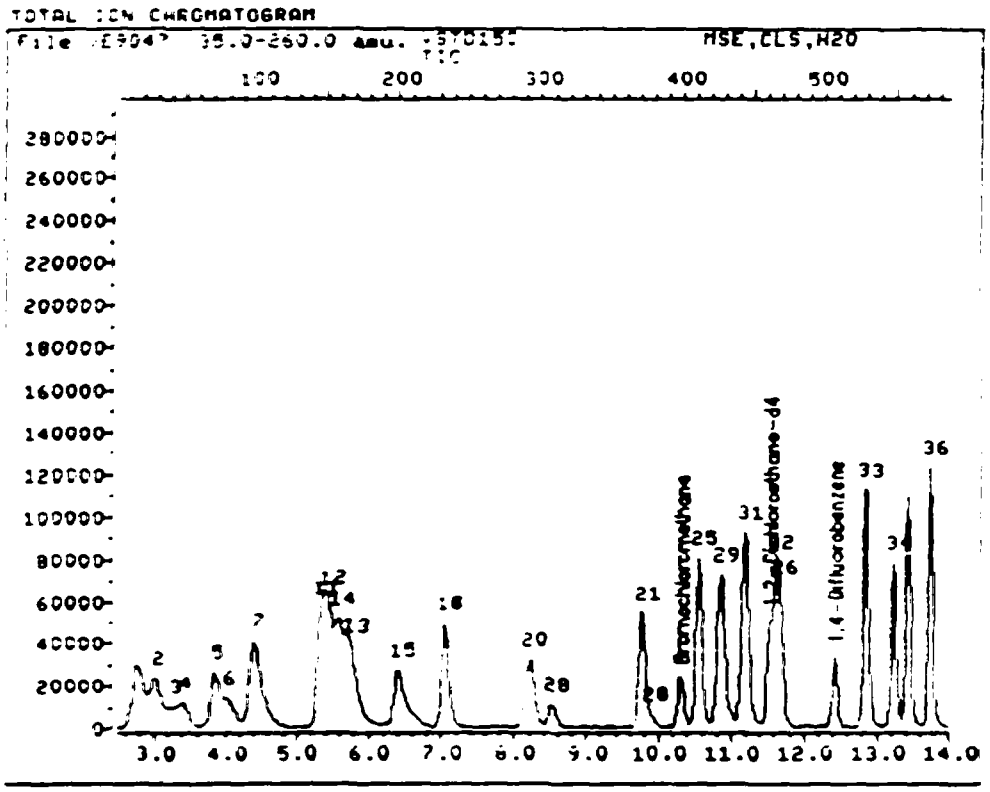
Quant Rev: 7 Quant Time: 940528 06:15
Injected at: 940528 05:48
Dilution Factor: 1.00000
Instrument ID: MSE

0000028

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.10	43.0	19431	143.07	UG/L	78
53)	Chlorobenzene	17.20	112.0	119493	137.72	UG/L	99
54)	1,1,1,2-Tetrachloroethane	17.34	131.0	94607	155.09	UG/L	92
55)	Ethylbenzene	17.38	106.0	46923	133.41	UG/L	91
56)	Xylene (total)	18.17	106.0	62331	133.51	UG/L	93
57)	o-Xylene	18.17	106.0	62331	133.51	UG/L	93
58)	m,p-Xylenes	17.56	106.0	117255	268.61	UG/L	91
59)	Styrene	18.19	104.0	106445	141.88	UG/L	85
72)	1,3-Dichlorobenzene	20.60	146.0	126858	137.94	UG/L	98
74)	1,4-Dichlorobenzene	20.74	146.0	130806	130.71	UG/L	97
75)	1,2-Dichlorobenzene	21.29	146.0	124063	136.35	UG/L	95
82)	Toluene-d8	14.91	98.0	139911	147.46	UG/L	97
83)	Bromofluorobenzene	18.95	95.0	124260	163.21	UG/L	90
84)	*Chlorobromomethane	10.31	128.0	18028	50.00	UG/L	96
85)	1,2-Dichloroethane-d4	11.55	65.0	98117	244.06	UG/L	85

* Compound is ISTD



Data File: >E9047::D5
Name: USTD150
Misc: MSE,CLS,H2O

Quant Output File: ^E9047::D1
Instrument ID: MSE

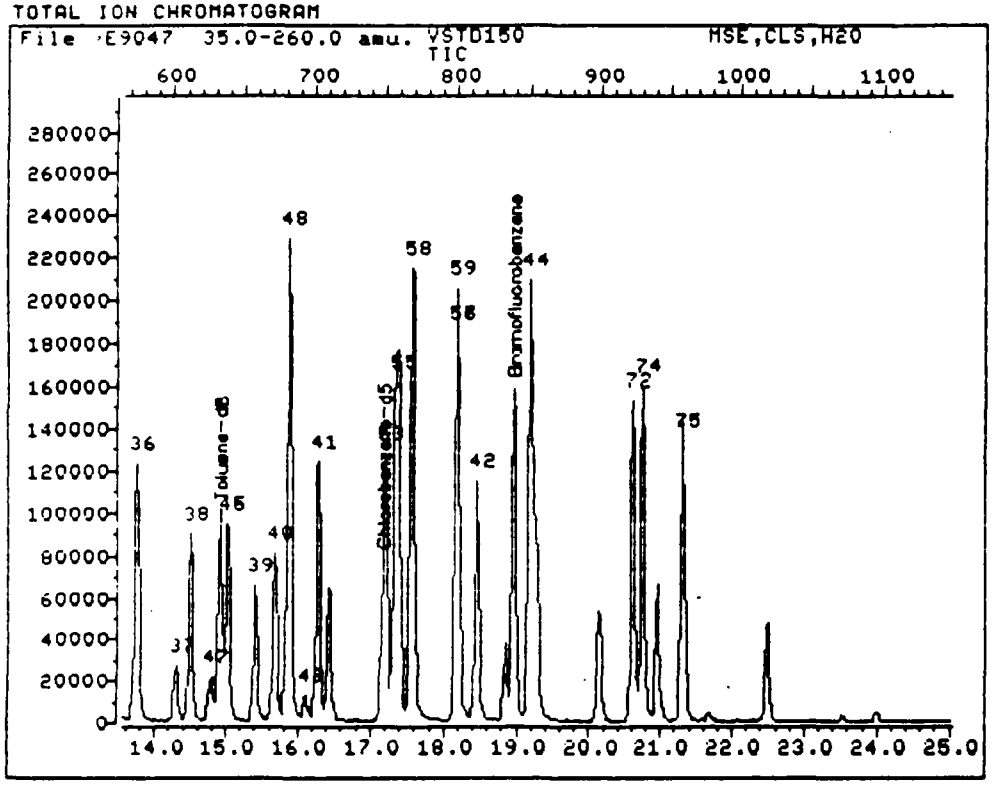
Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 06:15
Injected at: 940528 05:48

0000029

TOTAL ION CHROMATOGRAM



Data File: >E9047::D5 Quant Output File: ^E9047::D1
Name: VSTD150 Instrument ID: MSE
Misc: MSE,CLS,H20

Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 06:15
Injected at: 940528 05:48

000030

QUANT REPORT Page 1

Operator ID: MSE Quant Rev: 7 Quant Time: 940528 06:48
Output File: >E9048::D0 Injected at: 940528 06:20
Data File: >E9048::D5 Dilution Factor: 1.00000
Name: USTD200 Instrument ID: MSE
Misc: MSE,CLS,H20

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

0000031

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	•Bromochloromethane	10.28	128.0	16317	50.00	UG/L	83
2)	Dichlorodifluoromethane	3.01	85.0	123475	426.41	UG/L	96
3)	Chloromethane	3.25	50.0	41456	173.94	UG/L	89
4)	Vinyl Chloride	3.41	62.0	51024	183.45	UG/L	97
5)	Bromomethane	3.86	94.0	76536	229.59	UG/L	96
6)	Chloroethane	4.02	64.0	32701	169.77	UG/L	91
7)	Trichlorofluoromethane	4.37	101.0	227219	311.27	UG/L	96
11)	1,1-Dichloroethene	5.32	61.0	152345	228.03	UG/L	85
12)	1,1,2-Trichlorotrifluoroethane	5.41	101.0	189267	190.75	UG/L	90
13)	Carbon Disulfide	5.75	76.0	151146	141.17	UG/L	99
14)	Acetone	5.57	43.0	19299	165.80	UG/L	86
15)	Methylene Chloride	6.40	84.0	78400	151.79	UG/L	93
16)	1,2-Dichloroethene (total)	7.04	96.0	76549	172.26	UG/L	77
17)	trans-1,2-Dichloroethene	7.04	96.0	76549	172.26	UG/L	77
20)	1,1-Dichloroethane	8.20	63.0	154887	209.57	UG/L	92
21)	cis-1,2-Dichloroethene	9.75	96.0	83725	186.06	UG/L	84
23)	2-Butanone	9.89	72.0	4275	236.20	UG/L	77
24)	2-Butanone (90)	9.91	43.0	21648	247.16	UG/L	75
25)	Chloroform	10.54	83.0	221720	246.61	UG/L	96
26)	1,2-Dichloroethane	11.68	62.0	152170	351.17	UG/L	92
27)	•1,4-Difluorobenzene	12.42	114.0	56470	50.00	UG/L	85
28)	Vinyl Acetate	8.52	43.0	75094	148.91	UG/L	55
29)	1,1,1-Trichloroethane	10.85	97.0	192246	256.29	UG/L	99
31)	Carbon Tetrachloride	11.19	117.0	216491	251.79	UG/L	98
32)	Benzene	11.62	78.0	172909	173.22	UG/L	97
33)	Trichloroethene	12.85	130.0	109470	194.95	UG/L	94
34)	1,2-Dichloropropane	13.25	63.0	73566	190.54	UG/L	95
36)	Bromodichloromethane	13.74	83.0	218915	265.78	UG/L	96
37)	2-Chloroethyl vinyl ether	14.31	63.0	34340	259.29	UG/L	98
38)	cis-1,3-Dichloropropene	14.50	75.0	124065	243.67	UG/L	84
39)	trans-1,3-Dichloropropene	15.41	75.0	91399	289.20	UG/L	90
40)	1,1,2-Trichloroethane	15.68	97.0	66240	214.99	UG/L	94
41)	Dibromochloromethane	16.27	129.0	182913	244.51	UG/L	95
42)	Bromoform	18.47	173.0	150771	233.94	UG/L	99
43)	•Chlorobenzene-d5	17.15	117.0	39334	50.00	UG/L	98
44)	1,1,2,2-Tetrachloroethane	19.22	83.0	113426	192.39	UG/L	99
45)	Toluene	15.01	92.0	107518	196.55	UG/L	96
46)	Toluene (90)	15.01	91.0	191940	209.64	UG/L	97
47)	4-Methyl-2-Pentanone	14.80	43.0	53482	235.53	UG/L	84
48)	Tetrachloroethene	15.88	164.0	144961	286.83	UG/L	84

Operator ID: MSE
Output File: ^E9048::D0
Data File: >E9048::D5
Name: VSTD200
Misc: MSE,CLS,H20

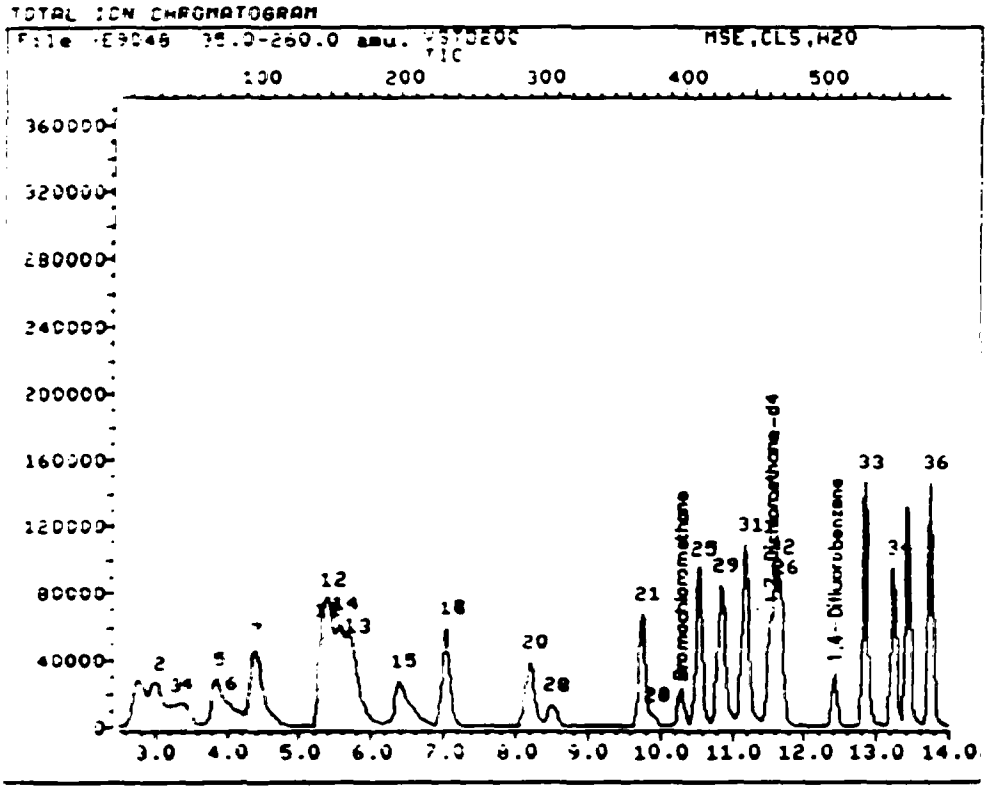
Quant Rev: 7 Quant Time: 940528 06:48
Injected at: 940528 06:20
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9043::D7
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

0000032

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.11	43.0	30274	241.75	UG/L	78
53)	Chlorobenzene	17.21	112.0	155307	194.13	UG/L	97
54)	1,1,1,2-Tetrachloroethane	17.35	131.0	119211	211.95	UG/L	91
55)	Ethylbenzene	17.39	106.0	60754	187.34	UG/L	94
56)	Xylene (total)	18.18	106.0	80407	186.79	UG/L	99
57)	o-Xylene	18.18	106.0	80407	186.79	UG/L	99
58)	m,p-Xylenes	17.57	106.0	149223	370.74	UG/L	93
59)	Styrene	18.20	104.0	137529	198.81	UG/L	84
72)	1,3-Dichlorobenzene	20.61	146.0	162680	191.84	UG/L	99
74)	1,4-Dichlorobenzene	20.75	146.0	170630	184.93	UG/L	96
75)	1,2-Dichlorobenzene	21.30	146.0	159277	189.86	UG/L	97
82)	Toluene-d8	14.92	98.0	181050	206.96	UG/L	99
83)	Bromofluorobenzene	18.96	95.0	164107	233.78	UG/L	92
84)	*Chlorobromomethane	10.28	128.0	16317	50.00	UG/L	83
85)	1,2-Dichloroethane-d4	11.54	65.0	124906	343.28	UG/L	87

* Compound is ISTD

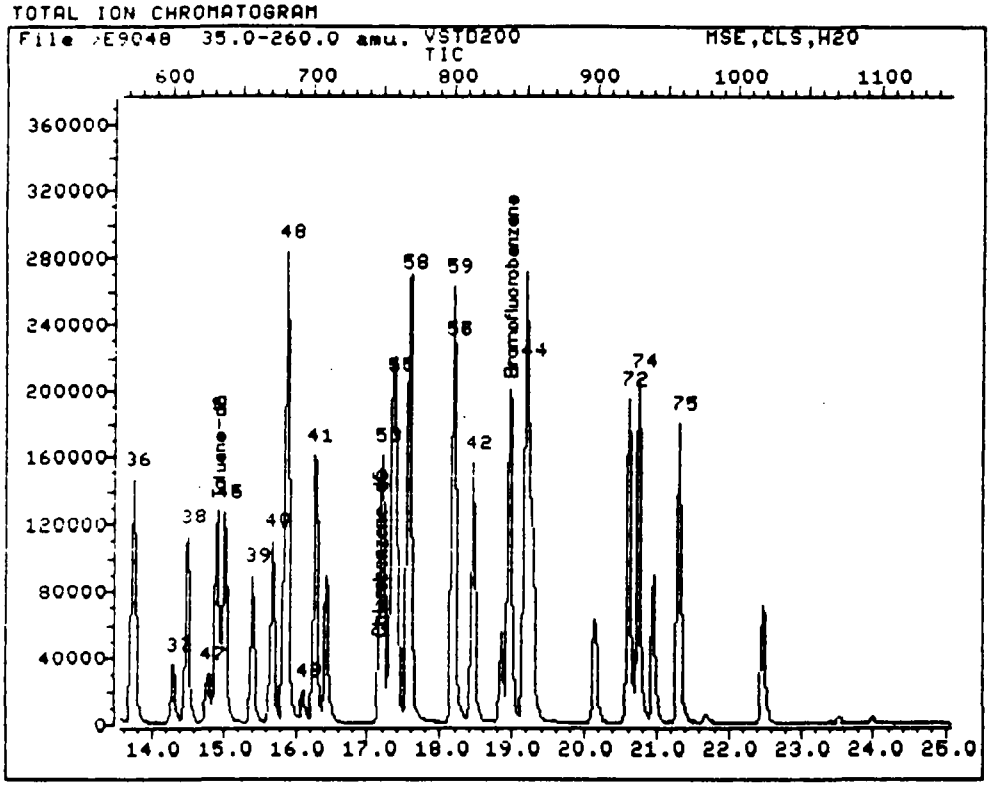


Data File: >E9048::D5 Quant Output File: ^E9048::D0
Name: CSTD200 Instrument ID: MSE
Misc: MSE,CLS,H20

Id File: @E9043::07
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 06:48
Injected at: 940528 06:20

TOTAL ION CHROMATOGRAM



0000034

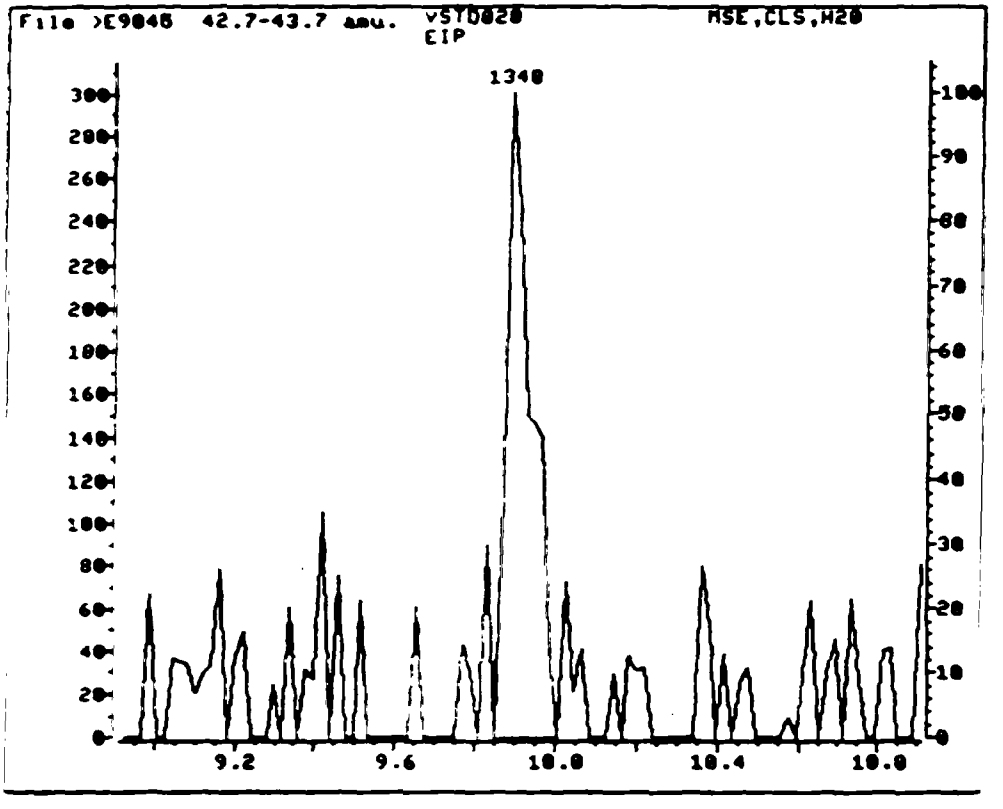
Data File: >E9048::D5
Name: VSTD200
Misc: MSE,CLS,H20

Quant Output File: ^E9048::D0
Instrument ID: MSE

Id File: @E9043::D7
Title: TCL LIST CLP/8240 -H20
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940524 22:00

Operator ID: MSE
Quant Time : 940528 06:48
Injected at: 940528 06:20



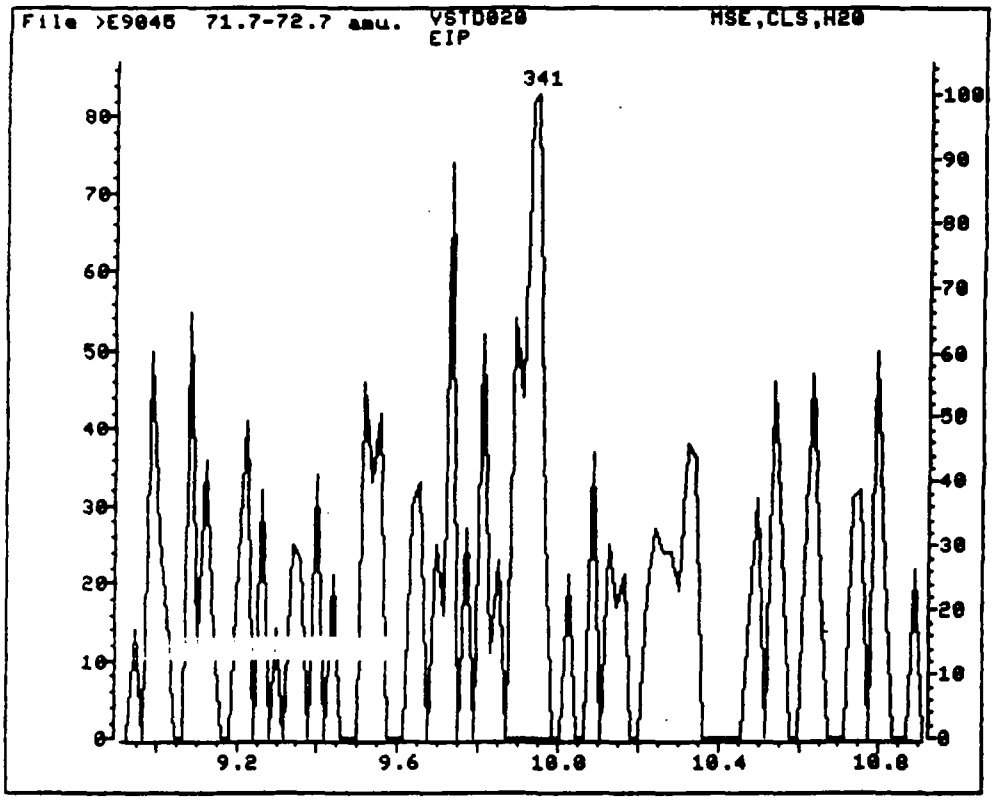
Data File: >E9045::D5
Name: VSTD020
Misc: MSE,CLS,H20
Quant Time: 940528 05:10
Injected at: 940528 04:42

Quant Output File: ^E9045::D1
Instrument ID: MSE
Quant ID File: @E9043::D7
Last Calibration: 940401 12:05

Compound No: 24
Compound Name: 2-Butanone (90)
Scan Number: 376
Retention Time: 9.89 min.
Quant Ion: 43.0
Area: 1348M
Concentration: 18.83 UG/L
q-value: 97

This report was produced by QAREA on: 940601 12:19

0000035



0000036

Data File: >E9045::D5
Name: VSTD020
Misc: MSE,CLS,H20
Quant Time: 940528 05:10
Injected at: 940528 04:42

Quant Output File: ^E9045::D1
Instrument ID: MSE

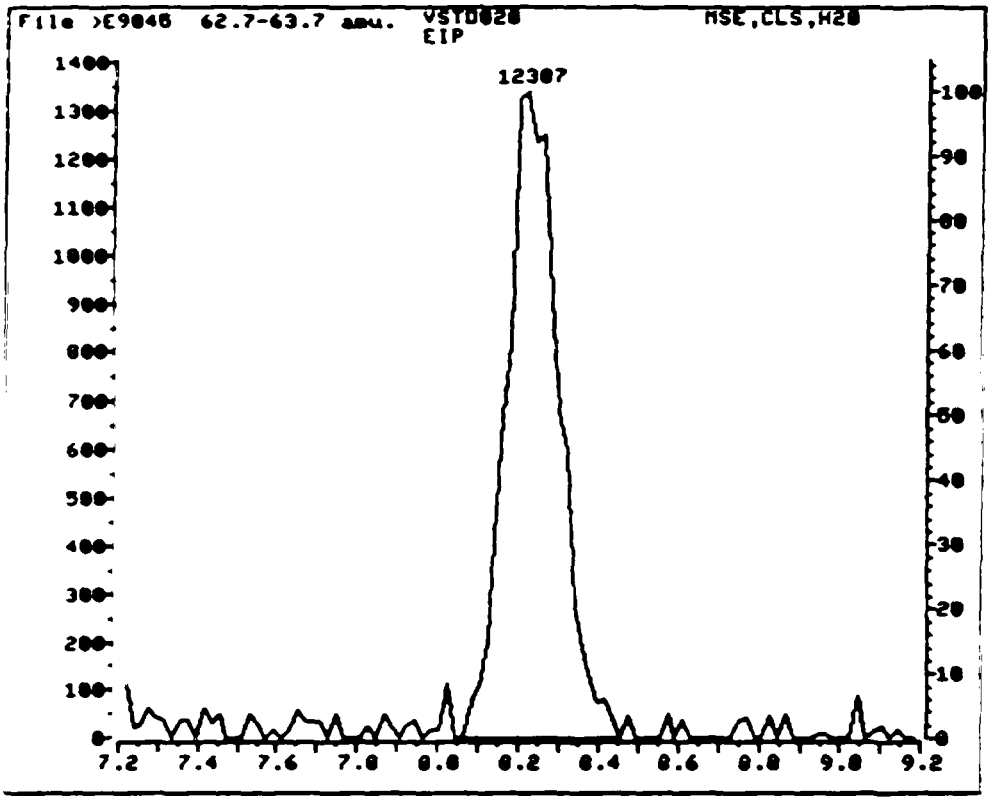
Quant ID File: @E9043::D7
Last Calibration: 940401 12:05

Compound No: 23
Compound Name: 2-Butanone
Scan Number: 379
Retention Time: 9.95 min.
Quant Ion: 72.0
Area: 341M
Concentration: 23.05 UG/L
q-value: 55

(See 2-Butanone '90 for Ion 47)

D. Nuike 06/01/94

This report was produced by QAREA on: 940601 12:17

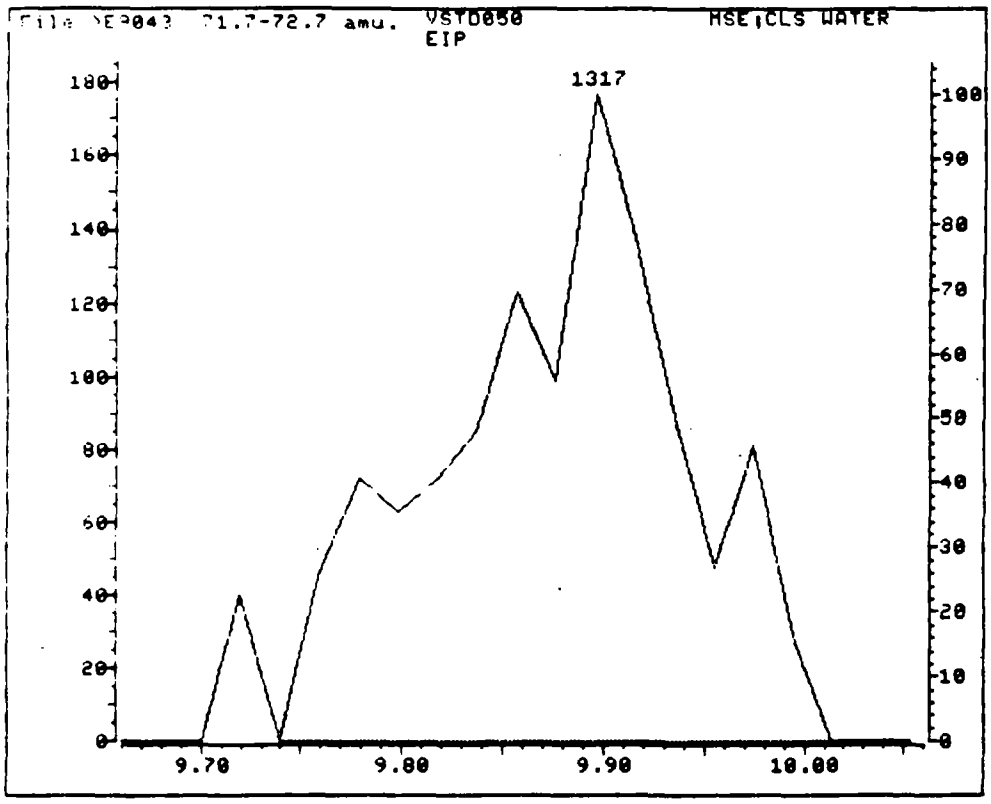


Data File: >E9045::D5 Quant Output File: ^E9045::D1
Name: VSTD020 Instrument ID: MSE
Misc: MSE,CLS,H20
Quant Time: 940528 05:10 Quant ID File: @E9043::D7
Injected at: 940528 04:42 Last Calibration: 940401 12:05

Compound No: 20
Compound Name: 1,1-Dichloroethane
Scan Number: 291
Retention Time: 8.22 min.
Quant Ion: 63.0
Area: 12307M
Concentration: 20.37 UG/L

This report was produced by QAREA on: 940601 12:14

0000037



Data File: >E9043::D5
Name: VSTD050
Misc: MSE;CLS WATER
Quant Time: 940528 03:47
Injected at: 940528 03:18

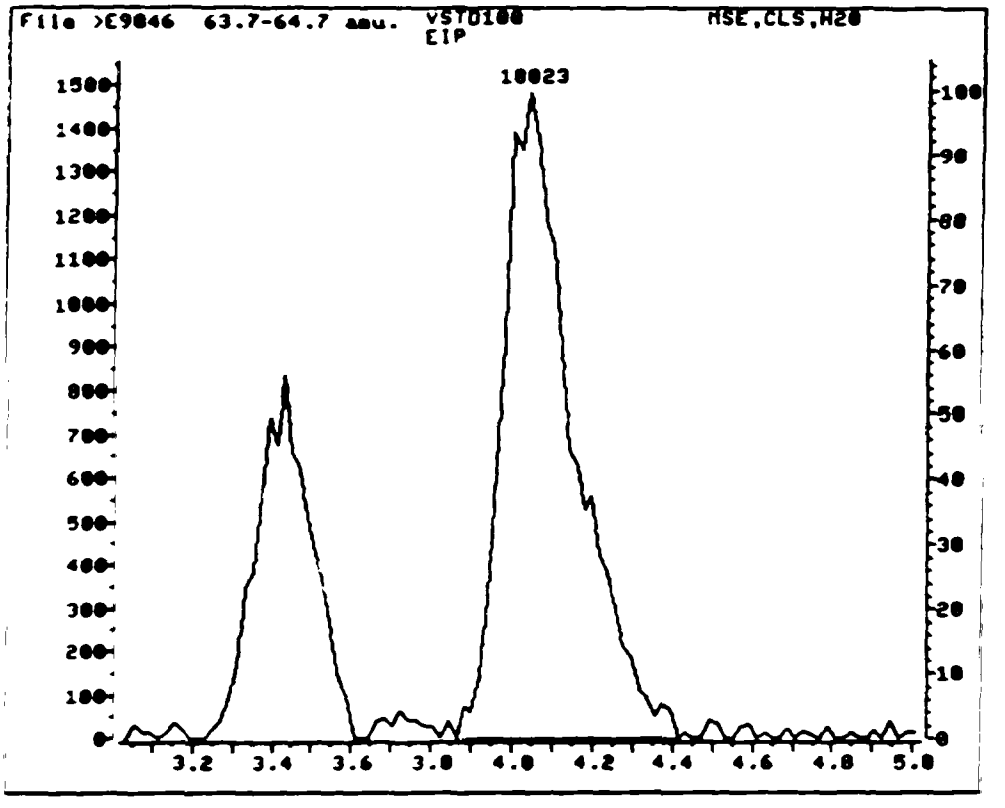
Quant Output File: ^E9043::D1
Instrument ID: MSE
Quant ID File: @E8921::D7
Last Calibration: 940401 12:05

Compound No: 23
Compound Name: 2-Butanone
Scan Number: 377
Retention Time: 9.90 min.
Quant Ion: 72.0
Area: 1317M
Concentration: 67.04 UG/L
q-value: 91

06-01-94

This report was produced by QAREA on: 940601 12:16

0000038



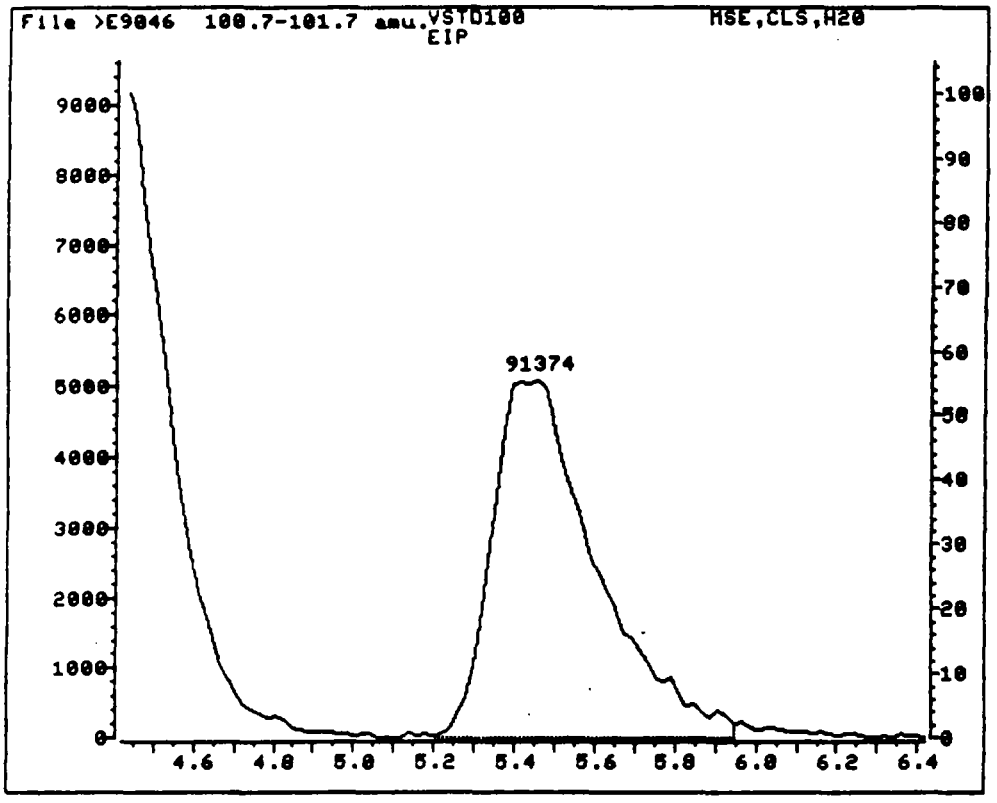
Data File: >E9046::D5
Name: VSTD100
Misc: MSE,CLS,H20
Quant Time: 940528 05:43
Injected at: 940528 05:15

Quant Output File: ^E9046::D1
Instrument ID: MSE
Quant ID File: @E9043::D7
Last Calibration: 940401 12:05

Compound No: 6
Compound Name: Chloroethane
Scan Number: 81
Retention Time: 4.04 min.
Quant Ion: 64.0
Area: 18023M
Concentration: 96.40 UG/L

This report was produced by QAREA on: 940601 12:26

0000039



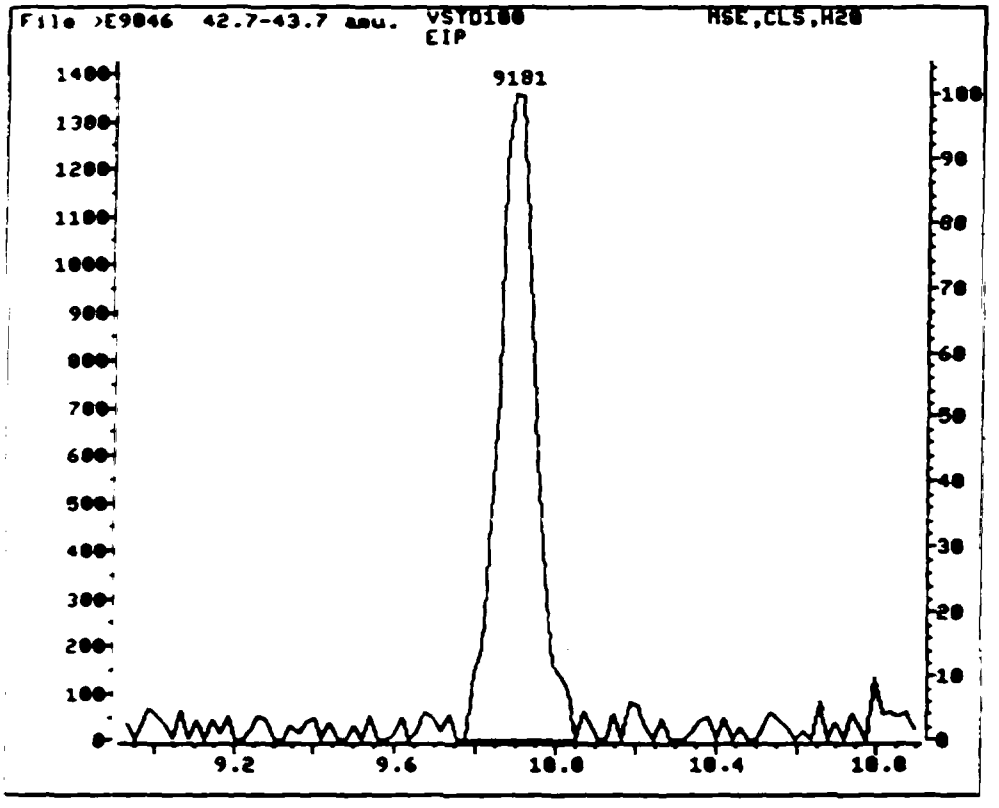
0000040

Data File: >E9046::D5 Quant Output File: ^E9046::D1
Name: VSTD100 Instrument ID: MSE
Misc: MSE,CLS,H20
Quant Time: 940528 05:43 Quant ID File: @E9043::D7
Injected at: 940528 05:15 Last Calibration: 940401 12:05

Compound No: 12
Compound Name: 1,1,2-Trichlorotrifluoroethane
Scan Number: 153
Retention Time: 5.46 min.
Quant Ion: 101.0
Area: 91374M
Concentration: 94.88 UG/L
q-value: 93

06-0-14

This report was produced by QAREA on: 940601 12:32



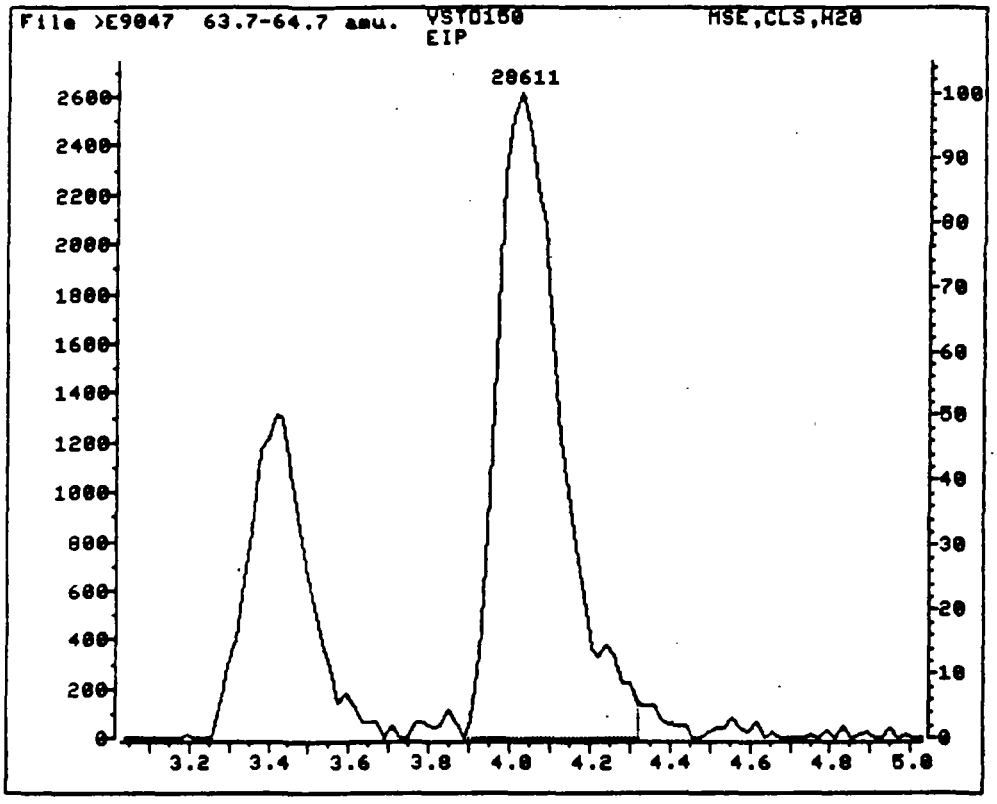
Data File: >E9046::D5
Name: VSTD100
Misc: MSE,CLS,H20
Quant Time: 940528 05:43
Injected at: 940528 05:15

Quant Output File: ^E9046::D1
Instrument ID: MSE
Quant ID File: @E9043::D7
Last Calibration: 940401 12:05

Compound No: 24
Compound Name: 2-Butanone (90)
Scan Number: 379
Retention Time: 9.89 min.
Quant Ion: 43.0
Area: 9181M
Concentration: 108.00 UG/L
q-value: 99

This report was produced by QAREA on: 940601 12:37

0000041



Data File: >E9047::D5
Name: VSTD150
Misc: MSE,CLS,H20
Quant Time: 940528 06:15
Injected at: 940528 05:48

Quant Output File: ^E9047::D1
Instrument ID: MSE
Quant ID File: @E9043::D7
Last Calibration: 940401 12:05

Compound No: 6
Compound Name: Chloroethane
Scan Number: 79
Retention Time: 4.03 min.
Quant Ion: 64.0
Area: 28611M
Concentration: 134.44 UG/L

This report was produced by QAREA on: 940601 12:39

0000042

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Instrument ID: MSE Calibration date: 06/03/94 Time: 1103

Lab File ID: E9146 Init. Calib. Date(s): 05/28/94 05/28/94

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND		$\overline{RRF}$	RRF50	%D	
Chloromethane	#	0.664	0.855	-28.8	#
Vinyl Chloride	*	0.804	0.914	-13.7	*
1,1-Dichloroethene	*	2.284	2.654	-16.2	*
1,1-Dichloroethane	#	2.274	2.416	-6.2	#
Chloroform	*	3.309	3.463	-4.7	*
1,2-Dichloroethane		2.291	2.400	-4.8	
2-Butanone		0.063	0.056	11.1	
Carbon Tetrachloride		1.037	1.105	-6.6	
1,2-Dichloropropane	*	0.307	0.340	-10.8	*
Trichloroethene		0.484	0.507	-4.8	
Benzene		0.758	0.796	-5.0	
Bromoform	#	0.668	0.789	-18.1	#
Tetrachloroethene		0.782	0.612	21.7	
1,1,2,2-Tetrachloroethane	#	0.713	0.707	0.8	#
Toluene	*	0.646	0.648	-0.3	*
Chlorobenzene	#	0.944	0.943	0.1	#
Ethylbenzene	*	0.380	0.396	-4.2	*
Toluene-d8		1.110	0.971	12.5	
Bromofluorobenzene		1.089	1.017	6.6	
1,2-Dichloroethane-d4		1.982	1.896	4.3	

Operator ID: MSE
Output File: ^E9146::D1
Data File: >E9146::D5
Name: VSTD050
Misc: MSE;DN 5.0ML

Quant Rev: 7 Quant Time: 940603 11:30
Injected at: 940603 11:03
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9130::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940602 12:12

0000044

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	10.30	128.0	17875	50.00	UG/L	98
2)	Dichlorodifluoromethane	3.04	85.0	46527	100.21	UG/L	96
3)	Chloromethane	3.24	50.0	15287	74.40	UG/L	93
4)	Vinyl Chloride	3.40	62.0	16340	64.87	UG/L	96
5)	Bromomethane	3.87	94.0	24904	57.09	UG/L	99
6)	Chloroethane	4.02	64.0	12713	63.55	UG/L	66
7)	Trichlorofluoromethane	4.44	101.0	75789	53.17	UG/L	99
11)	1,1-Dichloroethene	5.34	61.0	47432	52.89	UG/L	82
12)	1,1,2-Trichlorotrifluoroethane	5.44	101.0	58738	51.73	UG/L	98
13)	Carbon Disulfide	5.73	76.0	51600	51.09	UG/L	98
14)	Acetone	5.52	43.0	6705	49.30	UG/L	93
15)	Methylene Chloride	6.40	84.0	24490	53.10	UG/L	88
16)	1,2-Dichloroethene (total)	7.07	96.0	23399	51.18	UG/L	76
17)	trans-1,2-Dichloroethene	7.07	96.0	23399	51.18	UG/L	76
20)	1,1-Dichloroethane	8.24	63.0	43182	49.38	UG/L	93
21)	cis-1,2-Dichloroethene	9.77	96.0	23157	51.51	UG/L	80
23)	2-Butanone	9.91	72.0	1001	36.81	UG/L	70
24)	2-Butanone (90)	9.91	43.0	5146	46.00	UG/L	94
25)	Chloroform	10.56	83.0	61894	48.81	UG/L	98
26)	1,2-Dichloroethane	11.70	62.0	42894	48.89	UG/L	94
27)	*1,4-Difluorobenzene	12.44	114.0	59723	50.00	UG/L	91
28)	Vinyl Acetate	8.52	43.0	31427	52.44	UG/L	58
29)	1,1,1-Trichloroethane	10.89	97.0	58984	52.60	UG/L	98
31)	Carbon Tetrachloride	11.21	117.0	66010	52.21	UG/L	97
32)	Benzene	11.64	78.0	47565	53.74	UG/L	95
33)	Trichloroethene	12.87	130.0	30291	52.19	UG/L	92
34)	1,2-Dichloropropane	13.25	63.0	20308	55.75	UG/L	98
36)	Bromodichloromethane	13.76	83.0	61106	50.61	UG/L	96
37)	2-Chloroethyl vinyl ether	14.31	63.0	9760	50.46	UG/L	99
38)	cis-1,3-Dichloropropene	14.52	75.0	34373	49.58	UG/L	83
39)	trans-1,3-Dichloropropene	15.43	75.0	26904	51.03	UG/L	93
40)	1,1,2-Trichloroethane	15.70	97.0	19777	54.10	UG/L	95
41)	Dibromochloromethane	16.31	129.0	56573	53.82	UG/L	98
42)	Bromoform	18.47	173.0	47132	52.96	UG/L	97
43)	*Chlorobenzene-d5	17.17	117.0	50169	50.00	UG/L	99
44)	1,1,2,2-Tetrachloroethane	19.21	83.0	35485	51.07	UG/L	98
45)	Toluene	15.03	92.0	32505	49.35	UG/L	93
46)	Toluene (90)	15.03	91.0	56530	50.49	UG/L	93
47)	4-Methyl-2-Pentanone	14.80	43.0	14652	51.01	UG/L	84
48)	Tetrachloroethene	15.90	164.0	30690	50.45	UG/L	85

Operator ID: MSE
Output File: ^E9146::D1
Data File: >E9146::D5
Name: VSTD050
Misc: MSE;DN 5.0ML

Quant Rev: 7 Quant Time: 940603 11:30
Injected at: 940603 11:03
Dilution Factor: 1.00000
Instrument ID: MSE

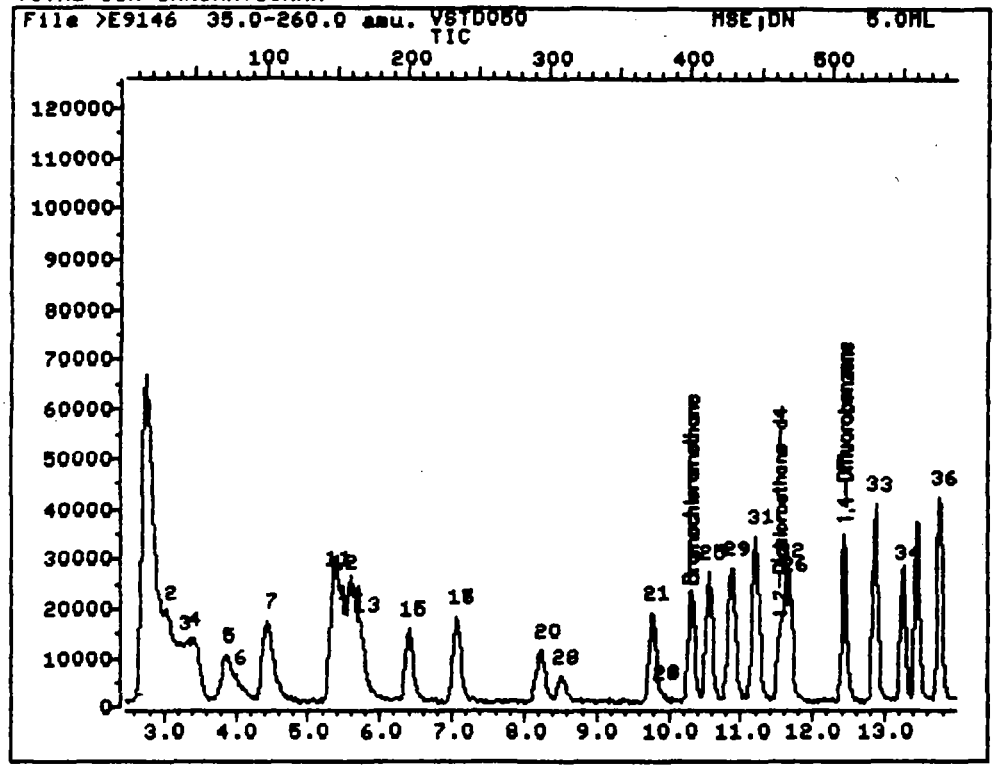
ID File: @E9130::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940602 12:12

0000045

	Compound	R.T.	Q ion	Area	Conc	Units	q
49)	2-Hexanone	16.13	43.0	9149	49.31	UG/L	78
53)	Chlorobenzene	17.23	112.0	47321	50.12	UG/L	99
54)	1,1,1,2-Tetrachloroethane	17.35	131.0	36466	51.79	UG/L	93
55)	Ethylbenzene	17.41	106.0	19878	51.18	UG/L	93
56)	Xylene (total)	18.19	106.0	24948	51.66	UG/L	94
57)	o-Xylene	18.19	106.0	24948	51.66	UG/L	94
58)	m,p-Xylenes	17.59	106.0	49877	104.79	UG/L	91
59)	Styrene	18.21	104.0	38151	51.24	UG/L	82
72)	1,3-Dichlorobenzene	20.61	146.0	52232	50.66	UG/L	96
74)	1,4-Dichlorobenzene	20.75	146.0	55719	50.46	UG/L	96
75)	1,2-Dichlorobenzene	21.31	146.0	50051	51.06	UG/L	98
82)	Toluene-d8	14.94	98.0	48708	48.74	UG/L	96
83)	Bromofluorobenzene	18.98	95.0	51001	50.44	UG/L	97
84)	*Chlorobromomethane	10.30	128.0	17875	50.00	UG/L	98
85)	1,2-Dichloroethane-d4	11.54	65.0	33897	46.86	UG/L	90

* Compound is ISTD

TOTAL ION CHROMATOGRAM



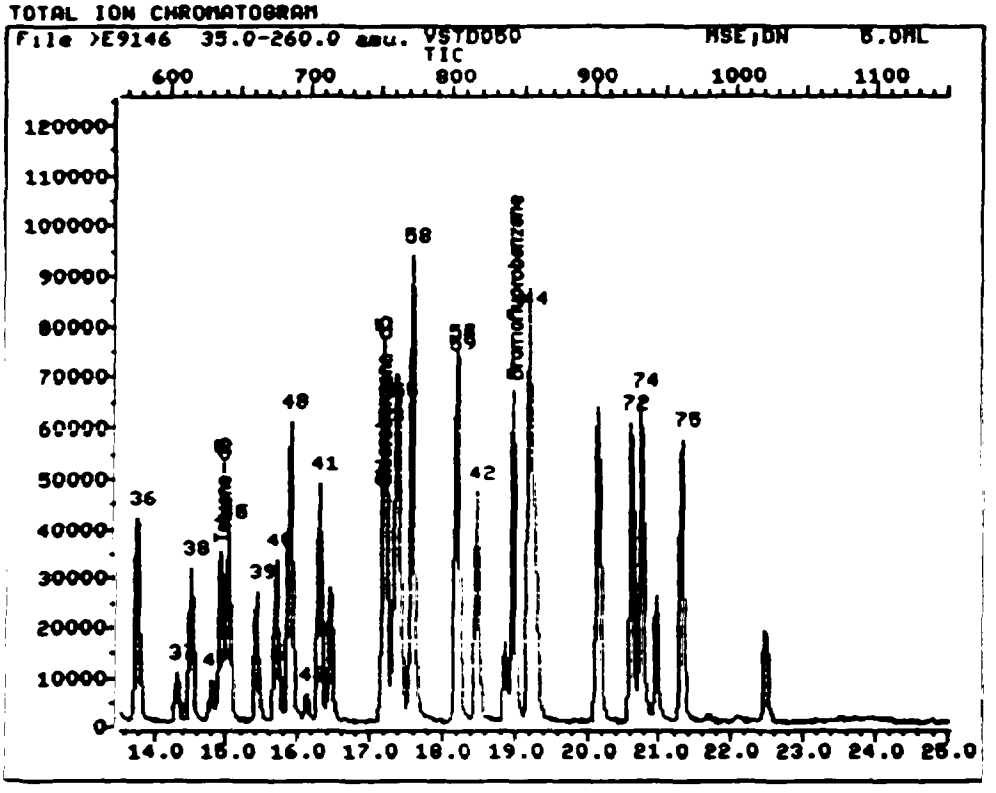
0000046

Data File: >E9146::D5 Quant Output File: ^E9146::D1
Name: VSTD050 Instrument ID: MSE
Misc: MSE;DN 5.0ML

Id File: @E9130::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940602 12:12

Operator ID: MSE
Quant Time : 940603 11:30
Injected at: 940603 11:03

TOTAL ION CHROMATOGRAM



Data File: >E9146::D5 · Quant Output File: ^E9146::D1
Name: VSTD050 Instrument ID: MSE
Misc: MSE;DN 5.0ML

Id File: @E9130::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940602 12:12

Operator ID: MSE
Quant Time : 940603 11:30
Injected at: 940603 11:03

0000047

8A
VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Lab File ID (Standard): E9146 Date Analyzed: 06/03/94

Instrument ID: MSE Time Analyzed: 1103

Matrix:(soil/water) WATER Level:(low/med) LOW Column:(pack/cap) CAP

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	17875	10.30	59723	12.44	50169	17.17
	UPPER LIMIT	35750		119446		100338	
	LOWER LIMIT	8938		29862		25084	
	EPA SAMPLE NO.						
01	CD-S78E18N23	17725	10.33	60619	12.45	48963	17.18
02	CD-S81E5N23	13394	10.31	44714	12.44	37711	17.17
03	VEXTBLK01	15367	10.31	49381	12.43	41707	17.18
04	VSPK01	14146	10.31	47458	12.43	38683	17.16
05	VBLK01	18630	10.35	60506	12.47	50530	17.19

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

0000048

2A
WATER VOLATILE SURROGATE RECOVERY

RAW QC

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	27.98	27.98	Ok
75	30-60% of mass 95	58.66	58.66	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.96	7.96	Ok
173	Less than 2% of mass 174	.85	1.20	Ok
174	Greater than 50% of mass 95	70.85	70.85	Ok
175	5-9% of mass 174	5.63	7.95	Ok
176	95-101% of mass 174	67.78	95.66	Ok
177	5-9% of mass 176	4.75	7.01	Ok

Injection Date: 05/28/94
Injection Time: 02:16
Data File: >EE056
Scan: 97

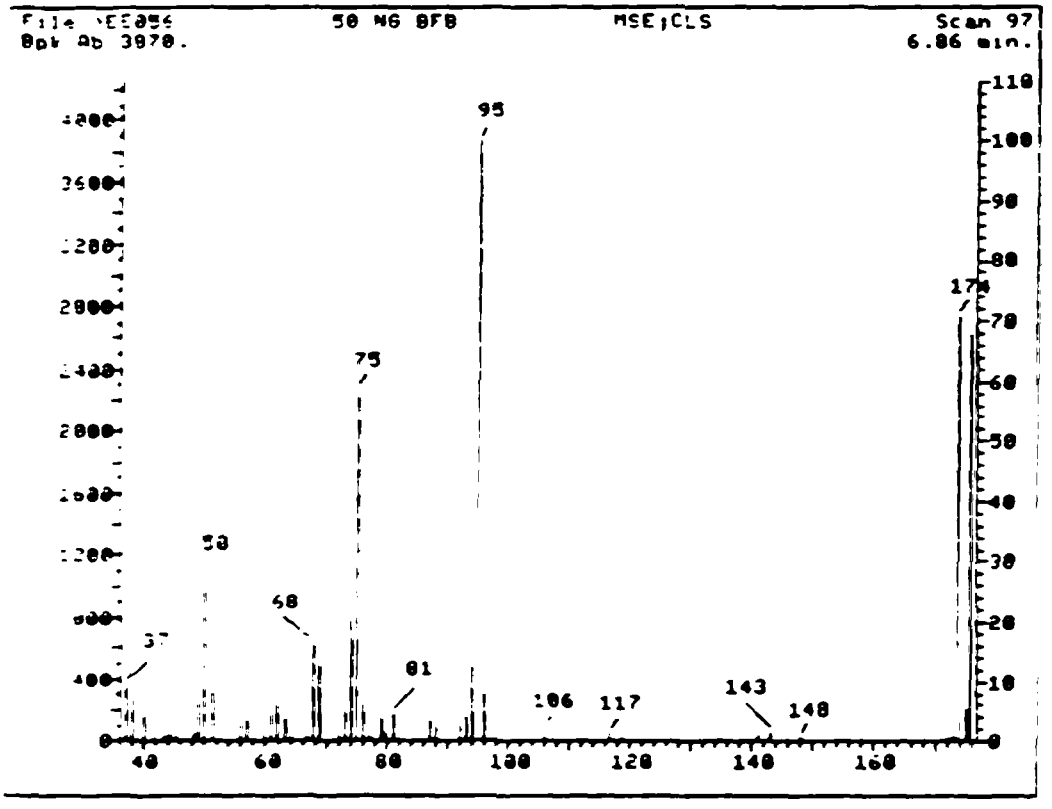
0000049

MS data file header from : >EE056::D5

Sample: 50 NG BFB Operator: MSB REG. GRP. 5/28/94 2:16
Misc : MSE;CLS
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

06-01-94



0000050

MS data file header from : >EE056::D5

Sample: 50 NG BFB Operator: MSB REG. GRP. 5/28/94 2:16
Misc : MSE;CLS
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

>EE056 50 NG BFB MSE;CLS
97 NRM

File: >EE056 Scan #: 97 Retn. time: 6.86

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
36.00	1.576	49.00	6.512	68.95	12.739	87.95	2.532	140.95	1.137
37.00	9.276	50.00	27.984	72.15	1.059	88.15	2.584	142.85	1.473
38.00	7.080	51.10	8.295	73.05	5.297	92.05	2.739	147.85	.594
40.00	4.031	56.00	2.817	74.05	20.310	93.05	4.005	148.25	.388
41.50	.879	57.00	3.488	75.05	58.656	94.05	12.661	172.25	.439
43.20	.879	59.95	1.447	76.05	6.202	95.05	100.000	172.55	.439
43.40	.879	60.95	7.080	77.25	.879	96.05	7.959	173.05	.853
44.10	2.326	61.95	6.512	78.95	3.953	106.00	1.628	173.95	70.853
44.80	.543	63.05	3.669	79.85	1.344	116.80	1.344	175.00	5.633
45.20	.749	64.15	.646	80.95	4.574	118.70	.775	175.90	67.778
48.10	.982	66.95	.749	87.05	3.437	134.60	.465	176.90	4.755
48.40	1.111	67.95	15.917						

MS data file header from : >EE056::D5

Sample: 50 NG BFB Operator: MSB REG. GRP. 5/28/94 2:16
Misc : MSE;CLS
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures : 90. 200. 0. 0. 0.
Chromatographic times, min. : 1.0 10.0 0.0 0.0 0.0
Chromatographic rate, deg/min: 11.0 0.0 0.0 .1 0.0

000051

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	23.01	23.01	Ok
75	30-60% of mass 95	50.84	50.84	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.78	7.78	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	75.44	75.44	Ok
175	5-9% of mass 174	5.72	7.59	Ok
176	95-101% of mass 174	73.30	97.16	Ok
177	5-9% of mass 176	4.65	6.35	Ok

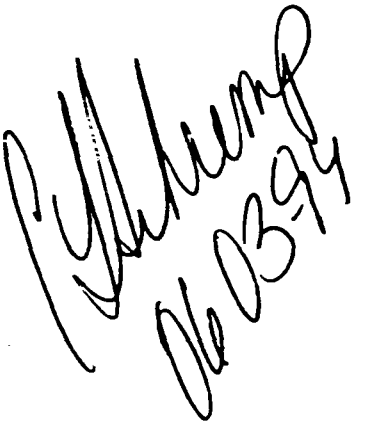
Injection Date: 06/03/94
Injection Time: 10:39
Data File: >EE066
Scan: 96

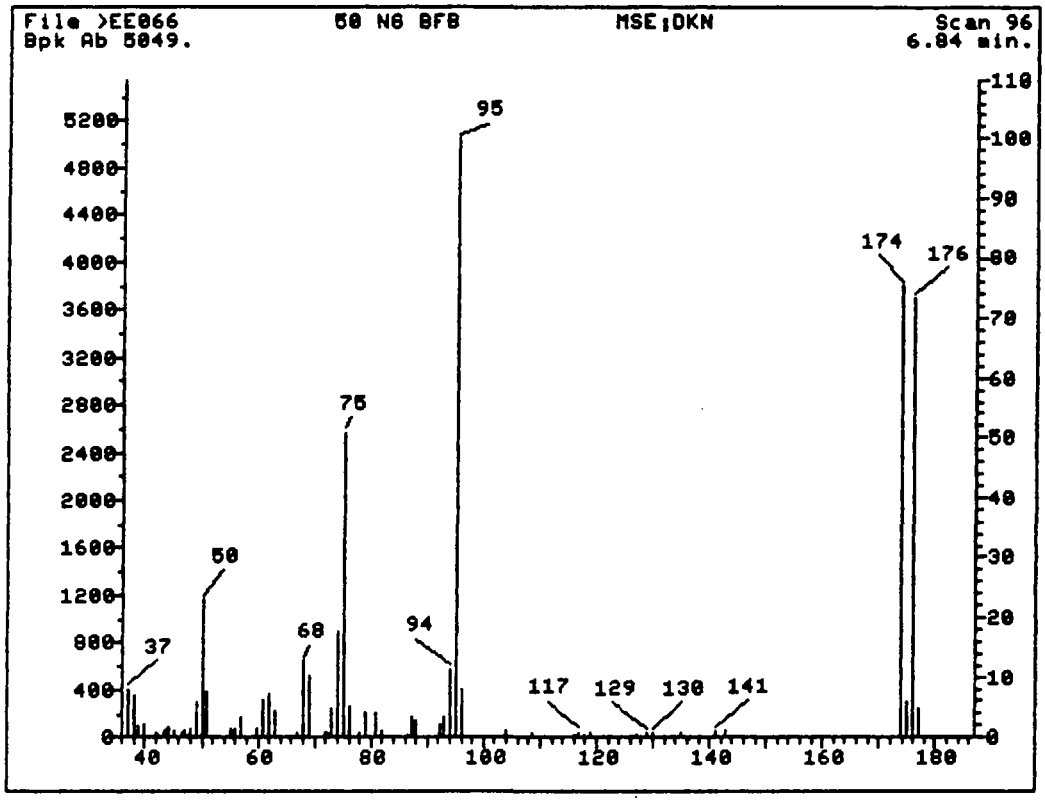
0000052

MS data file header from : >EE066::D5

Sample: 50 NG BFB Operator: MSE REG. GRP. 6/03/94 10:39
Misc : MSE;DKN
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0





000053

MS data file header from : >EE066::D5

Sample: 50 NG BFB Operator: MSE REG. GRP. 6/03/94 10:39
Misc : MSE;DKN
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

>EE066 50 NG BFB MSE;DKN
96 NRM

File: >EE066 Scan #: 96 Retn. time: 6.84

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
36.00	3.466	47.00	.931	63.05	4.417	81.95	1.248	118.00	.436
37.00	7.863	47.70	.495	66.95	.753	86.45	.555	119.00	.594
38.00	6.694	48.00	1.327	67.95	12.775	87.05	3.466	127.10	.357
38.90	1.842	48.20	1.327	68.95	10.240	88.05	2.931	128.80	.713
39.80	1.961	49.00	5.902	72.05	.772	92.05	2.258	129.90	.733
42.00	.753	50.00	23.014	72.35	.654	92.95	3.545	135.10	.614
42.30	.456	51.00	7.526	73.05	4.971	94.05	11.388	140.85	.970
43.50	1.010	55.00	1.545	73.95	17.607	95.05	100.000	142.85	.970
43.80	1.327	56.00	1.386	74.95	50.842	96.05	7.784	173.95	75.441
44.10	1.723	57.00	3.347	76.05	5.011	103.90	.931	174.90	5.724
45.00	1.248	59.95	1.604	78.05	.852	108.50	.812	175.90	73.302
46.50	.654	60.95	6.179	78.85	4.219	115.90	.495	176.90	4.654
46.80	.891	62.05	7.289	80.85	4.238	116.80	.911	187.10	.416

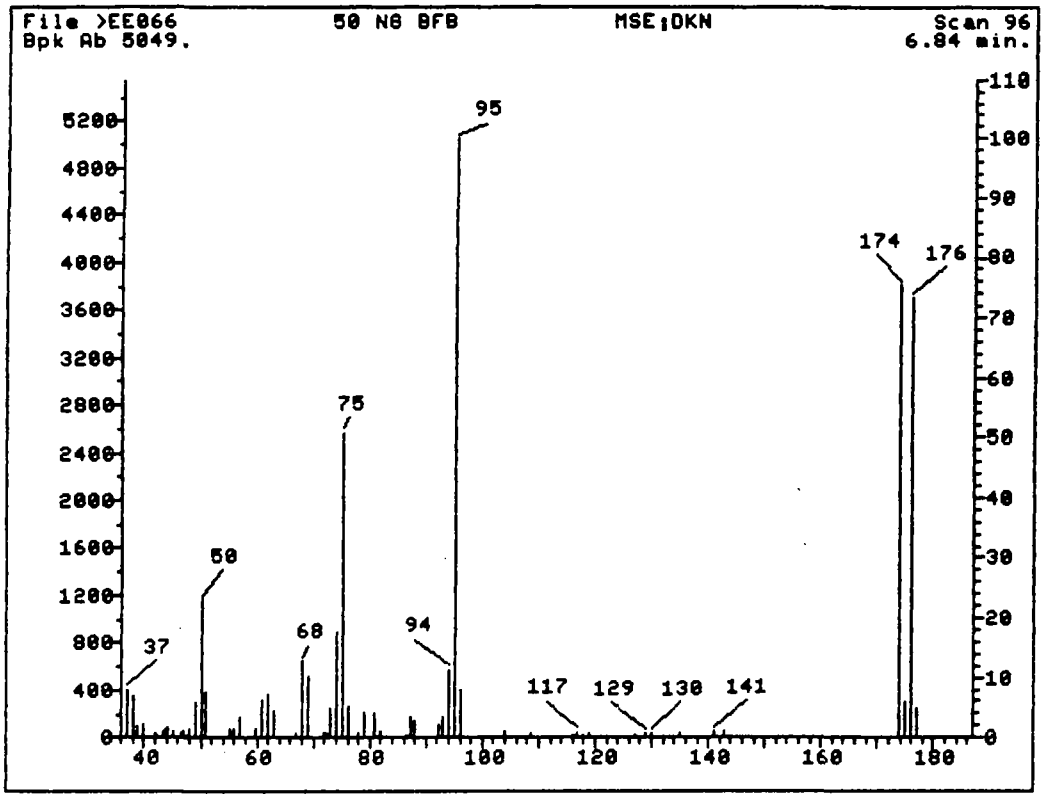
MS data file header from : >EE066::D5

Sample: 50 NG BFB Operator: MSE REG. GRP. 6/03/94 10:39
Misc : MSE;DKN
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

000054

METHOD BLANK DATA



0000053

MS data file header from : >EE066::D5

Sample: 50 NG BFB Operator: MSE REG. GRP. 6/03/94 10:39
Misc : MSE;DKN
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

>EE066 50 NG BFB MSE;DKN
96 NRM

File: >EE066 Scan #: 96 Retn. time: 6.84

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
36.00	3.466	47.00	.931	63.05	4.417	81.95	1.248	118.00	.436
37.00	7.863	47.70	.495	66.95	.753	86.45	.555	119.00	.594
38.00	6.694	48.00	1.327	67.95	12.775	87.05	3.466	127.10	.357
38.90	1.842	48.20	1.327	68.95	10.240	88.05	2.931	128.80	.713
39.80	1.961	49.00	5.902	72.05	.772	92.05	2.258	129.90	.733
42.00	.753	50.00	23.014	72.35	.654	92.95	3.545	135.10	.614
42.30	.456	51.00	7.526	73.05	4.971	94.05	11.388	140.85	.970
43.50	1.010	55.00	1.545	73.95	17.607	95.05	100.000	142.85	.970
43.80	1.327	56.00	1.386	74.95	50.842	96.05	7.784	173.95	75.441
44.10	1.723	57.00	3.347	76.05	5.011	103.90	.931	174.90	5.724
45.00	1.248	59.95	1.604	78.05	.852	108.50	.812	175.90	73.302
46.50	.654	60.95	6.179	78.85	4.219	115.90	.495	176.90	4.654
46.80	.891	62.05	7.289	80.85	4.238	116.80	.911	187.10	.416

MS data file header from : >EE066::D5

Sample: 50 NG BFB Operator: MSE REG. GRP. 6/03/94 10:39
Misc : MSE;DKN
Sys. #: 1 MS model: 70 SW/HW rev.: LF ALS # : 0 Equip ID: MSE
Method file: M_EE Tuning file: T_E No. of extra records: 2
Source temp.: N/A Analyzer temp.: N/A Transfer line temp. : 0

Chromatographic temperatures :	90.	200.	0.	0.	0.
Chromatographic times, min. :	1.0	10.0	0.0	0.0	0.0
Chromatographic rate, deg/min:	11.0	0.0	0.0	.1	0.0

0000054

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCBLK38799

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E9148

Level: (low/med) LOW Date Received:

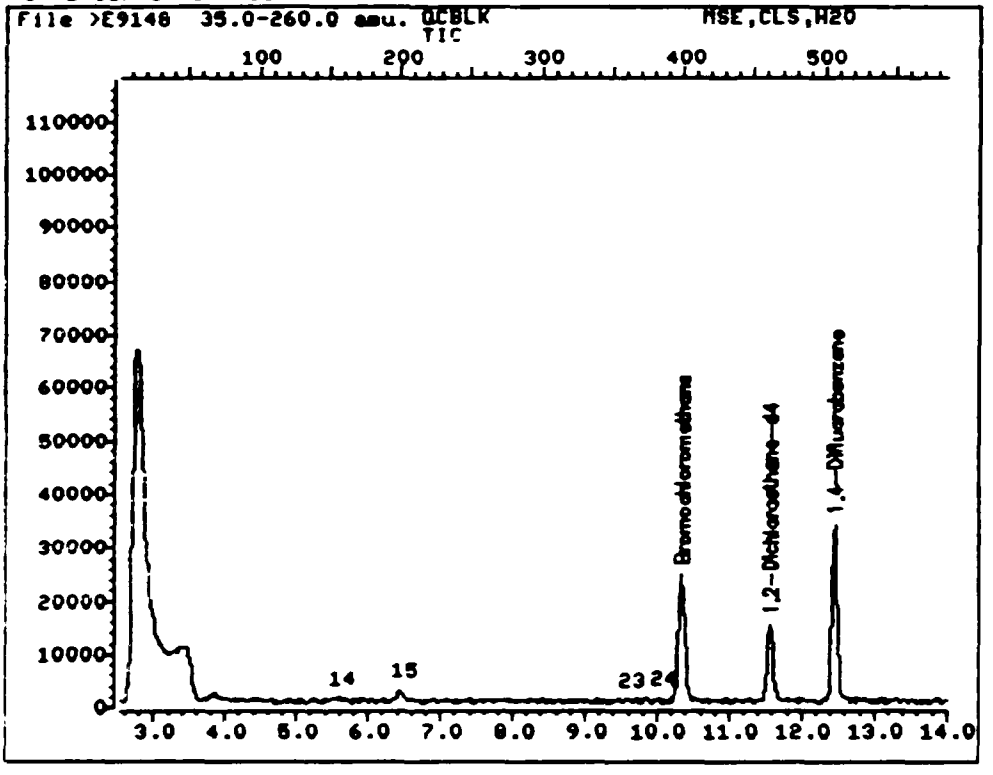
% Moisture: not dec. Date Analyzed: 06/03/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	10	U
75-35-4	1,1-Dichloroethene	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
56-23-5	Carbon Tetrachloride	5	U
79-01-6	Trichloroethene	5	U
71-43-2	Benzene	5	U
127-18-4	Tetrachloroethene	5	U
108-90-7	Chlorobenzene	5	U

0000055

TOTAL ION CHROMATOGRAM



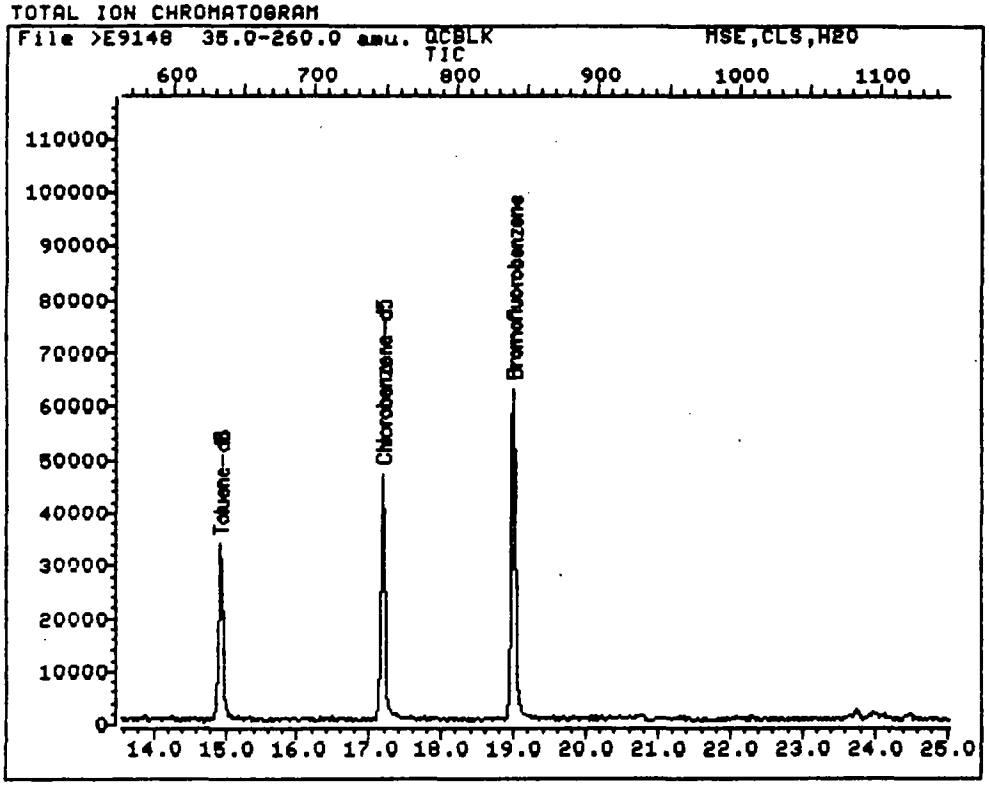
Data File: >E9148::D7 Quant Output File: ^E9148::D2
Name: QCBLK Instrument ID: MSE
Misc: MSE,CLS,H2O

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSE
Quant Time : 940603 13:38
Injected at: 940603 13:10

0000056

TOTAL ION CHROMATOGRAM



0000057

Data File: >E9148::D7 Quant Output File: ^E9148::D2
Name: QCBLK Instrument ID: MSE
Misc: MSE,CLS,H20

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSE
Quant Time : 940603 13:38
Injected at: 940603 13:10

QUANT REPORT Page 1

Operator ID: MSE
Output File: ^E9148::D2
Data File: >E9148::D7
Name: QCBLK
Misc: MSE,CLS,H20

Quant Rev: 7 Quant Time: 940603 13:38
Injected at: 940603 13:10
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9146::D5
Title: TCL LIST CLP/8240 -H20 Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

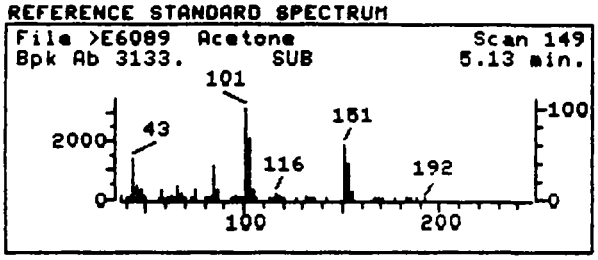
0000058

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	•Bromochloromethane	10.35	128.0	18630	50.00	UG/L	91
14)	Acetone	5.58	43.0	2076	14.85	UG/L	26
15)	Methylene Chloride	6.44	84.0	3246	6.36	UG/L	76
~~23)~~	~~2-Butanone~~	~~9.58~~	~~72.0~~	~~55~~	~~2.64~~	~~UG/L~~	~~7~~
~~24)~~	~~2-Butanone (90)~~	~~10.03~~	~~43.0~~	~~119~~	~~1.07~~	~~UG/L~~	~~79~~
27)	•1,4-Difluorobenzene	12.47	114.0	60506	50.00	UG/L	88
43)	•Chlorobenzene-d5	17.19	117.0	50530	50.00	UG/L	97
82)	Toluene-d8	14.94	98.0	47437	48.35	UG/L	97
83)	Bromofluorobenzene	19.00	95.0	48884	47.58	UG/L	96
84)	•Chlorobromomethane	10.35	128.0	18630	50.00	UG/L	91
85)	1,2-Dichloroethane-d4	11.56	65.0	32102	45.43	UG/L	90

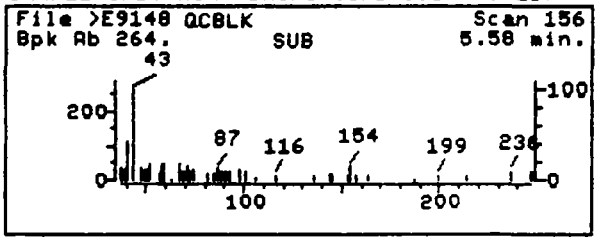
• Compound is ISTD

6/03/94

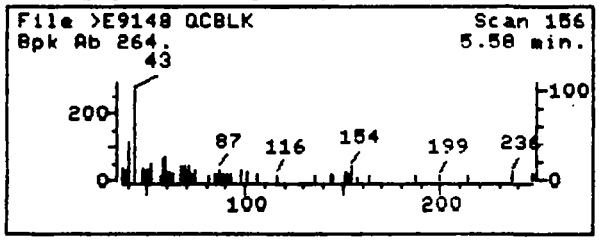
REFERENCE STANDARD SPECTRUM

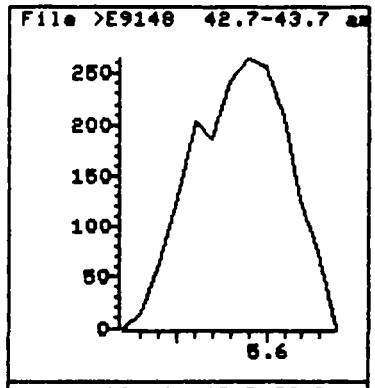


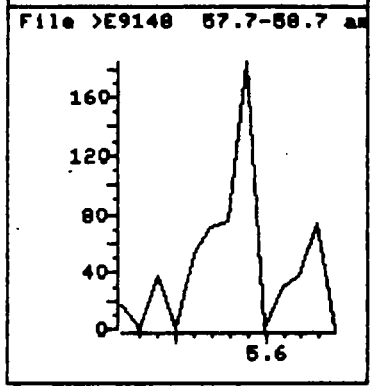
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)







0000059

Data File: >E9148::D7
Name: QCBLK
Misc: MSE,CLS,H20
Quant Time: 940603 13:38
Injected at: 940603 13:10
Last Qcal Time: 940603 11:03

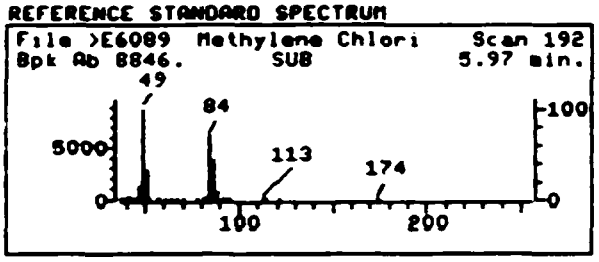
Quant Output File: ^E9148::D2
Instrument ID: MSE

Quant ID File: @E9146::D5
Last Calibration: 940401 12:05

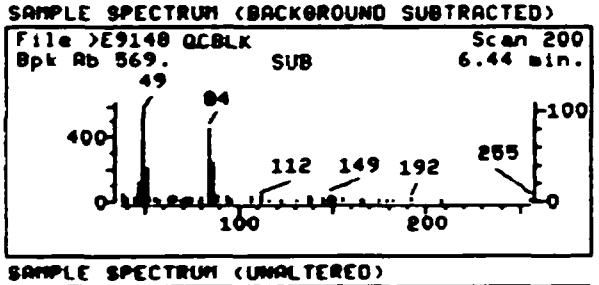
Compound No : 14
Compound Name : Acetone
Scan Number : 156
Retention Time: 5.58 min.
Quant Ion : 43.0
Area : 2076
Concentration : 14.85 UG/L
q-value : 26

✓ 6/03/94

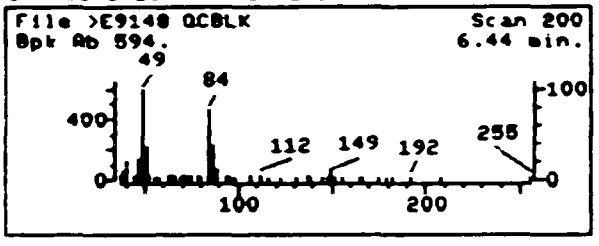
REFERENCE STANDARD SPECTRUM

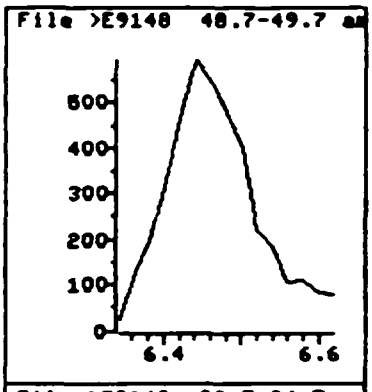


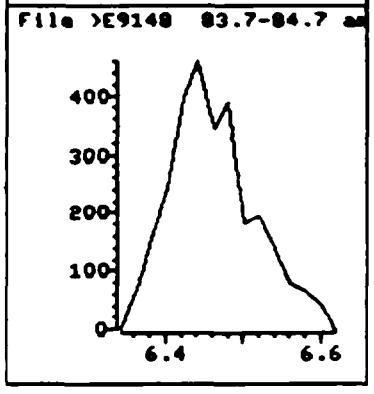
SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)







Data File: >E9148::D7
Name: QCBLK
Misc: MSE,CLS,H20
Quant Time: 940603 13:38
Injected at: 940603 13:10
Last Qcal Time: 940603 11:03

Quant Output File: ^E9148::D2
Instrument ID: MSE

Quant ID File: E9146::D5
Last Calibration: 940401 12:05

Compound No : 15
Compound Name : Methylene Chloride
Scan Number : 200
Retention Time: 6.44 min.
Quant Ion : 84.0
Area : 3246
Concentration : 6.36 UG/L
q-value : 76

✓

0000060

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VEXTBLK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCBLK38268EXT

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E9153

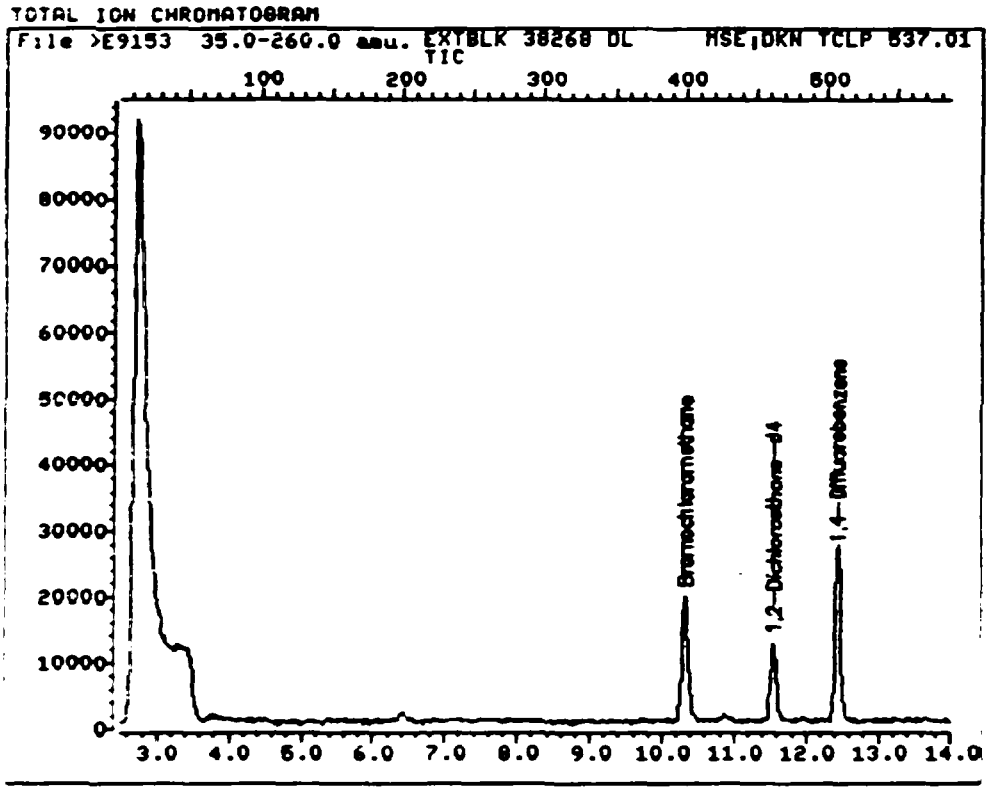
Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 06/03/94

Column: (pack/cap) CAP Dilution Factor: 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	100	U
75-35-4	1,1-Dichloroethene	50	U
67-66-3	Chloroform	50	U
107-06-2	1,2-Dichloroethane	50	U
78-93-3	2-Butanone	100	U
56-23-5	Carbon Tetrachloride	50	U
79-01-6	Trichloroethene	50	U
71-43-2	Benzene	50	U
127-18-4	Tetrachloroethene	50	U
108-90-7	Chlorobenzene	50	U

0000061



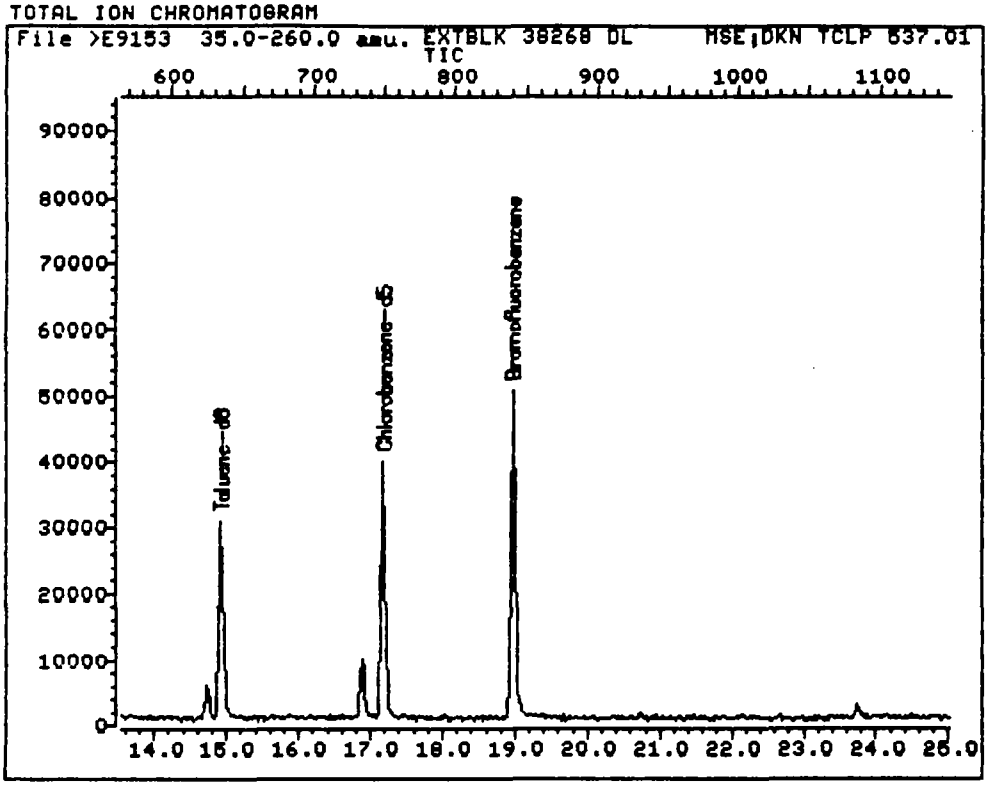
Data File: >E9153::D7 Quant Output File: ^E9153::D2
Name: EXTBLK 38268 DL Instrument ID: MSE
Misc: MSE;DKN TCLP 537.01

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 17:03
Injected at: 940603 16:35

0000062

TOTAL ION CHROMATOGRAM



0000063

Data File: >E9153::D7 Quant Output File: ^E9153::D2
Name: EXTBLK 38268 DL Instrument ID: MSE
Misc: MSE;DKN TCLP 537.01

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 17:03
Injected at: 940603 16:35

QUANT REPORT Page 1

Operator ID: MSB
Output File: ^E9153::D2
Data File: >E9153::D7
Name: EXTBLK 38268 DL
Misc: MSE;DKN TCLP 537.01, 1/10

Quant Rev: 7 Quant Time: 940603 17:03
Injected at: 940603 16:35
Dilution Factor: 1.00000
Instrument ID: MSE

ID File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	•Bromochloromethane	10.31	128.0	15367	50.00	UG/L	93
27)	•1,4-Difluorobenzene	12.43	114.0	49381	50.00	UG/L	93
43)	•Chlorobenzene-d5	17.18	117.0	41707	50.00	UG/L	99
82)	Toluene-d8	14.92	98.0	41200	50.87	UG/L	96
83)	Bromofluorobenzene	18.96	95.0	41757	49.24	UG/L	91
84)	•Chlorobromomethane	10.31	128.0	15367	50.00	UG/L	93
85)	1,2-Dichloroethane-d4	11.55	65.0	26663	45.75	UG/L	83

• Compound is ISTD

0000064

06-06-94

LCS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK01

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SDG No.: CD-S156

Matrix: (soil/water) WATER Lab Sample ID: QCSPK38799

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: E9152

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 06/03/94

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	13	
75-35-4	1,1-Dichloroethene	58	
67-66-3	Chloroform	56	
107-06-2	1,2-Dichloroethane	40	
78-93-3	2-Butanone	47	
56-23-5	Carbon Tetrachloride	38	
79-01-6	Trichloroethene	38	
71-43-2	Benzene	41	
127-18-4	Tetrachloroethene	56	
108-90-7	Chlorobenzene	58	

0000065

9A-LCS
VOA WATER LCS RECOVERY

Lab Name: ITAS-ST.LOUIS Contract: 537-01

Lab Code: ITSL Case No.: V17905 SAS No.: SDG No.: CD-S156

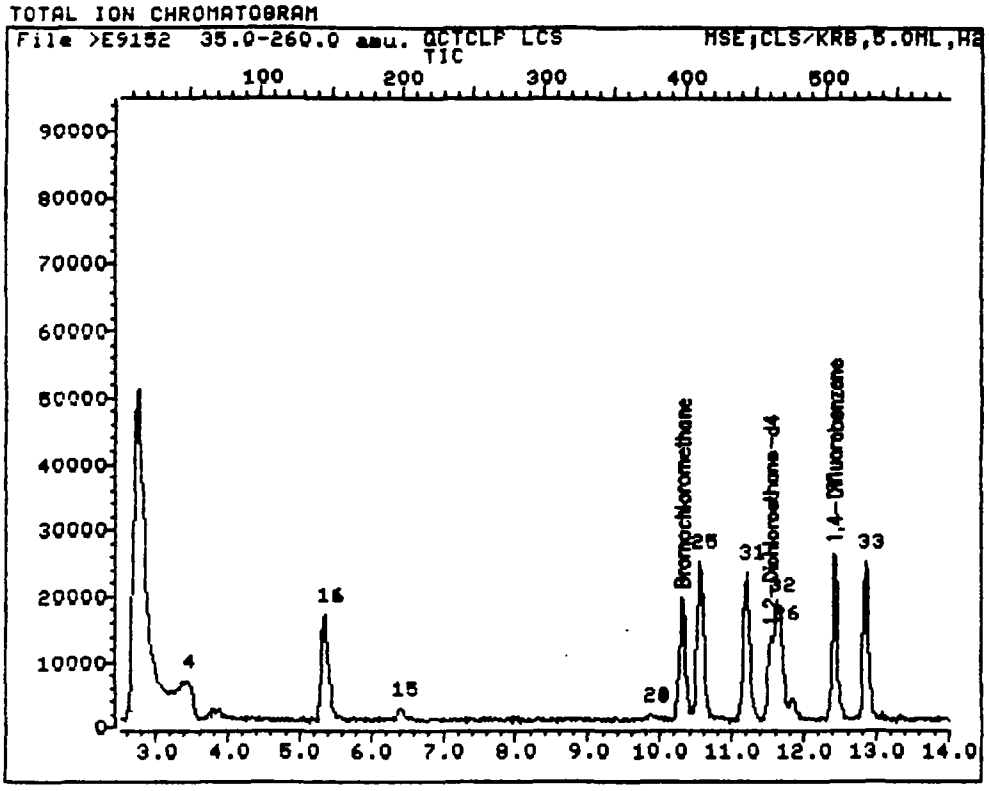
EPA Sample No.: VSPK01 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
Vinyl Chloride	20	13	67	D-251
1,1-Dichloroethene	70	58	82	D-234
Chloroform	70	56	80	51-138
1,2-Dichloroethane	50	40	80	49-155
2-Butanone	70	47	68	45-193
Carbon Tetrachloride	50	38	76	70-140
Trichloroethene	50	38	76	71-157
Benzene	50	40	81	37-151
Tetrachloroethene	70	56	80	64-148
Chlorobenzene	70	58	82	37-160

990066

Column to be used to flag recovery values with an asterisk.
* Values outside of QC limits.
D Detected.
NG: Not Given. Determined by QC Charting Procedures.

TOTAL ION CHROMATOGRAM



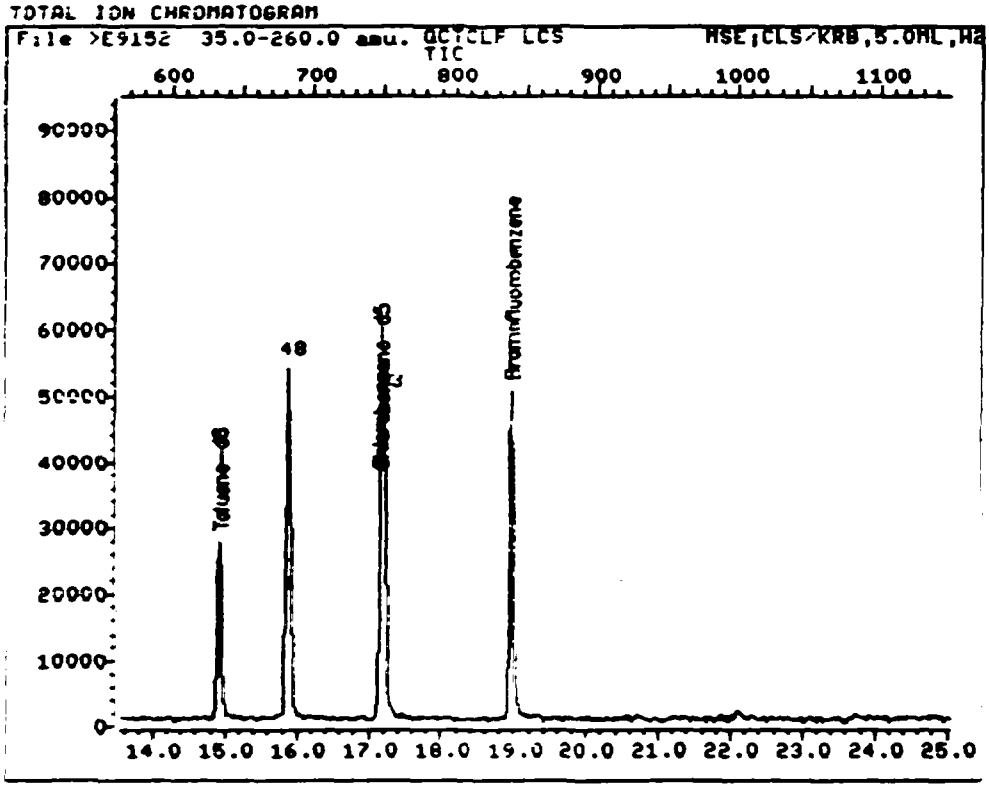
Data File: >E9152::D7 Quant Output File: ^E9152::D5
Name: QCTCLP LCS Instrument ID: MSE
Misc: MSE;CLS/KRB,5.0ML,H2O

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 16:08
Injected at: 940603 15:40

0000067

TOTAL ION CHROMATOGRAM



Data File: >E9152::D7
Name: QCTCLP LCS
Misc: MSE;CLS/KRB,5.0ML ,H2O

Quant Output File: ^E9152::D5
Instrument ID: MSE

Id File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O
Last Calibration: 940401 12:05

Calibration
Last Qcal Time: 940603 11:03

Operator ID: MSB
Quant Time : 940603 16:08
Injected at: 940603 15:40

0000068

Operator ID: MSB Quant Rev: 7 Quant Time: 940603 16:08
Output File: ^E9152::D5 Injected at: 940603 15:40
Data File: >E9152::D7 Dilution Factor: 1.00000
Name: QCTCLP LCS Instrument ID: MSE
Misc: MSE;CLS/KRB,5.0ML,H2O

ID File: @E9146::D5
Title: TCL LIST CLP/8240 -H2O Calibration
Last Calibration: 940401 12:05 Last Qcal Time: 940603 11:03

69000069

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	10.31	128.0	14146	50.00	UG/L	93
4)	Vinyl Chloride	3.44	62.0	3455	13.36	UG/L	90
11)	1,1-Dichloroethene	5.36	61.0	43279	57.65	UG/L	81
15)	Methylene Chloride	6.40	84.0	1992	5.14	UG/L	69
~~16)~~	~~1,2-Dichloroethene (total)~~	~~5.36~~	~~96.0~~	~~19449~~	~~52.51~~	~~UG/L~~	~~68~~
23)	2-Butanone	9.88	72.0	749	47.27	UG/L	96
~~24)~~	~~2-Butanone (90)~~	~~9.88~~	~~43.0~~	~~4502~~	~~55.27~~	~~UG/L~~	~~85~~
25)	Chloroform	10.56	83.0	54807	55.95	UG/L	93
26)	1,2-Dichloroethane	11.70	62.0	27270	40.17	UG/L	93
27)	*1,4-Difluorobenzene	12.43	114.0	47458	50.00	UG/L	93
31)	Carbon Tetrachloride	11.21	117.0	39972	38.10	UG/L	97
32)	Benzene	11.64	78.0	30637	40.53	UG/L	98
33)	Trichloroethene	12.86	130.0	18228	37.86	UG/L	92
43)	*Chlorobenzene-d5	17.16	117.0	38683	50.00	UG/L	99
48)	Tetrachloroethene	15.88	164.0	26418	55.82	UG/L	82
53)	Chlorobenzene	17.22	112.0	42055	57.63	UG/L	99
82)	Toluene-d8	14.92	98.0	37183	49.50	UG/L	98
83)	Bromofluorobenzene	18.96	95.0	38721	49.23	UG/L	99
84)	*Chlorobromomethane	10.31	128.0	14146	50.00	UG/L	93
85)	1,2-Dichloroethane-d4	11.54	65.0	25982	48.43	UG/L	85

* Compound is ISTD

06-06-94

EXTRACTION/PREP/BENCH SHEETS
INSTRUMENT RUN LOGS
CHAIN OF CUSTODY/SAMPLE LOG-IN/RECEIPT RECORDS

ITAS-ST.LOUIS ZHE Extraction Record/Chain of Custody

SOP No SL406.

Reviewed By/Date: [signature] 05-31-94

	Fluid #1
Daily pH Check	4.92 (4.88 - 4.98)
Lot #	940516

	Date	Time	Temp (°C)
Rotation Started	5-25-94	15:30	30
Rotation Ended	05-26-94	09:30	27

Batch #	38608
Project #	537.01
Page #	1 of 1

Sample	Percent Solids Determination					Leachate Preparation					
	Filter Tare	Sample Wt.	Wt. Filtrate	Wt. Dried Solids and Filter	% Solids	ZHE #	Sample Wt.	Wt. Filtrate*	Volume Fluid Added	Wt. Leachate*	Analyst
BLK 38608 (2)						1			500		SMS
5179-005 (2)	N/A				100	2	25.0				
5179-012 (2)	N/A				100	3	25.0				

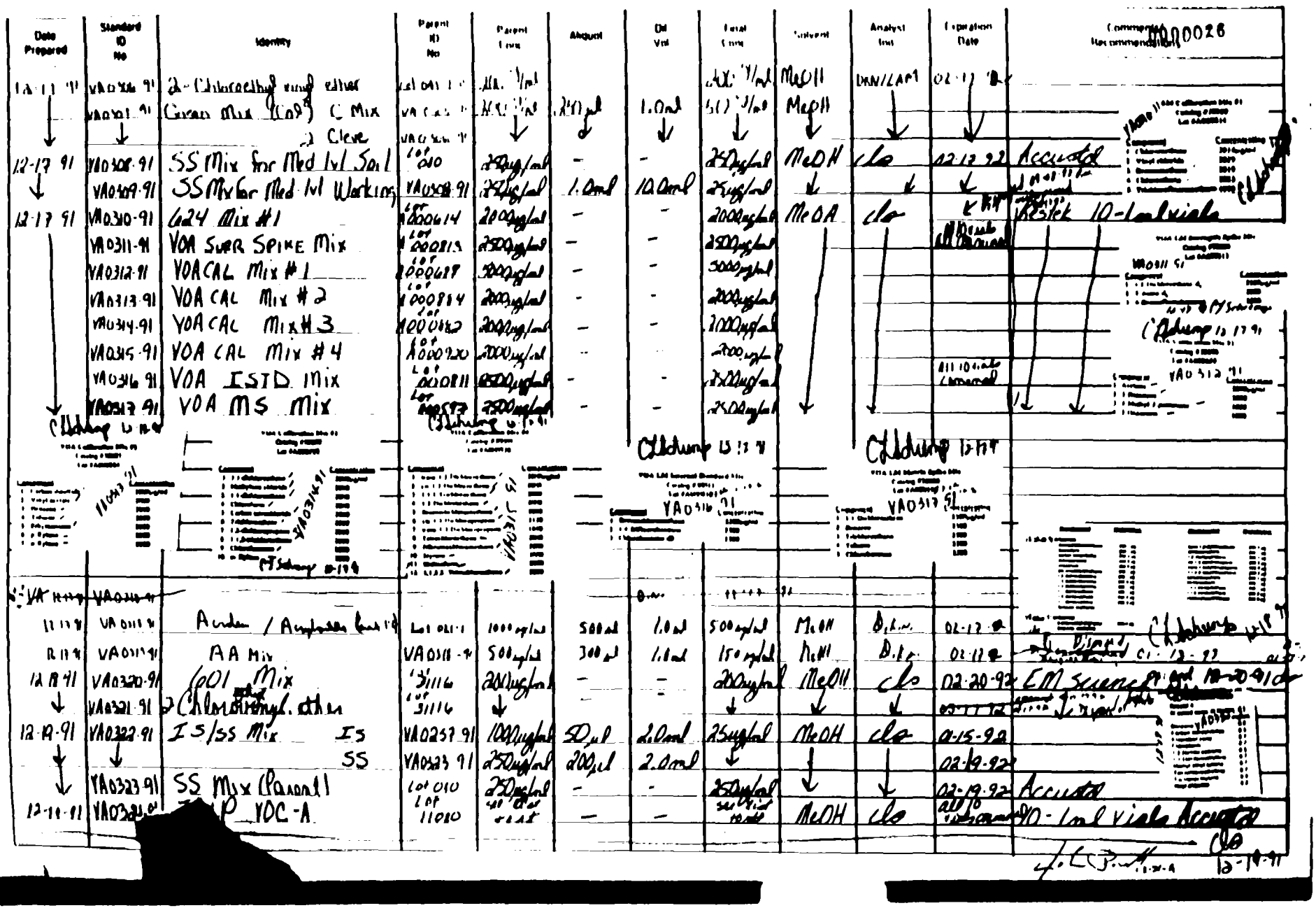
[signature] 05-31-94

* Required for Immiscible Multi-Phasic Samples Only

From	To	Date	Dept.
[signature]	[signature]	053194	VOA

Sample Control Shelf No	109B

0000070



0000026

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Ind	Expiration Date	Comments Recommendations
12-17-91	VA0306-91	2-Chloroethyl vinyl ether	Lot 041	[illegible]			[illegible]	MeOH	DRN/LAM	02-17-92	
↓	VA0307-91	Green Mix (Col) C Mix	VA [illegible]	[illegible]	[illegible]	1.0ml	[illegible]	MeOH	↓	↓	
↓	↓	2 Cleve	VA0306-91	↓	↓	↓	↓	↓	↓	↓	
12-17-91	VA0308-91	SS Mix for Med lvl Soil	Lot 010	250ug/ml	-	-	250ug/ml	MeOH	clo	02-17-92	Accusted
↓	VA0309-91	SS Mix for Med lvl Working	VA0308-91	250ug/ml	1.0ml	10.0ml	25ug/ml	↓	↓	↓	
12-17-91	VA0310-91	624 Mix #1	Lot A000614	2000ug/ml	-	-	2000ug/ml	MeOA	clo		Restek 10-1ml vials
↓	VA0311-91	VOA Surr Spike Mix	Lot A000813	2500ug/ml	-	-	2500ug/ml	↓	↓	All 10 vials consumed	↓
↓	VA0312-91	VOA CAL Mix #1	Lot A000628	5000ug/ml	-	-	5000ug/ml	↓	↓		↓
↓	VA0313-91	VOA CAL Mix #2	Lot A000884	2000ug/ml	-	-	2000ug/ml	↓	↓		↓
↓	VA0314-91	VOA CAL Mix #3	Lot A000882	2000ug/ml	-	-	2000ug/ml	↓	↓		↓
↓	VA0315-91	VOA CAL Mix #4	Lot A000920	2000ug/ml	-	-	2000ug/ml	↓	↓		↓
↓	VA0316-91	VOA ISTD Mix	Lot A000811	2500ug/ml	-	-	2500ug/ml	↓	↓	All 10 vials consumed	↓
↓	VA0317-91	VOA MS Mix	Lot A000597	2500ug/ml	-	-	2500ug/ml	↓	↓		↓
~~VA [illegible]~~	~~VA0318-91~~										
12-17-91	VA0319-91	Acrolein / Acrylonitrile [illegible]	Lot 021-1	1000ug/ml	500ml	1.0ml	500ug/ml	MeOH	D.L.N.	02-17-92	
12-17-91	VA0319-91	AA Mix	VA0318-91	500ug/ml	300ml	1.0ml	150ug/ml	MeOH	D.L.N.	02-17-92	Disposed 01-13-93
12-18-91	VA0320-91	601 Mix	Lot 31116	200ug/ml	-	-	200ug/ml	MeOH	clo	02-20-92	EM Science
↓	VA0321-91	2 Chloroethyl ether	Lot 31116	↓	-	-	↓	↓	↓	~~02-17-92~~	
12-19-91	VA0322-91	IS/SS Mix IS	VA0257-91	1000ug/ml	50µl	2.0ml	25ug/ml	MeOH	clo	01-15-92	
↓	↓	SS	VA0323-91	250ug/ml	200µl	2.0ml	↓	↓	↓	02-19-92	
↓	VA0323-91	SS Mix (Parent)	Lot 010	250ug/ml	-	-	250ug/ml	↓	↓	02-19-92	Accusted
12-19-91	VA0324-91	[illegible] VOC-A	Lot 11010	[illegible]	-	-	[illegible]	MeOH	clo	all 10 vials consumed	10-1ml vials Accusted

VA0311-91 VA0312-91 VA0313-91 VA0314-91 VA0315-91 VA0316-91 VA0317-91

C Schump 12-17-91

C Schump 12-17-91

C Schump 12-17-91

C Schump 12-17-91

C Schump 12-17-91

C Schump 12-17-91

C Schump 12-18-91

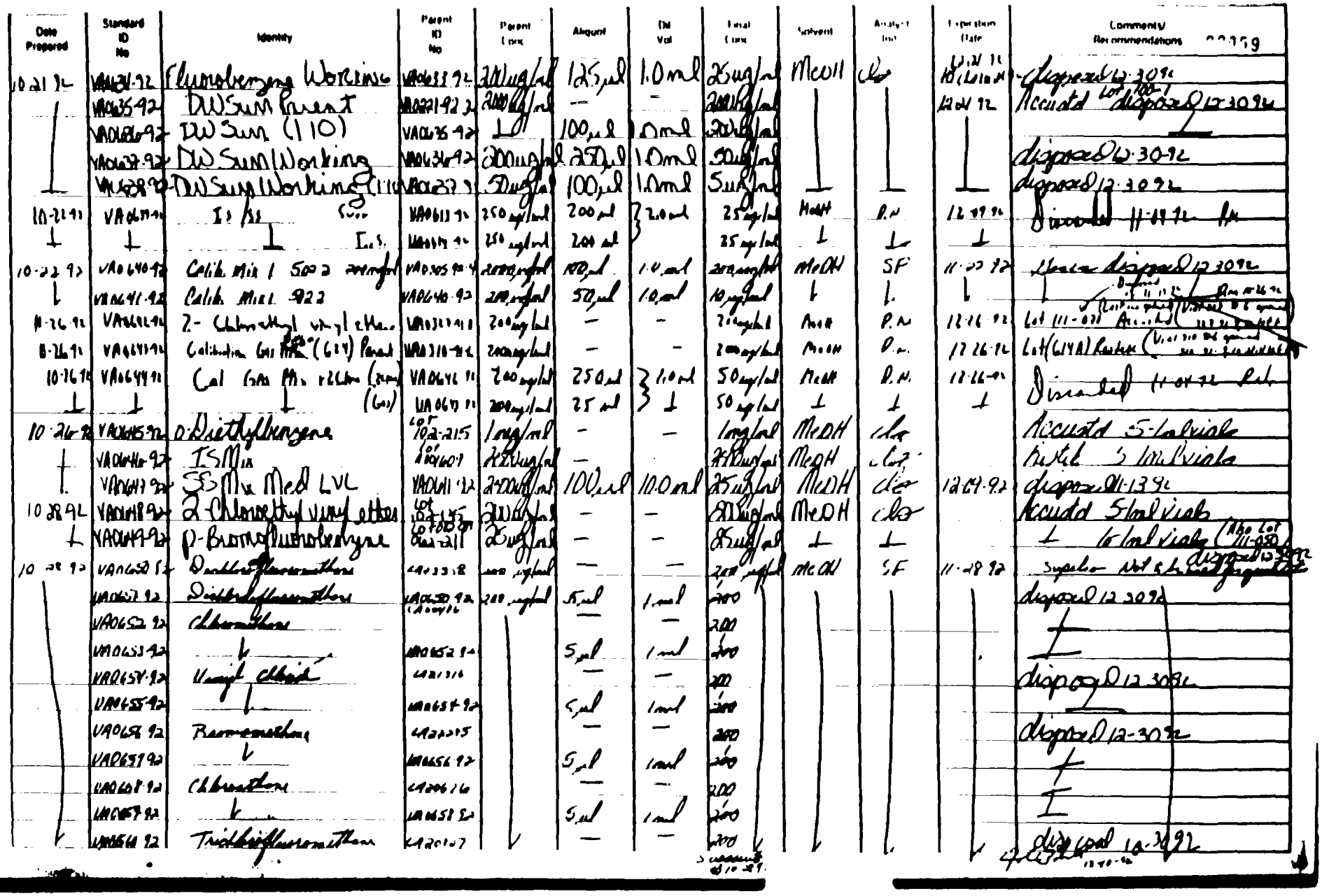
C Schump 12-18-91

J. C. [illegible] 12-19-91

0000071

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
07-30-92	VA0588-92	Gas Mix LCS Gas	VA0566-92	200ug/ml	250ul	1.0ml	50ug/ml	MeOH	[illegible]	11-8-92	Disposed of 11-19-92 [illegible]
		2-Cl	VA0589-92								
	VA0589-92 [illegible]	2-Cleve Parent	VA0527-91-9	200ug/ml	—	—	200ug/ml	MeOH	[illegible]	11-30-92	Accustd Lot 111-078 Vial Sof 10 Disposed of 11-25-92
10-01-92	VA0590-92	SS Mix Med-LVL	VA0522-92	2500ug/ml	100ul	10.0ml	250ug/ml	MeOH	[illegible]	10-21-92	disposed 10-26-92
	VA0591-92	MS Med-LVL	VA0592-92 [illegible]	2500ug/ml	100ul	10.0ml				12-01-92	Restek Lot A0005597 Vial Sof 10 disposed 11-13-92
	VA0592-92	MS Parent	VA0317-91-5	2500ug/ml	—	—	2500ug/ml				disposed 12-04-92
10-02-92	VA0593-92	Gases Mix (Cal) Gases	VA0527-92	2000ug/ml	25ul	1.0ml	50ug/ml	MeOH	[illegible]	10-28-92	Disposed of 10-26-92 [illegible]
		2-Cl Ethyl Vinyl Ether	VA0528-92	200ug/ml	250ul						
10-05-92	VA0594-92	CLP MS Working	VA0592-92	2500ug/ml	20ul	1.0ml	50ug/ml	MeOH	[illegible]	12-01-92	disposed 11-13-92
10-05-92	VA0595-92	8020 Mix Cal Mix	LA32210	2000ug/ml	—	—	2000ug/ml	MeOH	SF	all 5 used	Supplies 5 vials disposed 12-30-92
	VA0596-92	8020 Cal Mix 10ug/ml	VA0595-92-1		50ul	10.0ml	10ug/ml			12-[illegible]-92	disposed 12-30-92
	VA0597-92	50ug/ml			25ul	1.0ml	50ug/ml				
	VA0598-92	0.5ug/ml	VA0596-92	10ug/ml	50ul	1.0ml	0.5ug/ml				disposed 12-30-92
	VA0599-92	8020 LCS	VA0364-92-1	2000ug/ml	25ul	1.0ml	50ug/ml				Accustd disposed 12-30-92
	VA0600-92	8020 LCS Working	VA0599-92	50ug/ml	50ul	1.0ml	2.5ug/ml				Discarded
10-06-92	VA0601-92	Custom VOA Mix #1	Lot A0016216	10000ug/ml	—	—	10000ug/ml	MeOH	[illegible]		10-vials Restek (Cyclohexane & Pyridine)
	VA0602-92	Custom VOA Mix #2	Lot A0016186	1000ug/ml	—	—	1000ug/ml				10-1ml vials Restek
		Freon 114 (1,2-Dichloro-1,1,2,2-tetrafluoroethane)								[illegible]	
		Freon 123 (2,2-dichloro-1,1,1-trifluoroethane)									
	VA0603-92	Custom VOA Mix #3	Lot A0016185	1000ug/ml	—	—	1000ug/ml				10-1ml vials Restek
		2-Nitropropane									contains 2000ug/ml of each of the following in methanol: Benzene, Chlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Ethylbenzene, Toluene, m-Xylene, o-Xylene
		Ethylacetate									
		Diethylether									
10-06-92	VA0604-92	Freon 114 & Freon 123	VA0602-92-4	1000ug/ml	—	—	1000ug/ml	MeOH	[illegible]	12-06-92	1 of 10 vials Restek Lot A0016[illegible] disposed 12-30-92
	VA0605-92	Freon 114 & 123 Working	VA0604-92		50ul	1.0ml	50ug/ml				disposed 12-30-92
10-07-92	VA0606-92	Pyridine & Cyclohexane	VA0547-92	1000ug/ml	75ul	1.0ml	75ug/ml	MeOH	R.L.N.	11-12-92	Disposed 12-01-92 [illegible]
10-07-92	VA0607-92	M-8240A-MOD Parent (CALIB)	VA0524-92-1	0.2 mg/ml	—	—	0.2 mg/ml	MeOH	C.L.S.	12-07-92	Accustd Vial 1 of 8 used (Lot 011-[illegible]) disposed 12-30-92
10-07-92	VA0608-92	8240A-MOD Working (CALIB)	VA0607-92	200 ug/ml 0.2 mg/ml	250ul	1.0ml	50 ug/ml	MeOH	C.L.S.	12-07-92	disposed 12-30-92

[illegible] 12-10-92



Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
10 21 92	VA0634-92	Fluorobenzene Working	VA0633-92	200 ug/ml	125 µl	1.0 ml	25 ug/ml	MeOH	clw	10/21/93	Disposed 12-30-92
	VA0635-92	DW Sun Present	VA0221-92	200 ug/ml	—		200 ug/ml			12 04 92	Accepted Lot 100-7 Disposed 12-30-92
	VA0636-92	DW Sun (110)	VA0635-92	〃	100 µl	1.0 ml	20 ug/ml				
	VA0637-92	DW Sun Working	VA0636-92	200 ug/ml	250 µl	10 ml	5 ug/ml				Disposed 12-30-92
	VA0638-92	DW Sun Working (110)	VA0637-92	5 ug/ml	100 µl	1.0 ml	5 ug/ml				Disposed 12-30-92
10-21-92	VA0639-92	IS/SS Surr. Std.	VA0611-92	250 ug/ml	200 ml	2.0 ml	25 ug/ml	MeOH	P.N	12-29-92	Discarded 11-11-92 PN
〃	〃	〃	VA0612-92	250 ug/ml	200 ml		25 ug/ml	〃	〃	〃	
10-22-92	VA0640-92	Calib. Mix 1 500 ppm	VA0505-92	2000 ug/ml	100 µl	1.0 ml	200 ug/ml	MeOH	SF	11-22-92	Used disposed 12-30-92
〃	VA0641-92	Calib. Mix 1 500	VA0640-92	200 ug/ml	50 µl	10 ml	10 ug/ml	〃	〃	〃	Lot 111-030 Acc. 11-22-92
11-26-92	VA0642-92	2-Chloroethyl vinyl ether	VA0318-92	200 ug/ml	—	—	200 ug/ml	MeOH	P.N	12-26-92	Lot(614A) Rec'd 11-26-92
11-26-92	VA0643-92	Calibration Gas Mix (614) Pest	VA0318-92	200 ug/ml	—	—	200 ug/ml	MeOH	P.N	12-26-92	Lot(614A) Rec'd 11-26-92
10-26-92	VA0644-92	Cal Gas Mix 624 (Acid)	VA0642-92	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	P.N	12-26-92	Discarded 11-04-92 Lot
〃	〃	〃 (Base)	VA0643-92	200 ug/ml	25 ml	〃	50 ug/ml	〃	〃	〃	〃
10-26-92	VA0645-92	1,4-Dichlorobenzene	Lot 102-215	1 mg/ml	—	—	1 mg/ml	MeOH	clw		Accepted 5-1 ml vials
〃	VA0646-92	IS Mix	Lot 100-7	2.5 mg/ml	—		2.5 ug/ml	MeOH	clw		Rec'd 5 1 ml vials
〃	VA0647-92	SS Mix Med LVL	VA0641-92	2000 ug/ml	100 µl	10.0 ml	25 ug/ml	MeOH	clw	12-04-92	Disposed 11-13-92
10-28-92	VA0648-92	2-Chloroethyl vinyl ether	Lot 100-7	200 ug/ml	—	—	20 ug/ml	MeOH	clw		Accepted 5 1ml vials
〃	VA0649-92	p-Bromofluorobenzene	Lot 100-211	25 ug/ml	—	—	25 ug/ml	〃	〃	〃	5 1ml vials (Also Lot 111-030)
10-28-92	VA0650-92	Dichlorofluoromethane	VA0333-92	200 ug/ml	—	—	200 ug/ml	MeOH	SF	11-28-92	Surplus Vol 6 Disposed 12-30-92
	VA0651-92	Dichlorofluoromethane	VA0650-92 (Acrolein)	200 ug/ml	5 ml	1 ml	200				Disposed 12-30-92
	VA0652-92	Chloromethane			—	—	200				
	VA0653-92	〃	VA0652-92		5 µl	1 ml	200				
	VA0654-92	Vinyl Chloride	VA0316		—	—	200				Disposed 12-30-92
	VA0655-92	〃	VA0654-92		5 µl	1 ml	200				
	VA0656-92	Bromomethane	VA0205		—	—	200				Disposed 12-30-92
	VA0657-92	〃	VA0656-92		5 µl	1 ml	200				
	VA0658-92	Chloroethane	VA0616		—	—	200				
	VA0659-92	〃	VA0658-92		5 µl	1 ml	200				
	VA0660-92	Trichlorofluoromethane	VA0207		—	—	200				Disposed 12-30-92

Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05-27-93	VA0340-93	VOA 8240 CALIB MIX #4	VA0293-93	2000 ug/ml	100 ul	1.0 ml	200 ug/ml	MeOH	R.N	06-27-93 - 10-28-93	CLP90 CLP93 dispose 06-23-93 Lot from page 0033
05-27-93	VA0341-93	VOA 8240 CALIB Working 8240	VA0340-93	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	R.N.	06-27-93 - 10-28-93	CLP90 CLP93 disposed 06-07-93
"	"	" 8240	VA0342-93	200 ug/ml	250 ml	"	"	"	"	"	"
05-28-93	VA0346-93	Deluxe 8 B.S. Mix	VA0344-93	2,500 ug/ml	10 ml	1.0 ml	125.0 ug/ml	MeOH	R.N	06-28-93 - 10-28-93	CLP90 CLP93 Disposed Date 05-27-93
05-28-93	VA0347-93	p-DFB working 05-27-93	VA0349-93	25 2500 ug/ml	—	—	25 ug/ml	MeOH	SF	11-28-93 06-28-93	Lot 062-211 Disposed 08-15-93
"	VA0348-93	p-DFB working			40 ml 05-28-93						
06-02-93	VA0344-93	IS/SS IS	VA0285-93	2200 ug/ml	20 ml	20 ml	25 ug/ml	MeOH	SF	10-02-93	disposed 06-03-93
"	"	SS	VA0286-93	"	20 ml	"	"	"	"	"	"
06-03-93	VA0345-93	IS/SS IS	VA0285-93	2500 ug/ml	20 ml	2.0 ml	25 ug/ml	MeOH	clr	10-02-93	Not to be used for 3/90 CLP Disposed 06-16-93
"	"	SS	VA0210-93	"	20 ul	"	"	"	"	"	"
06-03-93	VA0346-93	Good Mix Good 2 Chlor	VA0334-93 VA0335-93	200 ug/ml	250 ul	1.0 ml	50 ug/ml	MeOH	clr	07-18-93	Good until for 3/90 only Good until 06-18-93
"	"	"	"	"	250 ul	"	"	"	"	"	"
06-03-93	VA0347-93	TCLP Spike Amount	VA0324-94-9	conc. varies	—	—	conc. varies	MeOH	SF	08-03-93 06-03-10	Vial 9 of 10 disposed 06-10-93
"	VA0348-93	TCLP Spike (1/10)	VA0347-93	conc. varies	100 ul	1.0 ml	conc. varies	"	"	"	Disposed 08-12-93
06-04-93	VA0349-93	FREON 113 Surr	VA0311-93-4	200 ug/ml	—	—	200 ug/ml	MeOH	RN	12-04-93 10-28-93	Lot 032-103
06-04-93	VA0350-93	8240 CALIB Working 8240	VA0340-93	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	R.N	10-28-93 06-11-93	CLP90 CLP93 disposed 06-23-93
"	"	" FREON	VA0349-93	200 ug/ml	250 ml	"	"	"	"	"	"
06-04-93	VA0351-93	Surrogate Stock	VA0311-93-1	2,500 ug/ml	—	—	2,500 ug/ml	MeOH	RN	11-28-93	Lot # A0491-3 for 3/90 CLP Concentrate
06-04-93	VA0352-93	Surrogate Working CALIB	VA0351-93	2,500 ug/ml	20 ml	1.0 ml	50 ug/ml	MeOH	RN	12-04-93	Disposed 08-21-93 R.N.
06-04-93	VA0353-93	I.S Working	VA0352-93	2,500 ug/ml	20 ml 06-04-93	1.0 ml	25 ug/ml	MeOH	RN	10-04-93	Parent for 3/90 Good until 06-23-93
06-10-93	VA0354-93	Good Mix Good 2 Chlor	VA0321-93 VA0336-93	200 ug/ml	250 ul	1.0 ml	20 ug/ml	MeOH	clr	08-10-93 08-11-93	Good until for CLP 90 Good until 06-23-93
"	"	"	"	"	250 ul	"	"	"	"	"	"
"	VA0355-93	Good Surr	VA0330-93-7	200 ug/ml	—	—	200 ug/ml	"	"	08-10-93	Accepted Lot 111-092 for 3/90 Contract
06-10-93	VA0356-93	VOA Surrogate Mix	505196	2000 ug/ml	—	—	2000 ug/ml	MeOH	clr		Receipt 5/6a
06-10-93	VA0357-93	Ketone Mix	VA0339-93	5000 ug/ml	10 ml	1.0 ml	50 ug/ml	MeOH	R.N.	06-17-93 11-27-93	CLP90 CLP93 Disposed
06-11-93	VA0358-93	AAMix Acetone	VA0311-93	1240 ug/ml	80 ml	1.0 ml	100 ug/ml	MeOH	RN	10-19-93	Disposed
"	"	" Acrylonitrile	VA0330-93	1840 ug/ml	95 ml	"	"	"	"	"	"
06-11-93	VA0359-93	Trichlorotrifluoroethane (Freon 113)	493 032-103	200 ug/ml	—	—	20 ug/ml	MeOH	clr	Consumed 06-19-93	Accepted 3 vials
06-11-93	VA0360-93	TCLP Mix	Lot 110890	Conc/ Varies	—	—	Conc/ Varies	"	"		1 Vial

0008.1

TCLP-VOC-A-REV
Custom Mix
(At stated conc. in MeOH)
VA0340-93

Compound	mg/ml
Benzene	0.5
Carbon tetrachloride	0.5
Chlorobenzene	0.7
Chloroform	0.7
1,2-Dichloroethane	0.5
1,1-Dichloroethylene	0.7
Methyl ethyl ketone	0.7
Tetrachloroethylene	0.7
Trichloroethylene	0.5
Vinyl chloride	0.5

0000074

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Amount	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
[illegible]	VA0515 93	Med Level Surrogate	VA0511 93	2,500 ug/mL	100 uL	10.0 mL	25 ug/mL	MeOH	DN	02 28 94	Dispensed CCl 10-0-93
11 17 93	VA0401 93	~~[illegible]~~ ISTD working	VA0397 93	200 ug/mL	25 uL	10 mL	5 ug/mL	MeOH	SE	01-28-94	Dispensed 11-11-93
11 09 93	VA0597 93	502A Working Std	VA0597 93	200 ug/mL	25 uL	1.0 mL	5 ug/mL	MeOH	CLS	10-20-93	Dispensed 11-11-93
	VA0460 93	8260 Additional Working	VA0530 93	200 ug/mL	25 uL	1.0 mL	5 ug/mL			12-29-93	
	↓	↓	VA0577 93		↓	↓	↓			↓	
	VA0461 93	Gas Mix Working Std	[illegible]	[illegible]	25 uL	1.0 mL	5 ug/mL			11-09-93	11-09-93
	VA0462 93	8260 Surr Working	[illegible]	[illegible]	25 uL	1.0 mL	5 ug/mL			12-29-93	
	VA0463 93	8260 IS Working	VA0533 93	200 ug/mL	25 uL	1.0 mL	5 ug/mL			12-29-93	
	VA0464 93	MA01B /02B (Gases) Mixed	Lot 062-050	200 ug/mL	—	—	200 ug/mL	MeOH	CLS	11-09-93	Accurate weight 3.65 Dispensed 11-10-93
	VA0465 93	8260 Surr Present (1-10)	VA0399 93	200 ug/mL	100 uL	1.0 mL	20 ug/mL	↓	↓	12-29-93	
	VA0466 93	Gas Mix Working Std	VA0464 93	200 ug/mL	20 uL	1.0 mL	4 ug/mL	MeOH	CLS	11-09-93	
11 10 93	VA0467 93	1,2-Dichloropropane	Lot 012 052	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		Neat Weight
	VA0468 93	1,3 Dichloropropane	Lot 012 027	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		
	VA0469 93	Dibromomethane	Lot 012 228	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		
	VA0470 93	1,1-Dichloropropene	Lot 012 155	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		
	VA0471 93	502/524 VOC Mix #6	Lot 092292	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		Absolute Lot 092292
	VA0472 93	502/524 VOC Mix #5	Lot 012292	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		
	VA0473 93	502/524 VOC Mix #4	Lot 092292	2000 ug/mL	—	—	2000 ug/mL	MeOH	CLS		

MIX #6
2000 ug/mL in Methanol 1 mL

(1) Benzene
(2) Bromochloromethane
(3) n-Butylbenzene
(4) Ethylbenzene
(5) p-Isopropyltoluene
(6) Naphthalene
(7) Styrene
(8) Toluene
(9) 1,2,3-Trichlorobenzene
(10) 1,2,4-Trichlorobenzene
(11) 1,2,4-Trimethylbenzene
(12) 1,3,5-Trimethylbenzene
(13) m-Xylene

VA0511

09-10-93

MIX #5
2000 ug/mL in Methanol 1 mL

(1) sec-Butylbenzene
(2) tert-Butylbenzene
(3) Chlorobenzene
(4) 2-Chlorotoluene
(5) 4-Chlorotoluene
(6) 1,2-Dichlorobenzene
(7) 1,3-Dichlorobenzene
(8) 1,4-Dichlorobenzene
(9) Isopropylbenzene
(10) p-Isopropyltoluene
(11) n-Propylbenzene
(12) o-Xylene
(13) p-Xylene

VA0511

09-10-93

MIX #4
2000 ug/mL in Methanol 1 mL

(1) 1,2-Dibromo-3-chloropropane
(2) 1,2-Dibromoethane (EDB)
(3) 1,2-Dichlorobenzene
(4) 1,2-Dichloropropane
(5) 1,3-Dichloropropane
(6) 1,3-Dichloropropene*
(7) 1,1-Dichloropropene
(8) Hexachlorobutadiene
(9) 1,1,1,2-Tetrachloroethane
(10) 1,1,2,2-Tetrachloroethane
(11) 1,1,2-Trichloroethane
(12) Trichloroethene
(13) 1,2,3-Trichloropropane

*4010 ug/mL cmpd
1250 ug/mL cis 48% trans

VA0511

09-10-93

09-10-93

09 10 93	VA0474 93	1,2 Dibromo-3-chloropropane	VA0563 93	200 ug/mL	—	—	200 ug/mL	MeOH	CLS	03-10-94	
↓	VA0475 93	1,2 Dibromo-3-chloropropane Working	VA0471 93	200 ug/mL	25 uL	1.0 mL	5 ug/mL	↓	↓	↓	Dispensed 12-11-93
12-13-93	VA0476 93	8260 IS Working	VA0533 93	200 ug/mL	125 uL	1.0 mL	25 ug/mL	MeOH	CLS	12-29-93	↓
01-13-94	VA0477 93	502/524 VOC Mix 6 Surr	VA0511 93	2000 ug/mL	—	—	2000 ug/mL	MeOH	DN	01-13-94	Absolute Lot 092292
↓	VA0478 93	502/524 VOC Mix 5 Surr	VA0512 93	2000 ug/mL	—	—	2000 ug/mL	MeOH	DN	01-13-94	Absolute Lot 071293 (Toni)

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Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
10-18-93	VA0559-93	8020 LCS Mix	VA0264-92-5	2000 µg/mL	25 µL	1.0 mL	50 µg/mL	MeOH	SF	04-18-94	
〃	VA0560-93	8020 ISTD Working	〃	200 µg/mL	250 µL	2 mL	25 µg/mL	〃	SF	04-18-94	Disposed 11-11-93
10-19-93	VA0561-93	8240 IS/SS IS	VA0500-93	2500 µg/mL	20 µL	2.0 mL	25 µg/mL	MeOH	clw	10-26-93	disposed 10-22-93
〃	〃	〃 SS	VA0499-93	〃	20 µL	〃	〃	〃	〃	〃	〃
10-19-93	VA0562-93	IS Working	VA0500-93	2500 µg/mL	10 mL	1.0 mL	25 µg/mL	MeOH	clw	10-26-93	disposed 10-21-93
10-19-93	VA0563-93	Freon 113	Lot 063-206	2000 µg/mL	—	—	200 µg/mL	MeOH	clw		Recertd. 3-1-94 via
〃	VA0564-93	Med-Lvl Surr	VA0499-93	2500 µg/mL	250 µL	25.0 mL	25 µg/mL	MeOH	clw	10-26-93	put into 2-14 mL vials disposed 10-20-93
10-20-93	VA0565-93	8240 Working	VA0499-93	400 µg/mL	125 µL	1.0 mL	50 µg/mL	MeOH	clw	10-27-93	disposed 10-28-93
〃	〃	〃	VA0551-93	200 µg/mL	250 µL	〃	〃	〃	〃	〃	〃
10-20-93	VA0566-93	Med-Lvl Surr	VA0197-93	2500 µg/mL	250 µL	25.0 mL	25 µg/mL	MeOH	clw	10-27-93	put into 2-14 mL vials Disposed 10-25-93 RCW
10-20-93	VA0567-93	GAS Mix	VA0521-93	2000 µg/mL	25 mL	1.0 mL	50 µg/mL	MeOH	clw	10-27-93	disposed 10-28-93
〃	〃	〃 2	VA0571-93	200 µg/mL	250 µL	〃	〃	〃	〃	〃	〃
10-21-93	VA0568-93	IS/SS IS	VA0500-93	2500 µg/mL	20 µL	2.0 mL	25 µg/mL	MeOH	clw	10-28-93	disposed 10-24-93
〃	〃	〃 SS	VA0499-93	〃	20 µL	〃	〃	〃	〃	〃	〃
〃	VA0569-93	IS Working	VA0500-93	2500 µg/mL	10 µL	1.0 mL	25 µg/mL	MeOH	clw	10-28-93	
〃	VA0570-93	SS Parent	VA0341-91-1	2000 µg/mL	—	25.0 mL	200 µg/mL	MeOH	clw	04-21-94	disposed 11-08-93
〃	VA0571-93	Med-Lvl Surr	VA0530-93	〃	250 µL	25.0 mL	25 µg/mL	〃	〃	10-28-93	put into 2-14 mL vials Disposed 10-29-93
10-25-93	VA0572-93	8260 Working 8260	VA0524-93	2500 µg/mL	250 µL	25.0 mL	25 µg/mL	MeOH	clw/sf	10-29-93	disposed 10-26-93
〃	〃	〃 F113	VA0551-93	〃	〃	〃	〃	〃	〃	〃	〃
〃	VA0573-93	8260 Addn Parent	VA0363-92-4	2000 µg/mL	—	—	200 µg/mL	MeOH	clw/sf	04-22-94	disposed 11-01-93 clw
〃	VA0574-93	8260 Addn Working	VA0573-93	〃	250 µL	1.0 mL	50 µg/mL	MeOH	clw/sf	10-29-93	disposed 11-01-93 clw
10-22-93	VA0575-93	8260 IS — Working	VA0342-92-4	2000 µg/mL	—	—	200 µg/mL	MeOH	SDF	04-22-94	Disposed 4-20-93
〃	VA0576-93	8260 IS/SS IS	VA0575-93	200 µg/mL	250 µL	2.0 mL	25 µg/mL	〃	〃	10-29-93	disposed 10-24-93
〃	〃	〃 SS	VA0570-93	2500 µg/mL	20 µL	〃	〃	〃	〃	〃	〃
10-27-93	VA0577-93	GAS Mix (Gas)	VA0521-93	2000 µg/mL	25 mL	1.0 mL	50 µg/mL	MeOH	clw	10-30-93	Disposed 11-01-93
10-27-93	VA0578-93	Gas Mix (8260)	VA0521-93	2000 µg/mL	25 mL	1.0 mL	50 µg/mL	MeOH	clw	10-30-93	disposed 11-01-93 clw
10-27-93	VA0579-93	Halocarbon Mix	VA0497-93	2500 µg/mL	20 mL	1.0 mL	50 µg/mL	MeOH	clw	10-30-93	Disposed of 10-31-93
10-24-93	VA0580-93	IS/SS IS	VA0500-93	2500 µg/mL	20 µL	2.0 mL	25 µg/mL	MeOH	clw	10-31-93	Disposed 10-26-93
〃	〃	〃 SS	VA0570-93	〃	〃	〃	〃	〃	〃	〃	〃

Date Prepared	Standard ID No	Identity		Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations	Date
10-24-93	VA05161-93	8260 II/SS	IS	VA04339-93	2000ug/ml	250ul	2.0ml	25ug/ml	MeOH	CL	11-01-93	Works 8260 II Parent used	
			SS	VA05205-93	2000ug/ml	20ul						disposed 11-24-93	
	VA05582-93	8260 II/SS	IS	VA05275-93	2000ug/ml	250ul	2.0ml		MeOH	CL	10-31-93	disposed 11-01-93	
			SS	VA05320-93	2500ug/ml	20ul							
10-24-93	VA05839-93	8260 IS Working		VA05339-93	2000ug/ml	125ul	1.0ml	25ug/ml				disposed 11-10-93 CL	
	VA05849-93	SS Working		VA05305-93	2500ug/ml	20ul	1.0ml	50ug/ml					
10-26-93	VA05115-93	IS/SS	IS	VA05200-93	2,500ug/ml	20ml	2.0ml	25ug/ml	MeOH	P.M.	11-02-93	disposed 10-29-93	
			SS	VA05370-93	2,500ug/ml	20ml							
10-26-93	VA05116-93	SS/SIM		VA05311-93	200ug/ml	250ul	1.0ml	50ug/ml	MeOH	DMN	11-01-93	disposed 11-16-93	
10-26-93	VA05017-93	TCL (1:10) Working		VA05215-93	Conc. unknown	100ul	1.0ml	Conc. 1:10 of [illegible]	MeOH	PM	11-01-93	Dispose 11-07-93 DL	
	VA05889-93	8240 Working	8240	VA05237-93	200ug/ml	250ul	1.0ml	50ug/ml	MeOH	CL	11-02-93	disposed 11-10-93 CL	
			Fr 113	VA05514-93									
10-28-93	VA05897-93	8240 Working	8240	VA05414-93	200ug/ml	250ul	1.0ml	50ug/ml	MeOH	CL	11-04-93	disposed 10-26-93 expired	
			Fr 113	VA05514-93	200ug/ml	125ul							
	VA05907-93	Freon 113		VA05639-93	1200ug/ml	—	—	200ug/ml	MeOH	CL	04-28-94	Accutest Lot #J3206	
	VA05911-93	8240 Concd	8240	VA05233-93	2000ug/ml	25ul	1.0ml	50ug/ml			11-04-93		
			2 Level	VA05412-93	2000ug/ml	25ul							
10-28-93	VA05905-93	8240 Working	Fr 113	VA05909-93	2000ug/ml	25ul	1.0ml	50ug/ml	MeOH	CL	11-04-93	Disposed 11-05-93	
			8240	VA05444-93	400ug/ml	125ul							
10-28-93	VA05913-93	Med. Lvl Surr		VA05709-93	2500ug/ml	250ul	10ml	25ug/ml	MeOH	CL	11-04-93	Disposed on 10-30-93	
	VA05914-93	IS Working		VA05800-93	2500ug/ml	10ml	1.0ml	25ug/ml	MeOH	CL	11-04-93	Disposed of 11-05-93	
10-28-93	VA05915-93	8020 Med (Working)		VA04414-93	2000ug/ml	15ml	30ml	10ug/ml	MeOH	SE	11-22-93	Disposed of 11-18-93	
10-27-93	VA05910-93	8240 IS/SS	IS	VA05200-93	2500ug/ml	20ml	2.0ml	25ug/ml	MeOH	CL	11-05-93	disposed 10-29-93	
			SS	VA05370-93									
10-29-93	VA05917-93	8240 II/SS	IS	VA05410-93		20ml	20ml	25ug/ml	MeOH	CL	11-05-93	disposed 11-02-93	
			SS	VA05370-93									
10-30-93	VA05918-93	Med-Lvl Surr		VA05701-93	2000ug/ml	125ul	10.0ml	25ug/ml	MeOH	CL	11-06-93	Disposed of 10-31-93	
10-31-93	VA05919-93	Mixture Spike Mix		VA04737-93	2000ug/ml	20ml	10ml	50ug/ml			11-07-93		
10-31-93	VA05600-93	Med-Lvl Surr		VA05705-93	2500ug/ml	10ml	10ml	25ug/ml			11-07-93		

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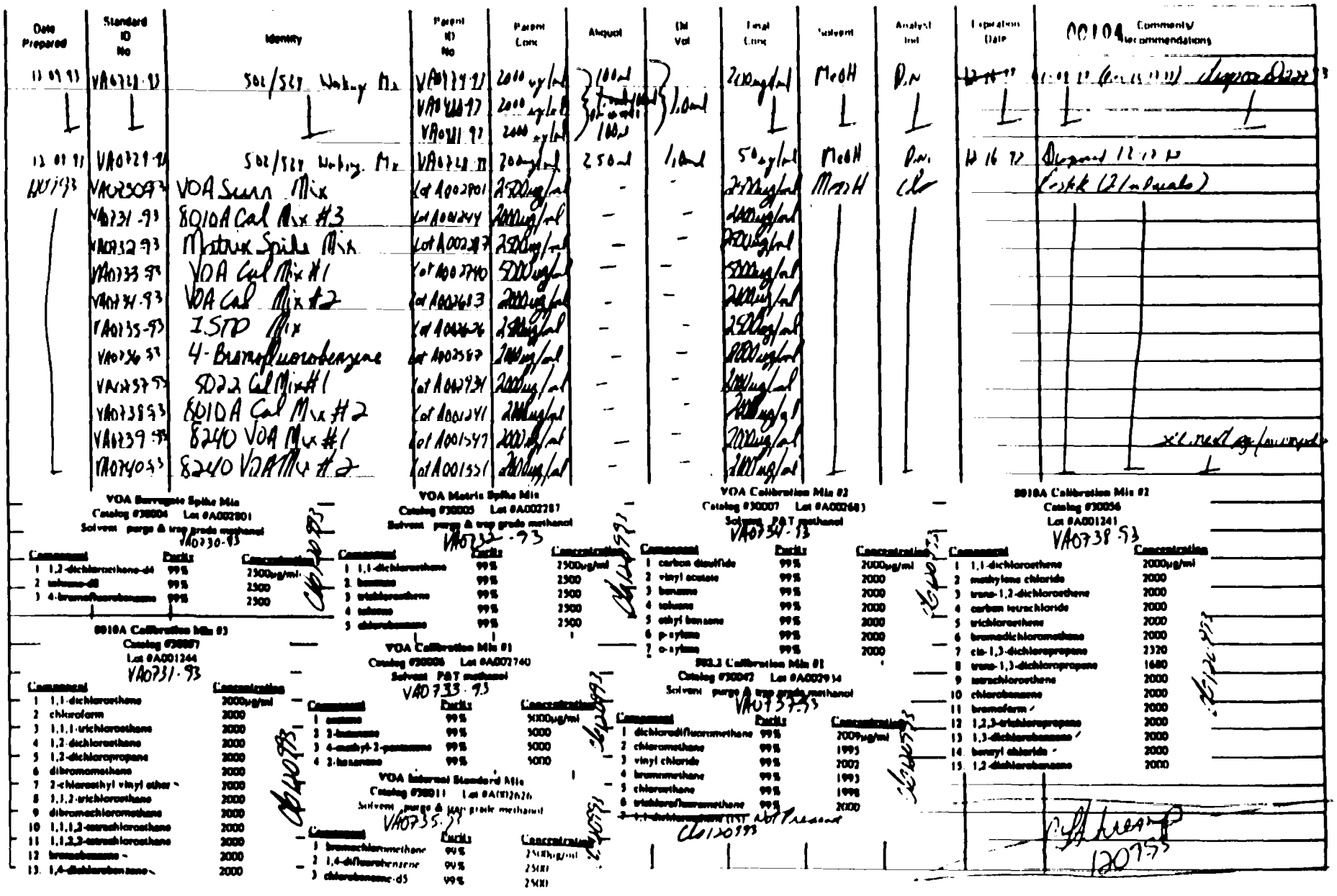
Date Prepared	Standard ID No.	Identity	Parent ID No.	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
10-28-93	VA0624-93	Med-level surr	VA0623-93	2000ng/ml	25µl	25.0ml	25ng/ml	1:1 DCM	ds	11-28-93	2-1ml vials
"	VA0625-93	Med-level MS	VA0497-93	2000ng/ml	100µl	10.0ml	25ng/ml	"	"	11-15-93	
11-10-93	VA0626-93	M-502 A-B	VA0224-93	200µg/ml	—	—	200µg/ml	MeOH	SDF	05-10-93	disposed 11-29-93
"	VA0627-93	8260 Mix Working 8260	VA0624-93	200ng/ml	250µl	1.0ml	50ng/ml	"	"	11-17-93	Disposed 11-23-93 Rm
"	"	" Fill3	VA0570-93	2000ng/ml	25µl	"	"	"	"	"	"
"	VA0628-93	8260 Addn's Working	VA0626-93	200ng/ml	250µl	1.0ml	50ng/ml	"	"	"	Disposed Rm 11-22-93
"	VA0629-93	8260 Dec Mix	VA0627-93	2000ng/ml	25µl	1.0ml	50ng/ml	"	"	"	Disposed Rm 11-23-93
"	VA0630-93	IS/SS 8260 IS	VA0625-93	200ng/ml	125µl	1.0ml	25ng/ml	"	"	"	
"	"	" SS	VA0623-93	2500ng/ml	10µl	"	"	"	"	"	Expired 11-10-93 Spiked
11-10-93	VA0631-93	8240 IS/SS IS	VA0500-93	2000ng/ml	20µl	2.0ml	25ng/ml	MeOH	ds	11-17-93	disposed 11-15-93
"	"	" SS	VA0623-93 VA0710-93	"	"	"	"	"	"	"	"
11-11-93	VA0632-93	TCLP Spike Pesticide	VA0630-93-1	Commercial	—	—	Volume to 100ml	MeOH	Rm	01-11-94	disposed 01-12-94
"	VA0633-93	TCLP Spike	VA0632-93	Commercial	100µl	1.0ml	1/10 of Bottle	MeOH	Rm	11-14-93	Disposed 11-22-93
11-12-93	VA0634-93	8020 ISTD Percent	VA0	200ng/µl	—	—	200ng/ml	MeOH	SDF	05-12-93	Disposed of 11-18-93
"	VA0635-93	8020 ISTD Working	VA0634-93	200ng/ml	250µl	20ml	25ng/ml	"	"	05-12-93	"
11-11-93	VA0636-93	Gas Mix 2 Cans	VA0615-93	200ng/l	250µl	1.0ml	50ng/l	MeOH	Rm	11-19-93	Disposed 11-22-93
"	"	" GAS	VA0616-93	2000ng/l	25µl	"	"	"	"	"	"
11-15-93	VA0637-93	8240 Working Fill3	VA0590-93	200ng/ml	25µl	1.0ml	5ng/ml	MeOH	ds	11-22-93	Disposed 11-23-93
"	"	" 8240	VA0638-93	400ng/ml	125µl	"	"	"	"	"	"
11-15-93	VA0639-93	8240 2° Parent	VA0499-93	500ng/ml	80µl		100ng/ml	MeOH	ds	01-15-94	disposed 11-30-93
"	"	"	VA0492-93	200ng/ml	200µl	1.0ml	"	"	"	"	"
"	"	"	VA0493-93	"	200µl	"	"	"	"	"	"
"	"	"	VA0494-93	"	200µl	"	"	"	"	"	"
"	VA0639-93	IS Parent	VA0492-93-2	200ng/ml	—	—	250ng/ml	MeOH	ds	05-15-94	Vial 2 of 5 Restek Lot 00K09
"	VA0640-93	IS/SS IS	VA0639-93	250ng/ml	20µl	2.0ml	25ng/ml	"	"	11-22-93	disposed 11-19-93
"	"	" SS	VA0623-93	"	"	"	"	"	"	"	"
11-15-93	VA0641-93	IS Working	VA0639-93	250ng/ml	10µl	1.0ml	25ng/ml	MeOH	ds	11-22-93	
"	VA0642-93	SS Working	VA0623-93	"	20µl	1.0ml	50ng/ml	"	"	"	
11-15-93	VA0643-93	Unleaded Gasoline	000777	2500ng/ml	—	—	2500ng/ml	MeOH	SDF	—	2 vials Restek

VA0643-93
Cat # 30061 Unleaded Gasoline Composite Standard
Lot # A 002797 Date Made 9/93 Store @ -10
2400 ug/ml in 1ml ampoules
Restek Corporation FOR LABORATORY USE ONLY PA



Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Final Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
11 09 93	VA0724-93	502/524 Mstr. Mix	VA0729-93	2000 ug/mL	10.0 mL	1.0 mL	200 ug/mL	MeOH	P.N	12-16-93	1:10 in 6 analytes Surr Spike
			VA0648-93	2000 ug/mL	10.0 mL						
			VA0711-93	2000 ug/mL	10.0 mL						
12 01 93	VA0729-93	502/524 Mstr. Mix	VA0724-93	200 ug/mL	2.50 mL	1.0 mL	50 ug/mL	MeOH	P.N.	12 16 93	Diluted 1:4 in MeOH
12/1/93	VA0250-93	VOA Surr Mix	Lot A002901	2500 ug/mL	-	-	25 ug/mL	MeOH	CL		Cyclohexane (2 analytes)
	VA0731-93	8010A Cal Mix #3	Lot A001244	200 ug/mL	-	-	40 ug/mL				
	VA0732-93	Matrix Spike Mix	Lot A002787	2500 ug/mL	-	-	500 ug/mL				
	VA0733-93	VOA Cal Mix #1	Lot A001740	5000 ug/mL	-	-	1000 ug/mL				
	VA0734-93	VOA Cal Mix #2	Lot A002683	2000 ug/mL	-	-	400 ug/mL				
	VA0735-93	ISTD Mix	Lot A002426	2500 ug/mL	-	-	500 ug/mL				
	VA0736-93	4-Bromofluorobenzene	Lot A002567	200 mg/mL	-	-	40 ug/mL				
	VA0737-93	8022 Cal Mix #1	Lot A001734	2000 ug/mL	-	-	400 ug/mL				
	VA0738-93	8010A Cal Mix #2	Lot A001241	2000 ug/mL	-	-	400 ug/mL				
	VA0739-93	8240 VOA Mix #1	Lot A001547	2000 ug/mL	-	-	200 ug/mL				
	VA0740-93	8240 VOA Mix #2	Lot A001551	2000 ug/mL	-	-	200 ug/mL				

VOA Surrogate Spike Mix
Catalog #30004 Lot #A002801
Solvent: purge & trap grade methanol
VA0730-93

Component	Purity	Concentration
1 1,2-dichloroethane-d4	99%	2500ug/ml
2 toluene-d8	99%	2500
3 4-bromofluorobenzene	99%	2500

8010A Calibration Mix #3
Catalog #30007
Lot #A001244
VA0731-93

Component	Concentration
1 1,1-dichloroethene	2000ug/ml
2 chloroform	2000
3 1,1,1-trichloroethane	2000
4 1,2-dichloroethane	2000
5 1,2-dichloropropane	2000
6 dibromomethane	2000
7 2-chloroethyl vinyl ether	2000
8 1,1,2-trichloroethane	2000
9 dibromochloromethane	2000
10 1,1,1,2-tetrachloroethane	2000
11 1,1,2,2-tetrachloroethane	2000
12 bromobenzene	2000
13 1,4-dichlorobenzene	2000

VOA Matrix Spike Mix
Catalog #30005 Lot #A002787
Solvent: purge & trap grade methanol
VA0732-93

Component	Purity	Concentration
1 1,1-dichloroethene	99%	2500ug/ml
2 benzene	99%	2500
3 trichloroethene	99%	2500
4 toluene	99%	2500
5 chlorobenzene	99%	2500

VOA Calibration Mix #1
Catalog #30006 Lot #A001740
Solvent: P&T methanol
VA0733-93

Component	Purity	Concentration
1 acetone	99%	5000ug/ml
2 2-butanone	99%	5000
3 4-methyl-2-pentanone	99%	5000
4 2-hexanone	99%	5000

VOA Internal Standard Mix
Catalog #30011 Lot #A(B)2626
Solvent: purge & trap grade methanol
VA0735-93

Component	Purity	Concentration
1 bromochloromethane	99%	2500ug/ml
2 1,4-difluorobenzene	99%	2500
3 chlorobenzene-d5	99%	2500

VOA Calibration Mix #2
Catalog #30007 Lot #A002683
Solvent: P&T methanol
VA0734-93

Component	Purity	Concentration
1 carbon disulfide	99%	2000ug/ml
2 vinyl acetate	99%	2000
3 benzene	99%	2000
4 toluene	99%	2000
5 ethyl benzene	99%	2000
6 p-xylene	99%	2000
7 o-xylene	99%	2000

502.2 Calibration Mix #1
Catalog #30002 Lot #A002914
Solvent: purge & trap grade methanol
VA0737-93

Component	Purity	Concentration
1 dichlorodifluoromethane	99%	2000ug/ml
2 chloromethane	99%	1995
3 vinyl chloride	99%	2002
4 bromomethane	99%	1993
5 chloroethane	99%	1998
6 trichlorofluoromethane	99%	2000
7 1,1-dichloroethene	NOT Present	

8010A Calibration Mix #2
Catalog #30004
Lot #A001241
VA0738-93

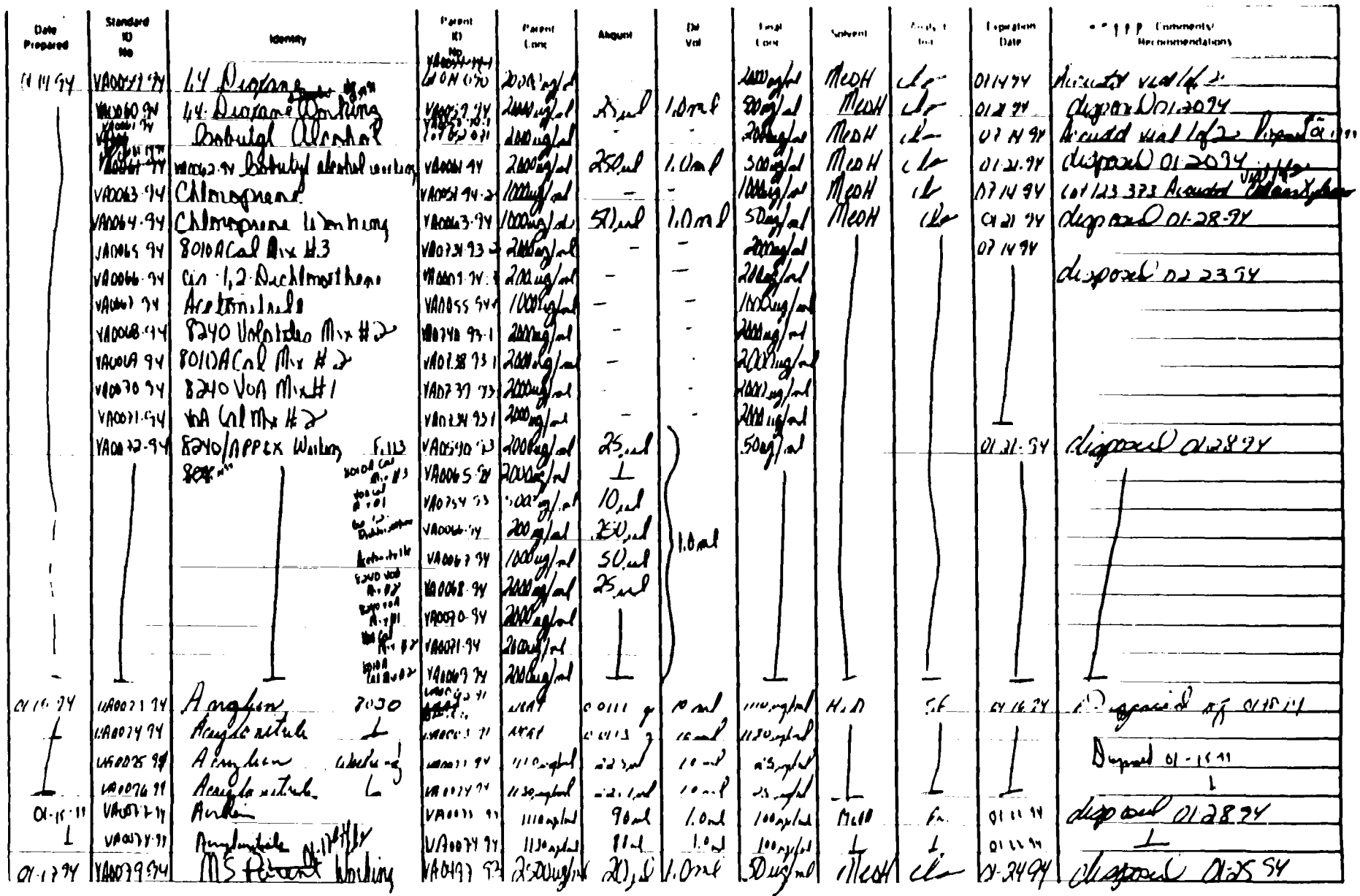
Component	Concentration
1 1,1-dichloroethene	2000ug/ml
2 methylene chloride	2000
3 trans-1,2-dichloroethene	2000
4 carbon tetrachloride	2000
5 trichloroethene	2000
6 bromodichloromethane	2000
7 cis-1,3-dichloropropene	2320
8 trans-1,3-dichloropropene	1680
9 tetrachloroethene	2000
10 chlorobenzene	2000
11 bromoform	2000
12 1,2,3-trichloropropane	2000
13 1,3-dichlorobenzene	2000
14 benzyl chloride	2000
15 1,2-dichlorobenzene	2000

0000079

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00105 Comments/ Recommendations
		8240 Volatiles Mix #1 Catalog # 30077 Lot #A001549 VA07359-93	—	8240 Volatiles Mix #2 Catalog #30078 Lot #A001551 VA07340-93							
		Component / Concentration: 1. acetonitrile 2000µg/ml; 2. allyl chloride 2000; 3. propionitrile 2000; 4. methacrylonitrile 2000; 5. methyl methacrylate 2000; 6. pyridine 2000; 7. ethyl methacrylate 2000; 8. 2-picoline 2000; 9. styrene 2000		Component / Concentration: 1. iodomethane 2000µg/ml; 2. 1,4-dioxane 2000; 3. 1,2-dibromomethane 2000; 4. cis-1,4-dichloro-2-butene 2000; 5. trans-1,4-dichloro-2-butene 2000; 6. pentachloroethane 2000; 7. 1,2-dibromo-3-chloropropane 2000						
12-07-93	VA07741-93	Hexane	VA07723-93	5000µg/ml	10µl	10ml	5µg/ml	MeOH	SF	06-07-94	
〃	VA07429	Gas Solve Matrix Mix	VA07741-93	50µg/ml	100µl	1.0ml	5µg/ml	〃	〃	〃	
〃	〃	〃 Benzene	VA07722-93	5000µg/ml	10µl	〃	〃	〃	〃	〃	
11-10-93	VA07493	MS spike Mix Working	VA07493-93	2500µg/ml	20µl	1.0ml	50µg/ml	MeOH	B.N.	12-12-93	Disposed 12-21-93
12-10-93	VA07494	I.S. Working	VA07331-93	2500µg/ml	10µl	1.0ml	25µg/ml	MeOH	〃	12-12-93	disposed 12-21-93
12-13-93	VA07345-93	Fluoro-1,3-Dichlorobenzene	(CS3-37)	Mix Solution	—	—	1000µg/ml	MeOH	CLS6-1	05-11-94	Lot # 12 (initials) 12-13-93
12-13-93	VA07346-93	8260 IS Parent	VA07049 93-1	2500µg/ml	—	—	25µg/ml	MeOH	cls	06-13-94	tested vial 1 of 2
	VA07347-93	8260 IS Working	VA07346-93	2500µg/ml	20µl	1.0ml	50µg/ml	MeOH	cls	12-20-93	disposed 12-20-94
	VA07348-93	SAS 89 Working IS	VA07347-93	50µg/ml	250µl	1.0ml	12.5µg/ml			12-20-93	Disposed 12-11-93
	VA07349-93	8260 Gases Working	VA07155-93	200µg/ml	25µl	1.0ml	5µg/ml			12-20-93	disposed 01-20-94
	VA07350-93	SAS Gases Working	VA07349-93	5µg/ml	100µl	1.0ml	5µg/ml			12-20-93	Disposed 12-11-93
	VA07351-93	4-BFB Parent DL	VA07163-93	200µg/ml	25µl	1.0ml	5µg/ml			03-13-94 12-13-93	disposed 01-20-94
	VA07352-93	BFB Working SAS Sum	VA07351-93	50µg/ml	250µl	1.0ml	12.5µg/ml			12-20-93	Disposed 12-11-93
	VA07353-93	Sum Working	VA07028-93	200µg/ml	20µl	1.0ml	5µg/ml			12-20-93	disposed 12-21-93
	VA07354-93	VOA Cal Mix #1 (Ketones)	VA07333-93-1	5000µg/ml	—	—	5000µg/ml			06-13-94	tested vial 1 of 2
	VA07355-93	Ketones Working (SAS 89)	VA07354-93	5000µg/ml	5µl	1.0ml	25µg/ml			12-20-93	Disposed 12-11-93
	VA07356-93	502.2 Cal Mix #2	VA07328-93-1	2000µg/ml	—	—	2000µg/ml			06-13-94	tested vial 1 of 2
	VA07357-93	502.2 Cal Mix #3	VA07329-93-1	2000µg/ml	—	—	2000µg/ml				
	VA07358-93	502.2 Cal Mix #4	VA07330-93-1	2000µg/ml	—	—	2000µg/ml				
	VA07359-93	502.2 Cal Mix #5	VA07159-93-1	2000µg/ml	—	—	2000µg/ml				
	VA07360-93	502.2 Cal Mix #6	VA07160-93-1	2000µg/ml	—	—	2000µg/ml				

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00108
12 28 93	VA0[illegible]	8240 Working 8240	VA0[illegible] 93	40 ug/ml	125 ul	} 1.0 ml	50 ug/ml	MeOH	[illegible]	01-04-94	Disposed 01-01-94
⊥	⊥	⊥ [illegible]	VA0590 93	2000 ug/ml	25 ul		⊥	⊥	⊥	⊥	⊥
12-29-93	VA0798 93	Gas Working GAS	VA0[illegible] 93	2000 ug/ml	25 ul	} 1.0 ml	50 ug/ml	MeOH	[illegible]	01-01-94	VA0[illegible] (Expires 01-12-94) Disposed
⊥	⊥	⊥ 2 Chem	VA0[illegible] 93	2000 ug/ml	250 ul		⊥	⊥	⊥	⊥	⊥
12 29 93	VA0799 93	2 Gas Parent	VA0333 93	2000 ug/ml	—		2000 ug/ml	MeOH	[illegible]	01 12 94	Lot # A 002324 [illegible] Disposed
12 30 93	VA0800 93	Gas Mix Working GAS	VA0799 93	2000 ug/ml	25 ul	} 1.0 ml	50 ug/ml	MeOH	[illegible]	01-05-94	Disposed 01-06-94
⊥	⊥	⊥ 2 Chem	VA0801 93	200 ug/ml	250 ul		⊥	⊥	⊥	⊥	⊥ Disposed 01-[illegible]-94
12 30 93	VA0801 93	2 Chem Parent	VA0771 93	2000 ug/ml			2000 ug/ml	MeOH	[illegible]	01 11 94	[illegible] Lot 0[illegible] [illegible]
12 29 93	VA0[illegible] 93	LCS/MS Matrix Spike Mix	VA0497 93	2500 ug/ml	20 ul	1.0 ml	50 ug/ml	MeOH	[illegible]	01-05-94	Disposed 01 06 94
01 03 94	VA0001-94 (VA0[illegible] 93)	8240 Working	VA0615 93	400 ug/ml	125 ul	} 1.0 ml	50 ug/ml	MeOH	[illegible]	01-10-94	Disposed 01 11 94 [illegible]
⊥	⊥	⊥	VA0[illegible] 93	2000 ug/ml	25 ul		⊥	⊥	⊥	⊥	⊥
01 04 94	VA0002 94	502/524 Working	VA0477 93	2000 ug/ml	25 ul	1.0 ml 5.0 ml [illegible]	50 ug/ml	MeOH	[illegible]	01 11 94	
			VA0478 93								
			VA0479 93								
			VA0480 93								
			VA0481 93								
01-05-94	VA0003-94	8240 IS/SS IS	VA0639 93	2000 ug/ml	20 ul	} 20 ml	2 ug/ml	MeOH	[illegible]	01-12-94	[illegible] 01-12-94 disposed
⊥	⊥	⊥ SS	VA0623 93	⊥	⊥		⊥	⊥	⊥	⊥	
01 06 94	VA0004-94	TCLP LCS Working	VA0632 93	[illegible]	100 ul	1.0 ml	[illegible]	MeOH	[illegible]	01-13-94	[illegible] 01-12-94 disposed
01 06 94	VA0005-94	Gas Working GAS	VA0791 93	2000 ug/ml	25 ul	} 1.0 ml	50 ug/ml	MeOH	[illegible]	01-13-94	disposed 01-14-94
⊥	⊥	⊥ 2 Chem	VA0801 93	200 ug/ml	250 ul		⊥	⊥	⊥	⊥	[label] VA0009 94
01 06 94	VA0006 94	LCS/M.S. Spike Mix	VA0497 93	2500 ug/ml	20 ul	1.0 ml	50 ug/ml	MeOH	[illegible]	01-13-94	
01 06 94	VA0007 94	LCS Parent 8020	VA0[illegible] 93	2000 ug/ml	—	—	[illegible] ug/ml	MeOH	SF	01 06 94	
⊥	VA0008 94	8020 LCS Working	VA0007 94	[illegible] ug/ml	[illegible] ul	1.0 ml	50 ug/ml	⊥	⊥	⊥	
01 10 94	VA0009-94	M.Sol 28 cis-1,2-Dichloroethene	LA 113 01	200 ug/ml	—	—	200 ug/ml	MeOH	[illegible]	01-10-95	3 x 1 ml (Lot 113 0[illegible])
01 11 94	VA0010-94	VOA Cal Mix #2	VA03[illegible] 93	2000 ug/ml	—	—	2000 ug/ml	MeOH	[illegible]	07-11-94	Vial #1 in Use
01 11 94	VA0011-94	VOA Cal Mix #3	VA03[illegible] 93	2000 ug/ml	—	—	2000 ug/ml	MeOH	[illegible]	07 11 94	⊥
01 11 94	VA0012-94	VOA Cal Mix #4	VA03[illegible] 93	2000 ug/ml	—	—	2000 ug/ml	MeOH	[illegible]	07 11 94	
01 11 94	VA0013-94	8240 [illegible] Parent	VA0[illegible] 93 Cal Mix #1	2000 ug/ml	[illegible]	1.0 ml	[illegible] ug/ml	MeOH	[illegible]	07-11-94	Continued on page 00109

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
01-11-94	VA0017-94	8240 2° Parent	VA0011-94	2000 ug/ml	250 ul	1.0 ml	500 ug/ml	MeOH	DM	03-11-94	VA0017 continued
		VOA Cal Mix #3	VA0012-94	2000 ug/ml	250 ul	1.0 ml	500 ug/ml				
		VOA Cal Mix #4	VA0154-93	5000 ug/ml	100 ul	1.0 ml	100 ug/ml				
		VOA Cal Mix #1									
01-11-94	VA0014-94	8240 Working	VA0013-94	500 ug/ml	100 ml	1.0 ml	50 ug/ml	MeOH	DM	01-18-94	disposed 01-18-94
			VA0510-93	2000 ug/ml	25 ml						
01-11-94	VA0015-94	BTEX CAL Mix Working	VA0668-93	200 ug/ml	125 ul	1.0 ml	25 ug/ml	MeOH	SF	03-11-94	Disposed of 02-25-94 (contained 8240 Int Std)
	VA0016-94	8240 ISTD ITF	VA0646-93	10000 ug/ml	7.5 ml	3.0 ml	25 ug/ml				Disposed 02-25-94
		SFB	VA0648-93								
01-12-94	VA0017-94	8240 IS/SS IS	VA0629-93	2500 ug/ml	20 ul	2.0 ml	25 ug/ml	MeOH	DM	01-19-94	disposed 01-19-94
		SS	VA0628-93								
01-12-94	VA0018-94	Surrogate Standard (SS Wrk.)	VA0633-93	2500 ug/ml	20 ul	1.0 ml	50 ug/ml	MeOH	DM	01-19-94	disposed 01-20-94
01-12-94	VA0019-94	Internal Standard (IS Wrk.)	VA0631-93	2500 ug/ml	10 ml	1.0 ml	25 ug/ml	MeOH	DM	01-19-94	Disposed 01-19-94
01-12-94	VA0020-94	2,2-Dichloropropane	VA0469-93	2000 ug/ml		-	200 ug/ml	MeOH	DM	02-12-94	Unused vial 2 of 2
	M0021-94	502/524 Working Blend Mix #1	VA0633-93	200 ug/ml	25 ml	2.0 ml	50 ug/ml			01-12-94	Return disposed 02-25-94
		Mix #3	VA0638-93			1.0 ml					
		Mix #4	VA0639-93								
		2,2-Dichloropropane	VA0020-94								
		Bromochloromethane	VA0468-93								
	VA0022-94	502/524 Working	VA0021-94	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	DM	01-19-94	disposed 01-25-94
01-11-94	VA0023-94	524.2 Gas Parent	VA0711-93-1	2000 ug/ml	-	-	2000 ug/ml	MeOH	DM	01-19-94	Lot # 002933 disposed 01-20-94
	VA0024-94	Gas Working	VA0033-94	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	DM	01-19-94	disposed 01-20-94
	VA0025-94	Gas Working	VA0034-94	50 ug/ml	100 ml	1.0 ml	5 ug/ml	MeOH	DM	01-19-94	disposed 01-20-94
	VA0026-94	524.2 Working	VA0761-93	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	DM	01-19-94	
	VA0027-94		VA0035-94	50 ug/ml	100 ml	1.0 ml	5 ug/ml	MeOH	DM	01-19-94	disposed 01-20-94
	VA0028-94	524.2 IS Working	VA0658-93	2000 ug/ml	25 ml	2.0 ml	25 ug/ml	MeOH	DM	01-19-94	Put into 1 dram vial disposed 02-25-94
01-11-94	VA0029-94	524.2 Surrogate Std (Working)	VA0663-93	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	DM	01-20-94	Disposed 01-21-94
		1,2-Dichlorobenzene-d4	VA0662-93	2000 ug/ml							
	VA0030-94	524.2 Surr. Std Working	VA0029-93	50 ug/ml	100 ml	1.0 ml	5.0 ug/ml	MeOH	DM	01-20-94	
01-17-94	VA0031-94	2,2 Dichloropropane	VA0020-94	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	DM	01-20-94	Disposed 03-04-94



Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
01 14 94	VA0059 94	1,4 Dioxane	VA0059 94	2000 ug/ml			2000 ug/ml	MeOH	[illegible]	01 14 94	Accusted vial 1 of 2
	VA0060 94	1,4 Dioxane Working	VA0059 94	2000 ug/ml	25 ul	1.0 ml	500 ug/ml	MeOH	[illegible]	01 21 94	disposed 01 20 94
	VA0061 94	Isobutyl Alcohol	VA0059 94	2000 ug/ml	-	-	2000 ug/ml	MeOH	[illegible]	07 14 94	Accusted vial 1 of 2 Disposed 01 [illegible]
	VA0062 94	Isobutyl alcohol working	VA0061 94	2000 ug/ml	250 ul	1.0 ml	500 ug/ml	MeOH	[illegible]	01 21 94	disposed 01 20 94
	VA0063 94	Chloroprene	VA0051 94-2	1000 ug/ml	-	-	1000 ug/ml	MeOH	[illegible]	07 14 94	Lot 123 373 Accusted [illegible]
	VA0064 94	Chloroprene Working	VA0063 94	1000 ug/ml	50 ul	1.0 ml	50 ug/ml	MeOH	[illegible]	01 21 94	disposed 01-28-94
	VA0065 94	8010A Cal Mix #3	VA0734 93	2000 ug/ml	-	-	2000 ug/ml			07 14 94	
	VA0066 94	cis 1,2 Dichloroethene	VA0009 94	2000 ug/ml	-	-	2000 ug/ml				disposed 02 23 94
	VA0067 94	Acetonitrile	VA0055 94	1000 ug/ml	-	-	1000 ug/ml				
	VA0068 94	8240 Volatiles Mix #2	VA0740 93-1	2000 ug/ml	-	-	2000 ug/ml				
	VA0069 94	8010A Cal Mix #2	VA0738 93 1	2000 ug/ml	-	-	2000 ug/ml				
	VA0070 94	8240 VOA Mix #1	VA0737 93	2000 ug/ml	-	-	2000 ug/ml				
	VA0071 94	VOA Cal Mix #2	VA0734 93 1	2000 ug/ml	-	-	2000 ug/ml				
	VA0072 94	8240/APPEX Working F.113	VA0590 93	2000 ug/ml	25 ul	1.0 ml	50 ug/ml			01 21 94	disposed 01 28 94
		8010A Cal Mix #3	VA0065 94	2000 ug/ml							
		VOA Cal Mix #1	VA0754 93	5000 ug/ml	10 ul						
		cis 1,2 Dichloroethene	VA0066 94	200 ug/ml	250 ul						
		Acetonitrile	VA0067 94	1000 ug/ml	50 ul						
		8240 VOA Mix #2	VA0068 94	2000 ug/ml	25 ul						
		8240 VOA Mix #1	VA0070 94	2000 ug/ml							
		VOA Cal Mix #2	VA0071 94	2000 ug/ml							
		8010A Cal Mix #2	VA0069 94	2000 ug/ml							
01 16 94	VA0073 94	Acrylonitrile 8030	VA0063 91	NEAT	0.0111 g	10 ml	1110 ug/ml	H2O	SF	01 16 94	Disposed of 01 18 94
	VA0074 94	Acrylonitrile	VA0063 91	NEAT	0.0113 g	10 ml	1130 ug/ml				
	VA0075 94	Acrylonitrile working	VA0073 94	1110 ug/ml	225 ul	10 ml	25 ug/ml				Disposed 01-15-94
	VA0076 94	Acrylonitrile	VA0074 94	1130 ug/ml	221 ul	10 ml	25 ug/ml				
01-15-94	VA0077 94	Aniline	VA0073 94	1110 ug/ml	90 ul	1.0 ml	100 ug/ml	MeOH	[illegible]	01 22 94	disposed 01 28 94
	VA0078 94	Acrylonitrile 01-17-94	VA0074 94	1130 ug/ml	81 ul	1.0 ml	100 ug/ml			01 22 94	
01-17 94	VA0079 94	MS Parent Working	VA0497 93	2500 ug/ml	20 ul	1.0 ml	50 ug/ml	MeOH	[illegible]	01-24 94	disposed 01-25 94

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Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
01-19-94	VA0080-94	Med Vol surr	VA0381-94	2500ug/ml	50µl	5.0ml	25ug/ml	MeOH	clo	01-26-94	disposed 01-26-94
"	VA0081-94	Surr Parent	VA0386-93	2500ug/ml	—	—	2500ug/ml	"	"	07/27/94	
01-18-94	VA0082-94	8240 IS/SS IS	VA0134-93	2500ug/ml	20µl	2.0ml	25ug/ml	MeOH	clo	01-25-94	disposed 01-25-94
"	"	" SS	VA0081-94	"	"	"	"	"	"	"	"
"	VA0083-94	8240 Working 8240	VA0013-94	5000ug/ml	100µl	1.0ml	50ug/ml	MeOH	clo	01-25-94	disposed 01-26-94
"	"	" 8270	VA0590-93	2000ug/ml	25µl	"	"	"	"	"	"
01-12-94	VA0084-94	Acrolein parent 8030	neat	neat	0.0019g	10ml	190ug/ml	H2O	SF	01-19-94	disposed 01-28-94
"	VA0085-94	Acrolein	VA0191-94	1900ug/ml	13.2µl	10ml	2.5ug/ml	"	"	"	disposed 01-28-94
"	VA0086-94	Acrylonitrile parent	neat	neat	0.0035g	10ml	350ug/ml	"	"	"	"
"	VA0087-94	Acrylonitrile "	VA0026-94	350ug/ml	7.1µl	10ml	2.5ug/ml	"	"	"	"
01-19-94	VA0088-94	TDS Working	VA0639-93	2500ug/ml	10ml	1.0ml	25ug/ml	MeOH	lw	01-26-94	disposed 01-27-94
01-13-94	VA0089-94	N-Codeine	1/10 40-1	5000ug/ml	—	—	5000ug/ml	MeOH	SF	—	"
"	VA0090-94	Caffeine Morphine Heroine	VA0241-93	5ug/ml	980µl	10ml	49ug/ml	"	"	01-19-94	"
"	"	" N-Codeine	VA0722-93	5000ug/ml	1ml	"	50ug/ml	"	"	"	"
"	"	" N-Codeine	VA0013-94	5000ug/ml	10ml	"	"	"	"	"	"
01-20-94	VC0091-94	Vol Surr Working TFT	VA0646-93	1000ug/ml	5µl	2.0ml	2.5ug/ml	"	"	02-13-94	Disposed 02-04-94
01-20-94	VA0092-94	Surr Working	VA0081-94	2500ug/ml	20µl	1.0ml	50ug/ml	MeOH	clo	01-27-94	disposed 01-28-94
"	VA0093-94	SAS 89 Working 8240 Mix	VA0606-93	200ug/ml	25µl	1.0ml	5ug/ml	"	"	01-27-94	Disposed 02-03-94
"	"	" SAS89	VA0761-93	"	"	"	"	"	"	"	"
"	"	" 4-BEB	VA0251-94	2000ug/ml	100µl	"	"	"	"	"	"
"	VA0094-94	BEB Parent A	VA0682-93	2000ug/ml	25µl	1.0ml	50ug/ml	MeOH	clo	03-20-94	Disposed 01-20-94
"	VA0095-94	SAS89 Surr	VA0094-94	5000ug/ml	250µl	1.0ml	125ug/ml	"	"	01-27-94	Disposed 02-03-94
"	VA0096-94	SAS89 Ketones	VA0754-93	5000ug/ml	5µl	1.0ml	25ug/ml	"	"	01-27-94	Disposed 02-03-94
"	VA0097-94	8240 SAS89 IS	VA0746-93	2500ug/ml	5µl	1.0ml	12.5ug/ml	"	"	"	Disposed 02-03-94
"	VA0098-94	SAS 89 Gases	VA0050-94	50ug/ml	100µl	1.0ml	5ug/ml	MeOH	clo	01-27-94	Disposed 02-07-94
"	VA0099-94	1,4-Dioxane	VA0059-94	2000ug/ml	25µl	1.0ml	50ug/ml	"	"	"	Disposed of 01-27-94
"	VA0100-94	Isobutyl Alcohol	VA0061-94	2000ug/ml	250µl	1.0ml	500ug/ml	"	"	"	"
"	VA0101-94	trans-1,4-Dichloro-2-butene	VA0643-93	100ug/ml	—	—	100ug/ml	MeOH	clo	01-27-94	Accurate Vial log / LBT 020668 02-20-94
01-11-94	VA0102-94	~~SAS 89 Surr~~	VA0745-93	111.5ug/ml	—	—	111.5ug/ml	"	lw	07-11-94	Vial 142

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	DI Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
1 31 94	VA0103-94	Trichloroethene Surrogate	VA0[illegible]-93	2000ug/mL	[illegible]	[illegible]	200ug/mL	MeOH	LL	[illegible]	[illegible]
	VA0104-94	Trichlorofluoromethane Working	VA0105-93		2mL	1.0mL	100ug/mL	MeOH	LL	01 28 94	Dispensed 2 01 94
01 31 94	VA0105-94	VOC Mix Primary	VA0291-91	2000ug/mL	-	-	200ug/mL	MeOH	DM	02 11 94	Used 2/9
	VA0106-94	VOC Mix Primary	VA0105-94	2000ug/mL	100mL	1.0mL	200ug/mL			01 11 94	Dispensed 02 23 94
	VA0107-94	LCI Mix (SAS/A)	VA0106-94	2000ug/mL	62.5mL	1.0mL	125ug/mL	MeOH	LL	01 28 94	Dispensed 02 03 94
			[illegible]	[illegible]	110mL						
01 31 94	VA0108-94	Gases Working Gas 2 Chlor	MA0199-93	2000ug/mL	25mL	1.0mL	50ug/mL	MeOH	LL	01-28-94	Dispensed 01-31-94
01 31 94	VA0109-94	m-Xylene	VA0101-93	2000ug/mL	250mL			MeOH	LL		Accurate 5 Invalid
	VA0110-94	1,2-Dichloropropane	[illegible]	2000ug/mL	-	-	2000ug/mL	MeOH	LL		1 2 Invalid
01 31 94	VA0111-94	TCLP Pest LCI Mix	VA0[illegible]-91	See Neat Weight	-	-	None	MeOH	LL	01 31 94	(Lot 110890) Already Dispensed 01-31-94
	VA0111-94	TCLP Working LCI Mix	VA0111-94	None	100mL	1.0mL	1/10 of Conc			01 11 94	Dispensed 02-23-94
01 31 94	VA0113-94	8240 IS/SS IS SS	VA0191-93	2500ug/mL	20mL	2.0mL	25ug/mL	MeOH	LL	01 31 94	Dispensed 1-31-94
	VA0114-94	MS Working	VA0011-93								
	VA0115-94	Chloroform Mix 1	VA0[illegible]-93	2000ug/mL	20mL	1.0mL	50ug/mL	MeOH	LL	01-31-94	Dispensed 2-1-94
01-24-94	VA0116-94	Gasoline MT MARKES w/Hexane	[illegible]	[illegible]	-	-	10 ug/mL	None		01-24-94	NA Dispensed 2-3-94
			VA0[illegible]-93	50ug/mL	720mL	1mL	50ug/mL			[illegible]	Dispensed 2-24-94
			[illegible]	5000ug/mL	10mL						
01 26 94	VA0117-94	8240 Working 8240 Fill3	VA0013-94	5000ug/mL	100mL	1.0mL	50ug/mL	MeOH	LL	02-02-94	Dispensed 2-10-94
			VA0590-93	2000ug/mL	85mL						
01-02-94	VA0118-94	IS Working	VA0[illegible]-93	2000ug/mL	10mL	1.0mL	25ug/mL	MeOH	LL	02-03-94	Dispensed 02-04-94
01 27 94	VA0119-94	4-Bromo	[illegible]	Neat	-	-	Neat	H2O	SF	[illegible]	Expired
	VA0120-94	Propionitrile	VA0104-93	100ug/mL	250mL	1.0mL	25ug/mL	MeOH		02 27 94	
	VA0121-94	Acrolein parent 1830	VA0002-91	Neat	0.0[illegible]g	10mL	[illegible]	H2O		02-28-94	
	VA0122-94	working	VA0121-94	1250ug/mL	1.25mL	10mL	25				Dispensed 03-23-94
	VA0123-94	Acrylonitrile parent	VA0003-91	Neat	0.0177g	10mL	17700				
	VA0124-94	working	VA0023-94	17700ug/mL	14mL	10mL	25				Dispensed 02-28-94
	VA0125-94	4,4-Dibromo	[illegible]	20,000ug/mL	5mL	10mL	100ug/mL	MeOH			Expired 01-27-94
	VA0126-94	1,4-Dioxane	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
01-27-94	VA0127-94	Isobutyl Alcohol	VA0061-94	2000 ug/ml	25 µl	1.0 ml	50 ug/ml	MeOH	SF	07-27-94	
	VA0128-94	Acetonitrile	VA0067-94	1000 ug/ml	100 µl	1.0 ml	100 ug/ml				
	VA0129-94	8030 + 8015 GW Fat Propionitrile Surr	VA0033-94	5750 ug/ml	8.7 µl	1.0 ml	50 ug/ml				
		Ethanol	VA0048-94	1750 ug/ml	5.71 µl		1000 ug/ml				
		Diethyl Ether	VA0046-94	25 ug/ml	200 µl		5 ug/ml				
		MEK	VA0049-94	1590 ug/ml	6.3 µl		10 ug/ml				
		MIBK	VA0130-94	200 ug/ml	500 µl						
	VA0130-94	MIBK	VA0043-94	2830 ug/ml	20.6 µl	1.0 ml	200 ug/ml				
	VA0131-94	L Tinal	VA0049-94	neat	0.0540 g	2.0 ml	10800 ug/ml			04-13-94	
01-28-94	VA0132-94	1,4-Dioxane	VA0059-94	20000 ug/ml	25 µl	1.0 ml	500 ug/ml	MeOH	cls	02-04-94	disposed 02-08-94
	VA0133-94	Isobutyl Alcohol	VA0060-94	2000 ug/ml	250 µl	1.0 ml	500 ug/ml				disposed 02-08-94
	VA0134-94	Surr Working	VA0081-94	2500 ug/ml	20 µl	1.0 ml	50 ug/ml				disposed 02-07-94
	VA0135-94	trans-1,4-Dichloro-2-butene	VA0101-94	100 ug/ml	100 µl	1.0 ml	10 ug/ml				Disposed 02-17-94
	VA0136-94	8240/APPIX Working Fe 113	VA0580-93	2000 ug/ml	25 µl	1.0 ml	50 ug/ml				disposed 02-07-94
		8010A Cal Mix #3	VA0065-94	2000 ug/ml	25 µl						
		VOA Cal Mix #1	VA0754-93	5000 ug/ml	10 µl						
		Cis-1,2-Dichloroethene	VA0066-94	2000 ug/ml	250 µl						
		Acetonitrile	VA0067-94	1000 ug/ml	50 µl						
		8240 VOA Mix #2	VA0068-94	2000 ug/ml	25 µl						
		8240 VOA Mix #1	VA0070-94								
		VOA Cal Mix #2	VA0071-94								
		8010A Cal Mix #2	VA0069-94								
	VA0137-94	Chloroprene Working	VA0063-94	1000 ug/ml	50 µl	1.0 ml	50 ug/ml				disposed 02-08-94
01-28-94	VA0138-94	Acrolein	VA0002-91	0.0425 g	0.0425 g	10.0 ml	0.0425 g/10 ml	MeOH	cls	07-28-94	saved in 7.0 ml vial
	VA0139-94	Acrolein Working	VA0138-94	4250 ug/ml	24 µl	1.0 ml	100 ug/ml	MeOH	cls	02-04-94	actual conc = 102 ug/ml disposed 02-08-94
	VA0140-94	Acrylonitrile	VA0003-91	neat	0.0160 g	10.0 ml	1600 ug/ml	MeOH	cls	07-28-94	saved in 3.5 ml vial
	VA0141-94	Acrylonitrile Working	VA0140-94	1600 ug/ml	62.5 µl	1.0 ml	100 ug/ml			02-04-94	disposed 02-08-94
01-29-94	VA0142-94	AA Mix Acrolein	VA0139-94	100 ug/ml	250 µl	1.0 ml	25 ug/ml	MeOH	SF	02-04-94	
		Acrylonitrile	VA0141-94		250 µl						

00114

0000086

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Ind	Expiration Date	Comments/ Recommendations
01-31-94	VA0143-94	8010 Mix Ethanol	VA0[illegible]	[illegible] ug/ml	[illegible] ml	1.0 ml	1000 ug/ml	MeOH	[illegible]	[illegible]	
		Diethyl Ether	VA0[illegible]	1920	6.4 ml		25				
		MEK	VA0[illegible]	1220	6.3 ml		10				
		MIBK	VA0043-94	2810	17.7 ml		50				
01-31-94	VA0144-94	8240 IS/SS IS	VA0139-93	2500 ug/ml	20 ml	2.0 ml	25 ug/ml	MeOH	[illegible]	02-07-94	disposed 02-07-94
		SS	VA0081-94								
	VA0145-94	M-Xylene	VA0109-94	2000 ug/ml	—	—	2000 ug/ml	MeOH	[illegible]	02-31-94	
	VA0146-94	Gased Working Gases	VA0199-93	2000 ug/ml	25 ml	1.0 ml	50 ug/ml			02-07-94	disposed 02-07-94
		M-Xylene	VA0145-94								
01-31-94	VA0147-94	MDL Mix Ethanol	VA0[illegible]-94	[illegible] ug/ml	5.71 ml	1.0 ml	1000 ug/ml	MeOH	[illegible]	[illegible]	
		1,4 Dioxane	VA0054-94	[illegible] ug/ml	25 ml		[illegible] ug/ml				
		Isobutyl Alcohol	VA0061-94	[illegible] ug/ml	[illegible] ml		50 ug/ml				
02-01-94	VA0148-94	MS Mix Working	VA0497-93	2500 ug/ml	20 ml	1.0 ml	50 ug/ml	MeOH	[illegible]	02-08-94	disposed 02-07-94
	VA0149-94	Propionitrile Working	VA0103-94	2000 ug/ml	[illegible] ml	1.0 ml	100 ug/ml				
02-01-94	VA0150-94	Gas Sure Working TFT	VA0646-93	[illegible] ug/ml	5 ml	2.0 ml	[illegible] ug/ml	MeOH	[illegible]	[illegible]	Disposed [illegible]
	VA0151-94	Gasoline Cal Chlor Mix	VA0643-93	[illegible] ug/ml	[illegible] ml	1.0 ml	[illegible] ug/ml				Disposed [illegible]
02-02-94	VA0152-94	TCLP Working Mx	VA0111-94	[illegible]	100 ml	1.0 ml	1/10 of Prod	MeOH	[illegible]	02-07-94	Disposed 02-11-94
02-03-94	VA0153-94	SAS 89 Working	VA0761-93	200 ug/ml	25 ml	1.0 ml	5 ug/ml	MeOH	[illegible]	02-10-94	Disposed 2-10-94
			VA0606-93	200 ug/ml	25 ml						
			VA0094-94	50 ug/ml	100 ml						
02-03-94	VA0154-94	SAS 89 Ketone	VA0754-93	500 ug/ml	5 ml	1.0 ml	25 ug/ml	MeOH	[illegible]	02-10-94	Disposed 02-10-94
02-03-94	VA0155-94	SAS Sur	VA0094-93	50 ug/ml	250 ml	1.0 ml	11.5 ug/ml				
	VA0156-94	SAS I.S.	VA0746-93	2500 ug/ml	5 ml	1.0 ml	12.5 ug/ml				
02-03-94	VA0157-94	SAS 89 (LCS Mix)	VA0106-94	200 ug/ml	62.5 ml	1.0 ml	12.5 ug/ml	MeOH	[illegible]	02-10-94	Disposed [illegible] 02-08-94
			VA0102-94	111.5 ug/ml	110 ml						
02-03-94	VA0158-94	SAS 89 LCS Mix	VA0106-94	200 ug/ml	62.5 ml	1.0 ml	12.5 ug/ml				Disposed [illegible] 02-11-94
			VA0102-94	111.5 ug/ml	110 ml						
02-04-94	VA0159-94	IS Working	VA0634-93	2500 ug/ml	10 ml	1.0 ml	25 ug/ml	MeOH	[illegible]	02-11-94	Disposed [illegible] 02-12-94
02-04-94	VA0160-94	FR113 Working	VA0590-93	2000 ug/ml	25 ml	[illegible]	50 ug/ml		[illegible]	02-11-94	

00115

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00116 Comments/ Recommendations
02-04-94	VA0161-94	Gasoline Surr TFT	VA0646-94	[illegible]	5 µl	2.0 ml	[illegible]	MeOH	[illegible]	05-15-94	~~Disposed of [illegible]~~
~~02-15-94~~	~~VA0162-94~~	~~Gasoline Surr TFT~~	~~VA0646-94~~	~~[illegible]~~	~~5 µl~~	~~2.0 ml~~	~~25 µg/ml~~	~~⊥~~	~~⊥~~	~~⊥~~	Didn't make
02-07-94	VA0162-94	8240 IS/SS IS	VA0639-93	2500 ug/ml	20 µl	2.0 ml	25 ug/ml	MeOH	[illegible]	02-14-94	disposed 02-15-94
⊥	⊥	⊥ SS	VA0081-94	⊥	⊥		⊥	⊥	⊥	⊥	⊥
	VA0163-94	Surr Working	VA0081-94	2500 ug/ml	~~2.0 ml~~ 20 ml	1.0 ml	50 ug/ml				Disposed 02-16-94
	VA0164-94	8240/APPIX Working Fill3	VA0590-93	2000 ug/ml	25 µl		50 ug/ml				disposed 02-15-94
		Pond Cal Mix #3	VA0065-94	2000 ug/ml	25 µl						
		VOA Cal Mix #1	VA0754-93	5000 ug/ml	10 µl						
		1,2-Dichloroethane	VA0066-94	200 ug/ml	250 µl	1.0 ml					
		Acetonitrile	VA0067-94	1000 ug/ml	50 µl						
		Exo VOA Mix #2	VA0068-94	2000 ug/ml	25 µl						
		Exo VOA Mix #1	VA0070-94	2000 ug/ml	25 µl						
		VOA Cal Mix #2	VA0071-94	2000 ug/ml	25 µl						
		Bond Cal Mix #2	VA0069-94	2000 ug/ml	25 µl						
⊥	VA0165-94	BFB Working	VA0663-93	2000 ug/ml	12.5 µl	1.0 ml	25 ug/ml	MeOH	[illegible]	05-17-94	
02-07-94	VA0166-94	Gas Mx	VA0799	2000 ug/ml	25 µl	1.0 ml	50 ug/ml	MeOH	[illegible]	02-14-94	disposed 02-07-94
⊥	⊥	⊥ n-xylene	VA0145	2000 ug/ml	25 µl		⊥	⊥	⊥	⊥	⊥
	VA0167-94	Gases Parent	VA0737-93	2000 ug/ml	–	–	2000 ug/ml	MeOH	[illegible]	04-07-94	
	VA0168-94	Gases Working Gas	VA0767-94	2000 ug/ml	25 µl	1.0 ml	50 ug/ml	MeOH	[illegible]	02-14-94	disposed 02-09-94
⊥	⊥	⊥ n-xylene	VA0145-94	⊥	⊥		⊥	⊥	⊥	⊥	⊥
⊥	VA0169-94	Gas Working (Fyo) for SA187	VA0166-94	50 ug/ml	100 µl	1.0 ml	5 ug/ml	MeOH	[illegible]	02-19-94	Disposed 2-10-94 [illegible]
02-08-94	VA0170-94	Acrolein Working	VA0138-94	4250 ug/ml	24 µl	1.0 ml	100 ug/ml	MeOH	[illegible]	02-15-94	Disposed [illegible] 02-17-94
	VA0171-94	Acrylonitrile Working	VA0140-94	1600 ug/ml	62.5 µl	1.0 ml	100 ug/ml				⊥
	VA0172-94	1,4 Dioxane	VA0059-94	20,000 ug/ml	25 µl	1.0 ml	500 ug/ml				Disposed [illegible] 02-17-94
	VA0173-94	Isobutyl Alcohol	VA0061-94	2000 ug/ml	250 µl	1.0 ml	500 ug/ml				
	VA0174-94	Chlorophene Working	VA0063-94	1000 ug/ml	50 µl	1.0 ml	50 ug/ml	⊥	⊥	⊥	⊥
	VA0175-94	VOA Custom #1 (WMCO) Pyridine Cyclohexane	VA0601-92-1	10,000 ug/ml	–	–	10,000 ug/ml	MeOH	[illegible]	~~02-15-94~~ 02-08-94	Lot #A 001685 (WMCO Mx #1)
	VA0176-94	VOA Custom #3 (WMCO) Methylene Chloride	VA0603-92-1	1,000 ug/ml	–	–	1,000 ug/ml	MeOH	[illegible]	~~02-15-94~~ 02-08-94	Lot #A 001626 (WMCO Mx #2)
⊥	VA0177-94	VOA Custom #3 (Fyo)	VA0176-94	1,000 ug/ml	100 µl	1.0 ml	100 ug/ml	⊥	⊥	⊥	Disposed 03-29-94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Amount	DM Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00122 Comments/ Recommendations
03/17/94	VA02164 94	R240/AAPIX Working Fill 3	VA0490 94	200 ug/ml	25 ml		5 ug/ml	MeOH	cb	03 MAR 94	dup of 03.14.94
		R240 Working Fill 2	VA0065 94	1	1						
		R240 Working Fill 1	VA0354.93	5,000 ug/ml	10 ml	1.0 ml					
		R240 Working Fill 4	VA0221 94	200 ug/ml	250 ml						
		Rotenone Working	VA0063 94	1000 ug/ml	50 ml						
		R240 Working Fill 5	VA0061 94	200 ug/ml	25 ml						
		R240 Working Fill 6	VA0050 94								
		R240 Working Fill 2	VA0091 94								
		R240 Working Fill 3	VA0069 94								
	VA02163 94	Cocaine Working	VA0062 94	200 ug/ml	25 ml	1.0 ml	5 ug/ml				dup of 03.21.94
	1	Cocaine Working Fill 2	VA0045 94	1	1		1				
	VA02164 94	TCP Working	VA0011 94	Concentrate	100 ml	1.0 ml	Concentrate				
03/14/94	VA02165 94	SUM Working	VA0004 94	200 ug/ml	20 ml	1.0 ml	5 ug/ml	MeOH	cb	03 MAR 94	dup of 03.22.94
	VA02166 94	R240/AAPIX Working Fill 3	VA0523 93	200 ug/ml	25 ml		5 ug/ml	MeOH	cb		dup of 03.22.94
		R240 Working Fill 1	VA0045 94	1	1						
		R240 Working Fill 4	VA0254.93	2000 ug/ml	10 ml						
		R240 Working Fill 5	VA0221 94	200 ug/ml	250 ml						
		Rotenone Working	VA0063 94	1000 ug/ml	50 ml	1.0 ml					
		R240 Working Fill 6	VA0061 94	200 ug/ml	25 ml						
		R240 Working Fill 2	VA0050 94								
		R240 Working Fill 3	VA0091 94								
		R240 Working Fill 1	VA0069 94								
03/15/94	VA02162 94	MS Working	VA0479 93	2500 ug/ml	20 ml	1.0 ml	5 ug/ml	MeOH	cb	03 23 94	dup of 03.23.94 (1)
03/15/94	VA02689 94	Aux working	VA0468 93	200 ng/ml	125 ml	1.0 ml	25 ng/ml	MeOH	NO	03 APR 94	
03/09/94	VA02169 94	8240 IS/SS	VA0429 93	2500 ug/ml	20 ml	2.0 ml	5 ug/ml	MeOH	cb	03 23 94	
1	1	1 SS	VA0081 94	1	1	2.0 ml	1	1	1	1	
3/1/94	VA02170 94	8240 1 SpikeCompMix Working	VA0252 94	200 ug/ml	250 ml	1.0 ml	5 ug/ml	MeOH	cb	03 APR 94	dup of 03.28.94
3/7/94	VA02171 94	SV2/S24 Mix #5	VA0472 93	2000 ug/ml	—	—	200 ug/ml	MeOH	cb	09 NOV 94	
1	VA02172 94	SV2/S24 Mix #6	VA0471 93	2000 ug/ml			200 ug/ml	1	1	1	

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00123 Comments/ Recommendations
031794	VA0373-94	502/524 Mix #4	VA0473-93	2000ug/ml	—	—	2000ug/ml	MeOH	clg	09-11-94	
	VA0449-94	Dibromomethane	VA0449-93	2000ug/ml	—	—	2000ug/ml	"	"	"	
	VA0279-94	502/524 Parent	VA0020-94	2000ug/ml	100 ul	1.0ml	200ug/ml	"	"	05-17-94	
			VA0274-94								
			VA0273-94								
			VA0272-94								
			VA0271-94								
	~~VA0276-94~~	~~388 Pt Spike Working~~	VA0275-94	2000ug/ml	250 ul	1.0ml	500ug/ml	MeOH	clg	03-24-94	Used 03/17/94
032194	VA0276-94	624 Working	VA0047-94	2000ug/ml	25 ul	1.0ml	50ug/ml	MeOH	clg	03-28-94	disposed 032994
			VA0045-94								
	VA0277-94	TCL Parent	VA0360933	conc varies	—	—	conc varies	MeOH	clg	03-21-94	
	VA0278-94	TCL Working	VA0277-94	conc varies	100 ul	1.0ml	1/10 conc of Parent	"	"	03-28-94	disposed 032994
032294	VA0279-94	8240/8260 Working Fr 113	VA0590-93	2000ug/ml	25 ul	1.0ml	50ug/ml	MeOH	clg	03-29-94	
		8240 VOA Cal Mix #3	VA0046-94								
		VOA Cal Mix #1	VA0754-93	500ug/ml	10 ul						
		cis 1,2-DCE	VA0221-94	2000ug/ml	250 ul						
		Acetonitrile	VA0047-94	10000ug/ml	50 ul						
		8240 VOA Mix #2	VA0048-94	2000ug/ml	25 ul						
		8240 VOA Mix #1	VA0220-94								
		VOA Cal Mix #2	VA0071-94								
		8240 VOA Mix #2	VA0069-94								
VA032294	VA0280-94	cis-1,2-Dichloroethene	VA0009-94	200ug/ml	—	—	20ug/ml	MeOH	clg	09-22-94	Accutest Lot 3 of 3
032394	VA0281-94	8240 Working	VA0190A-94	2000ug/ml	250 ul	1.0ml	50ug/ml	MeOH	clg	03-30-94	
			VA0188-94								
	VA0282-94	624 Working	VA0240-94	2000ug/ml	25 ul	1.0ml	50ug/ml				
	VA0283-94	8260 DS/SS DS	VA0746-93	250ug/ml	10 ul	1.0ml	25ug/ml				
		SS	VA0199-94								
	VA0284-94	MS Mix Parent	VA0312-11-A	2500 ug/L	~~20~~ 10 ml	3.0 ml 09-11-94	2500 ug/L	MeOH	RW	09-21-94	Vol 11 of 10 Lot A 000517
	VA0285-94	MS Working Mix	VA0284-94	2500 ug/L	20 ml	1.0 ml	50 ug/L	"	"	03-30-94	

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	0012 Comments/ Recommendations
01-11-94	VA018R-94	2-Propanol (Isopropyl)	[illegible]	Neat	—	—	Neat	(Isopropyl)	RA		
	VA014-94	2-Propanol 2°	VA0176-94	Neat	20 mL	100 mL	200 ppm		01-21-94		
	VA0218-94	2-Propanol Working	VA0218-94	Neat	.05 mL	10 mL	1500 ppm	MeOH	RA	01-10-94	
	VA0288-94	Iso Working	VA0611-94	2500 ug/mL	20 mL	2.0 mL	25 ug/mL	MeOH	RA	01-10-94	Expired 03-30-94
		L		L	L		L	L	L	L	L
	VA0289-94	Sum Working	VA0229-94	2500 ug/mL	20 mL	1.0 mL	50 ug/mL	MeOH	CA	033094	Expired 033194
	VA0290-94	IS Working	VA0296-93	L	10 mL	1.0 mL	25 ug/mL	L	L	L	L
01-24-94	VA0291-94	8260 Med Vol Surr	VA0299-94	2500 ug/mL	50 mL	5.0 mL	25 ug/mL	MeOH	CA	033194	
01-11-94	L'A0293-94	CH Cl Pent	[illegible]	Neat	—	—	Neat	CH2Cl2	RA		Lot G51314 (Burdick Ultra Res. Analyzed 03-30-94 11:30 AM)
L	VA0111-94	L	VA0191-94	Neat	.0065	10 mL	.0065 g	MeOH	RA	03-30-94	
L	VA0111-94	CH Cl	VA0113-94	650 ug/mL	77 mL	1.0 mL	50 ppm	MeOH	RA	04-01-94	
03-31-94	VA0298-94	8010 (Liquid) Working	VH0315-94	200 ug/mL	25 mL	1.0 mL	5 ug/mL	MeOH	CA	040194	
	VA0297-94	IS Working	VA0297-94	2500 ug/mL	10 mL	1.0 mL	25 ug/mL	MeOH	CA		
	VA0298-94	SS Working	VA0281-94	L	20 mL	1.0 mL	50 ug/mL	L	L	L	
03-27-94	VA0299-94	Gases Working	VA0296-94	2000 ug/mL	25 mL	1.0 mL	50 ug/mL	MeOH	CA	040594	Combined expires 04-03-94
L	L	L	VA0295-94	L	L		L	L	L	L	
01-21-94	VA0199-94	MA Aromatics	VA0111-94	4410 ug/mL	24 mL	1.0 mL	100 ug/mL	MeOH	RA	04-01-94	
L	L	L	VA0110-94	1600 ug/mL	63 mL		L	L	L	L	
01-21-94	VA0300-94	UMCO Mix #3	VA0126-94	1000 ug/mL	100 mL	1.0 mL	100 ug/mL	MeOH	RA	01-01-94	
	VA0301-94	UMCO Mix #1	VA0125-94	10,000 ug/mL	100 mL	1.0 mL	1000 ug/mL	L	L	Stock (01-11-94 2° Pent)	
	VA0302-94	UMCO Mix #2	VA0301-94	1,000 ug/mL	25 mL	1.0 mL	25 ug/mL	L	L	04-01-94	
03-30-94	VA0303-94	8240/8260 Working (113	VA0318-94	2500 ug/mL	25 mL	1.0 mL	50 ug/mL	MeOH	CA	04-06-94	
			VA0305-94	L	100 mL						
			VA0306-94	2500 ug/mL	10 mL						
			VA0307-94	2500 ug/mL	25 mL						
			VA0308-94	10 ug/mL	50 mL						
			VA0309-94	250 ug/mL	25 mL						
			VA0310-94	/	/						
		(cont'd)	[illegible]								

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00125 Comments/ Recommendations
0330 94	VA0303 94	Vol 8240/AFF9 Working Solution #2	VA0069 94	2000ug/ml	25 ml	1.0 ml	50ug/ml	MeOH	clo	04-06 94 ~~0330 94~~ 0330 94	
1	VA0304 94	8240 IS/SS IS	VA0639 94	2500ug/ml	20 ml	2.0 ml	25ug/ml	MeOH	1	1	
1	1	1 SS	VA0081 94	1	1		1	1	1	1	
0330 94	VA0305 94	8260 Med Vol Surr	VA0199 94	2500ug/ml	100 ml	10.0 ml	25ug/ml	MeOH	clo	0406 94	
1	VA0306 94	TCLP Spk Working	VA0277 94	Conc Liner	100 ml	1.0 ml	1/10 of Parent	MeOH	PLN	04-16-94	
0330 94	VA0307 94	AA Mix 1/10 Dr.	VA0299 94	100ug/ml	100 ml	1.0 ml	10ug/ml	MeOH	clo	0405 94	
0331 94	VA0308 94	8260 Working	VA0309 94 ~~VA0190 94~~	200ug/ml	250 ml	1.0 ml	50ug/ml	MeOH	clo	0407 94	
	1	1	VA0188 94	1	1		1			1	
	VA0309 94	8260/SAS 89 Parent	VA0310 94 ~~VA0590 93~~	2000ug/ml	100 ml		200ug/ml			0531 94	
			VA0756 93								
			VA0757 93								
			VA0758 93			1.0 ml					
			VA0759 93								
	1	1	VA0760 93	1	1		1	1	1	1	
	VA0310 94	Freon 113 Parent	VA0563 93	2000ug/ml	–	–	2000ug/ml	MeOH	clo	09-31 94	
	VA0311 94	Gases Working	VA0240 94	2000ug/ml	25 ml	1.0 ml	50ug/ml			04-07 94	
	VA0312 94	8260 IS/SS	VA0746 93	2500ug/ml	10 ml	1.0 ml	25ug/ml				
	1	1	VA0199 94	1	10 ml	1.0 ml 04-03-94	1				
	VA0313 94	8260 IS	VA0746 93	2500ug/ml	10 ml	1.0 ml	25ug/ml				
	VA0314 94	Med Vol MS	VA0284 94	2500ug/ml	20 ml	2.0 ml	25ug/ml				
	VA0315 94	MS Working	VA0284 94	2500ug/ml	20 ml	1.0 ml	50ug/ml				
04-01-94	VA0316 94	Med Vol Surr	VA0081 94	2500ug/ml	30 ml	3.0 ml	25ug/ml	MeOH	[illegible]	04-08-94	
0404 94	VA0317 94	Hexane Parent	LOT BE391	Neat	0.0165g	10.0 ml	0.00165g/ml	MeOH	clo	10-04 94	
	VA0318 94	Acrylonitrile + Natonitrile	VA0140 94	1000ug/ml	155 ml	1.0 ml	250ug/ml	MeOH	clo	04-11 94	
	1	1	VA0181 94	1000ug/ml	250 ml		1	1	1	1	0000092
	VA0319 94	Methyl Iodide	VA0056 93	100ug/ml	–	–	100ug/ml	MeOH	clo	1004 94	
	VA0320 94	O-Diethylbenzene	VA0645 92	1000ug/ml	–	–	1000ug/ml	1	1	1	
	VA0321 94	5250 Spk Working MI	VA0319 94	100ug/ml	500 ml	1.0 ml	50ug/ml			04-11 94	
	1	1 O-Diethyl	VA0320 94	1000ug/ml	50 ml		1			1	

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00126 Comments/ Recommendations
04-04-94	VA0342 94	525.0 Spill Working Mixture	VA0334 94	16 ug/ml	30 ml	1.0 ml	500 ug/ml	MeOH	clo	04/11/94	
	VA0322 94	AA LCS Analytes	VA0318 94	1200 ug/ml	210 ml	1.0 ml	250 ug/ml	MeOH	RM	04 11 94	@ 252 ug/ml / 250 · 100.8 % · 100
		Acetates	VA0311 94	1000 ug/ml	256 ml		250 ug/ml	MeOH	DA	04/11/94	
04-06-94	VA0323 94	Gas Permit	VA0324 94	200 ug/ml	—	—	200 ug/ml	MeOH	RM	06 06 94	
	VA0324 94	Gas Mix Gas	VA0322 94	200 ug/ml	250 ml	1.0 ml	50 ug/l	MeOH	RM	04-11-94	
		m-xylene	VA0315 94	2000 ug/ml	25 ml		1	L	L	L	
	VA0325 94	11/33 33	VA0611 94	2500 ug/ml	20 ml	2 ml	25 ug/ml	MeOH	RM	04-11-94	
		SS	VA0581 94	2500 ug/ml	20 ml		1	L	L	L	
	VA0326 94	n Butanol	Lot 092196	1000 ug/ml	—	—	1100 ug/ml	MeOH	RM	04-06 94	Accepted 1 x 1 ml 1 ml
	VA0313 94	n-Butanol	VA0319 94 1	1000 ug/ml	—	—	1000 ug/ml	MeOH	RM	10-06-94 04-06-94	Canada 0.5 x 2 (2)
	VA0316 94	tetrahydrofuran	Lot 022 001	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	04-06 94	Accepted 1/ml 1 ml
	VA0314 94	tetrahydrofuran	VA0312 94 1	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	10-06 94	
	VA0330 94	cis-1,2-Dichloroethene	Lot 113 033	200 ug/ml	—	—	200 ug/ml	MeOH	RM	4/95	Accepted 2/ml M-502-20
	VA0331 94	trans-1,3-Dichloropro...	Lot 053 319	100 ug/ml	—	—	100 ug/ml	MeOH	RM	4/95	Accepted 2/ml AM-1-032
	VA0332 94	Dibromomethane	Lot 082 118	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	4/95	Accepted 2/ml M-502 20-104
	VA0333 94	Isobutyl Alcohol	Lot 052 011	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	4/95	Accepted 2/ml AM-4-110-204
09-01-94	VA0334-94	502/524 VOC Mix #4	Lot 092293	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	09-01-96	20061 Accepted 2 ml
	VA0335-94	502/524 VOC Mix #5	Lot 111593	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	11-15-96	20061 / 2 ml
	VA0336 94	502/524 VOC Mix #6	Lot 111593	2000 ug/ml	—	—	2000 ug/ml	MeOH	RM	11-15-96	20061 1 2 ml

MIX #4 VA0334 94

2000 ug/mL in Methanol 1 mL

(1) 1,2-Dibromo-3-chloropropane
(2) 1,2-Dibromoethane (EDB)
(3) 1,2-Dichloroethane
(4) 1,2-Dichloropropane
(5) 1,3-Dichloropropane
(6) 1,3-Dichloropropene*
(7) 1,1-Dichloropropene
(8) Hexachlorobutadiene
(9) 1,1,1,2-Tetrachloroethane
(10) 1,1,2,2-Tetrachloroethane
(11) 1,1,2-Trichloroethane
(12) Trichloroethene
(13) 1,2,3-Trichloropropane

*cis/trans mixture

Part # 30061 525

MIX #5 VA0335 94

2000 ug/mL in Methanol 1 mL

(1) Benzene
(2) Bromobenzene
(3) n-Butylbenzene
(4) Ethylbenzene
(5) p-Isopropyltoluene
(6) Naphthalene
(7) Styrene
(8) Toluene
(9) 1,2,3-Trichlorobenzene
(10) 1,2,4-Trichlorobenzene
(11) 1,2,4-Trimethylbenzene
(12) 1,3,5-Trimethylbenzene
(13) m-Xylene

Part # 30063 525

MIX #6 VA0336 94

2000 ug/mL in Methanol 1 mL

(1) tert-Butylbenzene
(2) sec-Butylbenzene
(3) Chlorobenzene
(4) 4-Chlorotoluene
(5) 2-Chlorotoluene
(6) 1,1-Dichlorobenzene
(7) 1,2-Dichlorobenzene
(8) 1,4-Dichlorobenzene
(9) Isopropylbenzene
(10) o-Propylbenzene
(11) o-Xylene
(12) p-Xylene

Part # 30063 525

0000093

CLO 04 07 94

CLO 04 07 94

CLO 04 07 94

2-10-94	VA0333 94	VOA Matrix Spike Mix	Lot A003944	2500 ug/ml	—	—	250 ug/ml	1 ml	clo		Restek 5.1 ml vials
1	VA0328-94	1,2-Dichloro-3-(Methylthio)propane	Lot 052-115	2000 ug/ml	—	—	200 ug/ml	1	1	10-07-94	

VA0300 432

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil. Vol	Final Conc.	Solvent	Analyst Init	Expiration Date	00127 Comments/ Recommendations
04-07-94	VA0339-94	1,2-Dibromo-3-chloropropane	VA0338-94	2000ug/ml	25ul	1.0ml	50ug/ml	MeOH	cls	04-14-94	
		Dibromomethane	VA0274-94								
	VA0340-94	AA Working Acrolein	VA0138-94	4250ug/ml	24ul	1.0ml	100ug/ml				
		Acrylonitrile	VA0180-94	1200ug/ml	83.5ul						
	VA0341-94	2-Propanol 20	VA0286-94	Neat	04-07-94 .0150gm	10.0ml	1500ug/ml	MeOH	D.N.	06-07-94 ~~04-14-94~~	040794
	VA0342-94	~~525.07~~ 268.06 Working Cycl + Pyr	VA0175-94	10,000ug/ml	50ul	1.0ml	500ug/ml	MeOH	Cls	04-14-94	
		tetrahydrofuran	VA0329-94	2000ug/ml	250ul						
		2 Propanol	VA0341-94	1500ug/ml	330ul						
	VA0343-94	n-Butanol Working	VA0327-94	1000ug/ml	500ul	1.0ml	500ug/ml		OKN		
	VA0344-94	8240 Working Fr113	VA0310-93	2000ug/ml	25ul	1.0ml	50ug/ml	MeOH	Cls	04-14-94	
		8010A Cal Mix #3	VA0065-94	2000ug/ml							
		VOA Cal #1	VA0754-93	5000ug/ml	10ul						
		Cis-1,2-DCE	VA0280-94	200ug/ml	250ul						
		Acetonitrile	VA0067-94	1000ug/ml	50ul						
		8240 VOA #2	VA0068-94	2000ug/ml	25ul						
		8240 VOA #1	VA0070-94								
		VOA Cal #2	VA0071-94								
		8010A #2	VA0069-94								
04-08-94	VA0345-94	Styrene	Lot 044-075	1000ug/ml	–	–	1000ug/ml	MeOH	D.N.	ONGOING study (4/95)	Vial Lot # 044-075
	VA0346-94	Styrene Parent	VA0345-94-1	1000ug/ml	–	–	1000ug/ml	MeOH	D.N.	10-08-94	
	VA0347-94	Ms Mx Working	VA0284-94	2500ug/ml	20ul	1.0ml	50ug/ml	MeOH	D.N.	09-15-94	
04-08-94	VA0348-94	8240 Working for (MSF) FR113	VA0310-93	2000ug/ml		1.0ml	50ug/ml	MeOH	D.N.	04-15-94	
		8010A Cal Mix #3	VA0065-94	2000ug/ml							
		VOA Cal #1	VA0754-93	5000ug/ml							
		Cis-1,2-DCE	VA0280-94	200ug/ml							
		Acetonitrile	VA0067-94	1000ug/ml							
		8240 VOA Cal #2	VA0068-94	2000ug/ml							
		VOA Cal #2	VA0071-94								
		8010A #2	VA0069-94								Cont. on next page

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Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00128 Comments/ Recommendations
04 08 94	VA0348 94	(8240 [illegible]) Styrene	VA0346 94	1000 ug/ml	50 ml	1.0 ml	50 ug/ml	MeOH	[illegible]	04 15 94	disposed 04-18 94
↓	VA0349 94	TCLP LCS Working	VA0337 94	conc [illegible]	100 ml	1.0 ml	conc 1/10 of [illegible]	MeOH	[illegible]	04-15 94	↓
04 08 94	VA0350 94	IS Working	VA0639 94	2500 ug/ml	10 ml	1.0 ml	25 ug/ml	MeOH	[illegible]	04-15 94	↓
04 08 94	VA0351 94	SS Working	VA0081 94	2500 ug/ml	20 ml	1.0 ml	50 ug/ml	↓	[illegible]	↓	↓
04 13 94	VA0352 94	502.2 Cal Mix #1	[illegible]	2000 ug/ml	—	—	2000 ug/ml	MeOH	[illegible]		Lested 4 1 ml vials 04-13 94

502.2 Calibration Mix #1
Catalog #30042 Lot #A002912
Solvent purge & trap grade methanol
VA0352 94

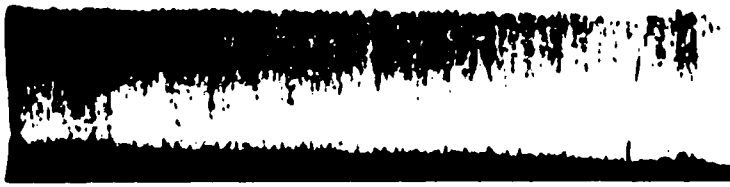
Component	Purity	Concentration
1 dichlorodifluoromethane	99%	2000 ug/ml
2 chloromethane	99%	1995
3 vinyl chloride	99%	2002
4 bromomethane	99%	1993
5 chloroethane	99%	1998
6 trichlorofluoromethane	99%	2000

[illegible] 04-13 94

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
04 13 94	VA0353 94	Styrene	lot 044 075	1000 ug/ml	—	—	1000 ug/ml	MeOH	[illegible]		Accusted 2-1 ml vials
↓	VA0354 94	n-Butanol	lot 042 130	1.0 mg/ml	—	—	1.0 mg/ml	↓	↓		↓ 1 ml vial
↓	VA0355 94	Tetrahydrofuran	lot 044 080	2.0 mg/ml	—	—	2.0 mg/ml	↓	↓		↓ ↓
04-14 94	VA0356 94	Gases Working Gases	VA0323 94	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	[illegible]	04-21 94	
↓	↓	↓ m Xylene	VA0145 94	2000 ug/ml	25 ml		↓	↓	↓	↓	
↓	VA0357 94	8240 IS/SS IS	VA0639 93	2500 ug/ml	20 ml	2.0 ml	25 ug/ml	↓	↓	↓	
↓	↓	↓ SS	VA0081 94	↓	↓		↓	↓	↓	↓	
04 18 94	VA0358 94	8240 Working Fr 113	VA0310 93	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	[illegible]	04-25 94	
↓	↓	↓ 8010A Cal Mix #3	VA0065 94	2000 ug/ml	↓		↓	↓	↓	↓	
		VDA Cal #1	VA0341 93	5000 ug/ml	10 ml						
		Cl 12 DCE	VA0350 94	200 ug/ml	250 ml						
		Butanitrile	VA0067 94	1000 ug/ml	50 ml						0000095
		8240 VDA #2	VA0068 94	2000 ug/ml	25 ml						
		VDA Cal #2	VA0071 94	↓	↓						
		8010A #2	VA0069 94	↓	↓						
		Styrene	VA0346 94	1000 ug/ml	50 ml						
↓	VA0359 94	cis-1,2 Dichloroethene	VA0717 92	200 ug/ml	—	—	200 ug/ml	MeOH	[illegible]	10-18 94	Accusted

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Oil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00129 Comments/ Recommendations
04-11-94	VA0360-94	MS Mix	VA0284-94	2500 ug/ml	20 ml	1.0 ml	50 ug/ml	MeOH	D.N.	04-25-94	disposed 04-26-94
	VA0361-94	SS Parent	VA0356-93-3	2500 ug/ml	—	—	2500 ug/ml	MeOH	D.N.	~~04-25-94~~ 04-18-94	(Vial 3 of 5 Lot A 002196)
	VA0362-94	Surrogate Working	VA0361-94	2500 ug/ml	20 ml	1.0 ml	50 ug/ml	MeOH	D.N.	04-25-94	disposed 04-26-94
	VA0363-94	I.S. Working	VA0631-93	2500 ug/ml	10 ml	1.0 ml	25 ug/ml	MeOH	D.N.	04-25-94	↓
04-14-94	VA0364-94	WMCO Working Mx #3	VA0176-94	1000 ug/ml	100 ml	1.0 ml	100 ug/ml	MeOH	D.N.	04-26-94	Disposed 04-27-94
↓	VA0365-94	WMCO Working Mx #1	VA0301-94	1000 ug/ml	75 ml	1.0 ml	75 ug/ml	MeOH	D.N.	04-26-94	↓
04-[illegible]-94	VA0366-94	TCLP working	VA0277-94	[illegible]	[illegible]	1.0 ml	[illegible]	MeOH	KB	04-27-94	Disposed 04-28-94 D.N.
04-21-94	VA0367-94	IS/SS	VA0361-94	2500 ug/ml	20 ml	2.0 ml	25 ug/ml	MeOH	D.N.	04-28-94	Disposed 04-29-94 D.N.
↓	↓	↓	VA0631-93	2500 ug/ml	↓	↓	↓	↓	↓	↓	↓
04-21-94	VA0368-94	Gas Mx Working (Gas)	VA0323-94	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	D.N.	04-28-94	
↓	↓	↓ Acrylonitrile	VA0195-94	2000 ug/ml	25 ml		↓	↓	↓	↓	
04-21-94	VA0369-94	AA Acrolein	VA0138-94	4250 ug/ml	24 ml	1.0 ml	100 ug/ml	MeOH	D.N.	04-28-94	Disposed 04-29-94 D.N.
↓	↓	↓ Acrylonitrile	VA0180-94	1200 ug/ml	85 ml		↓	↓	↓	↓	↓
04-25-94	VA0370-94	1,2-Dibromo-3-chloropropane	LOT 052185	2000 ug/ml	—	—	2000 ug/ml	MeOH	Cls		Accustd 2-1 ml vials
~~04-25-94~~	~~VA0371-94~~	~~50 ppb Ketones~~	~~VA0754-93~~	~~5000 ug/ml~~			~~50 ug/ml~~				Cls 04-26-94
04-26-94	VA0371-94	8240 Working Fr113	VA0310-93	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	Cls	05-01-94	
		8010A Cal Mix #3	VA0065-94	↓	↓						
		VOA Cal #1	VA0754-93	5000 ug/ml	10 ml						
		Cis-1,2-DCE	VA0359-94	200 ug/ml	250 ml						
		~~Acetonitrile~~	~~VA0067-94~~	~~1000 ug/ml~~	~~50 ml~~						Cls 04-26-94
		8240 VOA #2	VA0068-94	2000 ug/ml	25 ml						
		VOA Cal #2	VA0071-94	↓	↓						
		8010A #2	VA0069-94	↓	↓						
		Styrene	VA0346-94	1000 ug/ml	50 ml						
04-28-94	VA0372-94	TCLP Working	VA0277-94	Conc. varies from parent	100 ml	1.0 ml	Conc. varies 1/10 of Acid	MeOH	D.N.	05-05-94	
04-28-94	VA0373-94	MS Working	VA0284-94	2500 ug/ml	20 ml	1.0 ml	50 ug/ml	MeOH	D.N.	05-05-94	
04-29-94	VA0374-94	IS Parent	VA0646-93-3	2500 ug/ml	-	-	2500 ug/ml	MeOH	D.N.	10-29-94	Rested Lot A 001669
	VA0375-94	Gas Mx Working	VA0195-94	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	D.N.	05-06-94	
↓	↓	↓	VA0323-94	200 ug/ml	250 ml	↓	↓	↓	↓	↓	

0000096



Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00130 Comments/ Recommendations
04-27-94	VA03794	8240 Working	VA03163-92	2000ug/ml	-	-	200ug/ml	MeOH	CLA	10-29-94	
	VA0394	8240 Working	VA0309-94	2000ug/ml	2.5ml	1.0ml	50ug/ml			05-04-94	06-11-94 Exp. 5-27/[illegible]
			VA0377-94								
	VA0397-94	8240 Cal Mix	VA0340-94	2000ug/ml	2.5ml	1.0ml	50ug/ml			05-04-94	Use with Cal 11/1/94
	VA0380-94	8240 15/SS	VA0346-94	2000ug/ml	1.25ml	1.0ml	25ug/ml			05-06-94	
			VA0399-94								
05-03-94	VA0394	8240 Working Fills	VA0330-94	2000ug/ml	25ml		50ug/ml	MeOH	CLA	05-11-94	
		BDIDA Cal #1	VA0365-93								
		VOA Cal #1	VA0354-93	5000ug/ml	10ml						
		Cal 12 QC	VA0359-93	2000ug/ml	25ml	1.0ml					
		8240 VOA #2	VA0048-94	2000ug/ml	25ml						
		VOA Cal #2	VA0071-94								
		BDIDA #2	VA0049-94								
		Styrene	VA0316-94	1000ug/ml	50ml						
	VA0382-94	BFB Parent	VA0302-93	2000ug/ml	-	-	2000ug/ml			11-04-94	
	VA038394	BFB Working	VA0382-94		12.5ml	1.0ml	25ug/ml				
05-04-94	VA0384-94	8240 B/SS	VA0374-94	2000ug/ml	20ml	2.0ml	20ug/ml	MeOH	CLA	05-13-94	
			VA0361-94								
04-29-94	VA0385-94	MS Working	VA0384-94	2000ug/ml	2.5ml	1.0ml	50ug/ml				
05-09-94	VA0386-94	Cal Working	VA0345-94	2000ug/ml	25ml	2.0ml	50ug/ml	MeOH	CLA	05-16-94	0000087
			VA0353-94	1000ug/ml	2.5ml						
	VA0387-94	Cal Mix	VA0377-94	2000ug/ml		-	200ug/ml	MeOH	CLA	07-05-94	
05-04-94	VA0388-94	TCLP (Lily)	VA0177-94	Commercial	10ml	1.0ml	2.5ug/ml	MeOH	CLA	05-16-94	
04-11-94	VA0389-94	8260 Add	VA0361-93	-	-	-	200ug/ml	MeOH	CLA	07-10-94	(See VA0377-94)
05-03-94	VA0390-94	GAI Mix (GAI Acid/Base)	VA0383-94	2000ug/ml	2.5ml	1.0ml	50ug/ml	MeOH	CLA	05-10-94	Working QC mix expires 6-10-94
	VA0391-94	GAI Mix Working	VA0390-94	50ug/ml	1.0ml	1.0ml	5ug/ml	MeOH	CLA	05-16-94	
	VA0392-94	8260/GAI II Working	VA0378-94	50ug/ml	10ml	1.0ml	5ug/ml			05-13-94	

00131

Date Prepared	Standard ID No.	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations
05-16-94	VA0511-94	Ketone Working	VA0747-94	5001 ug/ml	5 ul	1 ml	25 ug/ml	MeOH	[illegible]	05-17-94	
	VA0711-94	IS/SS I.S.	VA0746-94	2501 ug/ml	10 ml	2.0 ml	12.5 ug/ml	MeOH	[illegible]	05-17-94	
		" SS	VA0663-94	2000 ug/ml	12.5 ml	"	"	"	"	"	
	VA0715-94	SAS11/CLP72 LCS	VA0105-94	2000 ug/ml	12.5 ml	2.0 ml	12.5 ug/ml	MeOH	[illegible]	05-17-94	
						[illegible]	vola	05-20-94			2nd ext. 11-94
05/11/94	VA0396-94	524.2 IS Working	VA0658-93	2000 ug/ml	12.5 ml	1.0 ml	25 ug/ml	MeOH	clo	05-18-94	Parents exp 05-17-94
	VA0397-94	524.2 Surr Working 4-BFB	VA0662-93		25 ml	1.0 ml	50 ug/ml	MeOH	clo	05-17-94	
		" 1,2-DCB-d4	VA0663-93		25 ml	"	"	"	"	"	
	VA0398-94	524.2 Surr Working (1:10)	VA0397-94	50 ug/ml	100 ml	1.0 ml	5 ug/ml	MeOH	[illegible]	05-17-94	
	VA0399-94	8260 Working	VA0301-94	200 ug/ml	250 ml	1.0 ml	50 ug/ml	MeOH	[illegible]	05-18-94	- 5th
05/29/94	VA0400-94	2,2 Dichloropropane + CH_2Cl_2	VA0293-94	6450 ug/ml	77 ml	1.0 ml	50 ug/ml	MeOH	clo	05-19-94	
			VA0020-94	2000 ug/ml	25 ml	"	"	"	"	"	
	VA0401-94	2,2-Dichloropropane in CH_2Cl_2 1/0	VA0400-94	50 ug/ml	100 ml	1.0 ml	5 ug/ml	"	"	"	
	VA0402-94	Cyclohexane	1ZG219	Neat	—	—	Neat		clo		
	VA0403-94	BTEX Cal Mix	VA0503-93	200 ug/ml	—	—	200 ug/ml	MeOH	KB	11-12-94	
	VA0404-94	BTEX working	VA0403-94	200 ug/ml	125 ul	1.0 ml	25 ug/ml	MeOH	KB	11-12-94	
	VA0405-94	BTEX Cal Std Low	VA0404-94	25 ug/ml	20 ml	10 ml	0.5 ug/ml	MeOH	KB	11-12-94	
05/13/94	VA0406-94	8240 Working Fr 13	VA0310-94	2000 ug/ml	25 ml		50 ug/ml	MeOH	clo	05-20-94	
		8010 Cal #3	VA0065-94	"	"						
		VOA Cal #1	VA0054-93	5000 ug/ml	10 ml	1.0 ml					
		cis-1,2-DCE	VA0059-94	200 ug/ml	25 ml						
		8240 VOA #2	VA0068-94	2000 ug/ml	25 ml						
		VOA Cal #2	VA0031-94								
		8010 #2	VA0069-94								
		Styrene	VA0346-94	1000 ug/ml	50 ml						
05-16-94	VA0407-94	IS/SS IS	VA0374-94	2500 ug/ml	20 ml	2.0 ml	250 ug/ml	MeOH	[illegible]	05-25-94	
		" SS	VA0361-94	2500 ug/ml	20 ml	"	"	"	"	"	
05/16/94	VA0408-94	LFB Working 524.2	VA0309-94	2000 ug/ml	25 ml	1.0 ml	50 ug/ml	MeOH	clo	05-23-94	
	VA0409-94	LFB Gases Working	VA0054-94	2000 ug/ml	25 ml	1 ml	"	"	"	"	

00132

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments Recommendations
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
			[illegible]	[illegible]	[illegible]						
	[illegible]	[illegible]	[illegible]	[illegible]	100 µl	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	Cyclohexane [illegible]	[illegible]	[illegible]	0.0048 g	10.0 ml	[illegible]	MeOH	[illegible]	11-[illegible]-94	
	[illegible]	[illegible] Working [illegible]	[illegible]	2000 µg/ml	25 µl	1.0 ml	50 µg/ml			05 25 94	
		[illegible]	VA0[illegible]								
		Chloroprene	[illegible]	1100 µg/ml	50 µl						
		Cyclohexane	[illegible]	980 µg/ml	50 µl						51.0/50 - 102%
		[illegible]	[illegible]	1000 µg/ml	50 µl						
	[illegible]	Ethyl Acetate [illegible]	[illegible]	1000 µg/ml			1000 µg/ml			11 18 94	
	[illegible]	2-Propanol + [illegible] Alcohol	[illegible]	[illegible]	330 µl	[illegible]	500 µg/ml	MeOH	[illegible]	05 25 94	[illegible] - 101%
			[illegible]	[illegible]	250 µl						
	[illegible]	[illegible]	[illegible]	[illegible] µg/ml	24 µl	[illegible]	100 µg/ml	[illegible]	[illegible]	05 25 94	
			[illegible]	1200 µg/ml	85 µl						
[illegible]	[illegible]	[illegible] Working	[illegible]	[illegible]	[illegible]	1.0 ml	[illegible]	MeOH	[illegible]	05-26-94	
	[illegible]	IS Working	[illegible]	[illegible]	[illegible]	1.0 ml	[illegible]				
	[illegible]	[illegible]	[illegible]	[illegible]	30 µl	[illegible] ml	[illegible]				
			[illegible]								
	[illegible]	[illegible]	[illegible]	[illegible]	30 µl	3.0 ml	[illegible]				Disposed [illegible] 05 30 94
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	05 27 94	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			05 27 94	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	200 µg/ml			[illegible]			11 25 94	[illegible]
	[illegible]	8240 Working [illegible]	[illegible]	2000 µg/ml	25 µl		50 µg/ml	[illegible]	[illegible]	05 30 94	
		[illegible]	[illegible]	2000 µg/ml	25 µl						
		[illegible]	[illegible]	[illegible] µg/ml	10 µl						

0000090

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00133 Comments/ Recommendations
5/13/94	VAC113	5240 Lot # 1 Lot 1121	VA0113-94	2000 µg/mL	250 µL	1.0 mL	50 µg/mL	MeOH	[illegible]	05/31/94	Aliquot from pg 00132
		5240 HAH #1	VA0611-94	2000 µg/mL	25 mL						
		VIA Cal #1	VA0771-94								
		8260A #2	VA0769-94								
		Styrene	VA0396-94	1000 µg/mL	5 mL						
05/23/94	VAC429-94	TCLP Parent	VA0360-94	conc varies	—	—	conc varies per conc of parent	MeOH	KB	11/23/94	
	VAC430-94	TCLP working	VA0429-94	conc varies	100 µL	1mL		MeOH	KB	05/30/94	05/23/94 disposed 05/31/94
	VA0431-94	8240 Hdo's Working	VA0359-94	200 µg/mL	250 µL	1.0 mL	50 µg/mL	MeOH	BN/AS	07-10 05-30-94	disposed 05/31/94
	VA0432-94	MS Working	VA0364-94	200 µg/mL	250 µL	1.0 mL	50 µg/mL			06-01-94	05/24/94 disposed 05/31/94
05/24/94	VA0433-94	8260 IS/SS	VA0399-94	2500 µg/mL	10 µL	1.0 mL	25 µg/mL	MeOH	CLZ	05-31-94	
			VA0346-93								
	VA0434-94	8260 Base Working	VA0387-94	2000 µg/mL	25 µL	1.0 mL	50 µg/mL			06-01-94	disposed 06/03/94
	VA0435-94	8260/SAS 89 Parent	VA0310-94	2000 µg/mL	100 µL		200 µg/mL			06-13-94	
			VA0326-93			1.0 mL					
			VA0357-93								
			VA0358-93								
			VA0359-93								
			VA0360-93								
	VA0436-94	8260 Working	VA0435-94	200 µg/mL	250 µL	1.0 mL	50 µg/mL			06/01/94	disposed 06/03/94
05-25-94	VA0437-94	GAS Working	VA0317-94	2000 µg/mL	25 mL	2.0 mL	50 µg/mL	MeOH	KB	06-01-94 05-31-94	disposed 05/31/94
			VA0115-94	2500 µg/mL	25 mL		125 µg/mL				
	VA0438-94	IS/SS IS	VA0376-94	2500 µg/mL	20 mL	2.0 mL	125 µg/mL	MeOH	KB	06-01-94	disposed 05/26/94
		SS	VA0377-94	2500 µg/mL	20 mL						
05-26-94	VA0439-94	GAS Mix	VA0332-94	2000 µg/mL	25 mL	2.0 mL	125 µg/mL	MeOH	KB	06-01-94	disposed 06/03/94
			VA0197-94	2000 µg/mL	25 mL						
05/26/94	VA0440-94	IS/SS IS SS	VA0421-94	2500 µg/mL	20 mL	2.0 mL	125 µg/mL	MeOH	CLZ	06-01-94	disposed 05/31/94
			VA0394-93								
5/27/94	VA0441-94	BFB Working	VA0427-94	200 µg/mL	25 mL	1.0 mL	25 µg/mL	MeOH	CLZ	11-04-94	
5/27/94	VA0442-94	DFTPP Working	VA0351-94	2000 µg/mL	10 mL	1.0 mL	25 µg/mL			06/04/94	

Date Prepared	Standard ID No	Identity		Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	Comments/ Recommendations 00131
052894	VA044394	Surr Working		VA036194	2500µg/ml	20µl	1.0ml	50µg/ml	MeOH	CLS	060494	
	VA044494	8240 IS/SS	IS	VA031494		20µl	2.0ml	25µg/ml	MeOH	CLS		
			SS	VA036194								
	VA044594	Med LVL Surr		VA036194	2500µg/ml	100µl	10.0ml	25µg/ml	MeOH	DN	060494	
053194	VA044694	8260 Addns Working		VA038994	200µg/ml	250µl	1.0ml	50µg/ml	MeOH	CLS	060794	
	VA044794	8260 IS/SS	IS	VA019994	2500µg/ml	10µl	1.0ml	25µg/ml	MeOH	CLS	060794	
			SS	VA014694								
	VA044894	8240 Working	Fill 3	VA031093	2000µg/ml	25µl	1.0ml	50µg/ml	MeOH	CLS	060794	
			Stock #3	VA006594								
			VOA #1	VA015493	5000µg/ml	10µl						
			CS 1,2 DCE	VA042794	200µg/ml	250µl						
			8240 VOA #2	VA006894	2000µg/ml	25µl						
			VOA Cal #2	VA001194								
			801 Mix #2	VA001794								
			Styrene	VA034694	1000µg/ml	50µl						
	VA044994	1,4-Dioxane + Isobutyl Alcohol		VA021594	2000µg/ml	250µl	1.0ml	500µg/ml				
				VA008994	2000µg/ml	25µl						
	VA045094	ADDIX Working	8240 #1	VA001094	2000µg/ml	25µl	1.0ml	50µg/ml				
			Chloroprene	VA006394	1000µg/ml	50µl						
			Acetonitrile	VA018194								
			Acrolein	VA013894	4250µg/ml	24µl		100µg/ml				
			Acrylonitrile	VA014094	1600µg/ml	625µl						
	VA045194	MS Working		VA028494	2500µg/ml	20µl	1.0ml	50µg/ml	MeOH	KRB	060794	
	VA045294	8260 Med LVL Surr		VA014994		30µl	3.0ml	25µg/ml	MeOH	DKN	060794	
	VA045394	8260 IS		VA014693	2500µg/ml	10µl	1.0ml	25µg/ml	MeOH			
	VA045794	AA Mix	Acrylo	VA014094	1600µg/ml	63µl	1.0ml	100µg/ml	MeOH			Disposed 5/31/94 Acetonitrile not very good response
			Aceto	VA015194		100µl						
	VA045894	AA LCS Mix	Acrylo	VA014094	1600µg/ml	63µl	1.0ml	100µg/ml	MeOH			
			Aceto	VA001094	2000µg/ml	50µl						

Copied from original on 060194 Original archived with S Lane K Brown 6/1/94

0000101

Date Prepared	Standard ID No	Identity	Parent ID No	Parent Conc	Aliquot	Dil Vol	Final Conc	Solvent	Analyst Init	Expiration Date	00135 Comments/ Recommendations
053194	VA0456-94	Acetonitrile	Lot 9017-03	neat	—	—	neat	—	cls		Baker
	VA0457-94	Acetonitrile	VA0457-94	neat	0.0140g	10.0 ml	0.0014g/ml	MeOH	cls	073194	
	VA0458-94	AA LCS Working	VA0456-94	1400ug/ml	72 ul	1.0 ml	1Mg/ml			06-0794	
			VA0140-94	1600ug/ml	63 ul						
060194	VA0459-94	8240 IS/SS IS	VA0374-94	2500ug/ml	28 ul	2.0 ml	25ug/ml	MeOH	cls	060894	
		SS	VA0361-94								
	VA0460-94	TCLP Working	VA0429-94	Concvaries	100 ul	1.0 ml	1/10 conc of parent				
060394	VA0461-94	Gases Working	VA0387-94	2000ug/ml	25 ul	1.0 ml	50ug/ml	MeOH	cls	06-1094	
			VA0145-94								
	VA0462-94	8260 Gases Working	VA0387-94	2000ug/ml	25 ul	1.0 ml	50ug/ml	MeOH	cls	061094	
	VA0463-94	8260 Working	VA0135-94	200ug/ml	250 ul	1.0 ml					
	VA0464-94	8260 Surr Working	VA0199-94	2500ug/ml	20 ul	1.0 ml	50ug/ml	MeOH	[illegible]	06-10-94	
	VA0465-94	TFT Parent	VA0646-93	10,000ug/ml	—	—	10,000ug/ml	MeOH	KB	120394	
	VA0466-94	Gas Surr Working	VA0465-94	10,000ug/ml	5 ul	2.0 ml	25ug/ml				
				Not	Used		[illegible]	06-03-94			
	VA0468-94	LCS Parent 8020	VA0608-93	2000ug/ml	—	—	2000ug/ml	MeOH	KB	120394	
	VA0469-94	8020 LCS Working	VA0468-94	2000ug/ml	25 ul	1.0 ml	50ug/ml				
	VA0470-94	Unlead gas	VA0169-93	500ug/ml	—	—	500ug/ml				
	VA0471-94	Gas LCS Working	VA0470-94	500ug/ml	1.0 ml	1.0 ml	500ug/ml				KB 060894
	VA0467-94	388.01 Working Stnd.	VA0467-94	2000ug/ml	25 ul	1.0 ml	50ug/ml	MeOH	[illegible]	06-10-94	
		Dibromomethane 2,2-Dichloropropane	VA0274-94	2000ug/ml							
		502/524 Min #6	VA0272-94	2000ug/ml							
		#5	VA0271-94	2000ug/ml							
		#4	VA0273-94	2000ug/ml							
	VA0468-94	[illegible]	VA0284-94	2500ug/ml	30 ul	3.0 ml	25ug/ml				
06-0694	VA0469-94	8240 IS/SS IS	VA0374-94	2500ug/ml	20 ul	2.0 ml	25ug/ml	MeOH	cls	06-1394	
		SS	VA0361-94								

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Data file	Pro. #	LAB ID	pH	Date	Oper	Matrix	Cal file	Wt/Vol
>E9136	519.37	5219-001		060294	DN	H_2O		12C
>E9137	↓	-001						↓
>E9138	519.34	5218-001MS						12B
>E9139	↓	-001MS						↓
>E9140	519.37	5219-001MS						12C
>E9141	↓	-001MS						↓
>E9142		QCLCS TCLP						↓
>E9143	500.01	5188-012DL				TCLP		1→10
>E9144	↓	5188-013DL						
>E9145	500.01	5188-014DL						
>EE066		50nsBFB		060394	CLS			
>E9146		VST0050				H_2O	>E9043	
>E9147		VST0050 388.01 Spillcomp					>E6074	
>E9148		QCBLK						
>E9149		QCLCS						
>E9150	388.01	5209-005				TCLP		1/10, 1/2
>E9151		940506	<2		DKN	H_2O		5.0ml
>E9152		QCLCS TCLP						+ds16049
>E9153	537.01	EXTBLK 38268				TCLP		1→10
>E9154	519.40	5224-001				H_2O (oil)		12D
>E9155		001						
>E9156		001MS						
>E9157		001MS						
>E9158	537.01	5179-005DL				TCLP		1→10
>E9159	↓	012DL						↓
>E9160	500.01	5188-008MSDL						
>E9161		008MSDL						
>E9162		009						
>E9163		010						

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Dilution	MG #	STDS	Comments	Dot #
10,000		10µl VA0459	Optical	7
100,000			Good	8
10,000,000		5µl VA0451		9
10,000,000				10
100,000				11
100,000				12
		5µl VA0460	Good	14
10				15
10				16
10				2
		2µl VA0441	Good	
		5µl VA0448, VA0461 10µl VA0459		
		5µl VA0467	22 Dich to propagate RF Low	
			Good	
		5µl VA0451		
20				
1.0				8
		5µl VA0460		9
				10
1250			too dilute	11
125			Good	12
				14
				15
10		10µl VA0459		16
				2
				3
				4
				6
				7

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Datafile	LABID	Date	OPER	2-butanone	Comments
>B8036	QCLCS	031894	CLS	130	Pt 227 (Last time 2
>B8049	QCLCS	032194	CLS	116	8
>B8048	QCLCS	032394	CLS	107	9
>B8109	QCLCS	032594	CLS	115	30
>E8362	Q.LLCS	032894	DKN	83	31
>E8398	Q.LLCS	033094	DKN	83	Pt 232
>E8425	Q.LLCS	040194	DKN	92	33
>E8460	Q.LLCS	040594	DN	87	34
>B8262	QCLCS	040894	CLS	121	35
>B8232	Q.LLCS	041194	DN	~~122~~ 141	236
>E8481	QCLCS	041294	DKN	124	Not Used 237
>B8298	QCLCS	041394	CLS	129	238
>E8548	QCLCS	04-20-94	CLS/KB	105	234
>E8588	Q.LLCS	04-25-94	DN	110	240
>B8387	QCLCS	04-27-94	CLS	110	241
>E8619	QCLCS	042994	DKN	89	Not Used 242
>E8622	QCLCS	050394	CLS	92	1
>E8641	QCLCS	050394	CLS	96	
>E8658	QCLCS	050494	CLS/KB	104	
>E8687	QCLCS	050594	CLS	84	
>E8716	Q.LLCS	05-09-94	DN	85	
>E8750	QCLCS	051394	KB/CLS	107	
>E8777	Q.LLCS	05[illegible]94	DN	68	
>E8837	Q.LLCS	051894	DN	112	250
>E8885	QCLCS	052394	DKN	80	251
>E8906	Q.LLCS	052494	DN	112	252
>E8924	Q.LLCS	052494	DN	82	253
>E9051	Q.LLCS	052894	DN	55	254
>E9074	Q.LLCS	052894	DN	81	255
~~>E8825~~	~~QCLCS~~	~~060294~~	~~CLS~~		Cls 060294
>E9142	QCLCS	060294	DKN	78 cls 060694	256
>E9125	Q.LLCS	060194	DN	~~77~~ 67	

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Well/Id	Tag #	Sample ID	pH	Date Sampled	Matrix	Cal Id	Vol
>E9037	246201	5775-146		05-28-94 DLW	Soil		50g
>E9038	|	147		05-28-94			|
>E9039	|	148		|		|
>E9040	|	149		|		|
>E9041	|	150		|		|
>EE0056		50 ml GBFB		052894 CCS/DW			
>E9042		VSTD050			H_2O		5.0 ml
>E9043		VSTD050				>E9043	
>E9044		VSTD010				>E9044 (90)	
>E9045		020 (0.05%)					
>E9046		050 (0.05%)					
>E9047		150					
>E9048		200					
>E9049		System Blk					
>E9050		Q.C. Blk					
>E9051		Q.C. LCS					
>E9052	246201	5100-001 MS			TCLP		1.0
>E9053	|	5100-001 MSD			|		|
>E9054	+	5100-003			+		+
>E9055	+	5100-004			+		+
>E9056	+	5116-007			+		+
>E9057	340106	5093-002			|		Pg 11B
>E9058	|	-003			|		|
>E9059	+	-004			+		+
>E9060	+	5093-002			+		Pg 11C
>E9061		NO RUN					
>EE0057		~~VSTD050~~ 50 ml GBFB		05-29-94 DW/LL			
>E9062		VSTD050					
>E9063		Q.C. Blk					
>E9064		5093-003					
>E9065		Post #7					
>E9066		Post #8					
>E9067		Post #9					
>EE0058		50 ml GBFB		05-29-94 DW			
>E9068		VSTD050					5.0 ml
>E9069		Q.C. Blk					

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[signature]	06-01-94		

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Dilfacto	MG#	STD	Comments	Pt #
1.0	ITC	10 µl VA0440	ISTD low	1
			Good	2
				3
				4
			out of clock	5
		2 µl VA0441	Good	
		3 µl VA0428, VA0439, 10 µl VA0444	Chromatography	
				9
		1 µl VA0443, 10 µl VA0442	Good	10
		2 µl		11
		10 µl		12
		15 µl		13
		20 µl		14
		~~VA0443 VA0442~~, Drawn 05-31-94		15
		VA0442 10 µl	Good	16
		, VA0430 - 5 µl		1
				2
				3
				4
				5
				6
1250		1 µl - VA0445 - M.L. Sur, I.I. VA0442 - 10 µl Surr Out	Chromatogram Over Cal	7
			Surr Out	8
			Over Cal	9
5000		Drawn 05-31-94 VA0444 - 10 µl	Good	10
			No Good (NOLC 51)	
		VA0441-94 - 2 µl	Dk	
		5 µl - VA0428, VA0439, VA0440 - 10 µl	Good	1
			Continued on Page	2

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Dan K. [illegible] 06-01-94

Signed Date Signed Date

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final Entered and Reviewed by: VKShaw PM Review:

Sample Header Template: due dates

Sample No. / Comments	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Date:								
5179-001	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
5179-001DUP	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79580:100)
5179-002	CD-S156E49N-3-4	Soil	22-MAY-94 12:50	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-011
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79581:100)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79581:100)
5179-003	CD-S-82E25N2-3	Soil	22-MAY-94 13:45	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-010
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79584:100)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79584:100)
5179-004	CD-S82E25N-3-4	Soil	22-MAY-94 14:05	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-009
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79585:100)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79585:100)
5179-005	CD-S78E18N-2-3	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-008
1 AM - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D		(79595:100)
1	EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79595:100)
1	HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D		(79595:100)
1	ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D		(79595:100)
1	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79596:100)
1 AM - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D		(79594:100)

(*=Sample has not been rad screened.

0000108

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:

Sample No. / #	Comments / Container Type	Client ID	C-Matrix / Analysis	Date: Collected	Class	Preservative	Anal. Due Date	Received / Hold Date	Due / Site	Shipper	Rad Category	Rad Sample No. (Container Number:% Filled)
Date:			FLPT/TOTO/04		S	COLD	09-JUN-94	18-NOV-94	R19D			(79594:100)
1			PAINT/9095/04		S	COLD	09-JUN-94	19-JUN-94	R19D			(79594:100)
1			PH/9045/04		S	COLD	09-JUN-94	05-JUN-94	R19D			(79594:100)
1			PH/IT/04		S	COLD	09-JUN-94	18-NOV-94	R19D			(79594:100)
1			S/9030/04		S	COLD	09-JUN-94	29-MAY-94	R19D			(79594:100)
1			TOX/9020/04		S	COLD	09-JUN-94	19-JUN-94	R19D			(79594:100)
2	AN - Amber Glass-120ML		TOC/9060/04		S	COLD	09-JUN-94	19-JUN-94	R19D			(79590:100 79591:100)
2			VOA/TCLP/04		S	COLD	09-JUN-94	08-JUN-94	109B			(79592:100 79593:100)
2			ZERO/TCLP/04		S	COLD	09-JUN-94	05-JUN-94	109B			(79592:100 79593:100)
5179-006		CD-889E16N-2-3	Soil	22-MAY-94 14:30			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-007
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79613:90)
1			RAD/SCREEN/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79613:90)
5179-007		CD-889E16N-3-4	Soil	22-MAY-94 14:40			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-006
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79624:90)
1			RAD/SCREEN/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79624:90)
5179-008		CD-878E18N-3-4-9	Soil	22-MAY-94 16:00			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-005
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79625:90)
1			RAD/SCREEN/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79625:90)
5179-009		CD-878E18N-3-4	Soil	22-MAY-94 16:00			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-004
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79630:90)
1			RAD/SCREEN/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79630:90)
5179-010		CD-881E5N-2-3-9	Soil	22-MAY-94 15:00			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-003
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79635:90)
1			RAD/SCREEN/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79635:90)
5179-011		CD-881E5N-3-4	Soil	22-MAY-94 15:00			24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-002
1	AN - Amber Glass-500ml		RAD/GAMMA/04		S	COLD	09-JUN-94	20-NOV-94	R19D			(79636:90)

3*=Sample has not been rad screened.

0000109

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Comments / Container Type		Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
5179-012	CD-S81ESM-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-001
1 AN - Amber Glass-500ml		BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79644:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1 AN - Amber Glass-250ML		CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D	(79645:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
2 AN - Amber Glass-120ML		TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	1098	(79646:100 79647:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	1098	(79646:100 79647:100)

1*-Sample has not been rad screened

0000110

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CLP 340

Reference Document No. 502240
Page 1 of 2

Project Name/No.[1] LINSAY LIGHT II
Sample Team Members[2] RAWLINSON, BERGGREN
~~Profit Center No.~~[3]
Project Manager[4] BERGGREN
Purchase Order No.[6] 27313-2H
Required Report Date[11]

Samples Shipment Date[7] 5/23/94
Lab Destination[8] ST LOUIS
Lab Contact[9] John Powell
Project Contact/Phone[12]
Carrier/Waybill No[13]

Bill to:[5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R C BERGGREN

Report to:[10] (SAME)

Where To accompany samples Yellow Field copy

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Preservative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
CD-S156C49N-2-3	SS-SOIL	5-22-94 12 40	500ml AMBER	500ml	NONE	✓ SPEC	100	
CD-S156249N-3-4	SS-SOIL	5-22-94 12:50	500ml Amber	500ml	NONE	✓ SPEC	100	
CD-S-B2E25N2-3	SS-SOIL	5/22/94 13 45	500ML AMBER	500ML	None	✓ SPEC	100	
CD SB2E25N-3-4	SS-SOIL	5/22/94 1405	500ML AMBER	500ML	NONE	✓ SPEC	100	
CD-S78E1BN-2-3	SS SOIL	5/22/94 1600	500 ml Amber	500ml	None	TCLP Metals & SVOAs	100	
CD S78E1BN 2-3	SS SOIL	5/22/94 1600	500 ml Amber	500ml	None	✓ SPEC	100	
CD S78E1BN-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E1BN-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions:[23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th ISOTOPE. ALSO ~~CD-S156E49N-2-3~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required:[26]
Normal ☒ Rush ☐

QC Level:[27]
I ☐ II ☐ III ☐ Project Specific (specify):

1. Relinquished by[28] (Signature/Affiliation) R. L. Berggren	Date: 5/23/94 Time: 1045	1. Received by[28] (Signature/Affiliation) Bob Cowart	Date: 05-24-94 Time: 0910
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

0000111

*See back of form for special instructions

CLK 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC=2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78G18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ml AMBER	500mL	NONE	& SPEC	90	
CD-SBAE16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD-S78E18N-3-4D	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metal & SVOA	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	125 ML AMBER	100 ML	NONE	TOC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-S81E5N-2-3-D	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-S81E5N-3-4	SS SOIL	5/22/94 1500	500 ML AMBER	400ml	NONE	& SPEC	9070	
						0000112		

White To accompany samples Yellow Field copy

*See back of form for special instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R and C.O.C

COPIED TO: D Powell
DATE: 05-24-94
TIME: 0945
BY: Bob Cowart

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II
Project No: 537.01
Analyses Requested: Refer to RFA/COC

Date: 05-24-94 0910
Initiated by: B Cowart
RFA/COC Numbers: 502210

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

(1)	NA	Not enough sample received for proper analysis. Received approximately: _____	8.	☑	Custody tape disturbed/broken/missing MCT Seals
			9.	NA	Sample splits performed by lab
(2)	☐	Sample received broken/leaking	(10)	NA	Volatile sample received with approximately _____ mm headspace
(3)	☐	Sample received without proper preservative.			
		☐ Cooler temperature not within 4°C ± 2°C Record temperature: 6°C	(11)	☐	Sample ID on container does not match sample ID on paperwork. Explain.
		☐ pH _____			
		☐ other _____			
(4)	☐	Sample received in improper container.	(12)	☐	All coolers on airbill not received with shipment
(5)	☐	Sample received without proper paperwork. Explain:	(13)	☐	Other (explain below): Shipping containers not rad surveyed
(6)	☐	Paperwork received without sample.			
(7)	☐	No sample ID on sample container			

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review (or designate) _____ Date: _____

Project Management Review: _____ Date: 05-24-94

0001113

INORGANIC SAMPLE DATA

537-01
5179
QD-5156

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_CDS78E18N23__	_5179-005_____
_CDS81E5N23___	_5179-012_____
_PBT39026_____	_PBT39026_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

100000

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CDS78E18N23

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: CD-S156_____

Matrix (soil/water): WATER Lab Sample ID: 5179-005

Level (low/med): LOW__ Date Received: 05/24/94

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	122	U		P
7440-39-3	Barium___	477	B		P
7440-43-9	Cadmium__	6.4	U		P
7440-47-3	Chromium_	16.8	U		P
7439-92-1	Lead____	125	U		P
7439-97-6	Mercury__	1.0	U		CV
7782-49-2	Selenium_	221	U		P
7440-22-4	Silver___	14.8	U		P

0000002

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

_____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CDS81E5N23

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: CD-S156_____

Matrix (soil/water): WATER Lab Sample ID: 5179-012

Level (low/med): LOW__ Date Received: 05/24/94

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	122	U		P
7440-39-3	Barium	78.7	B		P
7440-43-9	Cadmium	19.3	B		P
7440-47-3	Chromium	16.8	U		P
7439-92-1	Lead	125	U		P
7439-97-6	Mercury	1.0	U		CV
7782-49-2	Selenium	221	U		P
7440-22-4	Silver	14.8	U		P

0000003

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

TCLP

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

PBT39026

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: CD-S156_____

Matrix (soil/water): WATER Lab Sample ID: PBT39026

Level (low/med): LOW__ Date Received: 05/24/94

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic__	122	U		P
7440-39-3	Barium___	8.8	U		P
7440-43-9	Cadmium__	6.4	U		P
7440-47-3	Chromium_	16.8	U		P
7439-92-1	Lead____	125	U		P
7439-97-6	Mercury__	1.0	U		CV
7782-49-2	Selenium_	221	U		P
7440-22-4	Silver___	14.8	U		P

0000004

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

_____

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Initial Calibration Source: SOL+/ICF____

Continuing Calibration Source: SOL+/LL_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Arsenic	4000.0	4032.16	100.8	4000.0	4108.03	102.7			P
Barium	4000.0	3894.01	97.4	4000.0	3862.00	96.6			P
Cadmium	4000.0	3893.80	97.3	4000.0	3880.39	97.0			P
Chromium	4000.0	3948.81	98.7	4000.0	3942.78	98.6			P
Lead	4000.0	3950.05	98.8	4000.0	3961.56	99.0			P
Mercury	4.9	5.19	105.9	4.0	4.32	108.0	4.19	104.8	CV
Selenium	4000.0	3980.87	99.5	4000.0	3988.08	99.7			P
Silver	1000.0	996.97	99.7	1000.0	991.82	99.2			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

000005

FORM II (PART 1) - IN

TCLP

U.S. EPA - CLP

2B

CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

AA CRDL Standard Source: SPEX/SOLNS P

ICP CRDL Standard Source: SPEX/SOLNS P

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Arsenic								
Barium								
Cadmium								
Chromium								
Lead								
Mercury	0.2	0.23	115.0					
Selenium								
Silver								

900000

FORM II (PART 2) - IN

TCLP

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prep-aration Blank	C	M
Arsenic	30.4	U	30.4	U					30.400	U	P
Barium	2.2	U	2.2	U					2.200	U	P
Cadmium	1.6	U	1.6	U					1.600	U	P
Chromium	4.2	U	4.2	U					4.200	U	P
Lead	31.3	U	31.3	U					31.300	U	P
Mercury	0.1	U	0.1	U	0.1	U			0.100	U	CV
Selenium	55.2	U	55.2	U					55.200	U	P
Silver	3.7	U	3.7	U					3.700	U	P

2000000

FORM III - IN

TCLP

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__Case No.: _____ SAS No: _____ SDG No.: CD-S156_____

ICP ID Number: TJA9000_____ ICS Source: SPEX/SOLPLUS

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Arsenic	0	0	90	83.4		121	79.2	
Barium	0	500	7	464.7	92.9	5	467.3	93.5
Cadmium	0	1000	7	870.5	87.0	6	881.8	88.2
Chromium	0	500	5	442.6	88.5	3	445.7	89.1
Lead	0	1000	28	922.4	92.2	43	932.8	93.3
Mercury								
Selenium	0	0	60	69.8		71	18.7	
Silver	0	1000	5	970.0	97.0	4	974.8	97.5

800000

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Solid LCS Source: _____

Aqueous LCS Source: SOLUTIONS PL

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Arsenic	1000.0	1005.29	100.5						
Barium	1000.0	985.18	98.5						
Cadmium	1000.0	988.07	98.8						
Chromium	1000.0	1001.61	100.2						
Lead	1000.0	1001.40	100.1						
Mercury									
Selenium	1000.0	944.44	94.4						
Silver	250.0	201.44	80.6						

000039

FORM VII - IN

TCLP

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Solid LCS Source: _____

Aqueous LCS Source: LEEMAN LABS_

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Arsenic									
Barium									
Cadmium									
Chromium									
Lead									
Mercury	3.0	3.13	104.3						
Selenium									
Silver									

0000010

U.S. EPA - CLP

8
STANDARD ADDITION RESULTS

Lab Name: ITAS_ST._LOUIS___________ Contract: 537.01____

Lab Code: ITMO__ Case No.: ______ SAS No.: ______ SDG No.: CD-S156_____

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

0000011

U.S. EPA - CLP

10
Instrument Detection Limits (Quarterly)

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

ICP ID Number: TJA9000_____ Date: 04/01/94

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Arsenic	193.70		500	30.4	P
Barium	493.40		200	2.2	P
Cadmium	226.50		5	1.6	P
Chromium	267.72		20	4.2	P
Lead	220.35		100	31.3	P
Mercury			0.2		NR
Selenium	196.03		250	55.2	P
Silver	328.07		10	3.7	P

0000012

Comments:

FORM X - IN TCLP

U.S. EPA - CLP

10

Instrument Detection Limits (Quarterly)

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

ICP ID Number: _____ Date: 05/13/94

Flame AA ID Number : PS200_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Arsenic			500		NR
Barium			200		NR
Cadmium			5		NR
Chromium			20		NR
Lead			100		NR
Mercury	253.70		0.2	0.1	CV
Selenium			250		NR
Silver			10		NR

0000013

Comments:

FORM X - IN TCLP

U.S. EPA - CLP

11A

ICP INTERELEMENT CORRECTION FACTORS (ANNUALLY)

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

ICP ID Number: TJA9000_____ Date: 03/28/94

Analyte	Wavelength (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	NA_
Arsenic	193.70	0.0047500	0.0000000	0.0002900	0.0000000	0.0000000
Barium	493.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000100	0.0000000	0.0001400	0.0000000	0.0000000
Chromium	267.72	0.0000000	-0.0000400	0.0000500	-0.0000100	0.0000000
Lead	220.35	0.0009600	-0.0000300	0.0000000	0.0000000	0.0000000
Mercury						
Selenium	196.03	0.0000000	0.0000000	0.0003900	0.0000000	0.0000000
Silver	328.07	0.0000000	-0.0000100	-0.0002500	-0.0000200	0.0000100

Comments:

FORM XI (Part 1) - IN TCLP

U.S. EPA - CLP

12
ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO_ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

ICP ID Number: TJA9000_____ Date: 03/25/94

Analyte	Integ. Time (sec.)	Concentration (ug/L)	M
Arsenic	5.00	500000.0	P
Barium	5.00	100000.0	P
Cadmium	5.00	100000.0	P
Chromium	5.00	500000.0	P
Lead	5.00	100000.0	P
Mercury			NR
Selenium	5.00	500000.0	P
Silver	5.00	20000.0	P

0000015

Comments:

FORM XII - IN TCLP

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: ITAS_ST._LOUIS_____ . Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Method: P_

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
CDS78E18N23	06/09/94		100
CDS81E5N23	06/09/94		100
LCSW39103	06/09/94		100
PBT39026	06/09/94		100
PBW39103	06/09/94		100

0000016

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156_____

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
CDS78E18N23	06/09/94		100
CDS81E5N23	06/09/94		100
LCSW39118	06/09/94		100
PBT39026	06/09/94		100
PBW39118	06/09/94		100

FORM XIII - IN TCLP

000017

U.S. EPA - CLP

14

ANALYSIS RUN LOG

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156____

Instrument ID Number: TJA9000_____ Method: P_

Start Date: 06/09/94 End Date: 06/09/94

81000

EPA Sample No.	D/F	Time	% R	Analytes																											
				AS	BA	CD	CR	PB	HG	SE	AG																				
S0	1.00	1343		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1.00	1348		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1.00	1352		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1.00	1356										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1.00	1359		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICV	1.00	1403		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICB	1.00	1406		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICSA	1.00	1409		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICSAB	1.00	1413		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PBW39103	1.00	1416		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LCSW39103	1.00	1419		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDS78E18N23_	4.00	1423		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CDS81E5N23__	4.00	1426		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PBT39026____	4.00	1430		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICSA	1.00	1433		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ICSAB	1.00	1436		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCV	1.00	1440		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCB	1.00	1443		X	X	X	X	X	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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U.S. EPA - CLP

14

ANALYSIS RUN LOG

000019

Lab Name: ITAS_ST._LOUIS_____ Contract: 537.01____

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: CD-S156___

Instrument ID Number: PS200_____ Method: CV

Start Date: 06/09/94 End Date: 06/09/94

EPA Sample No.	D/F	Time	% R	Analytes																								
				AS	BA	CD	CR	PB	HG	SE	AG																	
S0	1.00	1508							X																			
S0.5	1.00	1510							X																			
S1	1.00	1512							X																			
S2	1.00	1515							X																			
S5	1.00	1518							X																			
S10	1.00	1521							X																			
ICV	1.00	1523							X																			
ICB	1.00	1526							X																			
CRA	1.00	1529							X																			
CCV	1.00	1531							X																			
CCB	1.00	1534							X																			
PBW39118	1.00	1536							X																			
LCSW39118	1.00	1538							X																			
PBT39026	1.00	1541							X																			
CDS78E18N23	1.00	1543							X																			
CDS81E5N23	1.00	1545							X																			
ZZZZZZ	1.00	1548																										
ZZZZZZ	1.00	1550																										
ZZZZZZ	1.00	1553																										
ZZZZZZ	1.00	1556																										
ZZZZZZ	1.00	1558																										
CCV	1.00	1601							X																			
CCB	1.00	1603							X																			

FORM XIV - IN TCLP

ICAP DATA

ICP Run Log

~~Analysis Report~~ Summary Thu 06-09-94 03:03:24 PM page 1

MHLaw 06-10-94

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	CALBLK	609I93	ITM0	06/09/94	13:43		X	IR
2	CAL1	609I93	ITM0	06/09/94	13:48		X	IR
3	CAL2	609I93	ITM0	06/09/94	13:52		X	IR
4	CAL3	609I93	ITM0	06/09/94	13:56		X	IR
5	CAL1	609I93	ITM0	06/09/94	13:59	MHC	Q	CONC
6	ICV	609I93	ITM0	06/09/94	14:03	MHC	Q	CONC
7	ICB	609I93	ITM0	06/09/94	14:06	MHC	Q	CONC
8	ICSA	609I93	ITM0	06/09/94	14:09	TGM	Q	CONC
9	ICSAB	609I93	ITM0	06/09/94	14:13	TGM	Q	CONC
10	PBW39103	609I93	ITM0	06/09/94	14:16	TGM	S	CONC
11	LCSW39103	609I93	ITM0	06/09/94	14:19	TGM	S	CONC
12	5179-005 4X	609I93	ITM0	06/09/94	14:23	TGM	S	CONC
13	5179-012 4X	609I93	ITM0	06/09/94	14:26	MHC	S	CONC
14	PBT39026 4X	609I93	ITM0	06/09/94	14:30	MHC	S	CONC
15	ICSA	609I93	ITM0	06/09/94	14:33	TGM	Q	CONC
16	ICSAB	609I93	ITM0	06/09/94	14:36	TGM	Q	CONC
17	CCV	609I93	ITM0	06/09/94	14:40	KAE	Q	CONC
18	CCB	609I93	ITM0	06/09/94	14:43	MHC	Q	CONC

pro, #537.01
SW846
TCLP
TJA#9000

MHLaw 06-10-94

0000020

#	Sample Name	Ag	As	Ba	Cd	Cr	Pb
1	CALBLK	-.0225	-.0038	.00029	.00049	.0005	.00069
2	CAL1	.56499	2.39179	4.2178	9.52759	3.9749	2.44479
3	CAL2						
4	CAL3						
5	CAL1	1.9956	9.9912	9.9877	9.9229	9.9612	9.9147
6	ICV	.99697	4.0322	3.8940	3.8938	3.9488	3.9501
7	ICB	-.00170	-.00542	.00165	.00010	-.00100	.00286
8	ICSA	.00526	.09001	.00663	.00736	.00465	.02775
9	ICSAB	.97004	.08337	.46473	.87047	.44258	.92240
10	PBW39103	L.00103	L.01053	L-.00023	L.00009	L.00176	L-.00171
11	LCSW39103	.20144	1.0053	.98518	.98807	1.0016	1.0014
12	5179-005 4X	L-.01588	L.05086	L.47705	L.00326	L.01259	L-.00701
13	5179-012 4X	L-.00095	L-.11096	L.07871	L.01928	L-.01513	L-.03126
14	PBT39026 4X	L-.02258	L-.00052	L-.00474	L-.00043	L.00103	L-.01842
15	ICSA	.00363	.12079	.00521	.00618	.00318	.04275
16	ICSAB	.97478	.07915	.46733	.88181	.44571	.93280
17	CCV	.99182	4.1060	3.8620	3.8804	3.9428	3.9616
18	CCB	-.00067	.01940	.00071	.00073	.00226	-.00004

#	Sample Name	Se
1	CALBLK	.0161
2	CAL1	4.7883
3	CAL2	
4	CAL3	
5	CAL1	9.9533
6	ICV	3.9809
7	ICB	-.00922
8	ICSA	.06002
9	ICSAB	.06982
10	PBW39103	L-.01258
11	LCSW39103	.94444
12	5179-005 4X	L.02995
13	5179-012 4X	L-1.3017
14	PBT39026 4X	L-.07545
15	ICSA	.07147
16	ICSAB	.01872
17	CCV	3.9881
18	CCB	-.00252

000021

Method: ITMO Standard: CALBLK

Elem	Ag	Al	As	B	Ba	Be	Ca
Avge	-.02250	-.09840	-.00380	.11810	.00030	.00660	.27340
SDev	.00014	.00028	.00028	.00071	.00014	.00000	.00170
%RSD	.62854	.28744	7.4432	.59874	47.140	.00000	.62073
#1	-.02240	-.09860	-.00360	.11860	.00040	.00660	.27460
#2	-.02260	-.09820	-.00400	.11760	.00020	.00660	.27220

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Avge	.00050	.00060	.00050	.00170	.00100	.04150	.11560
SDev	.00042	.00113	.00071	.00014	.00028	.00014	.00085
%RSD	84.853	188.56	141.42	8.2378	28.284	.34077	.73402
#1	.00080	.00140	.00100	.00180	.00120	.04160	.11620
#2	.00020	-.00020	.00000	.00160	.00080	.04140	.11500

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Avge	.11250	.00180	.01870	-.00010	.28780	.00000	.00070
SDev	.00042	.00198	.00014	.00014	.00453	.00000	.00297
%RSD	.37713	109.99	.75625	141.42	1.5724	.00000	424.26
#1	.11280	.00320	.01880	-.00020	.29100	.00000	.00280
#2	.11220	.00040	.01860	.00000	.28460	.00000	-.00140

Elem	Sb	Se	Si	Sr	Sr	Ti	Tl
Avge	.00750	.01610	.01880	.0710	.01690	.18940	.01813
SDev	.00665	.00721	.00057	.00283	.00014	.00085	.00878
%RSD	88.624	44.798	3.0094	281.34	.83692	.44800	48.405
#1	.01220	.01100	.01920	-.00160	.01700	.19000	.02434
#2	.00280	.02120	.01840	.00300	.01680	.18880	.01193

Elem	V	Zn
Avge	.00050	.00110
SDev	.00014	.00014
%RSD	28.284	12.856
#1	.00040	.00120
#2	.00060	.00100

Method: ITMO Standard: CAL1

Elem	Ag	As	Ba	Be	Cd	Co	Cr
Avge	.56500	2.3918	4.2178	7.0702	9.5276	11.744	3.9749
SDev	.00311	.0286	.0322	.0509	.0792	.106	.0327
%RSD	.55067	1.1944	.76447	.71966	.83123	.89835	.82186
#1	.56280	2.3716	4.1950	7.0542	9.4716	11.669	3.9518
#2	.56720	2.4120	4.2406	7.1262	9.5836	11.818	3.9980

Elem	Cu	Mn	Ni	Pb	Sb	Se	Tl
Avge	2.7314	6.6085	3.5380	2.4448	4.4686	4.7983	.88451
SDev	.0204	.0426	.0300	.0243	.0289	.0310	.01373
%RSD	.74658	.64413	.84741	.99495	.64661	.64682	1.5524

pw #537.01
SW846
TCLP
TJA #9000

0000022

#1	2.7179	6.5784	3.5168	2.4276	4.4482	4.7664	.87480
#2	2.7458	6.6386	3.5592	2.4620	4.4890	4.8102	.89422

Elem	V	Zn
Avge	.99070	6.5001
SDev	.00523	.0426
%RSD	.52817	.65488
#1	.98700	6.4700
#2	.99440	6.5302

Method: ITM0 Standard: CAL2

Elem	Al	Ca	Fe	Fe2714	K	Mg	Na
Avge	28.241	30.785	57.233	.47720	1.3723	20.577	19.485
SDev	.037	.129	.092	.00170	.0007	.045	.008
%RSD	.13220	.41942	.16110	.35563	.05153	.21856	.03920
#1	28.268	30.876	57.299	.47840	1.3728	20.609	19.491
#2	28.215	30.694	57.166	.47600	1.3718	20.545	19.480

Method: ITM0 Standard: CAL3

Elem	B	Li	Mo	Si	Sn	Sr	Ti
Avge	5.9629	5.5986	7.9801	4.2698	3.9381	11.741	13.696
SDev	.0262	.0190	.0089	.0093	.0177	.041	.044
%RSD	.43876	.33849	.11165	.21861	.44889	.35172	.31803
#1	5.9444	5.5852	7.9738	4.2632	3.9256	11.712	13.665
#2	5.9814	5.6120	7.9864	4.2764	3.9506	11.770	13.727

Method: ITM0 Sample Name: CAL1 Operator: MHC
Run Time: 06/09/94 13:59:52
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	1.9956	.17891	9.9912	.05663	9.9877	9.9694	.09488
SDev	.0014	.00649	.0147	.00097	.0047	.0026	.00440
%RSD	.07241	3.6257	.14741	1.7090	.04700	.02603	4.6408
#1	1.9945	.17432	9.9808	.05732	9.9844	9.9675	.09177
#2	1.9966	.18349	10.002	.05595	9.9910	9.9712	.09800
Errors	QC Pass	NOCHECK	QC Pass	NOCHECK	QC Pass	QC Pass	NOCHECK
Value	2.0000		10.000		10.000	10.000	
Range	5.0000		5.0000		5.0000	5.0000	

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	9.9229	9.9501	9.9613	9.9802	-.00804	5.7149	.01591
SDev	.0432	.0279	.0352	.0083	.00099	.0000	.04501
%RSD	.43532	.28080	.35364	.08305	12.298	.00000	282.85

0000023

#1	9.8923	9.9303	9.9363	9.9861	-.00874	5.7149	-.01591
#2	9.9534	9.9699	9.9862	9.9744	-.00734	5.7149	.04774
Errors	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	NOCHECK	NOCHECK
Value	10.000	10.000	10.000	10.000			
Range	5.0000	5.0000	5.0000	5.0000			

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00292	-.12709	9.9510	.00175	-.00000	9.9570	9.9147
SDev	.00077	.01409	.0227	.00124	.00000	.0176	.0532
%RSD	26.517	11.087	.22860	70.711	.00000	.17664	.53685
#1	.00237	-.13706	9.9349	.00263	-.00000	9.9446	9.8771
#2	.00346	-.11713	9.9671	.00088	-.00000	9.9695	9.9524
Errors	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass
Value			10.000			10.000	10.000
Range			5.0000			5.0000	5.0000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	9.9798	9.9533	-.04541	-.02057	.00145	.00650	9.9358
SDev	.0247	.0207	.01364	.00036	.00000	.00042	.0125
%RSD	.24777	.20841	30.035	1.7459	.00000	6.4599	.12542
#1	9.9623	9.9386	-.05505	-.02083	.00145	.00621	9.9439
#2	9.9972	9.9679	-.03576	-.02032	.00145	.00680	9.9282
Errors	QC Pass	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass
Value	10.000	10.000					10.000
Range	5.0000	5.0000					5.0000

Elem	V	Zn
Units	ppm	ppm
Avge	9.9920	9.9301
SDev	.0071	.0246
%RSD	.07144	.24762
#1	9.9971	9.9128
#2	9.9870	9.9475
Errors	QC Pass	QC Pass
Value	10.000	10.000
Range	5.0000	5.0000

Method: ITMO Sample Name: ICV Operator: MHC
Run Time: 06/09/94 14:03:26
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.99698	38.855	4.0322	.04842	3.8940	4.0184	20.274
SDev	.00389	.198	.0150	.00145	.0228	.0134	.056

0000024

%RSD	.38995	.50451	.37116	2.9984	.58556	.33288	.27549
#1	.99423	38.716	4.0216	.04739	3.8779	4.0090	20.235
#2	.99973	38.993	4.0427	.04945	3.9101	4.0279	20.314
Errors	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass	QC Pass	QC Pass
Value	1.0000	40.000	4.0000		4.0000	4.0000	20.000
Range	10.000	10.000	10.000		10.000	10.000	10.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	3.8938	3.9466	3.9488	3.8977	39.472	41.841	38.434
SDev	.0092	.0079	.0075	.0197	.143	.000	.158
%RSD	.23579	.20139	.18913	.50503	.36247	.00000	.40992
#1	3.8873	3.9412	3.9435	3.8837	39.370	41.841	38.323
#2	3.9003	3.9524	3.9541	3.9116	39.573	41.841	38.545
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	4.0000	4.0000	4.0000	4.0000	40.000		40.000
Range	10.000	10.000	10.000	10.000	10.000		10.000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	3.8738	19.699	3.9082	3.9133	38.113	3.9339	3.9501
SDev	.0271	.076	.0111	.0089	.162	.0048	.0216
%RSD	.69872	.38730	.28524	.22643	.42522	.12230	.54672
#1	3.8547	19.645	3.9003	3.9070	37.999	3.9304	3.9653
#2	3.8929	19.753	3.9161	3.9196	38.228	3.9373	3.9348
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	4.0000	20.000	4.0000	4.0000	40.000	4.0000	4.0000
Range	10.000	10.000	10.000	10.000	10.000	10.000	10.000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	4.1247	3.7809	4.0671	3.8290	3.9091	3.7514	3.7880
SDev	.0141	.0072	.0060	.0054	.0194	.0138	.0322
%RSD	.34232	.18006	.14657	.14072	.49682	.36807	.84948
#1	4.1147	3.7859	4.0629	3.8328	3.8954	3.7416	3.7652
#2	4.1346	3.7758	4.0713	3.8252	3.9228	3.7611	3.8107
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	4.0000	4.0000	4.0000	4.0000	4.0000		4.0000
Range	10.000	10.000	10.000	10.000	10.000		10.000

Elem	V	Zn
Units	ppm	ppm
Avge	3.9076	3.9527
SDev	.0071	.0178
%RSD	.18155	.45108
#1	3.9025	3.9401
#2	3.9126	3.9653

0000025

Errors	QC Pass	QC Pass
Value	4.0000	4.0000
Range	10.000	10.000

Method: ITMO Sample Name: ICB Operator: MHC
Run Time: 06/09/94 14:06:38
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00170	-.00106	-.00542	.00291	.00166	.00113	.00262
SDev	.00000	.00449	.02772	.00097	.00000	.00000	.00000
%RSD	.02019	423.01	511.24	33.276	.00000	.00000	.00000
#1	-.00170	.00211	.01418	.00222	.00166	.00113	.00262
#2	-.00170	-.00424	-.02503	.00359	.00166	.00113	.00262
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.01000	.20000	.50000	.15000	.20000	.00500	5.0000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00010	.00026	-.00101	.00037	.00489	.06885	.05570
SDev	.00089	.00108	.00178	.00104	.00049	.00000	.01125
%RSD	854.12	424.26	176.76	282.64	10.102	.00000	20.203
#1	-.00053	.00102	.00025	-.00037	.00524	.06885	.04774
#2	.00077	-.00051	-.00226	.00110	.00454	.06885	.06366
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	.00000	.00000	.00000	.00000	.00000		.00000
Range	.00500	.05000	.02000	.02500	.10000		5.0000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00383	.00146	.00167	.00213	-.00000	.00028	.00287
SDev	.00000	.01100	.00000	.00213	.00000	.00040	.00463
%RSD	.00000	754.25	.02814	99.827	.00000	141.16	161.71
#1	.00383	.00923	.00167	.00363	-.00000	-.00000	-.00041
#2	.00383	-.00632	.00167	.00063	-.00000	.00057	.00614
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.10000	5.0000	.01500	.20000	1.0000	.04000	.10000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.02734	-.00922	.00071	-.01194	.00077	.00186	-.04724
SDev	.00285	.00385	.00033	.00898	.00000	.00031	.02308
%RSD	10.438	41.773	47.363	75.224	.00000	16.873	48.851
#1	-.02936	-.00650	.00047	-.01829	.00077	.00164	-.03093
#2	-.02532	-.01195	.00094	-.00559	.00077	.00208	-.06356

Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.06000	.25000	.20000	.20000	.20000	.20000	.50000

Elem	V	Zn
Units	ppm	ppm
Avge	-.00505	.00046
SDev	.00000	.00000
%RSD	.00636	.08011
#1	-.00505	.00046
#2	-.00505	.00046

Errors	QC Pass	QC Pass
Value	.00000	.00000
Range	.05000	.02000

Method: ITMS Sample Name: ICSA Operator: TGM
Run Time: 06/09/94 14:09:59
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00527	480.60	.09002	.10522	.00664	.00169	470.56
SDev	.00210	2.46	.01370	.00048	.00034	.00000	3.26
%RSD	39.923	.51094	15.216	.45991	5.0508	.00000	.69211
#1	.00675	478.87	.09970	.10556	.00688	.00169	468.26
#2	.00378	482.34	.08033	.10488	.00640	.00169	472.86

Errors	NOCHECK	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass
Value		500.00					500.00
Range		20.000					20.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00736	-.00724	.00466	.00476	179.22	181.87	-.00003
SDev	.00015	.00205	.00011	.00104	.90	.75	.04531
%RSD	1.9827	28.284	2.3340	21.757	.50338	.41049	10e6
#1	.00726	-.00869	.00458	.00403	178.59	181.34	.03187
#2	.00747	-.00579	.00473	.00549	179.86	182.40	-.03187

Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK
Value					200.00		
Range					20.000		

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00201	511.09	.01448	.00276	-.00781	-.00215	.02776
SDev	.00052	2.35	.00028	.00301	.00074	.00271	.00931
%RSD	25.713	.46001	1.9409	109.28	9.4280	126.21	33.550
#1	-.00237	509.42	.01428	.00489	-.00833	-.00023	.02117

0000027

#2	-.00164	512.75	.01468	.00063	-.00729	-.00406	.03434
Errors	NOCHECK	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value		500.00					
Range		20.000					

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00260	.06002	.00410	.01422	.02857	.25938	-.21094
SDev	.00387	.04795	.00747	.01221	.00000	.00113	.08311
%RSD	148.85	79.891	182.09	85.862	.00000	.43615	39.399
#1	-.00014	.02611	.00936	.00559	.02857	.25858	-.26971
#2	.00534	.09393	-.00118	.02286	.02857	.26018	-.15217
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value							
Range							

Elem	V	Zn
Units	ppm	ppm
Avge	-.02890	.00541
SDev	.00069	.00007
%RSD	2.3824	1.3840
#1	-.02939	.00536
#2	-.02841	.00546
Errors	NOCHECK	NOCHECK
Value		
Range		

Method: ITMO Sample Name: ICSA2 Operator: TGM
Run Time: 06/09/94 14:13:21
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.97005	478.08	.08337	.11067	.46473	.45994	466.39
SDev	.00363	2.20	.00055	.00121	.00235	.00280	1.67
%RSD	.37461	.45990	.66143	1.0912	.50508	.60770	.35841
#1	.97262	479.64	.08376	.11001	.46639	.46191	467.57
#2	.96748	476.53	.08298	.11172	.46307	.45796	465.21
Errors	QC Pass	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass	NOCHECK
Value	1.0000	500.00			.50000	.50000	
Range	20.000	20.000			20.000	20.000	

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.87046	.42518	.44259	.47654	177.20	180.84	-.04774
SDev	.00343	.00301	.00112	.00311	.76	.52	.04501
%RSD	.39449	.70810	.25409	.65221	.42992	.28719	94.281

0000028

#1	.37290	.42731	.44338	.47874	177.74	181.20	-.07957
#2	.86805	.42305	.44179	.47434	176.66	180.47	-.01591
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	NOCHECK
Value	1.0000	.50000	.50000	.50000	200.00		
Range	20.000	20.000	20.000	20.000	20.000		

Ele#	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.98321	505.28	.45734	.90186	-.01042	.86340	.92241
SDev	.00222	2.83	.00156	.00390	.00147	.00727	.00893
%RSD	.23597	.56017	.34065	.43230	14.142	.84216	.96847
#1	.98485	507.29	.45844	.90461	-.01146	.86854	.92872
#2	.98157	503.28	.45623	.89910	-.00938	.85825	.91609
Errors	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass
Value			.50000			1.0000	1.0000
Range			20.000			20.000	20.000

Ele#	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.93283	.06982	.98753	.89431	.95779	.25661	-.17527
SDev	.02369	.01037	.00716	.00611	.00555	.00031	.07472
%RSD	2.5400	14.854	.72469	.68281	.57934	.12110	42.629
#1	.94958	.07716	.98246	.89863	.96171	.25683	-.12244
#2	.91607	.06249	.99259	.89000	.95386	.25639	-.22810
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value							
Range							

Ele#	V	Zn
Units	ppm	ppm
Avge	.41230	.92374
SDev	.00462	.00312
%RSD	1.1202	.33756
#1	.40889	.92594
#2	.41571	.92153
Errors	QC Pass	QC Pass
Value	.50000	1.0000
Range	20.000	20.000

Method: ITMG Sample Name: PBW39103 Operator: TGM
Run Time: 06/09/94 14:16:36
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Ele#	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.00103	L.08925	L.01084	L.00838	L-.00024	L-.00000	L.10226
SDev	.00197	.00649	.00771	.00048	.00067	.00000	.00464
%RSD	190.61	7.2661	71.114	5.7723	282.84	.00000	4.5327

000039

#1	L-.00033	L.08467	L.01629	L.00873	L-.00071	L-.00000	L.09898
#2	L.00239	L.09384	L.00539	L.00804	L.00024	L-.00000	L.10553

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low
High	20.000	1000.0	500.00	100.00	100.00	100.00	700.00
Low	.01000	.20000	.50000	.15000	.20000	.00500	5.0000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.00010	L.00034	L.00176	L.00147	L.03529	.06885	L.07957
SDev	.00089	.00120	.00071	.00155	.00346	.00000	.04501
%RSD	899.02	353.55	40.341	106.07	9.8015	.00000	56.569

#1	L.00073	L.00119	L.00126	L.00037	L.03285	.06885	L.11140
#2	L-.00053	L-.00051	L.00227	L.00256	L.03774	.06885	L.04774

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	NOCHECK	LC Low
High	100.00	200.00	500.00	100.00	1000.0		1000.0
Low	.00500	.05000	.02000	.02500	.10000		5.0000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.00237	L.07849	L-.00001	L.00013	L.02032	L.00000	L-.00172
SDev	.00000	.00928	.00021	.00283	.00810	.00160	.00753
%RSD	.00000	11.822	4070.9	2262.7	39.888	45291.	437.89

#1	L.00237	L.07193	L-.00016	L.00213	L.01459	L.00113	L.00360
#2	L.00237	L.08505	L.00015	L-.00188	L.02605	L-.00113	L-.00704

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low
High	100.00	600.00	100.00	100.00	1000.0	200.00	100.00
Low	.10000	5.0000	.01500	.20000	1.0000	.04000	.10000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.00894	L-.01259	L.02586	L.00330	L.00034	L.00101	L-.09535
SDev	.00222	.00326	.00865	.00251	.00012	.00011	.06537
%RSD	24.871	25.888	33.455	76.150	35.355	10.827	68.556

#1	L-.01051	L-.01489	L.03198	L.00508	L.00026	L.00093	L-.14157
#2	L-.00737	L-.01028	L.01974	L.00152	L.00043	L.00109	L-.04913

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low
High	100.00	500.00	200.00	100.00	100.00	10.000	100.00
Low	.06000	.25000	.20000	.20000	.20000	.20000	.50000

Elem	V	Zn
Units	ppm	ppm
Avge	L-.00499	L.00076
SDev	.00000	.00000
%RSD	.03205	.07264

#1	L-.00499	L.00076
#2	L-.00499	L.00076

Errors	LC Low	LC Low

High	100.00	100.00
Low	.05000	.02000

Method: ICPAE Sample Name: LCSW39107 Operator: TSM
Run Time: 06/09/94 14:19:59
Comment: TJA 9365
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.20145	1.0541	1.0053	.01805	.98518	.99868	.10963
SDev	.00490	.0025	.0053	.00000	.00929	.01118	.00116
%RSD	2.4319	.23816	.52705	.00000	.94312	1.1202	1.0569
#1	.20077	1.0558	1.0090	.01805	.99182	1.0060	.11045
#2	.20213	1.0523	1.0016	.01805	.97854	.99017	.10881
Errors	NOCHECK	LC Pass	LC Pass	NOCHECK	LC Pass	LC Pass	NOCHECK
High		1.2000	1.2000		1.2000	1.2000	
Low		.80000	.80000		.80000	.80000	

Elem	In	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.98836	.99402	1.0010	.99047	1.0291	1.5378	.06306
SDev	.00890	.00301	.0057	.00932	.0094	.0000	.04501
%RSD	.90126	.30324	.56857	.94176	.91248	.00000	70.712
#1	.99436	.99717	1.0056	.99867	1.0358	1.5378	.03187
#2	.98175	.99086	.99759	.98348	1.0225	1.5378	.09549
Errors	LC Pass	LC Pass	LC Pass	LC Pass	LC Pass	NOCHECK	NOCHECK
High	1.2000	1.2000	1.2000	1.2000	1.2000		
Low	.80000	.80000	.80000	.80000	.80000		

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.97721	.02673	.99526	.99421	.06668	1.0015	1.0014
SDev	.00926	.00412	.00644	.00545	.00000	.0004	.0004
%RSD	.94967	15.429	.64681	.55257	.00000	.04000	.03536
#1	.98376	.02965	.99982	.99810	.06668	1.0018	1.0059
#2	.97063	.02362	.99071	.99033	.06668	1.0012	.99691
Errors	NOCHECK	NOCHECK	LC Pass	NOCHECK	NOCHECK	LC Pass	LC Pass
High			1.2000			1.2000	1.2000
Low			.80000			.80000	.80000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.96299	.94445	1.6746	1.9505	.99370	.00267	.84769
SDev	.00359	.01244	.0113	.0143	.00965	.00093	.00912
%RSD	.37301	1.3175	1.0532	.71601	.97205	34.831	1.0765
#1	.96540	.95324	1.0660	1.9664	.99956	.00201	.84124
#2	.96058	.93565	1.0820	1.9346	.98783	.00333	.85414

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Errors	LC Pass	LC Pass	LC Pass	LC Pass	NOCHECK	NOCHECK	NOCHECK
High	1.2000	1.2000	1.2000	2.4000			
Low	.80000	.80000	.80000	1.6000			

Elem	V	Zn
Units	ppm	ppm
Avge	.98912	.99822
SDev	.03570	.00762
%RSD	3.6093	.76289
#1	1.0144	1.0036
#2	.96388	.99284

Errors	LC Pass	LC Pass
High	1.2000	1.2000
Low	.80000	.80000

Method: ITMO Sample Name: 5179-005 4X Operator: TGM
Run Time: 06/09/94 14:23:30
Comment: TJA 9000
Mode: CONC Corr. Factor: 4

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.01589	.85639	L.05087	L.17588	L.47706	L.00339	720.97
SDev	.00594	.00199	.02126	.01161	.00536	.00000	2.81
%RSD	37.405	.23236	41.804	6.6033	1.1246	.00000	.38933
#1	L-.02009	.85780	L.03583	L.16767	L.48085	L.00339	722.95
#2	L-.01169	.85498	L.06590	L.18410	L.47327	L.00339	718.98

Errors	LC Low	LC Pass	LC Low	LC Low	LC Low	LC Low	LC Pass
High	80.000	4000.0	2000.0	400.00	400.00	400.00	2800.0
Low	.04000	.80000	2.0000	.60000	.80000	.02000	20.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.00327	L-.00204	L.01259	L.01026	.57450	1.3771	L4.8381
SDev	.00534	.00096	.00297	.00414	.00988	.0000	.0900
%RSD	163.47	47.140	23.559	40.406	1.7205	.00000	1.8608
#1	L-.00051	L-.00136	L.01469	L.01319	.58149	1.3771	L4.7744
#2	L.00705	L-.00272	L.01049	L.00733	.56751	1.3771	L4.9017

Errors	LC Low	LC Low	LC Low	LC Low	LC Pass	NOCHECK	LC Low
High	400.00	800.00	2000.0	400.00	4000.0		4000.0
Low	.02000	.20000	.08000	.10000	.40000		20.000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.00802	89.110	.81099	L.01203	1412.9	L.01023	L-.00702
SDev	.00206	.804	.00083	.00071	21.2	.00160	.04174
%RSD	25.713	.90246	.10181	5.8926	1.4997	15.635	595.04
#1	L.00656	89.679	.81158	L.01253	1427.9	L.01136	L.02250
#2	L.00948	88.542	.81041	L.01153	1397.9	L.00910	L-.03653

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Errors	LC Low	LC Pass	LC Pass	LC Low	LC Pass	LC Low	LC Low
High	400.00	2400.0	400.00	400.00	4000.0	600.00	400.00
Low	.40000	2.0000	.60000	.60000	4.0000	.16000	.40000

Elem	Si	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.08818	L.02555	5.9210	L.06197	L.72945	L.01589	L-.50806
SDev	.02535	.12952	.0412	.00431	.01613	.00376	.21581
%RSD	28.752	98.921	.69414	6.9552	1.3891	23.635	42.478

#1	L-.10602	L.05899	5.9604	L.06502	L.73661	L.01323	L-.66066
#2	L-.07018	L.00005	5.9021	L.05892	L.72229	L.01855	L-.35546

Errors	LC Low	LC Low	LC Pass	LC Low	LC Low	LC Low	LC Low
High	400.00	2000.0	800.00	400.00	400.00	40.000	400.00
Low	.20000	1.0000	.80000	.90000	.90000	.80000	2.0000

Elem	V	Zn
Units	ppm	ppm
Avge	L.00136	.07673
SDev	.00511	.00177
%RSD	5.7788	.44518

#1	L.00665	.07542
#2	L.00391	.07795

Errors	LC Low	LC Pass
High	400.00	400.00
Low	.20000	.00000

Method: ICPI Sample Name: SITE-012 01 Operator: MnC
Run Time: 06 19 94 14:26:48
Element: ICAP 9000
Mode: DUAL Corr. Factor: 4

Elem	Mg	Mn	Mo	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.00495	1.5576	L-.11996	L.00386	L.07872	L.01129	480.73
SDev	.00577	.0143	.00035	.00296	.00000	.00000	1.23
%RSD	668.56	.89620	72.411	.95554	.00000	.00000	.25570

#1	L-.00504	1.5497	L-.05415	L.00591	L.07872	L.01129	481.60
#2	L.00314	1.5695	L-.16778	L.00181	L.07872	L.01129	479.86

Errors	LC Low	LC Pass	LC Low	LC Low	LC Low	LC Low	LC Pass
High	80.000	4000.0	2000.0	400.00	400.00	400.00	2800.0
Low	.04000	.60000	2.0000	.60000	.80000	.02000	20.000

Elem	Li	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.01928	L.00375	L-.01514	L.01465	L.11672	1.5607	L4.6153
SDev	.00416	.00723	.00005	.00622	.00692	.2597	.1356
%RSD	21.581	192.85	.34050	42.426	5.9278	16.638	2.9259

#1	L.01674	L-.00135	L-.01519	L.01905	L.12161	1.3771	L4.5198

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#2	.02222	L.00886	L-.01517	L.01026	L.11182	1.7443	L4.7108

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	NOCHECK	LC Low
High	400.00	800.00	2000.0	400.00	4000.0		4000.0
Low	.02000	.20000	.08000	.10000	.40000		20.000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L.01823	86.444	1.0782	L.01454	1296.3	L.12098	L-.03126
SDev	.00000	.272	.0060	.00283	2.9	.00480	.01394
%RSD	.00000	.31487	.55626	19.506	.22186	3.9641	44.580

#1	L.01823	86.636	1.0824	L.01654	1298.3	L.11759	L-.02141
#2	L.01823	86.251	1.0740	L.01253	1294.3	L.12438	L-.04112

Errors	LC Low	LC Pass	LC Pass	LC Low	LC Pass	LC Low	LC Low
High	400.00	2400.0	400.00	400.00	4000.0	800.00	400.00
Low	.40000	20.000	.06000	.80000	4.0000	.16000	.40000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.07651	L-1.3018	5.6219	L.07213	L.39543	L.03155	L-.05612
SDev	.00509	.0261	.0532	.03017	.00097	.00083	.04618
%RSD	6.6498	2.0031	.94635	41.823	.24404	2.6248	82.290

#1	L-.07291	L-1.2833	5.6555	L.09347	L.39611	L.03097	L-.08877
#2	L-.08011	L-1.3202	5.5843	L.05080	L.39475	L.03214	L-.02346

Errors	LC Low	LC Low	LC Pass	LC Low	LC Low	LC Low	LC Low
High	400.00	2000.0	800.00	400.00	400.00	40.000	400.00
Low	.24000	1.0000	.80000	.80000	.80000	.80000	2.0000

Elem	V	Zn
Units	ppm	ppm
Avge	L.07576	5.8186
SDev	.00470	.0287
%RSD	6.1999	.49351

#1	L.07244	5.8389
#2	L.07908	5.7983

Errors	LC Low	LC Pass
High	400.00	400.00
Low	.20000	.08000

Method: ITMO Sample Name: PBT39026 4X Operator: MHC
Run Time: 06/09/94 14:30:09
Comment: TJA 9000
Mode: CONC Corr. Factor: 4

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.02258	L.45869	L-.00052	L.01711	L-.00474	L-.00169	L.64500
SDev	.00009	.04591	.04508	.00387	.00000	.00080	.01669
%RSD	.40577	10.008	8636.5	22.627	.00000	47.140	2.5870

#1	L-.02265	L.49115	L-.03240	L.01437	L-.00474	L-.00226	L.65680
#2	L-.03251	L.42623	L.03136	L.01985	L-.00474	L-.00113	L.63020

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low
High	95.000	4000.0	2000.0	400.00	400.00	400.00	2800.0
Low	.04000	.80000	2.0000	.60000	.80000	.02000	20.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.00043	L-.00511	L.00133	L.00147	L.04473	-1.1935	L1.0185
Stdv.	.00238	.00145	.00285	.01243	.00395	.0000	.2701
%RSD	551.07	28.284	276.27	848.53	8.8388	.00000	26.517

#1	L-.00211	L-.00613	L.00334	L.01926	L.04753	-1.1935	L.82750
#2	L.00125	L-.00404	L-.00058	L-.00733	L.04193	-1.1935	L1.2095

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	MDCHECK	LC Low
High	400.00	800.00	2000.0	400.00	4000.0		4000.0
Low	.02000	.20000	.06000	.10000	.40000		20.000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.01677	L.07296	L-.00183	L.00751	1367.1	L.00000	L-.01842
Stdv.	.00000	.04536	.00000	.00992	9.4	.00000	.00921
%RSD	.00000	62.225	.11233	262.64	.71687	9.8586	50.014

#1	L-.01677	L.10496	L-.00183	L.01057	1373.8	L.00000	L-.01191
#2	L-.01677	L.04063	L-.00183	L-.00351	1360.5	L.00000	L-.02494

Errors	LC Low	LC Low	LC Low	LC Low	LC Pass	LC Low	LC Low
High	400.00	2400.0	400.00	400.00	4000.0	800.00	400.00
Low	.40000	20.000	.60000	.80000	4.0000	.16000	.40000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	L-.09063	L-.07545	L.23142	L.02124	L.02354	L-.01327	L-.52173
Stdv.	.03298	.07735	.04523	.02730	.00000	.00041	.21845
%RSD	36.38e	102.52	19.547	127.95	.00000	3.11e4	41.870

#1	L-.11375	L-.12994	L.26341	L.00203	L.02354	L-.01356	L-.36726
#2	L-.06731	L-.02097	L.19944	L.04064	L.02354	L-.01297	L-.67619

Errors	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low	LC Low
High	400.00	2000.0	800.00	400.00	400.00	40.000	400.00
Low	.24000	1.0000	.80000	.80000	.80000	.80000	2.0000

Elem	V	Zn
Units	ppm	ppm
Avge	L-.03191	L.03938
Stdv.	.00572	.00087
%RSD	17.934	2.2143

#1	L-.02776	L.03877
#2	L-.03586	L.04000

Errors	LC Low	LC Low
High	400.00	400.00

0000035

Low .20000 .08000

Method: ITMO Sample Name: ICSA Operator: TGM
Run Time: 06/09/94 14:33:40
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00363	480.79	.12079	.10385	.00522	.00113	471.77
SDev	.00118	7.70	.01184	.00048	.00034	.00000	5.01
%RSD	32.608	1.6016	9.8039	.46598	6.4282	.00000	1.0629
#1	.00447	475.35	.12916	.10351	.00545	.00113	468.22
#2	.00279	486.24	.11242	.10420	.00498	.00113	475.31
Errors	NOCHECK	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass
Value		500.00					500.00
Range		20.000					20.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00618	-.00826	.00319	.00403	179.42	182.86	-.01591
SDev	.00006	.00060	.00198	.00104	2.24	1.82	.04501
%RSD	.88597	7.2898	62.122	25.713	1.2483	.99405	282.84
#1	.00614	-.00869	.00459	.00476	177.84	181.57	.01591
#2	.00622	-.00783	.00179	.00330	181.00	184.14	-.04774
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK
Value					200.00		
Range					20.000		

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00310	511.40	.01400	.00451	.05261	-.00128	.04275
SDev	.00155	6.60	.00025	.00053	.00516	.00058	.00607
%RSD	49.913	1.2897	1.7544	11.785	9.8015	45.035	14.190
#1	-.00201	506.74	.01383	.00414	.05626	-.00087	.03846
#2	-.00419	516.06	.01417	.00489	.04896	-.00168	.04704
Errors	NOCHECK	QC Pass	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value		500.00					
Range		20.000					

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00521	.07147	-.00348	.00406	.02806	.25980	-.25567
SDev	.02216	.00505	.00575	.00575	.00048	.00254	.00698
%RSD	425.50	7.0706	165.49	141.42	1.7194	.97955	2.7320
#1	-.02088	.06790	.00059	.00000	.02772	.25800	-.25073
#2	.01046	.07504	-.00755	.00813	.02840	.26160	-.26061
Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK

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Value		
Range		
Elem	V	Zn
Units	ppm	ppm
Avge	-.03711	.00431
SDev	.00271	.00061
%RSD	7.2912	18.846
#1	-.03903	.00488
#2	-.03520	.00374
Errors	NOCHECK	NOCHECK
Value		
Range		

Method: ITMO Sample Name: ICSAB Operator: TGM
Run Time: 06/09/94 14:36:57
Comment: TJA 9000
Mode: ZONE Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.97478	480.[illegible]	.07916	.11189	.46734	.46431	470.72
SDev	.00972	4.12	.00886	.00218	.00335	.00459	4.93
%RSD	.99724	.85754	11.194	1.9462	.71751	.98896	1.0478
#1	.96791	477.69	.07289	.11035	.46497	.46106	467.24
#2	.98166	483.52	.08542	.11343	.46971	.46756	474.21
Errors	QC Pass	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass	NOCHECK
Value	1.0000	500.00			.50000	.50000	
Range	20.000	20.000			20.000	20.000	

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.88181	.43455	.44572	.47617	179.27	182.90	-.03183
SDev	.00937	.00373	.00408	.00570	1.69	2.40	.00000
%RSD	1.0627	.85912	.91496	1.1966	.94155	1.3132	.00000
#1	.87518	.43191	.44284	.47214	178.08	181.20	-.03183
#2	.88844	.43719	.44860	.48020	180.47	184.60	-.03183
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	NOCHECK
Value	1.0000	.50000	.50000	.50000	200.00		
Range	20.000	20.000	20.000	20.000	20.000		

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.98285	509.67	.46250	.91802	.02917	.87774	.93280
SDev	.01005	5.11	.00442	.01223	.00295	.00496	.02975
%RSD	1.0229	1.0031	.95472	1.3326	10.101	.56572	3.1895
#1	.97574	506.06	.45938	.90938	.03125	.87422	.91176
#2	.98996	513.29	.46562	.92667	.02709	.88125	.95384

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Errors	NOCHECK	NOCHECK	QC Pass	NOCHECK	NOCHECK	QC Pass	QC Pass
Value			.50000			1.0000	1.0000
Range			20.000			20.000	20.000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.97441	.01872	1.0017	.88568	.96478	.26011	-.27864
SDev	.00685	.02009	.0074	.02694	.00724	.00273	.06302
%RSD	.70258	107.28	.73813	3.0418	.75018	1.0500	22.616
#1	.96957	.00452	.99643	.86663	.95966	.25818	-.32320
#2	.97925	.03292	1.0069	.90473	.96990	.26205	-.23408

Errors	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK	NOCHECK
Value							
Range							

Elem	V	Zn
Units	ppm	ppm
Avge	.42465	.93005
SDev	.02014	.00581
%RSD	4.7416	.62410
#1	.41041	.92595
#2	.43889	.93416

Errors	QC Pass	QC Pass
Value	.50000	1.0000
Range	20.000	20.000

Method: ITMO Sample Name: CCV Operator: KAE
Run Time: 06/09/94 14:40:19
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.99182	38.801	4.1080	.04483	3.8620	4.0046	20.398
SDev	.00046	.143	.0031	.00121	.0104	.0082	.034
%RSD	.04597	.36766	.07471	2.6989	.26916	.20440	.16588
#1	.99215	38.700	4.1102	.04397	3.8547	3.9988	20.374
#2	.99150	38.902	4.1059	.04568	3.8694	4.0104	20.422

Errors	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass	QC Pass	QC Pass
Value	1.0000	40.000	4.0000		4.0000	4.0000	20.000
Range	10.000	10.000	10.000		10.000	10.000	10.000

Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	3.8804	3.9362	3.9428	3.8687	39.260	41.703	38.315
SDev	.0071	.0052	.0075	.0129	.103	.195	.281
%RSD	.18321	.13157	.18945	.33474	.26120	.46700	.73428
#1	3.8754	3.9325	3.9375	3.8596	39.188	41.565	38.116
#2	3.8854	3.9398	3.9481	3.8779	39.333	41.841	38.514

0000038

Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	4.0000	4.0000	4.0000	4.0000	40.000		40.000
Range	10.000	10.000	10.000	10.000	10.000		10.000

Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	3.8204	19.629	3.8994	3.9151	37.627	3.9126	3.9616
SDev	.0191	.059	.0013	.0113	.164	.0068	.0132
%RSD	.49932	.29940	.03281	.28969	.43659	.17394	.33250
#1	3.8069	19.587	3.8985	3.9070	37.511	3.9078	3.9522
#2	3.8339	19.670	3.9003	3.9231	37.744	3.9174	3.9709

Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	4.0000	20.000	4.0000	4.0000	40.000	4.0000	4.0000
Range	10.000	10.000	10.000	10.000	10.000	10.000	10.000

Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	4.0833	3.9881	4.0231	3.9976	3.8865	3.7416	3.6382
SDev	.0004	.0106	.0196	.0255	.0117	.0094	.0237
%RSD	.01075	.26650	.48740	.63796	.30091	.25001	.65227
#1	4.0830	3.9806	4.0092	4.0156	3.8902	3.7350	3.6549
#2	4.0836	3.9956	4.0370	3.9796	3.8967	3.7482	3.6214

Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	4.0000	4.0000	4.0000	4.0000	4.0000		4.0000
Range	10.000	10.000	10.000	10.000	10.000		10.000

Elem	V	Zr
Units	ppm	ppm
Avge	3.9260	3.9527
SDev	.0157	.0039
%RSD	.39898	.09884
#1	3.9169	3.9500
#2	3.9391	3.9555

Errors	QC Pass	QC Pass
Value	4.0000	4.0000
Range	10.000	10.000

Method: ITMO Sample Name: CCB Operator: MHC
Run Time: 06/09/94 14:43:38
Comment: TJA 9000
Mode: CONC Corr. Factor: 1

Elem	Ag	Al	As	B	Ba	Be	Ca
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.00067	.04445	.01940	.00325	.00071	.00071	.04916
SDev	.00048	.01297	.00183	.00339	.00067	.00020	.01112
%RSD	71.467	29.188	9.4485	104.21	94.281	28.284	22.627
#1	-.00102	.03527	.02070	.00086	.00024	.00056	.04130

0000039

#2	-.00033	.05362	.01811	.00565	.00119	.00085	.05703
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.01000	.20000	.50000	.15000	.20000	.00500	5.0000
Elem	Cd	Co	Cr	Cu	Fe	Fe2714	K
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00073	.00051	.00227	.00183	.02097	.16066	.11936
SDev	.00059	.00024	.00000	.00104	.00198	.12983	.05627
%RSD	81.130	47.140	.01633	56.569	9.4281	80.812	47.141
#1	.00031	.00034	.00227	.00256	.01957	.06885	.07957
#2	.00115	.00068	.00227	.00110	.02236	.25247	.15915
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	NOCHECK	QC Pass
Value	.00000	.00000	.00000	.00000	.00000		.00000
Range	.00500	.05000	.02000	.02500	.10000		5.0000
Elem	Li	Mg	Mn	Mo	Na	Ni	Pb
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.00383	.04885	.00078	.00326	.01511	.00113	-.00004
SDev	.00103	.00241	.00043	.00018	.02136	.00160	.00057
%RSD	26.937	4.9251	56.781	5.4293	141.42	141.18	1375.2
#1	.00310	.04714	.00045	.00338	-.00000	.00000	-.00044
#2	.00456	.05055	.00106	.00317	.03021	.00226	.00036
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.10000	5.0000	.01500	.20000	1.0000	.04000	.10000
Elem	Sb	Se	Si	Sn	Sr	Ti	Tl
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.01679	-.00252	.00399	.00813	.00060	.00277	.01934
SDev	.00888	.01926	.00565	.00575	.00024	.00136	.03220
%RSD	52.856	763.58	141.71	70.711	40.406	49.271	166.50
#1	-.02307	.01110	-.00001	.00406	.00043	.00180	-.00343
#2	-.01052	-.01614	.00799	.01219	.00077	.00373	.04211
Errors	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass	QC Pass
Value	.00000	.00000	.00000	.00000	.00000	.00000	.00000
Range	.06000	.25000	.20000	.20000	.20000	.20000	.50000
Elem	V	Zn					
Units	ppm	ppm					
Avge	-.00098	-.00000					
SDev	.00572	.00022					
%RSD	582.14	6931.7					
#1	-.00503	.00015					
#2	.00306	-.00016					
Errors	QC Pass	QC Pass					
Value	.00000	.00000					
Range	.05000	.02000					

MERCURY DATA

ANALYTICAL RUN LOG

File: 5179HG1_ Element: HG__ Instrument: PS200_____

Start Run Date: 06/09/94 End Run Date: 06/09/94

Correlation Coefficient: _-1.000000 Slope: __0.000000 Intercept: __0.000000

Concentration Units: Ug/L

#	SAMPLE ID	Time	Dil Factor	Sample (Absorb)	Sample (Conc)	%R/R	Flag		
1	S0	15:08	1.00		0.0000				
2	S0.5	15:10	1.00		0.5000				
3	S1	15:12	1.00		1.0000				
4	S2	15:15	1.00		2.0000				
5	S5	15:18	1.00		5.0000				
6	S10	15:21	1.00		10.0000				
7	ICV	15:23	1.00		5.1900				
8	ICB	15:26	1.00		-0.0150				
9	CRA	15:29	1.00		0.2280				
10	CCV1	15:31	1.00		4.3200				
11	CCB1	15:34	1.00		-0.0090				
12	PBW39118	15:36	1.00		0.0230				
13	LCSW39118	15:38	1.00		3.1300				
14	PBT39026	15:41	1.00		0.0080				
15	5179-005	15:43	1.00		0.0270				
16	5179-012	15:45	1.00		0.0330				
17	5248-001	15:48	1.00		1.1000				
18	5248-001D	15:50	1.00		1.0900				
19	5248-001S	15:53	1.00		1.8400				
20	PBW39119	15:56	1.00		0.0100				
21	LCSW39119	15:58	1.00		3.0500				
22	CCV2	16:01	1.00		4.1900				
23	CCB2	16:03	1.00		-0.0020				
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Analyst: TDC_____ QC Reviewer: R. Estes 06-10-94

0000041

2D Clark Stovell
06-09-94

Folder: 0609HG1 Page 1

15:08:01 09 Jun 1994 Protocol: EPA-ICV

Line	Conc.	Units	SD/RSD	1	2	3	4	5

*** Standard: 1 Rep: 1 Seq: 0 15:08:01 09 Jun 1994 HG

Hg .000 ppb -452
Ave. Int. = -452 S. D. = 0

*** Standard: 2 Rep: 1 mm1094-94 Seq: 1 15:10:22 09 Jun 1994 HG

Hg .500 ppb 9525
Ave. Int. = 9525 S. D. = 0

*** Standard: 3 Rep: 1 mm1095-94 Seq: 2 15:12:53 09 Jun 1994 HG

Hg 1.00 ppb 19859
Ave. Int. = 19859 S. D. = 0

*** Standard: 4 Rep: 1 mm1096-94 Seq: 3 15:15:28 09 Jun 1994 HG

Hg 2.00 ppb 40603
Ave. Int. = 40603 S. D. = 0

*** Standard: 5 Rep: 1 mm1097-94 Seq: 4 15:18:10 09 Jun 1994 HG

Hg 5.00 ppb 102614
Ave. Int. = 102614 S. D. = 0

*** Standard: 6 Rep: 1 mm1098-94 Seq: 5 15:21:01 09 Jun 1994 HG

Hg 10.0 ppb 210213
Ave. Int. = 210213 S. D. = 0

0000042

Protocol: EPA-ICP

Rev: 3.000 Time: 15:21:10 09 Jun 1994

Folder: 060594G1 Seq: 6 Print: On

User: TRACY CLARK Batch: Id: Std6Rep1 Cup: 2 10 Gas: 0.30 LPM

State: Idle Macro HGCLP F9: F3 Print Xmit: Off Autosampler: On

CALIBRATION: Line Calibration

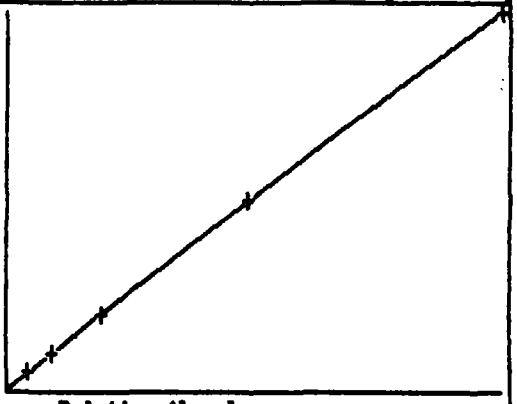
Line: Hg

	Conc.	Calc.	Dev.	Accepted linear
S1	.000	.001	.001	Quadratic
S2	.500	.492	-.008	WtdLinear
S3	1.00	1.00	-.000	
S4	2.00	2.01	.013	Accept
S5	5.00	4.99	-.006	
S6	10.0	10.0	.001	StdAdd

A -9.0458e-12 r .999998

B 4.93681e-5 C 2.29583e-2

Concentration



Relative Absorbance

	Mean	%RSD	
S1	-452	0	-452
S2	9525	0	9525
S3	19859	0	19859
S4	40683	0	40683
S5	102614	0	102614
S6	218213	0	218213

New calibration coefficients stored

0000043

Line	Conc.	Units	SD/RSD	1	2	3	4	5

mm1099-94

*** Check Standard: 4 Ck4ICV Seq: 6 15:23:58 09 Jun 1994 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		106.	5.19	4.90	ppb	.000 %

*** Check Standard: 1 Ck1ICB/CCB Seq: 7 15:26:46 09 Jun 1994 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.015	.200	ppb	.000 %

mm1101-94

*** Check Standard: 5 Ck5CRA Seq: 8 15:29:04 09 Jun 1994 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg	H	114.	.228	.200	ppb	.000 %

NY criteria

mm1100-94

*** Check Standard: 2 Ck2CCV Seq: 9 15:31:26 09 Jun 1994 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		108.	4.32	4.00	ppb	.000 %

*** Check Standard: 1 Ck1ICB/CCB Seq: 10 15:34:07 09 Jun 1994 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.009	.200	ppb	.000 %

*** Sample ID: PBW39118 Seq: 11 15:36:24 09 Jun 1994 HG

Hg	.023	ppb	.000 %	.023	<0.2 ug/L

*** Sample ID: LCSW39118 Seq: 12 15:38:39 09 Jun 1994 HG

Hg	3.13	ppb	.000 %	3.13	104%

*** Sample ID: PBT39026 Seq: 13 15:41:18 09 Jun 1994 HG

Hg	.000	ppb	.000 %	.000	<2.0 ug/L

*** Sample ID: 5179-005 Seq: 14 15:43:34 09 Jun 1994 HG

Hg	.027	ppb	.000 %	.027	<2.0 ug/L

*** Sample ID: 5179-012 Seq: 15 15:45:49 09 Jun 1994 HG

Hg	.033	ppb	.000 %	.033	<2.0 ug/L

*** Sample ID: 5248-001 Seq: 16 15:48:05 09 Jun 1994 HG

Hg	1.10	ppb	.000 %	1.10	

*** Sample ID: 5248-001D Seq: 17 15:50:43 09 Jun 1994 HG

Hg	1.09	ppb	.000 %	1.09	

0000044

Line	Conc.	Units	SD/RSD	1	2	3	4	5	
*** Sample ID: 5248-001S				Seq: 18		15:53:21 09 Jun 1994 HG			
Hg	1.84	ppb	.000 %	1.84					74%.
*** Sample ID: PBW39119				Seq: 19		15:56:07 09 Jun 1994 HG			
Hg	.010	ppb	.000 %	.010					<0.2 ug/L
*** Sample ID: LCSW39119				Seq: 20		15:58:23 09 Jun 1994 HG			
Hg	3.05	ppb	.000 %	3.05					102%.

*** Check Standard: 2 Ck2CCV Seq: 21 16:01:02 09 Jun 1994 HG

Line	Flag	%Rcv.	Found	True	Units	SD/RSD
Hg		105.	4.19	4.00	ppb	.000 %

*** Check Standard: 1 Ck1ICB/CCB Seq: 22 16:03:44 09 Jun 1994 HG

Line	Flag	Found	Range(+/-)	Units	SD/RSD
Hg		-.002	.200	ppb	.000 %

end of run for login 5179 KEC 06-10-94

*** Sample ID: PBT38896				Seq: 23		16:06:01 09 Jun 1994 HG			
Hg	.045	ppb	.000 %	.045					<2.0 ug/L
*** Sample ID: 5241-001				Seq: 24		16:08:16 09 Jun 1994 HG			
Hg	.206	ppb	.000 %	.206					2.06 ug/L
*** Sample ID: 5241-002				Seq: 25		16:10:33 09 Jun 1994 HG			
Hg	.451	ppb	.000 %	.451					4.51 ug/L
*** Sample ID: PBT38926				Seq: 26		16:13:04 09 Jun 1994 HG			
Hg	-.000	ppb	.000 %	-.000					<2.0 ug/L
*** Sample ID: 5251-001				Seq: 27		16:15:18 09 Jun 1994 HG			
Hg	.064	ppb	.000 %	.064					<2.0 ug/L
*** Sample ID: 5251-002				Seq: 28		16:17:32 09 Jun 1994 HG			
Hg	.044	ppb	.000 %	.044					<2.0 ug/L
*** Sample ID: 5251-003				Seq: 29		16:19:46 09 Jun 1994 HG			
Hg	.033	ppb	.000 %	.033					<2.0 ug/L

0000045

DIGESTION/STANDARDS PREP

ITAS-ST.LOUIS TCLP Extraction Record/Chain of Custody

SOP No. SL4065, Rev 0

Reviewed By/Date: D Hen 060974 (R19D)

	Fluid #1	Fluid #2
Daily pH Check	4.88 (4.88 - 4.98)	(2.83 - 2.93)
Lot #	940606	

	Date	Time	Temp (°C)
Rotation Started	060794	17:00	~~30~~ 23
Rotation Ended	060894	10:30	22

Batch #	39026
Project #	537.01
Page #	1 of 1

Sample	Percent Solids Determination: Filter Tare	Sample Wt.	Wt. Filtrate	Wt. Dried Solids and Filter	% Solids	Fluid Determination: pH #1	pH #2	Fluid #	Leachate Preparation: Sample Wt.	Wt. Filtrate*	Volume Fluid Added	Wt. Leachate*	Final pH	Analyst	Requested Analyses*
BLK 39026								1			2000		4.97	SNS	
5179-005RE	N/A				100	7.80	1.80	1	100.0				5.97		M
5179-012RE	N/A				100	7.70	2.02	1	100.0				5.24		M

Last Level 060894

* Required for Immiscible Multi-Phasic Samples Only

* B = BNA, H = Herbicides, P = Pesticides, M = Metals

Metals Preserved By	Date
2D Clark Stovall	06-09-94

Type	Standard Number(s) and Volume(s)

What*	From	To	Date	Dept.
M	Scott Lovell	K Wheeler	060894	Metal
	K Wheeler		060994	Sample Control

0000046

ITAS - St. Louis

Metals Prep Analyst: Kim Wheeler

Metals Digestion Prep Sheet

Method: SW846

Prep Batch: 39103

Digestion Method: TCLP

Prep Date: 09-JUN-94

Analyses: (ICP) GFAA FLAA HG

Page: 1

Sample Identification			Digestion				Sample Description					Spike Description				
Project Number	Sample Number	Client ID	Initial Vol	Initial Units	Final Vol	Final Units	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture Texture	Texture Artifacts	ID	Type	Amount	Units	Description
537.01	5179-009	CD-878E18N-2-3	100.	ML	100	ML											
537.01	5179-012	CD-881E5N-2-3	100.	ML	100	ML											
000.01	QCLCS39103-1	Lab Control Sample	100.	ML	100	ML							MS0002-94P	P	0.50	ml	
000.01	QCPREPBLK39103-1	Preparation Blank	100.	ML	100	ML											
000.01	QCBLK 39026-1		100	mL	100	mL	KRW 06-09-94										

Relinquished By: K L Wheeler 06-09-94 Comments:

Received By: [illegible] 06-09-94

Reviewed By: Kay Clay 06-10-94

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
Clarity Clear, Cloudy, Opaque
Texture Fine(powdery), Medium(sand), Coarse(rocks)

0000047

ITAS - St. Louis

Standards Log Sheet

Printed June 10, 1994 07:24 am

Batch: 39103

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
06-JUN-94	MI0288-94	CAL.1	Ag	MS0063-94	20	20	200	2	5% HCL 5% HNO3	Tom Makara	06-JUL-94
			As	MS0063-94	100	20	200	10			
			Ba	MS0063-94	100	20	200	10			
			Be	MS0063-94	100	20	200	10			
			Cd	MS0063-94	100	20	200	10			
			Co	MS0063-94	100	20	200	10			
			Cr	MS0063-94	100	20	200	10			
			Cu	MS0063-94	100	20	200	10			
			Mn	MS0063-94	100	20	200	10			
			Ni	MS0063-94	100	20	200	10			
			Pb	MS0063-94	100	20	200	10			
			Sb	MS0063-94	100	20	200	10			
			Se	MS0063-94	100	20	200	10			
			Tl	MS0063-94	100	20	200	10			
			V	MS0063-94	100	20	200	10			
			Zn	MS0063-94	100	20	200	10			
08-JUN-94	MI0295-94	ICV/CCV'88	Ag	MS0079-94	10	25	250	1			08-JUL-94
			Al,Fe,K,Na	MS0079-94	400	25	250	40			
			Ca,Mg	MS0079-94	200	25	250	20			
			Cr,Co,Cu,Pb,Li	MS0079-94	40	25	250	4			
			Mn,Mo,Ni,Se,Si	MS0079-94	40	25	250	4			
			Sb,As,Ba,Be,Cd	MS0079-94	40	25	250	4			
			Sr,Tl,Ti,Sn,V,Zn	MS0079-94	40	25	250	4			
02-MAR-94	MS0063-94	CAL.1 CONCENTRATE	Ag	MS0063-94	20				5% HCL 20% HNO3 REC'D 3-2-94 LOT # 2-09MM	Mark Crain	02-MAR-95
			As	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MM		

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
02-MAR-94	MS0063-94	CAL.1 CONCENTRATE	Be	MS0063-94	100				5% HCL 20% HNO3 REC'D 3-2-94 LOT # 2-09MN	Mark Crain	02-MAR-95
			Be	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Cd	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Co	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Cr	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Cu	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Mn	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Ni	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Pb	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Sb	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Se	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Tl	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			V	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
			Zn	MS0063-94	100				REC'D 3-2-94 LOT # 2-09MN		
15-APR-94	MS0079-94	ICV-CCV CONCENTRATE	Ag	MS0079-94	10				15%HCL 5% HNO3		15-OCT-94
			Al,Fe,K,Na	MS0079-94	400						
			Ca,Mg	MS0079-94	200						
			Cr,Co,Cu,Pb,Li	MS0079-94	40						
			Mn,Mo,Ni,Be,Si	MS0079-94	40						
			Sb,As,Ba,Be,Cd	MS0079-94	40						
			Sr,Tl,Ti,Sn,V,Zn	MS0079-94	40						
15-NOV-93	MS0200-93	ICP ICSB	Ag	MS0200-93	100				5% HNO3 SPEX, LOT # 4-37YW, REC'D 11-09-93		01-NOV-94
			Ba	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Be	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Cd	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		

0000049

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
15-NOV-93	MS0200-93	ICP ICSB	Co	MS0200-93	50				5% HNO3	Mark Crain	01-NOV-94
			Cr	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Cu	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Li	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Mn	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Mo	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Ni	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Pb	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Sb	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Si	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Sn	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Sr	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			V	MS0200-93	50				SPEX, LOT # 4-37YW, REC'D 11-09-93		
			Zn	MS0200-93	100				SPEX, LOT # 4-37YW, REC'D 11-09-93		
23-MAY-94	MI0274-94	ICSAB	Al,Ca,Mg	MS0081-94	5000	100	1000	500	5% HCL 5% HNO3		23-JUN-94
			Fe	MS0081-94	2000	100	1000	200			
			Ag	MS0200-93	100	10	1000	1			
			Ba	MS0200-93	50	10	1000	0.5			
			Be	MS0200-93	50	10	1000	0.5			
			Cd	MS0200-93	100	10	1000	1			
			Co	MS0200-93	50	10	1000	0.5			
			Cr	MS0200-93	50	10	1000	0.5			
			Cu	MS0200-93	50	10	1000	0.5			
			Li	MS0200-93	100	10	1000	1			
			Mn	MS0200-93	50	10	1000	0.5			

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
23-MAY-94	MI0274-94	ICSAB	Mo	MS0200-93	100	10	1000	1	5% HCL 5% HNO3	Mark Crain	23-JUN-94
			Ni	MS0200-93	100	10	1000	1			
			Pb	MS0200-93	100	10	1000	1			
			Sb	MS0200-93	100	10	1000	1			
			Si	MS0200-93	100	10	1000	1			
			Sn	MS0200-93	100	10	1000	1			
			Sr	MS0200-93	100	10	1000	1			
			V	MS0200-93	50	10	1000	0.5			
			Zn	MS0200-93	100	10	1000	1			
12-MAY-94	MS0081-94	INTF-A	Al,Ca,Mg	MS0081-94	5000						30-APR-95
			Fe	MS0081-94	2000						
23-MAY-94	MI0273-94	ICSA	Al,Ca,Mg	MS0081-94	5000	100	1000	500			23-JUN-94
			Fe	MS0081-94	2000	100	1000	200			
04-JAN-94	MS0002-94P	P	Ag	MS0002-94P	50				15% HCL 5% HNO3 Sol'ns Plus Lot#940103 Rec'd 01-04-94	Tracy Clark-Stovall	31-JUL-94
			Al	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			As	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Ba	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Be	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cd	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Co	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cr	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cu	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Fe	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Li	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Mn	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
04-JAN-94	MS0002-94P	P	Mo	MS0002-94P	200				15% HCL 5% HNO3	Tracy Clark-Stovall	31-JUL-94
			Ni	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Pb	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sb	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Se	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Si	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sn	MS0002-94P	400				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sr	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Ti	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			V	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Zn	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		

ITAS - St. Louis

Standards Log Sheet

Printed June 9, 1994 11:18 am

Batch: 39103

Date Prepared	Standard ID Number	Spike Type	Identity	Parent ID Number	Parent Conc. mg/L	Aliquot ml	Dilution Volume ml	Final Conc. mg/L	Solvent	Analyst	Expiration Date
04-JAN-94	MS0002-94P	P	Ag	MS0002-94P	50				15% HCL 5% HNO3 Sol'ns Plus Lot#940103 Rec'd 01-04-94	Tracy Clark-Stovall	31-JUL-94
			Al	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			As	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Ba	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Be	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cd	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Co	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cr	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Cu	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Fe	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Li	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Mn	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Mo	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Ni	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Pb	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sb	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Se	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Si	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sn	MS0002-94P	400				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Sr	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Ti	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			V	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		
			Zn	MS0002-94P	200				Sol'ns Plus Lot#940103 Rec'd 01-04-94		

ITAS-ST.LOUIS

METALS LABORATORY CONTROL SOLUTION ICAP

STANDARD NUMBER: MS-0002-94P
SOURCE: SOLUTIONS PLUS
LOT: 940103
EXPIRATION: 07-31-94

ELEMENT	STOCK CONC. mg/L	FINAL CONC. mg/L
Sn	400	2
Al	200	1
Sb	200	1
As	200	1
Ba	200	1
Be	200	1
Cd	200	1
Cr	200	1
Co	200	1
Cu	200	1
Fe	200	1
Li	200	1
Mn	200	1
Mo	200	1
Ni	200	1
Pb	200	1
Se	200	1
Si	200	1
Sr	200	1
Tl	200	1
V	200	1
Zn	200	1
Ag	50	0.25

MS 6-10-94

0000054

0000054

ITAS - St. Louis

Metals Digestion Prep Sheet

Metals Prep Analyst: Tracy Clark-Stovall

Prep Batch: 39118

Prep Date: 09-JUN-94

Method: SW846/CLP90

Digestion Method: _____

Analyses: ICP GFAA FLAA (HG)

Page: 1

Sample Identification			Digestion				Sample Description						Spike Description				
Project Number	Sample Number	Client ID	Initial Vol	Initial Units	Final Vol	Final Units	Color Initial	Color Final	Clarity Initial	Clarity Final	Texture	Artifacts	ID	Type	Amount	Units	Description
537.01	5179-005	CD-8788ISM-2-3	10.0	ML	100	ML											
537.01	5179-012	CD-8818SM-2-3	10.0	ML	100	ML											
335.16	5248-001	04568	100.	ML	100	ML											
335.16	5248-001DUP	04568	100.	ML	100	ML											
335.16	5248-001MS	04568	100.	ML	100	ML							MH1093-94	WORKING	1.0	ml	
000.01	GCBLK39118-1	pbt39026	10.0	ML	100	ML	5179										
000.01	GCLCS39118-1	Lab Control Sample	100.	ML	100	ML							MH1093-94	WORKING	3.0	ml	
	HG/CLP90/84	HG/TCLP/84															
000.01	GCPREPBLK39118-1	Preparation Blank	100.	ML	100	ML											
	HG/CLP90/84	HG/TCLP/84															

Relinquished By: Ld Clark Stovall 06-09-94 Comments: _____

Received By: Ld Clark Stovall 06-09-94

Reviewed By: Kay Clay 06-10-94

Color Red, Blue, Yellow, Green, Orange, Violet, White, Brown, Grey, Black, Colorless
Clarity Clear, Cloudy, Opaque
Texture Fine(powdery), Medium(sand), Coarse(rocks)

0000055

ITAS - St. Louis

Batch: 39118

Standards Log Sheet

Page: 1 of 1

Printed June 9, 1994 05:00 pm

	Standard			Parent	Parent		Dilution	Final			
09-JUN-94	MM1093-94	WORKING QC INTER.	Hg	MS0196-93	100	0.1	100	0.1	0.15% HNO3	Tracy Clark-Stovall	10-JUN-94
	MM1094-94	0.5	Hg	MM1092-94	0.1	0.5	100	0.0005	DI H2O		
	MM1095-94	1.0	Hg	MM1092-94	0.1	1	100	0.001			
	MM1096-94	2.0	Hg	MM1092-94	0.1	2	100	0.002			
	MM1097-94	5.0	Hg	MM1092-94	0.1	5	100	0.005			
	MM1098-94	10.0	Hg	MM1092-94	0.1	10	100	0.01			
	MM1099-94	ICV	Hg	MS0135-93	0.49	1	100	0.0049	2% HNO3		
	MM1100-94	CCV	Hg	MM1093-94	0.1	4	100	0.004	DI H2O		
27-JUL-93	MS0135-93	EPA ICV-5	Hg	MS0135-93	0.49				Dilute Acid EPA Lot# ICV592 ICV-5(0791)	Mark Crain	10-JUL-94
15-NOV-93	MS0202-93M	HG STD	Hg	MS0202-93M	100				Dil HNO3 Soil'ns Plus Lot#931110 Rec'd 11-15-93	Tracy Clark-Stovall	15-NOV-94
09-JUN-94	MM1092-94	WORKING CURVE INTER.	Hg	MS0202-93M	100	0.1	100	0.1	0.15% HNO3		10-JUN-94
06-NOV-93	MS0196-93	HG STOCK STANDARD	Hg	MS0196-93	100				10% HCL LEEMAN LABS, LOT # 200148, REC'D 10-27-93	Mark Crain	31-OCT-94
03-FEB-94	MM0286-94	HG MS-INTER. SPIKE	Hg	MS0196-93	100	1	100	1	0.1% HNO3	Tracy Clark-Stovall	03-AUG-94
09-JUN-94	MM1101-94	CRA	Hg	MM1093-94	0.1	0.2	100	0.0002	DI H2O		10-JUN-94

CHAIN OF CUSTODY
SAMPLE LOG-IN/RECEIPT RECORDS

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: ~~Final~~ Entered and Reviewed by: VR Shaw PM Review:

Sample Header Template: due dates

Sample No. / Comments / Date:	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)	
5179-001	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	26-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)	
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)	
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)	
5179-001DUP	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	26-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)	
5179-002	CD-S156E49N-3-4	Soil	22-MAY-94 12:50	26-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-011
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79581:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79581:100)	
5179-003	CD-S-82E25N2-3	Soil	22-MAY-94 13:45	26-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-010
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79584:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79584:100)	
5179-004	CD-S82E25N-3-4	Soil	22-MAY-94 14:05	26-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-009
1 AN - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79585:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79585:100)	
5179-005	CD-S78E18N-2-3	Soil	22-MAY-94 16:00	26-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-008
1 AN - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79595:100)	
1	EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79595:100)	
1	HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79595:100)	
1	ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79595:100)	
1	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)	
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)	
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)	
1 AN - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79594:100)	

3*:Sample has not been rad screened.

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / #	Client ID / Container Type	Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Rad Category / Site	Rad Sample No. (Container Numbers:% Filled)
Date:		PLPT/TOTU/04	S COLD		09-JUN-94	18-NOV-94 R19D		(79594:100)
1		PAINT/TOTU/04	S COLD		09-JUN-94	19-JUN-94 R19D		(79594:100)
1		PU/TOLS/04	S COLD		09-JUN-94	05-JUN-94 R19D		(79594:100)
1		PU/LT/04	S COLD		09-JUN-94	18-NOV-94 R19D		(79594:100)
1		U/TOSO/04	S COLD		09-JUN-94	29-MAY-94 R19D		(79594:100)
1		TOL/TOSO/04	S COLD		09-JUN-94	19-JUN-94 R19D		(79594:100)
1		TOL/TOSO/04	S COLD		09-JUN-94	19-JUN-94 R19D		(79590:100 79591:100)
2	AM - Amber Glass-120ML	VOA/TCLP/04	S COLD		09-JUN-94	08-JUN-94 10DD		(79592:100 79593:100)
2		ZERO/TCLP/04	S COLD		09-JUN-94	05-JUN-94 10DD		(79592:100 79593:100)
2								
5179-006	CD-SB9E14M-2-3	Soil		22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-007
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79613:90)
1		RAD/SCREEN/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79613:90)
5179-007	CD-SB9E14M-3-4	Soil		22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-006
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79624:90)
1		RAD/SCREEN/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79624:90)
5179-008	CD-S7BE16M-3-4-9	Soil		22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-005
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79625:90)
1		RAD/SCREEN/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79625:90)
5179-009	CD-S7BE16M-3-4	Soil		22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-004
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79630:90)
1		RAD/SCREEN/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79630:90)
5179-010	CD-SB16SN-2-3-9	Soil		22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-003
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79635:90)
1		RAD/SCREEN/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79635:90)
5179-011	CD-SB16SN-3-4	Soil		22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94 FED-EX	3	R2312-002
1	AM - Amber Glass-500ml	RAD/GAMMA/04	S COLD		09-JUN-94	20-NOV-94 R19D		(79636:90)

3*=Sample has not been rad screened.

0000058

TTAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Comments / Container Type		Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
5179-012	CD-S81ESH-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-001
1 AM - Amber Glass-500ml		DNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79644:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1 AM - Amber Glass-250ML		CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		PH/1T/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D	(79645:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
2 AM - Amber Glass-120ML		TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B	(79646:100 79647:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B	(79646:100 79647:100)

*=Sample has not been rad screened.

0000059

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

LLW $40

Reference Document No. 502240
Page 1 of 2

Project Name/No.[1] LINSAY LIGHT II
Sample Team Members[2] RAWLINSON, BERGGREN
Profit Center No.[3]
Project Manager[4] BERGGREN
Purchase Order No.[6] 27313-2H
Required Report Date[11]

Samples Shipment Date[7] 5/23/94
Lab Destination[8] ST LOUIS
Lab Contact[9] John Powell
Project Contact/Phone[12]
Carrier/Waybill No.[13]

Bill to:[5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R C BERGGREN

Report to:[10] (SAME)

Where To accompany samples — Yellow Field copy — *See back of form for special instructions

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Preservative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
CD-S156E49N-2-2	SS-SOIL	5-22-94 12:40	500 ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S156E49N-2-4	SS-SOIL	5-22-94 12:50	500 ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S-B2E25N-2-3	SS-SOIL	5/22/94 1345	500 ML AMBER	500 ML	NONE	γ SPEC	100	
CD SB2E25N-2-4	SS-SOIL	5/22/94 1405	500 ML AMBER	500 ML	NONE	γ SPEC	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	TCLP Metals & SVOAs	100	
CD S78E18N 2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	γ SPEC	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250 ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120 ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions:[23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th ISOTOPE. ALSO ~~COMPLETE~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☒ Archive ☐ (mos.)

Turnaround Time Required:[26]
Normal ☒ Rush ☐

QC Level:[27]
I ☐ II ☐ III ☐ Project Specific (specify):

1. Relinquished by[28] (Signature/Affiliation) Richard Berggren	Date: 5/23/94 Time: 1045	1. Received by[28] (Signature/Affiliation) Bob Cowart	Date: 05-24-94 Time: 0911
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

0000060

CLK 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC-2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ml AMBER	500ML	NONE	& SPEC	90	
CD-S84E16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD-S78E18N-3-4D	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metal & SVOA	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ML	NONE	TOC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-S81E5N-2-3-D	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-S81E5N-3-4	SS SOIL	5/22/94 1500	500 ml AMBER	400ml	NONE	& SPEC	90 70	
	000061							

White To accompany samples Yellow Field copy

*See back of page for specific instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: J Powell
DATE: 05-24-94
TIME: 0945
BY: Bob Cowart

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II
Project No: 537.01
Analysis Requested: Refer to RFA/COC

Date: 05-24-94 0910
Initiated by: B Cowart
RFA/COC Numbers: 502240

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1. NA — Not enough sample received for proper analysis. Received approximately: _____
2. ☐ — Sample received broken/leaking.
3. ☐ — Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: 6°C
   - ☐ pH _____
   - ☐ other: _____
4. ☐ — Sample received in improper container.
5. ☐ — Sample received without proper paperwork. Explain: _____
6. ☐ — Paperwork received without sample.
7. ☐ — No sample ID on sample container.
8. ☑ — Custody tape disturbed/broken/missing. N/A Seals
9. NA — Sample splits performed by lab.
10. NA — Volatile sample received with approximately _____ mm headspace.
11. ☐ — Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ — All coolers on airbill not received with shipment.
13. ☐ — Other (explain below): Shipping containers not rad surveyed

Notes: _____

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". Comments: _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designee) _____ Date: _____

Project Management Review: JRC Date: 05-24-94

000062

ISOTOPIC THORIUM

PREP/COUNTING DATA SUMMARY

CALIBRATIONS/STANDARDS LOG

SAMPLE DATA/INSTRUMENT PRINTOUT

CHAIN OF CUSTODIES

537-01
5179
CD-5156

PREP/COUNTING DATA SUMMARY

Quanterra Environmental Services

ITAS St. LOUIS
Isotopic Thorium Analysis

Quanterra St. Louis
Revision Number 3
Start Date: 07/07/94

PROJ: 537.01

BATCH: 38993

SAMPLE NUMBER	PREP DATE	ALIQUOT (g or l)	COUNT DATE	COUNT TIME	BKGD TIME	DET. NO.	EFF	ROI#1 Th-232	BKGD	ROI#2 TH-230	BKGD	ROI#3 TH-229	BKGD	ROI#4 TH-228	BKGD
LCS 38993	06-07-94	2.0000	06-08-94	200	4000	1	0.310	1018	71	1002	176	777	63	1138	94
BLK 38993	06-07-94	2.0000	06-08-94	200	4000	2	0.317	3	41	106	86	691	43	31	105
5179-001	06-07-94	2.0891	06-08-94	200	4000	3	0.307	58	141	212	208	658	121	86	108
5179-001DUP	06-07-94	2.0208	06-09-94	100	4000	8	0.310	36	62	59	114	389	32	51	102
5179-005	06-07-94	0.0104	06-08-94	200	4000	5	0.311	288	138	228	234	1425	59	334	122
5179-011	06-07-94	0.0101	06-08-94	200	4000	6	0.311	327	153	131	222	967	107	417	127
5179-012	06-07-94	0.0101	06-08-94	200	4000	7	0.308	227	89	105	153	903	59	260	91

TRACER pCi added: 9.01
LCS Th-232 pCi/matrix: 5.15
LCS Th-230 pCi/matrix: 4.20

CALCULATED BY: LEG DATE: 06/27/95

REVIEWED BY: _____ DATE 6/27/95

Quanterra Environmental Services

Quanterra St Louis
Revision Number 3
Start Date: 07/07/94

ITAS St. LOUIS
Isotopic Thorium Analysis

PROJ: 637.01

BATCH: 38993

SAMPLE NUMBER	CY	TH-229 pCi	TH-232 pCi/aliq	ERROR	MDA	TH-230 pCi/aliq	ERROR	MDA	TH-228 pCi/aliq	ERROR	MDA
LCS 38993	0.62	5.62E+00	5.91E+00	6.84E-01	6.68E-02	5.12E+00	5.96E-01	9.61E-02	6.60E+00	7.53E-01	7.45E-02
BLK 38993	0.54	4.89E+00	6.21E-03	2.88E-02	6.13E-02	2.87E-03	6.46E-04	8.08E-02	1.68E-01	7.89E-02	8.74E-02
5179-001	0.63	4.78E+00	3.37E-01	1.10E-01	9.96E-02	7.00E-01	1.22E-01	1.17E-01	5.33E-01	1.35E-01	8.94E-02
5179-001DUP	0.63	5.64E+00	3.96E-01	1.43E-01	9.76E-02	-1.05E-02	3.06E-03	1.21E-01	5.56E-01	1.74E-01	1.16E-01
5179-005	0.57	1.03E+01	3.42E+02	5.29E+01	1.81E+01	8.83E+00	1.51E+00	2.26E+01	3.99E+02	5.68E+01	1.73E+01
5179-011	0.77	6.96E+00	2.97E+02	4.43E+01	1.45E+01	-2.00E+01	4.36E+00	1.69E+01	3.82E+02	5.30E+01	1.34E+01
5179-012	0.73	6.58E+00	2.22E+02	3.68E+01	1.25E+01	-3.48E+01	8.18E+00	1.56E+01	2.54E+02	4.03E+01	1.26E+01

	Th-228	Th-230	Th-232
SPIKE% RECOVERY:	128	122	115
BLK ACT:	1.68E-01	< 0.061	< 0.061
DUP RPD:			

CALCULATED BY: LEG

DATE: 6/27/95

REVIEWED BY: [signature]

DATE: 6/27/95

ACT=(SCpm-BCpm)/(CF*EFF*ALIQ*CY)
ERROR = 1.96*ACT*SQRT((SC+BC)/(SC-BC)^2+.0025)
MDA = (4.65*SQRT(BC)+2.71)/(CF*EFF*ALIQ*CY*SCT)

INTERNATIONAL TECHNOLOGY CORPORATION

St Louis Laboratory
13715 Rider Trail North
Earth City, MO 63045-1205

Isotopic Thorium Analysis

Batch No. : 38493
Project No. : 537.01

Prep Date 06-07-94

	Sample Number	Aliquot Wt (gL)	Tracer Added	Tracer Verified	Spike Added	Spike Verified	Aliquot Emptied
1	LCS # 38173	2.0000	ACV	BL	ACV	BL	
2	BLK # 38473	2.0000					
3	5179001	2.0481					ILC
4	001 dup	2.0128					
*5	005	1.0426					
*6	011	1.0063					
*7	012	1.0058					
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

* Made to 10.0 mL Volume - 1 mL Aliquot taken for analysis

Tracer

Isotope :	Th229
Std Sol'n No. :	#4328-G
Vol (mL) :	1.0 mL
Ref Activity (pCi/mL) :	20.0 dpm/mL
Act Ref Date :	01-01-94

Standard

Isotope :	Th228/Th232	Th230*	NA
Std Sol'n No. :	* 1011	7509THCIA1	NA
Vol (mL) :	0.025 mL	1.0 mL	NA
Ref Activity (pCi/mL) :	914.8 dpm/mL	15.2 dpm/mL	NA
Act Ref Date :	May 1977	01-01-83	NA

Comments:

* The activity of the Th 230 from the Th232 standard must be added to the Th230 standard to yield total Th230 activity. See standard sheet for details.

Prepared By : ACV
Date : 06-07-94

Reviewed and received by:
Date : 06-08-94

5179-005 spiked with 40 dpm of Tracer.

0000003

CALIBRATIONS/STANDARDS LOG

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory-Las Vegas
Nuclear Radiation Assessment Division

Calibration Certificate

Description

Principal radionuclide: NATURAL URANIUM — Half-life: 4.5×10^9 years

Nominal activity: 11 nano curies

Nominal volume: 5 — ml or ampoule/flame number: 1843-1

Measurement Activity of principal radionuclide

Activity per gram of this solution

1.07 nano curies of Uranium-238 *Accompanied by

at 0600 hours PST on May 1989 49 picoCuries of Uranium-235 per gram of solution.

Activity of daughter radionuclide

The principal activity was compensated at the stated time by

1.07 nano curies Per gram

of the daughter nuclides Th-234, Pa-234, and U-234 assuming secular equilibrium.

Total mass of this solution

APPROX. 5.0 grams

Method of measurement

The solution was prepared gravimetrically by dissolving a known quantity of the National Bureau of Standards' SRM 950b which was 99.97 ± 0.02 percent Uranium Oxide (U_3O_8) in Nitric acid and diluting to a known weight. Natural Uranium was assumed to consist of 99.28 percent U-238 and 0.711 percent U-235 with specific activities of 3.36×10^2 and 2.16×10^3 nanoCuries per gram respectively.

000004

Useful Life

This radionuclide has attained secular [ ] half lives since it was obtained by EMSL-LV

We recommend that this solution should not be used after INDEFINITE

Purity

The manufacturer stated that activities other than that of the principal nuclide and of its daughter nuclides, if any, were estimated/known to be:

(1) Radium-226	less than equal to	0.6 %	of the principal activity
(2)	less than equal to	%	of the principal activity
(3)	less than equal to	%	of the principal activity

The activity of impurity (1) is not (2) is not (3) is not included in the quoted figures of the principal activity.

Random Errors

The precision of this standard was such that the certified value of the radioactive concentration of the principal activity had a standard error (sm) not greater than ± % (The 99.7% confidence limits are given by t(sm) where t is obtained from the student t factor for the degree of freedom (n-1)).

The maximum uncertainty due to the accessible systematic errors (dilution, counting, and known uncertainty of the standard) is obtained by the separate arithmetic summation of the positive and negative systematic error (+ δ − δ'). These have been estimated not to exceed

+ 5 % or − 5 %

the overall uncertainty (often called accuracy) is an estimate of the possible divergence of the quoted result from the true value. It is a combination of random error [t(sm)] at the 99.7% confidence limits and the worst case estimate of the systematic errors (+ δ, − δ'). The overall uncertainty is therefore calculated on the basis of + [t(sm) + δ], − [t(sm) + δ'] and is + 5 %, − 5 % of the quoted radioactive concentration.

Decay Schemes

This standardization is based on the following assumptions of the principle nuclide, its daughter nuclides and impurities (no allowance for error in these assumptions or the assumption of quoted half-life have been included in the statement of accuracy above).

Uranium-238 decays by alpha emission to Thorium-234 which decays by two successive beta emissions to Uranium-234. Uranium-234 is assumed to be in secular equilibrium with Uranium-238.

0000005

Chemical Composition of Solution

Carrier content per gram of solution:

Other components:
0.6M nitric acid

Preservative:

Remarks

The overall uncertainty in the quoted values is due primarily to the uncertainty in igniting the U_3O_8 to stoichiometric weight.

Date Certificate Prepared June 15, 1989

Approval Signature Paul B. Hahn

Revised 1/94

NOTEBOOK NO. _____

OJECT Natural Uranium # 1843-1

Continued From Page _____

EPA EMSLV

Natural uranium solution obtained through EMSLV was prepared as described below:

42.6137 g. Wt of flask plus standard sol'n
37.5446 g. Wt of flask
5.0691 g. Amount transferred

nCi / gram		%
1.07	U-238	48.9
1.07	U-234	48.9
0.049	U-235	2.2

$\Sigma = 2.189$ nCi/g.

$$\frac{\left(\frac{2.189\ nCi}{g}\right)(5.0691\ g)\left(\frac{2.22E3\ dpm}{nCi}\right)}{50\ ml.\ 1\ \text{a}\ HNO_3} = \boxed{492.7\ \frac{dpm}{ml.}\ \text{Total U. \#1843-1}}$$

Note: Total U contains following isotopes:

U238 492.7 * 0.489 = 240.9 d

U234 492.7 * 0.489 = 240.9 d

B. Thomas
2-23-93

R. Patterson 09-23-92

0000006

Continued on Page

Read and Understood By

M Baughn — Signed — 09-21-92 — Date

R. Patterson — Signed — 09-23-92 — Date

PROJECT U-238 (NATURAL U.) # 1843-1-2

Notebook No. 337

Continued From Page

EPA U-238 (NATURAL U) Standard # 1843-1-2 The initial Standard dilution is in Log-Book # 356 At # 26

Conversion from dpm/ml To ng/ml

Standard # 1843-1-2 = 240.06 dpm/ml U-238

$$\left(\frac{240.06\ dpm}{1\ ml}\right)\left(\frac{1\ Ci}{2.22E12\ dpm}\right)\left(\frac{1\ g}{3.37E-7\ Ci/g\ U\text{-}238}\right) = 3.21E-4\ g/ml = 321.65\ ng/ml\ \text{TOTAL U}$$

Using This STANDARD a Series OF dilutions were made and listed below

3.21[65] ng/ml x $\frac{10\ ml}{100.0\ ml}$ = 32.10 ng/ml TOTAL U # 1843-1-2A

32.10 ng/ml x $\frac{5.3\ ml}{100.0\ ml}$ = 20.22 ng/ml TOTAL U # 1843-1-2B

32.10 ng/ml x $\frac{4.7\ ml}{100.0\ ml}$ = 15.09 ng/ml TOTAL U # 1843-1-2C

32.10 ng/ml x $\frac{3.1\ ml}{100.0\ ml}$ = 9.95 ng/ml TOTAL U # 1843-1-2D

32.10 ng/ml x $\frac{1.6\ ml}{100.0\ ml}$ = 5.14 ng/ml TOTAL U # 1843-1-2E

20.22 ng/ml x $\frac{5.0\ ml}{100.0\ ml}$ = 10.1 ng/ml TOTAL U # 1843-1-2F

20.22 ng/ml x $\frac{3.5\ ml}{100.0\ ml}$ = 7.1 ng/ml TOTAL U # 1843-1-2G

20.22 ng/ml x $\frac{2.5\ ml}{100.0\ ml}$ = 5.1 ng/ml TOTAL U # 1843-1-2H

20.22 ng/ml x $\frac{1.0\ ml}{100.0\ ml}$ = 2.0 ng/ml TOTAL U # 1843-1-2I

10.1 ng/ml x $\frac{10.0\ ml}{100.0\ ml}$ = 1.0 ng/ml TOTAL U # 1843-1-2J

Continued on Page

Read and Understood By

K Eaton — Signed — 03-03-93 — Date

B A Thomas — Signed — 3-3-93 — Date

0000007

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide	U-232	Customer:	IT CORPORATION
Half Life:	68.9 ± 1.0 years	P.O.No.:	047870
Catalog No.:	7232-2	Reference Date:	September 1 1991 12:00 PST.
Source No.:	388-37	Contained Radioactivity:	1.039 µCi.

Description of Solution

a. Mass of solution:	5.2693	grams.
b. Chemical form:	UO2Cl2 in 2N HCl	
c. Carrier content:	None added	
d. Solution density:	1.0330	gram/ml @ 20°C.

Radioimpurities

See attached technical data sheet

Radioactive Daughters

See attached technical data sheet

Radionuclide Concentration

0.1974 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using alpha spectrometry with a surface barrier detector.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±1.3%
b. Random uncertainty in assay:	±1.0%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.3%

00000008

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

PROJECT U-232 # 383-37

Notebook No. 000043

Continued From Page

Isotope Products Laboratories solution # 383-51 was prepared as follows:

39.8628 g wt of ampule plus broken
34.6256 g wt of empty ampule plus broken
5.2372 g wt amount transferred

$$\frac{(5.2372\,g)\left(\frac{0.1474\,\mu C}{g}\right)\left(2.2256\,\frac{dpm}{\mu C}\right)}{50\,ml.\ (1\,N\,HNO_3)} = 45401.8\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37$$

$A = A_0 e^{-\lambda t}$

$t = 0.583\,yrs$ (04-01-91 to 04-01-92)

$\lambda = 0.693/72\,yrs$

$\lambda t = 0.0056$

$$45401.8\,\frac{dpm}{ml.}\ e^{-\left(\frac{0.693}{72\,yrs} \times 0.583\,yrs\right)} = \boxed{45645\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37\ \text{as of } 04\text{-}01\text{-}92}$$

$$\frac{(45645\,\frac{dpm}{ml.})(5\,ml)}{50\,ml.} = \boxed{4564.5\,\frac{dpm}{ml.}\ U\text{-}232,\ \#\ 383\text{-}37A}$$

$$\frac{(4564.5\,\frac{dpm}{ml.})(5\,ml)}{50\,ml.} = \boxed{456.4\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37B}$$

$$\frac{(456.4\,\frac{dpm}{ml.})(10\,ml.)}{100\,ml.} = \boxed{45.6\,\frac{dpm}{ml.}\ U\text{-}232\ \#\ 383\text{-}37B\text{-}1\ \text{in } 1\,N\,HNO_3}$$

000000

Continued on Page

Read and Understood By

M. Baughn 04-01-92 B Thiemer 04-15

PROJECT U-232

Notebook No. 356

Continued From Page

Prepared U-232 #388-37C from stock solution #388-37, Std Prep log book #43, page 92, at 45645 dpm/ml. Ref. date: 09-01-91

Gross Wt.	Container + Solution	136.4160
Tare Wt.	Wt. of Container	32.0936
Net Wt.	Total Solution	104.8224 g.

Added 1.0299 g of U-232 #388-37

$$\frac{(45645 \frac{dpm}{ml})(1.0299 g)}{104.8224 g} = \boxed{448.5 \frac{dpm}{ml} \text{ U-232 \#388-37C as of } \overset{\text{DN}}{\text{09-01-92}} \text{ MD 10-1-93}}$$

M. Baughan 11-19-92

0000010

Continued on Page

Read and Understood By

M. Baughan 11-19-92 BR [illegible] 12-29-92

PROJECT U 232 #388-37D

Continued From Page

Prepared U-232 #388-37D from Stock Solution #388-37B
Std. Prep log Book #43, page 92, at 456.4 dpm/ml, Ref date: 09-01-91

$$\frac{(456.4\ dpm/ml)\ (10\ ml)}{200\ ml} = 22.82\ dpm/ml\ \#388\text{-}37D$$

A.C. Vitatoe 03-01-94

Continued on Page

Read and Understood By

A.C. Vitatoe	03-01-94	RSat	03-01-94
Signed	Date	Signed	Date

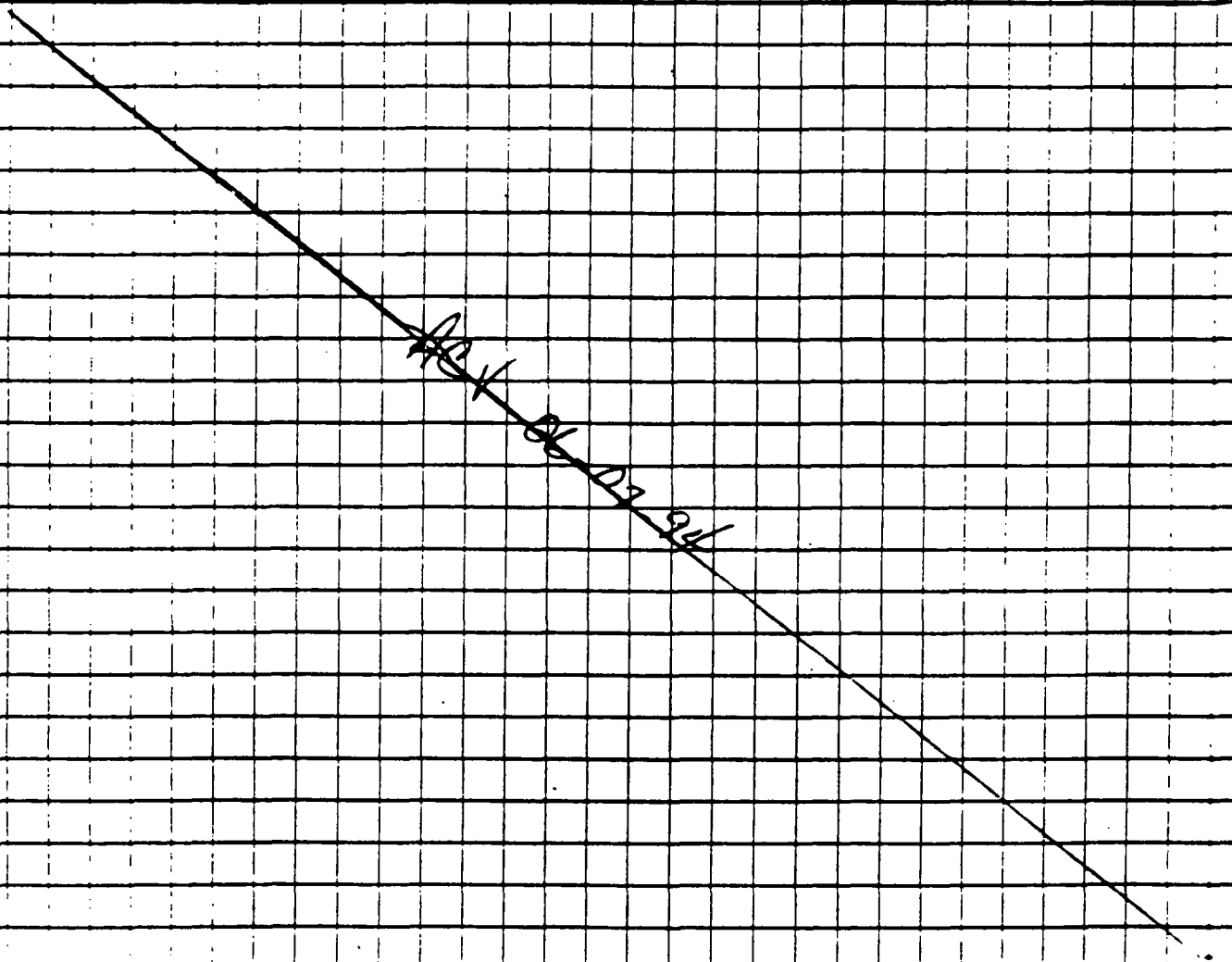
0000011

Prepared from U-232 Solution # 388-37A Std Prep. Log book #43, page 92 with a Concentration of 45645 dpm/ml, Ref Date 09-01-91

$$\frac{(45645 \frac{dpm}{ml})(5 ml)}{50 ml \; 1 N \; HNO_3} = 456.4 \text{ dpm/ml} \quad U\text{-}232 \; \# 388\text{-}37C\text{-}1$$

ACV 06-07-94

0000012



Continued on Page

Read and Understood By

C. Vitale — Signed
06-~~06~~ 07-94 — Date
Signed
Date

PROJECT 2:-232 388-37C-1-A

Notebook No. 627

Continued From Page

Prepared from 2L-232, Solution # 388-37C with a Concentration of 456.4 dpm/mL from Standard Log Book # 627, Page # 5

$$\frac{(456.4\ \text{dpm/mL})(25.0\ \text{mL})}{500\ \text{mL}} = 22.82\ \text{dpm/mL}$$

2L-232 # 388-37C-1AB

$$\frac{(456.4\ \text{dpm/mL})(25.0\ \text{mL})}{500\ \text{mL}} = 22.82\ \text{dpm/mL}$$

2L-232 # 388-37C-2AB

A.C.V.

000013

Continued on Page

Read and Understood By

A.C. Vitatoe — Signed

06-07-94 — Date

Signed

Date

FORM NBS [illegible]
(REV 11-70)

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D.C. 20234

REPORT OF TEST
for

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory
Las Vegas, Nevada

Radionuclide	Thorium-230 (1)*
Source description	Liquid in 5-ml flame-sealed glass ampoule
Solution composition	Thorium-230 in 1 M HNO_3
Solution mass	5.21 ± 0.02 grams
Reference time	1200 EST, 1 January 1983
Radioactivity concentration	490.1 Bq g^{-1} ($s^{-1}g^{-1}$) (2)
Random uncertainty	0.29 percent (3)
Systematic uncertainty	1.41 percent (4)
Total uncertainty (Random plus systematic)	1.70 percent
Photon-emitting impurities	None detected (5)
Half life	7.7 ± 0.3 x 10^4 years (6)
Measuring instrument	NBS "0.1π" defined-solid-angle alpha-particle counter with scintillation detector (7)

0000014

For the Director,

Dale D. Hoppes, Group Leader
Radioactivity Group
Center for Radiation Research

Washington, D.C. 20234
April 22, 1983

*Notes on next page

ROJECT

Continued From Page

EPA EMSLVQAD ^{230}Th Solution, AMPOULE # 7509-87

NBS ^{230}Th solution in ampoule was obtained through EPA QAD in Las Vegas, NV. It was prepared into 2 solutions, as shown below.

8.7990 g ampoule prior to transfer
3.6225 g ampoule after transfer

5.1765 grams transfered

5.1765 grams was transfered to a 50 mL Vanderbilt flask, and brought to volume c̄ ~ 1N HNO_3. Activity of this solution is:

5.1765 grams × 490.1 Bq/gram × 60 sec/min × 1/50 mL =

SOLN # 7509 TH 01A
3044.4 dpm/mL

As of 1 January 1983, $\frac{^{230}Ra}{^{230}Th} < 1E-5$

$\frac{^{232}Th}{^{230}Th} < 1E-5$

0000015

5.0 mL of soln # 7509 TH 01A were taken and diluted to 1000 mL c̄ ~1N HNO_3 and transfered to a Wheaton Bottle

SOLN # 7509 TH01A1

5.0 mL × 3044.4 dpm/mL × 1/1000 mL = 15.2 dpm/mL

Continued on Page

Signed Date Signed Date

Read and Understood By
R Patterson 10-23-9[illegible]

PRELIMINARY INFORMATION FOR STANDARD REFERENCE MATERIAL 4328A

Dear Customer:

Because of your urgent need, Standard Reference Material (SRM) 4328A, Thorium-229, is being sent to you before the Certificate is ready. Below is preliminary information that can be used until the Certificate is issued. The numbers below are not expected to change significantly, but this is not guaranteed. Only the numbers that appear on the Certificate are considered "official". The Certificate will be mailed to you as soon as it is issued, probably during the month of March 1994.

For further information, contact:
Dr. Larry Lucas
Radioactivity Group, Building 245, Room C114
National Institute of Standards and Technology
Gaithersburg, MD 20899-0001 USA
Phone: 1-301-975-5546
FAX: 1-301-926-7416

Radionuclide: Thorium-229

Source Identification: Standard Reference Material 4328A

Source Description: Liquid in 5-mL borosilicate-glass ampoule

Solution Composition: Thorium-229 plus progeny in 1-molar nitric acid

Solution Density: 1.032 ± 0.002 (two standard deviations) at 22.6 °C

Solution Mass: Approximately 5.1 grams

Reference Time: January 1994

Radioactivity Concentration: 32.8 Bq g^{-1}

Expanded Uncertainty: 1.5 percent (two standard deviations)

Radionuclidic Impurities: None detected

0000016

PROJECT Th 229 #4328 A-2

Notebook No. 304

Continued From Page

Th 229 obtained from NIST #4328A, activity concentration 32.8 Bq/g as of Jan 01, 1994. The halflive for Th 229 is 7340 yrs.

Amount transfered 5.0851 g into a 50 ml Volumetric flask Diluted to volume with 1M HNO_3

$$\frac{32.8\ Bq/g \times 60\ \frac{dpm}{Bq} \times 5.0851\ g}{50.0\ ml} = 200.0\ dpm/ml$$

~~4328~~ 4328-A-2

RE 03-30-94

Transfered 10.0 ml of Th 229 #4328A-2 above to a 100 ml Volumetric and diluted to volume with 1M HNO_3

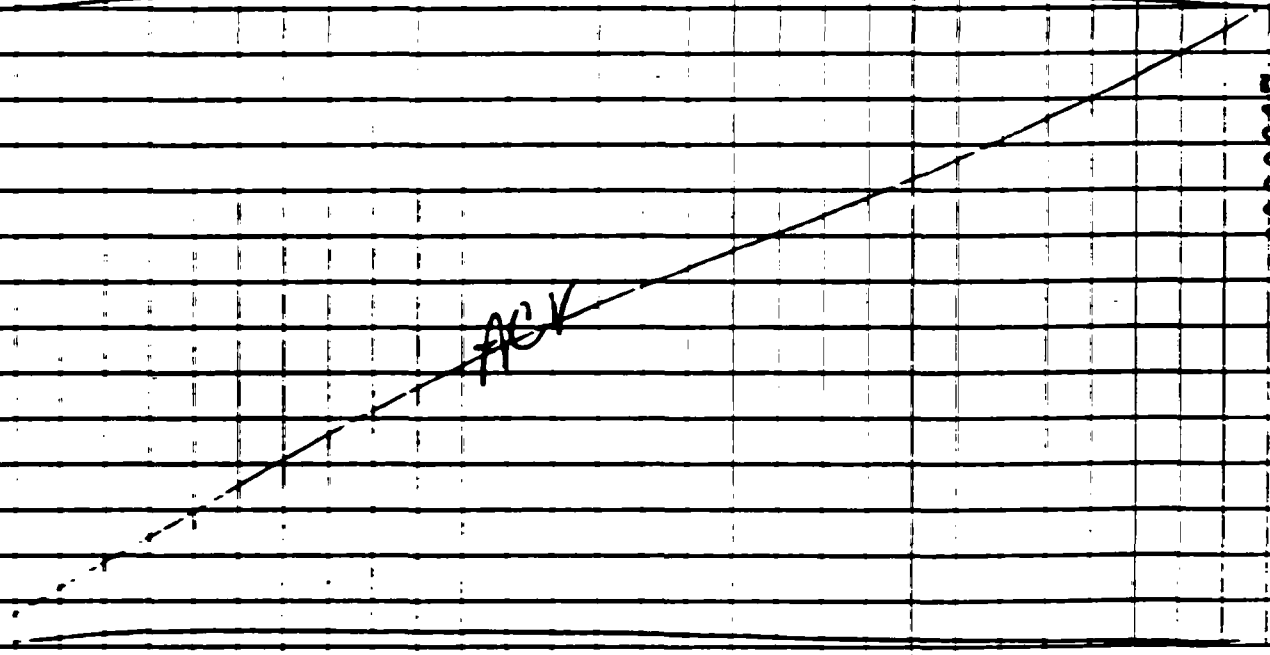
$$\frac{10.0\ ml \times 200.0\ dpm/ml}{100.0\ ml} = 20.0\ dpm$$

4328 E

=4328 E

ACV

0000017



Continued on Page

Read and Understood By

A.C. [illegible]	03-30-94	R Eaton	03-30-[illegible]
Signed	Date	Signed	Date

PROJECT Th 229 #4328-F

Notebook No. [illegible]

Continued From Page

Transferred 10.0 ml of Th 229 #4328-A-2 to a 100 ml Volumetric and diluted to volume with 1M HNO_3 - #4328-F

$$\frac{10.0\ ml \times 200.0}{100.0} = 20.0\ dpm/ml$$

4328-F

ACV 03-30-94

0000018

Continued on Page

Read and Understood By

A.C. Vitale	03-30-94	K Eaton	03-30-94
Signed	Date	Signed	Date

PROJECT Th 229 4328-G

Notebook No. [illegible]

Continued From Page

TRANSFERRED 10.0 ml of Th 4328-A-2 to a 100.0 ml VOL. FLASK and diluted to 100.0 ml with 1.0 N HNO_3 = 4328-G

$$\frac{10.0\ ml \times 200.0\ dpm/ml}{100.0\ ml} = 20.0\ dpm/ml$$

4328-G

Rec 04-20-94

0000019

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	04-20-94	A.C. [signature]	04-20-94

ITAS ST. LOUIS LABORATORY INSTRUMENT QC COUNTS with NORMALIZED DEVIATIONS ("NDEV"): 06/08/94

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A1	06/08/94	119	LEG	4919.00	1.36	0.13	0.38	1718.00	0.76	1.07	-0.90	0.00

ALPHA COUNT MEAN & SIGMA: 4831 / 65
ALPHA BKG. MEAN & SIGMA: 0.10 / 0.08
BETA COUNT MEAN & SIGMA: 1710 / 15
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A2	06/08/94	119	LEG	5635.00	-1.17	0.03	-0.13	3003.00	-0.10	1.40	1.14	0.00

ALPHA COUNT MEAN & SIGMA: 5669 / 29
ALPHA BKG. MEAN & SIGMA: 0.04 / 0.08
BETA COUNT MEAN & SIGMA: 3018 / 92
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 12

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A3	06/08/94	119	LEG	5384.00	0.84	0.07	0.13	2568.00	-0.16	1.00	-0.87	0.00

ALPHA COUNT MEAN & SIGMA: 5347 / 44
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 2586 / 80
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	A4	06/08/94	120	LEG	5892.00	2.03	0.13	0.88	3468.00	0.47	1.20	-0.65	0.00

ALPHA COUNT MEAN & SIGMA: 5809 / 41
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 3451 / 51
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B1	06/08/94	120	LEG	6281.00	0.78	0.13	0.00	3835.00	1.36	1.93	2.13	0.00

ALPHA COUNT MEAN & SIGMA: 6253 / 40
ALPHA BKG. MEAN & SIGMA: 0.13 / 0.08
BETA COUNT MEAN & SIGMA: 3784 / 44
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B2	06/08/94	121	LEG	7060.00	1.02	0.13	0.50	8441.00	1.94	1.17	0.28	0.00

ALPHA COUNT MEAN & SIGMA: 7017 / 42
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 8354 / 54
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	B3	06/08/94	120	LEG	6390.00	0.90	0.07	0.13	3428.00	-0.82	1.37	0.46	0.00

ALPHA COUNT MEAN & SIGMA: 6358 / 36
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 5742 / 2820
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B4	06/08/94	121	LBG	7779.00	-0.97	0.07	-0.25	9077.00	0.90	1.10	-0.42	0.00

ALPHA COUNT MEAN & SIGMA: 7833 / 56
ALPHA BKG. MEAN & SIGMA: 0.05 / 0.00
BETA COUNT MEAN & SIGMA: 6541 / 2851
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40021	C1	06/08/94	125	LBG	4267.00	-1.58	0.01	-0.75	1474.00	-1.31	0.73	-1.02	0.00

ALPHA COUNT MEAN & SIGMA: 4371 / 65
ALPHA BKG. MEAN & SIGMA: 0.07 / 0.00
BETA COUNT MEAN & SIGMA: 1512 / 27
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 13

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C2	06/08/94	123	LBG	5324.00	1.57	0.07	-0.13	2859.00	1.78	0.77	-1.12	0.00

ALPHA COUNT MEAN & SIGMA: 5268 / 36
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.00
BETA COUNT MEAN & SIGMA: 2793 / 43
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C3	06/08/94	125	LBG	4719.00	-0.58	0.13	0.50	2271.00	-0.28	1.30	2.33	0.00

ALPHA COUNT MEAN & SIGMA: 4824 / 180
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.00
BETA COUNT MEAN & SIGMA: 2654 / 1317
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C4	06/08/94	126	LBG	5268.00	-1.70	0.01	-1.13	3139.00	-0.57	1.30	0.63	0.00

ALPHA COUNT MEAN & SIGMA: 5317 / 36
ALPHA BKG. MEAN & SIGMA: 0.10 / 0.00
BETA COUNT MEAN & SIGMA: 3188 / 61
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B1	06/08/94	121	LBG	5185.00	-1.01	0.10	0.50	3215.00	-0.13	0.97	-0.07	0.00

ALPHA COUNT MEAN & SIGMA: 5276 / 169
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.00
BETA COUNT MEAN & SIGMA: 3278 / 89
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "I" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B2	06/08/94	122	LBG	5889.00	-0.75	0.23	1.00	6831.00	-0.72	1.40	-0.72	0.00

ALPHA COUNT MEAN & SIGMA: 5991 / 135
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.00
BETA COUNT MEAN & SIGMA: 6960 / 169
BETA BKG. MEAN & SIGMA: 2 / 1
**TOTAL DATA POINTS (N) = 10

0000021

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	D3	06/08/94	121	LEG	5366.00	0.09	0.03	-0.50	2752.00	-0.74	0.90	-3.50	0.00

ALPHA COUNT MEAN & SIGMA: 5359 / 75
ALPHA BKG. MEAN & SIGMA: 0.07 / 0.08
BETA COUNT MEAN & SIGMA: 4511 / 2333
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK
LB40001	D4	06/08/94	121	LEG	6369.00	-1.21	0.23	1.63	7173.00	0.81	1.23	1.05	0.00

ALPHA COUNT MEAN & SIGMA: 6549 / 149
ALPHA BKG. MEAN & SIGMA: 0.10 / 0.08
BETA COUNT MEAN & SIGMA: 5329 / 2298
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB40002	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB40003	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA_CTS	AC_NDEV	ALPHA_BKG	AB_NDEV	BETA_CTS	BC_NDEV	BETA_BKG	BB_NDEV	XTALK	ENTRY_LOG
LB5100	**	06/08/94	***			0.00		0.00		0.00		0.00		

REMARKS: No IQC data in system this instrument this date

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	C14_CTS	SC_NDEV	C14_BKG	SB_NDEV	ENTRY_LOG
LSC1	****	06/08/94	***			0.00		0.00	

REMARKS: No IQC data in system this instrument this date

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS01	06/08/94	113	LEG	4950	0.34	06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 4942 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS02	06/08/94	111	LEG	5035	0.13	06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 5032 / 25
** TOTAL DATA POINTS (N) = 3

0000022

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS03 06/08/94 111 LRG 5088 -0.01 06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 5088 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS04 06/08/94 112 LRG 5358 0.21 06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 5352 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS05 06/08/94 111 LRG 5090 0.09 06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 5088 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS06 06/08/94 112 LRG 5010 0.45 06/08/94.08:57

PULSE COUNTS MEAN & SIGMA: 4999 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS07 06/08/94 110 LRG 4995 0.52 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 4992 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS08 06/08/94 111 LRG 5019 0.53 06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5006 / 25
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS09	06/08/94	112	LEG	5429	-0.51	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5443 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS10	06/08/94	112	LEG	5375	-0.25	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5382 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS11	06/08/94	113	LEG	5092	-0.38	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5102 / 26
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS12	06/08/94	111	LEG	5396	-0.42	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 5407 / 27
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS13	06/08/94	111	LEG	3608	-0.24	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 3612 / 18
** TOTAL DATA POINTS (N) = 3

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE CTS	PC_NDEV	ENTRY LOG
ALPHAS	AS14	06/08/94	111	LEG	3601	-0.02	06/08/94.08:58

PULSE COUNTS MEAN & SIGMA: 3601 / 18
** TOTAL DATA POINTS (N) = 3

000024

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS15     06/08/94   112    LEG          3601   -0.02 06/08/94.08:59

            PULSE COUNTS MEAN & SIGMA: 3601 / 18
            ** TOTAL DATA POINTS (N) = 3
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  AS16     06/08/94   111    LEG          3602   -0.02 06/08/94.08:59

            PULSE COUNTS MEAN & SIGMA: 3602 / 18
            ** TOTAL DATA POINTS (N) = 3
```

```
COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS  **      06/08/94   ***                        0.00

        REMARKS: NOTE: 1 or more detector(s) missing or OOS this date.
```

```
COUNTER  DETECTOR COUNT_DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV ENTRY_LOG
LB4ALPHA **       06/08/94   ***                  0.00             0.00

        REMARKS: No IQC data in system this instrument this date
```

```
COUNTER  DETECTOR COUNT_DATE SERIES OPERATOR SOURCE_CTS SC_NDEV BACKGD_CTS SB_NDEV ENTRY_LOG
SORTCTS  ***      06/08/94   ***                   0.00

        REMARKS: No IQC data in system this instrument this date
```

0000025

REMARKS: _____

REVIEWED BY: _____ DATE: 06-08-94

0000026

ITAS ST. LOUIS LABORATORY INSTRUMENT QC COUNTS with NORMALIZED DEVIATIONS ("NDEV"): 06/09/94

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40061	A1	06/09/94	119	LEG	4911.00	1.15	0.17	0.75	1708.00	-0.43	1.50	0.55	0.00

ALPHA COUNT MEAN & SIGMA: 4836 / 66
ALPHA BKG. MEAN & SIGMA: 0.11 / 0.00
BETA COUNT MEAN & SIGMA: 1710 / 14
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	A2	06/09/94	119	LEG	5696.00	0.88	0.17	1.50	3012.00	0.00	1.67	1.85	0.00

ALPHA COUNT MEAN & SIGMA: 5671 / 29
ALPHA BKG. MEAN & SIGMA: 0.05 / 0.00
BETA COUNT MEAN & SIGMA: 3018 / 88
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 13

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	A3	06/09/94	119	LEG	5292.00	-1.13	0.03	-0.38	2573.00	-0.89	1.23	0.11	0.00

ALPHA COUNT MEAN & SIGMA: 5343 / 45
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.00
BETA COUNT MEAN & SIGMA: 2585 / 77
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	A4	06/09/94	120	LEG	5806.00	1.63	0.03	-0.25	3334.00	-1.81	1.63	1.08	0.00

ALPHA COUNT MEAN & SIGMA: 5814 / 44
ALPHA BKG. MEAN & SIGMA: 0.05 / 0.00
BETA COUNT MEAN & SIGMA: 3443 / 57
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B1	06/09/94	120	LEG	6238.00	-0.54	0.07	-0.75	3848.00	1.47	1.03	-1.58	0.00

ALPHA COUNT MEAN & SIGMA: 6251 / 39
ALPHA BKG. MEAN & SIGMA: 0.13 / 0.00
BETA COUNT MEAN & SIGMA: 3788 / 46
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B2	06/09/94	121	LEG	7068.00	1.12	0.03	-0.63	8364.00	0.49	1.13	0.06	0.00

ALPHA COUNT MEAN & SIGMA: 7020 / 43
ALPHA BKG. MEAN & SIGMA: 0.00 / 0.00
BETA COUNT MEAN & SIGMA: 8356 / 52
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B3	06/09/94	120	LEG	6429.00	1.70	0.07	0.13	3446.00	-0.77	0.98	-1.32	0.00

ALPHA COUNT MEAN & SIGMA: 6362 / 39
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.00
BETA COUNT MEAN & SIGMA: 5589 / 2781
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

000027

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	B4	06/09/94	121	LEG	7875.00	0.71	0.17	1.38	8868.00	0.78	0.93	-0.92	0.00

ALPHA COUNT MEAN & SIGMA: 7836 / 55
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 6697 / 2814
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C1	06/09/94	125	LEG	4286.00	-1.18	0.01	-0.75	1529.00	-0.71	1.87	-1.39	0.00

ALPHA COUNT MEAN & SIGMA: 4365 / 67
ALPHA BKG. MEAN & SIGMA: 0.07 / 0.08
BETA COUNT MEAN & SIGMA: 1513 / 26
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 14

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C2	06/09/94	123	LEG	5346.00	1.83	0.07	-0.13	2767.00	-0.55	0.87	-0.68	0.00

ALPHA COUNT MEAN & SIGMA: 5273 / 40
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 2791 / 39
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C3	06/09/94	125	LEG	4686.00	-0.73	0.07	-0.25	2264.00	-0.28	0.90	-0.36	0.00

ALPHA COUNT MEAN & SIGMA: 4815 / 177
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 2630 / 1276
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	C4	06/09/94	126	LEG	5251.00	-1.68	0.03	-0.75	3240.00	1.01	1.20	0.11	0.00

ALPHA COUNT MEAN & SIGMA: 5313 / 37
ALPHA BKG. MEAN & SIGMA: 0.09 / 0.08
BETA COUNT MEAN & SIGMA: 3185 / 61
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 15

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	D1	06/09/94	121	LEG	5097.00	-1.02	0.07	-0.13	3203.00	-0.26	1.03	-0.38	0.00

ALPHA COUNT MEAN & SIGMA: 5265 / 170
ALPHA BKG. MEAN & SIGMA: 0.06 / 0.08
BETA COUNT MEAN & SIGMA: 3277 / 87
BETA BKG. MEAN & SIGMA: 1 / 0
**TOTAL DATA POINTS (N) = 16

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	ALPHA CTS	AC_NDEV	ALPHA BKG	AB_NDEV	BETA CTS	BC_NDEV	BETA BKG	BB_NDEV	XTALK
LB40001	D2	06/09/94	122	LEG	5878.00	-0.77	0.07	-0.13	6929.00	-0.15	1.43	-0.63	0.00

ALPHA COUNT MEAN & SIGMA: 5981 / 133
ALPHA BKG. MEAN & SIGMA: 0.08 / 0.08
BETA COUNT MEAN & SIGMA: 6966 / 160
BETA BKG. MEAN & SIGMA: 2 / 1
**TOTAL DATA POINTS (N) = 11

0000028

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 D3       06/09/94  121    LBG        5312.00   -0.60      0.03   -0.50  2702.00   -0.69     5.67   -0.72  0.00

          ALPHA COUNT MEAN & SIGMA: 5356 / 73
          ALPHA BKG.  MEAN & SIGMA: 0.07 / 0.08
          BETA  COUNT MEAN & SIGMA: 4399 / 2290
          BETA  BKG.  MEAN & SIGMA: 1 / 0
          **TOTAL DATA POINTS (N) = 15
```

```
**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK
LB40001 D4       06/09/94  121    LBG        6497.00   -0.34      0.07   -0.38  7166.00    0.76     0.97   -0.14  0.00

          ALPHA COUNT MEAN & SIGMA: 6546 / 144
          ALPHA BKG.  MEAN & SIGMA: 0.10 / 0.08
          BETA  COUNT MEAN & SIGMA: 5452 / 2266
          BETA  BKG.  MEAN & SIGMA: 1 / 0
          **TOTAL DATA POINTS (N) = 15
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
LB40002 **       06/09/94  ***                      0.00             0.00             0.00             0.00

     REMARKS: No IQC data in system this instrument this date
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
LB40003 **       06/09/94  ***                      0.00             0.00             0.00             0.00

     REMARKS: No IQC data in system this instrument this date
```

```
COUNTER DETECTOR COUNT DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV BETA_CTS BC_NDEV BETA_BKG BB_NDEV XTALK ENTRY_LOG
LB5120  **       06/09/94  ***                      0.00             0.00             0.00             0.00

     REMARKS: No IQC data in system this instrument this date
```

```
     COUNTER DETECTOR COUNT DATE SERIES OPERATOR C14_CTS BC_NDEV C14_BKG BB_NDEV ENTRY_LOG
     LSC1    ****     06/09/94  ***                      0.00          0.00

          REMARKS: No IQC data in system this instrument this date
```

```
     **NOTE: "N" less than 20...
     COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
     ALPHA5  AS01     06/09/94  113    LBG          4945    0.10 06/09/94.09:21

               PULSE COUNTS MEAN & SIGMA: 4943 / 25
               ** TOTAL DATA POINTS (N) = 4
```

```
     **NOTE: "N" less than 20...
     COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
     ALPHA5  AS02     06/09/94  111    LBG          5038    0.19 06/09/94.09:21

               PULSE COUNTS MEAN & SIGMA: 5033 / 25
               ** TOTAL DATA POINTS (N) = 4
```

0000029

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS03	06/09/94	111	LEG	5107	0.55	06/09/94.09:21

PULSE COUNTS MEAN & SIGMA: 5093 / 25
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS04	06/09/94	112	LEG	5357	0.13	06/09/94.09:21

PULSE COUNTS MEAN & SIGMA: 5354 / 27
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS05	06/09/94	111	LEG	5089	0.04	06/09/94.09:22

PULSE COUNTS MEAN & SIGMA: 5088 / 25
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS06	06/09/94	112	LEG	5023	0.73	06/09/94.09:22

PULSE COUNTS MEAN & SIGMA: 5005 / 25
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS07	06/09/94	110	LEG	4985	0.09	06/09/94.09:22

PULSE COUNTS MEAN & SIGMA: 4983 / 25
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...

COUNTER	DETECTOR	COUNT DATE	SERIES	OPERATOR	PULSE_CTS	PC_NDEV	ENTRY_LOG
ALPHAS	AS08	06/09/94	111	LEG	5016	0.31	06/09/94.09:22

PULSE COUNTS MEAN & SIGMA: 5008 / 25
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS09 06/09/94 112 LBG 5426 -0.47 06/09/94.09:22

PULSE COUNTS MEAN & SIGMA: 5439 / 27
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS10 06/09/94 112 LBG 5362 -0.55 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 5377 / 27
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS11 06/09/94 113 LBG 5107 0.16 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 5103 / 26
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS12 06/09/94 111 LBG 5388 -0.54 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 5403 / 27
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS13 06/09/94 111 LBG 3607 -0.22 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3611 / 18
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS14 06/09/94 111 LBG 3602 0.03 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3602 / 18
** TOTAL DATA POINTS (N) = 4

0000031

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS15 06/09/94 112 LEG 3601 -0.01 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3601 / 18
** TOTAL DATA POINTS (N) = 4

**NOTE: "N" less than 20...
COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS AS16 06/09/94 111 LEG 3601 -0.06 06/09/94.09:23

PULSE COUNTS MEAN & SIGMA: 3602 / 18
** TOTAL DATA POINTS (N) = 4

COUNTER DETECTOR COUNT_DATE SERIES OPERATOR PULSE_CTS PC_NDEV ENTRY_LOG
ALPHAS ** 06/09/94 *** 0.00

REMARKS: NOTE: 1 or more detector(s) missing or OOS this date.

COUNTER DETECTOR COUNT_DATE SERIES OPERATOR ALPHA_CTS AC_NDEV ALPHA_BKG AB_NDEV ENTRY_LOG
LB4ALPHA ** 06/09/94 *** 0.00 0.00

REMARKS: No IQC data in system this instrument this date

COUNTER DETECTOR COUNT_DATE SERIES OPERATOR SOURCE_CTS SC_NDEV BACKGD_CTS SB_NDEV ENTRY_LOG
GDETECTS *** 06/09/94 *** 0.00

REMARKS: No IQC data in system this instrument this date

0000032

REMARKS: _____

REVIEWED BY: _____ DATE: 06-09-94

Notebook No. 326

PROJECT _____ Continued From Page _____

DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Init
04-25-94	5.027	5.048	5.028	5.025	5.033	5.025	4.936	5.024	5.006	4.979	5.010	5.049	4.999	5.012	4.984	4.997	LEG
04-26-94	5.027	5.048	5.028	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.012	4.984	4.997	LEG
04-27-94	5.027	5.048	5.028	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.008	4.979	4.997	LEG
04-28-94	5.027	5.048	5.026	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.995	5.008	4.979	4.997	LEG
04-29-94	5.027	5.048	5.028	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.004	5.049	4.995	5.008	4.984	4.997	LEG
05-02-94	5.027	5.048	5.028	5.025	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.012	4.979	4.997	LEG
05-03-94	5.027	5.048	*5.036	*5.028	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.003	4.979	4.997	LEG
05-04-94	5.029	5.043	5.027	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.004	5.049	4.999	5.008	4.979	4.997	LEG
05-05-94	5.027	5.048	5.027	5.020	5.033	5.020	4.936	5.019	—	4.979	5.004	5.049	4.995	5.003	4.979	4.997	LEG
05-06-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.010	5.049	4.995	5.003	4.979	4.997	LEG
05-09-94	5.027	5.043	5.017	5.020	5.033	5.020	4.936	5.019	→	4.979	5.004	5.049	4.999	5.008	4.979	4.997	LEG
05-10-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.979	5.010	5.049	4.995	5.008	4.979	4.997	LEG
05-11-94	5.029	5.048	5.022	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.010	5.049	4.999	5.008	4.979	4.997	LEG
05-17-94	5.027	5.043	5.022	5.020	5.033	5.020	4.936	5.024	5.006	4.979	5.010	5.049	4.995	5.009	4.979	4.997	LEG
05-18-94	5.027	5.048	5.022	5.020	5.033	5.020	4.936	5.019	5.006	4.979	4.992	5.049	4.999	5.003	4.984	4.992	LEG
05-24-94	5.027	5.043	5.031	5.026	5.033	5.020	4.936	5.031	5.001	4.978	—	5.049	4.999	5.003	4.979	4.997	LEG
05-25-94	5.027	5.048	5.036	5.028	5.033	5.020	4.936	5.036	5.006	4.978	4.992	5.049	4.995	5.003	4.984	5.002	LEG
05-26-94	5.027	5.048	5.031	5.023	5.033	5.020	4.936	5.031	5.001	4.978	4.992	5.049	4.999	5.008	4.984	5.007	LEG
05-31-94	5.027	5.043	5.046	—	5.033	5.020	4.936	5.036	5.006	4.975	4.992	5.049	4.995	5.006	4.979	5.002	LEG
06-02-94	5.027	5.048	5.031	5.026	5.033	5.020	4.936	5.036	5.001	4.983	4.992	5.049	4.999	5.012	4.979	5.007	LEG
06-03-94	5.027	5.048	5.036	5.026	5.033	5.020	4.941	5.036	5.006	4.983	4.992	5.049	4.999	5.008	4.979	5.007	LEG
06-06-94	5.027	5.048	5.031	5.018	5.033	5.020	4.936	5.031	5.001	4.978	4.992	5.043	5.004	5.003	4.984	5.007	LEG
06-07-94	5.022	5.043	5.031	5.023	5.033	5.020	4.936	5.031	5.001	4.977	4.986	5.043	5.009	5.008	4.984	5.012	LEG
06-08-94	5.027	5.048	5.031	5.028	5.033	5.020	4.936	5.031	5.006	4.983	4.992	5.049	4.999	5.008	4.984	5.002	LEG
06-09-94	5.027	5.048	5.036	5.028	5.033	5.020	4.936	5.019	5.001	4.979	4.992	5.247	4.999	5.008	4.984	5.002	LEG

Continued on Page

* New Det's

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

0000034

BACKGROUND FOR ALPHA SPECTROSCOPY DETECTORS

URANIUM:

	REGION OF INTEREST			
DETECTOR	**1**	**2**	**3**	**4**
1	87	86	93	64
2	53	30	75	57
3	149	112	147	119
4	56	48	79	111
5	153	112	102	91
6	129	130	117	101
7	80	82	54	69
8	62	58	72	59
9	11	6	24	68
10	22	5	25	35
11	3	4	9	61
12	9	11	61	55
13	7	8	24	70
14	21	17	37	72
15	13	16	17	35
16	86	20	73	79

REGION 1: U-238
REGION2: U-235,236
REGION3: U-234
REGION4: U-232

Background measured for 4000 min. JUNE 03, 1994

0000035

BACKGROUND FOR ALPHA SPECTROSCOPY DETECTORS

THORIUM

	REGION OF INTEREST			
DETECTOR	**1**	**2**	**3**	**4**
1	71	176	63	94
2	41	86	43	105
3	141	208	121	108
4	66	99	88	104
5	138	234	59	122
6	153	222	107	127
7	89	153	59	91
8	62	114	32	102
9	12	23	33	60
10	10	26	32	30
11	3	8	20	81
12	4	45	37	59
13	16	28	40	91
14	24	42	30	51
15	30	20	25	35
16	61	69	57	69

REGION 1: TH-232
REGION2: TH-230
REGION3: TH-229
REGION4: TH-228

Background measured for 4000 min. JUNE 03, 1994

0000036

COUNTER EFFECIENCY FOR ALPHA SPECTROSCOPY DETECTORS

DETECTOR	MEAN EFF.	06-08-94	05-10-94	04-12-94	03-29-94	03-03-94	02-14-94	02-07-94	01-24-94
1	0.310	0.354	0.323	0.309	0.296	0.316	0.321	0.309	0.313
2	0.317	0.353	0.320	0.309	0.305	0.325	0.324	0.313	0.316
3	0.307	0.351	0.320	0.300	0.292	0.316	0.291	0.294	0.309
4	0.308	0.348	0.318	0.302	0.298	0.32	0.283	0.306	0.316
5	0.311	0.351	0.319	0.290	0.309	0.315	0.286	0.302	0.32
6	0.311	0.347	0.322	0.301	0.298	0.32	0.287	0.299	0.318
7	0.308	0.348	0.316	0.295	0.295	0.323	0.292	0.306	0.315
8	0.310	0.354	0.321	0.291	0.308	0.322	0.289	0.305	0.314
9	0.224	0.225	0.225	0.226	0.235	0.217	0.232	0.217	0.235
10	0.293	0.287	0.295	0.299	0.298	0.291	0.291	0.301	0.294
11	0.217	0.209	0.225	0.227	0.217	0.214	0.213	0.207	0.233
12	0.292	0.286	0.302	0.295	0.288	0.288	0.295	0.276	0.293
13	0.227	0.234	0.219	0.232	0.227	0.224	0.227	0.216	0.223
14	0.191	0.192	0.196	0.187	0.193	0.193	0.184	0.188	0.187
15	0.170	0.151	0.188	0.158	0.169	0.178	0.179	0.167	0.179
16	0.219	0.226	0.223	0.218	0.214	0.203	0.206	0.221	0.205

EFFECIENCY WAS DETERMINED USING A PU-239 ELECTROPLATED SOURCE (11600 dpm) SERIAL #1277/92

Notebook No._____

PROJECT_____ Continued From Page_____ Pl

DATE	DET	Sample	Analyses	Time	Alarms
06-07-94	13	BCK 37565	Po	600	506032
"	14	BCK 37565-2	"	"	33
06-08-94	1	CCS 35993	Th	600 200	34
"	2	BCK 38993		06-09-94	35
"	3	5179-001			36
"	4	1dup			37
"	5	5			38
"	6	11			39
"	7	12			40
06-09-94	1	CCS 38993	U	100	41
"	2	BCK 38993			42
"	3	5179-001			43
"	4	1dup			44
"	5	5			45
"	6	11			46
"	7	12			47
"	8	5179-001dup	Th		48

Continued on Page

Read and Understood By

Signed Date Signed Date

0000038

SAMPLE DATA/INSTRUMENT PRINTOUT

MCA #1 - Canberra S100 - SD6035.MCA - BLK 38993 TH

Tag Number: 560
Report Group: 2/16
Input: 2 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:12
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.636e-006*Ch^2 + 0.004104*Ch + 3.516 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000039

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.903	3	-4	4.102
	4.150	0.00	254.28	0.1707
2	4.469	106	-55	4.715
	4.738	0.01	90.55	0.0062
3	4.753	691	326	4.815
	5.095	0.06	28.07	0.0472
4	5.179	31	24	5.381
	5.473	0.00	55.85	0.0164

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

91		0	0	0	0
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	1	0	0
120	0	0	0	0	0
125	1	0	0	0	0
130	0	0	0	0	0
135	0	0	0	0	0
140	0	0	0	0	0
145	0	1			

ROI # 2
Channel # **** Data ****

214					1
215	3	1	3	1	1
220	1	1	1	0	1
225	0	0	0	0	1
230	0	1	1	0	0
235	0	0	1	0	1
240	1	1	3	2	0
245	0	1	2	1	1
250	2	4	1	3	4
255	1	3	4	6	1
260	3	1	5	5	7
265	10	1	2	9	3

047000

REGION OF INTEREST DATA

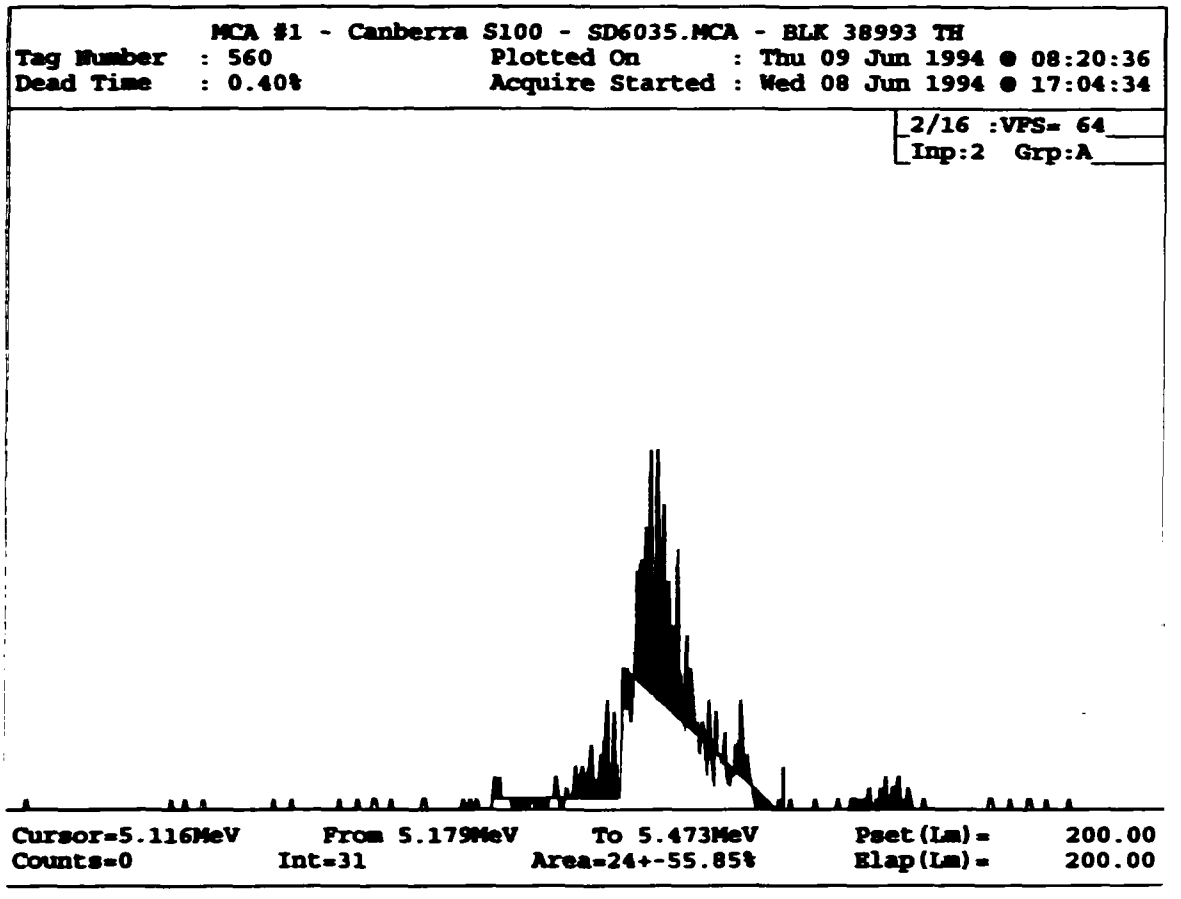
ROI # 3

Channel #		**** Data ****			
272			13	9	13
275	8	8	14	22	21
280	23	21	26	17	33
285	19	22	33	23	20
290	28	13	21	11	17
295	11	24	13	12	7
300	16	12	13	10	7
305	8	5	8	7	3
310	10	6	2	9	5
315	5	4	7	3	2
320	3	3	6	3	10
325	6	4	5	3	2
330	1	0	1	0	0
335	0	0	0	0	0

ROI # 4

Channel #		**** Data ****			
355	0	0	1	0	0
360	0	0	0	0	0
365	0	0	1	0	0
370	0	0	0	1	1
375	1	0	1	0	1
380	1	2	0	0	1
385	0	2	0	3	1
390	0	2	2	2	3
395	0	1	0	2	1
400	0	0	0	0	0
405	1	0	0	0	0
410	0				

0000041


MCA #1 - Canberra S100 - SD6035.MCA - BLK 38993 TH
Tag Number : 560
Dead Time : 0.40%
Plotted On : Thu 09 Jun 1994 @ 08:20:36
Acquire Started : Wed 08 Jun 1994 @ 17:04:34
2/16 :VFS= 64
Inp:2 Grp:A
Cursor=5.116MeV
From 5.179MeV
To 5.473MeV
Pset(Lm)= 200.00
Counts=0
Int=31
Area=24+-55.85%
Elap(Lm)= 200.00

0000042

MCA #1 - Canberra S100 - SD6034.MCA - LCS 38993 TH

Tag Number: 560
Report Group: 1/16
Input: 1 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:07
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.613e-006*Ch^2 + 0.004020*Ch + 3.586 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000043

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.930	1018	767	4.060
	4.140	0.08	9.75	0.0730
2	4.412	1002	581	4.657
	4.721	0.08	17.11	0.0670
3	4.730	777	389	4.825
	5.068	0.06	24.55	0.0323
4	5.144	1138	988	5.349
	5.452	0.09	7.40	0.0764

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

83				8	7
85	9	10	9	9	6
90	7	6	13	11	14
95	15	19	17	17	18
100	15	21	26	18	37
105	28	30	28	25	39
110	42	35	38	36	43
115	38	40	32	37	48
120	35	29	18	31	17
125	12	12	6	2	2
130	2	1			

ROI # 2
Channel # **** Data ****

191		1	5	4	2
195	1	2	3	3	4
200	7	4	3	5	2
205	5	4	2	3	3
210	4	7	6	7	7
215	3	5	8	12	7
220	11	13	13	6	12
225	22	13	19	19	21
230	23	24	19	20	14
235	32	40	38	32	29
240	37	37	40	27	34
245	35	38	39	27	33
250	19	31	17	14	9
255	11	5			

0000044

REGION OF INTEREST DATA

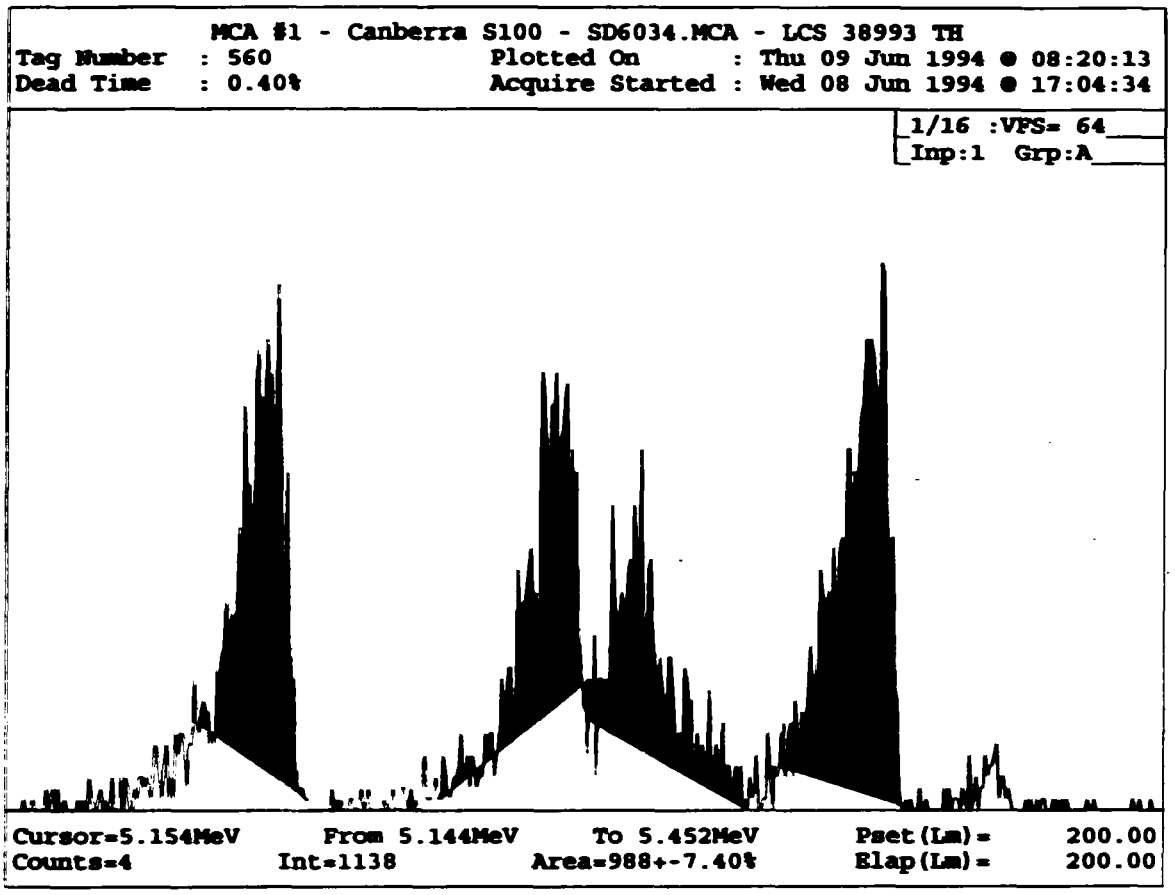
ROI # 3

Channel #	**** Data ****				
258				8	16
260	3	12	12	10	12
265	7	16	28	20	16
270	18	20	18	19	22
275	23	19	28	23	23
280	33	19	15	22	23
285	16	14	9	14	12
290	10	9	14	14	11
295	6	7	7	6	13
300	12	10	10	4	5
305	7	3	6	4	5
310	11	5	3	6	5
315	2	8	2	4	4
320	1	3	4	1	4
325	0	1			

ROI # 4

Channel #	**** Data ****				
341		4	7	4	3
345	7	8	3	10	7
350	5	9	8	9	12
355	15	9	12	14	22
360	20	19	19	20	16
365	24	13	22	24	25
370	17	33	33	22	31
375	30	32	36	37	43
380	34	43	42	40	38
385	29	50	49	30	25
390	24	25	11	10	2
395	0	0	1	0	1
400	0				

0000045


MCA #1 - Canberra S100 - SD6034.MCA - LCS 38993 TH
Tag Number : 560
Dead Time : 0.40%
Plotted On : Thu 09 Jun 1994 @ 08:20:13
Acquire Started : Wed 08 Jun 1994 @ 17:04:34
1/16 :VFS= 64
Inp:1 Grp:A
Cursor=5.154MeV
From 5.144MeV
To 5.452MeV
Pset(Lm)= 200.00
Counts=4
Int=1138
Area=988+-7.40%
Elap(Lm)= 200.00

0000046

MCA #1 - Canberra S100 - SD6036.MCA - 5179-001 TH

Tag Number: 560
Report Group: 3/16
Input: 3 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:17
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.671e-006*Ch^2 + 0.004188*Ch + 3.577 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000047

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.905	58	51	4.038
	4.150	0.00	30.87	0.0073
2	4.472	212	-85	4.718
	4.733	0.02	78.20	0.0031
3	4.743	658	174	4.809
	5.115	0.05	60.62	0.0132
4	5.162	86	57	5.316
	5.470	0.01	44.68	0.0195

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
76		0	0	0	0
80	0	0	0	1	0
85	3	0	0	2	2
90	0	0	1	0	0
95	2	4	1	0	0
100	2	3	2	2	0
105	2	5	0	2	0
110	1	1	3	3	0
115	4	2	1	2	1
120	0	2	2	0	0
125	1	0	1	0	0
130	0				

ROI # 2

Channel #	**** Data ****				
198				1	0
200	3	0	0	0	2
205	0	2	1	3	2
210	1	0	2	2	4
215	3	1	3	4	3
220	2	2	5	2	4
225	4	4	4	4	4
230	2	3	3	6	3
235	7	5	3	6	8
240	9	5	8	7	9
245	3	4	9	11	10
250	9	10			

0000048

REGION OF INTEREST DATA

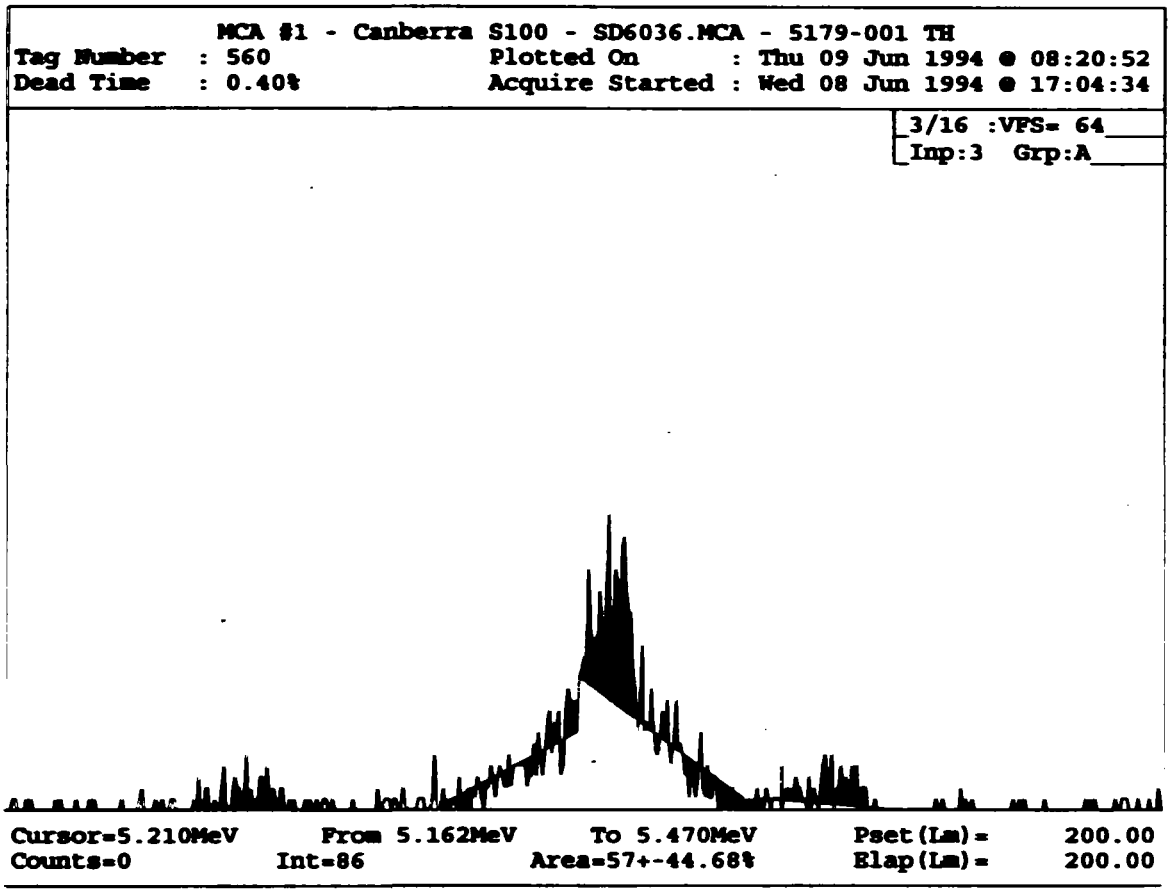
ROI # 3

Channel #	**** Data ****				
253				12	13
255	14	14	22	17	13
260	16	14	20	17	16
265	20	27	13	18	22
270	21	18	24	25	20
275	18	18	13	11	7
280	10	15	7	8	7
285	11	8	5	5	7
290	9	7	10	6	4
295	7	10	6	6	5
300	3	4	1	4	2
305	1	3	7	2	1
310	4	1	1	3	2
315	0	1	0	0	0
320	0	2	0	0	0
325	0				

ROI # 4

Channel #	**** Data ****				
334					1
335	0	2	1	0	1
340	1	1	1	0	1
345	2	1	2	1	3
350	2	2	1	1	0
355	3	0	2	1	0
360	2	4	5	3	2
365	5	0	2	2	4
370	2	3	2	2	4
375	3	4	0	2	2
380	2	0	0	0	1
385	0	0	0	0	0
390	0	0			

640000


MCA #1 - Canberra S100 - SD6036.MCA - 5179-001 TH
Tag Number : 560
Dead Time : 0.40%
Plotted On : Thu 09 Jun 1994 ● 08:20:52
Acquire Started : Wed 08 Jun 1994 ● 17:04:34
3/16 :VFS= 64
Inp:3 Grp:A
Cursor=5.210MeV
From 5.162MeV
To 5.470MeV
Pset(Lm)= 200.00
Counts=0
Int=86
Area=57+-44.68%
Elap(Lm)= 200.00

000050

MCA #1 - Canberra S100 - SD6048.MCA - 5179-001DUP TH

Tag Number: 561
Report Group: 8/16
Input: 8 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 11:24:08
Acquire Started: Thu 09 Jun 1994 @ 08:58:51

Elapsed Live Time: 100.00 min.
Elapsed True Time: 100.00 min.
Dead Time: 0.00 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 100.00 min.

Calibration: 8.804e-007*Ch^2 + 0.004653*Ch + 3.419 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

000051

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.855	36	30	4.001
	4.083	0.01	42.60	0.0093
2	4.445	59	-7	4.610
	4.709	0.01	435.04	0.0042
3	4.719	389	232	4.819
	5.077	0.06	27.16	0.0360
4	5.166	51	51	5.331
	5.459	0.01	23.10	0.0093

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
92			1	0	0
95	0	0	1	0	0
100	0	0	1	0	1
105	0	1	0	0	1
110	3	0	1	0	1
115	1	0	0	2	1
120	1	2	5	1	3
125	0	2	0	3	0
130	1	0	1	1	0
135	1	0	0	0	0

ROI # 2

Channel #	**** Data ****				
212			0	0	0
215	1	0	0	1	0
220	0	0	1	1	0
225	1	0	0	1	0
230	0	1	0	1	1
235	1	0	1	0	1
240	0	2	3	0	3
245	5	0	0	0	1
250	1	2	2	1	2
255	3	2	4	2	4
260	1	1	4	3	1

ROI # 3

Channel #	**** Data ****				
266		3	3	3	4
270	2	3	4	6	6
275	5	6	8	9	8
280	8	6	14	11	18

0000052

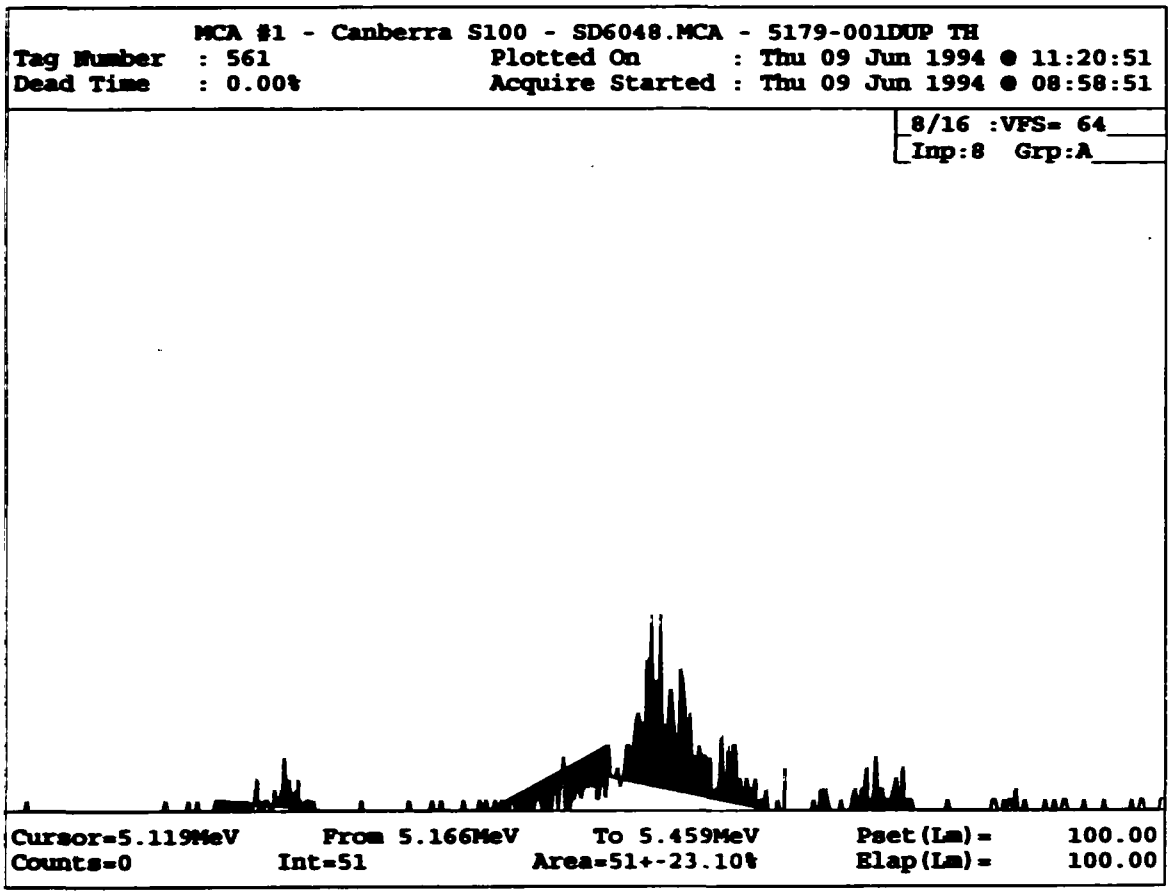
REGION OF INTEREST DATA

ROI # 3

Channel #	**** Data ****				
285	9	12	8	18	7
290	8	7	11	11	8
295	6	7	13	12	9
300	2	9	5	5	2
305	6	5	5	5	3
310	5	1	2	2	3
315	7	2	3	6	1
320	6	6	2	3	2
325	1	3	2	2	2
330	3	0	1	1	1
335	2				

ROI # 4

Channel #	**** Data ****				
352			0	0	0
355	0	1	0	0	2
360	1	2	1	0	0
365	0	0	0	1	0
370	0	0	0	1	2
375	1	0	2	2	4
380	1	1	1	5	1
385	2	2	1	1	1
390	1	2	3	1	1
395	4	0	1	1	1
400	0	0	0	0	0
405	0	0	0		


MCA #1 - Canberra S100 - SD6048.MCA - 5179-001DUP TH
Tag Number : 561
Plotted On : Thu 09 Jun 1994 ● 11:20:51
Dead Time : 0.00%
Acquire Started : Thu 09 Jun 1994 ● 08:58:51
8/16 :VFS= 64
Inp:8 Grp:A
Cursor=5.119MeV
From 5.166MeV
To 5.459MeV
Pset(Lm)= 100.00
Counts=0
Int=51
Area=51+-23.10%
Elap(Lm)= 100.00

0000054

MCA #1 - Canberra S100 - SD6038.MCA - 5179-005 TH

Tag Number: 560
Report Group: 5/16
Input: 5 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:29
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.541e-006*Ch^2 + 0.004180*Ch + 3.579 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000055

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.883	288	251	4.067
	4.148	0.02	14.64	0.0446
2	4.414	228	-193	4.711
	4.730	0.02	45.76	0.0041
3	4.750	1425	726	4.833
	5.095	0.12	17.67	0.0592
4	5.142	334	302	5.381
	5.476	0.03	12.53	0.0251

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
71		0	1	2	2
75	1	2	0	2	3
80	1	1	2	1	1
85	1	2	3	2	6
90	2	4	4	1	4
95	3	6	6	6	11
100	9	6	10	10	8
105	8	7	10	12	8
110	12	10	12	11	8
115	18	7	16	6	7
120	6	3	2	1	0
125	1	0	0	0	0
130	0				

ROI # 2

Channel #	**** Data ****				
187			1	0	0
190	0	0	0	0	1
195	0	1	0	0	2
200	0	3	0	1	0
205	0	1	0	0	0
210	1	3	0	2	1
215	2	2	0	1	1
220	6	3	2	1	0
225	2	6	3	4	4
230	3	4	4	6	4
235	8	3	7	6	5
240	9	1	8	11	6
245	9	5	9	16	11
250	12	12	15		

0000056

REGION OF INTEREST DATA

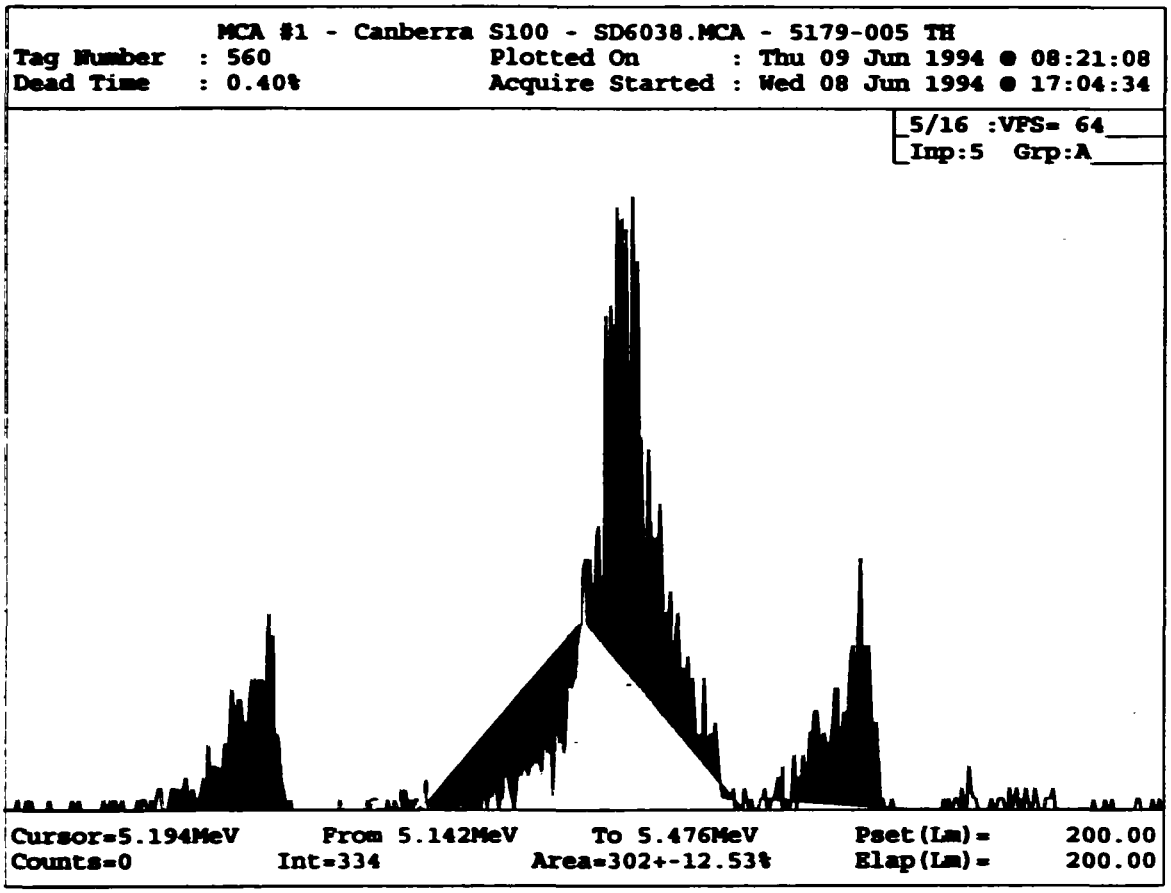
ROI # 3

Channel #	**** Data ****			
256	17	23	19	20
260 25	26	18	22	45
265 28	46	43	28	55
270 45	54	40	53	38
275 38	56	44	50	34
280 34	25	23	33	27
285 23	25	21	28	24
290 17	18	18	20	13
295 15	18	16	12	13
300 10	14	10	12	9
305 5	7	6	12	6
310 6	7	6	8	6
315 3	1	2	1	1
320 1	2	0	0	0

ROI # 4

Channel #	**** Data ****			
333			1	1
335 2	0	0	1	1
340 2	3	1	0	1
345 0	0	2	5	0
350 3	2	5	3	4
355 7	7	9	9	6
360 6	7	6	6	6
365 8	11	11	4	7
370 9	6	10	14	15
375 8	15	23	13	15
380 14	15	9	5	8
385 5	1	1	0	0
390 0	1	0	0	0
395 0	0			

0000057


MCA #1 - Canberra S100 - SD6038.MCA - 5179-005 TH
Tag Number : 560
Plotted On : Thu 09 Jun 1994 ● 08:21:08
Dead Time : 0.40%
Acquire Started : Wed 08 Jun 1994 ● 17:04:34
5/16 :VFS= 64
Inp:5 Grp:A
Cursor=5.194MeV
From 5.142MeV
To 5.476MeV
Pset(Lm)= 200.00
Counts=0
Int=334
Area=302+-12.53%
Elap(Lm)= 200.00

0000058

MCA #1 - Canberra S100 - SD6039.MCA - 5179-011 TH

Tag Number: 560
Report Group: 6/16
Input: 6 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:35
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.657e-006*Ch^2 + 0.004128*Ch + 3.611 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

0000059

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.895	327	299	4.078
	4.140	0.03	11.93	0.0413
2	4.422	131	-42	4.723
	4.737	0.01	136.06	0.0055
3	4.747	967	399	4.831
	5.102	0.08	28.86	0.0437
4	5.154	417	365	5.365
	5.463	0.03	11.90	0.0564

REGION OF INTEREST DATA

ROI # 1
Channel # **** Data ****

67			1	0	1
70	1	2	3	0	0
75	3	1	3	1	4
80	1	1	1	3	3
85	3	4	2	3	1
90	2	2	11	6	2
95	8	9	8	9	9
100	5	12	9	10	13
105	18	22	14	22	12
110	19	12	14	14	6
115	10	3	1	2	1
120	0	0	0		

ROI # 2
Channel # **** Data ****

183				0	0
185	0	1	1	0	0
190	0	1	2	0	0
195	0	0	1	0	1
200	0	0	0	0	0
205	0	0	2	0	2
210	0	0	2	0	1
215	1	5	0	4	2
220	1	0	3	3	1
225	2	6	2	4	3
230	2	2	1	4	7
235	2	5	4	3	7
240	6	2	4	6	5
245	8	6	4	2	

0000080

REGION OF INTEREST DATA

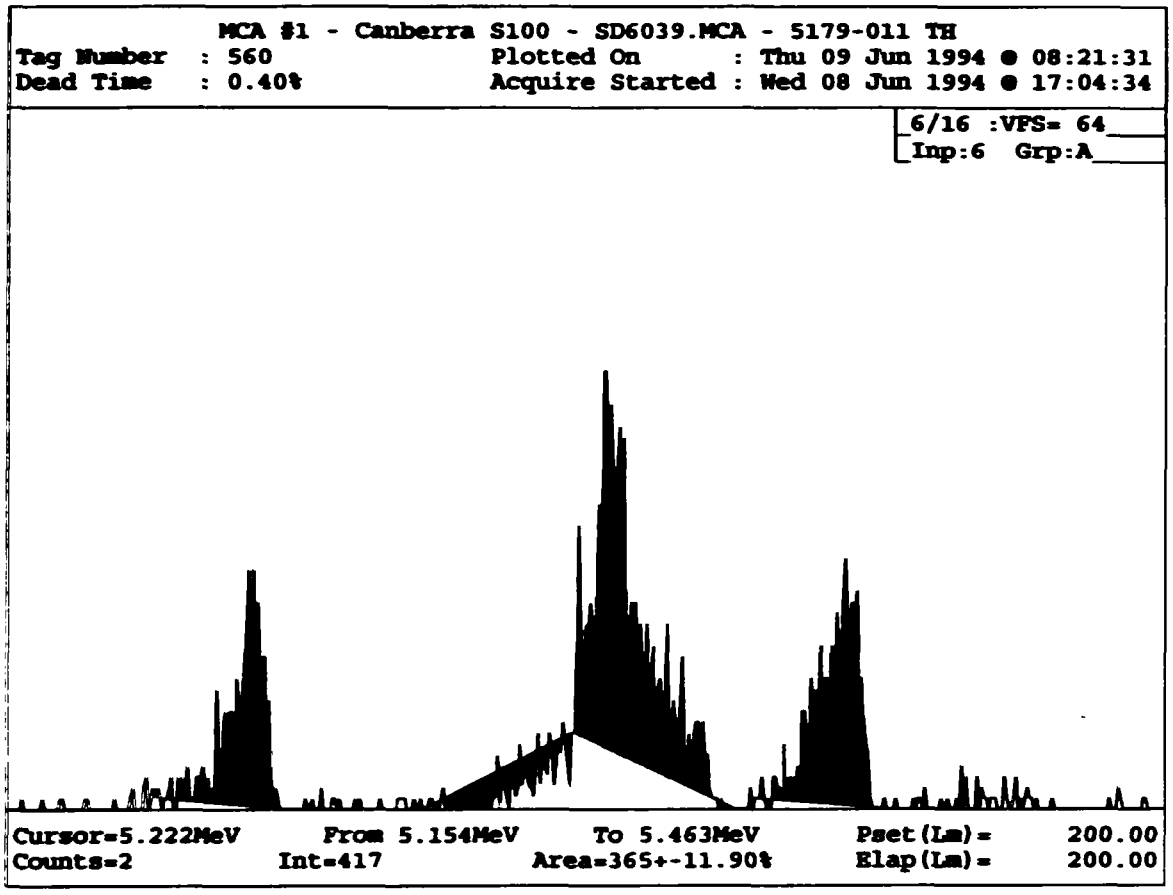
ROI # 3

Channel #	**** Data ****				
250	7	14	26	17	13
255	17	16	19	17	16
260	23	28	23	40	40
265	33	37	32	28	32
270	35	21	34	18	16
275	19	15	19	15	17
280	15	10	17	13	9
285	15	7	11	12	10
290	7	17	8	8	10
295	8	6	10	14	6
300	4	7	2	7	8
305	8	7	8	5	5
310	2	1	1	1	0
315	1	0	0	0	0
320	0				

ROI # 4

Channel #	**** Data ****				
330	1	1	1	3	1
335	0	0	0	3	3
340	2	2	1	2	2
345	3	2	3	2	4
350	2	9	9	7	7
355	12	9	11	10	15
360	6	12	12	11	15
365	10	18	15	14	20
370	23	15	18	19	17
375	20	12	12	8	6
380	5	1	0	0	0
385	0	0	1	0	

0000061


MCA #1 - Canberra S100 - SD6039.MCA - 5179-011 TH
Tag Number : 560
Plotted On : Thu 09 Jun 1994 ● 08:21:31
Dead Time : 0.40%
Acquire Started : Wed 08 Jun 1994 ● 17:04:34
6/16 :VFS= 64
Inp:6 Grp:A
Cursor=5.222MeV
From 5.154MeV
To 5.463MeV
Pset(Lm)= 200.00
Counts=2
Int=417
Area=365+-11.90%
Elap(Lm)= 200.00

0000062

MCA #1 - Canberra S100 - SD6040.MCA - 5179-012 TH

Tag Number: 560
Report Group: 7/16
Input: 7 Group: A
Group Size: 512

Readout: Thu 09 Jun 1994 @ 08:23:42
Acquire Started: Wed 08 Jun 1994 @ 17:04:34

Elapsed Live Time: 200.00 min.
Elapsed True Time: 200.81 min.
Dead Time: 0.40 %

ADC: ROI1:TH232ROI2:TH230ROI3:TH229ROI4:TH228
Detector:
Geometry:
Sample Description:

MCA Mode: PHA+ M/R, Inputs: 16, Type: 1520, Mode: Route
Preset Conditions: Live Time = 200.00 min.

Calibration: 1.580e-006*Ch^2 + 0.004109*Ch + 3.530 MeV

Area Statistics: Background Channels = 4
% Error Sigma = 1.65

000063

REGION OF INTEREST REPORT

ROI #	From(MeV) To (MeV)	Integral CPS	Area %Error	Peak(MeV) FWHM(MeV)
1	3.882	227	206	4.067
	4.132	0.02	14.72	0.0411
2	4.401	105	-93	4.496
	4.715	0.01	65.01	0.0011
3	4.725	903	439	4.814
	5.074	0.08	23.86	0.0431
4	5.152	260	220	5.357
	5.427	0.02	15.78	0.0445

REGION OF INTEREST DATA

ROI # 1

Channel #	**** Data ****				
83				0	0
85	0	2	1	1	0
90	2	1	1	3	0
95	2	2	2	2	3
100	4	2	0	2	6
105	5	4	7	4	4
110	3	6	5	6	5
115	5	2	12	2	8
120	8	8	7	9	10
125	9	8	15	12	9
130	5	8	2	2	0
135	0	0	1	0	0

ROI # 2

Channel #	**** Data ****				
197			0	0	0
200	0	0	0	0	0
205	0	0	0	0	0
210	1	0	0	0	0
215	0	0	3	0	1
220	0	0	2	0	0
225	1	2	1	0	1
230	1	1	0	1	2
235	1	0	3	3	0
240	2	1	2	4	1
245	0	2	5	5	2
250	3	4	5	1	4
255	4	4	2	6	4
260	6	4	10		

0000064

REGION OF INTEREST DATA

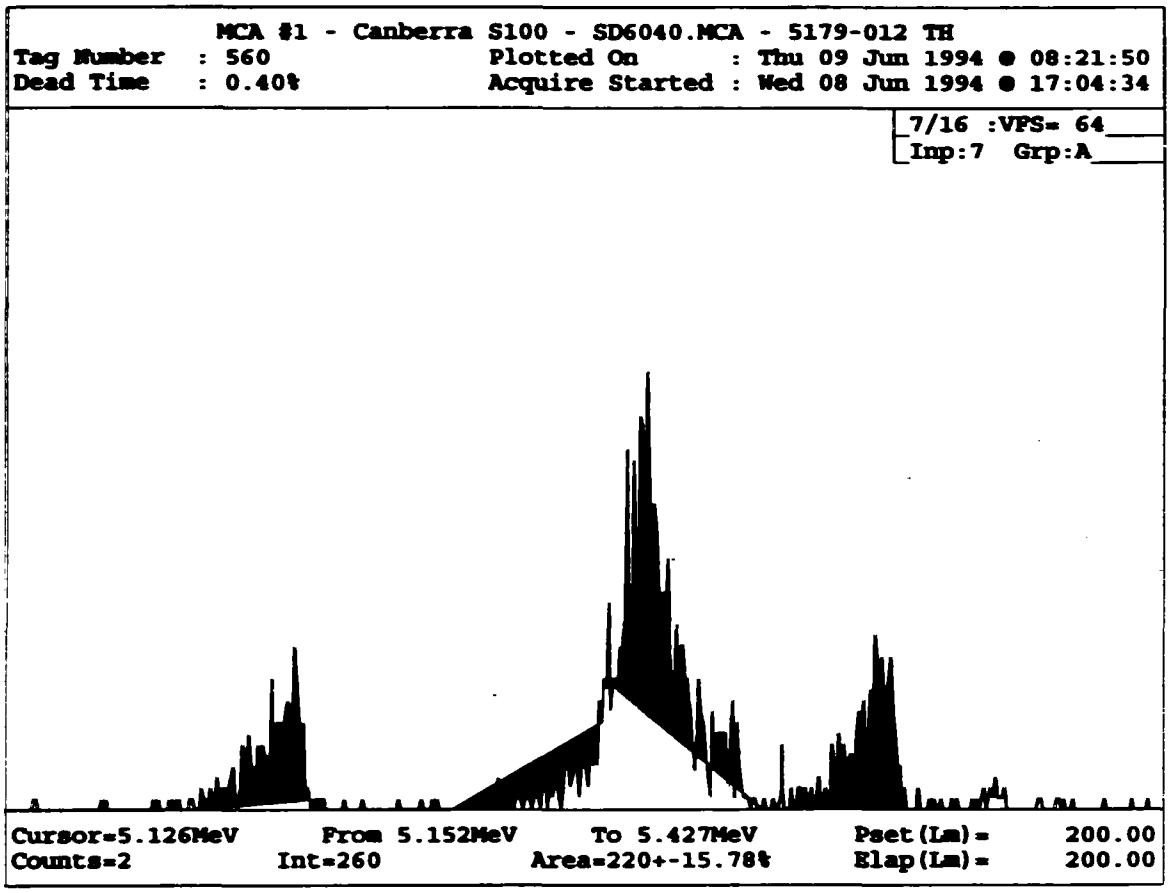
ROI # 3

Channel #	**** Data ****				
264					12
265	11	19	9	12	12
270	12	15	14	19	33
275	13	19	32	22	28
280	36	35	28	40	29
285	24	28	26	21	17
290	20	18	23	17	12
295	11	17	12	15	15
300	12	12	10	8	3
305	6	12	9	8	6
310	3	1	9	5	7
315	7	7	7	7	2
320	6	10	1	8	4
325	2	1	1	1	0
330	1	1	0	0	

ROI # 4

Channel #	**** Data ****				
348				0	0
350	2	2	0	2	1
355	0	2	0	1	3
360	1	1	2	1	1
365	6	4	2	7	4
370	6	4	4	5	5
375	4	7	9	7	10
380	4	7	11	9	16
385	14	11	14	10	9
390	12	14	9	7	4
395	4	0	2	0	0
400	0				

000065


MCA #1 - Canberra S100 - SD6040.MCA - 5179-012 TH
Tag Number : 560
Plotted On : Thu 09 Jun 1994 @ 08:21:50
Dead Time : 0.40%
Acquire Started : Wed 08 Jun 1994 @ 17:04:34
7/16 :VPS= 64
Inp:7 Grp:A
Cursor=5.126MeV
From 5.152MeV
To 5.427MeV
Pset(Lm)= 200.00
Counts=2
Int=260
Area=220+-15.78%
Elap(Lm)= 200.00

9900000

CHAIN OF CUSTODIES

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final Entered and Reviewed by: V.K Shaw PM Review:

Sample Header Template: due dates

Sample No. / # / Container Type / Comments / Date:	Client ID	C-Matrix / Analysis	Date: Collected / Class	Received / Preservative	Due / Anal. Due Date	Shipper / Hold Date	Rad Category / Site	Rad Sample No. (Container Numbers:% Filled)
5179-001	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)
5179-001DUP	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-012
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79580:100)
5179-002	CD-S156E49N-3-4	Soil	22-MAY-94 12:50	24-MAY-94 09:10	14-JUN-94	FED-EX	2	RZ312-011
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79581:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79581:100)
5179-003	CD-S-82E25N2-3	Soil	22-MAY-94 13:45	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-010
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79584:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79584:100)
5179-004	CD-S82E25N-3-4	Soil	22-MAY-94 14:05	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-009
1 AN - Amber Glass-500ml		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79585:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79585:100)
5179-005	CD-S78E18N-2-3	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-008
1 AN - Amber Glass-500ml		BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79595:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79595:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79595:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79595:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79596:100)
1 AN - Amber Glass-250ML		CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79594:100)

3*=Sample has not been rad screened.

0000067

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / Comments	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Date:								
1	PLPT/8010/84	S	COLD	09-JUN-94	18-NOV-94	R19D		(79595:100)
1	PAINT/8015/84	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
1	PH/8045/84	S	COLD	09-JUN-94	05-JUN-94	R19D		(79594:100)
1	PH/IT/84	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1	S/8030/84	S	COLD	09-JUN-94	29-MAY-94	R19D		(79594:100)
1	TCH/8020/84	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
2 AM - Amber Glass-120ML	TOC/9060/84	S	COLD	09-JUN-94	19-JUN-94	R19D		(79590:100 79591:100)
2	VOA/TCLP/84	S	COLD	09-JUN-94	08-JUN-94	109B		(79592:100 79593:100)
2	ZERO/TCLP/84	S	COLD	09-JUN-94	05-JUN-94	109B		(79592:100 79593:100)
5179-006 CD-SB9E14M-2-3	Soil	22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-007
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79613:90)
1	RAD/SCREEN/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79613:90)
5179-007 CD-SB9E14M-3-4	Soil	22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-006
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79624:90)
1	RAD/SCREEN/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79624:90)
5179-008 CD-87BE16M-3-4-9	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-005
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79625:90)
1	RAD/SCREEN/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79625:90)
5179-009 CD-87BE16M-3-4	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-004
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79630:90)
1	RAD/SCREEN/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79630:90)
5179-010 CD-SB1E5M-2-3-9	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-003
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79635:90)
1	RAD/SCREEN/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79635:90)
5179-011 CD-SB1E5M-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94 FED-EX		3		R2312-002
1 AM - Amber Glass-500ml	RAD/GAMMA/84	S	COLD	09-JUN-94	20-NOV-94 R19D			(79636:90)

3**=Sample has not been rad screened.

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:_____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Comments	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79636:90)
5179-012	CD-SB1ESH-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-001
1	AN - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19D	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79644:100)
1		MG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19D	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19D	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D	(79643:100)
1	AN - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19D	(79645:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19D	(79645:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79645:100)
2	AN - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19D	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B	(79646:100 79647:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B	(79646:100 79647:100)

3*=Sample has not been rad screened.

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CUR 340

Reference Document No. 502240
Page 1 of 2

Project Name/No. [1] LINSAY LIGHT II
Samples Shipment Date [7] 5/23/94
Bill to: [5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R C BERGGREEN

Sample Team Members [2] RAWLINSON, BERGGREEN
Lab Destination [8] ST. LOUIS

~~Profit Center No.~~ [3]
Lab Contact [9] John Powell

Project Manager [4] BERGGREEN
Project Contact/Phone [12]
Report to: [10] (SAME)

Purchase Order No. [6] 27313-ZH
Carrier/Waybill No. [13]

Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Preservative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12:40	500 ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500 ml AMBER	500 ml	NONE	γ SPEC	100	
CD-S-82E25N2-3	SS-SOIL	5/22/94 1345	500 ML AMBER	500 ML	None	γ SPEC	100	
CD S82E25N-3-4	SS-SOIL	5/22/94 1405	500 ML AMBER	500 ML	NONE	γ SPEC	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	TCLP Metals & SVOAs	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	γ SPEC	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250 ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120 ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: [23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th Isotope. Also ~~CD-S156E49N~~ CD-S156E49N-2-3 FOR U & Th ISOTOPE

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) Richard Berggreen	Date: 5/23/94 Time: 1045	1. Received by [28] (Signature/Affiliation) Bob Cawort	Date: 05-24-94 Time: 0910
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

0000070

White: To accompany samples Yellow: Field copy

*See back of form for special instructions

COC 340

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC-2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ML	NONE	TCLP VOAs	100	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ML AMBER	500mL	NONE	& SPEC	90	
CD-S84E16N-3-4	SS SOIL	5/22/94 1440	500ML AMBER	300ML	NONE	& SPEC	90	
CD-S78E18N-3-4D	SS SOIL	5/22/94 1600	500 ML AMBER	500ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	& SPEC	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500ML	NONE	TCLP Metals & SVOA	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90ML	NONE	TCLP VOAs	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60ML	NONE	TCLP VOCs	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ml	NONE	TOC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-S81E5N-2-3-D	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-S81E5N-3-4	SS SOIL	5/22/94 1500	500 ML AMBER	400ml	NONE	& SPEC	9070	
	0000071							

White: To accompany samples Yellow: Field copy

*See back of form for special instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: J Powell

DATE: 05-24-94

TIME: 0945

BY: Bob Cowart

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II

Date: 05-24-94 0910

Project No: 537.01

Initiated by: B Cowart

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: 502240

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1. NA Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: 6°C
   - ☐ pH _____
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☑ Custody tape disturbed/broken/missing. Mic Seals
9. NA Sample splits performed by lab.
10. NA Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): Shipping containers not rad surveyed

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: J Powell Date: 05-24-94

0000072

GAMMA SPECTROSCOPY

DATA SUMMARY

CALIBRATION/STANDARDS LOGS

INSTRUMENT PRINTOUTS

CHAIN OF CUSTODIES

537-01
5179
CD-5156

DATA SUMMARY

IT ANALYTICAL -- ST. LOUIS
GAMMA SPECTROSCOPY

BATCH DATE: 1994-May-31 PROJECT NUMBER: 537.01 BATCH NUMBER: 38537

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-001	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 09:46:57

ISOTOPE:	K-40	PB-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	1.39E+01	1.56E+00	1.24E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.45E+00	1.40E-01	1.15E-01						
MIN DET ACT:	6.97E+00	2.01E-01	1.89E-01	1.12E+00	6.49E+00	1.86E+01	1.76E+00	5.72E+01	6.98E-01

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-001DUP	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 09:46:57

ISOTOPE:	K-40	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	7.53E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.36E+00							
MIN DET ACT:	3.47E+00	3.34E-01	1.62E+00	1.74E+01	8.29E+01	3.61E+00	7.23E+02	1.18E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-002	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 09:46:56

ISOTOPE:	K-40	PB-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	1.20E+01	1.84E+00	1.78E+00	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	1.89E+00	1.60E-01	2.12E-01						
MIN DET ACT:	6.47E+00	1.55E-01	2.35E-01	1.14E+00	5.70E+00	1.57E+01	1.92E+00	5.51E+01	6.14E-01

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-003	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 10:52:02

DRD 6-2-94 DRD 6-1-94

ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	6.72E+00	1.51E+01	1.31E+02	5.30E+01	3.22E+02	2.71E+02	6.76E+01	3.93E+02	6.07E+01	4.18E+02
2 SIGMA ERROR:	4.83E-01	2.43E+00	3.92E+00	8.45E+00	1.19E+01	1.12E+01	3.27E+00	4.39E+01	1.85E+00	1.22E+01
MIN DET ACT:	7.98E-01	1.53E+00	7.93E-01	9.68E+00	1.15E+00	7.10E+00	3.57E+00	1.26E+01	1.48E+00	1.92E+00

ISOTOPE:	TH-228	TH-230	TH-234	PA-231	U-234	U-235
ACTIVITY(pCi/G):	5.43E+02	NON-DETECT	6.59E+01	5.92E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.14E+01	6.60E+00	3.80E+01			
MIN DET ACT:	3.87E+01	1.49E+02	8.17E+00	7.15E+01	3.92E+02	4.61E+00

DRD 6-7-94

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PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-004	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 10:52:01

ISOTOPE:	TL-208	PB-212	BI-212	RA-223	RA-226	RA-228	TH-228	TH-230	TH-234	U-234
ACTIVITY(pCi/G):	1.75E+01	4.85E+01	3.41E+01	1.33E+01	9.78E+00	5.39E+01	1.06E+02	NON-	3.69E+01	NON-
2 SIGMA ERROR:	7.01E-01	2.10E+00	2.82E+00	1.07E+00	5.54E-01	2.02E+00	2.13E+01	DETECT	4.55E+00	DETECT
MIN DET ACT:	4.03E-01	8.17E-01	3.80E+00	2.02E+00	8.72E-01	1.15E+00	3.74E+01	2.48E+02	6.90E+00	1.85E+03

ISOTOPE:	U-235
ACTIVITY(pCi/G):	NON-
2 SIGMA ERROR:	DETECT
MIN DET ACT:	2.03E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-005	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 10:52:02

ISOTOPE:	K-40	I-129	CS-139	CE-141	EU-154	TL-208	PB-212	BI-212	RA-224	RA-226
ACTIVITY(pCi/G):	1.49E+02	2.81E+02	2.73E+00	5.59E+00	4.52E+01	5.44E+02	1.25E+03	1.16E+03	1.66E+03	1.62E+02
2 SIGMA ERROR:	2.08E+01	1.19E+02	5.07E-01	1.08E+00	1.05E+01	3.07E+01	6.06E+01	8.12E+01	2.44E+02	9.18E+00
MIN DET ACT:	1.55E+01	2.38E+00	9.05E-01	1.47E+00	2.61E+00	1.66E+00	1.93E+00	1.41E+01	2.14E+01	2.65E+00

ISOTOPE:	RA-228	TH-228	TH-230	TH-234	PA-231	PA-234	U-234	U-235
ACTIVITY(pCi/G):	1.85E+03	2.04E+03	NON-	1.59E+02	5.14E+02	5.79E+02	NON-	NON-
2 SIGMA ERROR:	1.22E+02	2.03E+02	DETECT	1.99E+01	2.54E+02	1.05E+02	DETECT	DETECT
MIN DET ACT:	4.47E+00	6.45E+01	2.82E+02	1.36E+01	1.01E+01	2.36E+02	6.79E+02	7.96E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-006	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 12:05:50

ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	1.06E+00	2.11E+00	2.01E+01	1.83E+01	5.63E+01	4.18E+01	1.17E+01	4.85E+01	1.51E+01	6.55E+01
2 SIGMA ERROR:	2.73E-01	4.09E-01	6.81E-01	3.04E+00	1.98E+00	2.41E+00	8.21E-01	9.63E+00	5.68E-01	2.29E+00
MIN DET ACT:	3.39E-01	6.44E-01	3.61E-01	4.13E+00	5.29E-01	3.06E+00	1.48E+00	8.80E+00	6.15E-01	8.66E-01

ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	8.55E+01	NON-	NON-	NON-	NON-
2 SIGMA ERROR:	1.32E+01	DETECT	DETECT	DETECT	DETECT
MIN DET ACT:	1.64E+01	6.56E+01	3.59E+00	1.73E+02	1.93E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-007	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 12:05:50

ISOTOPE:	TL-208	PB-212	BI-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	1.96E+01	5.53E+01	4.06E+01	1.39E+01	5.96E+01	NON-	NON-	NON-	NON-	NON-
2 SIGMA ERROR:	8.30E-01	2.42E+00	3.13E+00	6.07E-01	2.10E+00	DETECT	DETECT	DETECT	DETECT	DETECT
MIN DET ACT:	5.43E-01	8.92E-01	4.68E+00	9.29E-01	1.47E+00	5.31E+01	2.69E+02	7.20E+00	2.04E+03	3.12E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-008	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 12:05:49

ISOTOPE:	K-40	I-129	EU-155	TL-208	PB-210	PB-212	BI-212	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	3.51E+01	5.78E+01	5.34E+00	1.34E+02	3.39E+01	3.52E+02	2.64E+02	4.06E+02	4.72E+01	4.43E+02
2 SIGMA ERROR:	5.97E+00	2.43E+01	4.64E+00	7.83E+00	7.94E+00	1.59E+01	2.16E+01	7.01E+01	2.74E+00	2.95E+01
MIN DET ACT:	7.79E+00	1.61E+00	1.35E+00	8.15E-01	8.40E+00	9.55E-01	6.99E+00	1.05E+01	1.32E+00	1.97E+00

ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235
ACTIVITY(pCi/G):	4.38E+02	NON-DETECT	8.03E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.31E+01		9.75E+00		
MIN DET ACT:	3.37E+01	1.42E+02	6.97E+00	3.61E+02	4.10E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-009	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 13:25:47

ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	6.58E+00	1.47E+01	1.27E+02	3.06E+01	3.19E+02	2.57E+02	8.03E+01	3.84E+02	4.14E+01	4.12E+02
2 SIGMA ERROR:	5.57E-01	2.31E+00	3.82E+00	7.23E+00	1.19E+01	1.23E+01	3.84E+00	3.69E+01	1.32E+00	1.18E+01
MIN DET ACT:	6.38E-01	1.47E+00	7.98E-01	9.56E+00	1.09E+00	6.73E+00	3.40E+00	1.20E+01	1.45E+00	2.06E+00

ISOTOPE:	TH-228	TH-230	TH-234	PA-231	U-234	U-235
ACTIVITY(pCi/G):	5.28E+02	NON-DETECT	7.38E+01	5.09E+01	NON-DETECT	NON-DETECT
2 SIGMA ERROR:	6.26E+01		6.76E+00	1.33E+01		
MIN DET ACT:	3.71E+01	1.47E+02	7.96E+00	2.15E+01	3.81E+02	4.53E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-010	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT2	1994-Jun-06 13:25:47

ISOTOPE:	K-40	EU-155	TL-208	PB-212	BI-212	RA-223	RA-226	RA-228	TH-228	TH-230
ACTIVITY(pCi/G):	4.21E+01	2.41E+01	1.68E+02	3.61E+02	2.99E+02	7.58E+01	9.26E+01	4.75E+02	7.60E+02	NON-DETECT
2 SIGMA ERROR:	7.17E+00	2.36E+00	4.13E+00	1.55E+01	1.26E+01	4.34E+00	2.72E+00	1.17E+01	7.13E+01	
MIN DET ACT:	1.21E+01	3.94E+00	1.43E+00	2.31E+00	1.14E+01	5.90E+00	2.46E+00	3.70E+00	1.07E+02	6.79E+02

ISOTOPE:	TH-234	PA-231	U-234	U-235
ACTIVITY(pCi/G):	NON-DETECT	1.35E+02	NON-DETECT	NON-DETECT
2 SIGMA ERROR:		5.28E+01		
MIN DET ACT:	1.95E+01	3.62E+01	5.22E+03	8.14E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE	SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME
537.01	5179-011	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT4	1994-Jun-06 13:25:47

ISOTOPE:	K-40	CE-141	EU-155	TL-208	PB-210	PB-212	BI-212	RA-224	RA-226	RA-228
ACTIVITY(pCi/G):	8.51E+01	3.44E+00	2.33E+01	2.88E+02	3.93E+01	7.54E+02	5.79E+02	9.64E+02	3.91E+01	9.65E+02
2 SIGMA ERROR:	4.02E+01	8.21E-01	8.41E+00	1.65E+01	9.48E+00	3.26E+01	4.81E+01	1.17E+02	2.88E+00	6.32E+01
MIN DET ACT:	1.07E+01	1.04E+00	1.91E+00	1.15E+00	1.16E+01	1.28E+00	9.75E+00	1.40E+01	1.84E+00	2.88E+00

PROJ.	SAMPLE NO.	MATRIX	SAMPLE SIZE		SAMPLE DATE/TIME	DETECTOR NO.	COUNT DATE/TIME

	ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235
	ACTIVITY(pCi/G):	1.16E+03	NON-	NON-	NON-	NON-
	2 SIGMA ERROR:	1.47E+02	DETECT	DETECT	DETECT	DETECT
	MIN DET ACT:	4.78E+01	1.95E+02	1.28E+01	4.92E+02	5.75E+00

537.01	5179-012	SOLID	4.500E+01 G	1994-May-22 12:00:00	DETECT1	1994-Jun-06 14:35:55

DRD 6-7-94

	ISOTOPE:	MN-54	EU-155	TL-208	PB-210	PB-212	BI-212	RA-223	RA-224	RA-226	RA-228
	ACTIVITY(pCi/G):	1.19E+01	2.60E+01	2.30E+02	1.04E+02	5.74E+02	4.66E+02	1.23E+02	6.31E+02	1.31E+02	7.41E+02
	2 SIGMA ERROR:	7.74E-01	4.05E+00	6.64E+00	1.66E+01	2.10E+01	1.86E+01	5.73E+00	8.64E+01	3.49E+00	2.12E+01
	MIN DET ACT:	9.60E-01	1.98E+00	1.14E+00	1.26E+01	1.54E+00	9.13E+00	4.74E+00	1.71E+01	1.94E+00	3.09E+00

	ISOTOPE:	TH-228	TH-230	TH-234	PA-231	U-234	U-235
	ACTIVITY(pCi/G):	9.36E+02	NON-	1.21E+02	9.92E+01	NON-	NON-
	2 SIGMA ERROR:	7.91E+01	DETECT	1.20E+01	6.48E+01	DETECT	DETECT
	MIN DET ACT:	5.05E+01	1.94E+02	1.07E+01	1.86E+01	5.14E+02	6.16E+00

DRD 6-7-94

337.04	5187-001	SOLID	4.500E+01 G	1994-May-23 12:00:00	DETECT2	1994-Jun-06 14:38:55

DRD 6-7-94

	ISOTOPE:	EU-155	TL-208	PB-212	BI-212	RA-226	RA-228	TH-228	TH-230	TH-234	U-234
	ACTIVITY(pCi/G):	3.71E+00	1.92E+01	5.43E+01	3.81E+01	1.70E+01	8.34E+01	NON-	NON-	NON-	NON-
	2 SIGMA ERROR:	6.16E-01	8.35E-01	2.65E+00	3.58E+00	7.03E-01	3.12E+00	DETECT	DETECT	DETECT	DETECT
	MIN DET ACT:	2.64E+00	5.86E-01	9.70E-01	5.15E+00	1.03E+00	1.40E+00	5.19E+01	2.82E+02	7.36E+00	2.11E+03

	ISOTOPE:	U-235
	ACTIVITY(pCi/G):	NON-
	2 SIGMA ERROR:	DETECT
	MIN DET ACT:	3.14E+00

000.01	BLK38537	SOLID	4.500E+01 G	1994-May-31 12:00:00	DETECT4	1994-Jun-06 14:59:19

	ISOTOPE:	RA-226	RA-228	TH-228	TH-230	TH-234	U-234	U-235
	ACTIVITY(pCi/G):	NON-	NON-	NON-	NON-	NON-	NON-	NON-
	2 SIGMA ERROR:	DETECT	DETECT	DETECT	DETECT	DETECT	DETECT	DETECT
	MIN DET ACT:	3.10E-01	6.04E-01	3.68E+00	1.13E+01	1.37E+00	3.95E+01	4.88E-01

000.01	LCS38537	SOLID	4.500E+01 G	1994-Oct-01 12:00:00	DETECT1	1994-Jun-06 16:06:15

	ISOTOPE:	CO-57	CO-60	Y-88	CD-109	SN-113	CS-137	CE-139	HG-203	RA-226	RA-228
	ACTIVITY(pCi/G):	8.43E+02	1.86E+03	1.06E+03	3.31E+04	6.99E+02	1.51E+03	4.12E+02	6.78E+01	NON-	NON-
	2 SIGMA ERROR:	3.27E+01	5.83E+01	4.27E+01	1.72E+03	3.56E+01	7.74E+01	2.27E+01	3.92E+00	DETECT	DETECT
	MIN DET ACT:	2.53E+00	6.72E+00	5.42E+00	7.24E+01	5.06E+00	6.41E+00	2.60E+00	3.26E+00	8.83E+00	2.83E+01

	ISOTOPE:	TH-228	TH-230	TH-234	U-234	U-235	AM-241
	ACTIVITY(pCi/G):	NON-	NON-	NON-	NON-	NON-	3.52E+03
	2 SIGMA ERROR:	DETECT	DETECT	DETECT	DETECT	DETECT	1.19E+02
	MIN DET ACT:	2.70E+02	9.14E+02	4.81E+01	1.21E+01	2.23E+01	8.22E+00

0000004

IT ANALYTICAL -- ST. LOUIS
GAMMA SPECTROSCOPY
QUALITY ASSURANCE WORKSHEET

BATCH DATE: 1994-May-31 PROJECT NUMBER: 537.01 BATCH NUMBER: 38537

CHECK STANDARD

STANDARD # 47272-334 REF DATE: 1993-OCT-01

ISOTOPE	TARGET	FOUND	%REC
AM-241	3.49E+03	3.52E+03	101
CS-137	1.46E+03	1.51E+03	104
CO-60	2.02E+03	1.86E+03	92

DUPLICATE: 5179-001

ISOTOPE	ORIGINAL	DUPLICATE	RPD
K-40	1.39E+01	7.53E+00	59
RA-226	1.24E+00	< 3.34E-01	N/A
RA-228	< 1.12E+00	< 1.62E+00	N/A

BLANK

ISOTOPE	ACTIVITY (pCi/G)
RA-226	< 3.18E-01
RA-228	< 6.04E-01
TH-228	< 3.68E+00
TH-230	< 1.13E+01
TH-234	< 1.37E+00
U-234	< 3.95E+01
U-235	< 4.88E-01

ANALYST: _____
DATE: 6-8-94

REVIEWED BY: Donald Dill
DATE: 6-8-94

INTERNATIONAL TECHNOLOGY CORPORATION

St. Louis Laboratory
13715 Rider Trail North
Earth City, MO 63045-1205

Preparation Date: 06-01-94 Project Number : 537.01/33704

5179-001	Soil	450g	
-001 Dup			
-002			
-003			
-004			
-005			
-006			
-007			
-008			
-009			
-010			
-011			
-012			
5187-001			

500 06-01-94

Comments

Prepared by K Wheeler 06-01-94 Reviewed by :

000006

CALIBRATION/STANDARDS LOGS

ANALYTICS

Analytics, Inc.
[illegible] Scenic Industrial Boulevard
Atlanta, Georgia 30[illegible]
404-[illegible]

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

47272-334

45 Grams of Sand in 2-3/4 Inch Petri

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. 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. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: October 1, 1993 12:00 EST

Source prepared by: M. D. Currie
M. D. Currie, Radiochemist

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	2085	5.0
Cd-109	88	462.6	d	2863	4.7
Co-57	122	271.7	d	2087	4.5
Ce-139	166	137.64	d	2016	4.7
Hg-203	279	46.60	d	3414	4.5
Sn-113	392	115.08	d	3349	4.4
Cs-137	662	30.0	y	2067	4.6
Y-88	898	106.61	d	8524	4.4
Co-60	1173	5.2714	y	3367	5.0
Co-60	1332	5.2714	y	3365	4.5
Y-88	1836	106.61	d	8985	4.3

2000000

This standard will expire one year after the calibration date.
P O NUMBER T639240, Item 1

Q A APPROVED E. W. Belvin 10-21-93

ANALYTICS

Analytics, Inc.
1561 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404 352-80

ANALYSIS OF UNCERTAINTY

BATCH 74 MIXED GAMMA STANDARDS WITH Am-241
CALIBRATION DATE: October 1, 1993 12:00 EST

GAMMA RAY ENERGY (keV)	RANDOM ERROR % (99 % CL)	SYSTEMATIC ERROR %	TOTAL %
59.5	2.0	3.0	5.0
88	1.7	3.0	4.7
122	1.7	2.8	4.5
166	2.0	2.7	4.7
279	1.3	3.2	4.5
392	1.2	3.2	4.4
662	1.8	2.8	4.6
898	1.2	3.2	4.4
1173	2.2	2.8	5.0
1332	1.7	2.8	4.5
1836	1.3	3.0	4.3

000008

The systematic error includes the error in calibration standards, weighing error, and estimated counting corrections. All uncertainties are stated at the 99% confidence level.

No interfering gamma emitting impurities were detected during calibration. Depending on the resolution and energy dispersion (kev/channel) of the measuring system, the following spectral conflicts may occur: (1) between the 88 keV gamma-ray and the X-rays emitted in the decay of Hg-203, (2) between the 1333 keV gamma-ray and the 1325 keV single escape peak from the 1836 keV gamma-ray.

U.S. DEPARTMENT OF COMMERCE
National Institute of Standards & Technology
Gaithersburg, MD 20899

Certificate of Participation

Analytics, Incorporated
Atlanta, Georgia

is a participant for the period January 1, 1993, through December 31, 1993, in a radioactivity measurements assurance program conducted by the National Institute of Standards and Technology, in cooperation with the U.S. Council for Energy Awareness. Continued participation is evidenced by dated Reports of Traceability issued for particular radionuclides, which indicate the deviation of the participant's reported value from that measured by the National Institute of Standards and Technology. The significance of these Reports is addressed on the back of this certificate.

600009

For the Director,

J.M. Robin Hutchinson, Acting Group Leader
Radioactivity Group
Physics Laboratory

(over)

Activity of Radioactive Calibration Standard

Standard # 47272-334

45 Gram 2-3/4 Inch Petri

Isotope	Xb/sec	Branching Ratio	Total Becquerel	pCi/gram
Am-241	2085	35.90	5808	3488
Cd-109	2863	3.72	76962	46224
Co-57	2087	85.51	2441	1466
Ce-139	2016	80.35	2509	1507
Hg-203	3414	77.30	4417	2653
Sn-113	3349	64.90	5160	3099
Cs-137	2067	85.12	2428	1458
Y-88	8524	93.40	9126	5481
Co-60	3367	100.0	3367	2022
Co-60	3365	100.0	3365	2021
Y-88	8985	99.38	9041	5430

Calibrated on
October 1, 1993

010000

ITAS St. LOUIS
GERMANIUM DETECTOR
CALIBRATION DATA

for

DETECTOR 1

with

45 g PETRI DISH

GEOMETRY

0000011

Energy calibration : DETECT1
File created : 1993-Apr-27 16:21:17 Modified : 1994-Feb-01 17:08:58

I	CHAN	ENERGY	EN. UNCERT. Kev	NONLINEARITY KeV
1	118.274	59.537	0.100	-0.254
2	175.011	88.032	0.100	-0.117
3	242.929	122.063	0.100	-0.033
4	330.482	165.853	0.100	-0.004
5	782.028	391.688	0.100	0.140
6	1026.729	513.990	0.100	0.135
7	1322.052	661.649	0.100	0.186
8	1795.131	898.021	0.100	0.103
9	2345.816	1173.216	0.100	0.055
10	2664.627	1332.486	0.100	-0.023
11	3672.373	1836.014	0.100	-0.187

Energy calibration function: 4
Energy calibration chi-square: 7.110E-002
Energy calibration coefficients

1	-5.362E-002	+-	1.145E-002
2	5.951E-002	+-	1.028E-003
3	4.987E-001	+-	2.809E-005
4	5.451E-006	+-	2.375E-007

0000013

Calibration source data file: ..\CALIBR\MARN650.CLF Standard #46642-334
File created: 1993-Jul-12 17:00:10 Modified: 1993-Jul-14 09:36:39

Index	Nuclide	Type	Esc	En. (keV) / Act (Bq)	En. Err. Cal. Unc.	Half-life Yr	Mon	Unit Day	Hr	Branch.rat. Min	Sec
1	AM-241	3	0	59.537	0.100	4.322E+002		Y			35.900
				3.360E+003	5.000	1993	7	1	12	0	0
2	CD-109	3	0	88.032	0.100	4.639E+002		D			3.720
				4.640E+004	4.700	1993	7	1	12	0	0
3	CO-57	3	0	122.063	0.100	2.709E+002		D			85.510
				8.830E+002	4.700	1993	7	1	12	0	0
4	CE-139	3	0	165.853	0.100	1.377E+002		D			80.350
				1.420E+003	4.800	1993	7	1	12	0	0
5	HG-203	3	0	279.189	0.100	4.660E+001		D			77.300
				2.470E+003	4.700	1993	7	1	12	0	0
6	SN-113	3	0	391.688	0.100	1.151E+002		D			64.900
				2.550E+003	4.500	1993	7	1	12	0	0
7	SR-85	3	0	513.990	0.100	6.484E+001		D			99.270
				2.900E+003	5.000	1993	7	1	12	0	0
8	CS-137	3	0	661.649	0.100	3.017E+001		Y			85.120
				1.290E+003	5.000	1993	7	1	12	0	0
9	Y-88	3	0	898.021	0.100	1.066E+002		D			93.400
				5.190E+003	4.500	1993	7	1	12	0	0
10	CO-60	3	0	1173.216	0.100	5.271E+000		Y			100.000
				1.910E+003	4.800	1993	7	1	12	0	0
11	CO-60	3	0	1332.486	0.100	5.271E+000		Y			100.000
				1.920E+003	4.700	1993	7	1	12	0	0
12	Y-88	3	0	1836.014	0.100	1.066E+002		D			99.380
				5.130E+003	4.900	1993	7	1	12	0	0

0000014

Patricia A Haworth

08-03-93

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Feb-01 17:37:31

****

* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

****

IT ANALYTICAL ST. LOUIS
Sample description:CALIBRATION_VERIFICATION
Spectrum file name;932593
Sample number :46642-334
Sample geometry :MARN650
Sample type :SOLID
Sample size : 6.500E+02 G
Measured by :DEFAULT

Start of sample collection :1993-Jul-01 at 12:00:00
End of sample collection :1993-Jul-01 at 12:00:00
Sample count started on :1994-Feb-01 at 17:04:03
Sample count ended on :1994-Feb-01 at 17:34:43

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 215 days 5 hours 4 minutes

Live time: 1.80E+003 s real time: 1.84E+003 s dead time: 2.17E+000 %

Shape calibration requested :MARN6501
Shape calibration used :MARN6501
Created :1993-Jan-20 11:13:47
Modified :1993-Aug-03 12:18:39

Energy calibration requested :DETECT1
Energy calibration used :DETECT1
Created :1993-Apr-27 16:21:17
Modified :1994-Feb-01 17:08:58

Efficiency calibration requested :MARN6501
Efficiency calibration used :MARN6501
Created :1993-Feb-04 15:13:24
Modified :1993-Aug-03 12:30:57

Last search discrimination level: 25.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 25.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 65 isotopes and 152 gamma lines.

0000015

********** PEAK FIT REPORT **********

Spectrum file name: 932593 Sample number: 46642-334

peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
1	118.19	59.54	6.62E+004	1.3	9.05E+003	1.21E+003	5.1	16.2
2	174.98	88.00	1.11E+005	1.3	8.25E+003	1.30E+003	3.4	28.3
3	242.91	122.02	4.34E+004	0.7	4.96E+003	4.54E+002	3.2	3.2
4	271.70	136.43	5.51E+003	1.5	4.20E+003	5.80E+001	3.3	1.1
5	330.43	165.83	3.60E+004	0.6	3.86E+003	3.98E+002	2.9	2.8
6	556.95	279.15	5.27E+003	1.3	2.67E+003	7.97E+001	3.2	0.9
7	781.99	391.67	2.40E+004	0.5	1.73E+003	4.81E+002	2.9	1.0
8	1026.65	513.98	1.15E+004	1.4	1.66E+003	2.93E+002	3.0	3.4
9	1322.05	661.62	3.67E+004	0.3	1.39E+003	1.18E+003	2.7	2.0
10	1795.05	897.99	2.92E+004	0.4	1.24E+003	1.23E+003	3.0	2.7
11	2345.81	1173.20	3.53E+004	0.4	5.82E+002	1.85E+003	3.1	1.2
12	2664.59	1332.48	3.15E+004	0.5	1.76E+002	1.84E+003	3.2	1.4
13	3672.25	1835.95	1.74E+004	0.7	9.25E+001	1.32E+003	5.1	1.6

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000018

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T ********

Spectrum file name: 932593 Sample number: 46642-334

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	CO-57	1.00	2.239E+001	2.31	3.884E+001	1.755E+000
	2	CO-60	1.00	7.689E+001	2.23	8.308E+001	3.628E+000
	3	SR-85	0.95	1.227E+001	3.02	1.224E+002	7.246E+000
	4	Y-88	0.98	5.475E+001	2.58	2.219E+002	1.122E+001
	5	CD-109	1.00	1.454E+003	3.41	2.006E+003	1.340E+002
	6	SN-113	0.98	3.081E+001	2.90	1.126E+002	6.396E+000
	7	CS-137	1.00	5.757E+001	2.68	5.836E+001	3.064E+000
	8	CE-139	0.99	2.058E+001	2.88	6.081E+001	3.434E+000
	9	HG-203	0.90	4.287E+000	3.17	1.053E+002	6.550E+000
	10	AM-241	1.00	1.404E+002	5.07	1.405E+002	1.398E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000017

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 932593 Sample number: 46642-334

Under determ set #	Nuclide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			3	242.91	122.02	101.38
			4	271.70	136.43	98.45
	2	CO-60				
			11	2345.81	1173.20	99.69
			12	2664.59	1332.48	100.31
	3	SR-85				
			8	1026.65	513.98	100.00
	4	Y-88				
			10	1795.05	897.99	100.29
			13	3672.25	1835.95	99.13
	5	CD-109				
			2	174.98	88.00	100.00
	6	SN-113				
			7	781.99	391.67	100.00
	7	CS-137				
			9	1322.05	661.62	100.00
	8	CE-139				
			5	330.43	165.83	100.00
	9	HG-203				
			6	556.95	279.15	100.00
	10	AM-241				
			1	118.19	59.54	100.00

0000018

CALIBRATION STANDARD DATA

Standard # 44955-265

Calibration source data file: ..\CALIBR\PETRISTD.CLF
File created: 1991-Sep-23 11:04:22 Modified: 1993-Jul-07 15:40:14

Index	Nuclide	Type	Esc	En. (keV) / Act (Bq)	En. Err. / Cal. Unc.	Half-life	Unit	Yr	Mon	Day	Hr	Min	Sec	Branch.rat.
1	AM-241	3	0	59.537	0.100	4.322E+002	Y							35.900
				3.830E+003	5.000			1992	10	1	12	0	0	
2	CD-109	3	0	88.032	0.100	4.639E+002	D							3.720
				4.970E+004	4.900			1992	10	1	12	0	0	
3	CO-57	3	0	122.063	0.100	2.709E+002	D							85.510
				1.220E+003	4.300			1992	10	1	12	0	0	
4	CE-139	3	0	165.853	0.100	1.377E+002	D							80.350
				2.570E+003	4.400			1992	10	1	12	0	0	
5	HG-203	3	0	279.189	0.100	4.660E+001	D							77.300
				2.640E+003	4.900			1992	10	1	12	0	0	
6	SN-113	3	0	391.688	0.100	1.151E+002	D							64.900
				3.150E+003	4.400			1992	10	1	12	0	0	
7	CS-137	3	0	661.649	0.100	3.017E+001	Y							85.120
				2.220E+003	4.400			1992	10	1	12	0	0	
8	Y-88	3	0	898.021	0.100	1.066E+002	D							93.400
				6.600E+003	4.400			1992	10	1	12	0	0	
9	CO-60	3	0	1173.216	0.100	5.271E+000	Y							100.000
				3.200E+003	4.200			1992	10	1	12	0	0	
10	CO-60	3	0	1332.486	0.100	5.271E+000	Y							100.000
				3.210E+003	4.900			1992	10	1	12	0	0	
11	Y-88	3	0	1836.014	0.100	1.066E+002	D							99.380
				6.530E+003	4.400			1992	10	1	12	0	0	

0000020

Patricia A Haworth
04-03-93

SHAPE CALIBRATION DATA

0000021

Standard -265

Calibration :
File created : 1993-Jan-20 11:13:47 Modified : 1993-Sep-03 01:04:36

I	CHANNEL	WIDTH FWHM keV	WIDTH FWHM chan	WIDTH SIGMA chan	LOWTAIL chan	HIGHTAIL chan	ENERGY keV
1	119.280	1.134	2.264	0.962	1.842	2.662	59.575
2	176.025	1.158	2.312	0.982	2.324	2.922	88.003
3	243.896	1.182	2.360	1.002	2.864	2.635	122.001
4	272.665	1.180	2.355	1.000	4.095	2.663	136.410
5	331.325	1.214	2.423	1.029	2.369	2.404	165.790
6	782.477	1.368	2.734	1.161	2.322	2.322	391.663
7	1322.056	1.534	3.067	1.302	3.831	2.735	661.649
8	1794.634	1.655	3.309	1.405	3.399	2.716	898.013
9	2344.869	1.807	3.615	1.535	4.093	3.229	1173.159
10	2663.353	1.889	3.777	1.604	5.166	3.645	1332.414
11	3670.086	2.152	4.301	1.826	7.003	4.412	1835.954

Shape width calibration function: 2
Shape width calibration chi-square: 1.291E+000
Shape width calibration coefficients
1 9.285E-001 +- 1.334E-003
2 3.065E-004 +- 4.452E-006
3 -2.005E-008 +- 1.651E-009
Shape hightail calibration function: 1
Shape lowtail calibration function: 1

09-01-93

0000022

EFFICIENCY CALIBRATION DATA

etector efficiency calibration : PETRI1.CDF Standard # 44955-265
File created : 1993-Jan-20 15:46:11 Modified : 1993-Sep-03 01:06:18

I	Energy	Efficiency	Eff. uncert. %
1	59.537	0.1177200	5.002
2	88.032	0.1203355	4.902
3	122.063	0.1123030	4.308
4	165.853	0.0852861	4.412
5	391.688	0.0451318	4.436
6	661.649	0.0283771	4.407
7	898.021	0.0194796	4.431
8	1173.216	0.0155972	4.208
9	1332.486	0.0139337	4.907
10	1836.014	0.0104280	4.444

Detector efficiency calibration function: 3
Detector efficiency calibration chi-square: 8.548E-001
Detector efficiency calibration coefficients

1	-1.485E+001	+-	2.761E+000
2	7.158E+000	+-	1.466E+000
3	-1.251E+000	+-	2.548E-001
4	6.397E-002	+-	1.453E-002

09-03-93

0000024

CALIBRATION COUNT DATA

0003025

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1993-Sep-03 01:32:38

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* GAMMA SPECTRUM ANALYSIS REPORT *

****

09-03-93

'T ANALYTICAL ST. LOUIS
 ample description:CALIBRATION
 pectrum file name:931432
Sample identifier :44955-265
Sample geometry   :PETRI
Sample type   :SOLID
Sample size   : 4.600E+01 G
Measured by   :DLD

Start of irradiation :1992-Oct-01 at 12:00:00
End of irradiation   :1992-Oct-01 at 12:00:00
Collect started on   :1993-Sep-02 at 22:44:02
Collect ended on   :1993-Sep-02 at 23:46:16

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time   :0 years 336 days 10 hours 44 minutes

Live time: 3.60E+003 s real time: 3.73E+003 s dead time: 3.59E+000 %

 ape calibration requested :PETRI1
 ape calibration used   :PETRI1
                  Created   :1993-Jan-20 11:13:47
                  Modified :1993-Sep-03 01:04:36

Energy calibration requested :DETECT1
Energy calibration used   :DETECT1
                  Created   :1993-Apr-27 16:21:17
                  Modified   :1993-Aug-03 12:26:22

Efficiency calibration requested :PETRI1
Efficiency calibration used   :PETRI1
                  Created   :1993-Jan-20 15:46:11
                  Modified   :1993-Sep-03 01:06:18

Last search discrimination level: 25.00
Last search   FROM channel 8 TO channel 4088
Last fitting discrimination level: 25.00
Last fit   FROM channel 1 TO channel 16384
Identification energy tolerance : 1.00
Minimum acceptable confidence   : 0.10
Gamma reference library   :..\LIBRARY\MAIN.ILF
with 64 isotopes and 151 gamma lines.

Peaked background file:.\BKG1.PTF
  ergy tolerance for peaked background subtraction: 1.00 keV
  reshold factor for peak areas: 1.00

0000026

********** P E A K F I T R E P O R T **********

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	75.96	37.87	1.49E+004	12.1	2.87E+004	4.06E+001	16.3	85.8
	2	119.27	59.57	5.86E+005	9.8	2.65E+004	1.36E+003	10.9	90.0
B			59.81	3.55E+000	22.2				
	3	176.02	88.00	4.85E+005	0.6	1.80E+004	1.14E+003	2.6	27.8
B			87.29	4.47E+000	25.3				
	4	243.89	122.00	1.78E+005	0.2	1.02E+004	4.64E+002	2.6	2.2
	5	272.66	136.41	2.13E+004	0.7	8.66E+003	5.85E+001	2.8	1.1
	6	331.33	165.79	1.17E+005	0.2	7.71E+003	3.57E+002	2.8	0.9
	7	397.79	199.08	7.31E+003	2.3	8.30E+003	2.53E+001	3.6	2.3
	8	782.48	391.66	4.38E+004	0.4	6.14E+003	2.67E+002	2.5	1.4
	9	1322.06	661.65	1.89E+005	0.2	5.10E+003	1.93E+003	2.5	1.5
	10	1794.63	898.01	4.85E+004	0.3	5.43E+003	6.70E+002	2.3	0.7
	11	2344.87	1173.16	1.59E+005	0.3	2.93E+003	2.85E+003	2.1	2.0
B			1173.36	2.12E+000	17.0				
	12	2663.35	1332.41	1.43E+005	0.3	1.60E+003	2.87E+003	2.2	2.1
	13	3670.09	1835.96	2.73E+004	0.6	4.96E+002	7.25E+002	3.9	1.5

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000027

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Un det set #	Nuc lid	Nuclide name	Confid	activity (pCi/G) Sample	Decay Corrected	Decay Corr. 2 Sigma Err
1		CO-57	0.99	3.214E+002	7.602E+002	+/- 2.875E+001
2		CO-60	1.00	1.680E+003	1.897E+003	+/- 5.709E+001
3		Y-88	0.95	4.233E+002	3.773E+003	+/- 1.482E+002
4		CD-109	1.00	1.796E+004	2.968E+004	+/- 1.520E+003
5		SN-113	0.96	2.422E+002	1.837E+003	+/- 9.119E+001
6		CS-137	1.00	1.331E+003	1.359E+003	+/- 6.693E+001
7		CE-139	0.97	2.611E+002	1.420E+003	+/- 7.804E+001
8		AM-241	1.00	2.218E+003	2.221E+003	+/- 4.726E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	75.96	37.87	4.06E+001	548.87	1059.87	16.27
7	397.79	199.08	2.53E+001	710.08	1221.08	3.61

0000028

********** PEAK ASSOCIATION REPORT **********

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			4	243.89	122.00	100.71
			5	272.66	136.41	99.18
	2	CO-60				
			11	2344.87	1173.16	100.33
			12	2663.35	1332.41	99.63
	3	Y-88				
			10	1794.63	898.01	100.43
			13	3670.09	1835.96	98.74
	4	CD-109				
			3	176.02	88.00	100.00
	5	SN-113				
			8	782.48	391.66	100.00
	6	CS-137				
			9	1322.06	661.65	100.00
	7	CE-139				
			6	331.33	165.79	100.00
	8	AM-241				
			2	119.27	59.57	100.00

0000029

90. 1993 PA,MN,JR. Version 3.20h 1993-Sep-03 09:27:35

```
*****************************************************************************
*                                                                           *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T           *
*                                                                           *
*****************************************************************************
```

IT ANALYTICAL ST. LOUIS PAA 09-03-93

Patricia A Haworth
09-03-93

Sample description:CALIBRATION VERIFICATION
Spectrum file name:931420
Sample identifier :44955-265
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.600E+01 G
Measured by :DLD

Start of irradiation	:1992-Oct-01	at 12:00:00
End of irradiation	:1992-Oct-01	at 12:00:00
Collect started on	:1993-Sep-02	at 17:45:35
Collect ended on	:1993-Sep-02	at 18:01:09

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 336 days 5 hours 45 minutes

Live time: 9.00E+002 s real time: 9.34E+002 s dead time: 3.64E+000 %

Shape calibration requested	:PETRI1	
Shape calibration used	:PETRI1	
Created	:1993-Jan-20	11:13:47
Modified	:1993-Sep-03	01:04:36
Energy calibration requested	:DETECT1	
Energy calibration used	:DETECT1	
Created	:1993-Apr-27	16:21:17
Modified	:1993-Aug-03	12:26:22
Efficiency calibration requested	:PETRI1	
Efficiency calibration used	:PETRI1	
Created	:1993-Jan-20	15:46:11
Modified	:1993-Sep-03	01:06:18

Last search discrimination level: 8.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 8.00
Last fit FROM channel 1 TO channel 16384
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :..\LIBRARY\MAIN.ILF
with 64 isotopes and 151 gamma lines.

Peaked backround file:.\BKG1.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000031

********** P E A K F I T R E P O R T **********

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	75.87	37.82	4.32E+003	7.9	7.18E+003	4.71E+001	13.5	26.2
	2	87.63	43.72	1.53E+003	13.8	5.90E+003	1.55E+001	16.2	7.0
	3	119.22	59.55	1.53E+005	1.1	6.68E+003	1.42E+003	4.7	31.5
B			59.81	8.87E-001	22.2				
	4	175.97	87.98	1.26E+005	0.4	4.50E+003	1.18E+003	2.6	2.7
B			87.29	1.12E+000	25.3				
	5	243.85	121.98	4.61E+004	0.3	2.56E+003	4.80E+002	2.7	2.2
	6	272.58	136.37	5.56E+003	1.1	2.23E+003	6.11E+001	2.9	0.8
	7	331.28	165.76	3.03E+004	0.6	1.91E+003	3.71E+002	2.9	1.8
	8	397.70	199.03	1.89E+003	2.9	2.10E+003	2.61E+001	4.0	1.2
	9	557.66	279.12	8.30E+002	4.0	1.67E+003	1.50E+001	4.8	0.7
	10	782.46	391.66	1.14E+004	0.7	1.57E+003	2.79E+002	2.6	0.7
	11	1322.04	661.64	4.87E+004	0.4	1.25E+003	1.99E+003	2.5	1.4
	12	1794.60	898.00	1.24E+004	0.7	1.38E+003	6.87E+002	2.4	1.0
	13	2344.87	1173.16	4.09E+004	0.5	7.50E+002	2.93E+003	2.2	1.7
B			1173.36	5.30E-001	17.0				
	14	2663.37	1332.42	3.68E+004	0.7	4.18E+002	2.96E+003	2.3	3.5
	15	3670.14	1835.98	6.96E+003	1.0	1.27E+002	7.38E+002	4.0	1.5

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000032

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Un det set	Nuc lid #	Nuclide name	Confid	Sample activity (pCi/G)	Decay Corrected	Decay Corr. 2 Sigma Err	%D
	1	CO-57	0.99	3.337E+002	7.888E+002	+/- 3.039E+001	+10.32%
	2	CO-60	1.00	1.728E+003	1.950E+003	+/- 6.019E+001	+3.34
	3	Y-88	0.95	4.334E+002	3.859E+003	+/- 1.567E+002	-0.41
	4	CD-109	1.00	1.868E+004	3.087E+004	+/- 1.558E+003	+5.82
	5	SN-113	0.96	2.522E+002	1.911E+003	+/- 9.717E+001	+3.35
	6	CS-137	1.00	1.371E+003	1.400E+003	+/- 6.960E+001	+7.44
	7	CE-139	0.97	2.711E+002	1.473E+003	+/- 8.252E+001	-2.39
	8	HG-203	0.77	1.138E+001	1.691E+003	+/- 1.577E+002	+9.24
	9	AM-241	1.00	2.320E+003	2.324E+003	+/- 2.138E+002	+3.20

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	75.87	37.82	4.71E+001	548.82	1059.82	13.48
2	87.63	43.72	1.55E+001	554.72	1065.72	16.18
8	397.70	199.03	2.61E+001	710.03	1221.03	3.98

0000033

********** PEAK ASSOCIATION REPORT **********

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			5	243.85	121.98	101.13
			6	272.58	136.37	98.60
	2	CO-60				
			13	2344.87	1173.16	100.50
			14	2663.37	1332.42	99.43
	3	Y-88				
			12	1794.60	898.00	100.25
			15	3670.14	1835.98	99.29
	4	CD-109				
			4	175.97	87.98	100.00
	5	SN-113				
			10	782.46	391.66	100.00
	6	CS-137				
			11	1322.04	661.64	100.00
	7	CE-139				
			7	331.28	165.76	100.00
	8	HG-203				
			9	557.66	279.12	100.00
	9	AM-241				
			3	119.22	59.55	100.00

0000034

ITAS St. LOUIS
GERMANIUM DETECTOR
CALIBRATION DATA

for

DETECTOR 2

with

45 g PETRI DISH

GEOMETRY

0000035

Energy calibration : DETECT2, CEF
File created : 1993-Jan-18 12:07:00 Modified : 1993-Jul-09 14:14:14

I	CHAN	ENERGY	EN. UNCERT. Kev	NONLINEARITY KeV
1	120.038	59.537	0.226	-0.069
2	177.029	88.032	0.100	-0.087
3	244.855	122.063	0.101	0.010
4	332.304	165.853	0.101	0.049
5	783.633	391.688	0.100	0.081
6	1323.274	661.649	0.103	0.055
7	1795.925	898.021	0.100	-0.044
8	2345.974	1173.216	0.100	-0.042
9	2664.354	1332.486	0.100	-0.060
10	3670.558	1836.014	0.101	0.056

Energy calibration function: 2
Energy calibration chi-square: 1.375E-001
Energy calibration coefficients

1	-5.428E-001	+-	9.959E-002
2	5.007E-001	+-	2.997E-004
3	-2.753E-007	+-	1.939E-007
4	4.923E-011	+-	3.341E-011

02-26-84

Standards # 46642-334

000037

Calibration source data file: C:\SAMPO\CALIBR\MARN650.CLF
File created: 1993-Jul-12 17:00:10 Modified: 1993-Jul-14 09:36:39

Index	Nuclide	Type	Esc	En. (keV) / Act (Bq)	En. Err. Cal.	Unc.	Half-life Yr	Mon	Unit Day	Hr	Branch.rat. Min	Sec
1	AM-241	3	0	59.537	0.100		4.322E+002		Y			35.900
				3.360E+003	5.000		1993	7	1	12	0	0
2	CD-109	3	0	88.032	0.100		4.639E+002		D			3.720
				4.640E+004	4.700		1993	7	1	12	0	0
3	CO-57	3	0	122.063	0.100		2.709E+002		D			85.510
				8.830E+002	4.700		1993	7	1	12	0	0
4	CE-139	3	0	165.853	0.100		1.377E+002		D			80.350
				1.420E+003	4.800		1993	7	1	12	0	0
5	HG-203	3	0	279.189	0.100		4.660E+001		D			77.300
				2.470E+003	4.700		1993	7	1	12	0	0
6	SN-113	3	0	391.688	0.100		1.151E+002		D			64.900
				2.550E+003	4.500		1993	7	1	12	0	0
7	SR-85	3	0	513.990	0.100		6.484E+001		D			99.270
				2.900E+003	5.000		1993	7	1	12	0	0
8	CS-137	3	0	661.649	0.100		3.017E+001		Y			85.120
				1.290E+003	5.000		1993	7	1	12	0	0
9	Y-88	3	0	898.021	0.100		1.066E+002		D			93.400
				5.190E+003	4.500		1993	7	1	12	0	0
10	CO-60	3	0	1173.216	0.100		5.271E+000		Y			100.000
				1.910E+003	4.800		1993	7	1	12	0	0
11	CO-60	3	0	1332.486	0.100		5.271E+000		Y			100.000
				1.920E+003	4.700		1993	7	1	12	0	0
12	Y-88	3	0	1836.014	0.100		1.066E+002		D			99.380
				5.130E+003	4.900		1993	7	1	12	0	0

02-26-94

Signature of 41664/2-334

9000038

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1993-Jul-14     12:36:42
********************************************************************************
*                                                                              *
*    G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T               *
*                                                                              *
********************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:CALIBRATION
Spectrum file name:930965
Sample identifier :46642-334
Sample geometry   :MARN650
Sample type       :SOLID
Sample size       : 6.500E+02 G
Measured by       :DLD

Start of irradiation            :1993-Jul-01    at 12:00:00
End of irradiation              :1993-Jul-01    at 12:00:00
Collect started on              :1993-Jul-12    at 08:37:47
Collect ended on                :1993-Jul-12    at 09:39:50

Irradiation/sampling time       :0 years 0 days 0 hours 0 minutes
Decay time                      :0 years 10 days 20 hours 37 minutes

Live time: 3.60E+003 s real time: 3.72E+003 s   dead time: 3.30E+000 %

Shape calibration requested     :MARN6502
Shape calibration used          :MARN6502
                       Created  :1993-Jan-18     11:47:07
                       Modified :1993-Jul-14     11:11:14

Energy calibration requested    :DETECT2
Energy calibration used         :DETECT2
                       Created  :1993-Jan-18     12:07:00
                       Modified :1993-Jul-09     14:14:14

Efficiency calibration requested :MARN6502
Efficiency calibration used     :MARN6502
                       Created  :1993-Feb-02     17:29:34
                       Modified :1993-Jul-14     10:57:21

Last search  discrimination level:   25.00
Last search     FROM channel 9 TO channel 4087
Last fitting discrimination level:   25.00
Last fit        FROM channel 1 TO channel 16384
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.10
Gamma reference library          :..\LIBRARY\MAIN.ILF
with 64 isotopes and 151 gamma lines.

Peaked backround file:.\BKG2.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

Patricia A Haworth
07-14-93

0000039

********** P E A K F I T R E P O R T **********

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	119.93	59.50	3.74E+004	0.9	2.70E+004	1.17E+003	5.1	2.9
B			59.47	1.45E+002	25.5				
	2	175.78	87.96	1.61E+005	0.9	3.09E+004	1.78E+003	3.6	18.2
B			87.70	4.00E+002	9.5				
	3	244.70	121.96	9.04E+004	0.5	2.74E+004	7.27E+002	3.5	3.5
B			122.02	3.92E+002	9.9				
	4	273.48	136.37	1.19E+004	1.4	2.64E+004	9.33E+001	3.7	1.1
	5	332.19	165.75	1.30E+005	0.4	2.29E+004	1.05E+003	3.3	2.7
B			165.92	2.99E+002	9.0				
	6	558.65	279.10	1.34E+005	0.3	1.32E+004	1.59E+003	3.6	1.6
B			279.39	1.83E+002	16.9				
	7	783.53	391.63	9.33E+004	0.3	7.51E+003	1.57E+003	3.6	1.3
B			391.57	3.26E+002	7.1				
	8	1028.02	513.95	1.16E+005	0.7	6.94E+003	2.58E+003	3.7	9.6
	9	1323.26	661.64	4.03E+004	0.4	6.05E+003	1.15E+003	3.7	1.0
B			661.73	5.66E+002	3.0				
	10	1795.89	898.05	1.19E+005	0.4	3.51E+003	4.44E+003	4.0	2.7
B			897.93	3.90E+002	4.5				
	11	2346.08	1173.26	3.99E+004	0.4	2.01E+003	1.88E+003	4.1	1.3
B			1173.22	4.14E+002	4.2				
	12	2664.42	1332.50	3.55E+004	0.6	1.94E+003	1.87E+003	4.2	2.4
B			1332.38	3.71E+002	4.8				
	13	3670.72	1836.10	6.64E+004	0.4	5.69E+002	4.84E+003	5.7	1.9
B			1835.78	2.00E+002	6.8				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

000040

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Un det set	Nuc lid #	Nuclide name	Confid	Sample activity (pCi/G)	Decay Corrected activity (pCi/G)	Decay Corr. 2 Sigma Err
	1	CO-57	1.00	3.583E+001	3.684E+001	+/- 1.845E+000
	2	CO-60	1.00	7.696E+001	7.726E+001	+/- 4.443E+000
	3	SR-85	1.00	1.081E+002	1.214E+002	+/- 8.694E+000
	4	Y-88	1.00	1.987E+002	2.132E+002	+/- 1.365E+001
	5	CD-109	1.00	1.979E+003	2.012E+003	+/- 1.405E+002
	6	SN-113	1.00	1.002E+002	1.070E+002	+/- 7.653E+000
	7	CS-137	1.00	5.530E+001	5.533E+001	+/- 3.994E+000
	8	CE-139	1.00	5.433E+001	5.738E+001	+/- 3.761E+000
	9	HG-203	1.00	8.550E+001	1.005E+002	+/- 7.035E+000
	10	AM-241	1.00	1.350E+002	1.350E+002	+/- 1.353E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000041

********** P E A K A S S O C I A T I O N R E P O R T **********

Under determ set #	Nuc Nuclide #	Peak #	Peak channel	Peak energy	Peak usage %
	1 CO-57				
		3	244.70	121.96	101.83
		4	273.48	136.37	97.91
	2 CO-60				
		11	2346.08	1173.26	99.73
		12	2664.42	1332.50	100.27
	3 SR-85				
		8	1028.02	513.95	100.00
	4 Y-88				
		10	1795.89	898.05	100.73
		13	3670.72	1836.10	98.45
	5 CD-109				
		2	176.78	87.96	100.00
	6 SN-113				
		7	783.53	391.63	100.00
	7 CS-137				
		9	1323.26	661.64	100.00
	8 CE-139				
		5	332.19	165.75	100.00
	9 HG-203				
		6	558.65	279.10	100.00
	10 AM-241				
		1	119.93	59.50	100.00

0000042

CALIBRATION STANDARD DATA

Calibration source data file: C:\SAMPO\CALIBR\PETRISTD.CLF
File created: 1991-Sep-23 11:04:22 Modified: 1993-Jul-07 15:40:14

Index	Nuclide	Type	Esc	En. (keV) / Act (Bq)	En. Err. Cal.	Unc.	Half-life Yr	Mon	Unit Day	Hr	Branch.rat. Min	Sec
1	AM-241	3	0	59.537	0.100		4.322E+002		Y			35.900
				3.830E+003	5.000		1992	10	1	12	0	0
2	CD-109	3	0	88.032	0.100		4.639E+002		D			3.720
				4.970E+004	4.900		1992	10	1	12	0	0
3	CO-57	3	0	122.063	0.100		2.709E+002		D			85.510
				1.220E+003	4.300		1992	10	1	12	0	0
4	CE-139	3	0	165.853	0.100		1.377E+002		D			80.350
				2.570E+003	4.400		1992	10	1	12	0	0
5	HG-203	3	0	279.189	0.100		4.660E+001		D			77.300
				2.640E+003	4.900		1992	10	1	12	0	0
6	SN-113	3	0	391.688	0.100		1.151E+002		D			64.900
				3.150E+003	4.400		1992	10	1	12	0	0
7	CS-137	3	0	661.649	0.100		3.017E+001		Y			85.120
				2.220E+003	4.400		1992	10	1	12	0	0
8	Y-88	3	0	898.021	0.100		1.066E+002		D			93.400
				6.600E+003	4.400		1992	10	1	12	0	0
9	CO-60	3	0	1173.216	0.100		5.271E+000		Y			100.000
				3.200E+003	4.200		1992	10	1	12	0	0
10	CO-60	3	0	1332.486	0.100		5.271E+000		Y			100.000
				3.210E+003	4.900		1992	10	1	12	0	0
11	Y-88	3	0	1836.014	0.100		1.066E+002		D			99.380
				6.530E+003	4.400		1992	10	1	12	0	0

02-26-94

Standard # 44955-265

0000044

SHAPE CALIBRATION DATA

Shape calibration : PETRI2
File created : 1993-Jan-18 11:47:07 Modified : 1993-Jul-14 16:16:37

I	CHANNEL	WIDTH FWHM keV	WIDTH FWHM chan	WIDTH SIGMA chan	LOWTAIL chan	HIGHTAIL chan	ENERGY keV
1	119.960	1.538	3.073	1.305	2.148	2.886	59.517
2	176.776	1.542	3.080	1.308	3.782	3.098	87.960
3	244.702	1.570	3.136	1.332	3.815	2.644	121.963
4	332.165	1.600	3.196	1.357	2.503	3.160	165.743
5	783.488	1.736	3.470	1.473	2.800	2.843	391.602
6	1323.224	1.888	3.774	1.603	3.305	4.002	661.624
7	1795.893	1.997	3.992	1.695	3.461	3.669	898.053
8	2346.039	2.167	4.333	1.840	3.381	4.009	1173.232
9	2664.405	2.235	4.467	1.897	3.403	4.464	1332.493
10	3670.750	2.468	4.929	2.093	3.342	5.903	1836.116

Shape width calibration function: 2
Shape width calibration chi-square: 9.154E-001
Shape width calibration coefficients
1 1.268E+000 +- 5.138E-003
2 2.670E-004 +- 7.881E-006
3 -1.137E-008 +- 2.499E-009
Shape hightail calibration function: 1
Shape lowtail calibration function: 1

02-26-94

Standard # 44955-245

0000046

EFFICIENCY CALIBRATION DATA

0000047

Detector efficiency calibration : PETRI2
File created : 1993-Jan-18 14:37:42 Modified : 1993-Aug-19 10:49:12

I	Energy	Efficiency	Eff. uncert. %
1	59.537	0.0139938	5.015
2	88.032	0.0500000	4.900
3	122.063	0.0612212	4.302
4	165.853	0.0585820	4.412
5	391.688	0.0280499	4.410
6	661.649	0.0166665	4.407
7	898.021	0.0117018	4.414
8	1173.216	0.0091886	4.212
9	1332.486	0.0081624	4.912
10	1836.014	0.0060081	4.427

Detector efficiency calibration function: 3
Detector efficiency calibration chi-square: 1.809E+000
Detector efficiency calibration coefficients

1	-1.943E+002	+-	1.793E+001
2	1.242E+002	+-	1.290E+001
3	-2.971E+001	+-	3.427E+000
4	3.113E+000	+-	3.988E-001
5	-1.215E-001	+-	1.716E-002

02-26-94

STANDARD # 44955-245

0000048

CALIBRATION COUNT DATA

0000049

SAMPO 90, 1993 PA,MN,JR. Version 3.20gM 1994-Feb-26 11:58:38

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* GAMMA SPECTRUM ANALYSIS REPORT *

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IT ANALYTICAL ST. LOUIS
Sample description:CALIBRATION
Spectrum file name:930985
Sample number :44955-265
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.600E+01 G
Measured by :DLD

02-26-94

Start of sample collection :1992-Oct-01 at 12:00:00
End of sample collection :1992-Oct-01 at 12:00:00
Sample count started on :1993-Jul-14 at 12:32:52
Sample count ended on :1993-Jul-14 at 13:49:42

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 286 days 0 hours 32 minutes

Live time: 4.50E+003 s real time: 4.61E+003 s dead time: 2.39E+000 %

Shape calibration requested :PETRI2
Shape calibration used :PETRI2
Created :1993-Jan-18 11:47:07
Modified :1993-Jul-14 16:16:37

Energy calibration requested :DETECT2
Energy calibration used :DETECT2
Created :1993-Jan-18 12:07:00
Modified :1993-Jul-09 14:14:14

Efficiency calibration requested :PETRI2
Efficiency calibration used :PETRI2
Created :1993-Jan-18 14:37:42
Modified :1993-Aug-19 10:49:12

Last search discrimination level: 20.00
Last search FROM channel 9 TO channel 4087
Last fitting discrimination level: 20.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 65 isotopes and 152 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000050

********** P E A K F I T R E P O R T **********

Spectrum file name: 930985 Sample number: 44955-265

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	119.93	59.50	8.54E+004	1.0	2.03E+004	1.31E+003	4.8	12.0
	2	176.74	87.94	2.46E+005	1.2	2.25E+004	1.22E+003	3.0	52.5
B			87.34	1.06E+001	13.1				
	3	244.67	121.95	1.38E+005	0.9	1.51E+004	4.88E+002	2.6	16.8
	4	273.48	136.37	1.70E+004	0.6	1.25E+004	5.88E+001	2.4	0.8
	5	332.16	165.74	1.28E+005	0.5	1.11E+004	4.60E+002	2.4	4.8
	6	558.62	279.08	5.07E+003	2.2	8.95E+003	2.80E+001	3.8	1.4
	7	783.48	391.60	4.60E+004	0.4	7.61E+003	3.70E+002	3.0	0.8
	8	1323.23	661.62	1.39E+005	0.2	5.85E+003	1.95E+003	1.5	0.8
B			661.36	1.83E+000	27.7				
	9	1795.88	898.05	5.02E+004	0.4	6.33E+003	9.35E+002	1.4	1.2
	10	2346.03	1173.23	1.19E+005	0.3	2.72E+003	2.81E+003	1.5	2.5
B			1173.19	2.51E+000	16.1				
	11	2664.41	1332.50	1.06E+005	0.4	1.15E+003	2.82E+003	1.3	2.4
B			1332.62	2.32E+000	15.7				
	12	3670.75	1836.11	2.73E+004	0.5	3.39E+002	1.03E+003	3.7	1.2

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000051

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 930985 Sample number: 44955-265

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	CO-57	0.99	3.301E+002	1.79	6.862E+002	2.406E+001
	2	CO-60	1.00	1.654E+003	0.98	1.834E+003	3.531E+001
	3	Y-88	0.96	5.909E+002	1.32	3.795E+003	9.808E+001
	4	CD-109	1.00	1.927E+004	2.96	2.954E+004	1.715E+003
	5	SN-113	0.97	3.349E+002	2.96	1.875E+003	1.089E+002
	6	CS-137	1.00	1.346E+003	1.55	1.371E+003	4.153E+001
	7	CE-139	0.98	3.366E+002	2.36	1.420E+003	6.574E+001
	8	HG-203	0.82	2.125E+001	3.77	1.497E+003	1.107E+002
	9	AM-241	1.00	2.141E+003	4.80	2.143E+003	2.017E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000052

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 930985 Sample number: 44955-265

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			3	244.67	121.95	98.52
			4	273.48	136.37	101.24
	2	CO-60				
			10	2346.03	1173.23	100.34
			11	2664.41	1332.50	99.71
	3	Y-88				
			9	1795.88	898.05	100.45
			12	3670.75	1836.11	96.92
	4	CD-109				
			2	176.74	87.94	100.00
	5	SN-113				
			7	783.48	391.60	100.00
	6	CS-137				
			8	1323.23	661.62	100.00
	7	CE-139				
			5	332.16	165.74	100.00
	8	HG-203				
			6	558.62	279.08	100.00
	9	AM-241				
			1	119.93	59.50	100.00

0000053

SAMPO 90, 1993 PA,MN,JR. Version 3.20gM 1994-Feb-26 12:13:29

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* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

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IT ANALYTICAL ST. LOUIS
Sample description:CAL VERIFICATION
Spectrum file name:931146
Sample number :44955-265
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.600E+01 G
Measured by :PAH

02-26-94

Start of sample collection :1992-Oct-01 at 12:00:00
End of sample collection :1992-Oct-01 at 12:00:00
Sample count started on :1993-Aug-19 at 08:41:46
Sample count ended on :1993-Aug-19 at 08:57:07

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 321 days 20 hours 41 minutes

Live time: 9.00E+002 s real time: 9.21E+002 s dead time: 2.28E+000 %

Shape calibration requested :PETRI2
Shape calibration used :PETRI2
  Created :1993-Jan-18 11:47:07
  Modified :1993-Jul-14 16:16:37

Energy calibration requested :DETECT2
Energy calibration used :DETECT2
  Created :1993-Jan-18 12:07:00
  Modified :1993-Jul-09 14:14:14

Efficiency calibration requested :PETRI2
Efficiency calibration used :PETRI2
  Created :1993-Jan-18 14:37:42
  Modified :1993-Aug-19 10:49:12

Last search discrimination level: 5.00
Last search FROM channel 9 TO channel 4087
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 65 isotopes and 152 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000055

********** P E A K F I T R E P O R T **********

Spectrum file name: 931146 Sample number: 44955-265

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	119.95	59.51	1.86E+004	1.6	3.74E+003	1.42E+003	5.0	6.4
	2	176.74	87.94	4.99E+004	1.5	4.14E+003	1.24E+003	3.1	16.6
B			87.34	2.12E+000	13.1				
	3	244.69	121.96	2.72E+004	1.0	2.68E+003	4.80E+002	2.7	4.6
	4	273.53	136.39	3.33E+003	1.8	2.25E+003	5.76E+001	3.0	1.0
	5	332.15	165.74	2.25E+004	0.9	1.93E+003	4.05E+002	2.5	2.7
	6	558.63	279.08	5.69E+002	7.2	1.76E+003	1.57E+001	7.8	1.1
	7	783.41	391.56	7.69E+003	1.2	1.47E+003	3.09E+002	3.2	1.6
	8	1323.09	661.56	2.85E+004	0.7	1.03E+003	2.00E+003	1.7	2.6
B			661.36	3.66E-001	27.7				
	9	1795.66	897.94	8.20E+003	1.1	1.11E+003	7.64E+002	1.8	1.3
	10	2345.74	1173.08	2.40E+004	0.6	4.71E+002	2.84E+003	1.5	1.5
B			1173.19	5.02E-001	16.1				
	11	2664.07	1332.33	2.15E+004	0.6	1.20E+002	2.87E+003	1.4	1.3
B			1332.62	4.63E-001	15.7				
	12	3670.22	1835.85	4.40E+003	1.1	5.09E+001	8.31E+002	3.8	1.2

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000056

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 931146 Sample number: 44955-265

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	CO-57	0.99	3.249E+002	1.99	7.403E+002	2.892E+001
	2	CO-60	1.00	1.676E+003	1.04	1.882E+003	3.829E+001
	3	Y-88	0.95	4.826E+002	1.60	3.913E+003	1.229E+002
	4	CD-109	1.00	1.951E+004	3.09	3.155E+004	1.911E+003
	5	SN-113	0.96	2.799E+002	3.19	1.944E+003	1.215E+002
	6	CS-137	1.00	1.378E+003	1.70	1.406E+003	4.685E+001
	7	CE-139	0.97	2.961E+002	2.47	1.496E+003	7.254E+001
	8	HG-203	0.78	1.192E+001	7.83	1.430E+003	2.195E+002
	9	AM-241	1.00	2.328E+003	4.96	2.331E+003	2.264E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000057

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 931146 Sample number: 44955-265

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			3	244.69	121.96	98.45
			4	273.53	136.39	101.84
	2	CO-60				
			10	2345.74	1173.08	100.54
			11	2664.07	1332.33	99.53
	3	Y-88				
			9	1795.66	897.94	100.39
			12	3670.22	1835.85	98.15
	4	CD-109				
			2	176.74	87.94	100.00
	5	SN-113				
			7	783.41	391.56	100.00
	6	CS-137				
			8	1323.09	661.56	100.00
	7	CE-139				
			5	332.15	165.74	100.00
	8	HG-203				
			6	558.63	279.08	100.00
	9	AM-241				
			1	119.95	59.51	100.00

0000058

********** M D A R E P O R T **********

Spectrum file name: 931146 Sample number: 44955-265

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	5.648E+001	NA-22	6.195E+000	NA-24	5.448E+000
K-40	5.548E+001	SC-46	9.360E+000	V-48	5.814E+000
CR-51	3.698E+001	MN-54	8.275E+000	FE-59	1.316E+001
CO-56	8.470E+000	CO-57	2.957E+000	CO-58	8.286E+000
CO-60	4.204E+000	NI-65	2.526E+001	ZN-65	2.024E+001
SE-75	3.827E+000	SR-85	5.731E+000	Y-88	4.007E+000
ZR-95	1.378E+001	NB-95	7.528E+000	TC-99M	2.742E+000
RU-103	6.137E+000	RU-106	6.447E+001	AG-110M	8.822E+000
CD-109	1.178E+002	SN-113	6.582E+000	SB-124	6.463E+000
SB-125	1.825E+001	I-131	5.455E+000	I-133	6.562E+000
CS-134	6.550E+000	CS-137	7.372E+000	BA-131	1.166E+001
BA-133	7.265E+000	BA-140	2.210E+001	LA-140	7.221E+000
CE-139	2.720E+000	CE-141	4.926E+000	CE-144	2.289E+001
EU-152	8.910E+000	EU-154	1.744E+001	EU-155	1.521E+001
GD-153	1.061E+001	IR-192	4.272E+000	HG-203	4.149E+000
TL-208	7.027E+000	PB-210	1.326E+003	PB-211	1.718E+002
PB-212	7.487E+000	BI-207	6.002E+000	BI-212	6.190E+001
BI-214	1.318E+001	RA-223	2.388E+001	RA-224	7.794E+001
RA-226	1.156E+001	RA-228	3.357E+001	AC-227	2.673E+001
TH-228	4.739E+002	TH-230	2.355E+003	TH-234	7.158E+001
PA-231	1.482E+002	PA-234	1.670E+003	U-234	2.083E+004
U-235	2.464E+001	AM-241	3.588E+001		

000059

ITAS St. LOUIS
GERMANIUM DETECTOR
CALIBRATION DATA

for

DETECTOR 4

with

45 g PETRI DISH

GEOMETRY

0900000

CALIBRATION STANDARD DATA

0000061

Calibration source data file: ..\CALIBR\PETRISTD.CLF Standard #44955-265
File created: 1991-Sep-23 11:04:22 Modified: 1993-Jul-07 15:40:14

Index	Nuclide	Type	Esc	En. (keV) / Act (Bq)	En. Err. Cal.	Unc.	Half-life Yr	Mon	Unit Day	Hr	Branch.rat. Min	Sec
1	AM-241	3	0	59.537	0.100		4.322E+002		Y			35.900
				3.830E+003	5.000		1992	10	1	12	0	0
2	CD-109	3	0	88.032	0.100		4.639E+002		D			3.720
				4.970E+004	4.900		1992	10	1	12	0	0
3	CO-57	3	0	122.063	0.100		2.709E+002		D			85.510
				1.220E+003	4.300		1992	10	1	12	0	0
4	CE-139	3	0	165.853	0.100		1.377E+002		D			80.350
				2.570E+003	4.400		1992	10	1	12	0	0
5	HG-203	3	0	279.189	0.100		4.660E+001		D			77.300
				2.640E+003	4.900		1992	10	1	12	0	0
6	SN-113	3	0	391.688	0.100		1.151E+002		D			64.900
				3.150E+003	4.400		1992	10	1	12	0	0
7	CS-137	3	0	661.649	0.100		3.017E+001		Y			85.120
				2.220E+003	4.400		1992	10	1	12	0	0
8	Y-88	3	0	898.021	0.100		1.066E+002		D			93.400
				6.600E+003	4.400		1992	10	1	12	0	0
9	CO-60	3	0	1173.216	0.100		5.271E+000		Y			100.000
				3.200E+003	4.200		1992	10	1	12	0	0
10	CO-60	3	0	1332.486	0.100		5.271E+000		Y			100.000
				3.210E+003	4.900		1992	10	1	12	0	0
11	Y-88	3	0	1836.014	0.100		1.066E+002		D			99.380
				6.530E+003	4.400		1992	10	1	12	0	0

0000062

Patricia A Haworth
09-22-93

Calibration source data file: C:\SAMPO\CALIBR\MARN650.CLF
File created: 1993-Jul-12 17:00:10 Modified: 1993-Jul-14 09:36:39

Index	Nuclide	Type	Esc	En. (keV) Act (Bq)	En. Err. Cal.	Unc.	Half-life Yr	Unit	Mon	Day	Hr	Min	Sec	Branch.rat.
1	AM-241	3	0	59.537	0.100		4.322E+002	Y						35.900
				3.360E+003	5.000		1993	7	1	12	0	0		
2	CD-109	3	0	88.032	0.100		4.639E+002	D						3.720
				4.640E+004	4.700		1993	7	1	12	0	0		
3	CO-57	3	0	122.063	0.100		2.709E+002	D						85.510
				8.830E+002	4.700		1993	7	1	12	0	0		
4	CE-139	3	0	165.853	0.100		1.377E+002	D						80.350
				1.420E+003	4.800		1993	7	1	12	0	0		
5	HG-203	3	0	279.189	0.100		4.660E+001	D						77.300
				2.470E+003	4.700		1993	7	1	12	0	0		
6	SN-113	3	0	391.688	0.100		1.151E+002	D						64.900
				2.550E+003	4.500		1993	7	1	12	0	0		
7	SR-85	3	0	513.990	0.100		6.484E+001	D						99.270
				2.900E+003	5.000		1993	7	1	12	0	0		
8	CS-137	3	0	661.649	0.100		3.017E+001	Y						85.120
				1.290E+003	5.000		1993	7	1	12	0	0		
9	Y-88	3	0	898.021	0.100		1.066E+002	D						93.400
				5.190E+003	4.500		1993	7	1	12	0	0		
10	CO-60	3	0	1173.216	0.100		5.271E+000	Y						100.000
				1.910E+003	4.800		1993	7	1	12	0	0		
11	CO-60	3	0	1332.486	0.100		5.271E+000	Y						100.000
				1.920E+003	4.700		1993	7	1	12	0	0		
12	Y-88	3	0	1836.014	0.100		1.066E+002	D						99.380
				5.130E+003	4.900		1993	7	1	12	0	0		

0000063

Energy calibration : DETECT4
File created : 1993-Jan-13 13:19:58 Modified : 1994-Jan-27 08:16:11

I	CHAN	ENERGY	EN. UNCERT. Kev	NONLINEARITY KeV
1	119.216	59.537	0.100	-0.098
2	176.000	88.032	0.100	0.003
3	244.000	122.063	0.100	0.033
4	331.532	165.853	0.100	0.054
5	783.167	391.688	0.100	0.059
6	1027.791	513.990	0.100	0.042
7	1323.137	661.649	0.100	0.020
8	1796.017	898.021	0.100	-0.062
9	2346.430	1173.216	0.100	-0.089
10	2664.874	1332.486	0.100	-0.049
11	3671.599	1836.014	0.100	0.088

Energy calibration function: 4
Energy calibration chi-square: 2.778E-002
Energy calibration coefficients

1	-5.943E-001	+-	1.150E-002
2	7.166E-002	+-	1.032E-003
3	4.978E-001	+-	2.818E-005
4	2.118E-005	+-	2.381E-007

0000065

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jan-27 08:19:18

GAMMA SPECTRUM ANALYSIS REPORT

IT ANALYTICAL ST. LOUIS
Sample description:CALIBRATION_VERIFICATION
Spectrum file name:932574
Sample number :46642-334
Sample geometry :MARN650
Sample type :SOLID
Sample size : 6.500E+02 G
Measured by :DEFAULT

Start of sample collection :1993-Jul-01 at 12:00:00
End of sample collection :1993-Jul-01 at 12:00:00
Sample count started on :1994-Jan-26 at 18:08:52
Sample count ended on :1994-Jan-26 at 18:39:38

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 209 days 6 hours 8 minutes

Live time: 1.80E+003 s real time: 1.85E+003 s dead time: 2.49E+000 %

Shape calibration requested :MARN6504
Shape calibration used :MARN6504
Created :1993-Jan-13 10:59:35
Modified :1993-Aug-03 15:43:11

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
Created :1993-Jan-13 13:19:58
Modified :1994-Jan-27 08:16:11

Efficiency calibration requested :MARN6504
Efficiency calibration used :MARN6504
Created :1993-Feb-04 14:27:31
Modified :1993-Aug-03 15:53:56

Last search discrimination level: 25.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 25.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 65 isotopes and 152 gamma lines.

0000086

********** P E A K F I T R E P O R T **********

Spectrum file name: 932574 Sample number: 46642-334

peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
1	119.27	59.58	1.31E+005	2.0	8.29E+003	1.23E+003	5.7	82.9
2	176.10	88.06	1.59E+005	1.3	5.93E+003	1.29E+003	4.3	47.3
3	244.04	122.08	5.45E+004	0.8	3.33E+003	4.57E+002	4.3	5.9
4	272.82	136.48	6.71E+003	0.8	3.15E+003	5.85E+001	4.3	0.5
5	331.55	165.87	4.21E+004	0.6	2.85E+003	4.03E+002	4.3	2.5
6	558.11	279.18	6.23E+003	0.9	2.10E+003	8.59E+001	4.9	0.7
7	783.14	391.69	2.61E+004	0.6	1.49E+003	4.84E+002	5.1	1.8
8	1027.81	514.00	1.30E+004	1.3	1.56E+003	3.10E+002	5.4	3.5
9	1323.18	661.65	3.82E+004	0.6	1.25E+003	1.16E+003	5.5	2.4
10	1796.04	898.04	3.11E+004	0.5	1.32E+003	1.25E+003	6.0	1.4
11	2346.38	1173.21	3.56E+004	1.0	6.51E+002	1.82E+003	6.4	6.6
12	2664.87	1332.47	3.21E+004	0.9	3.77E+002	1.83E+003	6.5	5.6
13	3671.57	1836.00	1.82E+004	0.9	1.02E+002	1.36E+003	7.9	2.8

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000067

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 932574 Sample number: 46642-334

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
				activity (pCi/G)			
	1	CO-57	1.00	2.259E+001	3.07	3.858E+001	2.321E+000
	2	CO-60	1.00	7.595E+001	4.57	8.190E+001	7.333E+000
	3	SR-85	0.95	1.300E+001	5.41	1.218E+002	1.290E+001
	4	Y-88	0.98	5.609E+001	4.78	2.187E+002	2.048E+001
	5	CD-109	1.00	1.438E+003	4.29	1.965E+003	1.652E+002
	6	SN-113	0.98	3.104E+001	5.10	1.094E+002	1.095E+001
	7	CS-137	1.00	5.650E+001	5.53	5.725E+001	6.207E+000
	8	CE-139	0.99	2.085E+001	4.33	5.979E+001	5.074E+000
	9	HG-203	0.90	4.622E+000	4.87	1.039E+002	9.923E+000
	10	AM-241	1.00	1.428E+002	5.73	1.429E+002	1.604E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000088

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 932574 Sample number: 46642-334

Under determ set #	Nuclide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			3	244.04	122.08	101.56
			4	272.82	136.48	98.38
	2	CO-60				
			11	2346.38	1173.21	100.36
			12	2664.87	1332.47	99.62
	3	SR-85				
			8	1027.81	514.00	100.00
	4	Y-88				
			10	1796.04	898.04	100.73
			13	3671.57	1836.00	98.70
	5	CD-109				
			2	176.10	88.06	100.00
	6	SN-113				
			7	783.14	391.69	100.00
	7	CS-137				
			9	1323.18	661.65	100.00
	8	CE-139				
			5	331.55	165.87	100.00
	9	HG-203				
			6	558.11	279.18	100.00
	10	AM-241				
			1	119.27	59.58	100.00

6900000

Shape calibration : PETRI4 , CSF Standard #44955-265
File created : 1993-Jan-13 10:59:35 Modified : 1993-Sep-03 01:11:04

I	CHANNEL	WIDTH FWHM keV	WIDTH FWHM chan	WIDTH SIGMA chan	LOWTAIL chan	HIGHTAIL chan	ENERGY keV
1	119.915	0.776	1.551	0.658	1.295	2.276	59.583
2	176.664	0.806	1.610	0.684	1.309	2.320	87.999
3	244.523	0.852	1.702	0.723	2.105	2.517	121.974
4	273.289	0.874	1.747	0.742	1.366	2.613	136.376
5	331.940	0.908	1.814	0.770	1.541	1.541	165.738
6	783.089	1.149	2.296	0.975	1.950	1.950	391.537
7	1322.649	1.405	2.809	1.193	2.386	2.386	661.486
8	1795.107	1.586	3.171	1.346	2.179	2.929	897.818
9	2344.978	1.807	3.613	1.534	2.421	3.810	1172.876
10	2663.188	1.918	3.833	1.627	2.461	4.225	1332.076
11	3668.886	2.276	4.545	1.930	2.757	4.961	1835.498

Shape width calibration function: 2
Shape width calibration chi-square: 1.116E+000
Shape width calibration coefficients
1 6.055E-001 +- 2.425E-003
2 4.586E-004 +- 9.036E-006
3 -2.688E-008 +- 2.673E-009
Shape hightail calibration function: 1
Shape lowtail calibration function: 1

09-03-93
Patricia A Haworth
09-22-93

0000071

Detector efficiency calibration : PETRI4 .COF Standard #44955-265
File created : 1993-Jun-25 14:12:16 Modified : 1993-Sep-21 15:14:24

I	Energy	Efficiency	Eff. uncert. %
1	59.537	0.1131913	5.002
2	88.032	0.1192236	4.902
3	122.063	0.1115209	4.307
4	165.853	0.0880000	4.400
5	391.688	0.0490000	4.400
6	661.649	0.0272166	4.407
7	898.021	0.0188963	4.430
8	1173.216	0.0152656	4.208
9	1332.486	0.0134673	4.908
10	1836.014	0.0100194	4.447

Detector efficiency calibration function: 3
Detector efficiency calibration chi-square: 9.806E-001
Detector efficiency calibration coefficients

1	-1.090E+001	+-	1.792E+001
2	3.683E+000	+-	1.289E+001
3	-1.824E-001	+-	3.426E+000
4	-7.384E-002	+-	3.987E-001
5	6.356E-003	+-	1.716E-002

Patricia G Haworth
09-22-93

000073

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1993-Sep-03 01:38:30

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* GAMMA SPECTRUM ANALYSIS REPORT *

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09-03-9

Patricia A Heworth
09-22-93

IT ANALYTICAL ST. LOUIS
Sample description:CALIBRATION
Spectrum file name:931434
Sample identifier :44955-265
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.600E+01 G
Measured by :DLD

Start of irradiation :1992-Oct-01 at 12:00:00
End of irradiation :1992-Oct-01 at 12:00:00
Collect started on :1993-Sep-02 at 23:47:00
Collect ended on :1993-Sep-03 at 00:49:17

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 336 days 11 hours 47 minutes

Live time: 3.60E+003 s real time: 3.74E+003 s dead time: 3.67E+000 %

Shape calibration requested :PETRI4
Shape calibration used :PETRI4
  Created :1993-Jan-13 10:59:35
  Modified :1993-Sep-03 01:11:04

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
  Created :1993-Jan-13 13:19:58
  Modified :1993-Aug-03 15:49:18

Efficiency calibration requested :PETRI4
Efficiency calibration used :PETRI4
  Created :1993-Jun-25 14:12:16
  Modified :1993-Sep-03 01:12:34

Last search discrimination level: 25.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 25.00
Last fit FROM channel 1 TO channel 16384
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.10
Gamma reference library :..\LIBRARY\MAIN.ILF
with 64 isotopes and 151 gamma lines.

Peaked backround file:.\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000074

********** P E A K F I T R E P O R T **********

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
?	1	76.61	37.90	1.37E+004	13.8	1.70E+004	4.69E+001	23.2	165.8
?	2	119.91	59.58	5.68E+005	1.2	1.67E+004	1.38E+003	4.8	144.2
B			59.63	1.06E+001	9.1				
	3	176.66	88.00	4.80E+005	0.4	1.16E+004	1.12E+003	2.8	11.1
B			87.54	1.90E+001	14.9				
	4	244.52	121.97	1.77E+005	0.3	6.89E+003	4.58E+002	2.5	3.3
B			121.98	6.74E+000	14.1				
	5	273.29	136.38	2.13E+004	0.6	6.01E+003	5.82E+001	2.5	0.8
	6	331.94	165.74	1.18E+005	0.4	5.40E+003	3.62E+002	2.4	4.5
B			165.77	3.40E+000	27.2				
	7	783.09	391.54	4.30E+004	0.7	5.16E+003	2.72E+002	3.1	3.5
B			391.73	1.36E+001	6.1				
	8	1322.65	661.49	1.83E+005	0.5	4.68E+003	1.93E+003	1.7	8.8
B			661.70	6.25E+000	10.2				
	9	1795.11	897.82	4.70E+004	0.5	5.29E+003	6.66E+002	1.4	1.7
B			897.90	4.96E+000	11.6				
	10	2344.98	1172.88	1.56E+005	0.3	2.85E+003	2.85E+003	1.4	5.1
B			1173.10	8.42E+000	6.4				
	11	2663.19	1332.08	1.38E+005	0.5	1.39E+003	2.84E+003	1.4	7.1
B			1332.32	8.65E+000	6.6				
	12	3668.89	1835.50	2.63E+004	1.7	4.84E+002	7.31E+002	4.0	1.4
B			1835.87	2.25E+000	13.4				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000075

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample	Decay Corrected	Decay Corr. 2 Sigma Err
	1	CO-57	0.99	3.185E+002	7.534E+002	+/- 2.605E+001
	2	CO-60	0.98	1.672E+003	1.887E+003	+/- 3.627E+001
	3	Y-88	0.93	4.205E+002	3.750E+003	+/- 1.000E+002
	4	CD-109	1.00	1.775E+004	2.933E+004	+/- 1.592E+003
	5	SN-113	0.95	2.466E+002	1.871E+003	+/- 1.126E+002
	6	CS-137	1.00	1.329E+003	1.357E+003	+/- 4.419E+001
	7	CE-139	0.97	2.647E+002	1.440E+003	+/- 6.766E+001
	8	AM-241	1.00	2.265E+003	2.268E+003	+/- 2.143E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	76.61	37.90	4.69E+001	548.90	1059.90	23.24

0000076

********** PEAK ASSOCIATION REPORT **********

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			4	244.52	121.97	101.28
			5	273.29	136.38	98.76
	2	CO-60				
			10	2344.98	1172.88	99.96
			11	2663.19	1332.08	100.04
	3	Y-88				
			9	1795.11	897.82	100.34
			12	3668.89	1835.50	97.33
	4	CD-109				
			3	176.66	88.00	100.00
	5	SN-113				
			7	783.09	391.54	100.00
	6	CS-137				
			8	1322.65	661.49	100.00
	7	CE-139				
			6	331.94	165.74	100.00
	8	AM-241				
			2	119.91	59.58	100.00

0000027

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1993-Sep-21 15:19:22

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* GAMMA SPECTRUM ANALYSIS REPORT *

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IT ANALYTICAL ST. LOUIS
Sample description:EFF CAL VERIFICATION
Spectrum file name:931462
Sample identifier :44955-265
Sample geometry   :PETRI
Sample type   :SOLID
Sample size   : 4.600E+01 G
Measured by   :PAH

Patricia G. Haworth
09-22-93

Start of irradiation   :1992-Oct-01   at 12:00:00
End of irradiation   :1992-Oct-01   at 12:00:00
Collect started on   :1993-Sep-10   at 08:30:25
Collect ended on   :1993-Sep-10   at 08:45:59

Irradiation/sampling time   :0 years 0 days 0 hours 0 minutes
Decay time   :0 years 343 days 20 hours 30 minutes

Live time: 9.00E+002 s real time: 9.34E+002 s dead time: 3.64E+000 %

Shape calibration requested   :PETRI4
Shape calibration used   :PETRI4
                  Created   :1993-Jan-13   10:59:35
                  Modified   :1993-Sep-03   01:11:04

Energy calibration requested :DETECT4
Energy calibration used   :DETECT4
                  Created   :1993-Jan-13   13:19:58
                  Modified   :1993-Aug-03   15:49:18

Efficiency calibration requested :PETRI4
Efficiency calibration used   :PETRI4
                  Created   :1993-Jun-25   14:12:16
                  Modified   :1993-Sep-21   15:14:24

0000078

Last search discrimination level: 4.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 4.00
Last fit   FROM channel 1 TO channel 16384
Identification energy tolerance : 1.00
Minimum acceptable confidence   : 0.10
Gamma reference library   :..\LIBRARY\MAIN.ILF
with 64 isotopes and 151 gamma lines.

Peaked backround file:.\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

********** P E A K F I T R E P O R T **********

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m?	1	74.15	36.67	1.55E+003	39.1	3.90E+003	1.88E+001	44.1	124.2
M?	2	76.64	37.91	4.05E+003	20.6	3.57E+003	4.79E+001	27.8	124.2
	3	88.47	43.84	1.29E+003	12.9	3.53E+003	1.41E+001	18.1	14.5
	4	100.17	49.70	1.92E+003	15.0	5.28E+003	1.97E+001	17.4	18.7
	5	119.88	59.56	1.43E+005	1.2	4.20E+003	1.39E+003	5.3	38.3
B			59.60	2.08E+000	6.9				
	6	176.63	87.98	1.20E+005	0.3	2.80E+003	1.14E+003	3.8	1.8
B			87.43	6.18E+000	13.3				
	7	244.49	121.96	4.37E+004	0.8	1.76E+003	4.49E+002	4.0	5.3
	8	273.22	136.34	5.33E+003	1.4	1.43E+003	5.72E+001	4.2	1.3
	9	331.89	165.72	2.83E+004	0.7	1.35E+003	3.36E+002	4.2	2.6
B			166.08	5.99E-001	25.8				
	10	398.30	198.96	1.65E+003	3.8	1.50E+003	2.20E+001	5.8	2.1
B			198.41	1.03E+000	14.6				
	11	510.15	254.94	4.22E+002	6.2	1.36E+003	6.78E+000	7.9	0.6
	12	558.33	279.06	7.55E+002	5.0	1.21E+003	1.31E+001	7.2	1.0
B			278.99	5.33E-001	24.0				
	13	783.02	391.50	1.02E+004	0.8	1.33E+003	2.41E+002	5.5	0.9
B			391.63	3.12E+000	6.4				
	14	1322.58	661.45	4.61E+004	0.7	1.15E+003	1.88E+003	5.6	3.9
B			661.48	1.98E+000	6.8				
	15	1795.02	897.77	1.12E+004	0.7	1.32E+003	6.28E+002	6.0	0.8
B			897.62	9.29E-001	10.7				
	16	2344.89	1172.83	3.88E+004	0.6	6.10E+002	2.87E+003	6.4	2.4
B			1172.75	2.25E+000	3.6				
	17	2663.06	1332.01	3.45E+004	0.7	3.78E+002	2.89E+003	6.6	3.2
B			1331.98	2.37E+000	3.7				
	18	3668.77	1835.44	6.32E+003	0.9	1.17E+002	6.98E+002	7.9	1.0
B			1835.68	5.13E-001	11.3				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

6700079

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Un det set	Nuc Id #	Nuclide name	Confid	Sample activity (pCi/G)	Decay Corrected activity (pCi/G)	Decay Corr. 2 Sigma Err (pCi/G)	9.D
	1	CO-57	0.99	3.125E+002	7.533E+002	+/- 4.270E+001	+5.36
	2	CO-60	0.97	1.690E+003	1.913E+003	+/- 1.715E+002	+1.38
	3	Y-88	0.92	4.011E+002	3.752E+003	+/- 3.497E+002	-3.17
	4	CD-109	1.00	1.804E+004	3.015E+004	+/- 2.258E+003	-13.35
	5	SN-113	0.95	2.180E+002	1.729E+003	+/- 1.850E+002	-6.49
	6	CS-137	0.99	1.295E+003	1.323E+003	+/- 1.440E+002	+1.53
	7	CE-139	0.97	2.455E+002	1.386E+003	+/- 1.134E+002	-8.15
	8	HG-203	0.75	9.923E+000	1.652E+003	+/- 2.318E+002	+6.72
	9	AM-241	1.00	2.276E+003	2.279E+003	+/- 2.378E+002	+1.20

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	74.15	36.67	1.88E+001	547.67	1058.67	44.09
2	76.64	37.91	4.79E+001	548.91	1059.91	27.83
3	88.47	43.84	1.41E+001	554.84	1065.84	18.06
4	100.17	49.70	1.97E+001	560.70	1071.70	17.38
10	398.30	198.96	2.19E+001	709.96	1220.96	5.85
11	510.15	254.94	6.78E+000	765.94	1276.94	7.94

000080

********** P E A K A S S O C I A T I O N R E P O R T **********

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			7	244.49	121.96	101.32
			8	273.22	136.34	98.52
	2	CO-60				
			16	2344.89	1172.83	100.35
			17	2663.06	1332.01	99.63
	3	Y-88				
			15	1795.02	897.77	101.53
			18	3668.77	1835.44	97.20
	4	CD-109				
			6	176.63	87.98	100.00
	5	SN-113				
			13	783.02	391.50	100.00
	6	CS-137				
			14	1322.58	661.45	100.00
	7	CE-139				
			9	331.89	165.72	100.00
	8	HG-203				
			12	558.33	279.06	100.00
	9	AM-241				
			5	119.88	59.56	100.00

0000081

60 Hour Background for Detector 1 (BKG1.PTF)

Counted: 21-APR-94

I	CHANNEL	ENERGY-KEV	EN-ERR-KEV	AREA-COUNTS	INTENS-COUNT	INT-ERR-PC
1	64.340	32.253	0.232	2.052E+003	1.616e+005	19.694
2	92.478	46.400	0.059	5.118E+002	2.791e+004	11.036
3	106.183	53.283	0.084	2.833E+002	1.332e+004	10.349
4	125.954	63.207	0.029	3.076E+003	1.220e+005	12.765
5	131.942	66.212	1.592	2.921E+002	1.111e+004	30.919
6	148.989	74.763	0.044	4.178E+002	1.441e+004	10.434
7	153.290	76.919	0.029	4.627E+002	1.564e+004	9.280
8	167.645	84.117	0.066	3.837E+002	1.224e+004	15.385
9	184.374	92.502	0.011	4.519E+003	1.372e+005	3.762
10	224.903	112.809	0.099	2.119E+002	6.048e+003	20.490
11	278.781	139.790	0.082	2.620E+002	7.447e+003	15.455
12	286.670	143.739	0.049	4.977E+002	1.420e+004	9.214
13	370.396	185.642	0.011	2.246E+003	6.965e+004	4.824
14	394.886	197.895	0.084	3.752E+002	1.202e+004	13.720
15	476.145	238.543	0.023	1.340E+003	4.827e+004	6.310
16	589.201	295.078	0.102	2.054E+002	8.717e+003	21.278
17	702.728	351.836	0.030	4.062E+002	2.007e+004	8.083
18	1020.965	510.889	0.070	2.219E+003	1.536e+005	11.624
19	1165.431	583.078	0.043	4.635E+002	3.606e+004	10.193
20	1217.809	609.250	0.042	4.236E+002	3.424e+004	9.958
21	1605.534	802.969	0.069	2.088E+002	2.118e+004	12.125
22	1822.069	911.149	0.080	1.413E+002	1.581e+004	13.895
23	1873.623	936.905	0.112	6.071E+001	6.941e+003	41.152
24	1950.438	975.281	0.292	2.971E+001	3.502e+003	74.503
25	2001.805	1000.943	0.060	1.545E+002	1.858e+004	14.100
26	2240.584	1120.232	0.058	1.263E+002	1.657e+004	15.868
27	2346.173	1172.982	0.173	6.781E+001	9.221e+003	27.163
28	2664.562	1332.043	0.094	1.328E+002	2.004e+004	16.312
29	2921.991	1460.652	0.024	9.996E+002	1.636e+005	12.160
30	3461.736	1730.312	0.114	7.313E+001	1.422e+004	17.203
31	3529.789	1764.313	0.065	1.672E+002	3.324e+004	14.509

000083

60 Hour Background for Detector 2 (BKG2.PTF)

Counted: 21-APR-94

I	CHANNEL	ENERGY-KEV	EN-ERR-KEV	AREA-COUNTS	INTENS-COUNT	INT-ERR-PC
1	65.331	32.450	0.168	4.666E+003	3.863e+007	19.641
2	126.999	63.333	0.090	3.717E+002	5.267e+004	8.981
3	145.927	72.811	0.075	1.015E+003	9.433e+004	6.195
4	150.248	74.974	0.064	2.184E+003	1.884e+005	3.467
5	169.877	84.802	0.064	1.396E+003	9.273e+004	4.207
6	175.000	87.367	0.090	4.469E+002	2.817e+004	11.188
7	185.457	92.603	0.063	1.154E+003	6.646e+004	4.706
8	279.274	139.568	0.140	1.806E+002	7.957e+003	24.474
9	371.424	185.689	0.054	9.682E+002	4.644e+004	4.017
10	477.048	238.542	0.068	6.257E+002	3.600e+004	5.417
11	590.188	295.146	0.088	3.882E+002	2.723e+004	7.845
12	676.670	338.405	0.117	1.496E+002	1.205e+004	16.852
13	703.609	351.879	0.061	7.617E+002	6.385e+004	3.140
14	1021.550	510.876	0.089	1.824E+003	2.235e+005	6.383
15	1165.805	583.004	0.238	2.342E+002	3.261e+004	7.240
16	1218.125	609.162	0.060	8.849E+002	1.285e+005	3.211
17	1536.745	768.460	0.125	1.030E+002	1.844e+004	13.757
18	1604.467	802.318	0.168	1.038E+002	1.930e+004	17.788
19	1821.818	910.989	0.108	2.292E+002	4.752e+004	8.476
20	1937.443	968.802	0.140	1.038E+002	2.267e+004	15.998
21	2239.476	1119.835	0.074	2.735E+002	6.760e+004	6.010
22	2475.973	1238.113	0.144	1.300E+002	3.510e+004	13.128
23	2753.957	1377.159	0.156	9.334E+001	2.778e+004	14.452
24	2920.459	1460.450	0.112	1.010E+003	3.182e+005	2.209
25	3183.325	1591.954	0.199	5.784E+001	1.990e+004	16.527
26	3526.887	1763.825	0.151	3.705E+002	1.429e+005	4.380

0000084

60 Hour Background for Detector 3 (BKG3.PTF)

Counted: 21-APR-94

0000085

I	CHANNEL	ENERGY-KEV	EN-ERR-KEV	AREA-COUNTS	INTENS-COUNT	INT-ERR-PC
1	66.286	33.569	0.326	1.862E+003	7.228e+004	27.365
2	78.487	39.688	0.063	2.498E+002	8.146e+003	11.232
3	92.222	46.574	0.011	2.188E+003	6.277e+004	3.366
4	105.697	53.326	0.029	3.862E+002	1.022e+004	6.662
5	118.038	59.508	0.064	4.280E+002	1.080e+004	15.546
6	125.616	63.303	0.005	5.922E+003	1.464e+005	2.119
7	144.685	72.852	0.036	6.081E+002	1.459e+004	7.518
8	148.775	74.900	0.014	1.747E+003	4.180e+004	3.659
9	153.033	77.031	0.017	1.225E+003	2.924e+004	4.588
10	167.863	84.455	0.082	9.387E+002	2.235e+004	13.247
11	173.615	87.334	0.106	4.638E+002	1.106e+004	22.668
12	178.702	89.879	0.189	2.170E+002	5.185e+003	27.539
13	184.100	92.581	0.015	7.750E+003	1.857e+005	3.266
14	195.868	98.470	0.037	3.211E+002	7.760e+003	8.838
15	224.492	112.791	0.030	4.046E+002	1.009e+004	8.049
16	257.361	129.233	0.084	1.343E+002	3.510e+003	24.765
17	286.391	143.753	0.019	7.617E+002	2.085e+004	4.446
18	325.420	163.270	0.029	4.081E+002	1.193e+004	7.045
19	370.220	185.670	0.005	3.288E+003	1.038e+005	1.754
20	395.714	198.416	0.041	2.812E+002	9.273e+003	8.710
21	409.290	205.203	0.085	2.418E+002	8.160e+003	17.266
22	476.086	238.594	0.017	1.069E+003	4.023e+004	3.947
23	482.642	241.872	0.060	2.970E+002	1.130e+004	10.808
24	589.205	295.135	0.013	8.252E+002	3.683e+004	4.570
25	598.229	299.645	0.055	8.950E+001	4.046e+003	24.809
26	702.716	351.865	0.012	1.385E+003	7.197e+004	3.132
27	803.101	402.033	0.156	9.696E+001	5.684e+003	32.374
28	1020.982	510.914	0.097	2.026E+003	1.485e+005	7.484
29	1116.221	558.507	0.058	2.010E+002	1.603e+004	8.321
30	1165.569	583.167	0.027	3.665E+002	3.045e+004	7.151
31	1217.844	609.290	0.022	9.867E+002	8.547e+004	3.877
32	1322.736	661.706	0.044	2.576E+002	2.413e+004	4.664
33	1605.270	802.898	0.073	1.552E+002	1.744e+004	10.983
34	1821.943	911.183	0.070	2.192E+002	2.768e+004	8.578
35	1896.814	948.602	0.142	5.386E+001	7.052e+003	28.143

36	2001.629	1000.986	0.069	1.965E+002	2.700e+004	8.623
37	2240.285	1120.269	0.047	2.498E+002	3.790e+004	7.048
38	2345.761	1172.989	0.019	2.269E+002	3.581e+004	8.920
39	2476.188	1238.182	0.100	1.151E+002	1.902e+004	12.708
40	2664.698	1332.412	0.052	1.944E+002	3.413e+004	9.519
41	2755.079	1377.593	0.064	1.049E+002	1.893e+004	12.193
42	2815.494	1407.794	0.133	7.936E+001	1.457e+004	16.574
43	2921.356	1460.716	0.037	5.132E+002	9.701e+004	4.926
44	3528.940	1764.486	0.057	2.801E+002	6.101e+004	6.425

0000086

60 Hour Background for Detector 4 (BKG4.PTF)

Counted: 21-APR-94

0000087

I	CHANNEL	ENERGY-KEV	EN-ERR-KEV	AREA-COUNTS	INTENS-COUNT	INT-ERR-PC
1	93.564	46.579	0.070	1.696E+003	4.637e+004	7.444
2	107.334	53.486	0.021	3.850E+002	9.673e+003	5.357
3	119.424	59.548	0.019	5.588E+002	1.338e+004	10.344
4	126.907	63.298	0.005	4.716E+003	1.105e+005	2.389
5	146.063	72.898	0.035	5.834E+002	1.324e+004	8.004
6	150.084	74.912	0.015	1.697E+003	3.838e+004	3.751
7	154.422	77.086	0.014	1.403E+003	3.163e+004	4.188
8	169.126	84.451	0.079	6.187E+002	1.390e+004	13.355
9	175.414	87.600	0.093	6.455E+002	1.451e+004	18.918
10	180.224	90.009	0.201	1.001E+002	2.253e+003	23.970
11	185.365	92.583	0.018	5.883E+003	1.327e+005	4.401
12	197.048	98.433	0.039	2.933E+002	6.669e+003	9.266
13	287.700	143.801	0.020	5.956E+002	1.523e+004	5.152
14	326.921	163.423	0.033	2.899E+002	7.894e+003	9.162
15	371.507	185.723	0.006	2.809E+003	8.230e+004	1.772
16	396.584	198.264	0.037	3.073E+002	9.378e+003	8.198
17	477.307	238.629	0.010	2.196E+003	7.611e+004	3.851
18	483.602	241.776	0.058	3.146E+002	1.101e+004	16.143
19	590.377	295.158	0.018	7.148E+002	2.917e+004	4.013
20	676.995	338.457	0.097	1.249E+002	5.705e+003	21.341
21	703.814	351.862	0.699	1.193E+003	5.629e+004	13.954
22	1022.052	510.922	0.109	2.559E+003	1.679e+005	9.389
23	1116.834	558.294	0.061	2.213E+002	1.574e+004	11.556
24	1139.382	569.563	0.061	1.330E+002	9.637e+003	11.022
25	1166.523	583.128	0.012	6.600E+002	4.885e+004	2.274
26	1218.786	609.249	0.018	9.888E+002	7.617e+004	2.888
27	1323.471	661.570	0.030	6.663E+002	5.534e+004	4.899
28	1454.831	727.225	0.056	1.748E+002	1.583e+004	10.461
29	1606.400	802.982	0.053	1.754E+002	1.737e+004	14.225
30	1721.594	860.561	1.138	9.397E+001	9.905e+003	20.479
31	1822.321	910.910	0.064	2.289E+002	2.538e+004	7.396
32	1938.286	968.877	0.233	1.033E+002	1.209e+004	17.442
33	2002.339	1000.896	0.052	1.518E+002	1.829e+004	8.989
34	2240.883	1120.146	0.059	2.559E+002	3.398e+004	6.338
35	2346.764	1173.080	0.029	4.053E+002	5.598e+004	5.044

36	2476.453	1237.920	0.129	8.431E+001	1.218e+004	16.712
37	2514.709	1257.047	0.188	4.863E+001	7.116e+003	34.899
38	2664.944	1332.163	0.047	3.241E+002	4.975e+004	6.553
39	2921.804	1460.601	0.065	5.429E+002	8.974e+004	4.605
40	2944.399	1471.900	0.255	2.959E+001	4.921e+003	42.160
41	3186.036	1592.738	0.117	7.697E+001	1.362e+004	14.303
42	3528.881	1764.208	0.038	3.024E+002	5.778e+004	4.588

0000088

ITAS - St. Louis

13715 Rider Trail North
Earth City, MO 63045-1205

Gamma

Spectroscopy

Quality Control

Charts

6800000

ITAS - St. Louis Quality Control Chart

GAMMA SPECTROSCOPY DETECTOR 1

CALIBRATION ENERGY & BACKGROUND

# Points Plotted:	10		10
UCL:	98832		1324
LCL:	96688		1100
Average:	97760		1212
UWL:	98475		1287
LWL:	97045		1138

No.	Date	Cs-137 COUNTS	Cs-137 FLAGS	BKGD	BKGD FLAGS
1	5/18/94	97100		1186	
2	5/20/94	97600		1248	
3	5/23/94	97900		1275	
4	5/24/94	97500		1236	
5	5/31/94	97200		1218	
6	6/1/94	96900	<LWL	1151	
7	6/2/94	97600		1226	
8	6/3/94	97900		1234	
9	6/6/94	98200		1247	
10	6/7/94	98600	>UWL	1167	
11					
12					
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15					
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17					
18					
19					
20					

Reviewed By: _____

Date: 6-8-94

000090

ITAS - St. Louis Quality Control Chart

GAMMA SPECTROSCOPY DETECTOR 2

CALIBRATION ENERGY & BACKGROUND

# Points Plotted:	10		10
UCL:	57457		1208
LCL:	55963		982
Average:	56710		1095
UWL:	57208		1168
LWL:	56212		1020

No.	Date	Cs-137 COUNTS	Cs-137 FLAGS	BKGD	BKGD FLAGS
1	5/18/94	56300		1114	
2	5/20/94	56500		1148	
3	5/23/94	56300		1134	
4	5/24/94	56900		1169	>UWL
5	5/31/94	56900		1108	
6	6/1/94	56800		1132	
7	6/2/94	56200	<LWL	1118	
8	6/3/94	57100		1059	
9	6/6/94	56500		1058	
10	6/7/94	56800		1089	
11					
12					
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17					
18					
19					
20					

1600000

ITAS - St. Louis Quality Control Chart

GAMMA SPECTROSCOPY DETECTOR 3

CALIBRATION ENERGY & BACKGROUND

# Points:	4		4
UCL:	89350		1431
LCL:	87180		1219
Average:	88265		1325
UWL:	88968		1394
LWL:	87542		1254

No.	Date	Cs-137 COUNTS	Cs-137 FLAGS	BKGD	BKGD FLAGS
1	5/18/94	88200		1274	
2	5/20/94	87600		1313	
3	5/23/94	87400	<LWL	1339	
4	5/24/94	87800		1345	
5					
6					
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17					
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19					
20					

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ITAS - St. Louis Quality Control Chart

GAMMA SPECTROSCOPY DETECTOR 4

CALIBRATION ENERGY & BACKGROUND

# Points:	10		10
UCL:	95055		1361
LCL:	93065		1159
Average:	94060		1260
UWL:	94723		1326
LWL:	93397		1192

No.	Date	Cs-137 COUNTS	Cs-137 FLAGS	BKGD	BKGD FLAGS
1	5/18/94	93800		1252	
2	5/20/94	93900		1284	
3	5/23/94	93500		1227	
4	5/24/94	94000		1279	
5	5/31/94	93700		1335	>UWL
6	6/1/94	93400		1297	
7	6/2/94	93700		1232	
8	6/3/94	93700	8Under	1192	<LWL
9	6/6/94	93700	8Under	1272	
10	6/7/94	94000	8Under	1274	
11					
12					
13					
14					
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16					
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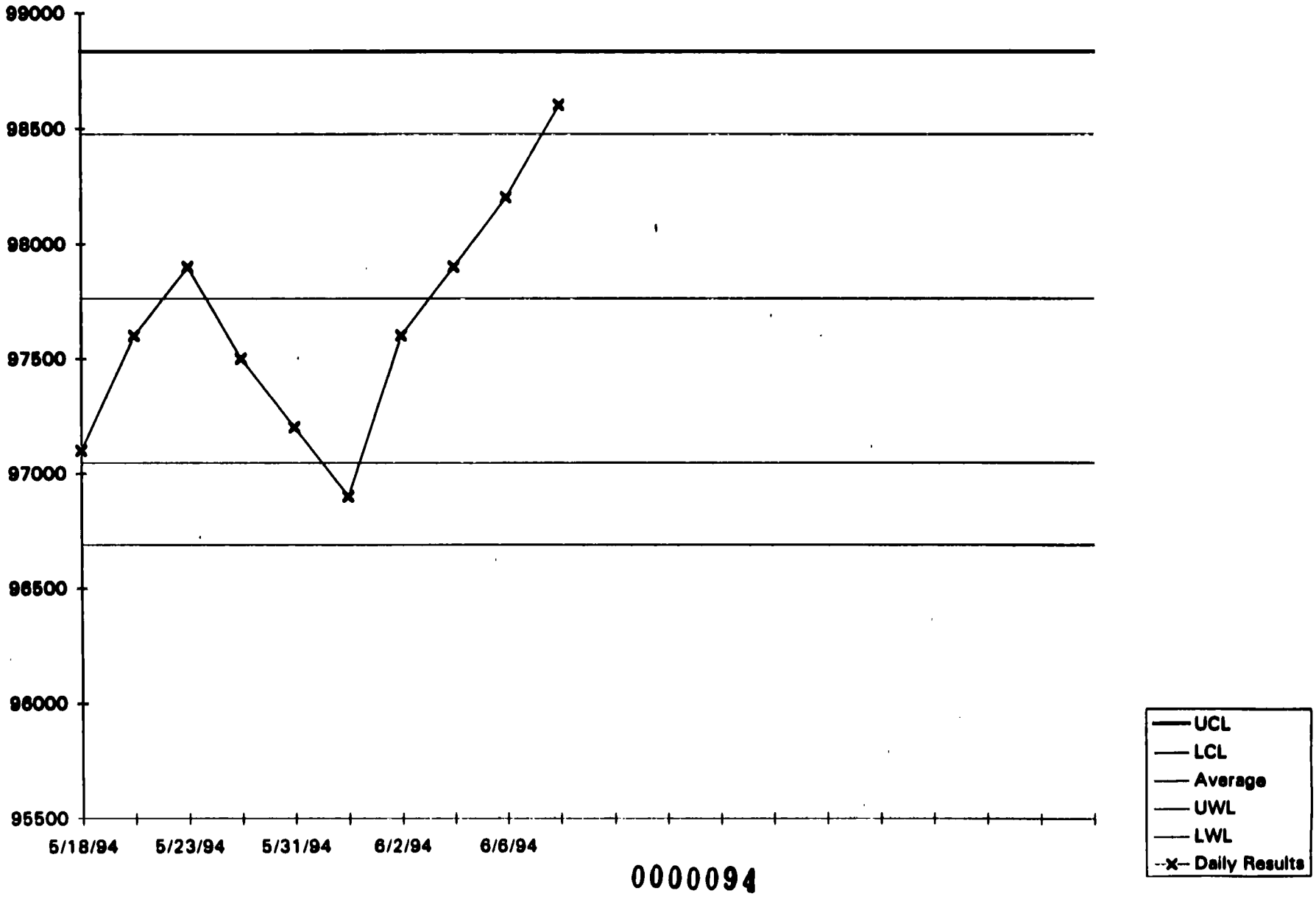
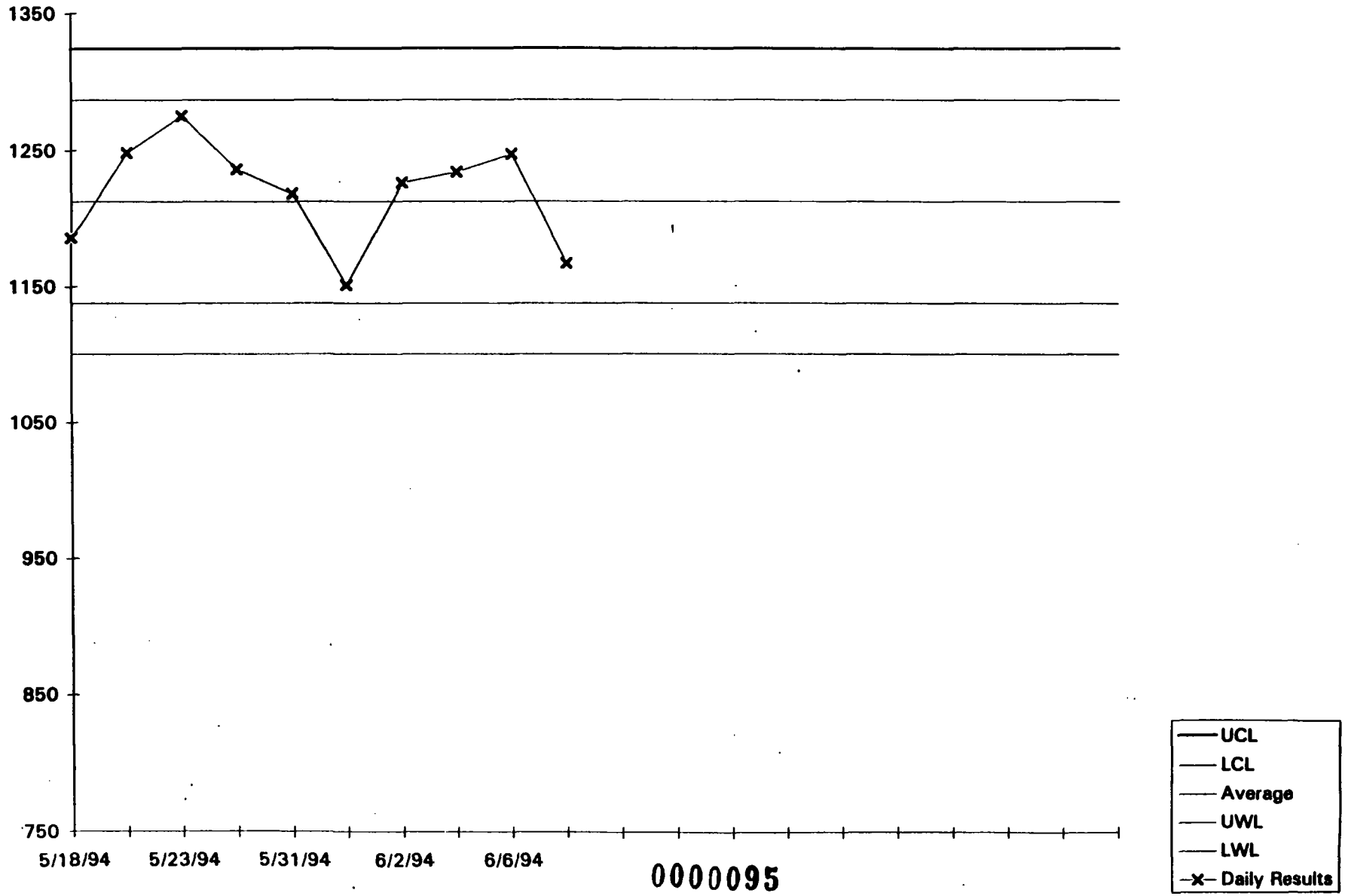
0000093

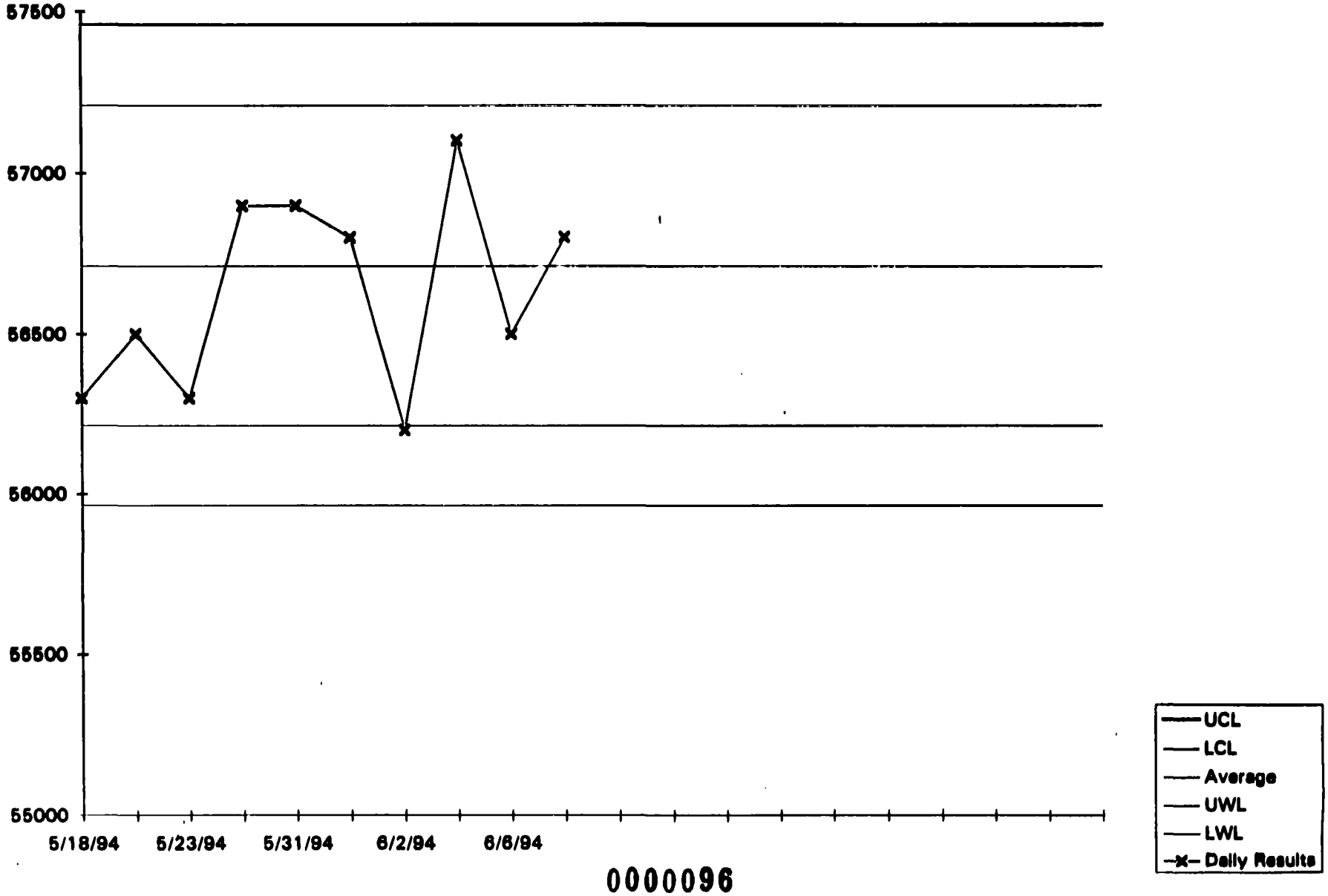
Cs137 Daily Checks For Detector 1



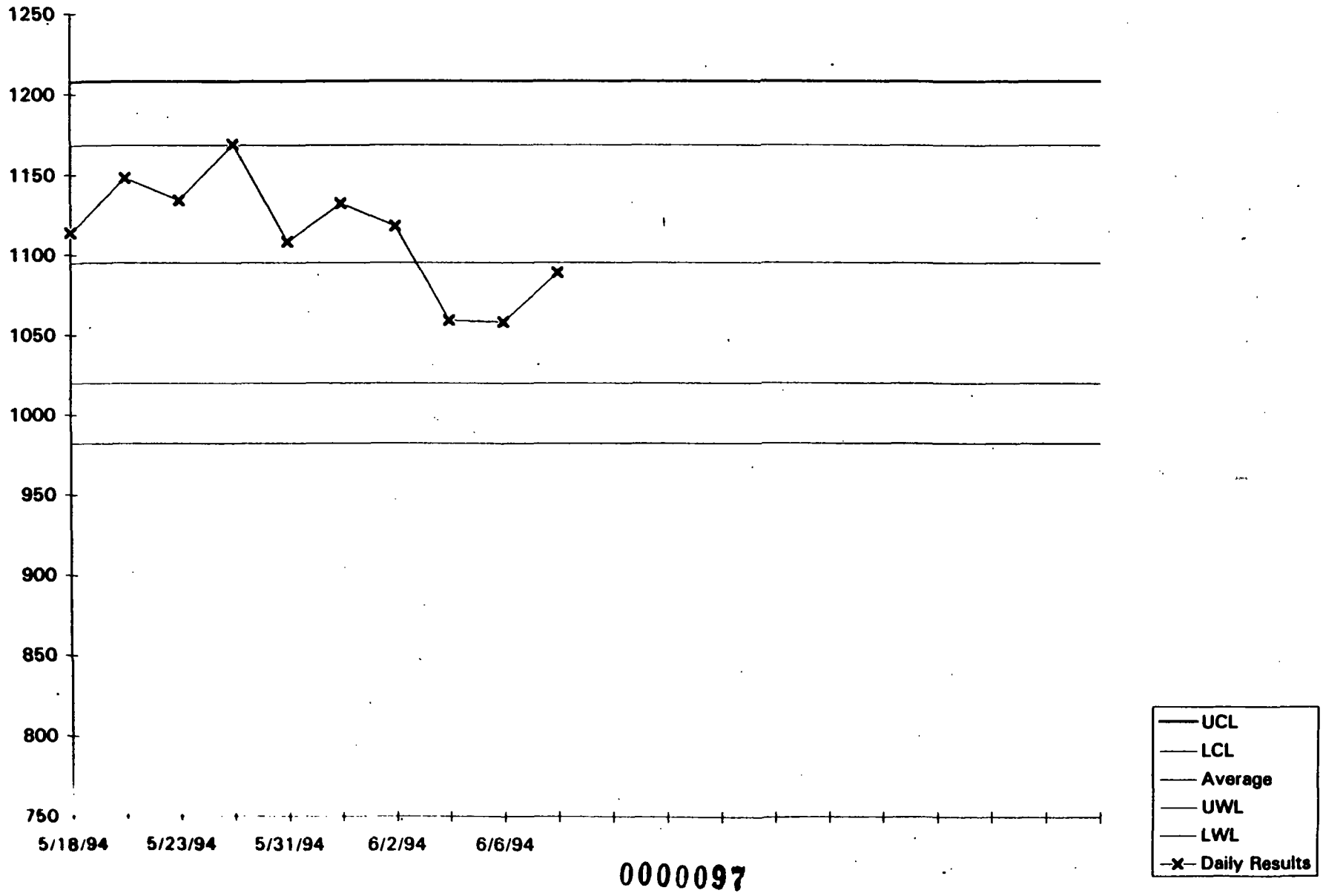
Backgrounds Daily Checks For Detector 1



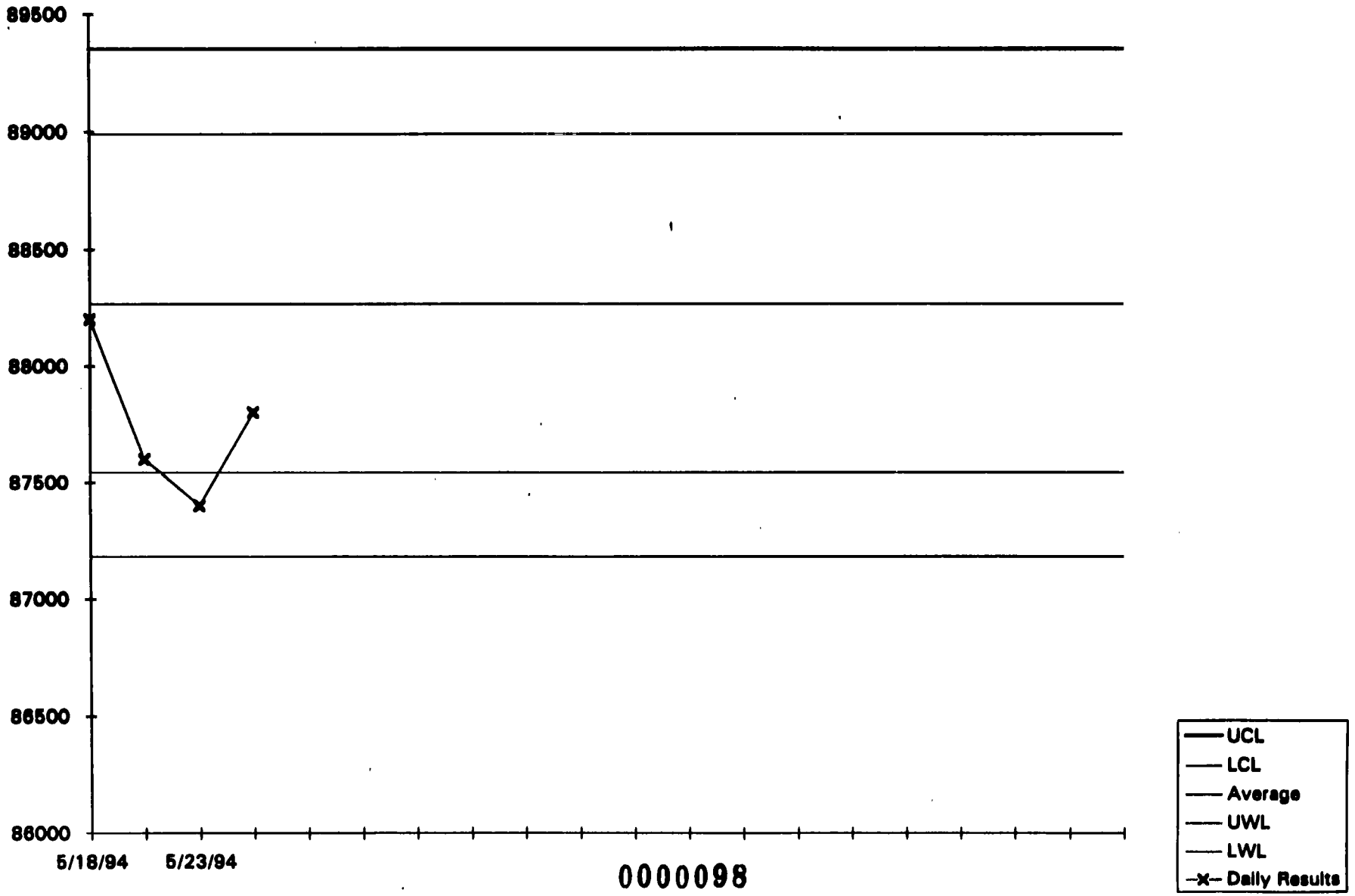
Cs137 Daily Checks For Detector 2



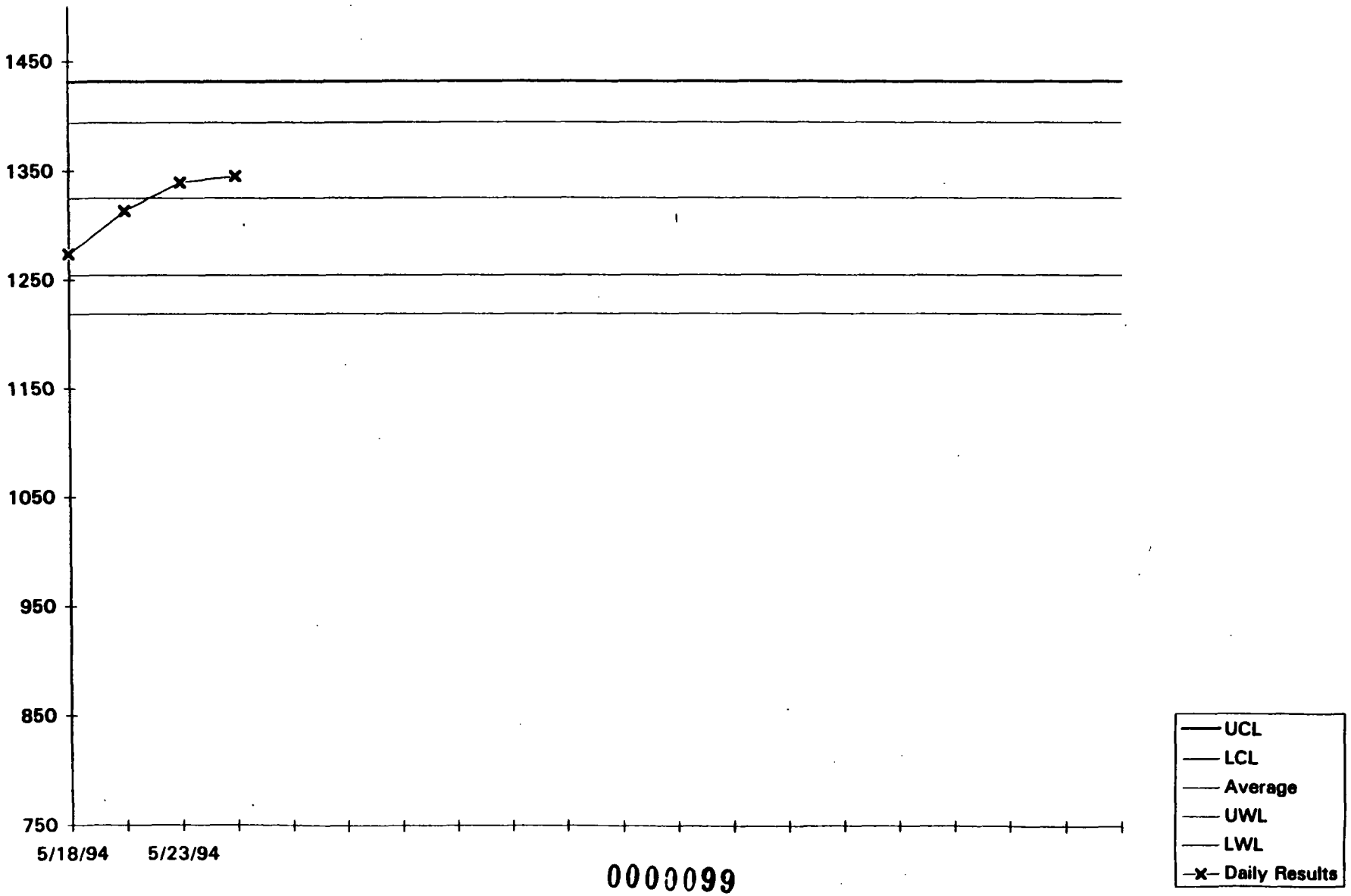
Backgrounds Daily Checks For Detector 2



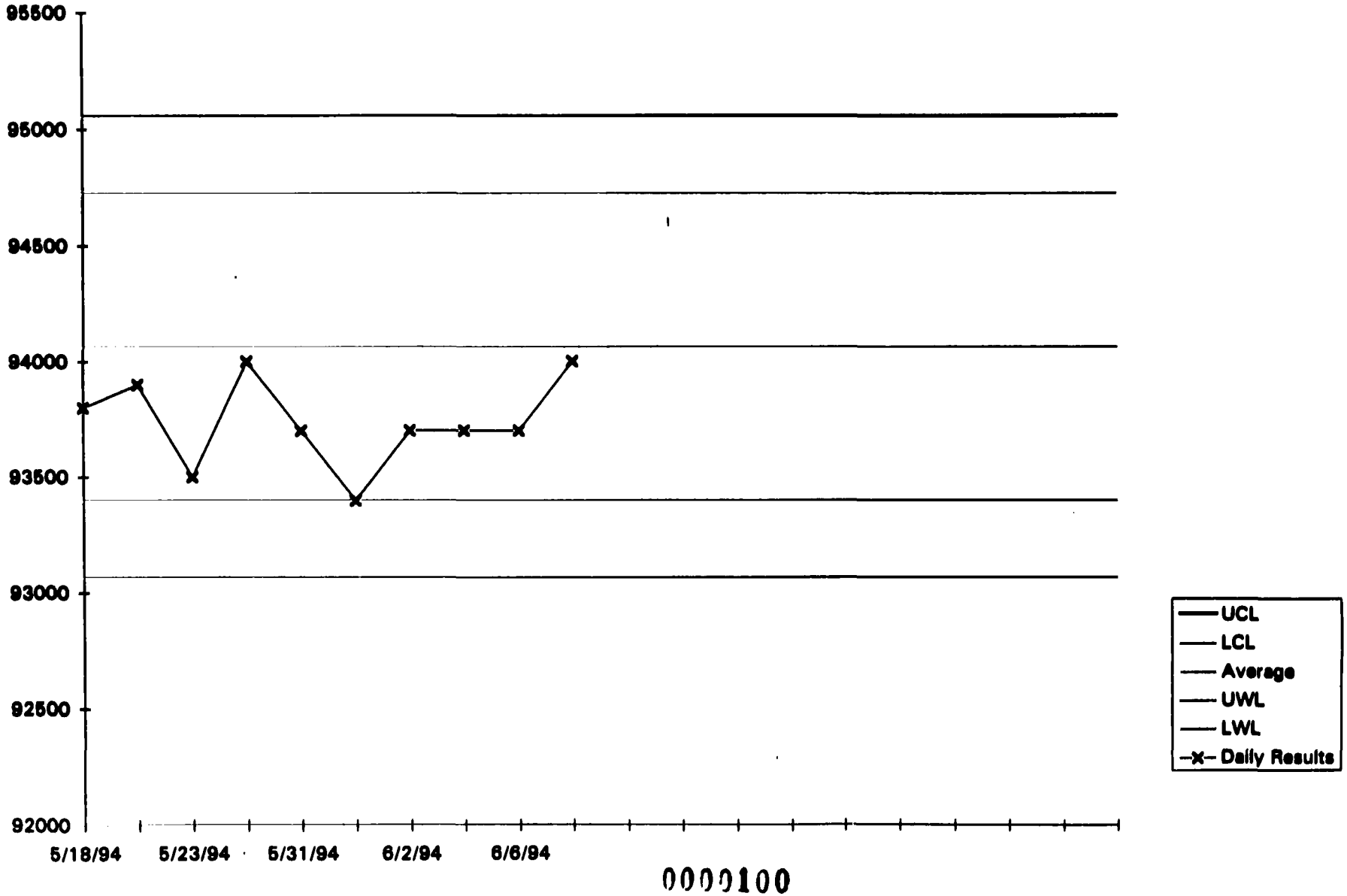
Cs137 Daily Checks For Detector 3



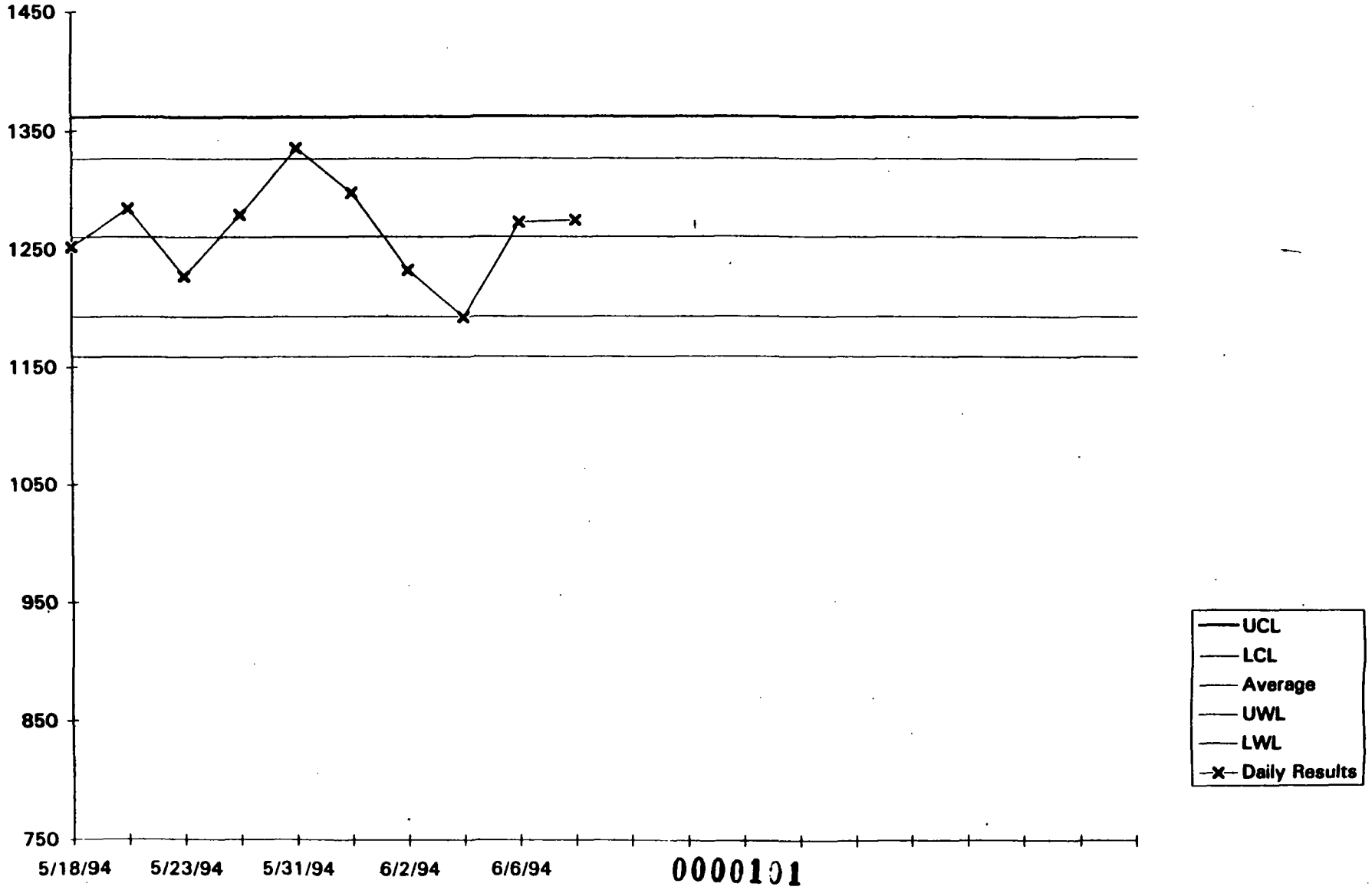
Backgrounds Daily Checks For Detector 3



Cs137 Daily Checks For Detector 4



Backgrounds Daily Checks For Detector 4



Notebook No. _____

PROJECT _____ Continued From Page _____

Date	Rig	Sample	Size	Date Rec'd	Geology	Time	ACT	Fax Time
5-24-94	537-01	5093-001 Bulk	1 mil	5-24-94	Hyc	2 M	4	933226
		5093-002				2 M	4	933227
5-31-94	060-01	LCS 37829	1.0	02-01-94	MARSH	3 M	4	933228
		LCS 36670	0.5		MARSH		4	933229
	346-01	5093-002	0.05	05-05-94	MARSH	12 H	1	933230
		002 DUP					4	933231
6-1-94	346-01	5093-003	0.05	05-05-94	MARSH	12 H	1	933232
		004					4	933233
6-3-94	346-01	5093-006	0.05	05-06-94	MARSH	12 H	1	933234
		007					4	933235
6-6-94	537-1	5179-001	45.0	5-22-94	PETRI	60 M	1	933236
		001 DUP					2	933237
		002					4	933238
	537-01	5175-003	45.0	5-22-94	PETRI	60 M	1	933239
		004					2	933240
		005					4	933241
	537-01	5175-006	45.0	5-22-94	PETRI	60 M	1	933242
		007					2	933243
		008					4	933244
	537-01	5179 009	45.0	5-22-94	PETRI	60 M	1	933245
		010					2	933246
		011					4	933247
	537-01	5179-012	45.0	5-22-94	PETRI	60 M	1	933248
	537-01	5187-001		5-23-94			2	933249
	060-01	LCS 38537		10-01-93		15 M	4	933250
	BLK-01	BLK 38537	45.0	5-31-94	PETRI	60 M	4	933251
	346-01	5093-005	0.05	5-6-94	MARSH	12 H	1	933252
	060-01	BLK 37739	0.5	5-11-94			4	933253
6-7-94	252-01	5175-003	650	5-18-94	MARSH	2 H	1	933254
		004					2	933255
	060-01	LCS 37739	0.5	02-09-94	MARSH	3 M	4	933256
	257-01	5201-001	650	5-25-94	MARSH	2 H	1	933257
		002		5-24-94			2	933258
		003					4	933259
6-8-94	060-01	LCS 38538	650	07-01-93	MARSH	3 M	1	
		BLK		31-May-94		2 H		

Continued on Page

Read and Understood By

Signed _____ Date 6-8-94

Signed _____ Date _____

INSTRUMENT PRINTOUTS

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     15:39:58
********************************************************************************
*                                                                              *
*      G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T             *
*                                                                              *
********************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933236
Sample number      :5179-001
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection       :1994-May-22    at 12:00:00
End of sample collection         :1994-May-22    at 12:00:00
Sample count started on          :1994-Jun-06    at 09:46:57
Sample count ended on            :1994-Jun-06    at 10:46:57

Irradiation/sampling time        :0 years 0 days 0 hours 0 minutes
Decay time                       :0 years 14 days 21 hours 46 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s   dead time: 0.00E+000 %

Shape calibration requested      :PETRI1
Shape calibration used           :PETRI1
                        Created  :1993-Jan-20     11:13:47
                        Modified :1993-Sep-03     01:04:36

Energy calibration requested     :DETECT1
Energy calibration used          :DETECT1
                        Created  :1993-Apr-27     16:21:17
                        Modified :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used      :PETRI1
                        Created  :1993-Jan-20     15:46:11
                        Modified :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000103

********** P E A K F I T R E P O R T **********

Spectrum file name: 933236 Sample number: 5179-001

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	148.82	74.89	1.73E+002	7.7	7.14E+001	3.97E-001	8.2	1.2
B			74.76	6.96E+000	10.0				
M	2	153.42	77.20	2.70E+002	5.9	7.02E+001	6.20E-001	6.5	1.2
B			76.92	7.71E+000	8.8				
	3	475.70	238.51	2.39E+002	6.8	4.52E+001	9.47E-001	7.3	1.5
B			238.54	2.23E+001	3.7				
	4	702.30	351.83	1.55E+002	6.7	1.24E+001	8.59E-001	7.1	1.1
B			351.84	6.77E+000	5.1				
	5	1216.62	608.93	1.05E+002	5.2	1.32E+001	9.84E-001	5.7	0.4
B			609.25	7.06E+000	5.8				
	6	2919.74	1459.96	1.29E+002	4.1	0.00E+000	2.83E+000	4.8	0.5
B			1460.65	1.67E+001	2.8				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000104

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933236 Sample number: 5179-001

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity (pCi/G)	% Error	Decay Corrected (pCi/G)	Decay Corr. 2 Sigma Error (pCi/G)
	1	K-40	0.89	1.386E+001	5.32	1.386E+001	1.446E+000
	2	PB-212	0.76	1.535E+000	4.58	1.558E+000	1.398E-001
	3	RA-226	0.40	1.238E+000	4.72	1.238E+000	1.145E-001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000105

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933236 Sample number: 5179-001

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			6	2919.74	1459.96	100.00
	2	PB-212				
			1	148.82	74.89	71.76
			2	153.42	77.20	76.33
			3	475.70	238.51	132.81
	3	RA-226				
			4	702.30	351.83	93.38
			5	1216.62	608.93	104.02

0000106

********** M D A R E P O R T **********

Spectrum file name: 933236 Sample number: 5179-001

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	6.003E-001	NA-22	1.249E-001	NA-24	1.363E-001
K-40	6.965E+000	SC-46	1.304E-001	V-48	1.362E-001
CR-51	8.769E-001	MN-54	1.159E-001	FE-59	2.977E-001
CO-56	1.243E-001	CO-57	8.201E-002	CO-58	1.314E-001
CO-60	1.703E-001	NI-65	6.003E-001	ZN-65	3.657E-001
SE-75	1.094E-001	SR-85	1.103E-001	Y-88	4.336E-002
ZR-95	2.383E-001	NB-95	1.514E-001	TC-99M	7.764E-002
RU-103	1.105E-001	RU-106	1.105E+000	AG-110M	1.447E-001
CD-109	2.296E+000	SN-113	1.544E-001	SB-124	1.144E-001
SB-125	3.832E-001	I-129	6.158E-001	I-131	1.137E-001
I-133	1.298E-001	CS-134	1.255E-001	CS-137	1.491E-001
BA-131	1.919E-001	BA-133	1.478E-001	BA-140	4.295E-001
LA-140	1.952E-001	CE-139	9.966E-002	CE-141	1.437E-001
CE-144	6.201E-001	EU-152	2.481E-001	EU-154	1.570E-001
EU-155	2.657E-001	GD-153	1.881E-001	IR-192	1.008E-001
HG-203	1.125E-001	TL-208	2.774E-001	PB-210	1.915E+000
PB-211	3.740E+000	PB-212	2.011E-001	BI-207	1.212E-001
BI-212	1.533E+000	BI-214	2.652E-001	RA-223	7.467E-001
RA-224	2.903E+000	RA-226	1.895E-001	RA-228	1.121E+000
AC-227	7.097E-001	TH-228	6.489E+000	TH-230	1.858E+001
TH-234	1.760E+000	PA-231	4.157E+000	PA-234	2.840E+001
U-234	5.724E+001	U-235	6.978E-001	AM-241	1.716E-001

0001000

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:41:06

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*********************************************************************
*                                                                   *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T   *
*                                                                   *
*********************************************************************
```

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933237
Sample number :5179-001DUP
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 09:46:57
Sample count ended on :1994-Jun-06 at 10:46:57

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 14 days 21 hours 46 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s dead time: 0.00E+000 %

Shape calibration requested :PETRI2
Shape calibration used :PETRI2
Created :1993-Jan-18 11:47:07
Modified :1993-Jul-14 16:16:37

Energy calibration requested :DETECT2
Energy calibration used :DETECT2
Created :1993-Jan-18 12:07:00
Modified :1993-Jul-09 14:14:14

Efficiency calibration requested :PETRI2
Efficiency calibration used :PETRI2
Created :1993-Jan-18 14:37:42
Modified :1993-Aug-19 10:49:12

Last search discrimination level: 5.00
Last search FROM channel 9 TO channel 4087
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000108

********** P E A K F I T R E P O R T **********

Spectrum file name: 933237 Sample number: 5179-001DUP

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	477.28	238.37	1.23E+002	10.0	5.88E+001	7.19E-001	10.4	1.2
B			238.54	1.04E+001	5.4				
	2	703.70	351.68	1.07E+002	9.2	1.31E+001	9.56E-001	9.7	1.3
B			351.88	1.27E+001	3.1				
	3	2921.75	1461.25	5.36E+001	6.2	7.80E-001	1.95E+000	6.4	0.8
B			1460.45	1.68E+001	1.6				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

60 10000

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933237 Sample number: 5179-001DUP

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	K-40	0.97	7.535E+000	9.22	7.535E+000	1.361E+000

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	477.28	238.37	6.58E-001	749.37	1260.37	11.34
2	703.70	351.68	8.43E-001	862.68	1373.68	10.86

0000110

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933237 Sample number: 5179-001DUP

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			3	2921.75	1461.25	100.00

111000

********** M D A R E P O R T **********

Spectrum file name: 933237 Sample number: 5179-001DUP

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	1.581E+000	NA-22	1.779E-001	NA-24	2.258E-001
K-40	3.469E+000	SC-46	2.701E-001	V-48	1.634E-001
CR-51	1.464E+000	MN-54	2.078E-001	FE-59	5.374E-001
CO-56	2.106E-001	CO-57	1.438E-001	CO-58	2.236E-001
CO-60	2.326E-001	NI-65	1.003E+000	ZN-65	4.013E-001
SE-75	1.670E-001	SR-85	2.312E-001	Y-88	2.099E-001
ZR-95	4.218E-001	NB-95	2.586E-001	TC-99M	1.397E-001
RU-103	1.776E-001	RU-106	1.761E+000	AG-110M	1.933E-001
CD-109	5.738E+000	SN-113	2.582E-001	SB-124	1.908E-001
SB-125	5.460E-001	I-129	7.319E+001	I-131	1.935E-001
I-133	1.865E-001	CS-134	1.923E-001	CS-137	2.156E-001
BA-131	3.269E-001	BA-133	2.428E-001	BA-140	7.549E-001
LA-140	2.344E-001	CE-139	1.322E-001	CE-141	2.368E-001
CE-144	9.598E-001	EU-152	4.021E-001	EU-154	3.044E-001
EU-155	6.784E-001	GD-153	4.959E-001	IR-192	1.635E-001
HG-203	1.993E-001	TL-208	3.817E-001	PB-210	4.655E+001
PB-211	5.190E+000	PB-212	3.160E-001	BI-207	2.015E-001
BI-212	1.840E+000	BI-214	8.554E-001	RA-223	9.328E-001
RA-224	4.155E+000	RA-226	3.344E-001	RA-228	1.624E+000
AC-227	1.246E+000	TH-228	1.744E+001	TH-230	8.286E+001
TH-234	3.609E+000	PA-231	6.600E+000	PA-234	4.357E+001
U-234	7.234E+002	U-235	1.182E+000	AM-241	1.415E+000

0000112

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:42:13

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* *
* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *
* *

****

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933238
Sample number :5179-002
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 09:46:56
Sample count ended on :1994-Jun-06 at 10:46:56

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 14 days 21 hours 46 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s dead time: 0.00E+000 %

Shape calibration requested :PETRI4
Shape calibration used :PETRI4
Created :1993-Jan-13 10:59:35
Modified :1993-Sep-03 01:11:04

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
Created :1993-Jan-13 13:19:58
Modified :1994-Jan-27 08:16:11

Efficiency calibration requested :PETRI4
Efficiency calibration used :PETRI4
Created :1993-Jun-25 14:12:16
Modified :1993-Sep-21 15:14:24

Last search discrimination level: 5.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000113

********** P E A K F I T R E P O R T **********

Spectrum file name: 933238 Sample number: 5179-002

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	150.18	75.08	1.97E+002	6.1	5.20E+001	4.64E-001	7.2	0.9
B			74.91	2.83E+001	3.4				
M	2	154.56	77.27	3.02E+002	4.7	5.35E+001	7.11E-001	6.0	0.9
B			77.09	2.34E+001	3.9				
	3	477.44	238.84	3.02E+002	6.4	1.67E+001	1.15E+000	8.0	1.8
B			238.63	3.66E+001	3.7				
	4	704.09	352.17	2.30E+002	4.6	1.77E+001	1.23E+000	7.1	0.8
B			351.86	1.99E+001	13.9				
	5	1219.14	609.64	1.60E+002	7.8	4.75E+000	1.50E+000	9.5	1.7
B			609.25	1.65E+001	2.8				
	6	2922.59	1461.36	1.02E+002	4.1	0.00E+000	2.33E+000	7.8	0.4
B			1460.60	9.05E+000	4.5				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000114

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933238 Sample number: 5179-002

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity (pCi/G)	% Error	Decay Corrected (pCi/G)	Decay Corr. 2 Sigma Error (pCi/G)
	1	K-40	0.95	1.196E+001	8.06	1.196E+001	1.889E+000
	2	PB-212	0.75	1.815E+000	4.44	1.842E+000	1.604E-001
	3	RA-226	0.40	1.785E+000	6.05	1.785E+000	2.116E-001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error

0000115

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933238 Sample number: 5179-002

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			6	2922.59	1461.36	100.00
	2	PB-212				
			1	150.18	75.08	81.42
			2	154.56	77.27	82.87
			3	477.44	238.84	133.20
	3	RA-226				
			4	704.09	352.17	98.68
			5	1219.14	609.64	102.38

0000116

********** M D A R E P O R T **********

Spectrum file name: 933238 Sample number: 5179-002

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	8.630E-001	NA-22	1.911E-001	NA-24	1.727E-001
K-40	6.471E+000	SC-46	1.684E-001	V-48	1.526E-001
CR-51	7.777E-001	MN-54	1.758E-001	FE-59	2.924E-001
CO-56	1.194E-001	CO-57	4.766E-002	CO-58	1.438E-001
CO-60	2.164E-001	NI-65	9.503E-001	ZN-65	3.918E-001
SE-75	9.134E-002	SR-85	1.309E-001	Y-88	1.642E-001
ZR-95	2.126E-001	NB-95	1.193E-001	TC-99M	7.350E-002
RU-103	1.195E-001	RU-106	1.461E+000	AG-110M	1.121E-001
CD-109	2.024E+000	SN-113	1.447E-001	SB-124	1.100E-001
SB-125	3.671E-001	I-129	7.071E-001	I-131	9.610E-002
I-133	1.396E-001	CS-134	1.032E-001	CS-137	1.612E-001
BA-131	1.905E-001	BA-133	1.351E-001	BA-140	3.638E-001
LA-140	2.331E-001	CE-139	7.749E-002	CE-141	1.129E-001
CE-144	5.170E-001	EU-152	1.682E-001	EU-154	1.154E-001
EU-155	2.029E-001	GD-153	1.416E-001	IR-192	9.854E-002
HG-203	1.068E-001	TL-208	2.625E-001	PB-210	2.313E+000
PB-211	2.909E+000	PB-212	1.555E-001	BI-207	8.893E-002
BI-212	1.591E+000	BI-214	2.367E-001	RA-223	4.703E-001
RA-224	2.377E+000	RA-226	2.348E-001	RA-228	1.143E+000
AC-227	6.255E-001	TH-228	5.696E+000	TH-230	1.570E+001
TH-234	1.919E+000	PA-231	4.204E+000	PA-234	3.861E+001
U-234	5.513E+001	U-235	6.144E-001	AM-241	1.667E-001

0000117

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SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     15:43:42
********************************************************************************
*                                                                              *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T              *
*                                                                              *
********************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933239
Sample number      :5179-003
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection        :1994-May-22    at 12:00:00
End of sample collection          :1994-May-22    at 12:00:00
Sample count started on           :1994-Jun-06    at 10:52:02
Sample count ended on             :1994-Jun-06    at 11:52:25

Irradiation/sampling time         :0 years 0 days 0 hours 0 minutes
Decay time                        :0 years 14 days 22 hours 52 minutes

Live time: 3.60E+003 s real time: 3.62E+003 s   dead time: 6.35E-001 %

Shape calibration requested       :PETRI1
Shape calibration used            :PETRI1
                        Created   :1993-Jan-20     11:13:47
                        Modified  :1993-Sep-03     01:04:36

Energy calibration requested      :DETECT1
Energy calibration used           :DETECT1
                        Created   :1993-Apr-27     16:21:17
                        Modified  :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used       :PETRI1
                        Created   :1993-Jan-20     15:46:11
                        Modified  :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000118

********** PEAK FIT REPORT **********

Spectrum file name: 933239 Sample number: 5179-003

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m?	1	68.54	34.62	5.29E+003	18.0	8.39E+002	1.53E+001	22.0	263.5
m?	2	73.56	37.14	2.90E+003	21.0	1.64E+003	7.99E+000	23.8	263.5
M?	3	78.79	39.77	2.95E+003	20.5	2.75E+003	7.83E+000	22.8	263.5
	4	92.56	46.68	1.46E+003	3.2	3.17E+003	3.59E+000	8.1	0.5
B			46.40	8.53E+000	10.7				
	5	114.89	57.88	8.91E+002	9.2	3.95E+003	2.07E+000	10.4	1.4
	6	126.38	63.64	1.17E+003	7.4	5.24E+003	2.69E+000	8.4	1.5
B			63.21	5.13E+001	12.4				
m	7	148.81	74.89	2.91E+004	2.5	6.97E+003	6.68E+001	3.9	19.8
B			74.76	6.96E+000	10.0				
M	8	153.33	77.15	4.65E+004	1.8	6.47E+003	1.07E+002	3.4	19.8
B			76.92	7.71E+000	8.8				
m	9	167.67	84.34	4.63E+003	5.1	5.09E+003	1.08E+001	5.8	8.1
B			84.12	6.39E+000	15.1				
m	10	173.45	87.24	1.54E+004	2.2	5.12E+003	3.60E+001	3.4	8.1
m	11	178.87	89.95	1.05E+004	2.9	4.91E+003	2.47E+001	3.9	8.1
M	12	185.68	93.36	1.04E+004	2.8	4.34E+003	2.46E+001	3.7	8.1
B			92.50	7.53E+001	2.0				
	13	198.03	99.55	2.62E+003	3.0	3.29E+003	6.35E+000	3.9	1.7
m	14	209.76	105.42	3.11E+003	4.9	3.50E+003	7.66E+000	5.5	5.0
M	15	216.54	108.82	7.83E+002	16.2	3.47E+003	1.95E+000	16.4	5.0
	16	229.24	115.18	1.55E+003	2.9	2.93E+003	3.94E+000	3.9	1.4
	17	256.94	129.05	4.87E+003	2.2	3.29E+003	1.30E+001	3.5	2.2
	18	306.77	153.99	1.70E+003	2.4	2.78E+003	4.99E+000	3.7	0.5
	19	370.89	186.08	2.03E+003	2.5	2.57E+003	6.71E+000	3.7	0.9
B			185.64	3.74E+001	1.7				
	20	417.07	209.18	6.98E+003	1.6	2.17E+003	2.50E+001	3.2	2.0
m	21	475.77	238.55	7.85E+004	1.0	2.08E+003	3.11E+002	2.9	13.5
B			238.54	2.23E+001	3.7				
M	22	480.80	241.06	8.26E+003	3.5	1.95E+003	3.30E+001	4.4	13.5
	23	503.72	252.52	4.56E+002	8.7	1.41E+003	1.89E+000	9.1	0.9
	24	538.91	270.12	4.90E+003	1.7	1.49E+003	2.15E+001	3.1	1.6
	25	553.24	277.29	2.75E+003	3.0	1.59E+003	1.23E+001	4.0	2.2
	26	574.76	288.06	5.21E+002	9.2	1.40E+003	2.41E+000	9.5	1.9
m	27	588.82	295.08	4.35E+003	1.4	1.32E+003	2.05E+001	2.9	1.0
B			295.08	3.42E+000	20.5				
M	28	598.60	299.98	4.23E+003	1.4	1.32E+003	2.03E+001	2.9	1.0
m	29	654.36	327.86	3.79E+003	2.1	1.29E+003	1.96E+001	3.3	2.0
M	30	663.02	332.19	3.95E+002	11.4	1.32E+003	2.07E+000	11.7	2.0
	31	674.96	338.16	1.41E+004	1.2	1.41E+003	7.49E+001	2.8	5.5
	32	702.10	351.73	7.15E+003	0.9	1.23E+003	3.95E+001	2.7	0.8
B			351.84	6.77E+000	5.1				
	33	817.17	409.26	1.75E+003	2.2	1.05E+003	1.11E+001	3.4	0.9
	34	903.90	452.62	3.65E+002	6.8	8.77E+002	2.56E+000	7.3	1.0
	35	924.16	462.74	3.68E+003	1.4	8.93E+002	2.63E+001	2.9	1.0
	36	1019.50	510.40	5.73E+003	2.3	1.07E+003	4.52E+001	3.4	4.1
B			510.89	3.70E+001	8.9				
	37	1122.95	562.11	7.74E+002	2.9	7.61E+002	6.71E+000	3.8	0.9
	38	1164.41	582.83	2.05E+004	0.9	6.72E+002	1.84E+002	2.7	2.6
B			583.08	7.72E+000	6.4				
	39	1216.66	608.95	4.68E+003	1.3	7.54E+002	4.39E+001	2.8	1.2
B			609.25	7.06E+000	5.8				

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	40	1452.49	726.81	4.57E+003	0.9	6.85E+002	5.12E+001	2.6	0.6
	41	1508.67	754.89	5.80E+002	4.5	6.56E+002	6.74E+000	5.1	0.9
m	42	1524.69	762.89	3.85E+002	7.2	5.70E+002	4.53E+000	7.6	1.2
m	43	1534.49	767.78	3.56E+002	7.4	5.46E+002	4.21E+000	7.8	1.2
M	44	1542.43	771.75	7.88E+002	4.2	5.30E+002	9.37E+000	4.8	1.2
m	45	1561.78	781.42	3.21E+002	6.4	4.41E+002	3.87E+000	6.9	0.6
M	46	1568.89	784.98	7.95E+002	3.2	4.16E+002	9.61E+000	4.0	0.6
	47	1587.77	794.41	2.25E+003	2.0	4.17E+002	2.75E+001	3.1	1.1
m	48	1659.16	830.09	2.38E+002	7.3	3.80E+002	3.05E+000	7.7	0.8
m	49	1669.36	835.19	8.42E+002	2.8	3.55E+002	1.08E+001	3.7	0.8
M	50	1678.58	839.79	5.25E+002	4.0	3.39E+002	6.79E+000	4.6	0.8
	51	1718.87	859.93	2.41E+003	1.2	2.98E+002	3.19E+001	2.6	0.8
	52	1784.97	892.95	1.90E+002	7.8	2.76E+002	2.61E+000	8.1	0.7
	53	1806.24	903.58	3.45E+002	7.9	2.85E+002	4.80E+000	8.2	1.5
	54	1820.24	910.58	1.39E+004	0.9	1.69E+002	1.94E+002	2.5	2.1
B			911.15	2.35E+000	10.0				
m	55	1927.39	964.12	2.55E+003	1.4	1.85E+002	3.77E+001	2.6	1.7
M	56	1935.73	968.29	8.01E+003	1.0	1.66E+002	1.19E+002	2.5	1.7
	57	2127.77	1064.25	1.98E+002	9.2	2.23E+002	3.22E+000	9.5	1.4
	58	2155.13	1077.92	2.27E+002	7.2	1.96E+002	3.74E+000	7.5	1.0
	59	2185.72	1093.21	3.23E+002	4.7	1.86E+002	5.40E+000	5.1	1.4
	60	2218.83	1109.75	2.13E+002	9.3	1.67E+002	3.61E+000	9.5	1.6
	61	2238.35	1119.50	8.23E+002	4.7	2.51E+002	1.41E+001	5.2	2.5
B			1120.23	2.11E+000	11.8				
	62	2474.08	1237.29	3.16E+002	5.1	1.77E+002	5.94E+000	5.5	1.0
	63	2752.97	1376.64	2.21E+002	8.4	2.07E+002	4.58E+000	8.7	1.3
	64	2916.56	1458.38	2.54E+002	7.0	1.76E+002	5.53E+000	7.4	1.0
m	65	2989.41	1494.78	3.18E+002	5.2	1.07E+002	7.09E+000	5.8	1.1
M	66	3000.62	1500.38	1.71E+002	7.9	9.48E+001	3.84E+000	8.3	1.1
	67	3023.93	1512.02	9.65E+001	14.4	1.60E+002	2.17E+000	14.6	1.1
m	68	3158.88	1579.45	2.07E+002	7.1	1.21E+002	4.84E+000	7.7	1.2
m	69	3173.99	1587.00	1.11E+003	2.8	1.33E+002	2.61E+001	4.0	1.2
M	70	3182.70	1591.35	7.40E+002	3.4	1.27E+002	1.74E+001	4.5	1.2
	71	3239.39	1619.68	4.79E+002	6.2	1.24E+002	1.14E+001	6.9	2.2
m	72	3258.86	1629.40	5.31E+002	3.3	1.10E+002	1.27E+001	4.4	0.8
M	73	3274.32	1637.13	1.51E+002	17.9	1.05E+002	3.65E+000	18.2	0.8
	74	3456.91	1728.36	1.47E+002	6.0	1.22E+002	3.71E+000	6.9	0.6
	75	3526.67	1763.21	7.51E+002	2.4	1.01E+002	1.93E+001	4.3	1.0
	76	3692.47	1846.05	1.41E+002	9.7	9.62E+001	3.76E+000	10.5	1.2

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000120

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933239 Sample number: 5179-003

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
				activity (pCi/G)			
	1	MN-54	0.98	6.503E+000	3.67	6.722E+000	4.832E-001
	2	EU-155	0.95	1.502E+001	7.54	1.510E+001	2.232E+000
	3	TL-208	0.98	1.305E+002	1.53	1.305E+002	3.920E+000
	4	PB-210	0.99	5.292E+001	8.14	5.299E+001	8.452E+000
	5	PB-212	1.00	3.172E+002	1.88	3.220E+002	1.189E+001
	6	BI-212	0.96	2.667E+002	2.10	2.707E+002	1.116E+001
	7	RA-223	0.67	6.753E+001	2.47	6.762E+001	3.271E+000
	8	RA-224	1.00	3.868E+002	5.70	3.926E+002	4.385E+001
	9	RA-226	0.97	6.068E+001	1.55	6.068E+001	1.845E+000
	10	RA-228	0.95	4.162E+002	1.48	4.183E+002	1.216E+001
	11	TH-228	0.70	5.349E+002	5.77	5.429E+002	6.138E+001
	12	TH-234	0.94	6.590E+001	5.11	6.590E+001	6.597E+000
	13	PA-231	0.35	5.923E+001	30.13	5.923E+001	3.498E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	68.54	34.62	1.53E+001	545.62	1056.62	21.97
2	73.56	37.14	7.99E+000	548.14	1059.14	23.84
3	78.79	39.77	7.83E+000	550.77	1061.77	22.82
5	114.89	57.88	2.07E+000	568.88	1079.88	10.40
11	178.87	89.95	2.47E+001	600.95	1111.95	3.86
13	198.03	99.55	6.35E+000	610.55	1121.55	3.90
15	216.54	108.82	1.95E+000	619.82	1130.82	16.40
16	229.24	115.18	3.94E+000	626.18	1137.18	3.90
17	256.94	129.05	1.30E+001	640.05	1151.05	3.49
19	370.89	186.08	6.58E+000	697.08	1208.08	3.78
20	417.07	209.18	2.50E+001	720.18	1231.18	3.18
23	503.72	252.52	1.89E+000	763.52	1274.52	9.13
26	574.76	288.06	2.41E+000	799.06	1310.06	9.55
29	654.36	327.86	1.96E+001	838.86	1349.86	3.31
30	663.02	332.19	2.07E+000	843.19	1354.19	11.67
33	817.17	409.26	1.11E+001	920.26	1431.26	3.36
34	903.90	452.62	2.56E+000	963.62	1474.62	7.28
35	924.16	462.74	2.63E+001	973.74	1484.74	2.86
37	1122.95	562.11	6.71E+000	1073.11	1584.11	3.81
41	1508.67	754.89	6.74E+000	1265.89	1776.89	5.09
42	1524.69	762.89	4.53E+000	1273.89	1784.89	7.62
43	1534.49	767.78	4.21E+000	1278.78	1789.78	7.83
44	1542.43	771.75	9.37E+000	1282.75	1793.75	4.84
45	1561.78	781.42	3.87E+000	1292.42	1803.42	6.87
47	1587.77	794.41	2.75E+001	1305.41	1816.41	3.11
48	1659.16	830.09	3.05E+000	1341.09	1852.09	7.71
50	1678.58	839.79	6.79E+000	1350.79	1861.79	4.63
52	1784.97	892.95	2.61E+000	1403.95	1914.95	8.12
53	1806.24	903.58	4.80E+000	1414.58	1925.58	8.20
55	1927.39	964.12	3.77E+001	1475.12	1986.12	2.63
57	2127.77	1064.25	3.22E+000	1575.25	2086.25	9.48
58	2155.13	1077.92	3.74E+000	1588.92	2099.92	7.53
59	2185.72	1093.21	5.40E+000	1604.21	2115.21	5.14
60	2218.83	1109.75	3.61E+000	1620.75	2131.75	9.53

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62	2474.08	1237.29	5.94E+000	1748.29	2259.29	5.55
63	2752.97	1376.64	4.58E+000	1887.64	2398.64	8.68
64	2916.56	1458.38	5.53E+000	1969.38	2480.38	7.44
65	2989.41	1494.78	7.09E+000	2005.78	2516.78	5.83
66	3000.62	1500.38	3.84E+000	2011.38	2522.38	8.26
67	3023.93	1512.02	2.17E+000	2023.02	2534.02	14.59
68	3158.88	1579.45	4.84E+000	2090.45	2601.45	7.68
69	3173.99	1587.00	2.61E+001	2098.00	2609.00	3.97
70	3182.70	1591.35	1.74E+001	2102.35	2613.35	4.46
72	3258.86	1629.40	1.27E+001	2140.40	2651.40	4.44
73	3274.32	1637.13	3.65E+000	2148.13	2659.13	18.15
74	3456.91	1728.36	3.71E+000	2239.36	2750.36	6.86
75	3526.67	1763.21	1.93E+001	2274.21	2785.21	4.29
76	3692.47	1846.05	3.76E+000	2357.05	2868.05	10.48

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933239 Sample number: 5179-003

Under determ set #	Nuclide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	MN-54				
			49	1669.36	835.19	100.00
	2	EU-155				
			10	173.45	87.24	21.45
			14	209.76	105.42	67.61
	3	TL-208				
			25	553.24	277.29	120.04
			36	1019.50	510.40	104.64
			38	1164.41	582.83	99.28
			51	1718.87	859.93	84.93
	4	PB-210				
			4	92.56	46.68	100.00
	5	PB-212				
			7	148.81	74.89	84.60
			8	153.33	77.15	88.90
			10	173.45	87.24	117.31
			21	475.77	238.55	75.75
			28	598.60	299.98	88.82
	6	BI-212				
			40	1452.49	726.81	102.44
			46	1568.89	784.98	90.99
			71	3239.39	1619.68	106.74
	7	RA-223				
			18	306.77	153.99	123.89
			24	538.91	270.12	70.26
	8	RA-224				
			22	480.80	241.06	77.07
	9	RA-226				
			22	480.80	241.06	22.93
			27	588.82	295.08	94.51
			32	702.10	351.73	95.24
			39	1216.66	608.95	106.74
			61	2238.35	1119.50	108.64
	10	RA-228				
			31	674.96	338.16	105.44
			54	1820.24	910.58	98.95
			56	1935.73	968.29	96.52
	11	TH-228				
			9	167.67	84.34	100.00
	12	TH-234				
			6	126.38	63.64	162.01
			12	185.68	93.36	24.28
	13	PA-231				
			28	598.60	299.98	11.18

0000123

********** M D A R E P O R T **********

Spectrum file name: 933239 Sample number: 5179-003

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	6.431E+000	NA-22	9.133E-001	NA-24	8.292E-001
K-40	9.591E+000	SC-46	6.931E-001	V-48	7.105E-001
CR-51	5.757E+000	MN-54	6.978E-001	FE-59	1.290E+000
CO-56	7.174E-001	CO-57	5.077E-001	CO-58	7.542E-001
CO-60	7.781E-001	NI-65	4.101E+000	ZN-65	1.541E+000
SE-75	7.948E-001	SR-85	7.453E-001	Y-88	7.838E-001
ZR-95	1.769E+000	NB-95	9.149E-001	TC-99M	5.792E-001
RU-103	7.693E-001	RU-106	8.274E+000	AG-110M	9.453E-001
CD-109	1.271E+001	SN-113	9.797E-001	SB-124	8.388E-001
SB-125	2.232E+000	I-129	5.231E+000	I-131	7.937E-001
I-133	8.698E-001	CS-134	8.322E-001	CS-137	1.093E+000
BA-131	1.472E+000	BA-133	1.023E+000	BA-140	3.092E+000
LA-140	9.138E-001	CE-139	6.784E-001	CE-141	1.047E+000
CE-144	4.351E+000	EU-152	1.538E+000	EU-154	1.082E+000
EU-155	1.525E+000	GD-153	1.439E+000	IR-192	7.095E-001
HG-203	7.753E-001	TL-208	7.927E-001	PB-210	9.678E+000
PB-211	2.421E+001	PB-212	1.150E+000	BI-207	8.407E-001
BI-212	7.099E+000	BI-214	1.593E+000	RA-223	3.574E+000
RA-224	1.264E+001	RA-226	1.481E+000	RA-228	1.923E+000
AC-227	5.803E+000	TH-228	3.868E+001	TH-230	1.491E+002
TH-234	8.174E+000	PA-231	2.153E+001	PA-234	1.427E+002
U-234	3.917E+002	U-235	4.612E+000	AM-241	1.395E+000

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SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:45:11

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* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

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IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933240
Sample number :5179-004
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 10:52:01
Sample count ended on :1994-Jun-06 at 11:52:03

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 14 days 22 hours 52 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s dead time: 5.55E-002 %

Shape calibration requested :PETRI2
Shape calibration used :PETRI2
Created :1993-Jan-18 11:47:07
Modified :1993-Jul-14 16:16:37

Energy calibration requested :DETECT2
Energy calibration used :DETECT2
Created :1993-Jan-18 12:07:00
Modified :1993-Jul-09 14:14:14

Efficiency calibration requested :PETRI2
Efficiency calibration used :PETRI2
Created :1993-Jan-18 14:37:42
Modified :1993-Aug-19 10:49:12

0000125

Last search discrimination level: 5.00
Last search FROM channel 9 TO channel 4087
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

********** P E A K F I T R E P O R T **********

Spectrum file name: 933240 Sample number: 5179-004

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	150.17	74.64	1.20E+003	3.6	6.89E+002	1.07E+001	4.6	1.5
B			74.97	3.64E+001	3.1				
M	2	154.79	76.95	1.87E+003	2.7	6.52E+002	1.53E+001	3.9	1.5
m	3	169.03	84.08	3.35E+002	9.2	5.49E+002	2.26E+000	9.6	1.2
B			84.80	2.33E+001	4.0				
m	4	174.91	87.02	8.23E+002	4.8	5.45E+002	5.19E+000	5.6	1.2
B			87.37	7.45E+000	11.1				
m	5	180.37	89.76	5.85E+002	6.4	5.35E+002	3.50E+000	7.0	1.2
M	6	186.97	93.06	5.92E+002	5.7	5.15E+002	3.34E+000	6.3	1.2
B			92.60	1.92E+001	4.5				
	7	258.80	129.02	3.27E+002	6.1	4.46E+002	1.42E+000	6.6	0.9
	8	372.55	185.96	2.93E+002	9.1	3.45E+002	1.40E+000	9.4	1.8
B			185.69	1.61E+001	4.0				
	9	418.90	209.15	5.64E+002	5.6	3.22E+002	2.95E+000	6.2	1.7
	10	477.62	238.54	6.01E+003	4.1	4.62E+002	3.53E+001	5.0	15.8
B			238.54	1.04E+001	5.4				
	11	540.76	270.14	4.46E+002	2.8	1.97E+002	2.97E+000	4.1	0.5
	12	554.82	277.18	2.85E+002	6.6	2.05E+002	1.95E+000	7.3	1.1
m	13	590.76	295.16	4.42E+002	4.6	1.86E+002	3.24E+000	5.6	1.1
B			295.15	6.47E+000	7.8				
M	14	600.64	300.11	3.54E+002	5.4	1.80E+002	2.64E+000	6.2	1.1
	15	656.23	327.92	3.53E+002	6.1	1.64E+002	2.91E+000	6.8	1.4
	16	676.93	338.28	1.11E+003	3.5	1.58E+002	9.49E+000	4.6	2.0
B			338.41	2.49E+000	16.8				
	17	704.11	351.88	7.24E+002	3.3	1.49E+002	6.45E+000	4.5	1.1
B			351.88	1.27E+001	3.1				
	18	926.17	462.99	3.14E+002	4.8	9.46E+001	3.80E+000	5.5	0.8
	19	1021.50	510.68	4.93E+002	3.6	1.23E+002	6.64E+000	4.2	0.9
B			510.88	3.04E+001	6.3				
	20	1166.61	583.28	1.58E+003	1.7	7.61E+001	2.45E+001	2.5	0.9
B			583.00	3.90E+000	7.2				
	21	1218.82	609.39	4.53E+002	4.6	7.02E+001	7.33E+000	4.9	1.4
B			609.16	1.47E+001	3.1				
	22	1454.87	727.47	3.43E+002	4.0	6.04E+001	6.60E+000	4.2	0.8
	23	1590.31	795.22	1.74E+002	8.0	3.93E+001	3.62E+000	8.1	1.6
	24	1721.47	860.83	1.79E+002	7.6	2.19E+001	4.01E+000	7.8	1.6
	25	1822.70	911.46	1.02E+003	2.4	1.62E+001	2.40E+001	2.8	1.1
B			910.99	3.82E+000	8.4				
m	26	1930.12	965.19	1.96E+002	5.5	1.06E+001	4.88E+000	5.7	1.0
M	27	1938.24	969.25	6.57E+002	2.9	4.37E+000	1.64E+001	3.2	1.0
B			968.80	1.73E+000	15.9				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000126

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933240 Sample number: 5179-004

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity (pCi/G)	% Error	Decay Corrected (pCi/G)	Decay Corr. 2 Sigma Error (pCi/G)
	1	TL-208	0.99	1.750E+001	2.04	1.750E+001	7.013E-001
	2	PB-212	1.00	4.783E+001	2.21	4.854E+001	2.098E+000
	3	BI-212	0.48	3.359E+001	4.21	3.409E+001	2.816E+000
	4	RA-223	0.25	1.330E+001	4.10	1.332E+001	1.070E+000
	5	RA-226	0.68	9.783E+000	2.89	9.783E+000	5.541E-001
	6	RA-228	0.99	5.363E+001	1.92	5.390E+001	2.024E+000
	7	TH-228	0.70	1.042E+002	10.29	1.057E+002	2.132E+001
	8	TH-234	0.25	3.589E+001	6.48	3.589E+001	4.555E+000

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
5	180.37	89.76	3.50E+000	600.76	1111.76	6.99
7	258.80	129.02	1.42E+000	640.02	1151.02	6.57
8	372.55	185.96	1.32E+000	696.96	1207.96	9.91
9	418.90	209.15	2.95E+000	720.15	1231.15	6.18
15	656.23	327.92	2.91E+000	838.92	1349.92	6.83
18	926.17	462.99	3.80E+000	973.99	1484.99	5.45
23	1590.31	795.22	3.62E+000	1306.22	1817.22	8.08
26	1930.12	965.19	4.88E+000	1476.19	1987.19	5.69

0000127

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933240 Sample number: 5179-004

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	TL-208				
			12	554.82	277.18	101.50
			19	1021.50	510.68	100.95
			20	1166.61	583.28	100.41
			24	1721.47	860.83	90.63
	2	PB-212				
			1	150.17	74.64	82.43
			2	154.79	76.95	93.53
			4	174.91	87.02	123.91
			10	477.62	238.54	100.78
			14	600.64	300.11	102.83
	3	BI-212				
			22	1454.87	727.47	100.00
	4	RA-223				
			11	540.76	270.14	100.00
	5	RA-226				
			13	590.76	295.16	98.08
			17	704.11	351.88	95.69
			21	1218.82	609.39	106.31
	6	RA-228				
			16	676.93	338.28	107.54
			25	1822.70	911.46	103.30
			27	1938.24	969.25	90.77
	7	TH-228				
			3	169.03	84.08	100.00
	8	TH-234				
			6	186.97	93.06	100.00

0000128

********** M D A R E P O R T **********

Spectrum file name: 933240 Sample number: 5179-004

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	3.967E+000	NA-22	4.886E-001	NA-24	4.592E-001
K-40	9.704E+000	SC-46	4.404E-001	V-48	4.213E-001
CR-51	3.154E+000	MN-54	6.890E-001	FE-59	7.695E-001
CO-56	4.856E-001	CO-57	3.537E-001	CO-58	5.011E-001
CO-60	4.373E-001	NI-65	2.303E+000	ZN-65	8.983E-001
SE-75	4.601E-001	SR-85	4.865E-001	Y-88	4.528E-001
ZR-95	1.071E+000	NB-95	6.140E-001	TC-99M	3.349E-001
RU-103	4.683E-001	RU-106	5.095E+000	AG-110M	5.003E-001
CD-109	1.966E+001	SN-113	6.342E-001	SB-124	4.844E-001
SB-125	1.374E+000	I-129	2.068E+002	I-131	4.680E-001
I-133	5.058E-001	CS-134	4.681E-001	CS-137	5.858E-001
BA-131	9.077E-001	BA-133	6.021E-001	BA-140	1.687E+000
LA-140	7.631E-001	CE-139	3.356E-001	CE-141	5.786E-001
CE-144	2.574E+000	EU-152	9.885E-001	EU-154	7.602E-001
EU-155	1.382E+000	GD-153	1.172E+000	IR-192	3.840E-001
HG-203	4.780E-001	TL-208	4.835E-001	PB-210	1.260E+002
PB-211	1.380E+001	PB-212	8.171E-001	BI-207	5.323E-001
BI-212	3.797E+000	BI-214	9.168E-001	RA-223	2.021E+000
RA-224	1.578E+001	RA-226	8.716E-001	RA-228	1.151E+000
AC-227	3.838E+000	TH-228	3.744E+001	TH-230	2.482E+002
TH-234	6.903E+000	PA-231	1.269E+001	PA-234	7.259E+001
U-234	1.848E+003	U-235	2.833E+000	AM-241	4.036E+000

0001129

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:46:52

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* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

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IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933241
Sample number :5179-005
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 10:52:02
Sample count ended on :1994-Jun-06 at 11:53:44

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 14 days 22 hours 52 minutes

Live time: 3.60E+003 s real time: 3.70E+003 s dead time: 2.76E+000 %

Shape calibration requested :PETRI4
Shape calibration used :PETRI4
  Created :1993-Jan-13 10:59:35
  Modified :1993-Sep-03 01:11:04

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
  Created :1993-Jan-13 13:19:58
  Modified :1994-Jan-27 08:16:11

Efficiency calibration requested :PETRI4
Efficiency calibration used :PETRI4
  Created :1993-Jun-25 14:12:16
  Modified :1993-Sep-21 15:14:24

Last search discrimination level: 5.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000130

********** PEAK FIT REPORT **********

Spectrum file name: 933241 Sample number: 5179-005

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m?	1	67.42	33.56	1.80E+004	22.1	1.18E+003	5.80E+001	33.7	1310.4
m?	2	69.94	34.83	2.86E+004	18.8	1.76E+003	8.95E+001	29.9	1310.4
m?	3	75.41	37.58	1.74E+004	20.5	3.38E+003	5.17E+001	28.1	1310.4
m?	4	79.63	39.70	1.29E+004	22.5	4.97E+003	3.71E+001	28.0	1310.4
M?	5	85.13	42.46	2.65E+003	20.0	7.50E+003	7.31E+000	24.3	1310.4
	6	93.64	46.73	1.78E+003	113.5	7.81E+003	4.70E+000	113.9	2.4
B			46.58	2.83E+001	7.3				
	7	116.11	58.00	2.73E+003	6.3	9.13E+003	6.67E+000	8.4	3.2
	8	127.49	63.71	3.63E+003	6.0	1.18E+004	8.70E+000	7.5	5.3
B			63.30	7.86E+001	1.8				
m	9	146.16	73.06	6.17E+003	10.6	1.46E+004	1.46E+001	11.3	26.2
B			72.90	9.72E+000	7.9				
m	10	150.11	75.04	1.02E+005	1.4	1.47E+004	2.42E+002	4.1	26.2
B			74.91	2.83E+001	3.4				
m	11	154.66	77.32	1.61E+005	1.1	1.44E+004	3.80E+002	3.9	26.2
B			77.09	2.34E+001	3.9				
	12	160.66	80.33	0.00E+000	0.0	0.00E+000	0.00E+000	0.0	26.2
M	13	162.46	81.23	8.39E+002	25.8	1.27E+004	1.98E+000	26.1	26.2
m?	14	169.07	84.54	1.56E+004	11.7	1.38E+004	3.68E+001	12.3	168.0
B			84.45	1.03E+001	13.3				
m?	15	174.80	87.41	5.31E+004	5.0	1.47E+004	1.26E+002	6.3	168.0
B			87.60	1.08E+001	18.9				
M?	16	180.24	90.13	4.25E+004	5.8	1.41E+004	1.01E+002	7.0	168.0
B			90.01	1.67E+000	23.9				
	17	187.04	93.54	4.67E+004	3.8	1.20E+004	1.12E+002	5.4	91.3
B			92.58	9.80E+001	4.2				
	18	199.36	99.71	9.64E+003	2.4	9.70E+003	2.34E+001	4.6	4.2
?	19	211.26	105.67	1.17E+004	9.8	1.12E+004	2.86E+001	10.5	112.7
	20	217.72	108.90	4.11E+003	12.6	1.02E+004	1.02E+001	13.2	30.0
	21	230.68	115.39	5.72E+003	2.1	8.61E+003	1.44E+001	4.5	1.6
m	22	258.42	129.28	2.10E+004	0.6	8.72E+003	5.51E+001	4.0	0.9
M	23	263.39	131.76	1.37E+003	5.3	8.64E+003	3.63E+000	6.6	0.9
	24	291.97	146.06	1.18E+003	9.0	8.41E+003	3.27E+000	9.8	1.8
	25	308.21	154.19	7.09E+003	1.7	8.02E+003	2.02E+001	4.4	1.5
	26	333.40	166.79	1.14E+003	8.5	7.59E+003	3.39E+000	9.5	1.6
	27	372.36	186.28	5.02E+003	3.7	7.94E+003	1.60E+001	5.7	3.9
B			185.72	4.68E+001	1.4				
	28	383.02	191.62	8.21E+002	11.6	7.30E+003	2.67E+000	12.4	1.3
	29	399.05	199.64	2.41E+003	9.1	6.88E+003	8.04E+000	10.1	1.1
	30	418.73	209.48	3.10E+004	0.9	6.94E+003	1.07E+002	4.6	4.0
	31	432.16	216.19	2.31E+003	3.2	6.64E+003	8.17E+000	5.6	0.9
m	32	477.48	238.86	3.49E+005	1.0	6.41E+003	1.33E+003	4.9	95.0
B			238.63	3.66E+001	3.7				
M	33	482.33	241.28	3.34E+004	4.0	6.11E+003	1.28E+002	6.3	95.0
B			241.78	5.24E+000	16.1				
	34	505.50	252.87	1.57E+003	3.2	5.04E+003	6.27E+000	5.9	1.2
	35	540.70	270.47	2.15E+004	0.7	4.98E+003	9.08E+001	5.1	2.2
	36	554.96	277.61	1.24E+004	2.3	5.13E+003	5.36E+001	5.6	7.4
	37	576.53	288.39	2.20E+003	3.9	4.67E+003	9.80E+000	6.4	1.7
	38	590.68	295.47	1.15E+004	1.2	4.65E+003	5.23E+001	5.3	1.8
B			295.16	1.19E+001	3.9				
	39	600.49	300.37	1.94E+004	0.8	4.55E+003	8.95E+001	5.2	2.1

0000131

	40	643.47	321.86	1.21E+003	3.8	4.42E+003	5.93E+000	6.5	0.4
	41	656.25	328.25	1.61E+004	1.8	4.55E+003	8.06E+001	5.6	7.7
	42	665.01	332.63	1.98E+003	3.2	4.53E+003	1.00E+001	6.2	1.1
m	43	676.90	338.57	6.45E+004	0.5	4.37E+003	3.32E+002	5.3	2.6
B			338.46	2.08E+000	21.3				
M	44	682.17	341.21	2.00E+003	5.6	4.27E+003	1.04E+001	7.7	2.6
	45	704.12	352.18	1.95E+004	0.7	4.28E+003	1.04E+002	5.4	1.4
B			351.86	1.99E+001	13.9				
	46	754.89	377.56	5.92E+002	18.9	4.59E+003	3.38E+000	19.7	3.3
	47	819.27	409.75	8.34E+003	2.7	3.77E+003	5.16E+001	6.1	0.8
	48	906.07	453.14	1.65E+003	3.3	3.29E+003	1.13E+001	6.4	0.7
	49	926.43	463.32	1.70E+004	0.8	3.17E+003	1.19E+002	5.5	1.7
	50	1021.93	511.06	2.42E+004	2.4	4.16E+003	1.87E+002	5.9	19.4
B			510.92	4.26E+001	9.4				
m	51	1093.50	546.84	7.08E+002	5.3	3.07E+003	5.89E+000	7.6	0.5
M	52	1100.14	550.16	5.10E+002	7.3	3.07E+003	4.27E+000	9.1	0.5
	53	1125.58	562.87	3.05E+003	1.5	3.03E+003	2.61E+001	5.6	0.4
	54	1142.20	571.18	4.36E+002	25.6	3.34E+003	3.80E+000	26.2	4.2
	55	1166.94	583.55	9.09E+004	0.7	3.09E+003	8.10E+002	5.5	7.4
B			583.13	1.10E+001	2.2				
	56	1219.22	609.68	1.28E+004	0.9	3.07E+003	1.19E+002	5.5	1.5
B			609.25	1.65E+001	2.8				
	57	1404.39	702.25	6.50E+002	7.2	3.31E+003	7.06E+000	9.1	0.9
	58	1455.31	727.70	2.02E+004	0.7	2.72E+003	2.27E+002	5.7	3.2
B			727.22	2.91E+000	10.5				
	59	1511.46	755.77	2.67E+003	2.5	2.57E+003	3.13E+001	6.2	1.5
m	60	1527.53	763.80	1.46E+003	3.3	2.48E+003	1.73E+001	6.5	0.8
m	61	1537.59	768.83	1.07E+003	4.7	2.34E+003	1.27E+001	7.4	0.8
M	62	1545.48	772.78	3.39E+003	1.9	2.22E+003	4.07E+001	6.0	0.8
m	63	1565.11	782.59	1.19E+003	3.5	1.96E+003	1.45E+001	6.7	0.8
M	64	1571.95	786.01	2.91E+003	1.8	1.90E+003	3.56E+001	6.0	0.8
	65	1590.71	795.39	1.01E+004	0.7	1.84E+003	1.25E+002	5.8	0.7
m	66	1661.93	830.99	1.25E+003	3.3	1.54E+003	1.62E+001	6.6	1.4
m	67	1672.31	836.18	3.75E+003	1.8	1.49E+003	4.90E+001	6.1	1.4
M	68	1681.58	840.82	2.08E+003	2.7	1.42E+003	2.73E+001	6.4	1.4
	69	1722.02	861.04	1.08E+004	0.7	1.26E+003	1.45E+002	5.9	0.8
B			860.56	1.57E+000	20.5				
	70	1787.70	893.87	8.15E+002	4.3	1.15E+003	1.14E+001	7.3	1.0
	71	1809.39	904.71	1.41E+003	3.8	1.24E+003	2.00E+001	7.1	1.5
	72	1823.37	911.71	6.09E+004	0.7	9.23E+002	8.71E+002	6.0	5.8
B			910.91	3.81E+000	7.4				
	73	1869.30	934.67	6.59E+002	5.4	1.02E+003	9.67E+000	8.1	0.8
	74	1918.19	959.11	5.91E+002	13.4	1.06E+003	8.92E+000	14.7	5.5
m	75	1930.56	965.30	1.09E+004	1.7	8.21E+002	1.65E+002	6.3	4.4
M	76	1938.96	969.49	3.54E+004	0.9	7.51E+002	5.40E+002	6.1	4.4
B			968.88	1.72E+000	17.4				
m	77	2002.91	1001.47	3.62E+002	6.9	9.59E+002	5.71E+000	9.2	0.5
B			1000.90	2.53E+000	9.0				
M	78	2010.07	1005.05	4.09E+002	6.2	9.44E+002	6.48E+000	8.7	0.5
	79	2067.30	1033.66	4.43E+002	4.8	8.13E+002	7.22E+000	7.8	0.6
	80	2131.28	1065.65	7.95E+002	6.6	9.81E+002	1.34E+001	9.1	2.4
	81	2158.67	1079.35	9.87E+002	3.0	8.28E+002	1.68E+001	6.9	0.7
	82	2188.98	1094.50	1.34E+003	4.3	9.25E+002	2.32E+001	7.6	2.2
	83	2222.19	1111.11	9.60E+002	3.7	7.96E+002	1.68E+001	7.3	1.1
	84	2241.78	1120.91	2.37E+003	4.1	1.00E+003	4.18E+001	7.5	3.8
B			1120.15	4.26E+000	6.3				
	85	2477.35	1238.70	9.13E+002	3.2	7.65E+002	1.78E+001	7.2	0.8
B			1237.92	1.41E+000	16.7				
	86	2494.86	1247.45	7.37E+002	9.4	8.94E+002	1.45E+001	11.4	4.5

0000132

m	87	2749.64	1374.86	4.80E+002	6.0	7.55E+002	1.03E+001	8.9	0.7
M	88	2756.94	1378.51	6.75E+002	4.4	7.38E+002	1.46E+001	7.9	0.7
m	89	2804.51	1402.30	2.83E+002	8.3	7.12E+002	6.21E+000	10.6	0.8
M	90	2817.20	1408.65	3.39E+002	6.8	6.90E+002	7.46E+000	9.5	0.8
	91	2919.51	1459.82	1.17E+003	2.5	6.38E+002	2.66E+001	7.1	0.8
B			1460.60	9.05E+000	4.5				
m	92	2993.18	1496.66	1.49E+003	2.2	5.06E+002	3.47E+001	7.1	0.9
M	93	3004.48	1502.32	7.51E+002	3.6	4.99E+002	1.75E+001	7.7	0.9
	94	3026.92	1513.54	4.97E+002	7.9	6.37E+002	1.17E+001	10.4	1.9
m	95	3162.34	1581.27	8.26E+002	5.3	5.42E+002	2.02E+001	8.7	2.0
m	96	3177.75	1588.98	4.87E+003	1.7	5.94E+002	1.19E+002	7.1	2.0
M	97	3185.94	1593.07	3.36E+003	2.0	5.85E+002	8.25E+001	7.2	2.0
B			1592.74	1.28E+000	14.3				
m	98	3242.83	1621.53	2.22E+003	1.9	5.08E+002	5.54E+001	7.3	1.2
m	99	3251.27	1625.75	4.31E+002	5.7	5.03E+002	1.08E+001	9.1	1.2
m	100	3262.59	1631.41	2.34E+003	1.9	4.99E+002	5.87E+001	7.3	1.2
M	101	3277.80	1639.02	6.99E+002	4.2	4.98E+002	1.76E+001	8.2	1.2
	102	3334.09	1667.18	2.50E+002	11.6	5.19E+002	6.39E+000	13.7	1.6
	103	3460.51	1730.42	4.61E+002	4.5	4.86E+002	1.21E+001	8.6	0.7
	104	3530.47	1765.42	1.97E+003	1.5	5.14E+002	5.27E+001	7.7	0.6
	105	3696.15	1848.30	2.73E+002	9.4	5.47E+002	7.57E+000	12.3	1.0

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000133

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933241 Sample number: 5179-005

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	K-40	0.85	1.488E+002	7.14	1.488E+002	2.083E+001
	2	I-129	1.00	2.810E+002	21.56	2.810E+002	1.188E+002
	3	CE-139	0.87	2.532E+000	9.48	2.730E+000	5.075E-001
	4	CE-141	0.94	4.061E+000	9.83	5.587E+000	1.076E+000
	5	EU-155	0.92	4.491E+001	17.47	4.516E+001	1.546E+001
	6	TL-208	0.97	5.437E+002	2.88	5.437E+002	3.072E+001
	7	PB-212	0.99	1.230E+003	2.48	1.249E+003	6.063E+001
	8	BI-212	0.94	1.139E+003	3.58	1.156E+003	8.122E+001
	9	RA-224	0.99	1.638E+003	7.48	1.663E+003	2.438E+002
	10	RA-226	0.98	1.623E+002	2.89	1.623E+002	9.177E+000
	11	RA-228	0.96	1.845E+003	3.34	1.855E+003	1.215E+002
	12	TH-228	1.00	2.006E+003	5.08	2.036E+003	2.028E+002
	13	TH-234	0.91	1.595E+002	6.35	1.595E+002	1.986E+001
	14	PA-231	0.35	5.141E+002	25.43	5.141E+002	2.563E+002
	15	PA-234	0.52	5.785E+002	9.23	5.785E+002	1.047E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
2	69.94	34.83	8.95E+001	545.83	1056.83	29.86
3	75.41	37.58	5.17E+001	548.58	1059.58	28.09
5	85.13	42.46	7.31E+000	553.46	1064.46	24.28
7	116.11	58.00	6.67E+000	569.00	1080.00	8.38
9	146.16	73.06	1.46E+001	584.06	1095.06	11.28
13	162.46	81.23	1.98E+000	592.23	1103.23	26.11
16	180.24	90.13	1.01E+002	601.13	1112.13	6.98
18	199.36	99.71	2.34E+001	610.71	1121.71	4.57
20	217.72	108.90	1.02E+001	619.90	1130.90	13.21
21	230.68	115.39	1.44E+001	626.39	1137.39	4.46
22	258.42	129.28	5.51E+001	640.28	1151.28	3.98
23	263.39	131.76	3.63E+000	642.76	1153.76	6.62
25	308.21	154.19	2.02E+001	665.19	1176.19	4.37
27	372.36	186.28	1.59E+001	697.28	1208.28	5.68
28	383.02	191.62	2.67E+000	702.62	1213.62	12.38
29	399.05	199.64	8.04E+000	710.64	1221.64	10.10
30	418.73	209.48	1.07E+002	720.48	1231.48	4.62
34	505.50	252.87	6.27E+000	763.87	1274.87	5.85
35	540.70	270.47	9.08E+001	781.47	1292.47	5.07
37	576.53	288.39	9.80E+000	799.39	1310.39	6.43
40	643.47	321.86	5.93E+000	832.86	1343.86	6.50
41	656.25	328.25	8.06E+001	839.25	1350.25	5.60
42	665.01	332.63	1.00E+001	843.63	1354.63	6.19
44	682.17	341.21	1.04E+001	852.21	1363.21	7.71
46	754.89	377.56	3.38E+000	888.56	1399.56	19.68
47	819.27	409.75	5.16E+001	920.75	1431.75	6.05
48	906.07	453.14	1.13E+001	964.14	1475.14	6.35
49	926.43	463.32	1.19E+002	974.32	1485.32	5.48
51	1093.50	546.84	5.89E+000	1057.84	1568.84	7.55
52	1100.14	550.16	4.27E+000	1061.16	1572.16	9.08
53	1125.58	562.87	2.61E+001	1073.87	1584.87	5.64
54	1142.20	571.18	3.80E+000	1082.18	1593.18	26.16

0000134

57	1404.39	702.25	7.06E+000	1213.25	1724.25	9.12
59	1511.46	755.77	3.13E+001	1266.77	1777.77	6.17
60	1527.53	763.80	1.73E+001	1274.80	1785.80	6.54
61	1537.59	768.83	1.27E+001	1279.83	1790.83	7.35
62	1545.48	772.78	4.07E+001	1283.78	1794.78	6.00
63	1565.11	782.59	1.45E+001	1293.59	1804.59	6.69
65	1590.71	795.39	1.25E+002	1306.39	1817.39	5.76
66	1661.93	830.99	1.62E+001	1341.99	1852.99	6.65
67	1672.31	836.18	4.90E+001	1347.18	1858.18	6.07
68	1681.58	840.82	2.73E+001	1351.82	1862.82	6.41
70	1787.70	893.87	1.14E+001	1404.87	1915.87	7.34
71	1809.39	904.71	2.00E+001	1415.71	1926.71	7.07
73	1869.30	934.67	9.67E+000	1445.67	1956.67	8.06
74	1918.19	959.11	8.92E+000	1470.11	1981.11	14.71
75	1930.56	965.30	1.65E+002	1476.30	1987.30	6.27
78	2010.07	1005.05	6.48E+000	1516.05	2027.05	8.67
79	2067.30	1033.66	7.22E+000	1544.66	2055.66	7.82
80	2131.28	1065.65	1.34E+001	1576.65	2087.65	9.07
81	2158.67	1079.35	1.68E+001	1590.35	2101.35	6.91
82	2188.98	1094.50	2.32E+001	1605.50	2116.50	7.58
83	2222.19	1111.11	1.68E+001	1622.11	2133.11	7.27
85	2477.35	1238.70	1.78E+001	1749.70	2260.70	7.19
86	2494.86	1247.45	1.45E+001	1758.45	2269.45	11.37
87	2749.64	1374.86	1.03E+001	1885.86	2396.86	8.89
88	2756.94	1378.51	1.46E+001	1889.51	2400.51	7.91
89	2804.51	1402.30	6.21E+000	1913.30	2424.30	10.63
90	2817.20	1408.65	7.46E+000	1919.65	2430.65	9.47
92	2993.18	1496.66	3.47E+001	2007.66	2518.66	7.11
93	3004.48	1502.32	1.75E+001	2013.32	2524.32	7.66
94	3026.92	1513.54	1.17E+001	2024.54	2535.54	10.41
95	3162.34	1581.27	2.02E+001	2092.27	2603.27	8.72
96	3177.75	1588.98	1.19E+002	2099.98	2610.98	7.13
97	3185.94	1593.07	8.25E+001	2104.07	2615.07	7.24
99	3251.27	1625.75	1.08E+001	2136.75	2647.75	9.07
100	3262.59	1631.41	5.87E+001	2142.41	2653.41	7.28
101	3277.80	1639.02	1.76E+001	2150.02	2661.02	8.20
102	3334.09	1667.18	6.39E+000	2178.18	2689.18	13.67
103	3460.51	1730.42	1.21E+001	2241.42	2752.42	8.62
104	3530.47	1765.42	5.27E+001	2276.42	2787.42	7.66
105	3696.15	1848.30	7.57E+000	2359.30	2870.30	12.28

0000135

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933241 Sample number: 5179-005

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			91	2919.51	1459.82	100.00
	2	I-129				
			1	67.42	33.56	106.52
			4	79.63	39.70	94.94
	3	CE-139				
			26	333.40	166.79	100.00
	4	CE-141				
			24	291.97	146.06	100.00
	5	EU-155				
			15	174.80	87.41	18.32
			19	211.26	105.67	54.06
	6	TL-208				
			36	554.96	277.61	114.82
			50	1021.93	511.06	104.55
			55	1166.94	583.55	94.12
			69	1722.02	861.04	77.69
	7	PB-212				
			10	150.11	75.04	90.76
			11	154.66	77.32	97.00
			15	174.80	87.41	129.96
			32	477.48	238.86	68.75
			39	600.49	300.37	78.01
	8	BI-212				
			58	1455.31	727.70	98.52
			64	1571.95	786.01	105.10
			98	3242.83	1621.53	94.19
	9	RA-224				
			33	482.33	241.28	84.19
	10	RA-226				
			33	482.33	241.28	15.81
			38	590.68	295.47	99.28
			45	704.12	352.18	96.54
			56	1219.22	609.68	105.23
			84	2241.78	1120.91	97.75
	11	RA-228				
			43	676.90	338.57	105.50
			72	1823.37	911.71	97.71
			76	1938.96	969.49	94.42
	12	TH-228				
			14	169.07	84.54	109.81
			31	432.16	216.19	97.73
	13	TH-234				
			8	127.49	63.71	118.57
			17	187.04	93.54	12.87
	14	PA-231				
			39	600.49	300.37	21.99
	15	PA-234				
			77	2002.91	1001.47	100.00

JJ0136

********** M D A R E P O R T **********

Spectrum file name: 933241 Sample number: 5179-005

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	1.285E+001	NA-22	1.723E+000	NA-24	1.760E+000
K-40	1.546E+001	SC-46	1.465E+000	V-48	1.654E+000
CR-51	1.122E+001	MN-54	2.272E+000	FE-59	2.782E+000
CO-56	1.494E+000	CO-57	7.707E-001	CO-58	1.568E+000
CO-60	1.598E+000	NI-65	8.194E+000	ZN-65	3.085E+000
SE-75	1.386E+000	SR-85	1.408E+000	Y-88	1.677E+000
ZR-95	3.046E+000	NB-95	1.928E+000	TC-99M	9.901E-001
RU-103	1.457E+000	RU-106	1.775E+001	AG-110M	2.003E+000
CD-109	2.174E+001	SN-113	1.980E+000	SB-124	1.539E+000
SB-125	4.201E+000	I-129	2.378E+000	I-131	1.468E+000
I-133	1.793E+000	CS-134	1.555E+000	CS-137	1.973E+000
BA-131	2.717E+000	BA-133	1.904E+000	BA-140	6.011E+000
LA-140	2.210E+000	CE-139	9.048E-001	CE-141	1.474E+000
CE-144	7.551E+000	EU-152	2.677E+000	EU-154	1.661E+000
EU-155	2.613E+000	GD-153	2.538E+000	IR-192	1.305E+000
HG-203	1.658E+000	TL-208	1.661E+000	PB-210	1.621E+001
PB-211	4.007E+001	PB-212	1.925E+000	BI-207	1.525E+000
BI-212	1.406E+001	BI-214	3.157E+000	RA-223	1.063E+001
RA-224	2.136E+001	RA-226	2.648E+000	RA-228	4.469E+000
AC-227	8.449E+000	TH-228	6.453E+001	TH-230	2.520E+002
TH-234	1.361E+001	PA-231	3.811E+001	PA-234	2.360E+002
U-234	6.790E+002	U-235	7.964E+000	AM-241	2.353E+000

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     15:48:33
*****************************************************************************
*                                                                           *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T           *
*                                                                           *
*****************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933242
Sample number      :5179-006
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection       :1994-May-22    at 12:00:00
End of sample collection         :1994-May-22    at 12:00:00
Sample count started on          :1994-Jun-06    at 12:05:50
Sample count ended on            :1994-Jun-06    at 13:05:54

Irradiation/sampling time        :0 years 0 days 0 hours 0 minutes
Decay time                       :0 years 15 days 0 hours 5 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s   dead time: 1.11E-001 %

Shape calibration requested      :PETRI1
Shape calibration used           :PETRI1
                        Created  :1993-Jan-20     11:13:47
                        Modified :1993-Sep-03     01:04:36

Energy calibration requested     :DETECT1
Energy calibration used          :DETECT1
                        Created  :1993-Apr-27     16:21:17
                        Modified :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used      :PETRI1
                        Created  :1993-Jan-20     15:46:11
                        Modified :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000138

********** PEAK FIT REPORT **********

Spectrum file name: 933242 Sample number: 5179-006

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	79.37	40.06	3.94E+002	6.7	5.96E+002	1.04E+000	12.0	0.7
	2	92.57	46.68	5.10E+002	3.9	5.59E+002	1.26E+000	8.4	0.4
B			46.40	8.53E+000	10.7				
m	3	148.87	74.92	5.21E+003	2.8	1.27E+003	1.20E+001	4.1	4.4
B			74.76	6.96E+000	10.0				
M	4	153.42	77.20	8.17E+003	2.0	1.16E+003	1.88E+001	3.5	4.4
B			76.92	7.71E+000	8.8				
m	5	167.85	84.43	7.35E+002	7.4	8.91E+002	1.71E+000	7.8	2.5
B			84.12	6.39E+000	15.1				
m	6	173.55	87.29	2.60E+003	3.0	8.93E+002	6.09E+000	4.0	2.5
m	7	178.98	90.01	1.61E+003	4.3	8.63E+002	3.80E+000	5.0	2.5
M	8	185.60	93.32	1.66E+003	4.0	7.88E+002	3.95E+000	4.7	2.5
B			92.50	7.53E+001	2.0				
	9	198.03	99.55	4.73E+002	7.7	5.82E+002	1.14E+000	8.1	1.8
	10	209.66	105.37	4.40E+002	6.7	6.24E+002	1.08E+000	7.1	2.9
	11	229.15	115.13	2.30E+002	7.4	5.24E+002	5.85E-001	7.8	0.6
	12	257.13	129.14	7.45E+002	4.0	5.62E+002	1.99E+000	4.9	1.0
	13	306.94	154.07	2.63E+002	6.5	4.84E+002	7.71E-001	7.1	0.8
	14	370.93	186.10	5.24E+002	4.0	4.77E+002	1.73E+000	4.9	0.7
B			185.64	3.74E+001	1.7				
	15	417.18	209.24	1.05E+003	3.3	3.93E+002	3.78E+000	4.3	1.4
m	16	475.85	238.59	1.21E+004	1.4	4.19E+002	4.78E+001	3.1	4.0
B			238.54	2.23E+001	3.7				
M	17	480.99	241.16	1.26E+003	5.7	3.98E+002	5.02E+000	6.3	4.0
	18	538.86	270.10	7.58E+002	2.9	2.46E+002	3.32E+000	3.9	0.8
	19	553.28	277.31	4.21E+002	5.9	2.79E+002	1.89E+000	6.5	1.6
m	20	588.91	295.13	1.09E+003	2.6	2.16E+002	5.14E+000	3.7	0.9
B			295.08	3.42E+000	20.5				
M	21	598.73	300.04	6.64E+002	3.6	2.28E+002	3.18E+000	4.4	0.9
	22	654.35	327.85	5.67E+002	3.3	2.36E+002	2.94E+000	4.2	0.8
	23	674.97	338.17	2.27E+003	1.8	2.46E+002	1.21E+001	3.1	1.2
	24	702.13	351.75	1.74E+003	2.1	2.11E+002	9.64E+000	3.3	1.2
B			351.84	6.77E+000	5.1				
	25	816.94	409.15	2.96E+002	4.6	1.57E+002	1.89E+000	5.3	0.5
	26	924.22	462.78	5.82E+002	4.1	1.48E+002	4.17E+000	4.8	1.4
	27	1019.48	510.39	9.01E+002	1.8	1.72E+002	7.10E+000	3.1	1.1
B			510.89	3.70E+001	8.9				
	28	1164.39	582.82	3.23E+003	1.0	1.29E+002	2.90E+001	2.7	0.5
B			583.08	7.72E+000	6.4				
	29	1216.71	608.97	1.18E+003	2.1	1.02E+002	1.11E+001	3.3	0.7
B			609.25	7.06E+000	5.8				
	30	1452.37	726.75	7.22E+002	1.6	1.20E+002	8.08E+000	2.9	1.4
	31	1587.83	794.44	3.46E+002	4.7	6.48E+001	4.24E+000	5.3	0.9
	32	1669.37	835.19	1.33E+002	12.8	7.84E+001	1.71E+000	13.1	2.0
	33	1718.97	859.97	3.67E+002	2.8	5.63E+001	4.85E+000	3.6	0.4
	34	1820.27	910.59	2.14E+003	1.4	2.96E+001	3.00E+001	2.7	0.7
B			911.15	2.35E+000	10.0				
m	35	1927.43	964.14	4.35E+002	5.0	3.93E+001	6.45E+000	5.5	1.7
M	36	1935.68	968.27	1.26E+003	2.9	4.20E+001	1.87E+001	3.7	1.7
	37	2238.29	1119.47	2.07E+002	8.1	3.38E+001	3.55E+000	8.4	1.9
B			1120.23	2.11E+000	11.8				
m	38	3174.04	1587.03	1.36E+002	6.5	2.71E+001	3.19E+000	7.1	0.9

0000139

M	39	3182.83	1591.42	1.01E+002	7.9	2.61E+001	2.37E+000	8.4	0.9
	40	3526.80	1763.28	1.62E+002	3.1	1.46E+001	4.15E+000	4.7	0.7

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000140

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933242 Sample number: 5179-006

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity (pCi/G)	% Error	Decay Corrected (pCi/G)	Decay Corr. 2 Sigma Error (pCi/G)
	1	MN-54	0.98	1.030E+000	13.06	1.065E+000	2.726E-001
	2	EU-155	0.95	2.096E+000	9.89	2.108E+000	4.087E-001
	3	TL-208	0.98	2.011E+001	1.73	2.011E+001	6.805E-001
	4	PB-210	0.99	1.832E+001	8.45	1.834E+001	3.040E+000
	5	PB-212	1.00	5.546E+001	1.79	5.629E+001	1.978E+000
	6	BI-212	0.48	4.115E+001	2.94	4.176E+001	2.410E+000
	7	RA-223	0.67	1.172E+001	3.57	1.173E+001	8.208E-001
	8	RA-224	1.00	4.774E+001	10.14	4.845E+001	9.632E+000
	9	RA-226	0.97	1.508E+001	1.92	1.509E+001	5.679E-001
	10	RA-228	0.95	6.521E+001	1.78	6.553E+001	2.287E+000
	11	TH-228	0.70	8.425E+001	7.90	8.551E+001	1.324E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	79.37	40.06	1.04E+000	551.06	1062.06	11.96
7	178.98	90.01	3.80E+000	601.01	1112.01	4.99
8	185.60	93.32	3.77E+000	604.32	1115.32	4.85
9	198.03	99.55	1.14E+000	610.55	1121.55	8.07
11	229.15	115.13	5.85E-001	626.13	1137.13	7.80
12	257.13	129.14	1.99E+000	640.14	1151.14	4.86
14	370.93	186.10	1.61E+000	697.10	1208.10	5.14
15	417.18	209.24	3.78E+000	720.24	1231.24	4.28
22	654.35	327.85	2.94E+000	838.85	1349.85	4.18
25	816.94	409.15	1.89E+000	920.15	1431.15	5.28
26	924.22	462.78	4.17E+000	973.78	1484.78	4.83
31	1587.83	794.44	4.24E+000	1305.44	1816.44	5.28
35	1927.43	964.14	6.45E+000	1475.14	1986.14	5.50
38	3174.04	1587.03	3.19E+000	2098.03	2609.03	7.09
39	3182.83	1591.42	2.37E+000	2102.42	2613.42	8.45
40	3526.80	1763.28	4.15E+000	2274.28	2785.28	4.73

0000141

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933242 Sample number: 5179-006

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	MN-54				
			32	1669.37	835.19	100.00
	2	EU-155				
			6	173.55	87.29	17.72
			10	209.66	105.37	66.74
	3	TL-208				
			19	553.28	277.31	120.61
			27	1019.48	510.39	106.18
			28	1164.39	582.82	97.42
			33	1718.97	859.97	85.93
	4	PB-210				
			2	92.57	46.68	100.00
	5	PB-212				
			3	148.87	74.92	82.75
			4	153.42	77.20	88.46
			6	173.55	87.29	121.38
			16	475.85	238.59	86.36
			21	598.73	300.04	98.89
	6	BI-212				
			30	1452.37	726.75	100.00
	7	RA-223				
			13	306.94	154.07	139.23
			18	538.86	270.10	78.75
	8	RA-224				
			17	480.99	241.16	62.53
	9	RA-226				
			17	480.99	241.16	37.47
			20	588.91	295.13	94.15
			24	702.13	351.75	97.29
			29	1216.71	608.97	105.41
			37	2238.29	1119.47	108.06
	10	RA-228				
			23	674.97	338.17	102.18
			34	1820.27	910.59	100.29
			36	1935.68	968.27	96.29
	11	TH-228				
			5	167.85	84.43	100.00

0000142

********** M D A R E P O R T **********

Spectrum file name: 933242 Sample number: 5179-006

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	2.772E+000	NA-22	3.934E-001	NA-24	3.778E-001
K-40	6.052E+000	SC-46	2.670E-001	V-48	3.140E-001
CR-51	2.373E+000	MN-54	3.389E-001	FE-59	5.401E-001
CO-56	2.963E-001	CO-57	2.234E-001	CO-58	2.923E-001
CO-60	3.369E-001	NI-65	1.823E+000	ZN-65	6.405E-001
SE-75	3.372E-001	SR-85	3.076E-001	Y-88	3.959E-001
ZR-95	6.955E-001	NB-95	3.750E-001	TC-99M	2.387E-001
RU-103	3.171E-001	RU-106	3.690E+000	AG-110M	4.051E-001
CD-109	5.367E+000	SN-113	3.944E-001	SB-124	3.229E-001
SB-125	9.358E-001	I-129	2.086E+000	I-131	3.232E-001
I-133	3.655E-001	CS-134	3.530E-001	CS-137	4.481E-001
BA-131	6.045E-001	BA-133	4.574E-001	BA-140	1.308E+000
LA-140	4.068E-001	CE-139	2.930E-001	CE-141	4.394E-001
CE-144	1.856E+000	EU-152	6.528E-001	EU-154	4.776E-001
EU-155	6.440E-001	GD-153	6.291E-001	IR-192	3.078E-001
HG-203	3.320E-001	TL-208	3.611E-001	PB-210	4.135E+000
PB-211	1.053E+001	PB-212	5.292E-001	BI-207	3.608E-001
BI-212	3.059E+000	BI-214	6.148E-001	RA-223	1.482E+000
RA-224	5.799E+000	RA-226	6.148E-001	RA-228	8.661E-001
AC-227	2.375E+000	TH-228	1.639E+001	TH-230	6.557E+001
TH-234	3.592E+000	PA-231	9.129E+000	PA-234	6.562E+001
U-234	1.725E+002	U-235	1.933E+000	AM-241	6.336E-001

0000143

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     15:49:59
*****************************************************************************
*                                                                           *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T           *
*                                                                           *
*****************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933243
Sample number      :5179-007
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection        :1994-May-22    at 12:00:00
End of sample collection          :1994-May-22    at 12:00:00
Sample count started on           :1994-Jun-06    at 12:05:50
Sample count ended on             :1994-Jun-06    at 13:05:52

Irradiation/sampling time         :0 years 0 days 0 hours 0 minutes
Decay time                        :0 years 15 days 0 hours 5 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s   dead time: 5.55E-002 %

Shape calibration requested       :PETRI2
Shape calibration used            :PETRI2
                        Created   :1993-Jan-18     11:47:07
                        Modified  :1993-Jul-14     16:16:37

Energy calibration requested      :DETECT2
Energy calibration used           :DETECT2
                        Created   :1993-Jan-18     12:07:00
                        Modified  :1993-Jul-09     14:14:14

Efficiency calibration requested  :PETRI2
Efficiency calibration used       :PETRI2
                        Created   :1993-Jan-18     14:37:42
                        Modified  :1993-Aug-19     10:49:12

Last search  discrimination level:    5.00
Last search     FROM channel 9 TO channel 4087
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000144

********** P E A K F I T R E P O R T **********

Spectrum file name: 933243 Sample number: 5179-007

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	150.26	74.68	1.37E+003	3.9	8.18E+002	1.21E+001	4.8	2.1
B			74.97	3.64E+001	3.1				
M	2	154.83	76.97	2.21E+003	2.8	7.97E+002	1.81E+001	4.0	2.1
m	3	175.16	87.15	9.09E+002	5.2	8.30E+002	5.72E+000	5.8	1.5
B			87.37	7.45E+000	11.1				
m	4	180.52	89.83	6.48E+002	6.9	6.61E+002	3.87E+000	7.5	1.5
M	5	187.20	93.18	7.99E+002	5.4	5.63E+002	4.50E+000	6.0	1.5
B			92.60	1.92E+001	4.5				
	6	258.65	128.95	4.82E+002	6.6	5.32E+002	2.09E+000	7.1	1.5
	7	372.76	186.06	2.36E+002	8.8	4.80E+002	1.13E+000	9.2	0.9
B			185.69	1.61E+001	4.0				
	8	418.97	209.19	6.26E+002	3.9	4.06E+002	3.27E+000	4.7	0.9
	9	477.69	238.58	7.00E+003	3.7	5.55E+002	4.11E+001	4.7	18.5
B			238.54	1.04E+001	5.4				
	10	540.89	270.21	4.85E+002	3.8	2.74E+002	3.23E+000	4.8	0.7
	11	555.37	277.45	2.49E+002	5.1	2.75E+002	1.70E+000	6.0	1.0
m	12	590.77	295.17	6.07E+002	3.7	2.20E+002	4.44E+000	4.8	1.1
B			295.15	6.47E+000	7.8				
M	13	600.70	300.14	3.88E+002	5.4	2.24E+002	2.89E+000	6.2	1.1
	14	656.28	327.95	3.76E+002	6.3	2.12E+002	3.09E+000	7.1	1.5
	15	677.03	338.33	1.22E+003	2.0	2.05E+002	1.04E+001	3.7	0.5
B			338.41	2.49E+000	16.8				
	16	704.16	351.91	9.84E+002	2.4	1.70E+002	8.76E+000	3.9	0.8
B			351.88	1.27E+001	3.1				
	17	819.19	409.47	2.01E+002	8.1	1.68E+002	2.13E+000	8.6	1.0
	18	926.25	463.03	2.96E+002	8.0	1.36E+002	3.58E+000	8.4	1.9
	19	1021.64	510.76	5.92E+002	3.9	1.39E+002	7.98E+000	4.5	1.2
B			510.88	3.04E+001	6.3				
	20	1166.75	583.35	1.84E+003	2.3	9.80E+001	2.84E+001	3.0	1.6
B			583.00	3.90E+000	7.2				
	21	1218.98	609.48	6.80E+002	3.1	7.86E+001	1.10E+001	3.6	1.0
B			609.16	1.47E+001	3.1				
	22	1455.09	727.59	4.09E+002	3.7	9.41E+001	7.86E+000	3.9	0.8
	23	1590.20	795.17	2.09E+002	6.8	4.91E+001	4.37E+000	6.9	1.4
	24	1721.39	860.79	2.25E+002	5.9	2.96E+001	5.05E+000	6.0	1.2
	25	1822.95	911.59	1.20E+003	2.0	2.96E+001	2.84E+001	2.4	1.8
B			910.99	3.82E+000	8.4				
m	26	1930.21	965.24	2.24E+002	6.9	3.11E+001	5.57E+000	7.0	1.4
M	27	1938.40	969.33	6.74E+002	3.6	2.93E+001	1.68E+001	3.9	1.4
B			968.80	1.73E+000	15.9				
	28	2241.50	1120.94	1.24E+002	7.1	2.12E+001	3.51E+000	7.2	0.9
	29	3529.64	1765.47	9.21E+001	7.3	8.84E+000	4.14E+000	7.9	0.8

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000145

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933243 Sample number: 5179-007

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	TL-208	0.99	1.956E+001	2.18	1.956E+001	8.377E-001
	2	PB-212	1.00	5.451E+001	2.23	5.533E+001	2.418E+000
	3	BI-212	0.48	4.002E+001	3.94	4.062E+001	3.134E+000
	4	RA-226	0.88	1.392E+001	2.22	1.392E+001	6.068E-001
	5	RA-228	0.98	5.929E+001	1.80	5.959E+001	2.104E+000

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
4	180.52	89.83	3.87E+000	600.83	1111.83	7.46
5	187.20	93.18	4.39E+000	604.18	1115.18	6.16
6	258.65	128.95	2.09E+000	639.95	1150.95	7.05
7	372.76	186.06	1.05E+000	697.06	1208.06	9.80
8	418.97	209.19	3.27E+000	720.19	1231.19	4.74
10	540.89	270.21	3.23E+000	781.21	1292.21	4.83
14	656.28	327.95	3.09E+000	838.95	1349.95	7.06
17	819.19	409.47	2.13E+000	920.47	1431.47	8.57
18	926.25	463.03	3.58E+000	974.03	1485.03	8.40
23	1590.20	795.17	4.37E+000	1306.17	1817.17	6.93
26	1930.21	965.24	5.57E+000	1476.24	1987.24	7.00
29	3529.64	1765.47	4.14E+000	2276.47	2787.47	7.93

0000146

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933243 Sample number: 5179-007

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	TL-208				
			11	555.37	277.45	130.08
			19	1021.64	510.76	92.94
			20	1166.75	583.35	96.64
			24	1721.39	860.79	80.45
	2	PB-212				
			1	150.26	74.68	82.35
			2	154.83	76.97	90.12
			3	175.16	87.15	128.03
			9	477.69	238.58	98.56
			13	600.70	300.14	106.93
	3	BI-212				
			22	1455.09	727.59	100.00
	4	RA-226				
			12	590.77	295.17	101.28
			16	704.16	351.91	99.67
			21	1218.98	609.48	99.66
			28	2241.50	1120.94	99.59
	5	RA-228				
			15	677.03	338.33	108.70
			25	1822.95	911.59	96.66
			27	1938.40	969.33	97.73

0000147

********** M D A R E P O R T **********

Spectrum file name: 933243 Sample number: 5179-007

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	4.512E+000	NA-22	5.562E-001	NA-24	5.732E-001
K-40	8.979E+000	SC-46	4.112E-001	V-48	4.820E-001
CR-51	3.649E+000	MN-54	7.250E-001	FE-59	1.025E+000
CO-56	4.940E-001	CO-57	3.774E-001	CO-58	5.011E-001
CO-60	4.440E-001	NI-65	2.484E+000	ZN-65	9.420E-001
SE-75	4.954E-001	SR-85	5.154E-001	Y-88	5.233E-001
ZR-95	1.337E+000	NB-95	6.789E-001	TC-99M	3.433E-001
RU-103	5.419E-001	RU-106	5.638E+000	AG-110M	6.049E-001
CD-109	1.366E+001	SN-113	6.627E-001	SB-124	6.117E-001
SB-125	1.448E+000	I-129	2.152E+002	I-131	4.934E-001
I-133	5.644E-001	CS-134	5.184E-001	CS-137	6.401E-001
BA-131	1.027E+000	BA-133	6.713E-001	BA-140	1.982E+000
LA-140	9.233E-001	CE-139	3.646E-001	CE-141	6.300E-001
CE-144	2.793E+000	EU-152	1.045E+000	EU-154	8.160E-001
EU-155	1.695E+000	GD-153	1.274E+000	IR-192	4.063E-001
HG-203	5.354E-001	TL-208	5.429E-001	PB-210	1.392E+002
PB-211	1.583E+001	PB-212	8.924E-001	BI-207	6.171E-001
BI-212	4.675E+000	BI-214	9.620E-001	RA-223	2.368E+000
RA-224	1.751E+001	RA-226	9.286E-001	RA-228	1.474E+000
AC-227	4.058E+000	TH-228	5.311E+001	TH-230	2.691E+002
TH-234	7.202E+000	PA-231	1.408E+001	PA-234	7.696E+001
U-234	2.038E+003	U-235	3.119E+000	AM-241	4.473E+000

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:51:33

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**********************************************************************
*                                                                    *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T    *
*                                                                    *
**********************************************************************
```

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933244
Sample number :5179-008
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 12:05:49
Sample count ended on :1994-Jun-06 at 13:06:14

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 15 days 0 hours 5 minutes

Live time: 3.60E+003 s real time: 3.63E+003 s dead time: 6.90E-001 %

Shape calibration requested :PETRI4
Shape calibration used :PETRI4
Created :1993-Jan-13 10:59:35
Modified :1993-Sep-03 01:11:04

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
Created :1993-Jan-13 13:19:58
Modified :1994-Jan-27 08:16:11

Efficiency calibration requested :PETRI4
Efficiency calibration used :PETRI4
Created :1993-Jun-25 14:12:16
Modified :1993-Sep-21 15:14:24

Last search discrimination level: 5.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000149

********** P E A K F I T R E P O R T **********

Spectrum file name: 933244 Sample number: 5179-008

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m?	1	67.43	33.57	3.42E+003	23.8	5.29E+002	1.10E+001	34.8	292.5
m?	2	70.02	34.87	5.17E+003	20.0	7.44E+002	1.62E+001	30.6	292.5
m?	3	75.40	37.57	2.94E+003	19.2	1.27E+003	8.73E+000	27.2	292.5
M?	4	80.39	40.08	2.88E+003	21.3	1.86E+003	8.22E+000	26.8	292.5
	5	93.77	46.79	8.95E+002	5.7	2.06E+003	2.36E+000	11.9	1.9
B			46.58	2.83E+001	7.3				
	6	116.14	58.01	9.48E+002	5.1	2.76E+003	2.32E+000	7.6	0.8
	7	127.52	63.72	1.51E+003	8.2	3.72E+003	3.60E+000	9.4	2.5
B			63.30	7.86E+001	1.8				
m	8	146.23	73.10	2.02E+003	7.6	4.33E+003	4.77E+000	8.5	5.3
B			72.90	9.72E+000	7.9				
m	9	150.20	75.09	3.15E+004	1.1	4.26E+003	7.43E+001	4.0	5.3
B			74.91	2.83E+001	3.4				
M	10	154.75	77.37	4.89E+004	0.9	3.98E+003	1.15E+002	3.9	5.3
B			77.09	2.34E+001	3.9				
	11	162.68	81.34	6.92E+002	26.0	2.94E+003	1.63E+000	26.3	8.1
m	12	169.18	84.59	4.31E+003	12.3	3.72E+003	1.02E+001	12.9	53.8
B			84.45	1.03E+001	13.3				
m	13	174.88	87.45	1.55E+004	2.1	3.87E+003	3.67E+001	4.4	53.8
B			87.60	1.08E+001	18.9				
M	14	180.33	90.18	1.10E+004	6.6	3.69E+003	2.61E+001	7.6	53.8
B			90.01	1.67E+000	23.9				
	15	187.10	93.57	1.11E+004	3.3	3.07E+003	2.67E+001	5.1	29.2
B			92.58	9.80E+001	4.2				
	16	199.47	99.76	2.65E+003	2.5	2.39E+003	6.43E+000	4.6	1.5
	17	211.38	105.73	2.72E+003	11.7	2.76E+003	6.68E+000	12.4	28.4
	18	217.96	109.02	8.83E+002	12.9	2.48E+003	2.19E+000	13.5	6.1
	19	230.75	115.43	1.42E+003	3.0	2.18E+003	3.59E+000	4.9	0.8
m	20	258.48	129.30	5.55E+003	1.3	2.20E+003	1.46E+001	4.2	1.2
M	21	263.80	131.97	4.20E+002	10.3	2.15E+003	1.11E+000	11.0	1.2
	22	308.34	154.26	1.80E+003	2.0	2.00E+003	5.14E+000	4.5	0.6
	23	372.46	186.33	1.47E+003	5.7	1.99E+003	4.69E+000	7.2	3.2
B			185.72	4.68E+001	1.4				
	24	399.05	199.63	5.41E+002	6.3	1.71E+003	1.80E+000	7.7	0.6
	25	418.82	209.52	7.65E+003	1.3	1.58E+003	2.64E+001	4.7	1.6
	26	432.15	216.19	4.60E+002	7.6	1.64E+003	1.63E+000	8.9	1.0
m	27	477.57	238.91	8.41E+004	1.7	1.54E+003	3.20E+002	5.1	34.3
B			238.63	3.66E+001	3.7				
M	28	482.45	241.35	8.39E+003	5.3	1.46E+003	3.22E+001	7.2	34.3
B			241.78	5.24E+000	16.1				
	29	540.79	270.52	5.16E+003	1.1	1.16E+003	2.17E+001	5.2	0.9
	30	555.04	277.64	3.06E+003	3.5	1.27E+003	1.32E+001	6.1	3.7
	31	576.63	288.44	5.56E+002	33.2	1.11E+003	2.48E+000	33.6	1.3
	32	590.78	295.51	3.49E+003	2.1	1.10E+003	1.59E+001	5.6	1.8
B			295.16	1.19E+001	3.9				
	33	600.59	300.42	4.62E+003	6.1	9.58E+002	2.13E+001	8.0	23.7
	34	643.55	321.90	3.81E+002	8.0	1.04E+003	1.87E+000	9.6	0.8
	35	656.36	328.30	3.92E+003	1.9	1.06E+003	1.96E+001	5.6	2.3
	36	665.11	332.68	4.86E+002	22.6	1.02E+003	2.46E+000	23.3	10.4
	37	676.98	338.61	1.51E+004	1.7	1.03E+003	7.80E+001	5.6	6.4
B			338.46	2.08E+000	21.3				
	38	704.19	352.22	5.70E+003	1.2	1.03E+003	3.04E+001	5.5	1.0

0000150

B			351.86	1.99E+001	13.9					
	39	819.34	409.78	1.96E+003	2.7	8.80E+002	1.21E+001	6.1	1.5
	40	906.12	453.17	3.88E+002	3.4	7.81E+002	2.65E+000	6.4	1.8
	41	926.50	463.35	4.02E+003	2.0	7.51E+002	2.82E+001	5.8	2.2
	42	1022.02	511.10	6.06E+003	2.3	9.02E+002	4.70E+001	5.9	4.9
B			510.92	4.26E+001	9.4				
	43	1125.60	562.88	6.98E+002	5.4	7.52E+002	5.99E+000	7.6	1.5
	44	1166.99	583.57	2.19E+004	1.0	7.23E+002	1.96E+002	5.5	4.3
B			583.13	1.10E+001	2.2				
	45	1219.25	609.69	3.74E+003	1.4	6.93E+002	3.49E+001	5.6	1.0
B			609.25	1.65E+001	2.8				
	46	1455.36	727.73	4.84E+003	1.1	6.55E+002	5.45E+001	5.7	1.0
B			727.22	2.91E+000	10.5				
	47	1511.47	755.78	5.76E+002	4.3	6.32E+002	6.76E+000	7.1	0.8
	48	1527.44	763.76	3.09E+002	9.0	5.79E+002	3.67E+000	10.7	1.1
	49	1545.62	772.85	8.12E+002	5.3	5.40E+002	9.76E+000	7.8	1.7
	50	1572.01	786.04	6.44E+002	6.8	4.86E+002	7.88E+000	8.9	2.4
	51	1590.67	795.37	2.38E+003	8.8	4.01E+002	2.95E+001	10.5	1.4
m	52	1661.70	830.88	3.20E+002	4.9	3.60E+002	4.15E+000	7.6	0.9
m	53	1672.38	836.22	9.29E+002	2.8	3.48E+002	1.21E+001	6.4	0.9
M	54	1681.59	840.82	4.58E+002	4.6	3.38E+002	6.01E+000	7.4	0.9
	55	1722.01	861.03	2.61E+003	1.8	2.95E+002	3.51E+001	6.1	1.3
B			860.56	1.57E+000	20.5				
	56	1788.05	894.05	2.07E+002	8.0	2.73E+002	2.90E+000	9.9	0.9
	57	1809.33	904.69	3.39E+002	6.9	2.72E+002	4.80E+000	9.1	1.4
	58	1823.38	911.71	1.47E+004	1.1	1.70E+002	2.10E+002	6.0	3.5
B			910.91	3.81E+000	7.4				
	59	1869.36	934.70	2.09E+002	10.2	2.30E+002	3.07E+000	11.8	1.8
	60	1918.13	959.08	2.12E+002	12.3	1.93E+002	3.20E+000	13.7	1.9
m	61	1930.57	965.30	2.62E+003	1.2	1.44E+002	3.97E+001	6.2	0.8
M	62	1938.95	969.49	8.52E+003	0.7	1.32E+002	1.30E+002	6.1	0.8
B			968.88	1.72E+000	17.4				
	63	2131.27	1065.65	1.93E+002	11.2	2.34E+002	3.25E+000	12.8	1.6
	64	2158.77	1079.40	2.73E+002	4.6	2.04E+002	4.64E+000	7.7	0.5
	65	2188.92	1094.47	3.45E+002	5.4	2.05E+002	5.95E+000	8.3	0.9
	66	2222.52	1111.27	2.49E+002	6.9	1.70E+002	4.37E+000	9.3	0.9
	67	2241.76	1120.89	6.41E+002	4.1	2.44E+002	1.13E+001	7.5	1.1
B			1120.15	4.26E+000	6.3				
	68	2477.48	1238.76	2.26E+002	5.7	1.86E+002	4.40E+000	8.6	0.7
B			1237.92	1.41E+000	16.7				
	69	2919.75	1459.94	2.83E+002	5.4	1.51E+002	6.44E+000	8.6	1.1
B			1460.60	9.05E+000	4.5				
m	70	2993.13	1496.64	3.34E+002	5.4	1.08E+002	7.76E+000	8.6	0.9
M	71	3004.08	1502.11	1.95E+002	7.6	1.04E+002	4.55E+000	10.2	0.9
	72	3026.53	1513.34	1.22E+002	22.3	1.74E+002	2.87E+000	23.4	3.2
m	73	3177.54	1588.88	1.11E+003	2.6	1.72E+002	2.72E+001	7.4	1.8
M	74	3185.86	1593.03	7.75E+002	3.9	1.56E+002	1.90E+001	8.0	1.8
B			1592.74	1.28E+000	14.3				
	75	3242.58	1621.41	4.58E+002	4.4	1.66E+002	1.14E+001	8.3	1.1
m	76	3262.58	1631.41	5.85E+002	3.7	1.12E+002	1.47E+001	7.9	1.0
M	77	3277.86	1639.05	1.67E+002	8.4	8.59E+001	4.20E+000	11.0	1.0
	78	3530.20	1765.28	5.84E+002	3.7	1.14E+002	1.56E+001	8.4	1.2

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000151

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933244 Sample number: 5179-008

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity (pCi/G)	% Error	Decay Corrected (pCi/G)	Decay Corr. 2 Sigma Error (pCi/G)
	1	K-40	0.89	3.511E+001	8.68	3.511E+001	5.972E+000
	2	I-129	0.99	5.784E+001	21.40	5.784E+001	2.427E+001
	3	EU-155	0.91	5.311E+000	38.56	5.341E+000	4.037E+000
	4	TL-208	0.97	1.341E+002	2.98	1.341E+002	7.831E+000
	5	PB-210	0.99	3.384E+001	11.96	3.388E+001	7.943E+000
	6	PB-212	0.99	3.467E+002	2.30	3.519E+002	1.586E+001
	7	BI-212	0.94	2.600E+002	4.17	2.639E+002	2.158E+001
	8	RA-224	0.98	3.999E+002	8.81	4.059E+002	7.005E+001
	9	RA-226	0.97	4.720E+001	2.96	4.720E+001	2.736E+000
	10	RA-228	0.96	4.404E+002	3.41	4.426E+002	2.954E+001
	11	TH-228	0.99	4.314E+002	7.36	4.379E+002	6.314E+001
	12	TH-234	0.90	8.030E+001	6.20	8.030E+001	9.751E+000

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
2	70.02	34.87	1.62E+001	545.87	1056.87	30.61
3	75.40	37.57	8.73E+000	548.57	1059.57	27.17
6	116.14	58.01	2.32E+000	569.01	1080.01	7.55
8	146.23	73.10	4.74E+000	584.10	1095.10	8.57
11	162.68	81.34	1.63E+000	592.34	1103.34	26.28
14	180.33	90.18	2.61E+001	601.18	1112.18	7.59
16	199.47	99.76	6.43E+000	610.76	1121.76	4.63
18	217.96	109.02	2.19E+000	620.02	1131.02	13.50
19	230.75	115.43	3.59E+000	626.43	1137.43	4.91
20	258.48	129.30	1.46E+001	640.30	1151.30	4.15
21	263.80	131.97	1.11E+000	642.97	1153.97	11.02
22	308.34	154.26	5.14E+000	665.26	1176.26	4.48
23	372.46	186.33	4.54E+000	697.33	1208.33	7.31
24	399.05	199.63	1.80E+000	710.63	1221.63	7.73
25	418.82	209.52	2.64E+001	720.52	1231.52	4.72
29	540.79	270.52	2.17E+001	781.52	1292.52	5.16
31	576.63	288.44	2.48E+000	799.44	1310.44	33.56
34	643.55	321.90	1.87E+000	832.90	1343.90	9.58
35	656.36	328.30	1.96E+001	839.30	1350.30	5.62
36	665.11	332.68	2.46E+000	843.68	1354.68	23.26
39	819.34	409.78	1.21E+001	920.78	1431.78	6.05
40	906.12	453.17	2.65E+000	964.17	1475.17	6.41
41	926.50	463.35	2.82E+001	974.35	1485.35	5.77
43	1125.60	562.88	5.99E+000	1073.88	1584.88	7.63
47	1511.47	755.78	6.76E+000	1266.78	1777.78	7.10
48	1527.44	763.76	3.67E+000	1274.76	1785.76	10.68
49	1545.62	772.85	9.76E+000	1283.85	1794.85	7.78
51	1590.67	795.37	2.95E+001	1306.37	1817.37	10.48
52	1661.70	830.88	4.15E+000	1341.88	1852.88	7.59
53	1672.38	836.22	1.21E+001	1347.22	1858.22	6.43
54	1681.59	840.82	6.01E+000	1351.82	1862.82	7.41
56	1788.05	894.05	2.90E+000	1405.05	1916.05	9.95
57	1809.33	904.69	4.80E+000	1415.69	1926.69	9.10
59	1869.36	934.70	3.07E+000	1445.70	1956.70	11.80
60	1918.13	959.08	3.20E+000	1470.08	1981.08	13.74

0000152

61	1930.57	965.30	3.97E+001	1476.30	1987.30	6.17
63	2131.27	1065.65	3.25E+000	1576.65	2087.65	12.78
64	2158.77	1079.40	4.64E+000	1590.40	2101.40	7.74
65	2188.92	1094.47	5.95E+000	1605.47	2116.47	8.26
66	2222.52	1111.27	4.37E+000	1622.27	2133.27	9.31
68	2477.48	1238.76	4.37E+000	1749.76	2260.76	8.62
70	2993.13	1496.64	7.76E+000	2007.64	2518.64	8.64
71	3004.08	1502.11	4.55E+000	2013.11	2524.11	10.15
72	3026.53	1513.34	2.87E+000	2024.34	2535.34	23.35
73	3177.54	1588.88	2.72E+001	2099.88	2610.88	7.39
74	3185.86	1593.03	1.90E+001	2104.03	2615.03	7.97
76	3262.58	1631.41	1.47E+001	2142.41	2653.41	7.94
77	3277.86	1639.05	4.20E+000	2150.05	2661.05	11.00
78	3530.20	1765.28	1.56E+001	2276.28	2787.28	8.37

0000153

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933244 Sample number: 5179-008

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			69	2919.75	1459.94	100.00
	2	I-129				
			1	67.43	33.57	115.30
			4	80.39	40.08	88.14
	3	EU-155				
			13	174.88	87.45	7.45
			17	211.38	105.73	27.38
	4	TL-208				
			30	555.04	277.64	115.18
			42	1022.02	511.10	103.30
			44	1166.99	583.57	96.15
			55	1722.01	861.03	79.22
	5	PB-210				
			5	93.77	46.79	100.00
	6	PB-212				
			9	150.20	75.09	83.20
			10	154.75	77.37	90.19
			13	174.88	87.45	125.93
			27	477.57	238.91	80.42
			33	600.59	300.42	92.45
	7	BI-212				
			46	1455.36	727.73	93.78
			50	1572.01	786.04	108.28
			75	3242.58	1621.41	104.30
	8	RA-224				
			28	482.45	241.35	81.71
	9	RA-226				
			28	482.45	241.35	18.29
			32	590.78	295.51	95.51
			38	704.19	352.22	96.35
			45	1219.25	609.69	104.63
			67	2241.76	1120.89	105.41
	10	RA-228				
			37	676.98	338.61	107.25
			58	1823.38	911.71	96.62
			62	1938.95	969.49	93.67
	11	TH-228				
			12	169.18	84.59	85.38
			26	432.15	216.19	105.60
	12	TH-234				
			7	127.52	63.72	148.73
			15	187.10	93.57	27.37

0000154

********** M D A R E P O R T **********

Spectrum file name: 933244 Sample number: 5179-008

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	6.267E+000	NA-22	8.953E-001	NA-24	9.221E-001
K-40	7.793E+000	SC-46	7.226E-001	V-48	7.711E-001
CR-51	5.486E+000	MN-54	1.118E+000	FE-59	1.367E+000
CO-56	7.323E-001	CO-57	3.906E-001	CO-58	7.482E-001
CO-60	8.223E-001	NI-65	4.226E+000	ZN-65	1.547E+000
SE-75	6.966E-001	SR-85	7.028E-001	Y-88	8.315E-001
ZR-95	1.527E+000	NB-95	9.612E-001	TC-99M	4.960E-001
RU-103	7.135E-001	RU-106	8.581E+000	AG-110M	9.897E-001
CD-109	1.121E+001	SN-113	9.877E-001	SB-124	7.618E-001
SB-125	2.077E+000	I-129	1.607E+000	I-131	7.103E-001
I-133	8.636E-001	CS-134	7.397E-001	CS-137	9.811E-001
BA-131	1.372E+000	BA-133	9.365E-001	BA-140	2.927E+000
LA-140	1.118E+000	CE-139	5.361E-001	CE-141	9.125E-001
CE-144	3.744E+000	EU-152	1.343E+000	EU-154	8.288E-001
EU-155	1.347E+000	GD-153	1.280E+000	IR-192	6.370E-001
HG-203	8.419E-001	TL-208	8.147E-001	PB-210	8.399E+000
PB-211	1.956E+001	PB-212	9.552E-001	BI-207	7.834E-001
BI-212	6.989E+000	BI-214	1.523E+000	RA-223	5.038E+000
RA-224	1.054E+001	RA-226	1.318E+000	RA-228	1.973E+000
AC-227	4.225E+000	TH-228	3.366E+001	TH-230	1.418E+002
TH-234	6.966E+000	PA-231	1.765E+001	PA-234	1.512E+002
U-234	3.612E+002	U-235	4.103E+000	AM-241	1.325E+000

0000155

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     15:53:17
********************************************************************************
*                                                                              *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T              *
*                                                                              *
********************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933245
Sample number      :5179-009
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection        :1994-May-22    at 12:00:00
End of sample collection          :1994-May-22    at 12:00:00
Sample count started on           :1994-Jun-06    at 13:25:47
Sample count ended on             :1994-Jun-06    at 14:26:09

Irradiation/sampling time         :0 years 0 days 0 hours 0 minutes
Decay time                        :0 years 15 days 1 hours 25 minutes

Live time: 3.60E+003 s real time: 3.62E+003 s   dead time: 6.07E-001 %

Shape calibration requested       :PETRI1
Shape calibration used            :PETRI1
                        Created   :1993-Jan-20     11:13:47
                        Modified  :1993-Sep-03     01:04:36

Energy calibration requested      :DETECT1
Energy calibration used           :DETECT1
                        Created   :1993-Apr-27     16:21:17
                        Modified  :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used       :PETRI1
                        Created   :1993-Jan-20     15:46:11
                        Modified  :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000156

********** P E A K F I T R E P O R T **********

Spectrum file name: 933245 Sample number: 5179-009

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m?	1	68.74	34.72	6.47E+003	17.1	8.00E+002	1.87E+001	21.2	302.4
m?	2	74.10	37.41	3.65E+003	21.5	1.63E+003	1.00E+001	24.2	302.4
M?	3	79.00	39.87	3.26E+003	24.5	2.64E+003	8.63E+000	26.5	302.4
	4	92.73	46.76	8.46E+002	9.4	3.09E+003	2.08E+000	12.0	1.5
B			46.40	8.53E+000	10.7				
	5	115.25	58.06	8.48E+002	8.9	3.94E+003	1.97E+000	10.1	1.3
	6	126.42	63.66	1.42E+003	5.9	5.02E+003	3.26E+000	7.1	1.5
B			63.21	5.13E+001	12.4				
m	7	148.98	74.97	2.92E+004	2.6	6.07E+003	6.70E+001	4.0	26.3
B			74.76	6.96E+000	10.0				
M	8	153.52	77.25	4.55E+004	2.0	5.79E+003	1.05E+002	3.5	26.3
B			76.92	7.71E+000	8.8				
m	9	167.89	84.45	4.51E+003	5.4	4.68E+003	1.05E+001	6.0	9.0
B			84.12	6.39E+000	15.1				
m	10	173.65	87.34	1.50E+004	2.4	4.78E+003	3.52E+001	3.5	9.0
m	11	179.06	90.05	1.04E+004	3.1	4.63E+003	2.44E+001	4.0	9.0
M	12	185.82	93.43	1.05E+004	2.9	4.11E+003	2.51E+001	3.8	9.0
B			92.50	7.53E+001	2.0				
	13	198.20	99.63	2.60E+003	3.9	3.18E+003	6.29E+000	4.7	2.9
m	14	209.92	105.50	3.13E+003	5.1	3.42E+003	7.70E+000	5.7	6.5
M	15	216.69	108.90	9.29E+002	13.9	3.37E+003	2.31E+000	14.2	6.5
	16	229.40	115.26	1.43E+003	5.5	2.87E+003	3.63E+000	6.1	2.0
	17	257.17	129.16	4.65E+003	3.4	3.16E+003	1.24E+001	4.3	4.5
	18	306.99	154.10	1.84E+003	4.2	2.50E+003	5.40E+000	5.0	1.6
	19	370.96	186.11	1.42E+003	3.5	2.54E+003	4.70E+000	4.4	0.8
B			185.64	3.74E+001	1.7				
	20	397.52	199.40	6.34E+002	5.9	2.24E+003	2.19E+000	6.5	0.8
	21	417.31	209.30	6.94E+003	1.4	2.12E+003	2.49E+001	3.1	1.6
m	22	475.99	238.65	7.76E+004	0.8	1.87E+003	3.08E+002	2.8	9.3
B			238.54	2.23E+001	3.7				
M	23	480.96	241.14	7.51E+003	3.0	1.76E+003	3.00E+001	4.1	9.3
	24	539.10	270.22	4.93E+003	0.6	1.35E+003	2.16E+001	2.7	0.5
	25	553.35	277.35	2.75E+003	2.3	1.49E+003	1.23E+001	3.4	1.3
	26	574.74	288.05	4.64E+002	6.6	1.32E+003	2.15E+000	7.1	1.5
m	27	589.09	295.22	2.88E+003	1.6	1.34E+003	1.36E+001	3.0	0.8
B			295.08	3.42E+000	20.5				
M	28	598.85	300.10	4.13E+003	1.1	1.32E+003	1.98E+001	2.8	0.8
m	29	654.50	327.93	3.75E+003	2.2	1.24E+003	1.94E+001	3.4	2.1
M	30	663.12	332.24	4.49E+002	10.5	1.26E+003	2.36E+000	10.8	2.1
	31	675.17	338.26	1.41E+004	1.1	1.41E+003	7.54E+001	2.7	5.2
	32	702.35	351.86	4.80E+003	1.2	1.18E+003	2.65E+001	2.8	1.3
B			351.84	6.77E+000	5.1				
	33	817.30	409.32	1.92E+003	2.0	1.01E+003	1.22E+001	3.2	0.6
	34	904.10	452.72	4.25E+002	8.0	8.26E+002	2.98E+000	8.4	0.6
	35	924.38	462.86	3.66E+003	1.2	8.57E+002	2.62E+001	2.8	0.7
	36	1019.74	510.52	5.45E+003	2.4	1.01E+003	4.29E+001	3.5	4.1
B			510.89	3.70E+001	8.9				
	37	1123.33	562.30	6.88E+002	4.9	7.73E+002	5.97E+000	5.5	1.2
	38	1164.63	582.94	2.03E+004	0.6	6.81E+002	1.83E+002	2.6	1.3
B			583.08	7.72E+000	6.4				
	39	1216.87	609.05	3.26E+003	1.5	7.28E+002	3.06E+001	2.9	1.0
B			609.25	7.06E+000	5.8				

0000157

	40	1452.71	726.92	4.50E+003	1.6	6.15E+002	5.04E+001	2.9	1.6
	41	1508.66	754.88	5.79E+002	4.5	5.96E+002	6.73E+000	5.1	1.0
m	42	1524.80	762.95	3.29E+002	7.4	5.69E+002	3.87E+000	7.8	0.9
m	43	1534.54	767.81	2.69E+002	7.8	5.31E+002	3.18E+000	8.2	0.9
M	44	1542.72	771.90	7.85E+002	3.7	5.17E+002	9.34E+000	4.4	0.9
m	45	1562.20	781.64	2.91E+002	7.1	4.74E+002	3.51E+000	7.5	0.9
M	46	1569.32	785.19	6.66E+002	3.7	4.47E+002	8.05E+000	4.5	0.9
	47	1588.06	794.56	2.26E+003	1.7	4.27E+002	2.77E+001	2.9	0.9
m	48	1659.28	830.15	2.45E+002	8.5	3.53E+002	3.13E+000	8.8	1.1
m	49	1669.54	835.27	8.23E+002	3.6	3.45E+002	1.06E+001	4.3	1.1
M	50	1678.72	839.86	4.91E+002	5.0	3.31E+002	6.35E+000	5.5	1.1
	51	1719.20	860.09	2.47E+003	1.8	3.08E+002	3.27E+001	3.0	1.2
	52	1784.85	892.90	1.98E+002	6.7	2.57E+002	2.72E+000	7.1	0.6
	53	1806.53	903.73	3.18E+002	6.1	2.86E+002	4.42E+000	6.5	1.0
	54	1820.48	910.70	1.35E+004	0.7	1.95E+002	1.89E+002	2.4	1.1
B			911.15	2.35E+000	10.0				
m	55	1927.52	964.19	2.37E+003	2.0	2.00E+002	3.51E+001	3.0	1.4
M	56	1936.00	968.43	7.84E+003	1.0	2.06E+002	1.17E+002	2.5	1.4
	57	2128.67	1064.70	1.85E+002	5.9	2.26E+002	3.01E+000	6.3	0.4
	58	2155.36	1078.03	2.46E+002	6.0	1.88E+002	4.05E+000	6.4	0.8
	59	2186.21	1093.45	3.08E+002	5.3	1.94E+002	5.15E+000	5.7	0.9
	60	2219.18	1109.92	2.17E+002	5.8	1.77E+002	3.68E+000	6.1	1.0
	61	2238.83	1119.74	5.84E+002	5.6	2.20E+002	9.98E+000	6.0	2.0
B			1120.23	2.11E+000	11.8				
	62	2474.45	1237.48	2.12E+002	6.8	1.76E+002	3.98E+000	7.1	1.0
	63	2492.08	1246.28	1.97E+002	7.5	1.95E+002	3.73E+000	7.8	1.3
	64	2916.34	1458.27	2.54E+002	7.3	1.49E+002	5.54E+000	7.7	1.2
m	65	2989.92	1495.03	3.57E+002	3.8	1.08E+002	7.95E+000	4.6	0.6
M	66	3001.43	1500.78	1.58E+002	6.7	1.15E+002	3.54E+000	7.1	0.6
m	67	3158.98	1579.50	1.82E+002	5.7	1.01E+002	4.26E+000	6.4	0.6
m	68	3174.36	1587.18	1.02E+003	2.0	1.18E+002	2.39E+001	3.5	0.6
M	69	3183.20	1591.60	6.80E+002	2.5	1.11E+002	1.60E+001	3.8	0.6
	70	3239.21	1619.59	4.33E+002	4.9	1.47E+002	1.03E+001	5.7	1.4
m	71	3259.45	1629.70	5.14E+002	3.8	1.07E+002	1.23E+001	4.9	1.0
M	72	3274.88	1637.41	1.79E+002	7.1	9.22E+001	4.33E+000	7.7	1.0
	73	3526.93	1763.34	4.96E+002	3.9	9.99E+001	1.27E+001	5.3	1.0
B			1764.31	2.79E+000	6.4				

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000158

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933245 Sample number: 5179-009

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	MN-54	0.97	6.359E+000	4.29	6.575E+000	5.525E-001
	2	EU-155	0.94	1.460E+001	8.02	1.468E+001	2.308E+000
	3	TL-208	0.99	1.267E+002	1.54	1.267E+002	3.818E+000
	4	PB-210	0.99	3.055E+001	12.05	3.059E+001	7.227E+000
	5	PB-212	1.00	3.144E+002	1.91	3.192E+002	1.194E+001
	6	BI-212	0.69	2.530E+002	2.45	2.568E+002	1.233E+001
	7	RA-223	0.66	8.022E+001	2.44	8.032E+001	3.837E+000
	8	RA-224	1.00	3.779E+002	4.91	3.836E+002	3.690E+001
	9	RA-226	0.98	4.138E+001	1.62	4.138E+001	1.318E+000
	10	RA-228	0.97	4.097E+002	1.46	4.118E+002	1.177E+001
	11	TH-228	0.70	5.200E+002	6.05	5.279E+002	6.258E+001
	12	TH-234	0.93	7.385E+001	4.67	7.385E+001	6.762E+000
	13	PA-231	0.35	5.089E+001	33.36	5.089E+001	3.328E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	68.74	34.72	1.87E+001	545.72	1056.72	21.21
2	74.10	37.41	1.00E+001	548.41	1059.41	24.22
3	79.00	39.87	8.63E+000	550.87	1061.87	26.46
5	115.25	58.06	1.97E+000	569.06	1080.06	10.14
11	179.06	90.05	2.44E+001	601.05	1112.05	4.00
13	198.20	99.63	6.29E+000	610.63	1121.63	4.65
15	216.69	108.90	2.31E+000	619.90	1130.90	14.17
16	229.40	115.26	3.63E+000	626.26	1137.26	6.09
17	257.17	129.16	1.24E+001	640.16	1151.16	4.32
19	370.96	186.11	4.57E+000	697.11	1208.11	4.51
20	397.52	199.40	2.19E+000	710.40	1221.40	6.53
21	417.31	209.30	2.49E+001	720.30	1231.30	3.09
26	574.74	288.05	2.15E+000	799.05	1310.05	7.07
29	654.50	327.93	1.94E+001	838.93	1349.93	3.35
30	663.12	332.24	2.36E+000	843.24	1354.24	10.75
33	817.30	409.32	1.22E+001	920.32	1431.32	3.19
34	904.10	452.72	2.98E+000	963.72	1474.72	8.35
35	924.38	462.86	2.62E+001	973.86	1484.86	2.78
37	1123.33	562.30	5.97E+000	1073.30	1584.30	5.52
41	1508.66	754.88	6.73E+000	1265.88	1776.88	5.09
42	1524.80	762.95	3.87E+000	1273.95	1784.95	7.82
43	1534.54	767.81	3.18E+000	1278.81	1789.81	8.19
44	1542.72	771.90	9.34E+000	1282.90	1793.90	4.41
45	1562.20	781.64	3.51E+000	1292.64	1803.64	7.52
47	1588.06	794.56	2.77E+001	1305.56	1816.56	2.94
48	1659.28	830.15	3.13E+000	1341.15	1852.15	8.83
50	1678.72	839.86	6.35E+000	1350.86	1861.86	5.53
52	1784.85	892.90	2.72E+000	1403.90	1914.90	7.10
53	1806.53	903.73	4.42E+000	1414.73	1925.73	6.50
55	1927.52	964.19	3.51E+001	1475.19	1986.19	2.99
57	2128.67	1064.70	3.01E+000	1575.70	2086.70	6.27
58	2155.36	1078.03	4.05E+000	1589.03	2100.03	6.37
59	2186.21	1093.45	5.15E+000	1604.45	2115.45	5.72
60	2219.18	1109.92	3.68E+000	1620.92	2131.92	6.14

0000159

62	2474.45	1237.48	3.98E+000	1748.48	2259.48	7.12
63	2492.08	1246.28	3.73E+000	1757.28	2268.28	7.78
64	2916.34	1458.27	5.54E+000	1969.27	2480.27	7.70
65	2989.92	1495.03	7.95E+000	2006.03	2517.03	4.56
66	3001.43	1500.78	3.54E+000	2011.78	2522.78	7.14
67	3158.98	1579.50	4.26E+000	2090.50	2601.50	6.39
68	3174.36	1587.18	2.39E+001	2098.18	2609.18	3.49
69	3183.20	1591.60	1.60E+001	2102.60	2613.60	3.78
70	3239.21	1619.59	1.03E+001	2130.59	2641.59	5.71
71	3259.45	1629.70	1.23E+001	2140.70	2651.70	4.87
72	3274.88	1637.41	4.33E+000	2148.41	2659.41	7.69
73	3526.93	1763.34	1.27E+001	2274.34	2785.34	5.33

0000160

********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933245 Sample number: 5179-009

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	MN-54				
			49	1669.54	835.27	100.00
	2	EU-155				
			10	173.65	87.34	21.31
			14	209.92	105.50	65.31
	3	TL-208				
			25	553.35	277.35	116.57
			36	1019.74	510.52	106.79
			38	1164.63	582.94	97.15
			51	1719.20	860.09	80.27
	4	PB-210				
			4	92.73	46.76	100.00
	5	PB-212				
			7	148.98	74.97	83.61
			8	153.52	77.25	89.91
			10	173.65	87.34	118.83
			22	475.99	238.65	75.94
			28	598.85	300.10	90.16
	6	BI-212				
			40	1452.71	726.92	98.62
			46	1569.32	785.19	103.05
	7	RA-223				
			18	306.99	154.10	136.03
			24	539.10	270.22	82.90
	8	RA-224				
			23	480.96	241.14	82.81
	9	RA-226				
			23	480.96	241.14	17.19
			27	589.09	295.22	97.25
			32	702.35	351.86	96.78
			39	1216.87	609.05	104.60
			61	2238.83	1119.74	104.59
	10	RA-228				
			31	675.17	338.26	103.13
			54	1820.48	910.70	100.14
			56	1936.00	968.43	97.16
	11	TH-228				
			9	167.89	84.45	100.00
	12	TH-234				
			6	126.42	63.66	148.62
			12	185.82	93.43	26.74
	13	PA-231				
			28	598.85	300.10	9.84

0000161

********** M D A R E P O R T **********

Spectrum file name: 933245 Sample number: 5179-009

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	6.477E+000	NA-22	8.374E-001	NA-24	7.934E-001
K-40	9.412E+000	SC-46	6.327E-001	V-48	7.521E-001
CR-51	5.664E+000	MN-54	6.877E-001	FE-59	1.239E+000
CO-56	6.831E-001	CO-57	4.994E-001	CO-58	7.251E-001
CO-60	7.318E-001	NI-65	3.673E+000	ZN-65	1.417E+000
SE-75	7.788E-001	SR-85	7.439E-001	Y-88	7.927E-001
ZR-95	1.702E+000	NB-95	9.014E-001	TC-99M	5.547E-001
RU-103	7.627E-001	RU-106	8.242E+000	AG-110M	9.423E-001
CD-109	1.228E+001	SN-113	9.732E-001	SB-124	7.924E-001
SB-125	2.287E+000	I-129	5.134E+000	I-131	7.631E-001
I-133	8.245E-001	CS-134	8.084E-001	CS-137	1.101E+000
BA-131	1.457E+000	BA-133	1.040E+000	BA-140	2.890E+000
LA-140	7.734E-001	CE-139	6.700E-001	CE-141	1.001E+000
CE-144	4.249E+000	EU-152	1.491E+000	EU-154	1.068E+000
EU-155	1.474E+000	GD-153	1.417E+000	IR-192	7.115E-001
HG-203	7.646E-001	TL-208	7.982E-001	PB-210	9.559E+000
PB-211	2.360E+001	PB-212	1.091E+000	BI-207	8.190E-001
BI-212	6.734E+000	BI-214	1.566E+000	RA-223	3.396E+000
RA-224	1.203E+001	RA-226	1.451E+000	RA-228	2.062E+000
AC-227	5.237E+000	TH-228	3.711E+001	TH-230	1.466E+002
TH-234	7.964E+000	PA-231	2.146E+001	PA-234	1.401E+002
U-234	3.814E+002	U-235	4.533E+000	AM-241	1.416E+000

0000162

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:54:56

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* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

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IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933246
Sample number :5179-010
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 13:25:47
Sample count ended on :1994-Jun-06 at 14:26:05

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 15 days 1 hours 25 minutes

Live time: 3.60E+003 s real time: 3.62E+003 s dead time: 4.98E-001 %

Shape calibration requested :PETRI2
Shape calibration used :PETRI2
Created :1993-Jan-18 11:47:07
Modified :1993-Jul-14 16:16:37

Energy calibration requested :DETECT2
Energy calibration used :DETECT2
Created :1993-Jan-18 12:07:00
Modified :1993-Jul-09 14:14:14

Efficiency calibration requested :PETRI2
Efficiency calibration used :PETRI2
Created :1993-Jan-18 14:37:42
Modified :1993-Aug-19 10:49:12

Last search discrimination level: 5.00
Last search FROM channel 9 TO channel 4087
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG2.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

0000163

********** PEAK FIT REPORT **********

Spectrum file name: 933246 Sample number: 5179-010

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	150.36	74.74	9.88E+003	2.9	5.61E+003	8.73E+001	4.1	7.8
B			74.97	3.64E+001	3.1				
M	2	154.95	77.03	1.55E+004	2.1	5.48E+003	1.27E+002	3.5	7.8
m	3	169.51	84.32	2.28E+003	3.9	4.71E+003	1.52E+001	4.8	1.6
B			84.80	2.33E+001	4.0				
m	4	175.12	87.13	7.42E+003	1.5	4.59E+003	4.67E+001	3.1	1.6
B			87.37	7.45E+000	11.1				
m	5	180.49	89.82	5.25E+003	1.9	4.48E+003	3.13E+001	3.3	1.6
M	6	187.34	93.25	5.43E+003	1.9	4.32E+003	3.06E+001	3.3	1.6
B			92.60	1.92E+001	4.5				
m	7	199.74	99.45	1.42E+003	4.3	3.93E+003	7.32E+000	5.1	1.3
m	8	211.47	105.33	2.05E+003	3.4	3.80E+003	9.97E+000	4.3	1.3
M	9	218.35	108.77	7.66E+002	7.8	3.80E+003	3.63E+000	8.2	1.3
	10	231.23	115.22	8.74E+002	9.9	3.64E+003	3.97E+000	10.3	1.2
	11	258.74	128.99	3.27E+003	2.7	3.80E+003	1.42E+001	3.6	1.5
	12	308.44	153.87	1.18E+003	4.2	3.45E+003	5.19E+000	4.8	0.6
	13	372.82	186.09	1.54E+003	3.4	3.27E+003	7.35E+000	4.2	0.9
B			185.69	1.61E+001	4.0				
	14	418.97	209.19	5.23E+003	1.4	2.96E+003	2.73E+001	3.0	0.9
?	15	477.79	238.63	5.48E+004	3.7	3.85E+003	3.22E+002	4.7	124.1
B			238.54	1.04E+001	5.4				
	16	540.90	270.21	3.79E+003	1.5	1.77E+003	2.53E+001	3.4	1.0
	17	555.20	277.37	2.34E+003	2.8	1.82E+003	1.60E+001	4.1	1.4
	18	576.85	288.20	2.71E+002	16.3	1.75E+003	1.93E+000	16.6	1.1
m	19	590.85	295.21	4.22E+003	1.6	1.57E+003	3.09E+001	3.5	1.2
B			295.15	6.47E+000	7.8				
M	20	600.64	300.11	3.41E+003	1.9	1.56E+003	2.54E+001	3.6	1.2
	21	656.34	327.98	2.70E+003	2.5	1.64E+003	2.22E+001	4.0	1.6
	22	677.03	338.33	1.03E+004	1.9	1.49E+003	8.78E+001	3.7	6.0
B			338.41	2.49E+000	16.8				
	23	704.20	351.93	6.56E+003	1.2	1.31E+003	5.84E+001	3.3	1.5
B			351.88	1.27E+001	3.1				
	24	819.33	409.53	1.29E+003	24.4	1.22E+003	1.36E+001	24.5	2.1
	25	905.74	452.77	2.49E+002	12.0	9.82E+002	2.94E+000	12.3	1.0
	26	926.44	463.12	2.72E+003	1.3	9.53E+002	3.30E+001	2.9	0.7
	27	1021.76	510.81	4.32E+003	1.8	1.00E+003	5.82E+001	2.9	1.8
B			510.88	3.04E+001	6.3				
	28	1125.50	562.71	4.96E+002	4.6	8.58E+002	7.40E+000	5.1	0.6
	29	1166.82	583.39	1.47E+004	1.0	7.48E+002	2.27E+002	2.1	2.6
B			583.00	3.90E+000	7.2				
	30	1219.07	609.52	4.50E+003	1.6	6.52E+002	7.27E+001	2.4	1.5
B			609.16	1.47E+001	3.1				
	31	1455.05	727.56	3.15E+003	1.8	5.99E+002	6.06E+001	2.3	1.3
	32	1511.14	755.62	3.93E+002	5.5	5.86E+002	7.82E+000	5.7	0.7
m	33	1537.30	768.71	3.88E+002	7.9	5.37E+002	7.85E+000	8.0	1.1
B			768.46	1.72E+000	13.7				
M	34	1545.47	772.79	5.22E+002	6.5	4.79E+002	1.06E+001	6.6	1.1
	35	1571.82	785.97	4.70E+002	8.0	4.74E+002	9.70E+000	8.1	1.9
	36	1590.41	795.27	1.62E+003	2.3	4.00E+002	3.38E+001	2.7	1.0
m	37	1672.08	836.12	5.60E+002	5.1	3.91E+002	1.22E+001	5.3	1.3
M	38	1681.13	840.65	2.88E+002	8.4	3.63E+002	6.32E+000	8.5	1.3
	39	1721.66	860.92	1.76E+003	1.5	2.65E+002	3.96E+001	2.0	0.6

0000164

m	40	1809.26	904.74	2.71E+002	9.2	2.58E+002	6.36E+000	9.3	1.9
M	41	1822.98	911.60	9.08E+003	1.1	2.21E+002	2.14E+002	1.7	1.9
B			910.99	3.82E+000	8.4				
	42	1868.63	934.43	2.13E+002	7.1	2.21E+002	5.15E+000	7.2	0.8
m	43	1930.19	965.22	1.73E+003	2.9	1.18E+002	4.30E+001	3.2	1.4
M	44	1938.49	969.38	5.41E+003	1.6	9.47E+001	1.35E+002	2.1	1.4
B			968.80	1.73E+000	15.9				
	45	2188.87	1094.61	1.78E+002	10.7	1.73E+002	4.94E+000	10.8	1.5
	46	2221.33	1110.85	1.71E+002	11.7	1.39E+002	4.81E+000	11.8	1.9
	47	2241.19	1120.79	7.71E+002	2.9	2.07E+002	2.19E+001	3.2	0.7
B			1119.84	4.56E+000	5.8				
	48	2476.71	1238.60	2.78E+002	6.2	1.80E+002	8.63E+000	6.3	1.0
B			1238.11	2.17E+000	13.0				
	49	2755.87	1378.25	1.82E+002	9.1	1.87E+002	6.24E+000	9.2	1.2
	50	2919.03	1459.89	2.22E+002	7.9	1.37E+002	8.09E+000	8.0	1.3
B			1460.45	1.68E+001	1.6				
	51	2992.20	1496.50	1.68E+002	10.9	1.48E+002	6.28E+000	11.0	1.5
	52	3018.68	1509.75	1.09E+002	15.4	1.46E+002	4.11E+000	15.5	1.6
m	53	3162.54	1581.74	1.27E+002	9.0	1.10E+002	5.02E+000	9.2	0.8
m	54	3176.81	1588.87	6.78E+002	3.1	1.07E+002	2.70E+001	3.6	0.8
M	55	3185.40	1593.18	6.88E+002	3.0	1.16E+002	2.75E+001	3.5	0.8
	56	3241.82	1621.41	2.39E+002	7.9	1.37E+002	9.72E+000	8.1	1.4
m	57	3261.66	1631.34	3.31E+002	5.8	1.18E+002	1.36E+001	6.2	1.3
M	58	3276.89	1638.96	1.32E+002	11.2	8.17E+001	5.46E+000	11.4	1.3
	59	3529.41	1765.36	5.82E+002	2.6	1.05E+002	2.62E+001	4.0	0.6

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000165

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933246 Sample number: 5179-010

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
				activity (pCi/G)			
1		K-40	0.87	4.211E+001	8.68	4.211E+001	7.168E+000
2		EU-155	0.97	2.400E+001	4.93	2.413E+001	2.334E+000
3		TL-208	0.99	1.675E+002	1.26	1.675E+002	4.127E+000
4		PB-212	1.00	3.561E+002	2.19	3.615E+002	1.551E+001
5		BI-212	0.96	2.946E+002	2.14	2.990E+002	1.256E+001
6		RA-223	0.66	7.574E+001	2.92	7.584E+001	4.342E+000
7		RA-226	0.89	9.261E+001	1.50	9.261E+001	2.721E+000
8		RA-228	0.97	4.722E+002	1.26	4.746E+002	1.174E+001
9		TH-228	0.70	7.490E+002	4.78	7.603E+002	7.128E+001
10		PA-231	0.35	1.354E+002	19.79	1.354E+002	5.251E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
5	180.49	89.82	3.13E+001	600.82	1111.82	3.32
6	187.34	93.25	3.04E+001	604.25	1115.25	3.30
7	199.74	99.45	7.32E+000	610.45	1121.45	5.06
9	218.35	108.77	3.63E+000	619.77	1130.77	8.18
10	231.23	115.22	3.97E+000	626.22	1137.22	10.26
11	258.74	128.99	1.42E+001	639.99	1150.99	3.60
13	372.82	186.09	7.28E+000	697.09	1208.09	4.19
14	418.97	209.19	2.73E+001	720.19	1231.19	2.96
18	576.85	288.20	1.93E+000	799.20	1310.20	16.63
21	656.34	327.98	2.22E+001	838.98	1349.98	4.00
24	819.33	409.53	1.36E+001	920.53	1431.53	24.55
25	905.74	452.77	2.94E+000	963.77	1474.77	12.26
26	926.44	463.12	3.30E+001	974.12	1485.12	2.88
28	1125.50	562.71	7.40E+000	1073.71	1584.71	5.06
32	1511.14	755.62	7.82E+000	1266.62	1777.62	5.69
33	1537.30	768.71	7.81E+000	1279.71	1790.71	8.05
34	1545.47	772.79	1.06E+001	1283.79	1794.79	6.59
36	1590.41	795.27	3.38E+001	1306.27	1817.27	2.69
37	1672.08	836.12	1.22E+001	1347.12	1858.12	5.31
38	1681.13	840.65	6.32E+000	1351.65	1862.65	8.55
40	1809.26	904.74	6.36E+000	1415.74	1926.74	9.26
42	1868.63	934.43	5.15E+000	1445.43	1956.43	7.22
43	1930.19	965.22	4.30E+001	1476.22	1987.22	3.18
45	2188.87	1094.61	4.94E+000	1605.61	2116.61	10.85
46	2221.33	1110.85	4.81E+000	1621.85	2132.85	11.77
48	2476.71	1238.60	8.56E+000	1749.60	2260.60	6.36
49	2755.87	1378.25	6.24E+000	1889.25	2400.25	9.22
51	2992.20	1496.50	6.28E+000	2007.50	2518.50	10.96
52	3018.68	1509.75	4.11E+000	2020.75	2531.75	15.50
53	3162.54	1581.74	5.02E+000	2092.74	2603.74	9.19
54	3176.81	1588.87	2.70E+001	2099.87	2610.87	3.61
55	3185.40	1593.18	2.75E+001	2104.18	2615.18	3.47
57	3261.66	1631.34	1.36E+001	2142.34	2653.34	6.19
58	3276.89	1638.96	5.46E+000	2149.96	2660.96	11.42
59	3529.41	1765.36	2.62E+001	2276.36	2787.36	4.00

0000166

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933246 Sample number: 5179-010

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			50	2919.03	1459.89	100.00
	2	EU-155				
			4	175.12	87.13	26.47
			8	211.47	105.33	82.97
	3	TL-208				
			17	555.20	277.37	118.27
			27	1021.76	510.81	104.31
			29	1166.82	583.39	103.37
			39	1721.66	860.92	87.85
	4	PB-212				
			1	150.36	74.74	72.93
			2	154.95	77.03	83.94
			4	175.12	87.13	101.68
			15	477.79	238.63	82.13
			20	600.64	300.11	79.59
	5	BI-212				
			31	1455.05	727.56	95.54
			35	1571.82	785.97	99.57
			56	3241.82	1621.41	138.84
	6	RA-223				
			12	308.44	153.87	133.67
			16	540.90	270.21	66.98
	7	RA-226				
			19	590.85	295.21	95.97
			23	704.20	351.93	98.40
			30	1219.07	609.52	98.49
			47	2241.19	1120.79	107.11
	8	RA-228				
			22	677.03	338.33	102.12
			41	1822.98	911.60	101.60
			44	1938.49	969.38	96.84
	9	TH-228				
			3	169.51	84.32	100.00
	10	PA-231				
			20	600.64	300.11	20.41

0000167

********** M D A R E P O R T **********

Spectrum file name: 933246 Sample number: 5179-010

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	1.152E+001	NA-22	1.338E+000	NA-24	1.406E+000
K-40	1.206E+001	SC-46	1.192E+000	V-48	1.158E+000
CR-51	9.454E+000	MN-54	1.869E+000	FE-59	2.225E+000
CO-56	1.288E+000	CO-57	9.920E-001	CO-58	1.272E+000
CO-60	1.303E+000	NI-65	6.676E+000	ZN-65	2.233E+000
SE-75	1.315E+000	SR-85	1.344E+000	Y-88	1.239E+000
ZR-95	3.331E+000	NB-95	1.669E+000	TC-99M	9.239E-001
RU-103	1.337E+000	RU-106	1.426E+001	AG-110M	1.627E+000
CD-109	3.171E+001	SN-113	1.730E+000	SB-124	1.482E+000
SB-125	3.881E+000	I-129	5.633E+002	I-131	1.271E+000
I-133	1.472E+000	CS-134	1.406E+000	CS-137	1.733E+000
BA-131	2.520E+000	BA-133	1.718E+000	BA-140	4.886E+000
LA-140	2.256E+000	CE-139	9.787E-001	CE-141	1.655E+000
CE-144	7.354E+000	EU-152	2.756E+000	EU-154	2.102E+000
EU-155	3.936E+000	GD-153	3.292E+000	IR-192	1.109E+000
HG-203	1.425E+000	TL-208	1.435E+000	PB-210	3.634E+002
PB-211	4.100E+001	PB-212	2.305E+000	BI-207	1.483E+000
BI-212	1.140E+001	BI-214	2.563E+000	RA-223	5.901E+000
RA-224	4.884E+001	RA-226	2.463E+000	RA-228	3.695E+000
AC-227	1.061E+001	TH-228	1.069E+002	TH-230	6.788E+002
TH-234	1.951E+001	PA-231	3.623E+001	PA-234	2.002E+002
U-234	5.220E+003	U-235	8.144E+000	AM-241	1.135E+001

0003168

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:56:36

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* G A M M A S P E C T R U M A N A L Y S I S R E P O R T *

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IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933247
Sample number :5179-011
Sample geometry :PETRI
Sample type :SOLID
Sample size : 4.500E+01 G
Measured by :DEFAULT

Start of sample collection :1994-May-22 at 12:00:00
End of sample collection :1994-May-22 at 12:00:00
Sample count started on :1994-Jun-06 at 13:25:47
Sample count ended on :1994-Jun-06 at 14:26:38

Irradiation/sampling time :0 years 0 days 0 hours 0 minutes
Decay time :0 years 15 days 1 hours 25 minutes

Live time: 3.60E+003 s real time: 3.65E+003 s dead time: 1.40E+000 %

Shape calibration requested :PETRI4
Shape calibration used :PETRI4
  Created :1993-Jan-13 10:59:35
  Modified :1993-Sep-03 01:11:04

Energy calibration requested :DETECT4
Energy calibration used :DETECT4
  Created :1993-Jan-13 13:19:58
  Modified :1994-Jan-27 08:16:11

Efficiency calibration requested :PETRI4
Efficiency calibration used :PETRI4
  Created :1993-Jun-25 14:12:16
  Modified :1993-Sep-21 15:14:24

Last search discrimination level: 5.00
Last search FROM channel 8 TO channel 4088
Last fitting discrimination level: 5.00
Last fit FROM channel 1 TO channel 4096
Identification energy tolerance : 1.00
Minimum acceptable confidence : 0.25
Gamma reference library :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance: 1.00 keV
MDA decision limit 1-alpha: 95.00 %
MDA detection limit 1-beta: 95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG4.PTF
Energy tolerance for peaked backround subtraction: 1.00 keV
Threshold factor for peak areas: 1.00

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********** PEAK FIT REPORT **********

Spectrum file name: 933247 Sample number: 5179-011

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	75.56	37.65	2.99E+003	18.9	5.75E+003	8.87E+000	26.9	57.5
M	2	80.51	40.14	4.92E+003	12.6	4.82E+003	1.40E+001	20.5	57.5
	3	93.91	46.86	1.03E+003	6.4	3.99E+003	2.72E+000	12.2	1.1
B			46.58	2.83E+001	7.3				
	4	116.29	58.09	1.96E+003	4.8	5.26E+003	4.77E+000	7.3	1.8
	5	127.82	63.87	2.04E+003	10.0	7.09E+003	4.88E+000	10.9	7.8
B			63.30	7.86E+001	1.8				
m	6	146.32	73.14	3.72E+003	8.4	8.75E+003	8.78E+000	9.2	10.6
B			72.90	9.72E+000	7.9				
m	7	150.30	75.14	6.37E+004	1.1	8.58E+003	1.50E+002	4.0	10.6
B			74.91	2.83E+001	3.4				
M	8	154.85	77.42	9.90E+004	0.9	7.88E+003	2.33E+002	3.9	10.6
B			77.09	2.34E+001	3.9				
	9	162.66	81.33	1.03E+003	23.5	6.07E+003	2.42E+000	23.8	7.7
m	10	169.31	84.66	9.06E+003	11.4	7.55E+003	2.14E+001	12.1	98.6
B			84.45	1.03E+001	13.3				
m	11	174.99	87.50	3.07E+004	4.8	7.84E+003	7.28E+001	6.2	98.6
B			87.60	1.08E+001	18.9				
M	12	180.45	90.24	2.38E+004	6.0	7.22E+003	5.67E+001	7.1	98.6
B			90.01	1.67E+000	23.9				
	13	187.25	93.65	2.51E+004	4.5	5.89E+003	6.01E+001	5.9	66.0
	14	199.56	99.81	5.93E+003	2.5	4.80E+003	1.44E+001	4.6	3.6
	15	211.46	105.77	6.29E+003	9.8	5.45E+003	1.55E+001	10.5	59.9
	16	218.02	109.05	2.20E+003	47.2	5.01E+003	5.45E+000	47.4	18.3
	17	230.86	115.48	3.15E+003	2.4	4.28E+003	7.93E+000	4.6	1.1
	18	258.60	129.36	1.16E+004	2.6	4.66E+003	3.04E+001	4.7	9.0
	19	292.12	146.14	7.25E+002	11.5	4.19E+003	2.01E+000	12.2	1.8
	20	308.47	154.32	3.98E+003	3.4	4.05E+003	1.14E+001	5.3	3.0
	21	372.47	186.34	1.45E+003	5.9	3.81E+003	4.62E+000	7.3	2.0
B			185.72	4.68E+001	1.4				
	22	399.19	199.70	1.05E+003	4.5	3.43E+003	3.52E+000	6.3	0.8
	23	418.94	209.58	1.62E+004	1.2	3.30E+003	5.58E+001	4.7	2.9
	24	432.34	216.28	1.33E+003	6.1	3.22E+003	4.71E+000	7.6	2.3
m	25	477.68	238.96	1.82E+005	0.9	2.79E+003	6.95E+002	4.9	28.1
B			238.63	3.66E+001	3.7				
M	26	482.48	241.36	1.75E+004	3.1	2.60E+003	6.73E+001	5.7	28.1
B			241.78	5.24E+000	16.1				
	27	505.71	252.98	8.50E+002	5.1	2.33E+003	3.39E+000	7.1	0.7
	28	540.92	270.58	1.13E+004	0.8	2.33E+003	4.74E+001	5.1	1.1
	29	555.22	277.74	6.64E+003	2.9	2.51E+003	2.86E+001	5.8	5.7
	30	576.79	288.52	1.18E+003	5.0	2.28E+003	5.28E+000	7.2	1.5
	31	590.94	295.60	2.81E+003	32.6	2.25E+003	1.28E+001	33.0	2.3
B			295.16	1.19E+001	3.9				
	32	600.68	300.47	9.76E+003	1.2	2.24E+003	4.50E+001	5.3	1.9
	33	643.83	322.04	5.51E+002	6.6	2.20E+003	2.70E+000	8.4	0.8
	34	656.46	328.36	8.72E+003	1.9	2.22E+003	4.36E+001	5.6	4.2
	35	665.17	332.71	1.21E+003	4.6	2.18E+003	6.12E+000	7.0	1.2
m	36	677.13	338.69	3.35E+004	0.5	2.01E+003	1.72E+002	5.3	1.1
B			338.46	2.08E+000	21.3				
M	37	682.44	341.34	1.06E+003	4.9	2.00E+003	5.52E+000	7.2	1.1
	38	704.31	352.28	4.91E+003	1.5	2.04E+003	2.62E+001	5.6	1.2
B			351.86	1.99E+001	13.9				

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	39	819.46	409.84	4.28E+003	1.3	1.87E+003	2.65E+001	5.6	0.8
	40	906.33	453.27	8.58E+002	4.5	1.57E+003	5.87E+000	7.1	0.7
	41	926.67	463.44	8.75E+003	0.8	1.62E+003	6.13E+001	5.5	1.0
	42	1022.14	511.16	1.28E+004	2.4	1.96E+003	9.91E+001	5.9	13.4
B			510.92	4.26E+001	9.4				
	43	1125.75	562.96	1.65E+003	2.1	1.54E+003	1.41E+001	5.8	0.6
	44	1167.16	583.66	4.75E+004	0.6	1.47E+003	4.24E+002	5.5	2.8
B			583.13	1.10E+001	2.2				
	45	1219.45	609.80	3.08E+003	1.7	1.52E+003	2.87E+001	5.7	1.1
B			609.25	1.65E+001	2.8				
	46	1455.53	727.81	1.04E+004	1.1	1.29E+003	1.17E+002	5.7	1.7
B			727.22	2.91E+000	10.5				
	47	1511.57	755.83	1.37E+003	2.9	1.25E+003	1.61E+001	6.3	1.1
	48	1527.70	763.89	8.32E+002	6.4	1.20E+003	9.88E+000	8.6	2.0
	49	1545.62	772.85	1.75E+003	3.7	1.10E+003	2.10E+001	6.8	2.1
m	50	1565.45	782.76	6.84E+002	4.9	9.39E+002	8.33E+000	7.5	0.8
M	51	1572.05	786.06	1.46E+003	2.7	9.00E+002	1.78E+001	6.3	0.8
	52	1590.91	795.49	5.18E+003	0.9	8.28E+002	6.42E+001	5.8	0.6
m	53	1662.09	831.08	6.62E+002	4.4	7.09E+002	8.59E+000	7.3	0.9
m	54	1672.39	836.23	1.94E+003	2.2	7.14E+002	2.53E+001	6.2	0.9
M	55	1681.81	840.94	1.12E+003	2.9	6.94E+002	1.47E+001	6.5	0.9
	56	1722.22	861.14	5.61E+003	1.5	5.28E+002	7.56E+001	6.1	1.9
B			860.56	1.57E+000	20.5				
	57	1788.25	894.15	4.51E+002	5.6	5.50E+002	6.33E+000	8.1	1.0
	58	1809.49	904.76	7.21E+002	6.4	5.70E+002	1.02E+001	8.7	2.5
	59	1823.60	911.82	3.18E+004	0.9	3.75E+002	4.55E+002	6.0	4.6
B			910.91	3.81E+000	7.4				
m	60	1930.81	965.42	5.50E+003	0.6	3.62E+002	8.35E+001	6.1	1.0
M	61	1939.17	969.60	1.84E+004	0.6	3.03E+002	2.81E+002	6.1	1.0
B			968.88	1.72E+000	17.4				
	62	2131.77	1065.90	4.26E+002	7.7	4.54E+002	7.16E+000	9.9	1.7
	63	2158.56	1079.29	4.93E+002	4.4	3.98E+002	8.39E+000	7.6	0.8
	64	2189.41	1094.72	7.00E+002	4.2	3.95E+002	1.21E+001	7.6	1.2
	65	2222.29	1111.16	5.27E+002	3.6	3.68E+002	9.24E+000	7.2	0.6
	66	2242.11	1121.07	5.31E+002	9.5	4.82E+002	9.38E+000	11.4	3.5
B			1120.15	4.26E+000	6.3				
	67	2477.82	1238.93	2.46E+002	7.2	3.76E+002	4.80E+000	9.6	0.7
	68	2495.63	1247.84	3.34E+002	9.3	4.49E+002	6.56E+000	11.3	1.8
	69	2749.67	1374.88	2.03E+002	13.6	3.96E+002	4.37E+000	15.1	1.7
	70	2919.93	1460.03	6.74E+002	22.8	2.95E+002	1.53E+001	23.8	1.8
B			1460.60	9.05E+000	4.5				
m	71	2993.40	1496.78	7.32E+002	2.5	2.12E+002	1.70E+001	7.2	0.8
M	72	3004.77	1502.46	4.09E+002	4.3	2.08E+002	9.56E+000	8.0	0.8
	73	3027.31	1513.73	2.54E+002	7.6	2.85E+002	5.96E+000	10.2	0.9
m	74	3162.33	1581.26	4.67E+002	3.8	2.24E+002	1.14E+001	7.9	1.2
m	75	3177.91	1589.06	2.54E+003	1.7	2.91E+002	6.23E+001	7.1	1.2
M	76	3186.19	1593.20	1.71E+003	2.2	2.88E+002	4.19E+001	7.3	1.2
B			1592.74	1.28E+000	14.3				
m	77	3243.11	1621.67	1.24E+003	2.3	2.16E+002	3.08E+001	7.4	0.9
m	78	3251.74	1625.99	2.43E+002	6.7	2.05E+002	6.08E+000	9.7	0.9
m	79	3262.85	1631.54	1.29E+003	2.2	1.98E+002	3.24E+001	7.4	0.9
M	80	3278.16	1639.20	4.12E+002	4.5	2.04E+002	1.04E+001	8.4	0.9
	81	3334.96	1667.62	1.61E+002	10.4	2.51E+002	4.10E+000	12.6	1.3
	82	3530.44	1765.40	5.60E+002	3.5	2.28E+002	1.50E+001	8.3	0.8

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

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******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933247 Sample number: 5179-011

Un det set	Nuc lid #	Nuclide name	Confid	Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
				activity (pCi/G)			
	1	K-40	0.91	8.515E+001	24.08	8.515E+001	4.019E+001
	2	CE-141	0.92	2.497E+000	12.17	3.442E+000	8.212E-001
	3	EU-155	0.90	2.313E+001	18.45	2.326E+001	8.414E+000
	4	TL-208	0.96	2.876E+002	2.93	2.876E+002	1.651E+001
	5	PB-210	0.98	3.925E+001	12.31	3.930E+001	9.478E+000
	6	PB-212	0.98	7.425E+002	2.21	7.537E+002	3.262E+001
	7	BI-212	0.66	5.700E+002	4.24	5.786E+002	4.807E+001
	8	RA-224	0.98	9.496E+002	6.21	9.639E+002	1.172E+002
	9	RA-226	0.96	3.910E+001	3.75	3.910E+001	2.875E+000
	10	RA-228	0.94	9.601E+002	3.34	9.649E+002	6.319E+001
	11	TH-228	0.99	1.144E+003	6.44	1.161E+003	1.466E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	75.56	37.65	8.87E+000	548.65	1059.65	26.86
2	80.51	40.14	1.40E+001	551.14	1062.14	20.49
4	116.29	58.09	4.77E+000	569.09	1080.09	7.35
5	127.82	63.87	4.69E+000	574.87	1085.87	11.30
6	146.32	73.14	8.76E+000	584.14	1095.14	9.27
9	162.66	81.33	2.42E+000	592.33	1103.33	23.79
12	180.45	90.24	5.67E+001	601.24	1112.24	7.08
13	187.25	93.65	6.01E+001	604.65	1115.65	5.91
14	199.56	99.81	1.44E+001	610.81	1121.81	4.59
16	218.02	109.05	5.45E+000	620.05	1131.05	47.40
17	230.86	115.48	7.93E+000	626.48	1137.48	4.59
18	258.60	129.36	3.04E+001	640.36	1151.36	4.70
20	308.47	154.32	1.14E+001	665.32	1176.32	5.27
21	372.47	186.34	4.47E+000	697.34	1208.34	7.48
22	399.19	199.70	3.52E+000	710.70	1221.70	6.33
23	418.94	209.58	5.58E+001	720.58	1231.58	4.68
27	505.71	252.98	3.39E+000	763.98	1274.98	7.07
28	540.92	270.58	4.74E+001	781.58	1292.58	5.10
30	576.79	288.52	5.28E+000	799.52	1310.52	7.18
33	643.83	322.04	2.70E+000	833.04	1344.04	8.42
34	656.46	328.36	4.36E+001	839.36	1350.36	5.62
35	665.17	332.71	6.12E+000	843.71	1354.71	7.04
37	682.44	341.34	5.52E+000	852.34	1363.34	7.25
39	819.46	409.84	2.65E+001	920.84	1431.84	5.56
40	906.33	453.27	5.87E+000	964.27	1475.27	7.07
41	926.67	463.44	6.13E+001	974.44	1485.44	5.47
43	1125.75	562.96	1.41E+001	1073.96	1584.96	5.81
47	1511.57	755.83	1.61E+001	1266.83	1777.83	6.34
48	1527.70	763.89	9.88E+000	1274.89	1785.89	8.57
49	1545.62	772.85	2.10E+001	1283.85	1794.85	6.80
50	1565.45	782.76	8.33E+000	1293.76	1804.76	7.51
52	1590.91	795.49	6.42E+001	1306.49	1817.49	5.80
53	1662.09	831.08	8.59E+000	1342.08	1853.08	7.28
54	1672.39	836.23	2.53E+001	1347.23	1858.23	6.19
55	1681.81	840.94	1.47E+001	1351.94	1862.94	6.52
57	1788.25	894.15	6.33E+000	1405.15	1916.15	8.14

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58	1809.49	904.76	1.02E+001	1415.76	1926.76	8.71
60	1930.81	965.42	8.35E+001	1476.42	1987.42	6.07
62	2131.77	1065.90	7.16E+000	1576.90	2087.90	9.87
63	2158.56	1079.29	8.39E+000	1590.29	2101.29	7.62
64	2189.41	1094.72	1.21E+001	1605.72	2116.72	7.55
65	2222.29	1111.16	9.24E+000	1622.16	2133.16	7.24
67	2477.82	1238.93	4.80E+000	1749.93	2260.93	9.65
68	2495.63	1247.84	6.56E+000	1758.84	2269.84	11.30
69	2749.67	1374.88	4.37E+000	1885.88	2396.88	15.15
71	2993.40	1496.78	1.70E+001	2007.78	2518.78	7.19
72	3004.77	1502.46	9.56E+000	2013.46	2524.46	8.00
73	3027.31	1513.73	5.96E+000	2024.73	2535.73	10.17
74	3162.33	1581.26	1.14E+001	2092.26	2603.26	7.90
75	3177.91	1589.06	6.23E+001	2100.06	2611.06	7.15
76	3186.19	1593.20	4.19E+001	2104.20	2615.20	7.28
77	3243.11	1621.67	3.08E+001	2132.67	2643.67	7.39
78	3251.74	1625.99	6.08E+000	2136.99	2647.99	9.69
79	3262.85	1631.54	3.24E+001	2142.54	2653.54	7.38
80	3278.16	1639.20	1.04E+001	2150.20	2661.20	8.40
81	3334.96	1667.62	4.10E+000	2178.62	2689.62	12.64
82	3530.44	1765.40	1.50E+001	2276.40	2787.40	8.27

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********** PEAK ASSOCIATION REPORT **********

Spectrum file name: 933247 Sample number: 5179-011

Under deter set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	K-40				
			70	2919.93	1460.03	100.00
	2	CE-141				
			19	292.12	146.14	100.00
	3	EU-155				
			11	174.99	87.50	16.35
			15	211.46	105.77	51.58
	4	TL-208				
			29	555.22	277.74	113.86
			42	1022.14	511.16	104.77
			44	1167.16	583.66	95.19
			56	1722.22	861.14	78.96
	5	PB-210				
			3	93.91	46.86	100.00
	6	PB-212				
			7	150.30	75.14	88.04
			8	154.85	77.42	95.36
			11	174.99	87.50	135.86
			25	477.68	238.96	79.37
			32	600.68	300.47	93.58
	7	BI-212				
			46	1455.53	727.81	95.54
			51	1572.05	786.06	104.95
	8	RA-224				
			26	482.48	241.36	92.76
	9	RA-226				
			26	482.48	241.36	7.24
			31	590.94	295.60	98.32
			38	704.31	352.28	92.70
			45	1219.45	609.80	105.43
			66	2242.11	1121.07	105.63
	10	RA-228				
			36	677.13	338.69	105.80
			59	1823.60	911.82	97.29
			61	1939.17	969.60	94.43
	11	TH-228				
			10	169.31	84.66	107.61
			24	432.34	216.28	96.64

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********** M D A R E P O R T **********

Spectrum file name: 933247 Sample number: 5179-011

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	8.889E+000	NA-22	1.200E+000	NA-24	1.318E+000
K-40	1.067E+001	SC-46	1.028E+000	V-48	1.145E+000
CR-51	7.874E+000	MN-54	1.598E+000	FE-59	1.851E+000
CO-56	1.021E+000	CO-57	5.529E-001	CO-58	1.105E+000
CO-60	1.071E+000	NI-65	5.642E+000	ZN-65	2.060E+000
SE-75	9.872E-001	SR-85	9.948E-001	Y-88	1.159E+000
ZR-95	2.136E+000	NB-95	1.363E+000	TC-99M	7.006E-001
RU-103	1.033E+000	RU-106	1.273E+001	AG-110M	1.427E+000
CD-109	1.590E+001	SN-113	1.391E+000	SB-124	1.082E+000
SB-125	2.893E+000	I-129	7.480E+000	I-131	1.005E+000
I-133	1.243E+000	CS-134	1.110E+000	CS-137	1.425E+000
BA-131	1.914E+000	BA-133	1.362E+000	BA-140	4.249E+000
LA-140	1.630E+000	CE-139	7.469E-001	CE-141	1.043E+000
CE-144	5.412E+000	EU-152	1.902E+000	EU-154	1.169E+000
EU-155	1.911E+000	GD-153	1.791E+000	IR-192	9.084E-001
HG-203	1.252E+000	TL-208	1.151E+000	PB-210	1.163E+001
PB-211	2.731E+001	PB-212	1.277E+000	BI-207	1.079E+000
BI-212	9.750E+000	BI-214	2.230E+000	RA-223	6.919E+000
RA-224	1.400E+001	RA-226	1.838E+000	RA-228	2.883E+000
AC-227	5.856E+000	TH-228	4.779E+001	TH-230	1.947E+002
TH-234	1.255E+001	PA-231	2.684E+001	PA-234	1.996E+002
U-234	4.917E+002	U-235	5.745E+000	AM-241	1.839E+000

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SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 15:58:22

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*************************************************************************
*                                                                       *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T       *
*                                                                       *
*************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:537.01
Spectrum file name:933248
Sample number      :5179-012
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection       :1994-May-22    at 12:00:00
End of sample collection         :1994-May-22    at 12:00:00
Sample count started on          :1994-Jun-06    at 14:35:55
Sample count ended on            :1994-Jun-06    at 15:36:37

Irradiation/sampling time        :0 years 0 days 0 hours 0 minutes
Decay time                       :0 years 15 days 2 hours 35 minutes

Live time: 3.60E+003 s real time: 3.64E+003 s   dead time: 1.15E+000 %

Shape calibration requested      :PETRI1
Shape calibration used           :PETRI1
                        Created  :1993-Jan-20     11:13:47
                        Modified :1993-Sep-03     01:04:36

Energy calibration requested     :DETECT1
Energy calibration used          :DETECT1
                        Created  :1993-Apr-27     16:21:17
                        Modified :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used      :PETRI1
                        Created  :1993-Jan-20     15:46:11
                        Modified :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:    5.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

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********** PEAK FIT REPORT **********

Spectrum file name: 933248 Sample number: 5179-012

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
m	1	74.58	37.65	2.46E+003	22.8	9.00E+003	6.72E+000	25.3	34.7
M	2	79.32	40.03	4.19E+003	13.1	7.31E+003	1.11E+001	16.4	34.7
	3	92.77	46.78	2.85E+003	3.4	5.37E+003	7.02E+000	8.2	1.2
B			46.40	8.53E+000	10.7				
	4	115.13	58.00	1.60E+003	4.7	6.68E+003	3.72E+000	6.7	1.4
	5	126.49	63.70	2.11E+003	7.5	8.79E+003	4.84E+000	8.5	3.7
B			63.21	5.13E+001	12.4				
m	6	149.05	75.01	5.21E+004	2.2	1.10E+004	1.20E+002	3.7	34.4
B			74.76	6.96E+000	10.0				
M	7	153.60	77.29	8.19E+004	1.7	1.06E+004	1.89E+002	3.3	34.4
B			76.92	7.71E+000	8.8				
m	8	168.02	84.51	7.82E+003	5.3	8.70E+003	1.82E+001	5.9	14.9
B			84.12	6.39E+000	15.1				
m	9	173.72	87.37	2.77E+004	2.2	8.65E+003	6.50E+001	3.4	14.9
m	10	179.13	90.08	1.91E+004	2.9	8.29E+003	4.49E+001	3.8	14.9
M	11	185.93	93.49	1.88E+004	2.7	7.43E+003	4.48E+001	3.7	14.9
B			92.50	7.53E+001	2.0				
	12	198.25	99.66	4.34E+003	3.5	5.89E+003	1.05E+001	4.3	3.3
m	13	210.02	105.55	5.72E+003	4.8	6.07E+003	1.41E+001	5.4	11.0
M	14	216.81	108.95	1.66E+003	13.4	6.10E+003	4.14E+000	13.7	11.0
	15	229.48	115.30	2.51E+003	2.6	5.28E+003	6.38E+000	3.7	0.7
	16	257.21	129.18	8.72E+003	1.8	5.65E+003	2.33E+001	3.2	2.8
	17	306.99	154.10	2.87E+003	3.0	4.99E+003	8.41E+000	4.1	1.4
	18	371.08	186.17	3.55E+003	3.1	4.69E+003	1.17E+001	4.2	2.1
B			185.64	3.74E+001	1.7				
	19	397.59	199.44	8.41E+002	8.1	4.29E+003	2.91E+000	8.6	1.3
	20	417.33	209.31	1.24E+004	1.1	3.99E+003	4.44E+001	3.0	1.7
	21	430.72	216.01	1.02E+003	5.6	3.79E+003	3.76E+000	6.3	0.9
m	22	476.04	238.68	1.38E+005	1.2	3.77E+003	5.48E+002	2.9	35.4
B			238.54	2.23E+001	3.7				
M	23	481.13	241.23	1.43E+004	4.2	3.60E+003	5.72E+001	5.0	35.4
	24	504.01	252.67	5.89E+002	11.1	2.75E+003	2.44E+000	11.4	1.9
	25	539.16	270.25	8.60E+003	0.7	2.64E+003	3.77E+001	2.7	0.8
	26	553.43	277.39	4.92E+003	2.1	2.81E+003	2.20E+001	3.4	2.1
	27	575.13	288.24	9.26E+002	10.9	2.45E+003	4.29E+000	11.2	1.3
m	28	589.10	295.23	9.46E+003	1.7	2.44E+003	4.47E+001	3.1	3.6
B			295.08	3.42E+000	20.5				
M	29	598.88	300.12	7.49E+003	2.0	2.35E+003	3.59E+001	3.2	3.6
	30	642.07	321.71	4.69E+002	8.8	2.31E+003	2.39E+000	9.2	1.0
m	31	654.58	327.97	6.51E+003	1.7	2.32E+003	3.37E+001	3.0	2.1
M	32	663.31	332.34	8.59E+002	7.7	2.35E+003	4.51E+000	8.1	2.1
	33	675.20	338.28	2.51E+004	1.4	2.56E+003	1.34E+002	2.9	8.8
	34	702.37	351.87	1.54E+004	0.7	2.13E+003	8.49E+001	2.6	1.0
B			351.84	6.77E+000	5.1				
	35	752.77	377.07	3.82E+002	13.7	2.31E+003	2.25E+000	14.0	1.4
	36	817.39	409.37	3.22E+003	2.0	1.89E+003	2.05E+001	3.2	0.9
	37	904.15	452.74	7.35E+002	5.0	1.56E+003	5.15E+000	5.6	0.6
	38	924.41	462.87	6.61E+003	1.3	1.58E+003	4.73E+001	2.8	1.6
	39	1019.73	510.52	1.00E+004	2.3	1.79E+003	7.88E+001	3.4	7.2
B			510.89	3.70E+001	8.9				
	40	1123.24	562.26	1.30E+003	1.5	1.42E+003	1.12E+001	2.9	0.7
	41	1164.64	582.94	3.63E+004	0.6	1.40E+003	3.26E+002	2.6	2.6

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B			583.08	7.72E+000	6.4				
	42	1216.87	609.05	1.02E+004	0.8	1.31E+003	9.59E+001	2.7	1.2
B			609.25	7.06E+000	5.8				
	43	1452.70	726.91	8.15E+003	0.9	1.14E+003	9.13E+001	2.6	1.5
	44	1508.65	754.88	9.46E+002	3.9	1.16E+003	1.10E+001	4.6	1.2
m	45	1524.82	762.96	7.13E+002	4.6	1.07E+003	8.39E+000	5.2	0.9
m	46	1534.80	767.94	8.56E+002	3.7	1.02E+003	1.01E+001	4.4	0.9
M	47	1542.68	771.88	1.32E+003	2.8	9.96E+002	1.57E+001	3.7	0.9
m	48	1562.35	781.71	5.53E+002	5.7	8.49E+002	6.66E+000	6.2	1.0
M	49	1569.18	785.12	1.28E+003	3.2	8.56E+002	1.55E+001	4.0	1.0
	50	1587.97	794.51	4.01E+003	1.1	7.92E+002	4.90E+001	2.7	0.8
m	51	1659.26	830.14	4.28E+002	6.1	7.19E+002	5.47E+000	6.5	0.9
m	52	1669.51	835.26	1.49E+003	2.3	6.85E+002	1.91E+001	3.3	0.9
M	53	1678.62	839.81	8.92E+002	3.3	6.46E+002	1.15E+001	4.1	0.9
	54	1719.20	860.09	4.39E+003	1.2	5.15E+002	5.81E+001	2.6	0.8
	55	1806.44	903.68	5.09E+002	4.2	5.80E+002	7.07E+000	4.8	0.6
	56	1820.45	910.68	2.41E+004	0.7	4.51E+002	3.38E+002	2.4	2.3
B			911.15	2.35E+000	10.0				
	57	1866.19	933.54	4.30E+002	5.5	4.97E+002	6.17E+000	6.0	0.9
m	58	1927.61	964.23	4.34E+003	1.5	4.01E+002	6.43E+001	2.7	1.3
M	59	1935.98	968.41	1.43E+004	0.8	3.81E+002	2.12E+002	2.4	1.3
	60	2007.14	1003.97	1.46E+002	21.1	4.58E+002	2.24E+000	21.2	2.0
	61	2128.25	1064.49	2.99E+002	8.6	4.23E+002	4.88E+000	8.9	1.4
	62	2155.59	1078.15	3.40E+002	6.9	3.68E+002	5.60E+000	7.2	1.1
	63	2185.90	1093.29	4.69E+002	6.9	3.98E+002	7.84E+000	7.2	1.8
	64	2219.03	1109.85	3.51E+002	6.8	3.40E+002	5.96E+000	7.1	1.2
	65	2238.64	1119.65	1.90E+003	1.5	4.50E+002	3.24E+001	2.6	1.4
B			1120.23	2.11E+000	11.8				
	66	2474.08	1237.29	7.04E+002	3.2	3.38E+002	1.32E+001	3.9	0.8
	67	2753.49	1376.90	5.05E+002	7.6	3.99E+002	1.05E+001	8.0	2.1
	68	2916.38	1458.29	4.68E+002	5.5	3.27E+002	1.02E+001	6.0	1.2
m	69	2989.94	1495.04	5.52E+002	3.6	2.22E+002	1.23E+001	4.4	0.9
M	70	3001.06	1500.60	2.84E+002	5.9	2.27E+002	6.35E+000	6.4	0.9
	71	3023.87	1511.99	1.32E+002	16.3	3.40E+002	2.97E+000	16.5	1.3
m	72	3159.10	1579.56	2.91E+002	6.2	2.50E+002	6.81E+000	6.9	1.1
m	73	3174.30	1587.16	1.89E+003	2.0	2.81E+002	4.43E+001	3.5	1.1
M	74	3183.07	1591.53	1.19E+003	2.6	2.68E+002	2.81E+001	3.9	1.1
	75	3239.36	1619.66	8.09E+002	4.2	2.78E+002	1.93E+001	5.2	1.7
m	76	3259.19	1629.57	9.79E+002	3.4	2.15E+002	2.35E+001	4.6	1.5
M	77	3274.37	1637.15	2.83E+002	7.7	1.77E+002	6.82E+000	8.3	1.5
	78	3320.52	1660.21	1.07E+002	16.8	2.16E+002	2.62E+000	17.1	1.4
	79	3456.93	1728.37	3.82E+002	3.4	1.83E+002	9.63E+000	4.8	0.5
	80	3526.88	1763.32	1.57E+003	2.1	1.73E+002	4.02E+001	4.2	1.1
B			1764.31	2.79E+000	6.4				
	81	3692.72	1846.18	2.47E+002	5.5	2.04E+002	6.57E+000	6.8	0.8

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

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******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933248 Sample number: 5179-012

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	MN-54	0.97	1.148E+001	3.33	1.187E+001	7.737E-001
	2	EU-155	0.93	2.782E+001	7.39	2.799E+001	4.053E+000
	3	TL-208	0.99	2.297E+002	1.47	2.297E+002	6.637E+000
	4	PB-210	0.99	1.038E+002	8.17	1.039E+002	1.664E+001
	5	PB-212	1.00	5.659E+002	1.87	5.745E+002	2.101E+001
	6	BI-212	0.97	4.589E+002	2.03	4.659E+002	1.856E+001
	7	RA-223	0.66	1.228E+002	2.38	1.230E+002	5.729E+000
	8	RA-224	0.99	6.212E+002	6.99	6.306E+002	8.639E+001
	9	RA-226	0.98	1.314E+002	1.35	1.314E+002	3.489E+000
	10	RA-228	0.97	7.371E+002	1.46	7.408E+002	2.125E+001
	11	TH-228	1.00	9.220E+002	4.31	9.359E+002	7.913E+001
	12	TH-234	0.92	1.210E+002	5.06	1.210E+002	1.199E+001
	13	PA-231	0.35	9.916E+001	34.37	9.916E+001	6.680E+001

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	74.58	37.65	6.72E+000	548.65	1059.65	25.34
2	79.32	40.03	1.11E+001	551.03	1062.03	16.41
4	115.13	58.00	3.72E+000	569.00	1080.00	6.73
10	179.13	90.08	4.49E+001	601.08	1112.08	3.83
12	198.25	99.66	1.05E+001	610.66	1121.66	4.27
14	216.81	108.95	4.14E+000	619.95	1130.95	13.69
15	229.48	115.30	6.38E+000	626.30	1137.30	3.69
16	257.21	129.18	2.33E+001	640.18	1151.18	3.23
18	371.08	186.17	1.16E+001	697.17	1208.17	4.20
19	397.59	199.44	2.91E+000	710.44	1221.44	8.60
20	417.33	209.31	4.44E+001	720.31	1231.31	2.96
24	504.01	252.67	2.44E+000	763.67	1274.67	11.40
27	575.13	288.24	4.29E+000	799.24	1310.24	11.25
30	642.07	321.71	2.39E+000	832.71	1343.71	9.19
31	654.58	327.97	3.37E+001	838.97	1349.97	3.05
32	663.31	332.34	4.51E+000	843.34	1354.34	8.14
35	752.77	377.07	2.25E+000	888.07	1399.07	13.97
36	817.39	409.37	2.05E+001	920.37	1431.37	3.17
37	904.15	452.74	5.15E+000	963.74	1474.74	5.55
38	924.41	462.87	4.73E+001	973.87	1484.87	2.83
40	1123.24	562.26	1.12E+001	1073.26	1584.26	2.92
44	1508.65	754.88	1.10E+001	1265.88	1776.88	4.57
45	1524.82	762.96	8.39E+000	1273.96	1784.96	5.25
46	1534.80	767.94	1.01E+001	1278.94	1789.94	4.44
47	1542.68	771.88	1.57E+001	1282.88	1793.88	3.72
48	1562.35	781.71	6.66E+000	1292.71	1803.71	6.21
50	1587.97	794.51	4.90E+001	1305.51	1816.51	2.67
51	1659.26	830.14	5.47E+000	1341.14	1852.14	6.51
53	1678.62	839.81	1.15E+001	1350.81	1861.81	4.06
55	1806.44	903.68	7.07E+000	1414.68	1925.68	4.81
57	1866.19	933.54	6.17E+000	1444.54	1955.54	5.99
58	1927.61	964.23	6.43E+001	1475.23	1986.23	2.70
60	2007.14	1003.97	2.24E+000	1514.97	2025.97	21.23
61	2128.25	1064.49	4.88E+000	1575.49	2086.49	8.85

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62	2155.59	1078.15	5.60E+000	1589.15	2100.15	7.18
63	2185.90	1093.29	7.84E+000	1604.29	2115.29	7.24
64	2219.03	1109.85	5.96E+000	1620.85	2131.85	7.13
66	2474.08	1237.29	1.32E+001	1748.29	2259.29	3.88
67	2753.49	1376.90	1.05E+001	1887.90	2398.90	7.97
68	2916.38	1458.29	1.02E+001	1969.29	2480.29	6.03
69	2989.94	1495.04	1.23E+001	2006.04	2517.04	4.43
70	3001.06	1500.60	6.35E+000	2011.60	2522.60	6.41
71	3023.87	1511.99	2.97E+000	2022.99	2533.99	16.52
72	3159.10	1579.56	6.81E+000	2090.56	2601.56	6.86
73	3174.30	1587.16	4.43E+001	2098.16	2609.16	3.49
74	3183.07	1591.53	2.81E+001	2102.53	2613.53	3.85
76	3259.19	1629.57	2.35E+001	2140.57	2651.57	4.57
77	3274.37	1637.15	6.82E+000	2148.15	2659.15	8.26
78	3320.52	1660.21	2.62E+000	2171.21	2682.21	17.12
79	3456.93	1728.37	9.63E+000	2239.37	2750.37	4.80
80	3526.88	1763.32	4.02E+001	2274.32	2785.32	4.15
81	3692.72	1846.18	6.57E+000	2357.18	2868.18	6.75

0000180

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933248 Sample number: 5179-012

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	MN-54				
			52	1669.51	835.26	100.00
	2	EU-155				
			9	173.72	87.37	22.03
			13	210.02	105.55	68.12
	3	TL-208				
			26	553.43	277.39	117.95
			39	1019.73	510.52	105.21
			41	1164.64	582.94	98.72
			54	1719.20	860.09	82.04
	4	PB-210				
			3	92.77	46.78	100.00
	5	PB-212				
			6	149.05	75.01	84.31
			7	153.60	77.29	89.92
			9	173.72	87.37	116.01
			22	476.04	238.68	76.76
			29	598.88	300.12	89.43
	6	BI-212				
			43	1452.70	726.91	98.74
			49	1569.18	785.12	97.01
			75	3239.36	1619.66	108.74
	7	RA-223				
			17	306.99	154.10	133.75
			25	539.16	270.25	72.77
	8	RA-224				
			23	481.13	241.23	71.37
	9	RA-226				
			23	481.13	241.23	28.63
			28	589.10	295.23	94.05
			34	702.37	351.87	95.98
			42	1216.87	609.05	105.72
			65	2238.64	1119.65	101.98
	10	RA-228				
			33	675.20	338.28	104.66
			56	1820.45	910.68	100.59
			59	1935.98	968.41	96.02
	11	TH-228				
			8	168.02	84.51	102.11
			21	430.72	216.01	97.53
	12	TH-234				
			5	126.49	63.70	161.95
			11	185.93	93.49	24.42
	13	PA-231				
			29	598.88	300.12	10.57

0000181

********** M D A R E P O R T **********

Spectrum file name: 933248 Sample number: 5179-012

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	8.786E+000	NA-22	1.145E+000	NA-24	1.175E+000
K-40	1.376E+001	SC-46	9.555E-001	V-48	1.034E+000
CR-51	7.608E+000	MN-54	9.605E-001	FE-59	1.658E+000
CO-56	9.387E-001	CO-57	6.841E-001	CO-58	9.868E-001
CO-60	1.028E+000	NI-65	5.297E+000	ZN-65	1.964E+000
SE-75	1.068E+000	SR-85	9.842E-001	Y-88	1.096E+000
ZR-95	2.338E+000	NB-95	1.229E+000	TC-99M	7.640E-001
RU-103	1.055E+000	RU-106	1.117E+001	AG-110M	1.270E+000
CD-109	1.649E+001	SN-113	1.314E+000	SB-124	1.098E+000
SB-125	3.020E+000	I-129	8.482E+000	I-131	1.048E+000
I-133	1.165E+000	CS-134	1.091E+000	CS-137	1.497E+000
BA-131	1.999E+000	BA-133	1.404E+000	BA-140	3.989E+000
LA-140	1.204E+000	CE-139	9.119E-001	CE-141	1.376E+000
CE-144	5.800E+000	EU-152	2.048E+000	EU-154	1.467E+000
EU-155	1.979E+000	GD-153	1.895E+000	IR-192	9.589E-001
HG-203	1.048E+000	TL-208	1.136E+000	PB-210	1.257E+001
PB-211	3.244E+001	PB-212	1.541E+000	BI-207	1.128E+000
BI-212	9.128E+000	BI-214	2.084E+000	RA-223	4.738E+000
RA-224	1.710E+001	RA-226	1.940E+000	RA-228	3.087E+000
AC-227	6.932E+000	TH-228	5.047E+001	TH-230	1.941E+002
TH-234	1.066E+001	PA-231	2.859E+001	PA-234	1.955E+002
U-234	5.136E+002	U-235	6.184E+000	AM-241	1.824E+000

0000182

SAMPO 90, 1993 PA,MN,JR. Version 3.20h 1994-Jun-06 16:25:37

```
**********************************************************************
*                                                                    *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T    *
*                                                                    *
**********************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:000.01
Spectrum file name:933251
Sample number      :BLK38537
Sample geometry    :PETRI
Sample type        :SOLID
Sample size        : 4.500E+01 G
Measured by        :DEFAULT

Start of sample collection       :1994-May-31    at 12:00:00
End of sample collection         :1994-May-31    at 12:00:00
Sample count started on          :1994-Jun-06    at 14:59:19
Sample count ended on            :1994-Jun-06    at 15:59:19

Irradiation/sampling time        :0 years 0 days 0 hours 0 minutes
Decay time                       :0 years 6 days 2 hours 59 minutes

Live time: 3.60E+003 s real time: 3.60E+003 s   dead time: 0.00E+000 %

Shape calibration requested      :PETRI4
Shape calibration used           :PETRI1
                        Created  :1993-Jan-20     11:13:47
                        Modified :1993-Sep-03     01:04:36

Energy calibration requested     :DETECT4
Energy calibration used          :DETECT4
                        Created  :1993-Jan-13     13:19:58
                        Modified :1994-Jan-27     08:16:11

Efficiency calibration requested :PETRI4
Efficiency calibration used      :PETRI1
                        Created  :1993-Jan-20     15:46:11
                        Modified :1993-Sep-03     01:06:18

Last search  discrimination level:    5.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:   15.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG4.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000183

********** P E A K F I T R E P O R T **********

Spectrum file name: 933251 Sample number: BLK38537

peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit

*** No peaks found ***

No Shape and Efficiency Calibration used.

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000184

********** M D A R E P O R T **********

Spectrum file name: 933251 Sample number: BLK38537

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	7.552E-001	NA-22	1.809E-001	NA-24	1.583E-001
K-40	2.804E+000	SC-46	1.097E-001	V-48	1.117E-001
CR-51	6.206E-001	MN-54	1.364E-001	FE-59	2.416E-001
CO-56	1.600E-001	CO-57	4.047E-002	CO-58	1.438E-001
CO-60	1.886E-001	NI-65	9.503E-001	ZN-65	3.469E-001
SE-75	7.554E-002	SR-85	1.058E-001	Y-88	1.228E-001
ZR-95	1.916E-001	NB-95	1.247E-001	TC-99M	5.394E-002
RU-103	9.565E-002	RU-106	9.731E-001	AG-110M	1.211E-001
CD-109	1.080E+000	SN-113	1.167E-001	SB-124	7.399E-002
SB-125	2.398E-001	I-129	6.014E-001	I-131	8.946E-002
I-133	1.339E-001	CS-134	1.032E-001	CS-137	1.489E-001
BA-131	1.364E-001	BA-133	9.403E-002	BA-140	4.338E-001
LA-140	1.550E-001	CE-139	4.855E-002	CE-141	8.758E-002
CE-144	3.977E-001	EU-152	1.434E-001	EU-154	8.571E-002
EU-155	1.279E-001	GD-153	1.284E-001	IR-192	8.035E-002
HG-203	8.574E-002	TL-208	1.525E-001	PB-210	1.640E+000
PB-211	2.465E+000	PB-212	2.323E-001	BI-207	9.296E-002
BI-212	1.116E+000	BI-214	3.750E-001	RA-223	4.420E-001
RA-224	1.340E+000	RA-226	3.178E-001	RA-228	6.037E-001
AC-227	4.732E-001	TH-228	3.684E+000	TH-230	1.125E+001
TH-234	1.366E+000	PA-231	3.068E+000	PA-234	2.413E+001
U-234	3.951E+001	U-235	4.879E-001	AM-241	1.334E-001

0000185

```
SAMPO 90, 1993 PA,MN,JR.      Version 3.20h          1994-Jun-06     16:24:31
********************************************************************************
*                                                                              *
*     G A M M A   S P E C T R U M   A N A L Y S I S   R E P O R T              *
*                                                                              *
********************************************************************************

IT ANALYTICAL ST. LOUIS
Sample description:000.01
Spectrum file name:933250
Sample number     :LCS38537
Sample geometry   :PETRI
Sample type       :SOLID
Sample size       : 4.500E+01 G
Measured by       :DEFAULT

Start of sample collection       :1994-Oct-01    at 12:00:00
End of sample collection         :1994-Oct-01    at 12:00:00
Sample count started on          :1994-Jun-06    at 16:06:15
Sample count ended on            :1994-Jun-06    at 16:22:09

Irradiation/sampling time        :0 years 0 days 0 hours 0 minutes
Decay time                       :-1 years 248 days 4 hours 6 minutes

Live time: 9.00E+002 s real time: 9.54E+002 s   dead time: 5.66E+000 %

Shape calibration requested      :PETRI1
Shape calibration used           :PETRI1
                        Created  :1993-Jan-20     11:13:47
                        Modified :1993-Sep-03     01:04:36

Energy calibration requested     :DETECT1
Energy calibration used          :DETECT1
                        Created  :1993-Apr-27     16:21:17
                        Modified :1994-Feb-01     17:08:58

Efficiency calibration requested :PETRI1
Efficiency calibration used      :PETRI1
                        Created  :1993-Jan-20     15:46:11
                        Modified :1993-Sep-03     01:06:18

Last search  discrimination level:   15.00
Last search     FROM channel 8 TO channel 4088
Last fitting discrimination level:   15.00
Last fit        FROM channel 1 TO channel 4096
Identification energy tolerance  :    1.00
Minimum acceptable confidence    :    0.25
Gamma reference library          :C:\SAMPO\LIBRARY\MAIN.ILF
with 66 isotopes and 154 gamma lines.

MDA library name: C:\SAMPO\LIBRARY\MAIN.ILF
MDA energy tolerance:     1.00 keV
MDA decision limit 1-alpha:   95.00 %
MDA detection limit 1-beta:   95.00 %

Peaked backround file:C:\SAMPO\SPECTRA\BKG1.PTF
Energy tolerance for peaked backround subtraction:     1.00 keV
Threshold factor for peak areas:     1.00
```

0000186

********** P E A K F I T R E P O R T **********

Spectrum file name: 933250 Sample number: LCS38537

	peak no	centroid channel	energy keV	area counts	error %	background counts	intensity gps	error %	gfit
	1	75.43	38.08	6.24E+003	5.7	1.48E+004	6.78E+001	12.2	23.6
	2	118.70	59.79	2.27E+005	0.9	1.29E+004	2.10E+003	4.6	31.1
	3	175.50	88.26	2.18E+005	0.8	1.04E+004	2.05E+003	2.7	22.2
	4	243.44	122.29	1.13E+005	0.6	5.43E+003	1.18E+003	2.7	7.2
	5	272.25	136.71	1.38E+004	1.0	4.30E+003	1.52E+002	2.9	1.6
	6	330.95	166.09	4.50E+004	0.3	3.66E+003	5.51E+002	2.8	6.0
	7	397.48	199.38	2.90E+003	2.6	3.47E+003	4.02E+001	3.8	1.6
	8	557.56	279.45	4.83E+003	1.4	2.47E+003	8.72E+001	3.0	1.4
	9	782.58	391.97	3.09E+004	0.7	2.26E+003	7.55E+002	2.6	2.6
	10	1322.66	661.93	5.24E+004	0.8	2.24E+003	2.14E+003	2.6	5.2
	11	1795.71	898.32	2.98E+004	0.6	1.91E+003	1.64E+003	2.4	2.0
	12	2346.51	1173.55	4.32E+004	0.6	1.20E+003	3.09E+003	2.2	2.3
B			1172.98	2.83E-001	24.9				
	13	2665.29	1332.83	3.85E+004	0.8	8.60E+002	3.10E+003	2.4	4.8
B			1332.04	5.54E-001	11.7				
	14	3673.04	1836.35	1.65E+004	0.9	3.09E+002	1.75E+003	4.0	2.7

Flags: m = a peak in a multiplet, M = last peak in a multiplet, ? = bad fit
B = backround peak - will be subtracted from the peak above.

0000187

******** R A D I O N U C L I D E A N A L Y S I S R E P O R T *********

Spectrum file name: 933250 Sample number: LCS38537

Un det set	Nuc lid #	Nuclide name	Confid	activity (pCi/G) Sample Activity	% Error	Decay Corrected	Decay Corr. 2 Sigma Error
	1	CO-57	0.99	8.432E+002	1.98	8.432E+002	3.265E+001
	2	CO-60	0.98	1.858E+003	1.60	1.858E+003	5.829E+001
	3	Y-88	0.98	1.058E+003	2.06	1.058E+003	4.267E+001
	4	CD-109	0.99	3.309E+004	2.66	3.309E+004	1.724E+003
	5	SN-113	0.99	6.988E+002	2.60	6.988E+002	3.562E+001
	6	CS-137	0.99	1.509E+003	2.62	1.509E+003	7.741E+001
	7	CE-139	0.99	4.122E+002	2.81	4.122E+002	2.271E+001
	8	HG-203	0.99	6.776E+001	2.95	6.776E+001	3.919E+000
	9	AM-241	0.99	3.518E+003	4.62	3.518E+003	3.186E+002

These peaks were not identified:

Peak	Channel	Energy	Intensity	SE Cand.	DE Cand.	Error
1	75.43	38.08	6.78E+001	549.08	1060.08	12.21
7	397.48	199.38	4.02E+001	710.38	1221.38	3.81

0000188

********** P E A K A S S O C I A T I O N R E P O R T **********

Spectrum file name: 933250 Sample number: LCS38537

Under determ set #	Nuc lide #	Nuclide	Peak #	Peak channel	Peak energy	Peak usage %
	1	CO-57				
			4	243.44	122.29	101.58
			5	272.25	136.71	98.14
	2	CO-60				
			12	2346.51	1173.55	100.09
			13	2665.29	1332.83	99.89
	3	Y-88				
			11	1795.71	898.32	100.07
			14	3673.04	1836.35	99.80
	4	CD-109				
			3	175.50	88.26	100.00
	5	SN-113				
			9	782.58	391.97	100.00
	6	CS-137				
			10	1322.66	661.93	100.00
	7	CE-139				
			6	330.95	166.09	100.00
	8	HG-203				
			8	557.56	279.45	100.00
	9	AM-241				
			2	118.70	59.79	100.00

0000189

********** M D A R E P O R T **********

Spectrum file name: 933250 Sample number: LCS38537

Isotope	Min. Det. Act.	Isotope	Min. Det. Act.	Isotope	Min. Det. Act.
BE-7	3.863E+001	NA-22	5.156E+000	NA-24	5.153E+000
K-40	5.494E+001	SC-46	6.490E+000	V-48	4.955E+000
CR-51	2.910E+001	MN-54	5.557E+000	FE-59	1.127E+001
CO-56	5.795E+000	CO-57	2.529E+000	CO-58	5.451E+000
CO-60	6.724E+000	NI-65	2.656E+001	ZN-65	1.502E+001
SE-75	3.422E+000	SR-85	4.311E+000	Y-88	5.417E+000
ZR-95	9.446E+000	NB-95	5.147E+000	TC-99M	2.553E+000
RU-103	4.529E+000	RU-106	4.740E+001	AG-110M	5.466E+000
CD-109	7.244E+001	SN-113	5.058E+000	SB-124	4.531E+000
SB-125	1.363E+001	I-129	4.952E+001	I-131	4.209E+000
I-133	4.876E+000	CS-134	4.616E+000	CS-137	6.412E+000
BA-131	8.677E+000	BA-133	5.589E+000	BA-140	1.599E+001
LA-140	7.860E+000	CE-139	2.603E+000	CE-141	4.606E+000
CE-144	2.064E+001	EU-152	7.607E+000	EU-154	5.359E+000
EU-155	1.096E+001	GD-153	7.935E+000	IR-192	3.722E+000
HG-203	3.275E+000	TL-208	5.126E+000	PB-210	9.176E+001
PB-211	1.326E+002	PB-212	6.012E+000	BI-207	4.219E+000
BI-212	4.394E+001	BI-214	1.001E+001	RA-223	2.172E+001
RA-224	6.748E+001	RA-226	8.829E+000	RA-228	2.825E+001
AC-227	2.316E+001	TH-228	2.702E+002	TH-230	9.139E+002
TH-234	4.826E+001	PA-231	1.220E+002	PA-234	1.223E+003
U-234	3.233E+003	U-235	2.230E+001	AM-241	8.222E+000

0001000

CHAIN OF CUSTODIES

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final Entered and Reviewed by: V.K.Shaw PM Review:

Sample Header Template: due dates

Sample No. / Comments	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)	
Date:								
5179-001	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79580:100)	
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79580:100)	
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79580:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79580:100)	
5179-001BUP	CD-S156E49N-2-3	Soil	22-MAY-94 12:40	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-012
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79580:100)	
5179-002	CD-S156E49N-3-4	Soil	22-MAY-94 12:50	24-MAY-94 09:10	14-JUN-94	FED-EX	2	R2312-011
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79581:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79581:100)	
5179-003	CD-S-82E25N2-3	Soil	22-MAY-94 13:45	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-010
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79584:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79584:100)	
5179-004	CD-S82E25N-3-4	Soil	22-MAY-94 14:05	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-009
1 AM - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79585:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79585:100)	
5179-005	CD-S78E18N-2-3	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	R2312-008
1 AM - Amber Glass-500ml	DNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R190	(79595:100)	
1	EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79595:100)	
1	HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R190	(79595:100)	
1	ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R190	(79595:100)	
1	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79596:100)	
1	RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79596:100)	
1	RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79596:100)	
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R190	(79596:100)	
1 AM - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R190	(79594:100)	

J*=Sample has not been rad screened.

0000191

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template:

Sample No. / Comments	Client ID	Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Date:								
1	PLPT/[illegible]/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79595:100)
1	PAINT/[illegible]/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
1	PH/[illegible]/04	S	COLD	09-JUN-94	03-JUN-94	R19D		(79594:100)
1	PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19D		(79594:100)
1	S/[illegible]/04	S	COLD	09-JUN-94	29-MAY-94	R19D		(79594:100)
1	TCL/[illegible]/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79594:100)
2 AH - Amber Glass-125ML	TCC/[illegible]/04	S	COLD	09-JUN-94	19-JUN-94	R19D		(79590:100 79591:100)
2	VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	1000		(79592:100 79593:100)
2	2000/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	1000		(79592:100 79593:100)
5179-006 CD-009E16M-2-3	Soil	22-MAY-94 14:30	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-007
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79613:90)
5179-007 CD-009E16M-3-4	Soil	22-MAY-94 14:40	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-006
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79624:90)
5179-008 CD-07BE12M-3-4-9	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-005
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79625:90)
5179-009 CD-07BE12M-3-4	Soil	22-MAY-94 16:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-004
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79630:90)
5179-010 CD-08IE5M-2-3-9	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-003
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
1	RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79635:90)
5179-011 CD-08IE5M-3-4	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3		RZ312-002
1 AH - Amber Glass-500ml	RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19D		(79636:90)

3*=Sample has not been rad screened.

ITAS - St. Louis June 07, 1994 02:49 pm
Account: 10952 Project: 537.01 STS Consultants QAS No. 563 Rev. 0
Master Sample Login: 5179

Project Manager: J. Powell

Draft: Final: Entered and Reviewed by: _____ PM Review: _____

Sample Header Template: _____

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Containers	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Date:								
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79636:90)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79636:90)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79636:90)
5179-012	CB-SB1ES4-2-3	Soil	22-MAY-94 15:00	24-MAY-94 09:10	14-JUN-94	FED-EX	3	RZ312-001
1	AM - Amber Glass-500ml	BNA/TCLP/04	S	COLD	09-JUN-94	01-JUN-94	R19B	(79644:100)
1		EXT/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	R19B	(79644:100)
1		HG/TCLP/04	S	COLD	09-JUN-94	22-JUN-94	R19B	(79644:100)
1		ICAP/TCLP/04	S	COLD	09-JUN-94	21-NOV-94	R19B	(79644:100)
1		RAD/GAMMA/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79643:100)
1		RAD/ISOTH/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79643:100)
1		RAD/ISOU/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79643:100)
1		RAD/SCREEN/04	S	COLD	09-JUN-94	20-NOV-94	R19B	(79643:100)
1	AM - Amber Glass-250ML	CN/9010/04	S	COLD	09-JUN-94	05-JUN-94	R19B	(79645:100)
1		FLPT/1010/04	S	COLD	09-JUN-94	18-NOV-94	R19B	(79645:100)
1		PAINT/9095/04	S	COLD	09-JUN-94	19-JUN-94	R19B	(79645:100)
1		PH/9045/04	S	COLD	09-JUN-94	05-JUN-94	R19B	(79645:100)
1		PH/IT/04	S	COLD	09-JUN-94	18-NOV-94	R19B	(79645:100)
1		S/9030/04	S	COLD	09-JUN-94	29-MAY-94	R19B	(79645:100)
1		TOX/9020/04	S	COLD	09-JUN-94	19-JUN-94	R19B	(79645:100)
2	AM - Amber Glass-120ML	TOC/9060/04	S	COLD	09-JUN-94	19-JUN-94	R19B	(79648:100 79651:100)
2		VOA/TCLP/04	S	COLD	09-JUN-94	08-JUN-94	109B	(79646:100 79647:100)
2		ZERO/TCLP/04	S	COLD	09-JUN-94	05-JUN-94	109B	(79646:100 79647:100)

*=Sample has not been rad screened.

TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

CVA 340

Reference Document No. 502240
Page 1 of 2

Project Name/No. [1] LINSAY LIGHT II
Samples Shipment Date [7] 5/23/94
Bill to: [5] STS CONSULTANTS LTD
111 Pfingsten Rd
Deerfield IL 60015
ATTN R C BERGGREEN

Sample Team Members [2] RAWLINSON, BERGGREEN
Lab Destination [8] ST LOUIS
~~Profit Center No.~~ [3]
Lab Contact [9] John Powell
Project Manager [4] BERGGREEN
Project Contact/Phone [12]
Report to: [10] (SAME)
Purchase Order No. [6] 27313-ZH
Carrier/Waybill No. [13]
Required Report Date [11]

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Preservative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
CD-S156E49N-2-3	SS-SOIL	5-22-94 12:40	500 ml amber	500 ml	NONE	γ SPEC	100	
CD-S156E49N-3-4	SS-SOIL	5-22-94 12:50	500 ml amber	500 ml	NONE	γ SPEC	100	
CD-S-B2E25N2-3	SS-SOIL	5/22/94 1345	500 ML AMBER	500 ML	None	γ SPEC	100	
CD SB2E25N-3-4	SS-SOIL	5/22/94 1405	500 ML AMBER	500 ML	NONE	γ SPEC	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	TCLP Metals & SVOAs	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	500 ml AMBER	500 ml	None	γ SPEC	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	250 ml Amber	250 ml	None	Reactivity Corrosivity Ignitability	100	
CD S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml Amber	120 ml	None	TOC	100	

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: [23] HOLD HIGHEST 3 GAMMA SPEC FOR U & Th Isotope. Also ~~[illegible]~~ CD-S156E49N-2-3 FOR U & Th Isotope

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: [26]
Normal ☒ Rush ☐

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by [28] (Signature/Affiliation) Richard Berggreen	Date: 5/23/94 Time: 1045	1. Received by [28] (Signature/Affiliation) Bob Cawart	Date: 05-24-94 Time: 0910
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

0000194

Write: To accompany samples Yellow: Field copy

*See back of form for special instructions

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 27313ZH-COC-2

Page 2 of 2

Project Name LINDSAY LIGHT II

Project No. 27313 ZH

Samples Shipment Date 5/23/94

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120ml	NONE	TOC	100	
CDS78G18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120 ml	NONE	TCLP VOAs	100	
CD-S78E18N-2-3	SS SOIL	5/22/94 1600	120 ml AMBER	120 ML	NONE	TCLP VOAs	100	
CD-S89E16N-2-3	SS SOIL	5/22/94 1430	500 ml AMBER	500 ML	NONE	& SPEC	90	
CD-S84E16N-3-4	SS SOIL	5/22/94 1440	500 ML AMBER	300 ML	NONE	& SPEC	90	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S78E18N-3-4	SS SOIL	5/22/94 1600	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500 ML	NONE	& SPEC	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	500 ML AMBER	500 ML	NONE	TCLP Metals & SVOA	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	90 ML	NONE	TCLP VOAs	100	
CD-S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	60 ML	NONE	TCLP VOCs	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	250 ML AMBER	220 ML	NONE	REACTIVITY CORROSIVITY IGNITABILITY	100	
CD S81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	100 ML	NONE	TOC	100	
CDS81E5N-2-3	SS SOIL	5/22/94 1500	120 ML AMBER	80 ML	NONE	TOC	100	
CD-S81E5N-2-3-9	SS SOIL	5/22/94 1500	500 ML AMBER	500 ml	NONE	& SPEC	100	
CD-S81E5N-3-4	SS SOIL	5/22/94 1500	500 ML AMBER	400 ml	NONE	& SPEC	9070	

0000195

White: To accompany samples Yellow: Field copy

*See back of form for specific instructions

INTERNATIONAL TECHNOLOGY CORPORATION

C.U.R. and C.O.C.

COPIED TO: H Powell
DATE: 05-24-94
TIME: 0945
BY: Bob Cousart

Work Order No.: 5179

Condition Upon Receipt Variance Report
ITAS - St. Louis Laboratory

Client: Linsay Light II
Project No: 537.01
Analysis Requested: Refer to RFA/COC

Date: 05-24-94 0910
Initiated by: B Cousart
RFA/COC Numbers: 502,240

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

(1)	NA	Not enough sample received for proper analysis. Received approximately: _____	8.	☑	Custody tape disturbed/broken/missing. MC Seals
			9.	NA	Sample splits performed by lab.
(2)	☐	Sample received broken/leaking.	(10)	NA	Volatile sample received with approximately _____ mm headspace.
(3)	☐	Sample received without proper preservative.			
	☐	Cooler temperature not within 4°C ± 2°C Record temperature: 6°C	(11)	☐	Sample ID on container does not match sample ID on paperwork. Explain:
	☐	pH _____			
	☐	other: _____			
(4)	☐	Sample received in improper container.	(12)	☐	All coolers on airbill not received with shipment
(5)	☐	Sample received without proper paperwork. Explain:	(13)	☐	Other (explain below): Shipping containers not rec'd/surveyed
(6)	☐	Paperwork received without sample.			
(7)	☐	No sample ID on sample container.			

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) _____ Date: _____

Project Management Review: JRQ Date: 05-24-94

0000196