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ENCLOSURE 29

QUALITY ASSURANCE FOR HEALTH AND ENVIRONMENTAL CHEMISTRY, 1984

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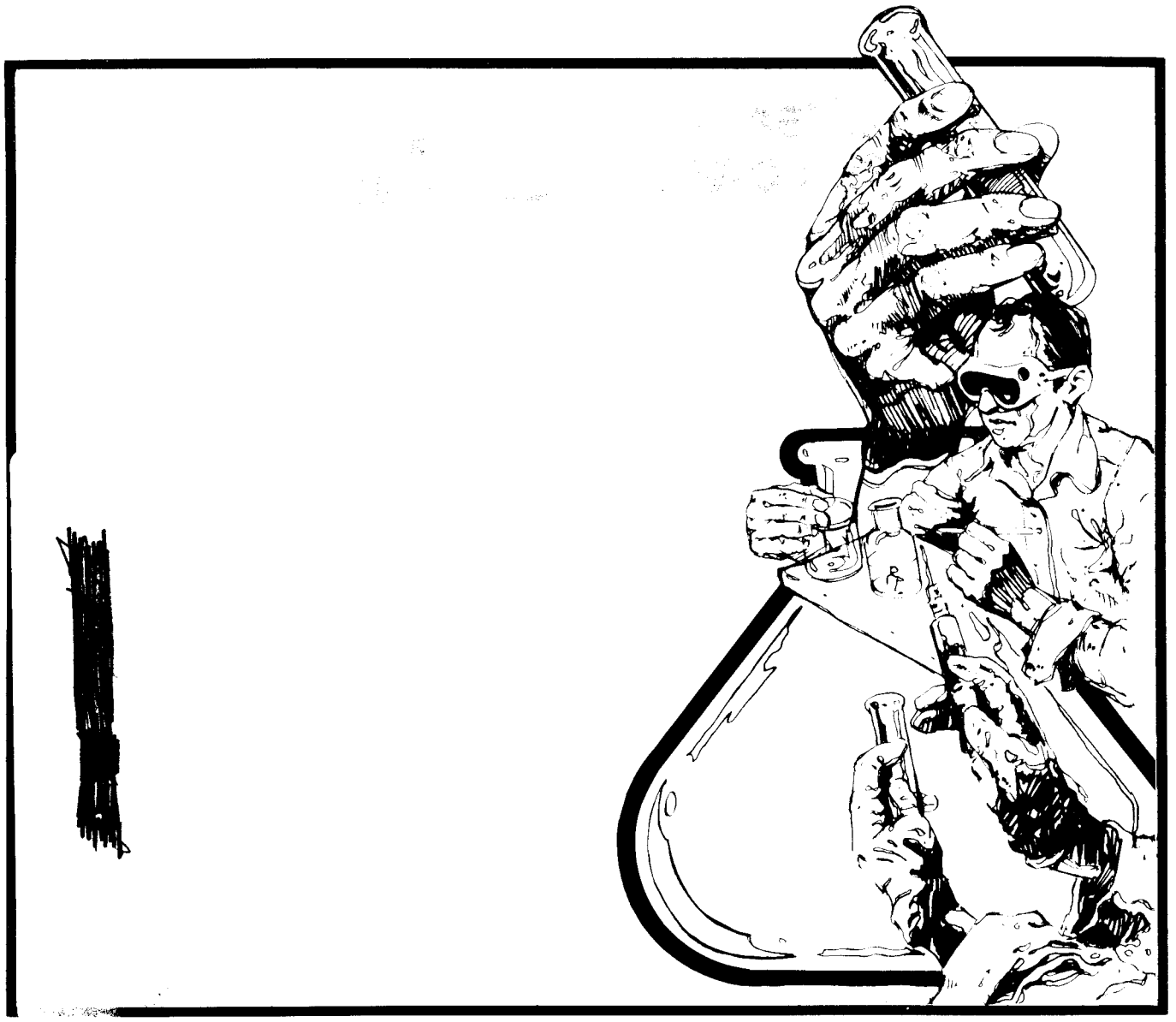

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Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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Quality Assurance for Health and Environmental Chemistry: 1984

Margaret A. Gautier
Ernest S. Gladney
Daniel R. Perrin

Los Alamos
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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QUALITY ASSURANCE FOR HEALTH AND ENVIRONMENTAL CHEMISTRY: 1984

by

Margaret A. Gautier, Ernest S. Gladney, and Daniel R. Perrin

ABSTRACT

The continuing quality assurance efforts by the newly formed Health and Environmental Chemistry Group at the Los Alamos National Laboratory are presented. Changes in philosophy, methodology, and computing resources that have taken place in the Quality Assurance Program to encompass the diversity of analytical chemistry practiced in the new group are documented. Included in this report are all quality assurance reference materials used, along with their certified or consensus concentrations, and all analytical chemistry quality assurance measurements made by HSE-9 during 1984.

I. INTRODUCTION

The Health and Environmental Chemistry Group (HSE-9) within the Health, Safety, and Environment Division was formed from existing analytical chemistry sections in four different groups on January 1, 1984. This reorganization brought together analytical chemistry activities from environmental, industrial hygiene, bioassay, tissue, and industrial waste-water areas and created a need for a new quality assurance (QA) program to encompass the diversity of analytical chemistry practiced in the new group. Elements from QA activities in the previous groups have been integrated to produce the system documented here. This report is the first in an annual series from the new group, patterned after and succeeding those issued previously by the Environmental Surveillance Group.[1-6]

The mission of our group at the Los Alamos National Laboratory is to provide qualitative and quantitative analytical data to health physicists, industrial hygienists, environmental surveillance scientists, epidemiologists, and waste treatment plant operators that accurately describe concentrations of materials in samples submitted for analysis. Incorrect results may lead to erroneous interpretation by management or operations personnel, which could affect the health and safety of exposed personnel or could affect Laboratory compliance with environmental and waste disposal regulations.

One of the fundamental responsibilities of HSE-9 management is to establish a continuing program to ensure the reliability and validity of analytical laboratory data. QA programs range from small, single investigator projects, in which one person conducts all sampling, analytical, and interpretive functions, to that of large-scale facilities-monitoring programs requiring year-to-year continuity. Our philosophy is that a QA program should be broad in focus by applying to all aspects of sample and information management. The program should begin at the conception of a project, follow through collection and storage of samples before analysis, include all phases of chemical and physical analyses, and extend through interpretation and final publication of results.

QA involves the planned and systematic actions necessary to provide confidence in each analytical result reported by our laboratory. We use two concepts in our QA program: quality control (QC), the mechanism established to control errors, and quality assessment, the system used to verify that our entire analytical process is operating within limits we consider acceptable.

The elements of our QC program include the following: (1) development of and adherence to principles of good laboratory practice, (2) consistent use of standard operating procedures, and (3) establishment of and adherence to carefully designed protocols for specific analytical processes. Consistently using qualified personnel, reliable and well-maintained equipment, appropriate calibrations and standards, and closely supervising all operations are primary components of our QC system. Proper conception and execution of this QC program have resulted in our analytical system operating in a state of control, in which errors are within acceptable levels and are characterized statistically.

Quality assessment describes the techniques we use to assess the quality of our analytical process. We have established a system of control charts, which are plots of multiple data points from the same or similar samples versus time. These charts are used to determine if our system is in a state of statistical control and are used to visualize and monitor the relative variability of repetitive data. These control charts are also used with reference materials and spiked samples to assess the accuracy of our measurements. These concepts are further discussed by Keith et al.[7]

A complete listing of definitions of terms, acronyms, and abbreviations used in this report is given in App. A.

II. ANALYTICAL QUALITY ASSURANCE PHILOSOPHY

Our approach is based firmly on the concept of traceability through concurrent analysis of matrix-based certified QA materials. Traceability is a hierarchical system developed largely for regulatory purposes whereby transfer of accuracy among various components or institutions of a measurement system is established. Uriano and Gravatt[8] have examined this concept in detail. Taylor[9] has recently pointed out that this process has its limitations, since the achievement of an acceptable result on a reference material does not guarantee a unique foundation for the result. Traceability may more often be based upon inference than firmly established scientific fact.

Laboratory policy[10] is to maintain traceability to the National Bureau of Standards (NBS), which in turn maintains traceability to international metrology standards where applicable. We cannot achieve this in all cases because NBS has limited resources for certification of matrix-based Standard Reference Materials (SRMs) for as many elements as we need to measure. This restraint has lead us in two directions. First, we have a large library of reference materials from other national and international agencies [US Environmental Protection Agency (EPA), US Geological Survey (USGS), Department of Energy (DOE) Environmental Measurements Laboratory (EML), Canadian Geological Survey (CGS), International Atomic Energy Agency (IAEA), Centre de Recherces Petrographiques et Geochimiques (CRPG), and the Japanese Geological Survey] in addition to the available NBS biological and environmental SRMs. Our current holdings are shown in App. B, along with a listing of secondary QC materials prepared in-house. Second, we continue to compile all available literature data on these reference materials so that "consensus" values for elemental concentrations not agency certified may be developed. We have over 300 reference materials, some of which have certified or consensus values for as many as 80 elements. Using Digital Equipment Corporation Datatrieve-11 software, we have created two data bases, SRMS and REFS, to permit random collection of literature data on reference materials. At any time, this collection may be sorted as a function of any logical combination of parameters and printed for our determination of a consensus value. This process is described in detail in the references.[11-22]

Some agencies recommend that splitting and analysis of duplicates on 5% of the samples are sufficient QA. We believe that this approach is inadequate, providing only an assessment of precision, not accuracy. Our alternative is concurrent analysis of reference materials of similar matrix with every batch of samples. In this fashion both precision and accuracy may be assessed and traceability to a national standards laboratory is maintained. Participation in intercomparison studies is a necessary but not sufficient component of our QA program, since these samples appear too infrequently to ensure that day-to-day control is maintained. We strive to run a minimum of 10% of all analyses as matrix-based QA reference materials. For some determinations (for example, isotopic plutonium on silicates), this level of QA has proved to be prohibitively expensive.

Precision describes the degree to which data generated from replicate or repetitive measurements agree. Unless the true value is known, accuracy (the correctness of the data) cannot be evaluated. Our analytical system ensures continued precision and accuracy of laboratory results through concurrent analyses of matrix-based agency-certified reference materials. Because the compositional properties of these reference materials simulate those of the sample routinely

measured, their correct measurement can infer correct measurement of routine samples. When insufficient quantities of reference materials are available, we develop as many of our own secondary materials, traceable to agency reference materials, as possible.

III. QUALITY ASSURANCE OBJECTIVES AND POLICIES

The purpose of the analytical QA program in HSE-9 is to continually monitor the scientific reliability (accuracy and precision) of reported laboratory data that are generated for use in HSE Division activities related to health and the environment. These data are also used by other organizations both within and outside the Laboratory. Specific QA program objectives are

1. To assess the capabilities of analytical methods for meeting users' needs regarding precision, accuracy, sensitivity, and specificity.

2. To establish and monitor the routine operational performance of our laboratory through appropriate systems checks for ensuring that all aspects of the QA program are operative.

3. To run performance audits of blind standard samples for evaluation of our laboratory and to participate in collaborative test programs with peer laboratories for achieving and maintaining consistent and uniform levels of quality.

4. To perform corrective actions as necessary.

Fundamental policies of our QA program are

1. QC materials will be a minimum of 10% of all analyses.

2. QC materials will be run with each batch and will include reagent blanks or samples that represent an appropriate blank.

3. Analysts will check with the QA officer or QA computer data base (through program QACHECK) to determine whether their analyses are under control for a particular batch. Appendix C shows a typical terminal session using this program.

4. Analyses are considered under control whenever the absolute value of the difference between our mean and the certified or consensus mean is inside the propagated single standard deviation uncertainty of the experimental and certified means. This concept is formulated in Eq. (1):

$$|\bar{X}_e - \bar{X}_c| < \sqrt{(S_e)^2 + (S_c)^2} \quad , \qquad (1)$$

where S_e and S_c are the standard deviations associated with X_e and X_c, respectively. Analyses are considered acceptable, but not fully under control, when the mean difference is between one and two standard deviations. Analyses are out of control when the mean difference exceeds two propogated standard deviations. This criterion is incorporated in the QACHECK computer program.

5. Analyses that are out of control by criterion 4 above are not reported to the SAMPLES data base or requesting investigator and are performed again on new aliquots of the original sample, if available.

6. An additional approach for assessing overall performance on a variety of QA materials over longer times (for example, annually) involves the calculation of mean ratios of X_e/X_c as a function of analysis and matrix types. These data are summarized as a mean (±) one standard deviation for each determination in each matrix type [Eq. (2)]:

$$\frac{\sum \frac{\bar{X}_e}{\bar{X}_c}}{n} \pm S \quad . \qquad (2)$$

Results of this mean ratio approach for radiochemical, stable element, and organic analyses for all 1984 QC measurements made by HSE-9 are shown in App. D along with all raw data used for these calculations, their certified or consensus values, and their sources. A summary of elemental determinations on NBS, Canadian Certified Reference Materials Program (CRMP), and USGS reference materials is also given in this appendix.

Appendix D contains plots showing 5-yr trends for routine analyses that have sufficient ratio data for evaluation and plots of 5-yr trends in the EPA Radiochemical Quality Assurance Program. Appendix E summarizes isotopic,

elemental, and organic compound analyses completed by HSE-9 in 1984.

7. Reliable, verified analytical techniques, drawn primarily from the EPA, American Association of Official Analytical Chemists (AOAC), American Society for Testing Materials (ASTM), NBS, and similar sources, are used. Development of improved procedures is continually pursued, and they are thoroughly verified through successful analyses of a variety of agency reference materials before becoming part of our routine analytical program.

We maintain a QC system for each instrument and analytical method, which includes the following items:

1. Appropriate fresh reagents and chemicals are used. Chemical calibration or standardization depends critically upon the quality of the chemicals used to provide the necessary standard solutions and the care exercised in their preparation.

2. Clean glassware of appropriate calibration is used.

3. Instruments are calibrated daily. Calibration, when possible, should be performed by regression analysis of the net signal on the analyte concentration. At least three different concentrations of calibration standards are measured in triplicate, but we recommend using more than three different concentrations. The concentrations of these standards must bracket the expected concentration of the analyte in the samples. For instruments in which absolute linearity cannot be established (for example, atomic absorption spectrophotometers), we use a calibration scheme of three standards per concentration decade. For example, the following standard concentrations are run to calibrate over the region of 1-100 ppm: 1, 5, 10, 50, and 100 ppm.

4. Results from instruments without absolute linearity are NOT reported based on extrapolation. All samples are bracketed by two standards with concentrations near the expected concentration of the unknown and determined by interpolation.

5. Raw data are retained with "archival" storage in the Laboratory's Communication and Records Management Office (CRMO).

6. Written, updated instrument operating instructions and instrument logbooks are available at the bench.

7. Current and complete analytical methods and procedures are published, distributed, and maintained.[23-25]

8. **Alpha spectrometer systems.** Background and calibration libraries have been created from 13 wk (one quarter) of accumulated data. Each new calibration and background is compared against the library mean and standard deviation for each detector. The libraries are not changed unless out-of-control conditions are evident. Because each system and each detector in the system are independent, control charts are kept on each detector for the spectrum of interest. Four quarters of 1984 data are shown in App. F. The count room QC program developed for our six alpha spectrometer systems is described below.

   Backgrounds. Run at least one 60 000-s background per week on each system and keep a QC chart for each detector showing counts for the ^{238}Pu, ^{239}Pu, and ^{242}Pu areas. The distribution of background counts in these areas of the spectrum, for each detector, is Poisson.

a. Probabilities associated with the upper 99% limits of the mean count for each detector are applied to determine out-of-control conditions.

b. Individual background counts greater than four for two consecutive counts for the ^{239}Pu areas are out of control and corrective action is required. The ^{238}Pu areas average four counts in 60 000 s. Two consecutive counts of nine is considered out of control. Several detectors exceeded this upper limit during 1984.

c. The desired detection limit, at the 0.05 confidence level, for the plutonium bioassay procedure is 0.03-pCi/700 cm^3 sample. To detect this concentration in routine samples, we apply the following conditions to the sample for acceptance of individual sample control: (1) 700 cm^3

sample volume, (2) ^{242}Pu tracer recovery greater than 40%, (3) detector efficiency greater than 30%, (4) count length of 60 000 s, and (5) background counts of four or less in 60 000 s.

d. The calculation for the detection limit of the minimum detectable amount (MDA) of activity based on Currie[26-27] is

$$\mathrm{MDA} = \frac{\sqrt{4} \times 4.65}{1000 \times 0.40 \times 0.30 \times 2.22}$$

$$= 0.03\ \mathrm{pCi}/700\ \mathrm{cm}^3 \quad . \qquad (3)$$

e. Because the ^{242}Pu tracer recovery averages greater than 85%, the detection limit for the majority of the samples analyzed is 0.01-pCi/700 cm^3 sample.

Calibrations. Run at least one calibration per week on each system and keep a QC chart for each detector. Use the set of 16 matched plates, which are calibrated against NBS SRM 5906-B15, a ^{238}Pu standard plate. The following criteria are applied to evaluate whether an out-of-control condition exists for calibration data:

a. One point outside the three-sigma control limits.

b. Eight successive points on one side of the mean (or 10 out of 11 or 12 out of 14).

c. Two out of three successive points between (±) two and three standard deviations from the mean.

d. Four out of five successive points between (±) one and two standard deviations from the mean.

e. A definite trend in the data.

Record keeping. Print copies of all calibration and background data. The count room manager will review and sign all data and give them to QA for approval before release to other data reduction codes. Printed copies of calibration and background data will be kept indefinitely in a notebook.

NBS standards. Use an NBS standard plate to calibrate secondary standard plates. All other standards are retired to backup status. The same NBS standard plate will be referenced by all data reduction codes.

Plate size. Use the 5/8-in. standard plate size with a 1/2-in. plating area.

System names. Refer to the alpha systems as Alpha 8, Alpha 16, Alpha 32, Alpha 48, Alpha 64, and Alpha 80.

IV. QUALITY ASSURANCE MANAGEMENT

The Quality Assurance Program is run by a QA Coordinator, who heads an independent Quality Assurance, Sample and Data Management (QASDM) Section within the group. Daily QC is the responsibility of each analyst. The Coordinator is responsible for carrying out our QA program and for taking or recommending measures to fulfill the quality objectives in the most efficient and economical manner possible while ensuring continuing accuracy and precision of all data produced. The Coordinator evaluates data monthly, prepares a written report each quarter about critical issues, and publishes an annual summary containing all raw QC data for historical archiving.

Our ability to address our diverse mission is strongly based on our overall QA management scheme. The current "central nervous system" is a Digital Equipment Corporation VAX 11/730. Peripherals include an RA80 121-Mbyte fixed-media disc drive, three RLO2 10-Mbyte removable-cartridge disc drives, numerous keyboard terminals, and two magnetic tape drives. A variety of analytical instruments also interface directly to the computer (Fig. 1). Our in-house software and data bases have been structured around the VAX Datatrieve-11 software system, which permits each user to tailor data bases and interactive software to suit his particular needs.

Figure 2 shows our overall QA operational scheme. A fundamental tenet of our philosophy is that analytical service work is not a linear transfer of samples from customer to analyst and of analytical results from analyst to customer. Continuing interaction between these parties is required. Ideally, the analyst is brought into the project at its inception and participates in the experimental design. This interaction gives the customer the benefit of the analyst's perspective on what can be readily determined in a particular matrix and on sample handling and preservation problems. It also alerts the analyst to future

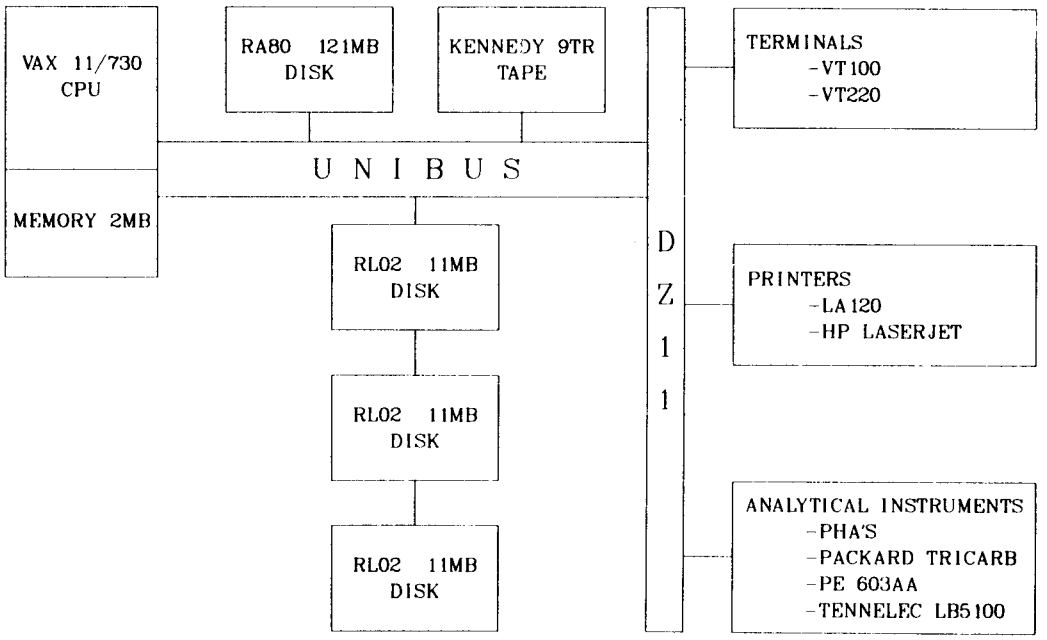

Fig. 1. Diagram of VAX 11/730 system.

research needs for new methodology. The QASDM Section then generates computer-compatible sample numbers printed on stick-on labels and gives these to the customer for use on their samples. This procedure avoids sample number duplication, eliminates computer-incompatible customer-generated numbering schemes, and minimizes transcription errors between customer and analyst. Once samples are taken, with analyst participation if possible, the customer submits them to the appropriate analytical chemistry section leader with an "HSE-9 Analytical Chemistry Request" multicarbon form (Fig. 3) filled out during a discussion between the customer and the section leader. The QASDM Section is responsible for transferring information from the request form to the master SAMPLES data base from a keyboard terminal by using our interactive program SUBMIT. The chemistry section leader involved then distributes a color-coded copy of the form to each responsible analyst.

SAMPLES is the software heart of our QA system and has been structured to contain the following information: sample number, owner, matrix, analysis, request number, requester, request date, project number, analyst, technique, symbol, result, uncertainty, units, completion date, status, and analytical comment. The power of the Datatrieve system then becomes important, for over 50 000 analyses per year flow between it and our 40 analysts. Datatrieve permits a search of the data base as a function of any single parameter or any logical combination of parameters. These data can be transmitted back to the analyst by video terminal or hard-copy line printer. Using logical combinations of simple Datatrieve commands, the analyst can get a real-time assessment of what has been requested, what remains unfinished, what procedures have been suggested for certain determinations, etc. This procedure eliminates the necessity for each analyst maintaining his own hard-copy record system and offers the analytical manager quick access to the overall status of the section or group.

Sometime ago our laboratory adopted a sample numbering scheme that uses a number of the structure AA.xxxxx; AA designates the last two digits of the current calendar year and xxxxx is a five-digit number serially assigned in blocks to various customers. This structure facilitates efficient computer management of the data. Because QC samples may carry over each year, we assign them constant numbers in the series 00.xxxxx to make them easily distinguishable from various years' samples. Los Alamos National Laboratory considers sample data from the bioassay and tissue analysis programs to be confidential personal information, and we keep these data bases on the NOS administrative machine at the Central Computing Facility. The associated QC sample information is kept in the SAMPLES data base on our VAX.

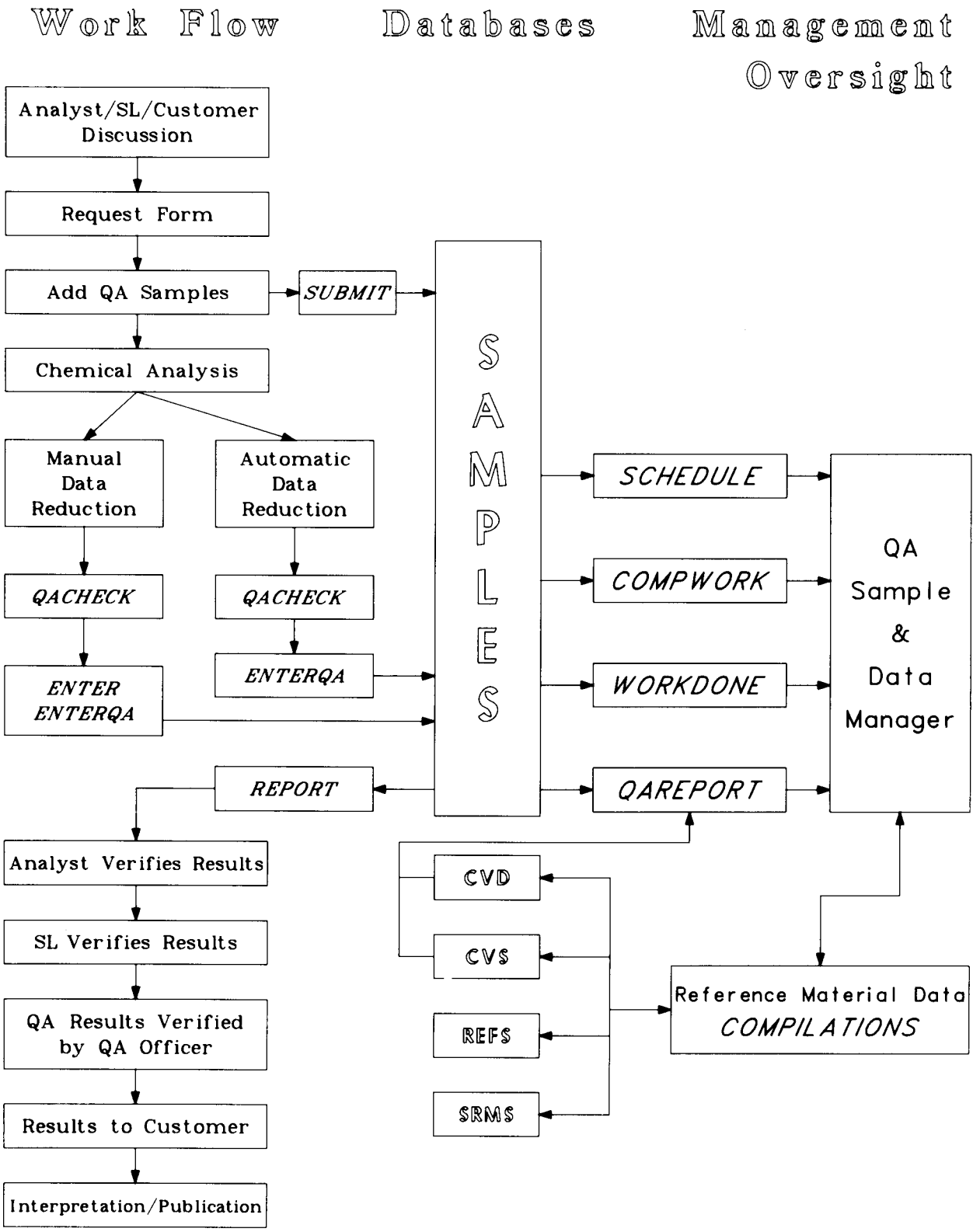

Fig. 2. Diagram of the overall quality assurance system.

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HSE-9 ANALYTICAL CHEMISTRY REQUEST

4365

REQUESTOR		SAMPLE NUMBERS:
PROJECT NUMBER		
SAMPLE OWNER ID		
DATE		
TOTAL No. of SAMPLES		
MATERIAL TYPE		

Analysis	Technique	Projected Completion Date	Analyst	Priority	Weight or Volume Aliquoted	Date completed and reported	Remarks

SPECIAL INFORMATION:

Form No. 991 (8/81)

Fig. 3. Analytical chemistry request form.

Organic chemistry nomenclature is complex and readily subject to typographical errors during entry into SAMPLES. We have adopted a modified version of the Chemical Abstract Service (CAS) compound numbering system to facilitate our record keeping for the diversity of organic analyses performed. The CAS number for a given compound is stripped of the "dashes" and entered into the "Analysis" field in SAMPLES. An ORGANICS data base is kept on the VAX to facilitate translation of these numbers to compound names before the data are reported to the customer. New compounds are added to this data base by the Organic Chemistry Section.

Many of our analytical instruments store their raw data directly on VAX disks for off-line reduction, and in a few cases, the entire data generation process is now computer controlled. The analyst has several data reduction programs, which in most cases generate Datatrieve executable command files that input final analytical results directly into SAMPLES upon analyst approval. For those instruments that still take raw data in the form of chart recordings, the analyst uses the interactive ENTER or ENTERQA programs to transfer his final calculated values back to SAMPLES. When a set of samples has been completed for a given analysis, the analyst uses the REPORT program to generate an "HSE-9 Analytical Results" report form. The results of QC samples run with the sample batch are printed on a separate form by using REPORT. The program recognizes QC sample numbers and will print the current certified or consensus value on these reports. The section leader reviews and signs the data reports and the report goes to the QA Coordinator for approval before release to the customer.

We have developed a utility program "QAREPORT" to permit the QA Coordinator to periodically assess our success in meeting the

analytical QA goals described above. With the DATATRIEVE concept of a view, program "QAREPORT" associates data from several data bases, which include routine QC results as well as certified and consensus values for a given material and element. For a user-selected time, the resulting report consists of (1) the ratio of QC samples to customer samples submitted by matrix and analysis, (2) a detailed list of submitted QC samples that have matrix or units conflicts with certified values, and (3) a listing of QC data falling inside or outside the acceptable limits of analytical error as defined by Eq. (1).

We have several other program tools available for sample management that formalize the common sets of logical commands mentioned above. SCHEDULE permits an overview of the current group backlog of unfinished work as a function of analyst, requested determination, sample number, request number, or matrix. WORKCOMP is a utility that facilitates rapid generation of reports for higher management concerning the number and type of determinations requested or completed during a given time, including cost code information. This program may also be used without modification to summarize the unfinished backlog for the same parameters.

V. INTERLABORATORY QUALITY ASSURANCE PROGRAM

We use the terms reproducibility, repeatability, intralaboratory variability, and interlaboratory variability in describing the various aspects of our measurement process. Repeatability is the variation in data generated on one sample by one analyst or instrument or both over a short time. Reproducibility is the variation over an extended time or by different laboratories or analysts. Intralaboratory variability is the difference in results obtained when a single laboratory repeatedly measures aliquots of the same sample, whereas interlaboratory variability is the difference in results obtained by various laboratories in measurements of aliquots of the same sample. Variabilities caused by equipment, conditions, and different operators (but independent of sample variabilities) affect reproducibility and are parts of intralaboratory variability. Laboratory biases, paired with differences in the capabilities of various laboratories, result in an interlaboratory variability that can be much larger than intralaboratory variability. Our well-designed and -executed QA program helps to reduce both intralaboratory and interlaboratory variability.

Group HSE-9 maintains widespread participation in intragroup, intergroup, and interlaboratory quality evaluation programs that use blind samples. We currently participate in the intercomparison programs described below and App. D reports the data from these studies.

1. The National Institute for Occupational Safety and Health (NIOSH), through its Proficiency Analytical Testing (PAT) Program, provides reference samples to our industrial hygiene chemistry efforts. Each quarter, sample kits are mailed to participating laboratories and data analysis is completed in time to allow participants to obtain repeat samples and correct any analytical problems before the next round starts. The reference samples are designed to cover a variety of analytical methods used by occupational health laboratories and include contaminants in which analytical agreement is poor. We receive metals on filters (a combination of lead, cadmium, and zinc) and organic solvents on charcoal tubes (a combination of up to three of the following: benzene, carbon tetrachloride, chloroform, 1,2 dichloroethane, methylene chloride, methyl chloroform, methyl ethyl ketone, methyl isobutyl ketone, p-dioxane, toluene, trichloroethylene, and o-xylene). The concentration levels are randomly selected from a range of concentrations that are typical of samples taken near current or proposed 8-h time-weighted-average threshold limit values (TLV).

2. The Environmental Monitoring and Support Laboratory-Cincinnati (EMSL-CI), as part of an independent evaluation of US EPA regional laboratories, state laboratories, and other selected laboratories for the drinking-water certification program, sends us Water Supply Performance Evaluation (PE) Study samples. The study covers 31 analytes, most at 2 concentration levels. We must satisfactorily analyze PE samples annually for each chemical for which certification has been granted. We currently analyze for nitrate, fluoride, and trace metals (a combination of arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). EMSL-CI prepares reports for each laboratory and reviews unacceptable data with the laboratory to identify and resolve problems. Once problems are corrected, a laboratory must analyze a second series of PE samples for problem parameters during a follow-up EMSL study.

3. The Quality Assurance Division of the EPA Environmental Monitoring Systems Laboratory-Las Vegas (EMSL-LV) has been assigned the responsibility for radiation QC on environmental measurements. The EPA supplies samples to us through an extensive laboratory intercomparison studies program involving environmental media (milk, water, air, and food) and a variety of radionuclides with activities at or near environmental levels. Simulated environmental samples, containing one or more radionuclides, are prepared and periodically distributed to laboratories upon request. A report is returned to each participant. This program enables us to document the precision and accuracy of our radiation data, identify instrument and procedural problems, and compare our performance with that of other laboratories.

   Drinking-water laboratories certified for radiochemistry must satisfactorily analyze two intercomparison cross-check samples and a set of PE samples annually. Intercomparison samples differ from PE samples in that the former contain only one or two radionuclides (for example, ^{226}Ra and ^{228}Ra), whereas PE samples for radiochemistry are complex mixtures of alpha, beta, and photon-emitting radionuclides. Contaminant concentrations are furnished to the laboratory after completion of the study.

4. The Environmental Measurements Laboratory (EML) operates the Quality Assessment Program (QAP) for the DOE. The program is designed to test the quality of the environmental measurements being reported to the DOE by its contractors. Since 1976 real or synthetic environmental samples that have been prepared and thoroughly analyzed at EML have been distributed to these contractors. We receive semiannual samples for various radionuclide determinations. The sample matrices include soil, water, vegetation, tissue, and air filter. Our results are returned to EML within 90 days, are compiled with EML's results, and are reported back to us 30 days later. The QAP Steering Committee has directed EML to include organic analyses in the semiannual sample sets. May 1986 is the target date for the first set of samples requiring organic analysis.

5. The US EPA and state agencies with approved programs have a QA program for all major permittees under the National Pollutant Discharge Elimination System (NPDES). We receive performance samples containing constituents normally found in industrial and municipal waste waters. Participation in this program is mandatory according to the authority of Sec. 308(a) of the Clean Water Act. The agency's legal opinion, dated August 11, 1977, reaffirms this authority. We are required to analyze and report only those pollutants specified in our NPDES permit (cadmium, chromium, copper, iron, mercury, nickel, zinc, pH, total suspended solids, ammonia as N, nitrate as N, total phosphorus as P, and chemical oxygen demand). An evaluation of our results is returned along with the true values. A copy of the evaluation is also sent to the appropriate EPA regional office and state agency.

6. Battelle is administering a bioassay intercomparison study in support of draft ANSI Standard N13.30, "Performance Criteria for Radiobioassay." This research program is jointly sponsored by the DOE and the Nuclear Regulatory Commission (NRC) to evaluate the appropriateness of the draft standard. The purpose of this standard is as follows: to provide the required accuracy, precision, and acceptable detection limits for measurement of radioactivity in humans ("radiobioassay") occupationally exposed to the intake of radioactive material and for biological matrices sampled from these humans; to provide criteria for testing radiobioassay service laboratories that determine whether their analyses conform adequately to these performance criteria for a selection of representative radionuclides; and to provide selected QC criteria and procedures of a nonquantitative nature that are necessary for ensuring continued reliability of both the radiobioassay service laboratories and the laboratories conducting the testing programs. We receive an artificial urine sample matrix and analyze for the following nuclides: ^{241}Am, ^{238}Pu, natural U, ^{3}H, ^{60}Co, and ^{137}Cs. Minimum detectable amounts (MDA) are calculated routinely to ascertain the estimated capabilities of bioassay laboratories. The results of the intercomparison testing will be considered in establishing acceptable minimum detectable amounts (AMDA) in the final standard.

VI. QC SAMPLE PREPARATION

Compounds closely related chemically to the analytes of concern are used as spikes. These spikes are used indirectly for quantitation of analytes, as for determination of recovery efficiency, and to evaluate analytical metholology. The analyte of interest is spiked onto blank samples of a matrix similar to that of the actual sample. The spiked sample is analyzed under the same conditions as the sample. Spikes are usually made after the samples have been returned to the laboratory, sometimes days or even longer after the samples are taken in the field. The recovery of both laboratory spikes and field samples is made with due consideration for differences of behavior that can occur between naturally incorporated substances and those added artificially. An analyte strongly associated with other components in the sample matrix may not be recovered as efficiently as it is from the blank matrix that we spike and then immediately extract.

Recovery of analytes is influenced by such factors as sample matrix, concentration of the analytes, and storage time. Because recovery often varies with concentration, our spikes and analyte concentrations are as close as practical. Recoveries of the analytes of interest are inferred from those found when spiked materials are used. A comparison of recovery of HSE-9 spiked samples with recovery of samples from the NIOSH PAT Program is shown in App. G.

BIOASSAY QUALITY ASSURANCE PROGRAM. QC samples for the bioassay program are prepared by spiking the analytes of interest into blank urine samples. These spiked samples comprise 10% of the routine sample load. Appendix G summarizes spike recovery results. The main areas of the bioassay program are discussed below.

Tritium. The recovery of tritium from urine would equal 100% provided the calibration and quench correction factors are correct. The results reported in 1984 were obtained on a Packard liquid scintillation spectrometer without benefit of internal quench correction. A 5% quench correction factor was applied to each sample. All tritium QC solutions and routine reference standards were calibrated against NBS SRM 4927-B. The mean background for 1984 data was 320 counts in 10 min and the 0.05 confidence level was 0.044 μCi/L of urine.

Depleted Uranium. The reference standard used for uranium bioassay was prepared from NBS SRM 950a and contains 1 μg/L of normal uranium. Aliquots of this solution are used to prepare the calibration curve used with each set of routine samples analyzed and to prepare the QC samples. Because Laboratory employees are working with and are potentially exposed to depleted uranium (0.18% ^{235}U content by mass), the values in App. D reflect the concentration of depleted uranium relative to the concentration of ^{235}U. This value is obtained by dividing the uranium concentration by four (for example, 1 μg of normal uranium containing 0.72% ^{235}U divided by four is equal to 4 μg of 0.18% depleted uranium).

The 0.05 confidence level for this procedure, delayed-neutron activation (DNA), is based on the counts observed on blank urine samples analyzed concurrently with the routine samples. The mean background count for the data collected in 1984 was 126 ± 15 counts (one sigma). Each sample set has a different set of background values but, as expected, 95% of the values fall within the two-sigma limits. The MDA for the procedure is calculated from the standard deviation about the linear regression calibration curve obtained by using the regression of the observed counts on the concentration of uranium standard added to blank urine samples. Four standards and two blanks are analyzed with each set of samples. For 1984 analyses, the MDA was 6 ± 2 μg/L (one sigma).

Enriched Uranium. QC samples are spiked with an enriched uranium standard (93.16% ^{235}U) prepared from NBS SRM U-930 and are analyzed concurrently with the routine samples. This same NBS standard is used by the analyst to prepare the calibration curve in blank urine. The 0.05 confidence level for the detection of enriched uranium by DNA is based on counts from blank urine samples. The mean background count for the method in 1984 was 126 ± 15 counts at the one-sigma level. The MDA for samples containing 93% enriched uranium is calculated from the standard deviation about the intercept of the linear regression caibration curve. This corresponds to 4 pCi/L for 1984 data. The recovery of uranium in the QC samples averaged 100%.

Plutonium. Based on 1984 QC samples, the mean recovery of ^{239}Pu added to "blank" urine samples averaged 98% after correction for the ^{242}Pu tracer chemical losses. The mean recovery of the QC samples containing 1.47 pCi of ^{242}Pu, added by the analyst at the beginning of analysis, was 89 ± 13% (one sigma). The standard deviation associated with the QC samples was a function of ^{239}Pu activity level. These data show that the relative standard deviation associated with measurements at the detection limit (0.01) will be greater than ±100% as expected. Similar data were obtained for ^{238}Pu.

The distribution of alpha activity associated with the analysis of blank urine samples was used to determine the detection limits for the plutonium bioassay procedure. These data demonstrated a Poisson distribution about a mean of 1.13 counts/1000 min in the ^{239}Pu area. By the use of the Currie[26,27] method for calculation of the detection limit for low alpha activity, the MDA for the plutonium procedure is as follows:

$$\text{MDA} = \sqrt{1.13} \times 4.65 + 3 = 8 \text{ counts} \quad . \qquad (4)$$

Currie recommends that the exact Poisson distribution be applied for the accurate setting of critical levels and detection limits when background counts are less than five. The introduction of 3 counts in Eq. (4) follows Currie's theory that 2.71 counts (rounded to 3) may be associated with a zero blank case. Currie also recommends for extreme low-level counting that the value 2.71 be added when less than 70 background counts are observed. Samples with eight or less counts are considered not detected at the 0.05 confidence level. Nine counts represent a measurement level of 0.01 pCi/L of sample.

ORGANIC CHEMISTRY QUALITY ASSURANCE PROGRAM. The Organic Chemistry Section analyzes a variety of matrices for a wide selection of organic compounds. Industrial hygiene samples collected on charcoal tubes, PCBs in air and oil, and products that hygienists feel are hazardous to the worker are examples of these sample types.

Charcoal Tubes. The majority of industrial hygiene samples are routine organics collected on charcoal tubes. These organics are analyzed by gas chromatography using flame ionization detection (GC/FID). To run these samples as routinely as possible, the Organic Chemistry Section assumes a 10-L sampling volume and sets up the calibration curve accordingly. A typical calibration curve will run 0.1-2 times the TLV of the compound of interest. TLVs are obtained from "Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment," printed by the American Conference of Governmental Industrial Hygienists.[28] If a TLV is not available for a certain compound, the analyst assumes a range of 1-10 mg per tube. The following example shows how to determine the range used to prepare a QC sample:

1. Obtain the TLV for the compound of interest, in this example, benzene: TLV = 30 mg/m^3 or 30 μg/L (1 m^3 = 1000 L).

2. Assume a 10-L sampling volume: 30 μg/L x 10 L = 300 μg.

3. One TLV is equivalent to 300 μg. The spike range should be between 0.1 and 2 TLV; therefore, the amount of benzene spiked onto the charcoal tube would be 30-600 μg.

The organic compound used as the spike is weighed and diluted with a suitable solvent. Carbon disulfide is the typical solvent for charcoal tubes. The stock solution is prepared at a concentration level such that 2-15 μL are used in spiking the small tube to obtain the desired spike range. Up to 25 μL can be easily spiked onto large charcoal tubes. A syringe is used to spike the analyte onto the tube and should only be used in the middle 80% of its range. The first and last 10% of the range contains a greater error in volume determination. The following procedure is used in spiking charcoal tubes:

1. Measure the correct volume into the syringe.

2. Place the syringe needle into the center of the tube and halfway into the front bed of charcoal.

3. Slowly expel the solution, making certain no glass surfaces become wet.

4. Withdraw the syringe, cap the tube, and seal it with Parafilm. Allow the spike solution to adsorb on the charcoal for at least 4 h. Refrigerate all samples pending analysis.

Fluorisil Tubes. Some solvents and compounds containing halogens, such as polychlorinated biphenyls (PCBs), are analyzed by gas chromatography using electron capture detection (GC/EC). This detector is much more sensitive and can easily be saturated. Because of this problem, the analyst prepares a calibration curve in the range of 0.01-10 μg/mL of diluent. QC samples should be spiked in this range as follows:

1. Assume that the analyst will desorb small tubes with 2 cm^3 of desorbant.

2. The amount to spike on a fluorisil tube would then be two times the range of the calibration curve or 0.02-20 μg. Because PCB is actually a mixture of compounds, the lower range should not be used. A better range would be 0.2-20 μg.

Organic Vapor Monitors. Occasionally compounds will be sampled by diffusion onto an organic

vapor monitor (OVM) manufactured by 3M Corporation. These monitors are not suitable for all organics, and the calculations to obtain spike ranges are different from those used for charcoal tubes. Information on suitable solvents and calculations are obtained from the *3M Brand Organic Vapor Monitor #3500 Compound Guide* available from the Occupational Health and Safety Products Division of 3M.[29] The following steps describe how to determine a suitable spike level and the method to use to spike the compound on the badge:

1. Remove the plastic ring and white film from a monitor.

2. Place a 2.5-mm-diam Whatman No. 5 paper on the spacer plate.

3. Snap the closure cap on the monitor.

4. Calculate the amount of material to be injected. The formula below will calculate the injection amount, in milligrams, that corresponds to the amount that would be collected by a monitor at sampling conditions chosen. A recovery coefficient can be generated by varying the chosen concentration levels and exposure times.

$$W = (K_o)(C)(t)(10^{-6}\ m^3/cm^3),$$

where W = amount of liquid injected in milligrams,
K_o = sampling rate of monitor cm^3/min,
C = average concentration in mg/m^3, and
t = sampling time in minutes.

For compounds that are solid at room temperature, prepare a solution in carbon disulfide such that no more than 5-μL injection is needed to spike the required number of milligrams of the compound. Assume an average concentration of one TLV and an 8-h exposure (t = 480 min). Determine that these assumptions do not recommend a spike level that exceeds the capacity of the monitor for the compound of interest. The example below uses benzene to determine the spike range for an OVM.

1. Find *benzene* in the Analysis Guide section of the *3M Brand Organic Vapor Monitor #3500 Compound Guide.*

2. Obtain the sampling rate (K_o) and the capacity:
K_o= 35.5 ± 0.6 cm^3/min, and capacity = 13 mg.

3. Find the TLV of benzene (TLV = 30 mg/m^3).

4. Use the values in the following equation:
$W = (35.5\ cm^3/min)(30\ mg/m^3)(480\ min)(10^{-6}\ m^3/cm^3) = 0.51$ mg.

5. The spike range for benzene would be 0.1 to 2 TLV or 0.05 to 1.02 mg.

6. Make sure the spike range does not exceed the monitor capacity.

7. Inject the known quantity of organic material onto the filter paper through the center port.

8. Allow the monitor to sit 16-24 h for total transfer of the organic material from the filter paper to the sorbent before elution.

9. Remove the filter paper from the monitor.

10. Refrigerate the sample pending analysis.

VII. INDIVIDUAL WATER SAMPLE QUALITY ASSURANCE

The program for evaluation of the quality and internal consistency of results for an individual natural or waste-water sample was continued this year. The methods for calculation of ratios were standardized previously[5] and a value of 1.00 ± 0.10 established as a criterion for reporting results. Allowances are made for reporting of results that appear to be outliers if justification can be demonstrated. We monitor the following six ratios:

1. Sum of meq cations to the sum of meq anions.

2. Ratio of meq hardness to the sum of meq Ca^{++} and Mg^{++}.

3. Ratio of total dissolved solids to the total calculated solids.

4. Ratio of observed conductivity to the sum of the contributing conductivity.

5. Ratio of 0.01 times the observed conductivity of the meq cations.

6. Ratio of 0.01 times the observed conductivity of the meq anions.

These ratios are used as guides for identification of erroneous results. Appendix H summarizes the ratios for natural waters and presents the raw data. The appendix also presents results for some of these ratios on waste-water samples, although incomplete data preclude preparation of a summary this year. Reanalysis of a sample for one or more chemical constituents is based on these sample quality parameters, the historical considerations, and the possible presence of constituents not requested by the investigator. Details of this approach are published separately.[30]

Complexities of instrumentation and analytical methodology impose additional needs. For instance, in atomic absorption, the interferences among flame, graphite furnace, hydride generation, and cold vapor are sufficiently different so that the same QC material may not be adequate to address all subcategories within an overall analytical technology. For example, the EPA-Cincinnati office distributes samples for nonradioactive QC analysis on an as-requested basis. These materials sometimes impart a false sense of QA for atomic absorption analyses. These water samples for trace inorganic analysis usually do not contain calcium, magnesium, etc., which create important interference problems with many analyses on the EPA primary pollutant list. The NBS SRMs 1643A and 1643B (trace metals in water) do contain reasonable levels of these interference producers, and we have found that many of our procedures can be adjusted to produce agreement with either one of these QA materials, not both. Therefore, in production and use of reference materials, both agencies and analysts must realize the importance of matrix matching of interferences as well as the elements of analytical interest.

VIII. CONCLUSIONS

Some agencies are attempting to legislate QA through promulgation of analytical methods regulations, through licensing requirements for analysts, and through laboratory certification programs. The rapid pace of technological change in chemical instrumentation, the wide variety of sample matrices, and the broad dispersion of procedures throughout the literature make it difficult to establish a definitive method for any given determination that is not soon outdated. Licensing and certification address the qualifications of personnel and the adequacy of facilities on an infrequent basis at best, not the day-to-day data quality. Development and implementation of a detailed, yet flexible, QA program is a preferable alternative to the legislative approach of QA management. This program permits each laboratory to use its existing expertise and facilities, to employ a variety of methods in the solution of ever-changing problems, and to encourage continuing innovation and adoption of the latest technology.

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APPENDIX A

GLOSSARY

Acceptable Minimum Detectable Amount (AMDA). The amount of radioactive material that analytical measurement procedures should be able to measure with the assumption that the material is free of interference from other radionuclides.

Accuracy. The degree of difference between average test results and true results if the latter are known or assumed.

Adsorption. The physical process in which molecules of gas, dissolved substances, or liquids adhere in an extremely thin layer to the surface of solid bodies with which they are in contact.

Alpha (α) probability. The proportion of false detection. Detection of an analyte that is not present.

ANSI. American National Standards Institute.

AOAC. American Association of Official Analytical Chemists.

ASTM. American Society for Testing Materials.

Average (mean). The sum of a series of results divided by the number of results. The symbol is $\bar{X}$.

Beta (β) probability. The proportion of false nondetection. The nondetection of an analyte that is present.

Bias. An effect that systematically distorts a statistical result.

Bioassay. Measurements to determine the amount of material in the excreta or in other biological materials removed from the body.

Blank. A sample that is identical, in principle, to the sample of interest, except that the substance being analyzed is absent.

CAS number. An organic compound numbering system developed by the Chemical Abstract Service.

CCRMP. Canadian Certified Reference Materials Program.

CGS. Canadian Geological Survey.

COD. Chemical oxygen demand.

Concentration. The quantity of material stated in terms of activity or mass per unit volume or mass of a sample.

Cond. Conductivity.

Confidence interval. The interval within which a parameter being estimated may lie with some given degree of probability.

Confidence level. The probability associated with a confidence interval.

Consensus value. A value assigned to the concentration of an element in a reference material by an investigator who compiles available literature data on international reference materials. Many methods exist for arriving at the assigned value, the most common of which is the calculation of a mean and standard deviation following the elimination of obvious outliers.

Control chart. The graphic record of values, results, samples, or controls recorded successively. The ordinate of the graph is scaled in units of the test result and the abscissa is scaled in units of time or sequence of results.

Control limit. Limits on the control chart, established at ±2 or 3 standard deviations from the mean, which are used as criteria for action or for judging the significance of variations between duplicate samples. Values falling outside the upper or lower control limit are considered "out of control."

CRMO. Communication and Records Management Office of the Los Alamos National Laboratory.

CRPG. Centre de Recherches Petrographiques et Geochimiques de Nancy, France.

Desorption. The process of freeing from a sorbed state.

Delayed-neutron assay (DNA). The determination of fissionable materials through measurement of neutron emission from their neutron-rich fission products. Most commonly used for the measurement of uranium.

DOE. Department of Energy.

Duplicate analysis. An analysis performed at the same time on equal quantities taken from the same sample.

EML. Environmental Measurements Laboratory, New York. Operates the Quality Assessment Program for the DOE.

EMSL. Environmental Monitoring and Support Laboratory of the EPA, Las Vegas, Nevada, and Cincinnati, Ohio.

EPA. Environmental Protection Agency.

Error. The difference between an observed value and its true value.

GC/EC. Gas chromatography using electron capture detection.

GC/FID. Gas chromatography using flame ionization detection.

HSE-8. Environmental Surveillance Group, Los Alamos National Laboratory.

HSE-9. Health and Environmental Chemistry Group, Los Alamos National Laboratory.

Hard. Hardness.

H_2O^-. Adsorbed water removable by drying at 110° C for 24 h.

IAEA. International Atomic Energy Agency, Vienna, Austria.

Interlaboratory variability. The difference in results obtained by different laboratories when portions of a common sample are measured.

Intralaboratory variability. The difference in results when a single laboratory repeatedly measures portions of a common sample.

JDEN. Junta de Energia Nuclear, Madrid, Spain.

Mean. Equal to the sum of units divided by the number of units (arithmetic average).

Minimum detectable amount (MDA). The smallest amount of an analyte in a sample that will be detected with a beta probability of nondetection (type II error) while accepting an alpha probability of erroneously detecting that analyte in an appropriate blank sample (type I error). The alpha and beta probabilities are commonly set at 0.05.

NBS. National Bureau of Standards, Gaithersburg, Maryland.

NPDES. National Pollutant Discharge Elimination System.

NPL. National Physical Laboratory, England.

NRC. Nuclear Regulatory Commission.

OVM. Organic vapor monitor.

P Alk. Phenolphthalein alkalinity.

PAT. Proficiency Analytical Testing program from NIOSH.

PCB. Polychlorinated biphenyls.

PE. Performance Evaluation samples from EML.

Poisson distribution. The exponential limit of a binomial distribution as the probability (p) approaches zero and the number of events (n) approaches infinity. It describes the frequency pattern of counts emitted by radioactive decay in a continuous interval of time. A distribution of counts from radioactive decay greater than twenty events may be considered normally distributed and the t distribution statistics may be used to test results obtained.

Precision. The degree to which data generated from replicate or repetitive measurements agree. Frequently assessed by calculating the standard deviation in a set of data points.

Primary standards. A class of single elements or compounds that are well characterized, stable, homogeneous, and produced in quantity. Their physical or chemical properties have been determined within specified measurement uncertainties by a recognized national standards laboratory such as NBS or NPL. NBS 83c (As_2O_3) and NBS SRM 950b (U_3O_8) are examples.

QAP. Quality Assessment Program from EML.

QASDM. Quality Assurance, Sample and Data Management Section.

QNS. Quantity not sufficient.

Quality assessment. The system or techniques used to verify that the entire analytical process is operating within acceptable limits. Control charts are an example.

Quality assurance (QA). Planned and systematic actions necessary to provide confidence in each analytical result or measurement reported by a laboratory.

Quality control (QC). Actions taken within a QA program to ensure validity of results. QC, as used in this document, means calibration of equipment, use of certified reagents, etc.

Range. The absolute value of the difference between the highest and lowest values in a set of results.

Regression. A statistical method for investigating the relationship between a dependent variable or response and one or more independent or predicated variables.

Relative standard deviation (RSD %). The standard deviation expressed as a fraction of the mean, $S/\bar{X}$. In this document it is expressed as percentage (%). The term is equivalent to coefficient of variation.

Repeatability. The variation in data generated on a single sample by a single analyst or instrument or both over a short period of time.

Reproducibility. Variation over an extended time or by various analysts or laboratories.

Statistical control. Errors are within acceptable levels based on values calculated from a sample of observations.

Sample. A group of units or portion of material, taken from a larger collection of units or quantity of material, that provides information that can be used by the customer.

Secondary standards. Materials produced by commercial organizations, laboratories, or governmental agencies that are well characterized, stable, and homogeneous. The secondary standards are produced in quantity and have one or more physical or chemical properties experimentally determined within stated measurement uncertainties. The important distinction between primary and secondary standards is that the latter may be complex natural materials (rocks, vegetations, etc.) as well as high-purity compounds or elements.

We differentiate secondary standards into two classes:
Class I. Complex materials whose composition or physical properties have been determined and certified within specified measurement uncertainties by a recognized national standards laboratory. The NBS SRM program has produced a large number of such materials for use in bioassay and environmental analyses.

Class II. Complex materials whose preparation has been similar to that of Class I materials, but whose composition has not been certified by a national standards laboratory. Certain elements in NBS SRMs and all materials from USGS, CCRMP, IAEA, or EPA fall in this catagory. Mean elemental concentrations are frequently established by consensus.

Spike. The addition of a known amount of a reference material, containing the analyte of interest, to a blank sample.

SRM. Standard reference material.

Standard deviation. The square root of the average of the squares of the deviations of single observations from their arithmetic mean.

TDS. Total dissolved solids.

Threshold limit values (TLV). Airborne concentrations of substances that represent conditions under which nearly all workers may be repeatedly exposed without adverse effect.

Tot alk. Total alkalinity.

Traceability. A heirarchical system, used largely for regulatory purposes, wherein transfer of accuracy among various components of a measurement system is established or inferred. For example, a working standard should be traceable to a secondary standard, Class II secondary standards to Class I secondary standards, and secondary standards to primary standards.

TSS. Total suspended solids.

USGS. United States Geological Survey.

Working standards. Materials produced by commercial organizations or by laboratories for direct use in instrument calibration. These materials are generally single elements in solution.

APPENDIX B

QUALITY ASSURANCE MATERIALS IN HSE-9 LIBRARY

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00500	Amersham Th-228 Standard Solution	W	10/01/80
00.00502	NBS 4350 Environmental Radioactivity Sediment	S	04/16/80
00.00503	EPA Nitrate/Fluoride-1	W	04/25/80
00.00504	EPA Nitrate/Fluoride-2	W	04/25/80
00.00505	NBS 1643A Water	W	04/14/80
00.00506	USGS BIR-1 Basalt	S	01/01/80
00.00507	USGS DNC-1 Diabase	S	01/01/80
00.00508	USGS W-2 Diabase	S	01/01/80
00.00509	NBS 1566 Oyster Tissue	B	03/23/80
00.00510-00.00513	NBS 4926C Tritium in Water	W	10/15/82
00.00514	EPA TH-230 in Water	W	03/05/81
00.00515	CCRMP SY-2 Syenite	S	02/15/78
00.00516	CCRMP SY-3 Syenite	S	02/15/78
00.00517	CCRMP MRG-1 Gabbro	S	02/15/78
00.00518	CCRMP BL-1 Uranium Ore	S	02/15/78
00.00519	CCRMP BL-2 Uranium Ore	S	02/15/78
00.00520	CCRMP BL-3 Uranium Ore	S	02/15/78
00.00521	CCRMP BL-4 Uranium Ore	S	02/15/78
00.00522	CCRMP DH-1 Thorium-Uranium Ore	S	02/15/78
00.00523	CCRMP DL-1 Thorium-Uranium Ore	S	02/15/78
00.00524	IAEA S-2 Uranium Ore	S	02/15/78
00.00525	IAEA S-4 Uranium Ore	S	02/15/78
00.00526	JDEN 467 Uranium Ore	S	02/15/78
00.00527	JDEN 25 Uranium Ore	S	02/15/78
00.00528	JDEN 33 Uranium Ore	S	02/15/78
00.00529	JDEN 463 Uranium Ore	S	02/15/78
00.00530	IAEA S-3 Uranium Ore	S	02/15/78
00.00531	NBS 1570 Spinach	B	02/15/78
00.00532	NBS 1571 Orchard Leaves	B	02/15/78
00.00533	NBS 1573 Tomato Leaves	B	02/15/78
00.00534	NBS 1575 Pine Needles	B	02/15/78
00.00535	NBS 1577 Bovine Liver	B	02/15/78
00.00536	NBS 1632 Trace Elements in Coal	B	02/15/78
00.00537	NBS 1633 Trace Elements in Coal Fly Ash	S	02/15/78
00.00538	NBS 1641 Mercury in Water	W	02/15/78
00.00539	NBS SRM 45b Homogeneous River Sediment	S	06/01/84
00.00540	NBS 1642A Mercury in Water	W	02/15/78
00.00541	NBS 950A U308	M	02/15/78
00.00542	NBS 83C As203	M	02/15/78
00.00543	NBS 193 KNO3	M	02/15/78
00.00544	NBS 194 NH4H2PO4	M	02/15/78
00.00545	NBS 950B U308	M	01/01/81
00.00546	NBS 79A Fluorspar	S	02/15/78
00.00547	NBS 120B Phosphate Rock	S	02/15/78
00.00548	NBS 91 Opal Glass	S	02/15/78
00.00549	NBS 633 Red Cap Cement	S	02/15/78

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00550	NBS 635 Blue Cap Cement	S	02/15/78
00.00551	NBS 278 Obsidian Rock	S	01/15/82
00.00552	NBS 113A Zinc Concentrate	M	02/15/78
00.00553	NBS 53E Lead	M	02/15/78
00.00554	NBS 348 Steel	M	02/15/78
00.00555	NBS 86C Aluminum	M	02/15/78
00.00556	NBS 133A Steel	M	02/15/78
00.00557	NBS 168 Co-Ni-Cr Alloy	M	02/15/78
00.00558	NBS 629 Zinc Alloy	M	02/15/78
00.00559	NBS 1197 Alloy	M	02/15/78
00.00560	NBS 4353 Rocky-Flats Soil No. 1	S	12/01/81
00.00561	NBS 1091 Steel	M	02/15/78
00.00562	NBS 1093 Steel	M	02/15/78
00.00563	NBS 644 Steel	M	02/15/78
00.00564	NBS 1135 Steel	M	02/15/78
00.00565	NBS 1262 Steel	M	02/15/78
00.00566	NBS 1264 Steel	M	02/15/78
00.00567	Kodak TEG-50A	B	02/15/78
00.00568	Kodak TEG-50B	B	02/15/78
00.00569	Kodak TEG-50C	B	02/15/78
00.00570	USGS AGV-1 Andesite	S	02/15/78
00.00571	USGS G-2 Granite	S	02/15/78
00.00572	USGS BCR-1 Basalt	S	02/15/78
00.00573	USGS PCC-1 Peridotite	S	02/15/78
00.00574	USGS GSP-1 Granodiorite	S	02/15/78
00.00575	USGS GXR-1 Jasperoid	S	02/15/78
00.00576	NBS 1646 Estuarine Sediment	S	04/09/82
00.00577	USGS GXR-2 Soil	S	02/15/78
00.00578	NBS 1634A Trace Elements in Residual Fuel Oil	M	05/05/82
00.00579	USGS GXR-3 Hot Springs Deposit	S	02/15/78
00.00580	NBS 1572 Citrus Leaves	B	05/20/82
00.00581	USGS GXR-4 Copper Mill Heads	S	02/15/78
00.00582	NBS 688 Basalt Rock	S	06/23/82
00.00583	USGS GXR-5 Soil	S	02/15/78
00.00585	USGS GXR-6 Soil	S	02/15/78
00.00586	CCRMP BL-4A Uranium Ore	S	09/01/82
00.00587	CCRMP BL-5 Uranium Ore	S	02/15/78
00.00588	NBS 4958 Ra-226 in Water	W	02/15/78
00.00589	Amersham Pb-210 Standard Solution	W	03/18/82
00.00590	NBS 1577A Bovine Liver	B	01/01/83
00.00591-00.00592	EPA Trace Metals in Water	W	06/01/84
00.00593	HSE-9 Uranium in Water	W	10/01/83
00.00594	CCRMP SO-1 Regosolic Soil	S	07/17/78
00.00595	NBS 1642b Mercury in Water - ng/mL	W	06/01/84
00.00596	CCRMP SO-2 Podzolic Soil	S	07/17/78

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00598	CCRMP SO-3 Calcareous C Horizon Soil	S	07/17/78
00.00599	HSE-9 Tap Water	W	10/01/82
00.00600	CCRMP SO-4 Chernozemic A Horizon Soil	S	07/17/78
00.00601	EPA-NBS Mancos Shale	S	01/01/81
00.00603	EPA-NBS Fly Ash from Coal Combustion	S	01/01/81
00.00605	NBS 1632A Trace Elements in Coal (Bituminous)	B	01/15/79
00.00606	NBS 1635 Trace Elements in Coal (Subbituminous)	B	02/15/79
00.00607	NBS 1648 Urban Particulate Matter	F	03/01/79
00.00608	NBS 1645 River Sediment	S	03/01/79
00.00609	CCRMP DL-1A Thorium-Uranium Ore	S	03/01/79
00.00610	USGS BHVO-1 Basalt	S	05/01/79
00.00611	USGS MAG-1 Marine Mud	S	05/01/79
00.00612	USGS QLO-1 Quartz Latite	S	05/01/79
00.00613	USGS RGM-1 Rhyolite	S	05/01/79
00.00614	USGS SCo-1 Cody Shale	S	05/01/79
00.00615	USGS SDC-1 Mica Schist	S	05/01/79
00.00616	USGS SGR-1 Green River Shale	S	05/01/79
00.00617	USGS STM-1 Syenite	S	05/01/79
00.00618	EPA Uranium in Water, Nov. 1983	W	11/30/83
00.00620-00.00621	NBS 4921C Na-22 in Water	W	02/15/78
00.00623-00.00626	NBS 4921C Na-22 on Soil GTP-3	S	02/15/78
00.00627-00.00629	NBS 4921C Na-22 on Chamita Sediment	S	02/15/78
00.00630	NBS 1567 Wheat Flour	B	07/01/79
00.00631	NBS 1568 Rice Flour	B	07/01/79
00.00632	NBS 1569 Brewers Yeast	B	07/01/79
00.00633	NBS 1633A Trace Elements in Coal Fly Ash	S	07/01/79
00.00634	NBS 1631A Sulfur in Coal	B	02/15/78
00.00635	NBS 1631B Sulfur in Coal	B	02/15/78
00.00636	NBS 1631C Sulfur in Coal	B	02/15/78
00.00637-00.00639	EML Cs-137 in Water	W	04/01/80
00.00640-00.00642	EML Cs-137 in Soil	S	04/01/80
00.00643	EPA Trace Metals in Water, Sample #1	W	04/25/80
00.00644	EPA Trace Metals in Water, Sample #2	W	04/25/80
00.00645	EPA Nutrients in Water, Sample #1	W	04/25/80
00.00646	EPA Nutrients in Water, Sample #2	W	04/25/80
00.00647	EPA Nutrients in Water, Sample #5	W	04/25/80
00.00648	EPA Nutrients in Water, Sample #6	W	04/25/80
00.00649	EPA Trace Metals in Water, Sample #1	W	04/25/80
00.00650	EPA Trace Metals in Water, Sample #2	W	04/25/80
00.00651	EPA Trace Metals in Water, Sample #3	W	04/25/80
00.00652	NBS SRM 4351 Environmental Radioactivity: Lung	B	06/01/84
00.00653	NBS SRM 4352 Environmental Radioactivity: Liver	B	06/01/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00654	EPA Trace Metals in Water, Sample #1	W	04/25/80
00.00655	EPA Trace Metals in Water, Sample #10	W	04/25/80
00.00657	CCRMP DH-1A Thorium-Uranium Ore	S	10/01/80
00.00658	HSE-9 Uranium in Water	W	01/01/83
00.00660-00.00669	EPA Arsenic Filter Strips	F	05/20/80
00.00670-00.00679	EPA SO4-NO3 Filter Strips	F	05/20/80
00.00680-00.00689	EPA Lead Filter Strips	F	05/20/80
00.00690	CRPG FK-N Feldspath	S	05/22/80
00.00691	CRPG GH Granite	S	05/22/80
00.00692	CRPG VS-N Verre Synthetique	S	05/22/80
00.00693	CRPG GA Granite	S	05/22/80
00.00694	CRPG AN-G Anorthosite	S	05/22/80
00.00695	CRPG DT-N Disthene	S	05/22/80
00.00696	CRPG BR Basalte	S	05/22/80
00.00697	CRPG MG-Mica	S	05/22/80
00.00698	CRPG GL-O Glauconite (Grains)	S	05/22/80
00.00699	CRPG MA-N Granite	S	05/22/80
00.00700	CRPG BX-N Bauxite	S	05/22/80
00.00701	CRPG DR-N Diorite	S	05/22/80
00.00702	CRPG UB-N Serpentine	S	05/22/80
00.00703	CRPG FE-Mica	S	05/22/80
00.00704	CRPG BE-N Basalte	S	05/22/80
00.00705	CRPG GL-O Glauconite (Powder)	S	05/22/80
00.00706	CRPG GS-N Granite	S	05/22/80
00.00707	USGS Standard Reference Water Sample 50	W	01/01/81
00.00708	USGS Standard Reference Water Sample 54	W	01/01/81
00.00709	USGS Standard Reference Water Sample 55	W	01/01/81
00.00710	USGS Standard Reference Water Sample 60	W	01/01/81
00.00711	NBS 610 Trace Elements in Glass	S	01/01/81
00.00712	NBS 612 Trace Elements in Glass	S	01/01/81
00.00713	NBS 614 Trace Elements in Glass	S	01/01/81
00.00714	NBS 616 Trace Elements in Glass	S	01/01/81
00.00715	Biorad 41819 C-13 Enriched Barium Carbonate	X	07/16/74
00.00716	EPA Climax Sand Tailings	S	01/01/81
00.00717	EPA Composite Sand Tailings	S	01/01/81
00.00718	EPA Standard Monazite Ore	S	01/01/81
00.00719	EPA Standard Pitchblend Ore	S	01/01/81
00.00720	NBS U-0002 Uranium Isotopic Standard	M	01/14/81
00.00721	NBS U-005 Uranium Isotopic Standard	M	07/25/84
00.00722	NBS U-010 Uranium Isotopic Standard	M	01/14/81
00.00723	NBS U-015 Uranium Isotopic Standard	M	01/14/81
00.00724	NBS U-020 Uranium Isotopic Standard	M	01/14/81
00.00725	NBS U-030 Uranium Isotopic Standard	M	07/25/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00726	NBS U-050 Uranium Isotopic Standard	M	07/25/84
00.00727	NBS U-100 Uranium Isotopic Standard	M	01/14/81
00.00728	NBS U-150 Uranium Isotopic Standard	M	01/14/81
00.00729	NBS U-200 Uranium Isotopic Standard	M	01/14/81
00.00730	NBS U-350 Uranium Isotopic Standard	M	01/14/81
00.00731	NBS U-500 Uranium Isotopic Standard	M	01/14/81
00.00732	NBS U-750 Uranium Isotopic Standard	M	01/14/81
00.00733	NBS U-800 Uranium Isotopic Standard	M	01/14/81
00.00734	NBS U-850 Uranium Isotopic Standard	M	01/14/81
00.00735	NBS U-900 Uranium Isotopic Standard	M	01/14/81
00.00736	NBS U-930 Uranium Isotopic Standard	M	01/14/81
00.00737	NBS U-970 Uranium Isotopic Standard	M	01/14/81
00.00738	CCRMP FeR-1 Iron Formation	S	12/10/81
00.00739	CCRMP FeR-2 Iron Formation	S	12/10/81
00.00740	CCRMP FeR-3 Iron Formation	S	12/10/81
00.00741	CCRMP FeR-4 Iron Formation	S	12/10/81
00.00742	NBS 4350B River Sediment	S	12/15/81
00.00744	NBS 1876 Chrysotile Asbestos Fibers	F	06/15/84
00.00745-00.00748	NBS 4926C Tritium in Water	W	05/01/82
00.00749	EPA Trace Metals in Water, Sample #1	W	11/01/82
00.00750	EPA Trace Metals in Water, Sample #2	W	11/01/82
00.00751	EPA Trace Metals in Water, Sample #1	W	11/01/82
00.00752	EPA Trace Metals in Water, Sample #2	W	11/01/82
00.00753	EPA Trace Metals in Water, Sample #3	W	11/01/82
00.00754	CRPG, GIT-IWG AL-1 Albite	S	05/01/84
00.00755	CRPG, GIT-IWG IF-G Iron Formation	S	05/01/84
00.00756	EPA Nutrients in Water, Sample #1	W	11/01/82
00.00757	EPA Nutrients in Water, Sample #2	W	11/01/82
00.00758	EPA Nutrients in Water, Sample #5	W	11/01/82
00.00759	EPA Nutrients in Water, Sample #6	W	11/01/82
00.00760	EPA Nitrate/Fluoride in Water, Sample #1	W	11/01/82
00.00761	EPA Nitrate/Fluoride in Water, Sample #10	W	11/01/82
00.00762	EPA Nutrients in Water, Sample #1	W	04/01/83
00.00763	EPA Nutrients in Water, Sample #2	W	04/01/83
00.00764	EPA Nutrients in Water, Sample #5	W	04/01/83
00.00765	EPA Nutrients in Water, Sample #6	W	04/01/83
00.00766	EPA Mineral Analysis in Water, Sample #3	W	04/01/83
00.00767	EPA Mineral Analysis in Water, Sample #4	W	04/01/83
00.00768	EPA Mineral Analysis in Water, Sample #1	W	04/01/83
00.00769	EPA Mineral Analysis in Water, Sample #2	W	04/01/83
00.00770	EPA Trace Metals in Water, Sample #4	W	04/01/83
00.00771	EPA Trace Metals in Water, Sample #5	W	04/01/83
00.00772	EPA Trace Metals in Water, Sample #6	W	04/01/83
00.00773	EPA Nitrate/Fluoride in Water, Sample #1	W	04/01/83
00.00774	EPA Nitrate/Fluoride in Water, Sample #10	W	04/01/83

Sample Number	Sample Name	Sample Type [a]	Date Received
00.00775	EPA Nitrate/Fluoride in Water, Sample #11	W	04/01/83
00.00776	EPA Trace Metals in Water, Sample #1	W	04/01/83
00.00777	EPA Trace Metals in Water, Sample #10	W	04/01/83
00.00778	NBS 2682 Sulfur in Coal	B	05/09/83
00.00779	NBS 2683 Sulfur in Coal	B	05/09/83
00.00780	NBS 2684 Sulfur in Coal	B	05/09/83
00.00781	NBS 2685 Sulfur in Coal	B	05/09/83
00.00782	NBS 2676B Metals on Filter Media IB	F	07/22/83
00.00783	NBS 2676B Metals on Filter Media IIB	F	07/22/83
00.00784	NBS 2676B Metals on Filter Media IIIB	F	07/22/83
00.00785	NBS 2676B Metals on Filter Media Blank	F	07/22/83
00.00786	Sill 3-1 Soil for Pu-238 and Pu-239	S	01/01/76
00.00787	Sill 3-2 Soil for Pu-239	S	01/01/76
00.00788	EPA Mineral Analysis in Water, Sample #1	W	10/03/83
00.00789	EPA Mineral Analysis in Water, Sample #2	W	10/03/83
00.00790	EPA Trace Metals in Water, Sample #1	W	04/02/84
00.00791	EPA Trace Metals in Water, Sample #2	W	04/02/84
00.00792-00.00795			
	NBS 4926C Tritium in Water	W	04/02/84
00.00796	NBS 1580 Organics in Shale Oil	M	06/15/84
00.00797	NBS 1581 Polychlorinated Biphenyls in Oils	M	06/15/84
00.00798	NBS 1647 Priority Pollutant PNA Hydrocarbons	M	06/15/84
00.00799	NBS 914 Cretinine		01/01/77
00.00800	NBS 50 Albacore Tuna	B	01/01/76
00.00801	NBS 2671 Freeze Dried Urine: Low Fluoride	B	01/01/76
00.00802	NBS 2671 Freeze Dried Urine: High Fluoride	B	01/01/76
00.00803	NBS 2672 Freeze Dried Urine: Low Mercury	B	01/01/76
00.00804	NBS 2672 Freeze Dried Urine: High Mercury	B	01/01/76
00.00806	NBS 198 Silica Refractory	S	01/01/76
00.00807	NBS 102 Silica Brick	S	10/01/77
00.00808	NBS 1630 Trace Mercury in Coal	B	10/01/77
00.00810	NBS 559 Hydrocarbon Calibration Blend #8	M	01/01/76
00.00811	NBS 2676a Metals on Filter Media Blank	F	01/01/76
00.00812	NBS 2676a Metals on Filter Media IA	F	01/01/76
00.00813	NBS 2676a Metals on Filter Media IIA	F	01/01/76
00.00814	NBS 2676a Metals on Filter Media IIIa	F	01/01/76
00.00815	NBS 1634 Trace Elements in Residual Fuel Oil	M	01/01/76
00.00816	NBS Gamma-ray Emission-rate Spiked Clay	S	01/01/76
00.00817	NBS 4927-B Tritium in Water	W	01/01/76
00.00818	IAEA A-2 Dried Whole Animal Blood: Trace Elements	B	01/01/74
00.00819	IAEA A-7/1 Powdered Milk for Trace Elements	B	10/01/74
00.00820	IAEA A-6 Fish Solubles for Trace Elements	B	05/01/75
00.00821	IAEA A-3/1 Calcined Animal Bone for Trace Elements	B	10/01/74
00.00822	IAEA A-10 Calcined Animal Bone: Sr-90, Ra-226	B	05/01/75
00.00823	IAEA A-3 Animal Bone Ash for Sr-90 and Ra-226	B	10/01/74
00.00824	IAEA Air-1/1 and Air-2/1 Air Filters	F	09/30/77

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00825	IAEA A-1 Animal Bone Serum: Cs-137, K, Cs	B	08/02/71
00.00826	IAEA A-7 Milk Powder: Radionuclides & Elements	B	10/01/74
00.00827	IAEA SW-A-1 Sea Water: Fallout level Radioactivity	W	12/29/77
00.00828	IAEA MA-B-1 Clam for Radionuclides	B	10/01/76
00.00829	IAEA MA-B-2 Sea-Hare for Radionuclides	B	10/01/76
00.00830	IAEA H-6 Human Serum for Iodine	B	01/01/76
00.00831	IAEA H-4 Animal Muscle: Multielement Analysis	B	01/01/76
00.00832	IAEA AIR-3/1 Air Filters for Trace Elements	F	01/01/76
00.00833	NEN NEZ-018 Cs-137 Cesium Chloride	M	07/12/77
00.00834	NEN NEZ-083 Sr-90 Strontium Chloride	M	07/12/77
00.00835	NEN Po-210	M	02/13/74
00.00836	CONOSTAN 2107 C-21 10 ppm Oil	M	01/01/78
00.00837	CONOSTAN 2107 C-21 30 ppm Oil	M	01/01/78
00.00838	CONOSTAN 1228 C-12 100 ppm Oil	M	01/01/78
00.00839	CONOSTAN 1228 C-12 300 ppm Oil	M	01/01/78
00.00840	CONOSTAN 2 Base Oil 85 Oil	M	01/01/78
00.00841	CONOSTAN 106 Arsenic 100 ppm Oil	M	01/01/78
00.00842	CONOSTAN 101 Selenium 100 ppm Oil	M	10/10/78
00.00843	CONOSTAN 103 Mercury 100 ppm Oil	M	01/01/78
00.00844-00.00846	NBS 2675 B-3 Beryllium on Filter Media	F	01/01/76
00.00847	NBS 1584 Priority Pollutant Phenols in Methanol	M	07/10/84
00.00848-00.00851	NBS 2661 Benzene on Charcoal	T	07/25/84
00.00852-00.00854	NBS 2661a Benzene on Charcoal	T	07/25/84
00.00855-00.00858	NBS 2662 m-Xylene on Charcoal	T	07/25/84
00.00859-00.00862	NBS 2663 p-Dioxane on Charcoal	T	07/25/84
00.00863-00.00866	NBS 2664 1,2-Dichloroethane on Charcoal	T	07/25/84
00.00867-00.00870	NBS 2665 Chloroform on Charcoal	T	07/25/84
00.00871-00.00874	NBS 2666 Trichloroethylene on Charcoal	T	07/25/84
00.00875-00.00878	NBS 2667 Carbon tetrachloride on Charcoal	T	07/25/84
00.00879-00.00880	NBS 2670 Toxic Metals in Urine	B	08/20/84
00.00881-00.00884	NBS 2674 Lead on Filter Media	F	08/20/84
00.00885	NBS 4926C Tritium in Water (HSE-9 Dilution)	W	08/20/84
00.00886	NBS 2121-1 Cadmium Spectrometric Standard Solution	W	08/20/84
00.00887	NBS 2121-2 Lead Spectrometric Standard Solution	W	08/20/84
00.00888	NBS 2121-3 Silver Spectrometric Standard Solution	W	08/20/84
00.00889	NBS 2121-4 Zinc Spectrometric Standard Solution	W	08/20/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00890	NBS 2123-1 Lithium Spectrometric Standard Solution	W	08/20/84
00.00891	NBS 2123-2 Potassium Spectrometric Standard Solu.	W	08/20/84
00.00892	NBS 2123-3 Sodium Spectrometric Standard Solution	W	08/20/84
00.00893	NBS 2123-4 Rubidium Spectrometric Standard Solu.	W	08/20/84
00.00894	NBS 4355 Peruvian Soil	S	08/20/84
00.00895	NBS 1643b Trace Elements in Water	W	08/20/84
00.00896	NBS 1549 Non-fat Milk Powder	B	08/20/84
00.00897	NBS 1639 Halocarbons in Methanol for Water Anal.	W	08/20/84
00.00898	EPA Uranium in Water, Sept. 1984	W	08/23/84
00.00899-00.00902	NBS 2679 Quartz on Filter Media	F	01/01/75
00.00903-00.00905	NBS 2676-A-3 Metals on Filter Media	F	01/01/75
00.00906	NBS 4354 Gytija Lake Sediment	S	09/01/84
00.00907	NBS 4355 Irish Sea Sediment	S	09/01/84
00.00908	GSJ JA-1 Andesite	S	10/01/84
00.00909	GSJ JB-1a Basalt	S	10/01/84
00.00910	GSJ JB-2 Basalt	S	10/01/84
00.00911	GSJ JB-3 Basalt	S	10/01/84
00.00912	GSJ JG-1a Granodiorite	S	10/01/84
00.00913	GSJ JGb-1 Gabbro	S	10/01/84
00.00914	GSJ JP-1 Peroditite	S	10/01/84
00.00915	GSJ JR-1 Rhyolite	S	10/01/84
00.00916	GSJ JR-2 Rhyolite	S	10/01/84
00.00917	EPA Uranium in Water, Sept. 1983	W	09/01/83
00.00918	EPA Uranium in Water, Feb. 1984	W	02/01/84
00.00919	HSE-9 Trace Metals in Tap Water	W	12/14/84
00.00920	HSE-9 Trace Metals in Deionized Water	W	12/14/84
00.00921	EPA Plutonium in Water, Jan. 1984	W	12/22/84
00.00922	EPA Plutonium in Water, July 1984	W	12/22/84
00.00923	EPA Trace Metals III in Water, Sample #1	W	01/01/84
00.00924	EPA Trace Metals III in Water, Sample #2	W	01/01/84
00.00925	EPA Nitrate/Fluoride in Water, Sample #4	W	01/01/84
00.00926	EPA Nitrate/Fluoride in Water, Sample #13	W	01/01/84
00.00927	EPA Nitrate/Fluoride in Water, Sample # 15	W	01/01/84
00.00928	EPA Nutrients in Water, Sample #3	W	01/01/84
00.00929	EPA Nutrients in Water, Sample #4	W	01/01/84
00.00930	EPA Nutrients in Water, Sample #7	W	01/01/84
00.00931	EPA Nutrients in Water, Sample #8	W	01/01/84
00.00932	EPA Mineral Analyses in Water, Sample #1	W	01/01/84
00.00933	EPA Mineral Analyses in Water, Sample #2	W	01/01/84
00.00934	EPA Mineral Analyses in Water, Sample #3	W	01/01/84
00.00935	EPA Mineral Analyses in Water, Sample #4	W	01/01/84
00.00936	EPA Trace Metals in Water, Sample #1	W	01/01/84
00.00937	EPA Trace Metals in Water, Sample #2	W	01/01/84
00.00938	EPA Trace Metals in Water, Sample #3	W	01/01/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.00939	EPA Demand Analyses in Water, Sample #1	W	01/01/84
00.00940	EPA Demand Analyses in Water, Sample #2	W	01/01/84
00.00941	EPA Demand Analyses in Water, Sample #3	W	01/01/84
00.00942	EPA Demand Analyses in Water, Sample #4	W	01/01/84
00.00943	EPA Cyanide in Water, Sample #2	W	01/01/84
00.00944	EPA Cyanide in Water, Sample #5	W	01/01/84
00.00945	EPA Cyanide in Water, Sample #8	W	01/01/84
00.00946	EPA Residual Chlorine in Water, Sample #2	W	01/01/84
00.00947	EPA Residual Chlorine in Water, Sample #4	W	01/01/84
00.00948	EPA Nutrients in Water, Sample #1	W	01/01/84
00.00949	EPA Nutrients in Water, Sample #2	W	01/01/84
00.00950	EPA Nutrients in Water, Sample #3	W	01/01/84
00.00951	EPA Nutrients in Water, Sample #4	W	01/01/84
00.00952	EPA Municipal Digested Sludge: Dry	S	01/01/84
00.00953	EPA Municipal Digested Sludge: Wet	W	01/01/84
00.00954	H-8 Guaje Well Soil Blank	S	01/01/73
00.00955	H-8 Spiked Bandalier Soil	S	01/01/73
00.00966	HSE-9 pH, TDS, Conductivity in Water	W	01/01/84
00.00967	HSE-9 COD in Water	W	01/01/84
00.00968	HSE-9 Boron in Water	W	01/01/84
00.00969	HSE-9 Boron in Water	W	10/10/84
00.00970	EML Am-241 in Soil (50g)	S	05/01/84
00.00971	EML Am-241 in Soil (100g)	S	05/01/84
00.91419	EML Radionuclides on Air Filters	F	11/01/83
00.91421	EML Radionuclides on Soil	S	11/01/83
00.91424	EML Radionuclides in Water	W	11/01/83
00.91427	EML Radionuclides on Vegetation	B	11/01/83
00.91431	EML Radionuclides in Tissue	B	11/01/83
00.91435	EPA Radium in Water	W	11/14/84
00.91438	EPA Strontium in Water	W	11/14/83
00.92000	EPA Tritium in Water	W	01/20/84
00.92003	EPA Tritium Blank in Water	W	01/20/84
00.92006	EPA Alpha/Beta on Air Filter	F	02/03/84
00.92009	EPA Ra-226 in Water	W	02/10/84
00.92012	EPA Sr-90 in Water	W	03/16/84
00.92015	EPA Pu-239 in Water	W	03/09/84
00.92018	EPA Alpha/Beta in Water	W	02/17/84
00.92021	EPA Gamma Nuclides in Food	B	04/06/84
00.92024	EPA Tritium Blank in Water	W	03/09/84
00.92027	EPA Tritium in Water	W	03/09/84
00.92030	EPA Gamma Nuclides in Water	W	03/16/84
00.92033	EPA Uranium in Water	W	03/30/84
00.92036	EPA Ra-226 in Water	W	05/04/84
00.92039	EPA Alpha/Beta in Water	W	04/13/84
00.92042	EPA Alpha/Beta in Air Filters	F	06/01/84
00.92045	EPA Tritium in Water	W	05/11/84
00.92048	EPA Tritium Blank in Water	W	04/13/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.92051	EPA Alpha, Ra-226, U in Water	W	05/07/84
00.92054	EPA Beta,Sr-90,Co-60,Cs-134,Cs-137 in Water	W	05/07/84
00.92057	EML Gamma Nuclides in Soil	S	05/10/84
00.92060	EML Gamma Nuclides in Water	W	05/10/84
00.92065	EML Gamma Nuclides in Vegetation	B	05/10/84
00.92068	EPA Sr-90 in Water	W	06/01/84
00.92071	EPA Ra-226 in Water	W	08/10/84
00.92074	EPA Tritium in Water	W	07/06/84
00.92077	EPA Gamma Nuclides in Water	W	07/13/84
00.92080	EPA Alpha, Beta in Water	W	05/18/84
00.92083	EPA Radionuclides in Milk	B	06/22/84
00.92086	EPA Pu-239 in Water	W	07/13/84
00.92089	EPA Alpha, Beta in Water	W	07/20/84
00.92090	EPA Gamma Nuclides in Food	B	07/30/84
00.92091	EPA Pu-239 in Water	W	07/30/84
00.92092	EPA Tritium in Water	W	08/21/84
00.92093	EPA Tritium Blank in Water	W	08/21/84
00.92094	EPA Uranium in Water	W	08/21/84
00.92096	EPA Alpha, Beta on Air Filter	F	08/24/84
00.92097	EPA Sr-90 in Water	W	09/07/84
00.92098	EPA Ra-226 in Water	W	09/14/84
00.92100	EPA Alpha, Beta in Water	W	09/21/84
00.92101-00.92105	NIOSH PAT Round 79 Metals on Air Filters	F	10/01/84
00.92106-00.92110	NIOSH PAT Round 79 Organics on Charcoal	T	10/01/84
00.92111-00.92115	NIOSH PAT Round 78 Metals on Air Filters	F	07/01/84
00.92116-00.92120	NIOSH PAT Round 78 Organics on Charcoal	T	07/01/84
00.92121-00.92122	EPA Performance Evaluation Study No. 15	W	10/01/84
00.92123	EPA Gamma Nuclides in Water	W	10/05/84
00.92125	EPA Tritium in Water	W	10/12/84
00.92126	EPA Gamma Nuclides in Food	B	10/26/84
00.92127	EPA Alpha, Ra-226, Uranium in Water	W	10/22/84
00.92128	EPA Beta, Sr-90, Co-60, Cs-134, Cs-137 in Water	W	10/22/84
00.92138	EPA Gross Alpha-Beta in Water	W	11/16/84
00.92140	EPA Tritium in Water, Dec. 1984	W	12/14/84
00.92141	EPA Radium in Water, Dec. 1984	W	12/21/84
00.93000-00.93004	HSE-9 Trace Metals on Filter Media	F	07/07/84
00.93006-00.93008	HSE-9 Trace Metals in Urine	W	07/09/84
00.93009-00.93032	HSE-9 Plutonium in Urine	W	07/09/84
00.93033-00.93048	HSE-9 Uranium in Urine	W	07/23/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.93049-00.93051			
	HSE-9 Trichloroacetic Acid in Urine	W	07/09/84
00.93052-00.93061			
	HSE-9 Tritium in Urine	W	07/11/84
00.93062-00.93064			
	HSE-9 Methylethylketone on Silica Gel	T	07/17/84
00.93068-00.93069			
	HSE-9 Phenol in Water	W	07/16/84
00.93070	HSE-9 Arsenic on Air Filter	F	07/18/84
00.93072-00.93073			
	HSE-9 Formaldehyde in Water	W	07/19/84
00.93078-00.93079			
	HSE-9 Beryllium on Air Filter	F	07/24/84
00.93080	HSE-9 Arsenic on Air Filter	F	07/24/84
00.93081	HSE-9 Trace Metals in Water	W	08/01/84
00.93082	HSE-9 Barium on Air Filter	F	08/01/84
00.93083-00.93098			
	HSE-9 Uranium in Urine	W	08/20/84
00.93099-00.93102			
	HSE-9 Tritium in Urine	W	08/01/84
00.93103-00.93105			
	HSE-9 Organics in Urine	W	08/18/84
00.93106-00.93107			
	HSE-9 Cadmium in Urine	W	08/01/84
00.93108	HSE-9 Beryllium on Air Filter	F	08/02/84
00.93109	HSE-9 Organics in Gas Badge	T	08/02/84
00.93110-00.93114			
	HSE-9 Beryllium or Arsenic on Air Filter	F	08/09/84
00.93115	HSE-9 PCB's in Oil	M	08/13/84
00.93116-00.93125			
	HSE-9 Beryllium on Air Filter	F	08/14/84
00.93126-00.93127			
	HSE-9 Organics on Silica Gel	T	08/17/84
00.93128-00.93133			
	HSE-9 Trace Metals on Air Filters	F	08/24/84
00.93134-00.93138			
	HSE-9 Tritium in Urine	W	08/28/84
00.93139-00.93162			
	HSE-9 Plutonium in Urine	W	09/04/84
00.93163-00.93169			
	HSE-9 Organics on Silica Gel	T	08/31/84
00.93170-00.93185			
	HSE-9 Uranium in Urine	W	09/17/84
00.93186-00.93187			
	HSE-9 Cadmium on Air Filters	F	09/04/84
00.93188-00.93190			
	HSE-9 Trichloroacetic Acid in Urine	W	09/18/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.93191-00.93200			
	HSE-9 Tritium in Urine	W	09/04/84
00.93201	HSE-9 Arsenic on Air Filter	F	09/06/84
00.93202-00.93225			
	HSE-9 Pu-239 and Am-241 on Calcium Phosphate	S	09/06/84
00.93226-00.93231			
	HSE-9 Organics on Silica Gel	T	09/10/84
00.93237-00.93245			
	Battelle Radionuclides in Artificial Urine	W	03/01/84
00.93246	HSE-9 Beryllium on Air Filter	F	09/18/84
00.93247	HSE-9 Titanium on Air Filter	F	09/19/84
00.93248-00.93249			
	HSE-9 Trace Metals on Air Filters	F	09/20/84
00.93250-00.93259			
	HSE-9 Organics on Charcoal	T	09/21/84
00.93260-00.93269			
	HSE-9 Trace Metals on Air Filters	F	09/20/84
00.93270-00.93273			
	HSE-9 Organics in Water	W	09/21/84
00.93284-00.93293			
	HSE-9 Tritium in Urine	W	09/26/84
00.93294-00.93297			
	HSE-9 Methylcyclohexane on Charcoal	T	09/26/84
00.93298	HSE-9 Nickel on Air Filter	F	10/01/84
00.93299-00.93302			
	HSE-9 Major Anions in Water	W	10/02/84
00.93303-00.93306			
	HSE-9 Major Cations in Water	W	10/02/84
00.93307-00.93309			
	HSE-9 Plutonium in Water	W	10/03/84
00.93310-00.93312			
	HSE-9 Cs-137 in Water	W	10/03/84
00.93313-00.93315			
	HSE-9 Plutonium in Water, Blanks	W	10/03/84
00.93316-00.93317			
	HSE-9 Cadmium in Urine	W	10/04/84
00.93318-00.93329			
	HSE-9 Plutonium in Urine	W	10/04/84
00.93330-00.93353			
	HSE-9 Uranium in Urine	W	10/29/84
00.93354-00.93356			
	HSE-9 Trichloroacetic Acid in Urine	W	10/15/84
00.93357	HSE-9 Major Anions in Water	W	10/04/84
00.93358-00.93366			
	HSE-9 Trace Metals on Air Filters	F	10/04/84
00.93367-00.93374			
	HSE-9 Organics on Charcoal	T	10/09/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.93375-00.93377	HSE-9 Trace Metals on Air Filters	F	10/09/84
00.93378-00.93379	HSE-9 Formaldehyde in Water	W	10/10/84
00.93380-00.93383	HSE-9 Trace Metals on Air Filters	F	10/15/84
00.93384-00.93386	HSE-9 Organics on Charcoal	T	10/18/84
00.93387-00.93398	HSE-9 Trace Metals on Air Filters	F	10/24/84
00.93399-00.93404	HSE-9 Polychlorinated Biphenyls on Fluorisil	T	10/30/84
00.93405-00.93412	HSE-9 Uranium in Urine	W	11/26/84
00.93413-00.93415	HSE-9 Trichloroacetic Acid in Urine	W	11/19/84
00.93416-00.93423	HSE-9 Uranium in Urine	W	11/26/84
00.93424-00.93433	HSE-9 Tritium in Urine	W	11/01/84
00.93434-00.93435	HSE-9 Cadmium in Urine	W	11/19/84
00.93436-00.93447	HSE-9 Plutonium in Urine	W	11/01/84
00.93448	HSE-9 Beryllium on Air Filter	F	11/06/84
00.93449-00.93450	HSE-9 Formaldehyde in Water	W	11/06/84
00.93451	HSE-9 Beryllium on Air Filter	F	11/09/84
00.93452	HSE-9 Methylene Chloride on Charcoal	T	11/13/84
00.93453	HSE-9 Organics on Charcoal	T	11/13/84
00.93454-00.93477	HSE-9 Pu-239 and Am-241 on Calcium Phosphate	S	11/14/84
00.93478	HSE-9 Beryllium on Air Filter	F	11/21/84
00.93479-00.93481	HSE-9 Uranium on Air Filter	F	11/26/84
00.93482-00.93486	HSE-9 Beryllium on Air Filter	F	11/29/84
00.93487-00.93502	HSE-9 Uranium in Urine	W	12/26/84
00.93503-00.93505	HSE-9 Trichloroacetic Acid in Urine	W	12/15/84
00.93506-00.93515	HSE-9 Tritium in Urine	W	12/03/84
00.93516-00.93517	HSE-9 Cadmium in Urine	W	12/15/84
00.93518-00.93529	HSE-9 Plutonium in Urine	W	12/03/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.93530-00.93533			
	HSE-9 Beryllium on Air Filter	F	12/05/84
00.93534	HSE-9 Anions in Water	W	12/12/84
00.93535-00.93537			
	HSE-9 Beryllium on Air Filter	F	12/27/84
00.94000-00.94004			
	HSE-9 Beryllium or Arsenic on Air Filter	F	01/04/84
00.94005-00.94020			
	HSE-9 Organics on Charcoal	T	01/06/84
00.94021-00.94045			
	HSE-9 Trace Metals on Air Filters	F	01/12/84
00.94046-00.94061			
	HSE-9 Uranium in Urine	W	01/23/84
00.94062-00.94064			
	HSE-9 Trichloroacetic Acid in Urine	W	01/22/84
00.94065-00.94074			
	HSE-9 Tritium in Urine	W	01/14/84
00.94075-00.94079			
	HSE-9 Trace Metals on Air Filter	F	01/23/84
00.94080-00.94081			
	HSE-9 Cadmium in Urine	W	01/25/84
00.94082	HSE-9 Bismuth on Air Filter	F	02/01/84
00.94083-00.94084			
	HSE-9 Beryllium on Air Filter	F	02/01/84
00.94085-00.94086			
	HSE-9 Nitric Acid in Water	W	02/01/84
00.94088	HSE-9 Arsenic on Air Filter	F	02/03/84
00.94089-00.94104			
	HSE-9 Uranium in Urine	W	02/21/84
00.94105-00.94109			
	HSE-9 Tritium in Urine	W	02/08/84
00.94110-00.94112			
	HSE-9 Trichloroacetic Acid in Urine	W	02/18/84
00.94113-00.94123			
	HSE-9 Plutonium in Urine	W	02/08/84
00.94124	HSE-9 Nitric Acid in Water	W	02/09/84
00.94125-00.94135			
	HSE-9 Trace Metals on Air Filter	F	02/15/84
00.94136-00.94137			
	HSE-9 Cadmium in Urine	W	03/06/84
00.94138-00.94139			
	HSE-9 Beryllium on Air Filter	F	03/07/84
00.94140-00.94147			
	HSE-9 Uranium in Urine	W	03/19/84
00.94148-00.94150			
	HSE-9 Trichloroacetic Acid in Urine	W	03/20/84
00.94151-00.94158			
	HSE-9 Uranium in Urine	W	03/19/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.94159-00.94160			
	HSE-9 Cadmium in Urine	W	03/20/84
00.94161-00.94170			
	HSE-9 Tritium in Urine	W	03/08/84
00.94171-00.94182			
	HSE-9 Plutonium in Urine	W	03/08/84
00.94183-00.94195			
	HSE-9 Trace Metals on Air Filter	F	03/23/84
00.94196-00.94222			
	HSE-9 Trace Metals on Air Filter	F	04/09/84
00.94223	HSE-9 Methyl Chloroform on Charcoal	T	04/09/84
00.94224	HSE-9 Beryllium on Air Filter	F	04/09/84
00.94225-00.94227			
	HSE-9 Trichloroacetic Acid in Urine	W	04/20/84
00.94228-00.94251			
	HSE-9 Uranium in Urine	W	04/30/84
00.94252-00.94261			
	HSE-9 Tritium in Urine	W	04/10/84
00.94262-00.94273			
	HSE-9 Plutonium in Urine	W	04/10/84
00.94274-00.94275			
	HSE-9 Cadmium in Urine	W	04/15/84
00.94276	HSE-9 Beryllium on Air Filter	F	04/19/84
00.94277	HSE-9 Methyl Chloroform on Charcoal	T	04/19/84
00.94278-00.94280			
	HSE-9 Beryllium on Air Filter	F	04/24/84
00.94281-00.94292			
	HSE-9 Organics on Charcoal	T	04/30/84
00.94293	HSE-9 Beryllium on Air Filter	F	05/08/84
00.94294-00.94309			
	HSE-9 Uranium in Urine	W	05/28/84
00.94310	HSE-9 Cadmium in Urine	W	05/10/84
00.94311-00.94333			
	HSE-9 Plutonium in Urine	W	05/11/84
00.94334-00.94336			
	HSE-9 Trichloroacetic Acid in Urine	W	05/11/84
00.94337-00.94346			
	HSE-9 Tritium in Urine	W	05/11/84
00.94347-00.94350			
	HSE-9 Trace Metals on Air Filters	F	05/30/84
00.94351-00.94352			
	HSE-9 Cadmium in Urine	W	06/13/84
00.94353-00.94368			
	HSE-9 Uranium in Urine	W	06/11/84
00.94369-00.94371			
	HSE-9 Trichloroacetic Acid in Urine	W	06/14/84
00.94372-00.94381			
	HSE-9 Tritium in Urine	W	06/14/84

Sample Number	Sample Name	Sample Type[a]	Date Received
00.94382	HSE-9 Arsenic on Air Filter	F	06/20/84
00.94383	HSE-9 1-Octanol on Charcoal	T	06/21/84
00.94384-00.94385	HSE-9 Beryllium on Air Filter	F	06/28/84
00.94386	HSE-9 Phenol in Water	W	06/01/84
00.94387	HSE-9 Barium in Water	W	06/14/84
00.94388-00.94391	NIOSH PAT Round 76 Trace Metals on Air Filters	F	01/01/84
00.94392-00.94395	NIOSH PAT Round 76 Organics on Charcoal	T	01/01/84
00.94396-00.94399	NIOSH PAT Round 77 Trace Metals on Air Filters	F	04/01/84
00.94400-00.94404	NIOSH PAT Round 77 Organics on Charcoal	T	04/01/84

[a]Sample type: B = Biologicals, F = Filters, M = Bulk Materials, S = Silicates, T = Charcoal Tubes, W = Water and Urine, X = Miscellaneous.

APPENDIX C

TYPICAL TERMINAL SESSION FOR QACHECK COMPUTER PROGRAM

```
Username:  GAUTIER
Password:

WELCOME TO HSE-9 VAX/VMS COMPUTING

*****************************************************
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%MOUNT-I-MOUNTED, SAMPLES mounted on _DLA0:
%MOUNT-I-MOUNTED, DATA mounted on _DLA1:

$ QACHECK

Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: BE
Enter RESULT     : 9.1
Enter UNCERTAINTY: 1.0
Enter UNITS: UG/FILTER
ANALYSIS UNDER CONTROL FOR 00.00476 BE

AGAIN? [Y/N]: Y
Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: BE
Enter RESULT     : 5.4
Enter UNCERTAINTY: 6.8
Enter UNITS: UG/FILTER
ABORT: REPORTED UNCERTAINTY TOO LARGE: > 25%

AGAIN? [Y/N]: Y
Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: BE
Enter RESULT     : 5.8
Enter UNCERTAINTY: 1.0
Enter UNITS: MG/FILTER
ABORT: UNITS CONFLICT-CORRECT UNITS ARE UG/FILTER

AGAIN? [Y/N]: Y
Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: HG
Enter RESULT     : 9.0
Enter UNCERTAINTY: 0.45
Enter UNITS: UG/FILTER
ABORT: NO DATA AVAILABLE FOR 00.00476 HG
AGAIN? [Y/N]: Y
Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: BE
Enter RESULT     : 6.7
Enter UNCERTAINTY: 0.6
Enter UNITS: UG/FILTER
ANALYSIS OUT OF CONTROL FOR 00.00476 BE   **REPEAT SAMPLE BATCH

AGAIN? [Y/N]: Y
Enter USER ID (XXX): MAG
Enter HSE-9 QA NUMBER: 00.00476
Enter ANALYSIS: BE
Enter RESULT     : 8.0
Enter UNCERTAINTY: 0.7
Enter UNITS: UG/FILTER
WARNING-ANALYSIS IN 1-2 SIGMA REGION FOR 00.004767 BE

AGAIN? [Y/N]: N
$ LO
  GAUTIER        logged out at 13-JUN-1985 15:22:12.14
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APPENDIX D

SUMMARY TABLES OF QUALITY ASSURANCE DATA FOR 1984 AND PLOTS OF FIVE-YEAR TRENDS

TABLE D-I

SUMMARY OF ANALYTICAL QUALITY ASSURANCE RESULTS FOR RADIOCHEMICAL AND STABLE ELEMENT ANALYSES COMPLETED IN HSE-9 DURING 1984 BY MATRIX

	Silicates			Waters and Urines			Biologicals			Air Filters		
Analysis	Mean	Std Dev	N[a]	Mean	Std Dev	N[a]	Mean	Std Dev	N[a]	Mean	Std Dev	N[a]
Gross Alpha				1.29	± 0.31	(18)				1.05	± 0.10	(9)
Gross Beta				1.37	± 0.19	(18)				0.96	± 0.02	(9)
H-3				0.94	± 0.11	(290)						
Na-22	0.88	± 0.03	(3)	1.03		(2)						
K-40	0.80	± 0.37	(6)				0.70	± 0.33	(5)			
Cr-51				1.07	± 0.07	(3)						
Mn-54				1.05	± 0.03	(3)						
Co-60				1.09	± 0.41	(15)	0.99	± 0.05	(3)			
Sr-90	0.94	± 0.24	(6)	0.99	± 0.27	(18)	0.92	± 0.11	(12)			
Cs-134				1.94	± 0.23	(3)						
Cs-137	1.05	± 0.13	(47)	1.06	± 0.22	(75)	1.09	± 0.27	(10)			
Ra-226	0.81	± 0.07	(3)	0.94	± 0.11	(16)						
U-235				1.00	± 0.11	(72)						
U-238				1.00	± 0.23	(72)						
Pu-238	0.99	± 0.22	(5)	0.88	± 0.12	(50)	0.93	± 0.11	(3)			
Pu-239+240	1.26	± 0.80	(6)	0.97	± 0.16	(93)	0.90	± 0.14	(6)	0.90		(2)
Am-241	1.42	± 2.06	(8)	0.68	± 0.35	(9)	1.46	± 0.41	(6)	0.96		(2)
Ag				1.01	± 0.08	(38)				1.13		(2)
Al	1.03		(2)	1.20	± 0.12	(7)	0.98	± 0.09	(10)	1.02		(1)
As				1.00	± 0.08	(24)	0.96	± 0.14	(84)	1.10	± 0.23	(15)
B	0.99	± 0.06	(7)	1.02	± 0.02	(13)	1.02		(1)			
Ba	1.22		(1)	1.06	± 0.09	(22)	1.08	± 0.22	(16)	1.03		(2)
Be	0.94	± 0.07	(15)							1.10	± 0.14	(75)
Bi										0.95		(1)
Br							1.00	± 0.12	(26)			
Ca	1.03	± 0.08	(4)	0.99	± 0.04	(30)	0.98	± 0.03	(6)	1.02		(1)
Cd	0.72		(1)	0.94	± 0.15	(64)				1.03	± 0.07	(41)
Ce	1.01	± 0.07	(8)				1.04	± 0.08	(13)			
Cl				1.05	± 0.10	(38)	0.93	± 0.14	(14)			
CN				0.88	± 0.03	(12)						
Co	0.96	± 0.01	(4)				1.03	± 0.08	(16)	1.10	± 0.11	(16)
COD				0.98	± 0.02	(34)						
Cond				1.00	± 0.02	(29)						
Cr	1.00	± 0.14	(3)	0.97	± 0.10	(29)	1.04	± 0.09	(24)	1.12	± 0.05	(3)
Cs	1.04	± 0.10	(32)				1.24	± 0.22	(56)	1.09	± 0.10	(35)
Cu	0.74	± 0.03	(3)	1.04	± 0.20	(39)				1.03		(2)
Dy	0.96	± 0.12	(16)									
Eu	0.96	± 0.06	(12)				1.07	± 0.10	(13)			
F	0.98	± 0.24	(19)	1.02	± 0.08	(17)	0.96	± 0.22	(12)			
Fe	1.03	± 0.02	(5)	0.98	± 0.05	(10)	1.00	± 0.04	(19)	1.06		(1)
Gd	0.99		(1)									
HARD				0.99	± 0.03	(7)						
Hf	1.07	± 0.04	(4)				1.03	± 0.11	(12)	1.05		(2)

TABLE D-I (cont)

Analysis	Silicates Mean	Silicates Std Dev	Silicates N[a]	Waters and Urines Mean	Waters and Urines Std Dev	Waters and Urines N[a]	Biologicals Mean	Biologicals Std Dev	Biologicals N[a]	Air Filters Mean	Air Filters Std Dev	Air Filters N[a]
Hg				0.98	± 0.17	(38)						
HNO3				0.97	± 0.08	(3)						
I							1.01		(1)			
In										1.04	± 0.07	(19)
K	0.90	± 0.07	(4)	1.00	± 0.07	(33)	0.94	± 0.06	(3)			
La	1.02	± 0.05	(15)				1.03	± 0.11	(22)			
Li	0.93		(2)				1.18		(2)			
Lu							0.74	± 0.27	(12)			
Mg	1.02	± 0.18	(6)	0.97	± 0.05	(27)						
Mn	0.93	± 0.05	(8)	1.03	± 0.11	(19)	0.96	± 0.07	(12)	1.10	± 0.14	(16)
Na	0.99	± 0.05	(22)	1.02	± 0.07	(36)	1.10	± 0.30	(32)			
Nd	1.14	± 0.26	(4)									
NH3-N				1.01	± 0.02	(13)						
Ni	1.02	± 0.05	(4)	1.10	± 0.19	(13)				1.00	± 0.07	(4)
NO3				1.00	± 0.10	(21)						
NO3-N				0.99	± 0.05	(16)						
Os										1.03		(2)
P	1.61		(2)	1.04	± 0.05	(8)						
Pb	1.04	± 0.03	(3)	0.99	± 0.15	(98)	1.13	± 0.34	(7)	1.03	± 0.09	(45)
pH				1.00	± 0.01	(25)						
PO4				1.08		(2)						
Rb							0.96	± 0.05	(12)			
Re										0.83		(2)
Sb							1.04	± 0.13	(18)	1.09	± 0.07	(30)
Sc	1.00	± 0.04	(9)				1.01	± 0.09	(27)			
Se				0.99	± 0.16	(62)						
Si	1.04	± 0.08	(17)									
Sm	0.98	± 0.10	(10)				0.89	± 0.06	(19)			
SO4				0.95	± 0.05	(38)						
Sr	0.95	± 0.03	(6)				0.95	± 0.09	(31)			
Ta							1.01	± 0.17	(12)	1.06	± 0.10	(39)
Tb	1.14		(2)									
TDS				1.00	± 0.06	(60)						
Th	0.90	± 0.15	(6)				1.14	± 0.22	(19)			
Ti										0.96		(1)
Tot Alk				0.96	± 0.04	(15)						
U	1.00	± 0.08	(196)	1.00	± 0.07	(173)	1.02	± 0.11	(72)	0.97	± 0.10	(13)
U-235/238	1.01	± 0.05	(6)									
V	1.01	± 0.07	(3)				0.98	± 0.11	(10)	1.04	± 0.08	(11)
W										1.16		(2)
Yb							1.02	± 0.05	(12)			
Zn	1.31		(2)	1.03	± 0.19	(50)				0.99	± 0.07	(39)

[a]Total number of analyses included in the mean.

Note: Std Dev is +- 1 sigma.

TABLE D-II

SUMMARY OF ANALYTICAL QUALITY ASSURANCE RESULTS
FOR ORGANIC ANALYSES COMPLETED BY HSE-9 IN 1984

Compound	CAS No.	Matrix	Mean Std Dev	N[a]
Acenaphthylene	208968	T	1.18 +- 0.06	(6)
Acetone	67641	W	1.06 +- 0.09	(4)
Anthracene	120127	T	1.08 +- 0.04	(6)
Aroclor 1260 (PCB)	11096825	M	1.00 +- 0.12	(6)
Benzene	71432	T	0.97 +- 0.23	(24)
Benzo-b-fluoranthrene	205992	T	0.66 +- 0.08	(6)
Carbon Tetrachloride	56235	T	0.95 +- 0.11	(8)
Chloroform	67663	T	1.14 +- 0.08	(12)
o-Cresol	95487	T	1.01 +- 0.05	(7)
Dichloroethane	107062	T	0.87 +- 0.14	(8)
2,4-Dimethylphenol	105679	M	0.94	(1)
		T	0.96 +- 0.04	(7)
3,4-Dimethylphenol	95658	T	1.03 +- 0.05	(7)
Ethylbenzene	100414	T	0.99 +- 0.09	(16)
o-Ethylphenol	90006	T	0.94 +- 0.04	(7)
Ethyl Propionate	105373	W	1.30 +- 0.27	(4)
Formaldehyde	50000	W	0.97 +- 0.15	(6)
Fluorene	86737	T	1.02 +- 0.08	(6)
Heptane	142825	T	1.00 +- 0.09	(17)
Isopropyl Ether	108203	T	0.86 +- 0.06	(10)
Methyl Alcohol	67561	T	1.00	(2)
Methyl Chloroform	71556	T	1.07 +- 0.06	(14)
Methyl Ethyl Ketone	78933	T	1.00 +- 0.10	(7)
Naphthalene	91203	T	1.14 +- 0.07	(6)
1-Octanol	111875	T	0.72	(1)
Phenol	108952	M	0.92	(1)
		T	0.92 +- 0.04	(7)
		W	1.01 +- 0.03	(3)
Polychlorinated Biphenyls	A2	T	0.98	(1)
Toluene	108883	T	0.96 +- 0.12	(23)
		W	2.06 +- 1.00	(4)
Trichloroacetic Acid	76039	W	0.95 +- 0.23	(25)
Trichloroethylene	79016	T	0.86 +- 0.10	(8)
1,2,4-Trimethylbenzene	95636	T	0.97 +- 0.09	(16)
2,3,4-Trimethylpentane	565753	T	0.95 +- 0.05	(8)
o-Xylene	95476	T	1.00 +- 0.21	(23)

[a]Total number of analyses included in the mean.

TABLE D-III

SUMMARY OF ELEMENTAL DETERMINATIONS
ON NBS STANDARD REFERENCE MATERIALS

SRM	Constituent	Mean Std Dev	Units	N[a]	Technique[b]
278	Na	3.49 +- 0.01	%	4	ITNA
	Sr	58.	ppm	1	IENA
	U	4.51 +- 0.08	ppm	22	DNA
610	U-235/238	0.0024 +- 0.0002		3	RTNA
688	Ce	13.7 +- 0.05	ppm	4	RTNA
	Dy	3.4 +- 0.5	ppm	7	FAA
		3.1 +- 0.3	ppm	9	RTNA
	Er	2.2 +- 0.4	ppm	6	FAA
	Eu	1.01 +- 0.04	ppm	8	RTNA
	Ho	810 +- 60	ppb	6	FAA
	La	5.3 +- 0.3	ppm	11	RTNA
	Mg	5.2	%	1	AA
	Na	1.48 +- 0.02	%	4	ITNA
	P	930	ppm	2	COLOR
	Si	22.6	%	2	COLOR
	Sm	2.46 +- 0.14	ppm	5	RTNA
	Th	320	ppb	1	ITNA
	Tm	250 +- 60	ppb	6	FAA
	Zn	94	ppm	1	AA
1566	As	11.3 +- 1.0	ppm	3	RTNA
	Sr	10.8 +- 0.6	ppm	4	IENA
	U	117 +- 8	ppb	13	DNA
1567	Br	8.6	ppm	1	IENA
		8.3	ppm	1	ITNA
	Cl	580 +- 30	ppm	4	ITNA
	Mn	8.6	ppm	2	ITNA
	Na	13 +- 3	ppm	4	ITNA
1568	Cl	248	ppm	2	ITNA
	Na	10	ppm	2	ITNA
1569	Li	440 +- 20	ppb	6	AAC
	Sc	196	ppb	2	ITNA
	Sr	10.3	ppm	1	IENA
1570	As	149 +- 25	ppb	4	RTNA
	Cs	68 +- 8	ppb	11	ITNA
	Sr	83.7 +- 0.7	ppm	3	AA
		83.4 +- 0.2	ppm	3	IENA
	U	48 +- 2	ppb	9	DNA
1571	As	9.9 +- 1.3	ppm	3	RTNA

TABLE D-III (cont)

SRM	Constituent	Mean Std Dev	Units	N[a]	Technique[b]
1571	Cs	44 +- 2	ppb	3	ITNA
	Li	830	ppb	2	AA
	Sc	66	ppb	1	ITNA
	Sr	37.8 +- 0.1	ppm	3	IENA
	U	33.6 +- 0.6	ppb	3	DNA
1572	As	2.7 +- 0.3	ppm	18	RTNA
	Be	7.6 +- 1.6	ppb	3	FAAC
	Cr	1.0 +- 0.5	ppm	1	FAA
	Cs	111 +- 25	ppb	5	ITNA
	Li	150 +- 20	ppb	9	AAC
		350 +- 50	ppb	4	AA
	Pb	13.6 +- 1.1	ppm	3	FAA
	Sc	11	ppb	1	ITNA
	Sr	97 +- 1	ppm	3	AA
		93 +- 5	ppm	6	IENA
	U	37 +- 5	ppb	12	DNA
1573	As	240 +- 25	ppb	19	RTNA
	Be	38 +- 4	ppb	4	FAAC
	Br	22.5	ppm	1	ITNA
	Cr	4.6 +- 0.7	ppm	4	FAA
	Cs	70 +- 8	ppb	15	ITNA
	F	5.4 +- 1.3	ppm	12	ISE
	Pb	7.6 +- 3.1	ppm	4	FAA
	Sc	175 +- 1	ppb	3	ITNA
	Sr	43.7 +- 0.2	ppm	3	AA
		35.6 +- 1.4	ppm	5	IENA
	U	63 +- 6	ppb	22	DNA
1575	Al	590 +- 50	ppm	3	ITNA
	As	205 +- 22	ppb	6	ITNA
	Ba	8.4 +- 2.5	ppm	3	ITNA
	Br	6.9 +- 0.2	ppm	6	ITNA
	Ca	4070 +- 120	ppm	3	ITNA
	Ce	220 +- 50	ppb	6	ITNA
	Cl	300 +- 20	ppm	3	ITNA
	Co	140 +- 20	ppb	3	ITNA
	Cr	2.7 +- 0.2	ppm	6	ITNA
	Cs	126 +- 18	ppb	10	ITNA
	Eu	11.3 +- 1.6	ppb	4	ITNA
	Fe	204 +- 10	ppm	6	ITNA
	Hf	36 +- 17	ppb	5	ITNA
	La	190 +- 13	ppb	3	ITNA
	Li	340 +- 40	ppb	3	AA
	Lu	2.2 +- 0.5	ppb	6	ITNA
	Mn	690 +- 20	ppm	3	ITNA
	Na	37 +- 4	ppm	6	ITNA
	Rb	10.8 +- 0.5	ppm	6	ITNA

TABLE D-III (cont)

SRM	Constituent	Mean Std Dev	Units	N[a]	Technique[b]
1575	Sb	189 +- 17	ppb	6	ITNA
	Sc	45 +- 6	ppb	7	ITNA
	Sm	21 +- 2	ppb	6	ITNA
	Sr	5.4	ppm	1	IENA
	Ta	13 +- 4	ppb	6	ITNA
	Th	50 +- 12	ppb	6	ITNA
	U	20 +- 4	ppb	12	DNA
	V	450	ppb	2	ITNA
	Yb	26 +- 8	ppb	6	ITNA
1577	As	63 +- 5	ppb	4	RTNA
	Br	9.0	ppm	2	IENA
	I	237	ppb	1	IENA
1577A	As	49 +- 4	ppb	8	RTNA
	Br	11.2	ppm	2	IENA
		9.7	ppm	1	ITNA
	Cl	2570	ppm	2	ITNA
1584	105679	48.6	ppm	1	GCFI
	108934	< 1	ppm	1	GCFI
	108952	27.2	ppm	1	GCFI
	1230709	< 1	ppm	1	GCFI
	526750	< 1	ppm	1	GCFI
	576261	< 1	ppm	1	GCFI
	620177	< 1	ppm	1	GCFI
	90006	< 1	ppm	1	GCFI
	95487	< 1	ppm	1	GCFI
	95658	< 1	ppm	1	GCFI
1632	Br	15.6 +- 0.4	ppm	6	ITNA
	U	1.19	ppm	1	DNA
1632A	As	9.7 +- 0.3	ppm	6	ITNA
	B	54	ppm	1	TCGS
	Ba	136 +- 16	ppm	6	ITNA
	Ce	31.8 +- 1.5	ppm	6	ITNA
	Co	6.56 +- 0.22	ppm	6	ITNA
	Cr	35.6 +- 1.0	ppm	6	ITNA
	Cs	2.27 +- 0.15	ppm	6	ITNA
	Eu	540 +- 40	ppb	6	ITNA
	Fe	1.14 +- 0.04	%	6	ITNA
	Hf	1.65 +- 0.15	ppm	6	ITNA
	La	15.9 +- 0.6	ppm	6	ITNA
	Lu	177 +- 10	ppb	6	ITNA
	Na	858 +- 22	ppm	7	ITNA
	Rb	29.1 +- 0.8	ppm	6	ITNA
	Sb	650 +- 90	ppb	6	ITNA
	Sc	6.14 +- 0.20	ppm	6	ITNA

TABLE D-III (cont)

SRM	Constituent	Mean	Std Dev	Units	N[a]	Technique[b]
1632A	Sm	2.28	+- 0.08	ppm	6	ITNA
	Ta	390	+- 50	ppb	6	ITNA
	Th	4.81	+- 0.17	ppm	6	ITNA
	U	1.29	+- 0.04	ppm	10	DNA
	V	49		ppm	1	ITNA
	Yb	1.09	+- 0.06	ppm	6	ITNA
1633A	Ag	< 300		ppb	1	ITNA
	Ca	1.29		%	1	ITNA
	Cs	11.1	+- 1.2	ppm	12	ITNA
	Fe	9.62	+- 0.10	%	4	ITNA
	Mg	5700		ppm	1	ITNA
	Mn	182		ppm	2	ITNA
	Na	1770	+- 80	ppm	7	ITNA
	U	10.3	+- 0.2	ppm	26	DNA
1635	Al	2960	+- 170	ppm	4	ITNA
	As	510	+- 40	ppb	6	ITNA
	Ba	69	+- 6	ppm	7	ITNA
	Br	840	+- 140	ppb	6	ITNA
	Ca	5300	+- 250	ppm	3	ITNA
	Ce	3.4	+- 0.3	ppm	7	ITNA
	Cl	27	+- 6	ppm	4	ITNA
	Co	630	+- 40	ppb	7	ITNA
	Cr	2.55	+- 0.17	ppm	7	ITNA
	Cs	60	+- 10	ppb	6	ITNA
	Eu	66	+- 6	ppb	7	ITNA
	Fe	2320	+- 70	ppm	7	ITNA
	Hf	290	+- 30	ppb	6	ITNA
	La	1.93	+- 0.08	ppm	7	ITNA
	Lu	15	+- 3	ppb	6	ITNA
	Mn	20.4	+- 1.5	ppm	4	ITNA
	Na	2410	+- 50	ppm	6	ITNA
	Rb	0.95	+- 0.37	ppm	6	ITNA
	Sb	147	+- 21	ppb	6	ITNA
	Sc	610	+- 14	ppb	7	ITNA
	Sm	260	+- 10	ppb	7	ITNA
	Ta	48	+- 9	ppb	6	ITNA
	Th	630	+- 25	ppb	7	ITNA
	V	4.7	+- 0.3	ppm	4	ITNA
	Yb	159	+- 3	ppb	6	ITNA
1642A	Hg	1.14	+- 0.05	ppb	5	CVAA
1642B	Hg	1.48	+- 0.06	ppb	7	CVAA
1643A	Ag	2.8	+- 0.4	ppb	7	FAA
	As	78	+- 6	ppb	9	FAA

TABLE D-III (cont)

SRM	Constituent	Mean	Std Dev	Units	N[a]	Technique[b]
1634A	Ba	49	+- 3	ppb	3	FAA
	Ca	27.5	+- 1.4	ppm	14	AA
	Cd	9.3	+- 0.9	ppb	3	FAA
		10.1	+- 0.8	ppb	3	FAAC
	Cr	17.6	+- 0.9	ppb	6	FAA
	Cu	17.0	+- 2.6	ppb	5	FAA
	K	1.82		ppm	2	AA
	Mg	7.70	+- 0.23	ppm	10	AA
	Mn	33.5		ppb	2	FAA
	Na	8.9	+- 0.4	ppm	8	AA
	Ni	52		ppb	1	FAA
	Pb	27	+- 2	ppb	6	FAA
		27	+- 3	ppb	6	FAAC
	Se	12.0	+- 0.8	ppb	6	FAA
	Zn	63		ppb	1	FAA
1643B	As	54	+- 5	ppb	3	FAA
	Ba	43		ppb	1	FAA
	Ca	35		ppm	1	AA
		31	+- 2	ppm	3	TITR
	Cd	20		ppb	2	FAA
	Cr	19.2	+- 1.8	ppb	5	FAA
	Cu	24	+- 8	ppb	8	FAA
	Mn	25	+- 2	ppb	3	FAA
	Ni	69		ppb	1	FAA
	Pb	27	+- 3	ppb	13	FAA
	Se	9.2	+- 1.4	ppb	7	FAA
	Zn	66	+- 3	ppb	9	FAA
1645	U	1.11	+- 0.03	ppm	18	DNA
1646	B	81	+- 3	ppm	6	TCGS
	Ca	8120		ppm	1	AA
	Cd	260		ppb	1	AAC
	Cu	13.3	+- 0.6	ppm	3	AAC
	Li	46		ppm	2	AA
	Mg	0.97		%	2	AA
	Ni	32.8	+- 1.7	ppm	4	AAC
	Pb	29	+- 1	ppm	3	AAC
	Th	10.7		ppm	1	ITNA
	U	2.96	+- 0.09	ppm	15	DNA
	Zn	139		ppm	1	AA
1648	U	5.2	+- 0.6	ppm	10	DNA
2661A-II						
	71432	57.9		µg/tube	1	GCFI

TABLE D-III (cont)

SRM	Constituent	Mean	Std Dev	Units	N[a]	Technique[b]
2675B-2						
	Be	0.35		µg/f[c]	1	AA
2676A-Blank						
	Cd	0.03		µg/f	1	AA
	Pb	0.17		µg/f	1	AA
	Zn	8.1		µg/f	1	AA
2676A-II						
	Cd	2.47		µg/f	1	AA
	Pb	15.6		µg/f	1	AA
	Zn	47.6		µg/f	1	AA
2676A-III						
	Cd	9.8		µg/f	1	AA
	Pb	28.7		µg/f	1	AA
	Zn	95.0		µg/f	1	AA
2682	Al	4140	+- 120	ppm	3	ITNA
	As	0.96	+- 0.06	ppm	6	ITNA
	Br	3.64	+- 0.19	ppm	6	ITNA
	Cl	37	+- 4	ppm	3	ITNA
	La	4.59	+- 0.14	ppm	6	ITNA
	Mn	22.6	+- 0.8	ppm	3	ITNA
	Na	981	+- 12	ppm	6	ITNA
	Sm	633	+- 16	ppb	6	ITNA
	V	13.9	+- 0.7	ppm	3	ITNA
4350	Cs-137	2.95	+- 0.18	pCi/g	7	GE(LI)
4350B	Cs-137	0.80	+- 0.10	pCi/g	6	GE(LI)
	U	2.43	+- 0.05	ppm	15	DNA
4353	Am-241	0.035	+- 0.004	pCi/g	3	RAS
	Cs-137	0.56	+- 0.05	pCi/g	3	GE(LI)
	U	3.04	+- 0.07	ppm	15	DNA
4355	U	2.75	+- 0.09	ppm	5	DNA

[a]Total number of analyses included in the mean.
[b]Analytical technique codes:
AA = Flame Atomic Absorption Spectrophotometry
AAC = Flame Atomic Absorption Preceded by Chemical Separation
COLOR = Spectrophotometry or Colorimetry
CVAA = Cold Vapor Atomic Absorption Spectrophotometry
DNA = Delayed-Neutron Assay
FAA = Flameless Atomic Absorption Spectrophotometry
FAAC = Flameless Atomic Absorption Preceded by Chemical Separation
GCFI = Gas Chromatography with Flame Ionization Detection
GE(LI) = Germanium (Lithium) Gamma-Ray Spectrometry
IENA = Instrumental Epithermal Neutron Activation Analysis
ISE = Ion Selective Electrode
ITNA = Instrumental Thermal Neutron Activation Analysis
RAS = Radiochemical Alpha Spectrometry
RTNA = Radiochemical Thermal Neutron Activation Analysis
TCGS = Thermal Neutron-Capture Prompt Gamma-Ray Spectrometry
TITR = Titrimetry
[c]µg/f = Microgram per Filter

TABLE D-IV

SUMMARY OF ELEMENTAL DETERMINATIONS ON CCRMP REFERENCE MATERIALS

Mat.	Constituent	Mean Std Dev	Units	N[a]	Technique[b]
BL-1	U	219	ppm	2	DNA
DL-1	U	38.6 +- 0.8	ppm	8	DNA
MRG-1	Ce	28 +- 3	ppm	4	ITNA
	Co	83 +- 1	ppm	4	ITNA
	Cr	472	ppm	2	ITNA
	Cs	720	ppb	1	ITNA
	Eu	1.41 +- 0.10	ppm	4	ITNA
	Hf	3.76 +- 0.18	ppm	4	ITNA
	K	1200	ppm	1	ITNA
	La	9.6 +- 0.4	ppm	4	ITNA
	Mn	1280 +- 10	ppm	3	ITNA
	Na	5230	ppm	2	ITNA
	Nd	22 +- 6	ppm	4	ITNA
	Sb	820	ppb	2	ITNA
	Sc	53.4 +- 0.5	ppm	4	ITNA
	Sm	4.35 +- 0.06	ppm	4	ITNA
	Ta	850 +- 200	ppb	4	ITNA
	Tb	570	ppb	2	ITNA
	Th	790 +- 160	ppb	4	ITNA
	V	505	ppm	1	ITNA
SO-1	Cs	5.4 +- 0.3	ppm	4	ITNA
	F	1060 +- 30	ppm	4	ISE
	U	1.68	ppm	2	DNA
SO-2	Sr	316	ppm	2	IENA
	U	1.02	ppm	2	DNA
SO-3	Cs	2.65	ppm	2	ITNA
	F	250 +- 90	ppm	15	ISE
	Sc	8.22	ppm	2	ITNA
	U	2.38	ppm	2	DNA
	U-235/238	0.0073 +- 0.0001		3	RTNA
SY-2	Be	19.5 +- 1.2	ppm	3	AA
SY-3	Be	18.6 +- 0.4	ppm	3	AA

[a]Total number of analyses included in the mean.
[b]Analytical technique codes:
AA = Flame Atomic Absorption Spectrophotometry
DNA = Delayed-Neutron Assay
IENA = Instrumental Epithermal Neutron Activation Analysis
ISE = Ion Selective Electrode
ITNA = Instrumental Thermal Neutron Activation Analysis
RTNA = Radiochemical Thermal Neutron Activation Analysis

TABLE D-V

SUMMARY OF ELEMENTAL DETERMINATIONS ON USGS REFERENCE MATERIALS

Mat.	Constituent	Mean Std Dev	Units	N[a]	Technique[b]
AGV-1	B	7.8	ppm	1	TCGS
	Mn	720	ppm	1	ITNA
	Na	3.05	%	1	ITNA
	Sm	6.0	ppm	1	ITNA
GSP-1	B	1.0	ppm	1	TCGS
	Gd	12.9	ppm	1	TCGS
GXR-1	Ba	747	ppm	1	ITNA
	Cr	10.3	ppm	1	ITNA
	Fe	27.0	%	1	ITNA
	Sc	1.83	ppm	1	ITNA
	U	33.9 +- 1.0	ppm	11	DNA
GXR-2	Sr	146 +- 6	ppm	3	IENA
	U	2.93 +- 0.08	ppm	15	DNA
GXR-3	Be	26 +- 2	ppm	3	AAC
	Cs	169 +- 5	ppm	9	ITNA
	Si	6.8 +- 0.4	%	7	COLOR
	U	2.91 +- 0.10	ppm	15	DNA
GXR-4	Be	1.75 +- 0.18	ppm	6	AAC
	Si	30.7 +- 1.9	%	8	COLOR
	U	6.13 +- 0.07	ppm	6	DNA
GXR-5	U	2.15 +- 0.06	ppm	18	DNA
GXR-6	U	1.50 +- 0.03	ppm	4	DNA
MAG-1	Al	8.76	%	1	ITNA
	Ca	1.01	%	1	ITNA
	Cs	8.0	ppm	2	ITNA
	K	2.74	%	2	ITNA
	Mg	2.06	%	1	ITNA
	Mn	720	ppm	2	ITNA
	Na	2.79	%	2	ITNA
	V	133	ppm	1	ITNA
QLO-1	U	1.93 +- 0.05	ppm	3	DNA
RGM-1	Cs	9.6	ppm	2	ITNA
SCo-1	U	3.18	ppm	2	DNA
STM-1	U	8.83 +- 0.15	ppm	3	DNA

[a]Total number of analyses included in the mean.
[b]Analytical technique codes:
AAC = Flame Atomic Absorption Preceded by Chemical Separation
COLOR = Spectrophotometry or Colorimetry
DNA = Delayed-Neutron Assay
IENA = Instrumental Epithermal Neutron Activation Analysis
ITNA = Instrumental Thermal Neutron Activation Analysis
TCGS = Thermal Neutron-Capture, Prompt Gamma-Ray Spectrophotometry

TABLE D-VI

INDIVIDUAL CONSTITUENT CONCENTRATIONS IN QUALITY ASSURANCE MATERIALS

MEASURED BY HSE-9 IN CY 1984

****

NBS 4921C Na-22 on Soil GTP-3
(HSE-9 Preparation)

Na-22: (64NBS 02) (84PER 01)

CV = 576. +/- 60. pCi/g

Result	Uncer.	Date
523.	105.	1/23
522.	105.	1/23
485.	97.	1/23

****

NBS 4350 Environmental
Radioactivity Sediment

Cs-137: (75NBS 03)

CV = 2.7 +/- 0.12 pCi/g

Result	Uncer.	Date
2.90	0.59	2/06
2.80	0.56	2/06
2.88	0.58	11/21
3.30	0.67	11/21
2.88	0.60	11/21
3.08	0.64	11/21
2.78	0.44	12/17

****

NBS 278 Obsidian Rock

Na: (81NBS 03)

CV = 3.59 +/- 0.04 %

Result	Uncer.	Date
3.47	0.18	7/28
3.50	0.18	7/28
3.49	0.18	7/28

Sr: (81NBS 03)

CV = 63.5 +/- 0.1 ppm

Result	Uncer.	Date
58.	9.	2/03

U: (81NBS 03)

CV = 4.58 +/- 0.04 ppm

Result	Uncer.	Date
4.64	0.23	1/26
4.71	0.24	9/06
4.55	0.46	9/06
4.46	0.2	10/04
4.46	0.2	10/04
4.55	0.2	10/04
4.39	0.3	11/12
4.54	0.3	11/12
4.47	0.3	11/12
4.38	0.3	11/12
4.46	0.3	11/12
4.49	0.3	11/12
4.44	0.3	11/19
4.47	0.3	11/19
4.39	0.3	11/19
4.60	0.3	12/01
4.53	0.3	12/01
4.60	0.3	12/01
4.47	0.3	12/01
4.47	0.3	12/01
4.53	0.3	12/01
4.55	0.3	12/12

****

NBS 4353 Rocky-Flats
Soil No. 1

Am-241: (81NBS 01)

CV = 0.0338 +/- 0.0025 pCi/g

Result	Uncer.	Date
0.034	0.006	2/07
0.031	0.007	2/07

Cs-137: (81NBS 01)

CV = 0.464 +/- 0.021 pCi/g

Result	Uncer.	Date
0.58	0.13	1/23
0.59	0.15	11/21
0.50	0.12	11/21

U:

CV = None Available (ppm)

Result	Uncer.	Date
3.00	0.15	10/04
2.99	0.15	10/04
3.03	0.15	10/04
3.01	0.15	10/04
3.09	0.15	10/04
3.00	0.15	10/04
3.06	0.15	10/04
3.11	0.15	10/04
3.21	0.15	10/04
2.97	0.15	10/04
3.00	0.15	10/04
2.98	0.15	10/04
3.12	0.15	10/04
3.02	0.15	10/04
2.95	0.15	10/04

****

NBS 1646 Estuarine Sediment

B: (84GLA 04)

CV = 83. ppm

Result	Uncer.	Date
78.	8.	6/29
81.	8.	6/29
78.	8.	8/10
81.	8.	8/10
87.	9.	8/10

TABLE D-VI (cont)

****

NBS 1646 Estuarine Sediment (cont)

Ca: (82NBS 01)

CV = 8300. +/- 300. ppm

Result	Uncer.	Date
8120.	800.	9/17

Cd: (82NBS 01)

CV = 360. +/- 70. ppb

Result	Uncer.	Date
260.	100.	9/17

Cu: (82NBS 01)

CV = 18. +/- 3. ppm

Result	Uncer.	Date
14.	2.	9/17
13.	2.	9/17
13.	2.	9/17

Li: (82NBS 01)

CV = 49. ppm

Result	Uncer.	Date
47.	4.	8/07
44.	4.	8/07

Mg: (82NBS 01)

CV = 1.09 +/- 0.08 %

Result	Uncer.	Date
0.73	0.1	9/17
1.2	0.1	9/17

Ni: (82NBS 01)

CV = 32. +/- 3. ppm

Result	Uncer.	Date
31.5	3.	11/08
34.0	3.	11/08
31.1	3.	11/08
34.5	3.	11/08

Pb: (82NBS 01)

CV = 28.2 +/- 1.8 ppm

Result	Uncer.	Date
30.	2.	9/17
30.	2.	9/17
28.	2.	9/17

Th: (82NBS 01)

CV = 10. ppm

Result	Uncer.	Date
10.7	1.1	5/17

U: (84GLA 04)

CV = 3. ppm

Result	Uncer.	Date
2.96	0.05	10/04
2.97	0.15	10/04
2.97	0.15	10/04
3.12	0.25	11/12
2.93	0.22	11/12
2.84	0.22	11/12
3.03	0.20	11/12
2.74	0.22	11/12
2.93	0.24	11/12
3.03	0.20	12/01
2.98	0.20	12/01
2.98	0.20	12/01
3.03	0.20	12/01
2.96	0.20	12/01
2.96	0.20	12/01

Zn: (82NBS 01)

CV = 138. +/- 6. ppm

Result	Uncer.	Date
139.	20.	9/17

****

NBS 688 Basalt Rock

Ce: (81NBS 04)

CV = 13.3 ppm

Result	Uncer.	Date
14.4	1.	9/06
13.6	1.	9/06
13.2	1.	9/06
13.7	1.	9/06

Dy: (84GLA 12)

CV = 3.4 +/- 0.2 ppm

Result	Uncer.	Date
3.6	0.4	1/17
3.2	0.3	1/17
3.15	0.3	1/17
3.66	0.4	3/02
3.84	0.4	3/02
2.4	0.3	3/02
3.34	0.4	3/02
3.46	0.4	3/02
3.24	0.4	3/02
4.06	0.4	3/02
3.24	0.33	8/29
2.73	0.28	8/29
3.10	0.32	8/29
2.92	0.3	8/29
3.20	0.33	8/29
2.92	0.3	8/29

TABLE D-VI (cont)

****

NBS 688 Basalt Rock
(cont)

Er:

CV = None Available (ppm)

Result	Uncer.	Date
2.86	0.2	3/06
2.24	0.2	3/06
1.97	0.2	3/06
2.14	0.2	3/06
1.86	0.2	3/06
2.16	0.2	3/06

Eu: (81NBS 04)

CV = 1.07 ppm

Result	Uncer.	Date
1.01	0.08	1/17
0.98	0.08	1/17
1.06	0.09	1/17
0.94	0.08	1/17
1.01	0.09	9/05
1.06	0.09	9/05
1.03	0.09	9/05
0.98	0.08	9/05

Ho:

CV = None Available (ppb)

Result	Uncer.	Date
730.	80.	3/20
830.	80.	3/20
890.	80.	3/20
860.	80.	3/20
740.	80.	3/20
810.	80.	3/20

La: (84GLA 12)

CV = 5.2 +/- 0.5 ppm

Result	Uncer.	Date
5.14	0.52	8/31
5.46	0.39	8/31
4.86	0.34	8/31
5.26	0.53	8/31
5.15	0.37	8/31
5.62	0.40	8/31
5.62	0.41	8/31
4.89	0.49	8/31
5.62	0.40	8/31
5.60	0.42	8/31
5.48	0.55	8/31

Mg: (81NBS 04)

CV = 5.07 %

Result	Uncer.	Date
5.2	0.5	9/17

Na: (81NBS 04)

CV = 1.6 +/- 0.02 %

Result	Uncer.	Date
1.49	0.08	7/28
1.45	0.08	7/28
1.48	0.08	7/28
1.49	0.08	7/28

P: (81NBS 04)

CV = 584. +/- 13. ppm

Result	Uncer.	Date
952.	50.	9/24
927.	50.	9/24

Si: (81NBS 04)

CV = 22.6 +/- 0.05 %

Result	Uncer.	Date
23.1	1.	9/05
22.	1.	9/05

Sm: (84GLA 04)

CV = 2.3 +/- 0.2 ppm

Result	Uncer.	Date
2.37	0.19	9/04
2.55	0.20	9/04
2.65	0.21	9/04
2.34	0.19	9/04
2.38	0.19	9/04

Th: (81NBS 04)

CV = 330. +/- 20. ppb

Result	Uncer.	Date
316.	55.	5/17

Tm:

CV = None Available (ppb)

Result	Uncer.	Date
277.	60.	3/20
244.	60.	3/20
165.	60.	3/20
348.	60.	3/20
250.	60.	3/20
209.	60.	3/20

Zn: (81NBS 04)

CV = 58. ppm

Result	Uncer.	Date
94.	20.	9/17

TABLE D-VI (cont)

****

NBS 1645 River Sediment

U: (82NBS 11)

CV = 1.11 +/- 0.05 ppm

Result	Uncer.	Date
1.09	0.06	10/04
1.11	0.06	10/04
1.11	0.06	10/04
1.08	0.1	11/12
1.18	0.1	11/12
1.09	0.1	11/12
1.06	0.1	11/12
1.10	0.1	11/12
1.08	0.1	11/12
1.11	0.1	11/19
1.12	0.1	11/19
1.15	0.1	11/19
1.09	0.1	12/01
1.11	0.1	12/01
1.11	0.1	12/01
1.17	0.1	12/01
1.09	0.1	12/01
1.17	0.1	12/01

****

NBS 1633A Trace Elements in Coal Fly Ash

Ag:

CV = None Available (ppb)

Result	Uncer.	Date
<300.	300.	11/05

Ca: (79NBS 02)

CV = 1.11 +/- 0.01 %

Result	Uncer.	Date
1.29	0.12	7/28

Cs: (84GLA 04)

CV = 10. +/- 0.4 ppm

Result	Uncer.	Date
10.67	1.19	4/06
9.97	1.21	4/06
10.03	1.19	4/06
10.24	1.08	4/27
11.21	1.19	4/27
12.7	1.8	7/24
12.1	1.5	7/24
9.85	1.65	7/24
11.5	2.5	7/24
13.4	2.9	7/24
10.8	1.6	7/24
10.4	1.1	7/24

Fe: (79NBS 02)

CV = 9.4 +/- 0.1 %

Result	Uncer.	Date
9.60	0.58	4/19
9.59	0.58	4/19
9.52	0.58	4/19
9.76	0.59	4/19

Mg: (79NBS 02)

CV = 4550. +/- 100. ppm

Result	Uncer.	Date
5700.	1400.	7/28

Mn: (84GLA 04)

CV = 210. +/- 35. ppm

Result	Uncer.	Date
184.	13.	7/28
181.	14.	7/28

Na: (79NBS 02)

CV = 1700. +/- 100. ppm

Result	Uncer.	Date
1695.	91.	3/29
1715.	97.	3/29
1737.	99.	3/29
1701.	91.	3/29
1840.	100.	7/28
1825.	150.	7/28
1900.	200.	8/29

U: (79NBS 02)

CV = 10.2 +/- 0.1 ppm

Result	Uncer.	Date
10.95	1.1	1/09
10.88	1.09	1/09
10.46	0.52	1/26
10.21	0.51	2/09
10.35	0.52	2/09
10.08	0.61	2/23
10.18	0.51	3/01
10.3	0.52	3/01
10.08	0.5	3/01
10.04	0.5	3/01
10.27	0.61	6/26
10.2	0.61	6/26
10.48	0.63	6/26
10.31	0.62	6/26
10.01	0.5	10/04
10.02	0.5	10/04
10.2	0.5	10/04
10.29	0.5	12/01
10.27	0.5	12/01
10.28	0.5	12/01
10.27	0.5	12/01
10.29	0.5	12/01
10.28	0.5	12/01
10.6	0.5	12/12
10.4	0.5	12/12
10.2	0.5	12/12

TABLE D-VI (cont)

****

NBS 610 Trace Elements in Glass

U-235/238: (72NBS 01)

CV = 0.0024 +/- 0.0001 Ratio

Result	Uncer.	Date
0.0025	0.0001	3/12
0.0022	0.0001	8/31
0.0026	0.0001	8/31

****

NBS 4350B River Sediment

Cs-137: (81NBS 02)

CV = 0.783 +/- 0.049 pCi/g

Result	Uncer.	Date
0.97	0.20	1/23
0.86	0.18	1/23
0.80	0.19	11/21
0.69	0.16	11/21
0.72	0.04	11/21
0.74	0.07	11/21

U:

CV = None Available (ppm)

Result	Uncer.	Date
2.44	0.1	10/04
2.45	0.1	10/04
2.32	0.1	10/04
2.48	0.1	10/04
2.39	0.1	10/04
2.44	0.1	10/04
2.51	0.1	10/04
2.41	0.1	10/04
2.46	0.1	10/04
2.44	0.1	10/04
2.39	0.1	10/04
2.41	0.1	10/04
2.41	0.1	10/04
2.40	0.1	10/04
2.49	0.1	10/04

****

NBS 4355 Peruvian Soil

U: (82NBS 10)

CV = 3.04 +/- 0.51 ppm

Result	Uncer.	Date
2.71	0.13	10/04
2.64	0.13	10/04
2.86	0.13	10/04
2.71	0.13	10/04
2.83	0.13	10/04

****

NBS 1643A Trace Elements in Water

Ag: (80NBS 01)

CV = 2.8 +/- 0.3 ppb

Result	Uncer.	Date
2.40	0.50	1/11
2.44	0.24	6/18
2.49	0.25	6/18
3.18	0.30	6/18
3.01	0.30	6/18
3.16	0.32	6/19
3.29	0.33	6/19

As: (80NBS 01)

CV = 76. +/- 7. ppb

Result	Uncer.	Date
84.6	8.5	1/11
85.	8.	7/05
73.	8.	7/05
80.	8.	7/09
80.	8.	7/09
85.	8.	7/09
75.3	8.	10/02
71.8	7.2	11/19
71.8	7.2	11/19

Ba: (80NBS 01)

CV = 46. +/- 2. ppb

Result	Uncer.	Date
52.	10.	1/16
47.	5.	9/24
47.	5.	9/24

Ca: (84GLA 12)

CV = 28. +/- 2. ppm

Result	Uncer.	Date
26.7	2.7	6/19
28.2	2.8	6/19
30.	3.	6/19
28.6	2.9	6/19
28.	2.8	6/19
25.	2.5	6/19
25.2	2.5	6/19
28.4	2.8	6/19
27.6	2.8	6/19
27.3	2.7	6/19
29.2	2.9	12/19
27.1	2.7	12/19
26.6	2.7	12/19
27.	2.7	12/19

Cd: (80NBS 01)

CV = 10. +/- 1. ppb

Result	Uncer.	Date
8.3	0.8	1/05
9.53	1.91	5/03
9.8	1.0	6/28
11.0	1.1	6/28
9.83	0.98	11/19
9.83	0.98	11/19

TABLE D-VI (cont)

****

NBS 1643A Trace Elements in Water (cont)

Cr: (80NBS 01)

CV = 17. +/- 2. ppb

Result	Uncer.	Date
18.3	1.7	7/19
16.7	1.7	7/19
17.4	2.0	7/19
16.3	1.6	9/17
18.4	1.8	11/19
18.4	1.8	11/19

Cu: (80NBS 01)

CV = 18. +/- 2. ppb

Result	Uncer.	Date
15.	2.	1/05
19.	2.	1/05
20.	2.	3/27
17.	2.	6/27
14.	2.	9/17

K: (84GLA 12)

CV = 1.6 +/- 0.2 ppm

Result	Uncer.	Date
1.7	0.2	6/19
1.93	0.19	12/19

Mg: (84GLA 12)

CV = 7.8 +/- 0.4 ppm

Result	Uncer.	Date
7.64	0.76	6/19
7.92	0.79	6/19
7.71	0.77	6/19
7.28	0.73	6/19
7.59	0.76	6/19
8.04	0.80	7/26
7.79	0.78	7/26
7.83	0.78	7/26
7.76	0.78	7/26
7.39	0.74	12/19

Mn: (80NBS 01)

CV = 31. +/- 2. ppb

Result	Uncer.	Date
31.7	3.2	1/05
35.3	7.0	12/31

Na: (84GLA 12)

CV = 9.2 +/- 0.4 ppm

Result	Uncer.	Date
9.0	0.9	6/19
7.99	0.8	6/19
8.71	0.87	6/19
8.88	0.89	6/19
9.14	0.9	7/26
9.1	0.9	7/26
9.1	0.9	7/26
9.17	0.46	12/31

Ni: (80NBS 01)

CV = 55. +/- 3. ppb

Result	Uncer.	Date
52.	5.2	9/24

Pb: (80NBS 01)

CV = 27. +/- 1. ppb

Result	Uncer.	Date
24.	2.	1/05
27.	3.	1/05
26.6	5.3	5/03
27.9	5.5	5/03
25.4	5.0	5/03
26.2	5.2	5/03
24.9	5.0	6/27
33.4	6.6	6/27
26.8	2.7	9/24
29.1	2.9	9/24
26.2	2.6	11/19
26.2	2.6	11/19

Se: (80NBS 01)

CV = 11. +/- 1. ppb

Result	Uncer.	Date
13.	2.	1/16
11.1	1.1	9/05
11.8	1.2	9/05
12.8	1.3	9/05
11.1	1.1	9/05
12.1	1.2	9/05

Zn: (80NBS 01)

CV = 72. +/- 4. ppb

Result	Uncer.	Date
63.	6.	3/20

****

NBS 4926C Tritium in Water (HSE-9 Dilution)

H-3: (79NBS 01) (84PER 01)

CV = 1500. +/- 300. pCi/l

Result	Uncer.	Date
1300.	200.	1/13
1100.	200.	1/16
1400.	200.	1/16
580.	90.	2/02
1600.	300.	2/13
900.	300.	2/13
1700.	300.	2/13
1500.	300.	2/17
1700.	400.	2/17
1500.	300.	2/17
1400.	300.	3/12
1300.	300.	3/12
1600.	300.	3/21
1300.	300.	4/06

TABLE D-VI (cont)

****

NBS 4926C Tritium in Water
(HSE-9 Dilution)
(cont)

H-3: (79NBS 01) (84PER 01)

CV = 2900. +/- 500. pCi/l

Result	Uncer.	Date
3500.	400.	4/12
3100.	400.	4/19
2700.	400.	5/09
3200.	400.	5/22
2900.	400.	5/31
2400.	300.	6/15
2700.	400.	6/22
2700.	400.	6/22
2800.	400.	6/27
2700.	400.	7/31
3600.	400.	8/03

CV = 3000. +/- 300. pCi/l

Result	Uncer.	Date
3000.	400.	1/13
2700.	300.	1/16
2300.	300.	1/16
1900.	200.	2/02
2900.	400.	2/13
2700.	400.	2/13
2900.	400.	2/13
2800.	400.	2/17
2200.	400.	2/17
3300.	400.	2/17
2500.	400.	3/12
2600.	400.	3/12
2800.	400.	3/21
2600.	400.	4/06

CV = 4400. +/- 400. pCi/l

Result	Uncer.	Date
4100.	500.	1/13
4000.	400.	1/16
3800.	400.	1/16
3000.	300.	2/02
4000.	500.	2/13
4200.	500.	2/13
4100.	500.	2/13
3900.	500.	2/17
4200.	600.	2/17

H-3: (cont)

4200.	500.	2/17
4400.	500.	3/12
4100.	500.	3/12
4000.	500.	3/21
3800.	500.	4/06
4000.	500.	4/12
4500.	500.	4/19
3900.	500.	5/09
4100.	500.	5/22
3900.	500.	5/31
4200.	500.	6/15
3900.	500.	6/22
4000.	500.	6/22
4100.	500.	6/27
4100.	500.	7/31
4500.	500.	8/03

CV = 5900. +/- 600. pCi/l

Result	Uncer.	Date
5300.	600.	4/12
5600.	600.	4/19
4600.	500.	5/09
5300.	600.	5/22
5000.	600.	5/31
5500.	600.	6/15
5600.	600.	6/22
4600.	500.	6/22
5300.	600.	6/27
5000.	600.	7/31
6100.	700.	8/03

CV = 7200. +/- 800. pCi/l

Result	Uncer.	Date
8100.	900.	8/20
6500.	800.	8/20
7100.	800.	8/20
7600.	900.	8/20
6000.	900.	8/20
8300.	900.	8/20
6200.	600.	8/20
8100.	900.	8/20
7300.	800.	8/20
7800.	900.	8/20
6600.	800.	8/20
8100.	900.	8/20
7500.	900.	8/27
6900.	800.	8/27
6200.	800.	8/27
6800.	800.	9/18
7300.	800.	9/18
7300.	800.	9/18

H-3: (cont)

7000.	800.	9/25
7400.	800.	9/25
6600.	800.	9/25
6500.	800.	9/26
6600.	800.	9/26
7100.	800.	9/26
7600.	900.	10/02
7100.	800.	10/02
7600.	900.	10/02
7700.	900.	11/08
7500.	900.	11/08
6900.	800.	11/08
7100.	800.	11/08
7200.	800.	11/08
7000.	800.	11/08
7700.	900.	11/13
7300.	800.	11/13
7100.	800.	11/13
7900.	900.	11/19
7800.	900.	11/19
7400.	800.	11/19
6700.	800.	12/07
7500.	900.	12/07
7200.	800.	12/07
7100.	800.	12/11
7200.	800.	12/11
7400.	800.	12/11
7100.	800.	12/18
7700.	900.	12/18
7300.	800.	12/18
7400.	800.	12/21
7400.	800.	12/21
7800.	900.	12/21
6700.	800.	12/21
7000.	800.	12/21
7000.	800.	12/21

CV = 7300. +/- 700. pCi/l

Result	Uncer.	Date
6800.	700.	4/12
6100.	700.	4/19
6400.	700.	5/09
6300.	700.	5/22
6400.	700.	5/31
6600.	700.	6/15
6000.	700.	6/22
6200.	700.	6/22
6100.	700.	6/27
6300.	700.	7/31
6600.	700.	8/03

TABLE D-VI (cont)

****

NBS 4926C Tritium in Water
(HSE-9 Dilution)
(cont)

H-3: (79NBS 01) (84PER 01)

CV = 7400. +/- 700. pCi/l

Result	Uncer.	Date
6400.	700.	1/13
6700.	700.	1/16
6600.	700.	1/16
6300.	700.	2/02
7200.	800.	2/13
6600.	700.	2/13
6600.	700.	2/13
6700.	700.	2/17
7000.	800.	2/17
7200.	800.	2/17
6600.	700.	3/12
6400.	700.	3/12
6400.	700.	3/21
6700.	700.	4/06

****

NBS 1643b Trace Elements
in Water

As: (84NBS 05)

CV = 49. ppb

Result	Uncer.	Date
59.9	6.0	10/02
51.5	5.2	11/19
51.5	5.2	11/19

Ba: (84NBS 05)

CV = 44. +/- 2. ppb

Result	Uncer.	Date
43.	4.	9/24

Ca:

CV = None Available (ppm)

Result	Uncer.	Date
33.8	3.	9/26
29.	3.	9/26
31.5	3.	9/26
35.	3.5	12/19

Cd: (84NBS 05)

CV = 20. +/- 1. ppb

Result	Uncer.	Date
20.	2.	11/19
20.	2.	11/19

Cr: (84NBS 05)

CV = 18.6 +/- 0.4 ppb

Result	Uncer.	Date
17.5	1.8	9/17
17.	2.	11/08
20.	2.	11/08
20.8	2.1	11/19
20.8	2.1	11/19

Cu: (84NBS 05)

CV = 21.9 +/- 0.4 ppb

Result	Uncer.	Date
20.	2.	9/17
21.	2.	9/26
24.	4.	9/26
34.	4.	9/26
19.	2.	10/03
22.	2.	10/03
39.	4.	10/03
16.	2.	12/21

Mn: (84NBS 05)

CV = 28. +/- 2. ppb

Result	Uncer.	Date
26.	3.	10/11
27.	3.	10/11
23.	3.	10/11

Ni: (84NBS 05)

CV = 49. +/- 3. ppb

Result	Uncer.	Date
69.	8.	8/10

Pb: (84NBS 05)

CV = 23.7 +/- 0.7 ppb

Result	Uncer.	Date
32.	3.	9/14
27.	3.	9/21
27.	3.	9/21
27.	3.	9/25
28.	3.	9/25
32.	3.	10/06
30.	3.	10/06
30.	3.	10/06
25.	2.	11/19
25.	2.	11/19
23.	2.	11/30
23.	2.	11/30
23.	2.	11/30

Se: (84NBS 05)

CV = 9.7 +/- 0.5 ppb

Result	Uncer.	Date
9.2	0.9	9/05
9.3	0.9	9/05
10.5	1.1	9/05
11.7	1.2	9/05
8.	1.	9/28
8.	1.	9/28
8.	1.	9/28

TABLE D-VI (cont)

****

NBS 1643b Trace Elements in Water (cont)

Zn: (84NBS 05)
CV = 66. +/- 2. ppb

Result	Uncer.	Date
65.	6.	9/17
61.	6.	9/19
64.	6.	9/19
69.	7.	9/26
70.	7.	9/26
68.	7.	10/03
68.	7.	10/03
65.	6.	12/13
69.	7.	12/13

****

NBS 1642A Mercury in Water

Hg: (77NBS 02)
CV = 1.10 +/- 0.06 ug/l

Result	Uncer.	Date
1.1	0.1	1/11
1.2	0.1	1/11
1.2	0.1	3/06
1.1	0.1	3/06
1.1	0.1	3/06

****

NBS 1642b Mercury in Water

Hg: (82NBS 08)
CV = 1.49 +/- 0.06 ug/l

Result	Uncer.	Date
1.50	0.1	7/02
1.57	0.1	7/02
1.43	0.1	7/02
1.53	0.1	7/02
1.39	0.1	7/02
1.48	0.1	7/02
1.48	0.1	7/02

****

NBS 4921C Na-22 in Water (HSE-9 Dilution)

Na-22: (64NBS 02) (84PER 01)

CV = 289. +/- 15. nCi/l

Result	Uncer.	Date
275.	55.	1/23
322.	65.	1/23

****

NBS 1566 Oyster Tissue

As: (83NBS 02)

CV = 13.4 +/- 1.9 ppm

Result	Uncer.	Date
11.9	1.2	1/13
11.9	1.2	1/13
10.1	1.0	1/13

Sr: (83NBS 02)

CV = 10.36 +/- 0.56 ppm

Result	Uncer.	Date
11.5	1.4	6/19
11.1	1.5	6/19
10.4	1.4	6/19
10.2	1.4	6/19

U: (83NBS 02)

CV = 116. +/- 6. ppb

Result	Uncer.	Date
119.	12.	4/06
102.	15.	4/06
128.	13.	9/20
109.	11.	9/20
117.	10.	11/06
127.	10.	11/06
115.	10.	11/06

U: (cont)

119.	11.	11/09
104.	10.	11/09
123.	12.	11/12
113.	11.	11/14
121.	12.	11/14
120.	12.	11/14

****

NBS 1570 Spinach

As: (84GLA 04)

CV = 163. +/- 12. ppb

Result	Uncer.	Date
118.	13.	1/13
177.	19.	1/13
141.	16.	1/13
159.	16.	1/13

Cs: (84GLA 12)

CV = 58. +/- 9. ppb

Result	Uncer.	Date
61.2	10.4	4/09
68.1	6.3	4/09
88.7	22.4	4/09
64.3	5.7	4/09
60.8	6.6	7/10
68.4	8.4	7/10
68.6	8.3	7/10
58.9	7.4	7/10
67.1	7.6	7/10
69.3	8.2	7/10
71.0	8.3	7/10

Sr: (76NBS 01)

CV = 87. +/- 2. ppm

Result	Uncer.	Date
83.5	9.2	5/08
83.2	9.2	5/08
83.4	9.	5/08
84.3	4.	6/06
84.	4.	6/06
82.9	4.	6/06

TABLE D-VI (cont)

****

NBS 1570 Spinach (cont)

U: (76NBS 01)

CV = 46. +/- 9. ppb

Result	Uncer.	Date
49.	7.	11/06
43.	6.	11/06
49.	7.	11/06
50.	6.	12/01
48.	6.	12/01
48.	6.	12/01
50.	6.	12/01
48.	6.	12/01
48.	6.	12/01

****

NBS 1571 Orchard Leaves

As: (77NBS 01)

CV = 10. +/- 2. ppm

Result	Uncer.	Date
11.4	1.1	1/13
9.3	0.9	1/13
8.9	0.9	1/13

Cs: (84GLA 04)

CV = 35. +/- 8. ppb

Result	Uncer.	Date
42.6	9.5	4/09
42.5	3.5	4/09
46.1	3.5	4/09

Li: (84GLA 04)

CV = 710. +/- 120. ppb

Result	Uncer.	Date
760.	200.	8/07
910.	200.	8/07

Sc: (84GLA 04)

CV = 61. +/- 14. ppb

Result	Uncer.	Date
66.	7.	3/01

Sr: (77NBS 01)

CV = 37. +/- 1. ppm

Result	Uncer.	Date
37.7	4.1	5/08
37.8	4.1	5/08
37.9	4.2	5/08

U: (77NBS 01)

CV = 29. +/- 5. ppb

Result	Uncer.	Date
34.	5.	12/01
34.	5.	12/01
33.	3.	12/19

****

NBS 1573 Tomato Leaves

As: (76NBS 02)

CV = 270. +/- 50. ppb

Result	Uncer.	Date
249.	25.	1/13
264.	27.	1/13
237.	24.	1/13
264.	27.	1/13
216.	43.	7/18
233.	47.	7/18
211.	43.	7/18
262.	53.	7/18
193.	39.	7/18
206.	42.	7/18
258.	52.	7/18
248.	50.	7/18

As: (cont)

225.	46.	7/18
195.	40.	7/18
227.	46.	7/18
256.	52.	7/18
265.	53.	7/18
238.	48.	7/18
252.	51.	7/18

Be: (84GLA 12)

CV = 26. +/- 10. ppb

Result	Uncer.	Date
35.	7.	11/20
35.	7.	11/20
36.	7.	11/20
44.	7.	11/20

Br: (84GLA 04)

CV = 21. +/- 2. ppm

Result	Uncer.	Date
22.5	2.63	9/28

Cr: (76NBS 02)

CV = 4.5 +/- 0.5 ppm

Result	Uncer.	Date
4.4	0.8	11/05
5.6	0.8	11/05
4.1	0.8	11/05
4.2	0.8	11/05

Cs: (84GLA 04)

CV = 51. +/- 7. ppb

Result	Uncer.	Date
69.	4.	4/09
82.	8.	4/09
67.	4.	4/09
79.	12.	4/09
90.	9.	4/09

TABLE D-VI (cont)

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NBS 1573 Tomato Leaves
CS (cont)

68.	4.	4/09
71.	8.	7/10
67.	8.	7/10
62.	7.	7/10
64.	7.	7/10
72.	8.	7/10
65.	7.	7/10
67.	8.	7/10
66.	7.	7/10
62.	9.	12/02

F: (84GLA 04)
CV = 5.6 +/- 0.5 ppm

Result	Uncer.	Date
4.1	1.0	6/26
5.9	0.5	6/26
4.4	0.5	6/26
3.4	0.5	6/26
5.4	0.5	6/26
5.6	1.0	6/26
6.8	1.0	6/26
6.6	0.6	6/26
6.8	1.0	6/26
6.5	1.0	6/26
3.1	0.5	6/26
5.7	1.0	6/26

Pb: (76NBS 02)
CV = 6.3 +/- 0.3 ppm

Result	Uncer.	Date
5.6	0.5	2/22
10.8	1.0	2/22
4.5	0.5	2/22
9.7	1.0	2/22

Sc: (84GLA 04)
CV = 180. +/- 30. ppb

Result	Uncer.	Date
176.	18.	3/01
174.	20.	12/31
174.	20.	12/31

Sr: (76NBS 02)

CV = 44.9 +/- 0.3 ppm

Result	Uncer.	Date
36.8	4.2	5/08
37.0	4.2	5/08
34.8	3.9	5/08
44.0	3.0	6/06
43.5	3.0	6/06
43.7	3.0	6/06
33.7	3.7	6/19
35.7	4.0	6/19

U: (76NBS 02)

CV = 61. +/- 3. ppb

Result	Uncer.	Date
43.	13.	4/06
59.	6.	9/20
68.	7.	9/20
64.	6.	11/06
64.	6.	11/06
64.	6.	11/06
63.	8.	11/09
60.	8.	11/09
62.	7.	11/12
72.	9.	11/12
53.	7.	11/14
62.	7.	11/14
55.	7.	11/14
65.	7.	12/01
65.	7.	12/01
70.	8.	12/01
65.	7.	12/01
65.	7.	12/01
70.	8.	12/01
67.	7.	12/19
70.	7.	12/19
64.	7.	12/19

****

NBS 1575 Pine Needles

Al: (76NBS 03)

CV = 545. +/- 30. ppm

Result	Uncer.	Date
569.	60.	12/04
647.	67.	12/04
551.	58.	12/04

As: (76NBS 03)

CV = 210. +/- 40. ppb

Result	Uncer.	Date
227.	38.	11/27
227.	38.	11/27
208.	36.	11/27
179.	32.	11/27
179.	32.	11/27
208.	36.	11/27

Ba: (84GLA 04)

CV = 6.2 +/- 1.7 ppm

Result	Uncer.	Date
6.3	3.0	12/19
11.1	2.5	12/19
7.8	1.5	12/19

Br: (84GLA 04)

CV = 6.6 +/- 0.8 ppm

Result	Uncer.	Date
6.8	0.8	11/27
7.1	0.8	11/27
7.	0.8	11/27
6.8	0.8	11/27
6.8	0.8	11/27
6.5	0.8	11/27

TABLE D-VI (cont)

****

NBS 1575 Pine Needles (cont)

Ca: (76NBS 03)

CV = 4100. +/- 200. ppm

Result	Uncer.	Date
4120.	694.	12/10
3930.	669.	12/10
4150.	701.	12/10

Ce:

CV = None Available (ppb)

Result	Uncer.	Date
218.	33.	12/19
183.	64.	12/19
230.	64.	12/19
159.	55.	12/19
262.	38.	12/19
290.	68.	12/19

Cl: (84GLA 04)

CV = 400. +/- 160. ppm

Result	Uncer.	Date
320.	44.	12/07
285.	40.	12/07
297.	43.	12/07

Co: (84GLA 04)

CV = 121. +/- 13. ppb

Result	Uncer.	Date
132.	40.	12/11
156.	61.	12/11
125.	20.	12/11

Cr: (76NBS 03)

CV = 2.6 +/- 0.2 ppm

Result	Uncer.	Date
2.46	0.27	12/11
3.04	0.36	12/11
2.47	0.25	12/11
2.72	0.30	12/11
2.70	0.33	12/11
2.92	0.30	12/11

Cs: (84GLA 04)

CV = 120. +/- 27. ppb

Result	Uncer.	Date
127.	7.	4/09
129.	10.	4/09
136.	8.	4/09
126.	7.	4/09
103.	18.	12/14
158.	24.	12/14
115.	15.	12/14
97.	18.	12/14
127.	16.	12/14
143.	26.	12/14

Eu:

CV = None Available (ppb)

Result	Uncer.	Date
12.5	2.8	12/14
9.8	4.5	12/14
10.1	3.7	12/14
12.7	5.8	12/14

Fe: (76NBS 03)

CV = 200. +/- 10. ppm

Result	Uncer.	Date
197.	25.	12/11
210.	24.	12/11
205.	24.	12/11
197.	22.	12/11
222.	23.	12/11
196.	20.	12/11

Hf:

CV = None Available (ppb)

Result	Uncer.	Date
27.	9.	12/13
17.	14.	12/13
38.	9.	12/13
33.	7.	12/13
61.	8.	12/13

La: (84GLA 04)

CV = 160. +/- 40. ppb

Result	Uncer.	Date
175.	26.8	11/18
194.	28.4	11/18
200.	28.3	11/18

Li:

CV = None Available (ppm)

Result	Uncer.	Date
0.33	0.08	8/07
0.38	0.08	8/07
0.30	0.08	8/07

Lu:

CV = None Available (ppb)

Result	Uncer.	Date
2.1	0.9	12/22
3.0	1.4	12/22
1.9	1.3	12/22
1.7	0.4	12/22
2.1	0.5	12/22
2.0	0.9	12/22

Mn: (76NBS 03)

CV = 675. +/- 15. ppm

Result	Uncer.	Date
691.	104.	12/07
707.	107.	12/07
674.	102.	12/07

TABLE D-VI (cont)

****

NBS 1575 Pine Needles (cont)

Na: (84GLA 12)

CV = 41. +/- 23. ppm

Result	Uncer.	Date
34.7	3.6	11/18
41.4	4.3	11/18
34.6	3.6	11/18
41.2	4.2	11/18
36.3	3.8	11/18
33.2	3.4	11/18

Rb: (76NBS 03)

CV = 11.7 +/- 0.1 ppm

Result	Uncer.	Date
11.3	1.8	12/14
10.6	1.6	12/14
11.5	1.9	12/14
10.4	1.5	12/14
10.3	1.7	12/14
10.4	1.6	12/14

Sb: (84GLA 04)

CV = 195. +/- 16. ppb

Result	Uncer.	Date
193.	37.	12/14
166.	27.	12/14
191.	31.	12/14
189.	41.	12/14
216.	39.	12/14
177.	33.	12/14

Sc: (84GLA 04)

CV = 41. +/- 13. ppb

Result	Uncer.	Date
51.	5.	3/01
40.	4.	12/10
53.1	5.6	12/10
40.2	4.4	12/10
42.9	4.6	12/11
48.4	5.	12/11
38.7	4.5	12/11

Sm:

CV = None Available (ppb)

Result	Uncer.	Date
23.3	2.7	11/26
19.3	2.3	11/26
21.3	2.5	11/26
23.4	2.9	11/27
20.5	2.5	11/27
20.	2.6	11/27

Sr: (76NBS 03)

CV = 4.8 +/- 0.2 ppm

Result	Uncer.	Date
5.4	2.5	6/19

Ta:

CV = None Available (ppb)

Result	Uncer.	Date
12.4	8.6	12/22
16.2	8.8	12/22
6.1	3.5	12/22
15.6	6.5	12/22
16.6	9.4	12/22
8.7	2.8	12/22

Th: (76NBS 03)

CV = 37. +/- 3. ppb

Result	Uncer.	Date
35.6	4.0	12/12
41.5	7.4	12/12
53.8	8.1	12/12
40.0	6.0	12/13
64.2	13.1	12/13
62.8	11.6	12/13

U: (76NBS 03)

CV = 20. +/- 4. ppb

Result	Uncer.	Date
19.	4.	11/06
19.	4.	11/06
20.	4.	11/06
21.	4.	11/14
19.	4.	11/14
14.	4.	11/14
16.	4.	12/01
24.	4.	12/01
24.	4.	12/01
24.	4.	12/01
16.	4.	12/01
24.	4.	12/01

V: (84GLA 04)

CV = 400. +/- 50. ppb

Result	Uncer.	Date
429.	198.	12/07
480.	225.	12/07

Yb:

CV = None Available (ppb)

Result	Uncer.	Date
21.	14.	12/22
37.	17.	12/22
33.	9.	12/22
24.	7.	12/22
23.	19.	12/22
16.	14.	12/22

TABLE D-VI (cont)

****

NBS 1577 Bovine Liver

As: (77NBS 03)

CV = 55. +/- 5. ppb

Result	Uncer.	Date
63.	11.	9/29
68.	11.	9/29
65.	11.	9/29
54.	11.	9/29
61.	11.	9/29

Br: (84GLA 04)

CV = 9.1 +/- 1.2 ppm

Result	Uncer.	Date
9.6	0.9	5/07
8.3	0.8	5/15

I: (84GLA 04)

CV = 235. +/- 32. ppb

Result	Uncer.	Date
237.	32.	5/15

****

NBS 1632 Trace Elements in Coal

Br: (84GLA 04)

CV = 17.7 +/- 1.8 ppm

Result	Uncer.	Date
15.7	1.9	11/27
15.3	1.8	11/27
16.2	1.9	11/27
15.7	1.9	11/27
15.5	1.8	11/27
14.9	1.8	11/27

U: (74NBS 01)

CV = 1.4 +/- 0.1 ppm

Result	Uncer.	Date
1.19	0.12	9/20

****

NBS 1572 Citrus Leaves

As: (82NBS 03)

CV = 3.1 +/- 0.3 ppm

Result	Uncer.	Date
2.62	0.52	7/18
2.58	0.51	7/18
2.51	0.50	7/18
2.44	0.49	7/18
2.54	0.51	7/18
3.21	0.64	7/18
2.64	0.53	7/18
3.21	0.64	11/06
2.54	0.51	11/06
2.64	0.53	11/06
2.51	0.50	11/06
2.44	0.49	11/06
2.58	0.51	11/06
2.62	0.52	11/06
2.93	0.30	12/21
3.17	0.30	12/21
3.08	0.30	12/21
2.76	0.30	12/21

Be:

CV = None Available (ppb)

Result	Uncer.	Date
5.7	2.	11/20
8.8	2.	11/20
8.2	2.	11/20

Cr: (82NBS 03)

CV = 0.8 +/- 0.2 ppm

Result	Uncer.	Date
1.	0.5	11/05

Cs: (82NBS 03)

CV = 98. ppb

Result	Uncer.	Date
109.	9.	4/09
130.	17.	4/09
143.	19.	4/09
86.	9.	12/02
87.	12.	12/02

Li:

CV = None Available (ppm)

Result	Uncer.	Date
0.28	0.10	8/07
0.40	0.10	8/07
0.38	0.10	8/07
0.34	0.10	8/07
0.17	0.05	11/19
0.13	0.05	11/19
0.15	0.05	11/19
0.13	0.05	11/19
0.17	0.05	11/19
0.13	0.05	11/19
0.15	0.05	11/19
0.17	0.05	11/19
0.15	0.05	11/19

Pb: (82NBS 03)

CV = 13.3 +/- 2.4 ppm

Result	Uncer.	Date
14.6	1.0	2/22
13.8	1.0	2/22
12.5	1.0	2/22

TABLE D-VI (cont)

****

NBS 1572 Citrus Leaves (cont)

Sc: (82NBS 03)

CV = 10. ppb

Result	Uncer.	Date
11.4	1.2	3/01

Sr: (82NBS 03)

CV = 100. +/- 2. ppm

Result	Uncer.	Date
93.4	9.5	5/08
103.	10.	5/08
98.	5.	6/06
95.8	5.	6/06
97.3	5.	6/06
89.4	9.1	6/19
90.8	9.2	6/19
93.1	9.4	6/19
88.2	9.0	6/19

U: (82NBS 03)

CV = < 150. ppb

Result	Uncer.	Date
35.	5.	11/06
41.	6.	11/06
36.	5.	11/06
45.	6.	12/01
34.	5.	12/01
34.	5.	12/01
31.	5.	12/01
31.	5.	12/01
45.	6.	12/01
39.	4.	12/19
37.	4.	12/19
36.	4.	12/19

****

NBS 1577A Bovine Liver

As: (82NBS 06)

CV = 47. +/- 6. ppb

Result	Uncer.	Date
52.8	11.	9/29
53.8	11.	9/29
47.4	11.	9/29
43.6	11.	9/29
46.3	11.	9/29
51.8	11.	9/29
47.7	7.	10/04
48.9	7.	10/04

Br: (82NBS 06)

CV = 9. ppm

Result	Uncer.	Date
9.3	1.4	5/21
13.	2.	5/21
9.6	1.0	5/21

Cl: (82NBS 06)

CV = 2800. +/- 100. ppm

Result	Uncer.	Date
2794.	282.	5/21

Na: (82NBS 06)

CV = 2430. +/- 130. ppm

Result	Uncer.	Date
2344.	235.	5/21

****

NBS 1632A Trace Elements in Coal (Bituminous)

As: (84GLA 04)

CV = 9.3 +/- 0.4 ppm

Result	Uncer.	Date
10.1	1.2	11/27
9.4	1.1	11/27
9.4	1.1	11/27
9.7	1.1	11/27
10.1	1.2	11/27
9.7	1.1	11/27

B: (84GLA 04)

CV = 53. +/- 2. ppm

Result	Uncer.	Date
54.	4.	6/14

Ba: (84GLA 04)

CV = 124. +/- 16. ppm

Result	Uncer.	Date
140.	23.	12/19
158.	25.	12/19
137.	26.	12/19
117.	18.	12/19
116.	17.	12/19
145.	28.	12/19

Ce: (84GLA 04)

CV = 29. +/- 2. ppm

Result	Uncer.	Date
30.	3.	12/19
32.6	3.2	12/19
34.3	3.4	12/19
31.1	3.1	12/19
32.	3.	12/19
31.1	3.1	12/19

TABLE D-VI (cont)

****

NBS 1632A Trace Elements
in Coal (Bituminous) (cont)

Co: (84GLA 04)

CV = 6.4 +/- 0.3 ppm

Result	Uncer.	Date
6.67	0.67	12/11
6.73	0.68	12/11
6.62	0.67	12/11
6.49	0.66	12/11
6.69	0.69	12/11
6.15	0.62	12/11

Cr: (78NBS 01)

CV = 34.4 +/- 1.5 ppm

Result	Uncer.	Date
34.3	3.4	12/11
36.6	3.7	12/11
34.4	3.5	12/11
36.6	3.7	12/11
35.8	3.6	12/11
36.	3.6	12/11

Cs: (84GLA 04)

CV = 2.3 +/- 0.2 ppm

Result	Uncer.	Date
2.11	0.28	12/14
2.12	0.26	12/14
2.23	0.28	12/14
2.52	0.33	12/14
2.32	0.31	12/14
2.29	0.29	12/14

Eu: (84GLA 04)

CV = 527. +/- 23. ppb

Result	Uncer.	Date
591.	103.	12/14
481.	81.	12/14
535.	87.	12/14
507.	80.	12/14
526.	86.	12/14
591.	103.	12/14

Fe: (78NBS 01)

CV = 1.11 +/- 0.02 %

Result	Uncer.	Date
1.13	0.11	12/11
1.20	0.12	12/11
1.11	0.11	12/11
1.18	0.11	12/11
1.10	0.11	12/11
1.14	0.11	12/11

Hf: (84GLA 04)

CV = 1.68 +/- 0.19 ppm

Result	Uncer.	Date
1.56	0.19	12/13
1.59	0.20	12/13
1.45	0.18	12/13
1.84	0.24	12/13
1.80	0.23	12/13
1.67	0.21	12/13

La: (84GLA 04)

CV = 15. +/- 3. ppm

Result	Uncer.	Date
15.9	1.2	11/18
15.4	1.2	11/18
16.0	1.3	11/18
16.9	1.3	11/18
15.9	1.2	11/18
15.2	1.2	11/18

Lu: (84GLA 04)

CV = 176. +/- 30. ppb

Result	Uncer.	Date
183.	28.	12/22
163.	26.	12/22
175.	26.	12/22
192.	30.	12/22
172.	26.	12/22
177.	27.	12/22

Na: (84GLA 04)

CV = 830. +/- 100. ppm

Result	Uncer.	Date
873.	87.	5/11
834.	84.	11/18
826.	83.	11/18
852.	86.	11/18
870.	87.	11/18
862.	87.	11/18
890.	90.	11/18

Rb: (84GLA 04)
CV = 29. +/- 0.5 ppm

Result	Uncer.	Date
29.4	4.9	12/14
28.2	4.7	12/14
29.6	4.7	12/14
29.8	5.3	12/14
28.0	4.4	12/14
29.5	4.6	12/14

Sb: (84GLA 04)
CV = 600. +/- 120. ppb

Result	Uncer.	Date
621.	114.	12/14
785.	156.	12/14
589.	130.	12/14
564.	107.	12/14
741.	171.	12/14
611.	119.	12/14

TABLE D-VI (cont)

****

NBS 1632A Trace Elements
in Coal (Bituminous) (cont)

Sc: (84GLA 04)

CV = 6.4 +/- 0.3 ppm

Result	Uncer.	Date
6.29	0.63	12/11
6.16	0.62	12/11
6.39	0.64	12/11
6.20	0.62	12/11
5.90	0.59	12/11
5.92	0.59	12/11

Sm: (84GLA 04)

CV = 2.4 +/- 0.3 ppm

Result	Uncer.	Date
2.34	0.23	11/26
2.25	0.22	11/26
2.18	0.21	11/26
2.28	0.23	11/27
2.25	0.23	11/27
2.40	0.24	11/27

Ta: (84GLA 04)

CV = 410. +/- 30. ppb

Result	Uncer.	Date
440.	82.	12/22
461.	82.	12/22
324.	54.	12/22
348.	62.	12/22
382.	67.	12/22
378.	82.	12/22

Th: (78NBS 01)

CV = 4.5 +/- 0.1 ppm

Result	Uncer.	Date
4.71	0.38	12/12
5.03	0.41	12/12
4.62	0.37	12/12
4.99	0.50	12/13
4.81	0.48	12/13
4.70	0.47	12/13

U: (78NBS 01)

CV = 1.28 +/- 0.02 ppm

Result	Uncer.	Date
1.28	0.06	10/04
1.38	0.06	10/04
1.28	0.06	10/04
1.26	0.10	11/12
1.24	0.08	11/12
1.26	0.12	11/12
1.32	0.12	11/12
1.28	0.10	12/12
1.33	0.10	12/12
1.29	0.10	12/12

V: (78NBS 01)

CV = 44. +/- 3. ppm

Result	Uncer.	Date
49.	6.	6/28

Yb: (84GLA 04)

CV = 1.03 +/- 0.12 ppm

Result	Uncer.	Date
1.07	0.16	12/22
1.12	0.18	12/22
1.03	0.16	12/22
1.16	0.19	12/22
1.13	0.18	12/22
1.02	0.16	12/22

****

NBS 1635 Trace Elements
in Coal (Subbituminous)

Al: (84GLA 04)
CV = 3100. +/- 200. ppm

Result	Uncer.	Date
3100.	200.	6/28
2810.	282.	12/04
2810.	282.	12/04
3120.	315.	12/04

As: (79NBS 04)
CV = 420. +/- 150. ppb

Result	Uncer.	Date
546.	88.	11/27
455.	79.	11/27
455.	79.	11/27
536.	96.	11/27
546.	88.	11/27
536.	96.	11/27

Ba: (84GLA 04)
CV = 73. +/- 6. ppm

Result	Uncer.	Date
76.0	12.1	6/29
62.8	8.0	12/19
68.0	9.5	12/19
70.5	9.3	12/19
76.9	10.7	12/19
62.2	9.1	12/19
69.6	7.9	12/19

Br:
CV = None Available (ppm)

Result	Uncer.	Date
0.99	0.18	11/27
0.62	0.13	11/27
0.77	0.14	11/27
0.93	0.16	11/27
0.76	0.15	11/27
0.96	0.17	11/27

TABLE D-VI (cont)

****

NBS 1635 Trace Elements in Coal (Subbituminous) (cont)

Ca: (84GLA 04)

CV = 5500. +/- 200. ppm

Result	Uncer.	Date
5480.	875.	12/10
5030.	775.	12/10
5430.	836.	12/10

Ce: (84GLA 04)

CV = 3.4 +/- 0.1 ppm

Result	Uncer.	Date
2.83	0.30	6/29
3.60	0.37	12/19
3.42	0.35	12/19
3.24	0.32	12/19
3.52	0.36	12/19
3.55	0.35	12/19
3.55	0.36	12/19

Cl: (84GLA 04)

CV = 29. +/- 6. ppm

Result	Uncer.	Date
33.6	12.1	6/28
25.1	6.1	12/07
28.3	7.1	12/07
19.5	11.8	12/07

Co: (84GLA 04)

CV = 640. +/- 60. ppb

Result	Uncer.	Date
640.	70.	6/29
715.	80.	12/11
590.	73.	12/11
641.	68.	12/11
591.	75.	12/11
607.	76.	12/11
653.	67.	12/11

Cr: (79NBS 04)

CV = 2.5 +/- 0.3 ppm

Result	Uncer.	Date
2.32	0.29	6/29
2.62	0.30	12/11
2.73	0.34	12/11
2.40	0.27	12/11
2.48	0.25	12/11
2.53	0.26	12/11
2.79	0.31	12/11

Cs: (84GLA 04)

CV = 50. ppb

Result	Uncer.	Date
55.8	16.0	12/14
66.1	14.4	12/14
55.7	8.5	12/14
54.1	9.2	12/14
51.0	17.5	12/14
78.8	16.9	12/14

Eu: (79NBS 04)

CV = 60. ppb

Result	Uncer.	Date
62.6	7.	6/29
63.3	11.6	12/14
79.4	13.9	12/14
63.4	12.	12/14
66.2	10.5	12/14
66.5	13.	12/14
62.3	9.8	12/14

Fe: (79NBS 04)

CV = 2390. +/- 50. ppm

Result	Uncer.	Date
2317.	234.	6/29
2280.	231.	12/11
2290.	230.	12/11
2340.	236.	12/11
2450.	248.	12/11
2310.	234.	12/11
2230.	226.	12/11

Hf: (84GLA 04)

CV = 270. +/- 20. ppb

Result	Uncer.	Date
325.	43.	12/13
314.	39.	12/13
275.	33.	12/13
238.	32.	12/13
316.	40.	12/13
295.	36.	12/13

La: (84GLA 04)

CV = 1.8 +/- 0.4 ppm

Result	Uncer.	Date
1.81	0.22	5/11
2.06	0.17	11/18
1.84	0.15	11/18
1.95	0.16	11/18
1.93	0.16	11/18
1.97	0.17	11/18
1.93	0.16	11/18

Lu: (84GLA 04)

CV = 32. ppb

Result	Uncer.	Date
15.2	2.4	12/22
15.2	2.9	12/22
21.3	3.7	12/22
13.3	2.6	12/22
14.5	2.8	12/22
12.1	1.9	12/22

Mn: (79NBS 04)

CV = 21.4 +/- 1.5 ppm

Result	Uncer.	Date
18.4	1.9	6/28
20.2	3.1	12/07
21.9	3.4	12/07
20.9	3.4	12/07

TABLE D-VI (cont)

****

NBS 1635 Trace Elements in Coal (Subbituminous) (cont)

Na: (84GLA 04)

CV = 2400. +/- 200. ppm

Result	Uncer.	Date
2390.	240.	11/18
2490.	250.	11/18
2440.	246.	11/18
2370.	238.	11/18
2370.	238.	11/18
2390.	240.	11/18

Rb:

CV = None Available (ppm)

Result	Uncer.	Date
1.42	0.52	12/14
0.75	0.21	12/14
0.56	0.35	12/14
1.16	0.35	12/14
0.58	0.19	12/14
1.23	0.42	12/14

Sb: (84GLA 04)

CV = 140. +/- 20. ppb

Result	Uncer.	Date
139.	30.	12/14
143.	29.	12/14
134.	22.	12/14
134.	27.	12/14
145.	24.	12/14
189.	37.	12/14

Sc: (79NBS 04)

CV = 630. ppb

Result	Uncer.	Date
610.	60.	6/29
599.	60.	12/10
600.	60.	12/10
629.	63.	12/10
599.	60.	12/11
602.	61.	12/11
632.	64.	12/11

Sm: (84GLA 04)

CV = 290. +/- 40. ppb

Result	Uncer.	Date
276.	31.	5/11
260.	26.	11/26
267.	27.	11/26
251.	25.	11/26
247.	25.	11/27
259.	26.	11/27
260.	26.	11/27

Ta: (84GLA 04)

CV = 45. ppb

Result	Uncer.	Date
55.	13.	12/22
59.	13.	12/22
51.	9.	12/22
36.	11.	12/22
45.	7.	12/22
39.	12.	12/22

Th: (79NBS 04)

CV = 620. +/- 40. ppb

Result	Uncer.	Date
600.	60.	6/29
608.	50.	12/12
642.	53.	12/12
635.	51.	12/12
619.	62.	12/13
672.	68.	12/13
644.	65.	12/13

V: (79NBS 04)

CV = 5.2 +/- 0.5 ppm

Result	Uncer.	Date
5.	1.	6/28
4.9	0.6	12/07
4.3	0.4	12/07
4.4	0.4	12/07

Yb: (84GLA 04)

CV = 160. +/- 20. ppb

Result	Uncer.	Date
159.	27.	12/22
158.	24.	12/22
156.	25.	12/22
163.	29.	12/22
155.	29.	12/22
163.	30.	12/22

****

NBS 1567 Wheat Flour

Br: (78NBS 05)

CV = 9. ppm

Result	Uncer.	Date
8.6	0.9	5/07
8.2	0.9	9/28

Cl: (84GLA 12)

CV = 585. ppm

Result	Uncer.	Date
603.	49.	5/04
609.	50.	5/04
555.	56.	5/15
567.	57.	5/15

TABLE D-VI (cont)

****

NBS 1567 Wheat Flour (cont)

Mn: (78NBS 05)

CV = 8.5 +/- 0.5 ppm

Result	Uncer.	Date
9.	0.8	5/15
8.3	0.7	5/15

Na: (78NBS 05)

CV = 8. +/- 1.5 ppm

Result	Uncer.	Date
13.	3.	5/04
17.	3.	5/04
12.1	2.3	5/15
8.5	2.4	5/15

****

NBS 1568 Rice Flour

Cl: (84GLA 12)

CV = 240. ppm

Result	Uncer.	Date
248.	20.	5/04
248.	20.	5/04

Na: (78NBS 06)

CV = 6. +/- 1.5 ppm

Result	Uncer.	Date
12.	2.	5/04
9.	2.	5/04

****

NBS 1569 Brewers Yeast

Li:

CV = None Available (ppm)

Result	Uncer.	Date
0.45	0.1	11/19
0.42	0.1	11/19
0.42	0.1	11/19
0.45	0.1	11/19
0.42	0.1	11/19
0.45	0.1	11/19

Sc: (84GLA 04)

CV = 200. ppb

Result	Uncer.	Date
194.	22.	12/31
198.	22.	12/31

Sr:

CV = None Available (ppm)

Result	Uncer.	Date
10.3	1.3	6/19

****

NBS 2682 Sulfur in Coal

Al: (83NBS 01)

CV = 4600. ppm

Result	Uncer.	Date
4190.	422.	12/04
4010.	404.	12/04
4230.	427.	12/04

As: (83NBS 01)

CV = 1. ppm

Result	Uncer.	Date
0.89	0.12	11/27
0.96	0.13	11/27
1.02	0.13	11/27
0.96	0.13	11/27
1.02	0.13	11/27
0.89	0.12	11/27

Br: (83NBS 01)

CV = 3.7 ppm

Result	Uncer.	Date
3.35	0.42	11/27
3.79	0.48	11/27
3.67	0.47	11/27
3.75	0.47	11/27
3.45	0.44	11/27
3.80	0.48	11/27

Cl:

CV = None Available (ppm)

Result	Uncer.	Date
40.6	9.8	12/07
33.7	11.6	12/07
35.7	11.5	12/07

La: (83NBS 01)

CV = 5.2 ppm

Result	Uncer.	Date
4.56	0.37	11/18
4.56	0.37	11/18
4.49	0.37	11/18
4.47	0.37	11/18
4.62	0.38	11/18
4.85	0.40	11/18

TABLE D-VI (cont)

****

NBS 2682 Sulfur in Coal (cont)

Mn: (83NBS 01)

CV = 26. ppm

Result	Uncer.	Date
22.7	3.6	12/07
23.4	3.7	12/07
21.8	3.6	12/07

Na: (83NBS 01)

CV = 1000. ppm

Result	Uncer.	Date
988.	99.	11/18
1000.	101.	11/18
981.	99.	11/18
970.	97.	11/18
967.	97.	11/18
985.	99.	11/18

Sm: (83NBS 01)

CV = 780. ppb

Result	Uncer.	Date
626.	63.	11/26
664.	67.	11/26
637.	64.	11/26
618.	63.	11/27
625.	63.	11/27
626.	63.	11/27

V: (83NBS 01)

CV = 15. ppm

Result	Uncer.	Date
14.7	1.6	12/07
13.5	1.4	12/07
13.6	1.4	12/07

****

NBS 1648 Urban Particulate Matter

U: (78NBS 03)

CV = 5.5 +/- 0.1 ppm

Result	Uncer.	Date
4.77	0.48	9/24
4.7	0.48	9/24
4.81	0.48	9/24
5.5	0.7	11/06
6.7	0.8	11/06
5.3	0.7	11/06
5.07	0.5	12/07
5.54	0.5	12/07
5.14	0.5	12/07
4.68	0.5	12/07

****

NBS 2676a Metals on Filter Media Blank

Cd:

CV = None Available (ug/filter)

Result	Uncer.	Date
0.03	0.03	10/04

Pb:

CV = None Available (ug/filter)

Result	Uncer.	Date
0.17	0.11	11/05

Zn:

CV = None Available (ug/filter)

Result	Uncer.	Date
8.1	1.6	11/05

****

NBS 2676a Metals on Filter Media IIA

Cd: (78NBS 02)

CV = 2.5 +/- 0.02 ug/filter

Result	Uncer.	Date
2.47	0.03	11/07

Pb: (78NBS 02)

CV = 15.23 +/- 0.15 ug/filter

Result	Uncer.	Date
15.55	0.32	11/07

Zn: (78NBS 02)

CV = 49.52 +/- 0.48 ug/filter

Result	Uncer.	Date
47.6	0.4	11/07

****

NBS 2676a Metals on Filter Media IIIa

Cd: (78NBS 02)

CV = 10.18 +/- 0.1 ug/filter

Result	Uncer.	Date
9.77	0.3	11/05

Pb: (78NBS 02)

CV = 29.64 +/- 0.2 ug/filter

Result	Uncer.	Date
28.66	0.6	11/05

TABLE D-VI (cont)

****

NBS 2676a Metals on Filter Media IIIa (cont)

Zn: (78NBS 02)

CV = 99.22 +/- 0.99 ug/filter

Result	Uncer.	Date
95.	4.	11/05

****

NBS 2675 B-2 Beryllium on Filter Media

Be: (75NBS 06)

CV = 0.25 +/- 0.03 ug/filter

Result	Uncer.	Date
0.35	0.05	8/14

****

NBS 1584 Priority Pollutant Phenols in Methanol

2,4-Dimethylphenol: (84NBS 01)

CV = 51.6 +/- 0.2 ppm

Result	Uncer.	Date
48.6	4.9	11/26

---

m-Cresol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

Phenol: (84NBS 01)

CV = 29.7 +/- 0.9 ppm

Result	Uncer.	Date
27.2	2.7	11/26

---

p-Ethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

2,3-Dimethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

2,6-Dimethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

---

m-Ethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

---

o-Ethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

---

o-Cresol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

3,4-Dimethylphenol:

CV = None Available (ppm)

Result	Uncer.	Date
0.	1.	11/26

****

NBS 2661a-II Benzene on Charcoal

Benzene: (78NBS 11)

CV = 0.030 +/- 0.002 mg/tube

Result	Uncer.	Date
0.058	0.010	10/26

****

USGS AGV-1 Andesite

B: (83GLA 04)

CV = 7. +/- 4. ppm

Result	Uncer.	Date
7.8	0.8	6/06

Mn: (83GLA 04)

CV = 740. +/- 60. ppm

Result	Uncer.	Date
720.	40.	3/02

TABLE D-VI (cont)

****

USGS AGV-1 Andesite (cont)

Na: (83GLA 04)

CV = 3.15 +/- 0.09 %

Result	Uncer.	Date
3.05	0.15	3/02

Sm: (83GLA 04)

CV = 5.9 +/- 0.5 ppm

Result	Uncer.	Date
6.0	0.6	6/06

****

USGS GSP-1 Granodiorite

B: (73FLA 01)

CV = < 3. ppm

Result	Uncer.	Date
1.	0.1	6/06

Gd: (83GLA 04)

CV = 13. +/- 2. ppm

Result	Uncer.	Date
12.9	1.2	6/06

****

USGS GXR-1 Jasperoid

Ba: (84GLA 09)

CV = 610. +/- 70. ppm

Result	Uncer.	Date
747.	82.	8/24

Cr: (84GLA 09)

CV = 13. +/- 3. ppm

Result	Uncer.	Date
10.3	1.7	8/24

Fe: (84GLA 09)

CV = 25.0 +/- 0.6 %

Result	Uncer.	Date
27.	1.4	8/24

Sc: (84GLA 09)

CV = 1.7 +/- ppm

Result	Uncer.	Date
1.8	0.1	8/24

U: (84GLA 09)

CV = 35. +/- 1.4 ppm

Result	Uncer.	Date
34.8	2.0	1/26
32.5	2.2	2/23
33.2	2.3	2/23
33.9	2.0	3/01
33.6	2.0	3/01
34.0	3.6	9/06
34.6	3.5	9/06
32.3	1.5	10/04
33.0	1.5	10/04
35.0	1.5	11/12
35.2	1.5	11/12

****

USGS GXR-2 Soil

Sr: (84GLA 09)

CV = 152. +/- 16. ppm

Result	Uncer.	Date
141.	17.	2/03
149.	18.	2/03
150.	19.	2/03

U: (84GLA 09)

CV = 2.91 +/- 0.07 ppm

Result	Uncer.	Date
3.01	0.30	1/26
2.92	0.15	2/23
2.86	0.29	2/23
2.94	0.21	3/01
2.89	0.20	3/01
2.92	0.20	3/01
2.89	0.14	6/26
2.92	0.29	6/26
2.91	0.29	6/26
2.89	0.20	9/06
2.83	0.15	10/04
2.82	0.15	10/04
2.99	0.25	11/12
3.13	0.25	11/12
3.04	0.25	11/12

****

USGS GXR-3 Hot Springs Deposit

Be: (84GLA 12)

CV = 28. +/- 2. ppm

Result	Uncer.	Date
25.	3.	11/20
25.	3.	11/20
28.	3.	11/20

TABLE D-VI (cont)

****

USGS GXR-3 Hot Springs Deposit (cont)

Cs: (84GLA 09)
CV = 171. +/- 16. ppm

Result	Uncer.	Date
162.	16.	7/24
178.	18.	7/24
167.	16.	7/24
172.	17.	7/24
168.	16.	7/24
164.	16.	7/24
171.	17.	7/24
170.	17.	9/04
169.	17.	9/04

Si: (84GLA 09)
CV = 6.17 +/- 0.27 %

Result	Uncer.	Date
6.3	0.5	3/07
7.4	0.5	3/07
6.8	0.3	3/29
6.8	0.3	3/29
6.6	0.6	5/14
6.2	0.6	6/26
7.2	0.7	6/26

U: (84GLA 09)
CV = 3.07 +/- 0.26 ppm

Result	Uncer.	Date
3.05	0.31	1/26
2.81	0.14	2/23
2.78	0.14	2/23
2.90	0.20	3/01
2.90	0.20	3/01
2.85	0.20	3/01
2.77	0.19	3/01
2.97	0.24	6/26
3.06	0.24	6/26
2.84	0.24	9/06
2.85	0.15	10/04
2.87	0.15	10/04
3.07	0.25	11/12
2.92	0.25	11/12
3.05	0.25	11/12

****

USGS GXR-4 Copper Mill Heads

Be: (84GLA 09)

CV = 1.9 +/- 0.2 ppm

Result	Uncer.	Date
2.04	0.3	11/20
1.56	0.3	11/20
1.67	0.3	11/20
1.67	0.3	11/20
1.88	0.3	11/20
1.69	0.3	11/20

Si: (84GLA 09)

CV = 30.8 +/- 0.8 %

Result	Uncer.	Date
28.	2.	3/07
28.6	3.	5/14
32.8	3.3	6/26
32.4	3.2	6/26
32.4	3.2	6/26
31.6	2.	9/05
29.5	2.	9/05
30.2	2.	9/05

U: (84GLA 09)

CV = 6.5 +/- 0.4 ppm

Result	Uncer.	Date
6.25	0.32	1/26
6.12	0.37	6/26
6.06	0.30	6/26
6.08	0.30	6/26
6.18	0.31	9/06
6.07	0.32	9/06

****

USGS GXR-5 Soil

U: (84GLA 09)

CV = 2.0 +/- 0.2 ppm

Result	Uncer.	Date
2.14	0.21	1/26
2.11	0.21	2/23
2.13	0.21	2/23
2.09	0.15	3/01
2.10	0.15	3/01
2.17	0.15	3/01
2.14	0.21	6/26
2.06	0.21	6/26
2.23	0.22	9/06
2.24	0.18	9/06
2.11	0.11	10/04
2.04	0.11	10/04
2.18	0.15	11/12
2.22	0.20	11/12
2.28	0.20	11/12
2.13	0.20	12/12
2.14	0.20	12/12
2.13	0.20	12/12

****

USGS GXR-6 Soil

U: (84GLA 09)

CV = 1.56 +/- 0.07 ppm

Result	Uncer.	Date
1.49	0.15	1/26
1.48	0.15	9/06
1.49	0.07	10/04
1.54	0.14	11/12

TABLE D-VI (cont)

****

USGS MAG-1 Marine Mud

Al: (81GLA 05)

CV = 8.65 +/- 0.15 %

Result	Uncer.	Date
8.76	0.45	7/28

Ca: (81GLA 05)

CV = 1.04 +/- 0.2 %

Result	Uncer.	Date
1.01	0.12	7/28

Cs: (81GLA 05)

CV = 8.3 +/- 0.5 ppm

Result	Uncer.	Date
8.32	0.91	4/06
7.69	0.86	4/06

K: (81GLA 05)

CV = 3.0 +/- 0.2 %

Result	Uncer.	Date
2.79	0.21	7/28
2.69	0.20	7/28

Mg: (81GLA 05)

CV = 1.86 +/- 0.12 %

Result	Uncer.	Date
2.06	0.31	7/28

Mn: (81GLA 05)

CV = 810. +/- 160. ppm

Result	Uncer.	Date
718.	51.	7/28
721.	53.	7/28

Na: (81GLA 05)

CV = 2.77 +/- 0.19 %

Result	Uncer.	Date
2.73	0.14	7/28
2.85	0.15	7/28

V: (81GLA 05)
CV = 142. +/- 3. ppm

Result	Uncer.	Date
133.	18.	7/28

****

USGS QLO-1 Quartz Latite

U: (81GLA 05)
CV = 1.97 +/- 0.03 ppm

Result	Uncer.	Date
1.91	0.19	1/26
1.89	0.07	10/04
1.98	0.15	11/12

****

USGS RGM-1 Rhyolite

Cs: (81GLA 05)
CV = 9.9 +/- 0.4 ppm

Result	Uncer.	Date
9.9	1.0	4/06
9.2	0.9	4/06

****

USGS SCo-1 Cody Shale

U: (81GLA 05)
CV = 3.09 +/- 0.14 ppm

Result	Uncer.	Date
3.22	0.32	1/26
3.13	0.30	9/06

****

USGS STM-1 Syenite

U: (81GLA 05)
CV = 9.07 +/- 0.07 ppm

Result	Uncer.	Date
8.97	0.54	1/26
8.85	0.40	10/04
8.67	0.50	11/12

****

CCRMP SY-2 Syenite

Be: (81GLA 06)
CV = 20. +/- 6. ppm

Result	Uncer.	Date
18.5	2.0	2/03
20.8	2.0	2/03
19.3	2.0	2/03

****

CCRMP SY-3 Syenite

Be: (81GLA 06)
CV = 20. +/- 6. ppm

Result	Uncer.	Date
18.8	2.0	2/03
18.8	2.0	2/03
18.1	2.0	2/03

TABLE D-VI (cont)

****

CCRMP MRG-1 Gabbro

Ce: (81GLA 06)

CV = 28. +/- 6. ppm

Result	Uncer.	Date
27.6	2.8	4/23
23.6	2.4	4/23
30.	3.	4/23
30.	3.	4/23

Co: (81GLA 06)
CV = 86. +/- 12. ppm

Result	Uncer.	Date
82.	8.	5/01
83.	8.	5/01
83.	8.	5/01
84.	8.	5/01

Cr: (81GLA 06)
CV = 430. +/- 80. ppm

Result	Uncer.	Date
471.	47.3	5/01
472.	47.4	5/01

Cs: (81GLA 06)
CV = 600. +/- 300. ppb

Result	Uncer.	Date
717.	156.	5/01

Eu: (81GLA 06)
CV = 1.4 +/- .1 ppm

Result	Uncer.	Date
1.42	0.14	4/19
1.42	0.14	4/19
1.53	0.15	4/19
1.28	0.13	4/19

Hf: (81GLA 06)

CV = 3.5 +/- .5 ppm

Result	Uncer.	Date
3.7	0.3	4/23
3.6	0.3	4/23
4.0	0.3	4/23
3.7	0.2	4/23

K: (81GLA 06)

CV = 1500. +/- 200. ppm

Result	Uncer.	Date
1200.	600.	7/28

La: (81GLA 06)

CV = 9.7 +/- 0.9 ppm

Result	Uncer.	Date
9.4	1.	3/29
9.8	0.4	3/29
9.3	0.7	3/29
10.1	0.9	3/29

Mn: (81GLA 06)

CV = 1300. +/- 100. ppm

Result	Uncer.	Date
1280.	80.	3/02
1290.	90.	7/28
1270.	90.	7/28

Na: (81GLA 06)

CV = 5400. +/- 400. ppm

Result	Uncer.	Date
5150.	250.	3/02
5320.	540.	8/29

Nd: (81GLA 06)

CV = 19. +/- 3. ppm

Result	Uncer.	Date
17.	6.	5/01
30.	11.	5/01
19.	6.	5/01
21.	12.	5/01

Sb: (81GLA 06)

CV = 19. +/- 3. ppm

Result	Uncer.	Date
0.72	0.21	5/01
0.92	0.19	5/01

Sc: (81GLA 06)
CV = 52. +/- 7. ppm

Result	Uncer.	Date
52.6	4.2	4/19
53.6	4.3	4/19
53.6	4.3	4/20
53.6	4.3	4/20

Sm: (81GLA 06)
CV = 5. +/- 1. ppm

Result	Uncer.	Date
4.4	0.5	3/29
4.3	0.5	3/29
4.3	0.5	3/29
4.4	0.5	3/29

Ta:
CV = None Available (ppm)

Result	Uncer.	Date
0.75	0.13	5/01
0.64	0.10	5/01
0.89	0.11	5/01
1.1	0.19	5/01

TABLE D-VI (cont)

****

CCRMP MRG-1 Gabbro (cont)

Tb: (81GLA 06)

CV = 500. +/- 40. ppb

Result	Uncer.	Date
567.	89.	5/01
574.	89.	5/01

Th: (81GLA 06)

CV = 0.93 +/- 0.19 ppm

Result	Uncer.	Date
1.01	0.09	4/23
0.63	0.12	4/23
0.73	0.07	4/23
0.79	0.08	4/23

V: (81GLA 06)

CV = 510. +/- 50. ppm

Result	Uncer.	Date
505.	50.	7/28

****

CCRMP BL-1 Uranium Ore

U: (77ING 01)

CV = 220. +/- 10. ppm

Result	Uncer.	Date
223.	16.	1/09
217.	15.	1/09

****

CCRMP DL-1 Thorium-Uranium Ore

U: (77ING 01)

CV = 41. +/- 2. ppm

Result	Uncer.	Date
39.8	2.3	1/26
38.2	2.6	2/09
38.3	2.6	2/09
37.8	2.6	2/23
38.3	2.3	2/23
39.6	2.3	3/01
37.9	2.2	3/01
38.6	2.3	3/01

****

CCRMP SO-1 Regosolic Soil

Cs: (84GLA 06)
CV = 5.10 +/- 0.13 ppm

Result	Uncer.	Date
5.44	0.62	7/24
5.1	0.6	7/24
5.30	0.84	9/04
5.86	0.75	9/04

F: (84GLA 06)
CV = 800. +/- 150. ppm

Result	Uncer.	Date
1070.	70.	6/26
1090.	70.	6/26
1070.	70.	6/26
1020.	70.	6/26

U: (84GLA 06)
CV = 1.70 +/- 0.04 ppm

Result	Uncer.	Date
1.67	0.17	2/09
1.68	0.17	2/09

****

CCRMP SO-2 Podzolic Soil

Sr: (84GLA 06)

CV = 334. +/- 49. ppm

Result	Uncer.	Date
327.	34.	2/03
305.	32.	2/03

U: (84GLA 06)

CV = 0.96 +/- 0.02 ppm

Result	Uncer.	Date
1.03	0.11	2/09
1.01	0.11	2/09

****

CCRMP SO-3 Calcareous C Horizon Soil

Al: (80STE 02)

CV = 3.05 +/- 0.11 %

Result	Uncer.	Date
3.19	0.17	7/28

Ca: (84GLA 06)

CV = 15. +/- 0.9 %

Result	Uncer.	Date
15.17	0.84	7/28

K: (80STE 02)
CV = 1.16 +/- 0.05 %

Result	Uncer.	Date
1.15	0.11	7/28

TABLE D-VI (cont)

****

CCRMP SO-3 Calcareous C Horizon Soil (cont)

Mg: (79BOW 01)

CV = 5.11 +/- 0.1 %

Result	Uncer.	Date
4.99	0.52	7/28

Na: (84GLA 06)

CV = 7500. +/- 300. ppm

Result	Uncer.	Date
7500.	400.	7/28
7300.	400.	7/28

Sc: (84GLA 06)

CV = 5.2 +/- 0.3 ppm

Result	Uncer.	Date
4.95	0.5	12/31
5.04	0.5	12/31

U: (84GLA 06)

CV = 1.08 +/- 0.19 ppm

Result	Uncer.	Date
1.09	0.11	2/09
1.11	0.11	2/09

V: (84GLA 06)

CV = 36. +/- 6. ppm

Result	Uncer.	Date
40.	7.	7/28

****

CCRMP SO-4 Chernozemic A Horizon Soil

Cs: (84GLA 06)

CV = 2.9 +/- 0.2 ppm

Result	Uncer.	Date
2.44	0.34	4/06
2.85	0.34	4/06

F: (84GLA 06)

CV = 300. +/- 10. ppm

Result	Uncer.	Date
340.	40.	6/26
324.	30.	6/26
273.	30.	6/26
260.	30.	6/26
400.	100.	6/26
205.	30.	6/26
230.	60.	6/26
265.	30.	6/26
168.	30.	6/26
272.	30.	6/26
234.	30.	6/26
240.	30.	6/26
256.	30.	6/26
263.	30.	6/26
258.	30.	6/26

Sc: (84GLA 06)

CV = 8.5 +/- 0.5 ppm

Result	Uncer.	Date
8.32	0.8	12/31
8.11	0.8	12/31

U: (84GLA 06)

CV = 2.4 +/- 0.2 ppm

Result	Uncer.	Date
2.44	0.24	2/09
2.33	0.23	2/09

U-235/238: (81H-8 03)

CV = 0.0073 +/- 0.0001 Ratio

Result	Uncer.	Date
0.0074	0.0004	3/12
0.0072	0.0004	8/31
0.0073	0.0004	8/31

****

EPA Tritium in Water, Dec. 1983

H-3: (84EPA 01)

CV = 2389. +/- 351. pCi/l

Result	Uncer.	Date
2200.	300.	1/16
2500.	300.	1/16
1900.	300.	1/16

****

EPA Tritium in Water, Feb. 1984

H-3: (84EPA 01)

CV = 2383 +/- 351 pCi/l

Result	Uncer.	Date
2100.	300.	2/17
2300.	300.	2/17
2100.	300.	2/17

****

EPA Tritium in Water, Apr. 1984

H-3: (84EPA 01)

CV = 3508 +/- 364 pCi/l

Result	Uncer.	Date
3100.	400.	5/09
3700.	500.	5/09
3400.	400.	5/09

TABLE D-VI (cont)

****

EPA Tritium in Water, June 1984

H-3: (84EPA 01)

CV = 3051 +/- 359 pCi/l

Result	Uncer.	Date
2800.	400.	6/27
2700.	400.	6/27
2200.	300.	6/27

****

EPA Tritium in Water, Aug. 1984

H-3: (84EPA 01)

CV = 2817. +/- 356. pCi/l

Result	Uncer.	Date
2900.	500.	8/27
2300.	500.	8/27
2700.	500.	8/27
2664.	400.	12/28
2148.	400.	12/28
2304.	400.	12/28

****

EPA Tritium in Water, Oct. 1984

H-3: (84EPA 01)

CV = 2810.0 +/- 356.0 pCi/l

Result	Uncer.	Date
2900.	400.	11/13
3000.	500.	11/13
2700.	400.	11/13

****

EPA Tritium in Water, Dec. 1984

H-3 (84EPA 01)

CV = 3182. +/- 360. pCi/l

Result	Uncer.	Date
3000.	400.	12/31
3200.	500.	12/31
3300.	500.	12/31

****

EPA Tritium Blank in Water, Dec. 1983

H-3: (84EPA 01)

CV = Blank pCi/l

Result	Uncer.	Date
50.	170.	1/16
80.	170.	1/16
20.	170.	1/16

****

EPA Tritium Blank in Water, Feb. 1984

H-3: (84EPA 01)

CV = Blank pCi/l

Result	Uncer.	Date
100.	200.	2/17
100.	200.	2/17
0.	200.	2/17

****

EPA Tritium Blank in Water, Apr. 1984

H-3: (84EPA 01)

CV = Blank pCi/l

Result	Uncer.	Date
0.	200.	5/09
100.	200.	5/09
100.	200.	5/09

****

EPA Tritium Blank in Water, Aug. 1984

H-3: (84EPA 01)

CV = Blank pCi/l

Result	Uncer.	Date
100.	400.	8/27
100.	400.	8/27
0.	400.	8/27

****

EPA Tritium Blank in Water, Oct. 1984

H-3: (84EPA 01)

CV = Blank pCi/l

Result	Uncer.	Date
0.	300.	11/13
0.	300.	11/13
0.	300.	11/13

TABLE D-VI (cont)

****

EPA Alpha/Beta on Air Filter
Nov. 1983

Gross Alpha: (84EPA 01)

CV = 19. +/- 5. pCi/filter

Result	Uncer.	Date
22.	5.	1/13
23.	5.	1/13
21.	5.	1/13

Gross Beta: (84EPA 01)

CV = 50. +/- 5. pCi/filter

Result	Uncer.	Date
49.	6.	1/13
49.	6.	1/13
48.	6.	1/13

****

EPA Alpha/Beta on Air Filters,
Mar. 1984

Gross Alpha: (84EPA 01)

CV = 15. +/- 5. pCi/filter

Result	Uncer.	Date
16.	3.	3/30
16.	3.	3/30
17.	4.	3/30

Gross Beta: (84EPA 01)

CV = 51 +/- 5. pCi/filter

Result	Uncer.	Date
50.	6.	3/30
48.	6.	3/30
50.	6.	3/30

****

EPA Alpha/Beta on Air Filter,
Aug. 1984

Gross Alpha: (84EPA 01)

CV = 17.0 +/- 5.0 pCi/filter

Result	Uncer.	Date
16.	4.	9/26
15.	3.	9/26
16.	4.	9/26

Gross Beta: (84EPA 01)

CV = 51.0 +/- 5.0 pCi/filter

Result	Uncer.	Date
50.	6.	9/26
47.	6.	9/26
49.	6.	9/26

****

EPA Alpha/Beta on Air Filters,
Nov. 1984

Gross Alpha: (84EPA 01)

CV = 15. +/- 5. pCi/filter

Result	Uncer.	Date
18.	4.	12/21
17.	4.	12/21
19.	4.	12/21

Gross Beta: (84EPA 01)

CV = 52. +/- 5. pCi/filter

Result	Uncer.	Date
53.	7.	12/21
59.	8.	12/21
58.	7.	12/21

****

EPA Sr-90 in Water, Jan. 1984

Sr-90: (84EPA 01)

CV = 24. +/- 2.6 pCi/l

Result	Uncer.	Date
22.5	0.9	3/14
19.2	0.5	3/14
21.1	1.1	3/14

****

EPA Sr-90 in Water, May 1984

Sr-90: (84EPA 01)

CV = 5. +/- 1.5 pCi/l

Result	Uncer.	Date
6.7	0.3	7/02
7.6	0.8	7/02
7.2	0.3	7/02

****

EPA Sr-90 in Water, Sept. 1984

Sr-90: (84EPA 01)

CV = 19.0 +/- 1.5 pCi/l

Result	Uncer.	Date
21.7	0.9	11/16
20.5	0.9	11/16
19.3	0.8	11/16

TABLE D-VI (cont)

****

EPA Pu-239 in Water, Jan. 84

Pu-239: (84EPA 01)

CV = 18.8 +/- 1.9 pCi/l

Result	Uncer.	Date
16.4	2.	2/01
17.4	2.	2/01
16.6	2.	2/01
17.	2.	2/01
17.2	2.	2/01
16.4	2.	2/01
18.	0.5	2/23
17.5	0.6	2/23
17.1	0.5	2/23
16.6	0.3	5/10
17.	0.3	5/10
16.4	0.3	5/10

****

EPA Pu-239 in Water, July 1984

Pu-239: (84EPA 01)

CV = 12.5 +/- 1.3 pCi/l

Result	Uncer.	Date
11.3	0.3	9/07
11.1	0.3	9/07
10.9	0.3	9/07
10.2	2.	9/07
10.9	2.	9/07
10.3	2.	9/07
11.1	2.	9/07
10.6	2.	9/07
11.2	2.	9/07

****

EPA Alpha/Beta in Water, Jan. 1984

Gross Alpha: (84EPA 01)

CV = 10. +/- 5. pCi/l

Result	Uncer.	Date
10.	2.	2/23
11.	2.	2/23
10.	2.	2/23

Gross Beta: (84EPA 01)

CV = 12. +/- 5. pCi/l

Result	Uncer.	Date
15.8	1.7	2/23
16.0	2.0	2/23
15.9	1.7	2/23

****

EPA Alpha/Beta in Water, Mar. 1984

Gross Alpha: (84EPA 01)

CV = 5.0 +/- 5.0 pCi/l

Result	Uncer.	Date
5.9	1.4	4/12
5.9	1.4	4/12
5.7	1.3	4/12

Gross Beta: (84EPA 01)

CV = 20.0 +/- 5. pCi/l

Result	Uncer.	Date
24.	3.	4/12
25.	3.	4/12
26.	3.	4/12

****

EPA Alpha/Beta in Water, May 1984

Gross Alpha: (84EPA 01)

CV = 3. +/- 5. pCi/l

Result	Uncer.	Date
4.8	1.2	7/31
5.5	1.3	7/31
3.4	0.9	7/31

Gross Beta: (84EPA 01)

CV = 6. +/- 5. pCi/l

Result	Uncer.	Date
7.4	0.9	7/31
7.6	0.9	7/31
7.4	0.9	7/31

****

EPA Alpha/Beta in Water, July 1984

Gross Alpha: (84EPA 01)

CV = 6. +/- 5. pCi/l

Result	Uncer.	Date
6.2	1.5	8/13
6.2	1.5	8/13
7.3	1.7	8/13

Gross Beta: (84EPA 01)

CV = 13. +/- 5. pCi/l

Result	Uncer.	Date
16.4	1.8	8/13
16.4	1.8	8/13
16.2	1.8	8/13

TABLE D-VI (cont)

****

EPA Alpha/Beta in Water,
Sept. 1984

Gross Alpha: (84EPA 01)

CV = 5.0 +/- 5.0 pCi/l

Result	Uncer.	Date
6.6	1.6	12/31
9.7	2.3	12/31
6.4	0.15	12/31

Gross Beta: (84EPA 01)

CV = 16.0 +/- 5.0 pCi/l

Result	Uncer.	Date
29.2	4.4	12/31
30.4	4.6	12/31
24.2	3.6	12/31

****

EPA Alpha-Beta in Water,
Nov. 1984

Gross Alpha: (85EPA 01)

CV = 7.0 +/- 5.0 pCi/l

Result	Uncer.	Date
13.3	3.	12/26
10.	2.	12/26
6.7	1.	12/26

Gross Beta: (84EPA 01)

CV = 20.0 +/- 5.0 pCi/l

Result	Uncer.	Date
29.	3.	12/26
30.	3.	12/26
26.7	3.	12/26

****

EPA Gamma Nuclides in Water,
Feb. 1984

Co-60: (84EPA 01)
CV = 10. +/- 5. pCi/l

Result	Uncer.	Date
0.	30.	3/09
0.	30.	3/09
0.	30.	3/09

Cr-51: (84EPA 01)
CV = 40. +/- 5. pCi/l

Result	Uncer.	Date
0.	100.	3/09
0.	100.	3/09
0.	100.	3/09

Cs-134: (84EPA 01)
CV = 31. +/- 5. pCi/l

Result	Uncer.	Date
0.	30.	3/09
0.	30.	3/09
0.	30.	3/09

Cs-137: (84EPA 01)
CV = 16. +/- 5. pCi/l

Result	Uncer.	Date
0.	30.	3/09
0.	30.	3/09
0.	30.	3/09

Ru-106: (84EPA 01)
CV = 61. +/- 5. pCi/l

Result	Uncer.	Date
0.	200.	3/09
0.	200.	3/09
0.	200.	3/09

Zn-65: (84EPA 01)
CV = 50. +/- 5. pCi/l

Result	Uncer.	Date
0.	100.	3/09
0.	100.	3/09
0.	100.	3/09

****

EPA Gamma Nuclides in Water,
June 1984

Co-60: (84EPA 01)
CV = 31. +/- 5. pCi/l

Result	Uncer.	Date
0.	35.2	7/05
0.	38.6	7/05
0.	38.8	7/05

Cr-51: (84EPA 01)
CV = 66. +/- 5. pCi/l

Result	Uncer.	Date
0.	281.	7/05
0.	282.	7/05
0.	285.	7/05

Cs-134: (84EPA 01)
CV = 47. +/- 5. pCi/l

Result	Uncer.	Date
99.	36.	7/05
98.	35.	7/05
75.	34.	7/05

Cs-137: (84EPA 01)
CV = 37. +/- 5. pCi/l

Result	Uncer.	Date
78.	34.	7/05
9.	30.	7/05
78.	34.	7/05

TABLE D-VI (cont)

****

EPA Gamma Nuclides in Water,
June 1984 (cont)

Ru-106: (84EPA 01)

CV = 29. +/- 5. pCi/l

Result	Uncer.	Date
0.	244.	7/05
0.	265.	7/05
0.	252.	7/05

Zn-65: (84EPA 01)

CV = 63. +/- 5. pCi/l

Result	Uncer.	Date
125.	68.	7/05
89.	64.	7/05
184.	81.	7/05

****

EPA Gamma Nuclides in Water,
Oct. 1984

Cs-137: (84EPA 01)

CV = 24.0 +/- 5.0 pCi/l

Result	Uncer.	Date
0.	60.	11/13
0.	60.	11/13
0.	60.	11/13

****

EPA Uranium in Water,
Sept. 1984

U: (84EPA 01)

CV = 31. +/- 6. ppb

Result	Uncer.	Date
28.6	2.9	9/05
28.4	2.8	9/05
29.2	2.9	9/05
29.7	2.	11/12
27.8	2.	11/12
29.1	2.	11/12
28.6	2.	11/12
28.4	2.	11/12
28.5	2.	11/12
29.6	2.	11/12
31.	4.	12/07
31.	4.	12/07

U*: (84EPA 01)

CV = 20. +/- 6. pCi/l

Result	Uncer.	Date
20.5	2.	09/28
19.3	2.	09/28
18.6	2.	09/28
19.2	2.	10/25
21.	2.	10/25
19.8	2.	10/25
20.9	2.	10/25
20.9	2.	10/25
21.9	2.	11/27
19.5	2.	11/27
20.7	2.	11/27
18.2	2.	11/27
20.3	2.	11/27
20.8	2.	11/27
20.1	2.	12/21
19.9	2.	12/21
20.1	2.	12/21
20.2	2.	12/21
19.7	2.	12/21
21.	2.	12/21

****

EPA Uranium in Water,
Sept. 1983

U: (83EPA 01)

CV = 26. +/- 6. pCi/l

Result	Uncer.	Date
28.7	3.	01/20
26.8	3.	01/20
27.4	3.	01/20
29.0	3.	01/20
25.4	3.	01/20
28.6	3.	02/24
27.2	3.	02/24
26.	3.	02/24
29.7	3.	02/24
28.2	3.	02/24
24.7	3.	03/28
28.2	3.	03/28
28.4	3.	03/28
26.6	3.	03/28
27.5	3.	03/28
27.4	3.	04/25
24.9	3.	04/25
24.5	3.	04/25
26.5	3.	04/25
28.8	3.	04/25
25.6	3.	05/20
26.5	3.	05/20
28.8	3.	05/20
29.2	3.	05/20
28.3	3.	05/20
25.4	3.	06/29
27.8	3.	06/29
25.1	3.	06/29
26.9	3.	06/29
26.9	3.	06/29
27.1	3.	07/21
25.7	3.	07/21
27.1	3.	07/21
26.9	3.	07/21
27.3	3.	07/21
24.5	3.	08/26
27.2	3.	08/26
26.5	3.	08/26
27.2	3.	08/26
26.4	3.	08/26
26.9	3.	09/19
24.1	3.	09/19

TABLE D-VI (cont)

****

EPA Uranium in Water,
Sept. 1983 (cont)

U: (cont)

27.7	3.	09/19
26.5	3.	09/19
23.2	3.	09/19
24.7	3.	10/24
28.9	3.	10/24
28.6	3.	10/24
27.6	3.	10/24
26.6	3.	10/24
27.2	3.	11/20
29.3	3.	11/20
23.3	3.	11/20
26.4	3.	11/20
29.1	3.	12/27
25.5	3.	12/27
28.3	3.	12/27
27.2	3.	12/27

****

EPA Uranium in Water,
Feb. 1984

U: (84EPA 01)

CV = 15. +/- 6. pCi/l

Result	Uncer.	Date
14.9	2.	03/22
15.5	2.	03/22
15.8	2.	03/22
14.9	2.	05/28
14.9	2.	05/28
15.3	2.	05/28
15.	2.	05/28
14.3	2.	05/28
16.2	2.	05/28
15.3	2.	06/21
15.4	2.	06/21
16.	2.	06/21
15.6	2.	06/21
15.5	2.	06/21
14.9	2.	08/23
14.	2.	08/23
14.7	2.	08/23

U: (cont)

14.9	2.	08/23
15.4	2.	08/23
13.	2.	09/29
14.9	2.	09/29
15.8	2.	09/29
14.5	2.	09/29
14.9	2.	10/25
12.5	2.	10/25
14.7	2.	10/25
15.3	2.	10/25
15.8	2.	10/25
15.2	2.	10/25
14.4	2.	10/25
15.1	2.	11/20
17.	2.	11/20
16.	2.	11/20
13.8	2.	11/20
13.9	2.	11/20
14.2	2.	11/20
16.3	2.	11/20
15.1	2.	12/28
14.9	2.	12/28
13.	2.	12/28
13.3	2.	12/28
12.9	2.	12/28
15.3	2.	12/28
13.5	2.	12/28
14.8	2.	12/28

****

EPA Uranium in Water,
Nov. 1983

U: (83EPA 01)

CV = 17. +/- 4. ppb

Result	Uncer.	Date
18.2	1.8	3/12
18.4	3.8	3/16
19.7	4.0	3/16
19.0	3.8	3/16
15.8	2.4	4/06
17.4	2.6	4/06
18.6	1.9	5/10
17.9	1.8	5/10
19.5	2.0	6/26
17.6	1.8	6/26

****

EPA Uranium in Water,
Feb. 1984

U: (84EPA 01)

CV = 15. +/- 6. pCi/l

Result	Uncer.	Date
13.	2.	3/01
14.	2.	3/01
15.	2.	3/01
12.2	1.8	3/12
11.6	1.7	3/12
13.2	2.0	3/12
15.	1.	5/10
14.	1.	5/10
13.	1.	5/10

****

EPA Uranium in Water,
Aug 1984

U: (84EPA 01)

CV = 30.8 +/- 9.2 ppb

Result	Uncer.	Date
28.5	2.9	9/05
29.4	2.9	9/05
27.0	2.7	9/05

U*: (84EPA 01)

CV = 20.0 +/- 6.0 pCi/l

Result	Uncer.	Date
23.	3.	09/31
24.	3.	09/31
24.	3.	09/31

TABLE D-VI (cont)

****

EPA Ra-226 in Water, Mar. 1984

Ra-226: (84EPA 01)

CV = 4.1 +/- 0.6 pCi/l

Result	Uncer.	Date
4.2	0.4	4/01
4.4	0.4	4/01
4.3	0.4	4/01
3.0	0.3	5/04
3.2	0.3	5/04
3.0	0.3	5/04

****

EPA Ra-226 in Water, June 1984

Ra-226: (84EPA 01)

CV = 3.5 +/- 0.53 pCi/l

Result	Uncer.	Date
3.31	0.33	08/31

****

EPA Ra-226 in Water, Sept. 1984

Ra-226: (84EPA 01)

CV = 4.9 +/- 0.74 pCi/l

Result	Uncer.	Date
5.07	0.5	10/31
4.7	0.5	10/31
4.64	0.5	10/31
4.99	0.5	12/31
4.96	0.5	12/31
5.05	0.5	12/31

****

EPA Ra-226 in Water, Dec. 1984

CV = 8.6 +/- 1.3 pCi/l

Result	Uncer.	Date
8.66	0.87	12/31
8.58	0.86	12/31
8.22	0.82	12/31

****

EPA Gamma Nuclides in Food, Jan. 1984

Cs-137: (84EPA 01)

CV = 20. +/- 5. pCi/kg

Result	Uncer.	Date
19.4	7.1	2/21
33.6	15.	2/21
10.4	14.	2/21

I-131: (84EPA 01)

CV = 20. +/- 6. pCi/kg

Result	Uncer.	Date
0.	30.	2/21
0.	30.	2/21
0.	30.	2/21

K: (84EPA 01)

CV = 2720. +/- 136. mg/kg

Result	Uncer.	Date
2392.	645.	2/21
2505.	569.	2/21
2756.	595.	2/21

Sr-90: (84EPA 01)

CV = 20. +/- 5. pCi/kg

Result	Uncer.	Date
20.6	0.9	3/14
21.5	1.1	3/14
19.2	0.8	3/14

****

EPA Gamma Nuclides in Food, July 1984

Cs-137: (84EPA 01)

CV = 25.0 +/- 5.0 pCi/kg

Result	Uncer.	Date
0.	60.	9/25
0.	60.	9/25
0.	60.	9/25

I-131: (84EPA 01)

CV = 39.0 +/- 6.0 pCi/kg

Result	Uncer.	Date
0.	60.	9/25
0.	60.	9/25
0.	60.	9/25

Sr-90: (84EPA 01)

CV = 20.0 +/- 1.5 pCi/kg

Result	Uncer.	Date
19.9	0.6	11/16
13.0	0.4	11/16
15.7	0.4	11/16

TABLE D-VI (cont)

****

EPA Radionuclides in Milk,
June 1984

Cs-137: (84EPA 01)

CV = 35. +/- 5.0 pCi/l

Result	Uncer.	Date
0.	45.	8/14
0.	45.	8/14
0.	45.	8/14

I-131: (84EPA 01)

CV = 43.0 +/- 6.0 pCi/l

Result	Uncer.	Date
0.	150.	8/14
0.	150.	8/14
0.	150.	8/14

Sr-90: (84EPA 01)

CV = 17. +/- 1.5 pCi/l

Result	Uncer.	Date
15.7	0.6	8/22
15.7	0.7	8/22
15.3	0.4	8/22

****

EPA Gamma Nuclides in Milk,
Oct. 1984

Cs-137: (84EPA 01)

CV = 32.0 +/- 5.0 pCi/l

Result	Uncer.	Date
0.	40.	11/07
0.	40.	11/07
0.	40.	11/07

Sr-90: (84EPA 01)

CV = 16.0 +/- 1.5 pCi/l

Result	Uncer.	Date
12.9	0.7	12/28
13.5	0.7	12/28
11.8	0.7	12/28

****

EPA Performance Evaluation,
Apr. 1984

Gross Alpha: (84EPA 01)

CV = 35. +/- 8.8 pCi/l

Result	Uncer.	Date
28.	6.	5/22
24.	5.	5/22
30.	6.	5/22

U: (84EPA 01)

CV = 23. +/- 9. ppb

Result	Uncer.	Date
23.7	2.4	6/26
25.5	2.6	6/26
24.4	2.4	6/26

Gross Beta: (84EPA 01)

CV = None Available (pCi/l)

Result	Uncer.	Date
380.	40.	5/22
390.	40.	5/22
380.	40.	5/22

Co-60: (84EPA 01)

CV = 30. +/- 5. pCi/l

Result	Uncer.	Date
0.	40.	6/14
0.	40.	6/14
0.	40.	6/14

Cs-134: (84EPA 01)

CV = 30. +/- 5. pCi/l

Result	Uncer.	Date
0.	50.	6/14
0.	50.	6/14
0.	50.	6/14

Cs-137: (84EPA 01)

CV = 26. +/- 5. pCi/l

Result	Uncer.	Date
0.	88.	5/24
0.	88.	5/24
0.	88.	5/24

Sr-90: (84EPA 01)

CV = 26. +/- 1.5 pCi/l

Result	Uncer.	Date
25.4	1.2	7/02
28.6	1.	7/02
28.3	1.	7/02

TABLE D-VI (cont)

****

EPA Performance Evaluation,
Oct. 1984

Gross Alpha: (84EPA 01)

CV = 14.0 +/- 5.0 pCi/l

Result	Uncer.	Date
27.	6.	12/07
24.	5.	12/07
33.	7.	12/07

Note: Incorrect sample volume used in computations; correct data are:

Result	Uncer.	Date
15.	3.	12/07
13.	3.	12/07
18.	4.	12/07

U: (84EPA 01)

CV = 5.0 +/- 6.0 ppb

Result	Uncer.	Date
9.6	1.5	12/05
8.3	1.5	12/05
9.2	1.5	12/05

Gross Beta: (84EPA 01)
CV = 64.0 +/- 5.0 pCi/l

Result	Uncer.	Date
150.	20.	12/07
140.	10.	12/07
150.	10.	12/07

Note: Incorrect sample volume used in computations; correct data are:

Result	Uncer.	Date
83.	11.	12/07
78.	6.	12/07
83.	6.	12/07

Co-60: (84EPA 01)

CV = 14.0 +/- 5.0 pCi/l

Result	Uncer.	Date
0.	50.	12/31
0.	50.	12/31
0.	50.	12/31

Cs-134: (84EPA 01)

CV = 2.0 +/- 5.0 pCi/l

Result	Uncer.	Date
0.	50.	12/31
0.	50.	12/31
0.	50.	12/31

Cs-137: (84EPA 01)

CV = 14.0 +/- 5.0 pCi/l

Result	Uncer.	Date
0.	20.	11/24
0.	20.	11/24
0.	20.	11/24

Sr-90: (84EPA 01)

CV = 12.0 +/- 1.5 pCi/l

Result	Uncer.	Date
12.2	0.4	12/28
10.1	0.7	12/28
10.6	0.4	12/29

****

EPA Performance Evaluation
Study No. 15, Oct. 1984
Trace Metals in Water

Ag: (84EPA 01)

CV = 12.0 +/- 1.9 ug/l

Result	Uncer.	Date
11.1	1.1	11/19

CV = 52.0 +/- 5.2 ug/l

Result	Uncer.	Date
51.2	5.1	11/19

As: (84EPA 01)

CV = 22.5 +/- 2.8 ug/l

Result	Uncer.	Date
25.2	2.5	11/19

CV = 112. +/- 12. ug/l

Result	Uncer.	Date
107.7	11.	11/19

Ba: (84EPA 01)

CV = 63. +/- 11. ug/l

Result	Uncer.	Date
74.3	7.4	11/19

CV = 882. +/- 85. ug/l

Result	Uncer.	Date
902.	90.	11/19

TABLE D-VI (cont)

****

EPA Performance Evaluation
Study No. 15, Oct. 1984
Trace Metals in Water
(cont)

Cd: (84EPA 01)

CV = 10.0 +/- 1.4 ug/l

Result	Uncer.	Date
8.77	0.88	11/19

CV = 20.0 +/- 2.6 ug/l

Result	Uncer.	Date
17.4	1.7	11/19

Cr: (84EPA 01)

CV = 30.8 +/- 3.2 ug/l

Result	Uncer.	Date
32.2	3.2	11/19

CV = 44.1 +/- 4.0 ug/l

Result	Uncer.	Date
43.5	4.4	11/19

Hg: (84EPA 01)

CV = 0.55 +/- 0.14 ug/l

Result	Uncer.	Date
0.7	0.2	11/19

CV = 8.25 +/- 1.07 ug/l

Result	Uncer.	Date
6.6	0.6	11/19

Pb: (84EPA 01)

CV = 17.0 +/- 2.8 ug/l

Result	Uncer.	Date
15.6	1.6	11/19

CV = 116. +/- 11. ug/l

Result	Uncer.	Date
109.8	11.	11/19

Se: (84EPA 01)

CV = 11. +/- 2. ug/l

Result	Uncer.	Date
10.9	1.1	11/19

CV = 38.5 +/- 4.8 ug/l

Result	Uncer.	Date
38.1	3.5	11/19

****

EPA Mineral Analyses in Water

PH: (82EPA 01)

CV = 5.7 +/- 0.06 Units

Result	Uncer.	Date
5.72	0.1	12/19

CV = 7.8 +/- 0.08 Units

Result	Uncer.	Date
7.81	0.1	12/19

Ca: (82EPA 01)

CV = 5.3 +/- 0.4 mg/l

Result	Uncer.	Date
5.58	0.56	6/19
5.7	0.6	6/19
5.24	0.52	7/26
4.87	0.50	12/19
5.2	0.5	12/27
5.4	0.5	12/27

CV = 40.6 +/- 2.1 mg/l

Result	Uncer.	Date
38.5	4.	6/19
40.	4.	6/19
37.6	3.8	6/19
40.5	4.	6/19
39.8	4.	6/19
42.4	4.	6/19
42.2	4.2	7/26
41.3	4.	8/17
39.7	4.	12/19

Cl: (82EPA 01)

CV = 17.8 +/- 0.9 mg/l

Result	Uncer.	Date
17.6	1.7	6/27
19.4	2.	8/02
17.7	1.8	8/27
15.6	2.	9/05
16.2	2.	9/05
20.	2.	9/18
19.2	2.	10/11
19.	2.	10/17
21.	2.	10/17
19.3	2.	10/23
22.	2.	10/30
23.	2.	11/13
22.	2.	11/19
21.	2.	11/27
19.	2.	12/07
20.	2.	12/11
21.	2.	12/11
21.	2.	12/12
18.7	2.	12/12
17.8	1.8	12/19

TABLE D-VI (cont)

****

EPA Mineral Analyses in Water
(cont)

Cl: (cont)

18.2	1.8	12/19
17.1	1.7	12/19
16.6	1.7	12/19
16.5	1.7	12/19

CV = 85.3 +/- 2.8 mg/l

Result	Uncer.	Date
81.23	8.1	6/27
85.	9.	9/05
77.1	8.	8/27
97.	9.	9/18
89.	9.	10/30
101.	10.	12/13
91.	9.	12/13
98.	9.	12/17
78.	8.	12/17
85.9	8.6	12/19
86.2	8.6	12/19
81.	8.1	12/19
85.4	8.5	12/19

CONDUCTIVITY: (82EPA 01)
CV = 108. +/- 6. umhos

Result	Uncer.	Date
105.	11.	6/19
105.	11.	6/19
110.	11.	6/19
111.	11.	6/19
109.	11.	6/19
111.	11.	7/26
110.	6.	12/31
111.	6.	12/31

CV = 568. +/- 30. umhos

Result	Uncer.	Date
590.	59.	6/19
575.	58.	6/19
568.	57.	6/19
570.	57.	6/19
590.	59.	6/19
575.	58.	7/26
570.	29.	12/31

HARDNESS: (82EPA 01)

CV = 20.7 +/- 2.0 mg/l

Result	Uncer.	Date
22.	2.	6/19
20.5	2.	6/19
20.	1.	7/26
20.	1.	12/19
20.5	1.1	12/19

CV = 136. +/- 4. mg/l

Result	Uncer.	Date
132.5	6.6	7/26
131.	6.5	12/19

K: (82EPA 01)

CV = 2.1 +/- 0.2 mg/l

Result	Uncer.	Date
2.24	0.22	6/19
2.19	0.22	6/19
2.13	0.21	6/19
2.25	0.11	6/27
2.16	0.11	6/27
2.19	0.22	9/05
2.1	0.2	9/05
2.1	0.2	9/14
1.8	0.2	9/18
2.0	0.2	9/18
1.96	0.2	9/24
2.06	0.2	9/24
2.06	0.2	10/04
2.06	0.2	10/11
2.0	0.2	12/19
1.92	0.2	12/21
1.9	0.2	12/21
1.9	0.2	12/21

CV = 9.8 +/- 0.8 mg/l

Result	Uncer.	Date
9.3	0.9	6/19
10.6	0.5	6/27
10.2	0.5	6/27
9.4	0.9	9/05
9.3	0.9	9/05
10.	1.0	9/05

K: (cont)

9.3	0.9	9/14
10.	1.0	9/18
9.2	0.9	9/18
9.3	0.9	12/19

Mg: (82EPA 01)

CV = 1.8 +/- 0.2 mg/l

Result	Uncer.	Date
1.76	0.18	6/19
1.90	0.19	6/19
1.83	0.18	6/19
1.78	0.18	6/19
1.64	0.16	9/05
1.75	0.18	12/19
1.53	0.20	12/21
1.52	0.20	12/21
1.52	0.20	12/21

CV = 8.4 +/- 0.6 mg/l

Result	Uncer.	Date
8.3	0.8	6/19
8.4	0.8	6/19
8.3	0.8	6/19
7.5	0.7	9/05
7.9	0.8	12/19

Na: (82EPA 01)

CV = 8.2 +/- 0.5 mg/l

Result	Uncer.	Date
8.51	0.85	6/19
8.21	0.82	6/19
8.0	0.8	7/02
8.25	0.82	7/26
8.14	0.81	7/26
10.5	1.0	9/05
10.5	1.0	9/14
8.17	0.8	9/18
8.58	0.9	9/18
8.81	0.9	9/24
8.57	0.9	9/24
8.67	0.9	10/04
8.52	0.9	10/11
8.39	0.22	12/31

TABLE D-VI (cont)

****

EPA Mineral Analyses in Water
(cont)

Na: (cont)

CV = 46.5 +/- 2.2 mg/l

Result	Uncer.	Date
45.2	4.5	6/19
45.6	4.6	6/19
42.4	4.2	7/02
46.8	4.7	7/02
45.7	4.6	7/26
46.	5.	9/05
48.	5.	9/05
48.	5.	9/14
47.2	5.	9/18
46.	5.	9/18
46.4	2.3	12/31

SO4: (82EPA 01)

CV = 7.2 +/- 1.2 mg/l

Result	Uncer.	Date
6.9	0.7	8/02
6.5	0.6	8/27
8.0	0.8	9/05
6.4	0.6	9/05
6.7	0.7	9/18
6.5	0.5	9/25
6.8	0.7	10/11
6.8	0.7	10/17
7.1	0.7	10/17
6.7	0.7	10/23
6.9	0.7	10/30
7.0	0.7	11/13
7.3	0.7	11/19
6.8	0.7	11/27
6.7	0.7	12/07
6.3	0.6	12/11
6.1	0.6	12/12
6.8	0.6	12/19
6.5	0.6	12/19
6.6	0.6	12/19
7.1	0.7	12/19
6.9	0.7	12/19
6.6	0.6	12/19

SO4: (cont)

CV = 93.8 +/- 5.1 mg/l

Result	Uncer.	Date
86.1	8.	8/27
91.8	9.2	9/05
89.	9.	9/18
93.	9.	11/19
98.	9.	12/13
92.	9.	12/13
91.	9.	12/17
89.	9.	12/17
87.8	8.8	12/19
88.3	8.8	12/19
87.7	8.8	12/19
91.7	9.2	12/19

TDS: (82EPA 01)

CV = 44.2 +/- 11.9 mg/l

Result	Uncer.	Date
52.	10.	6/19
68.	10.	6/19
61.	10.	6/19
49.	5.	9/05
55.	10.	12/31
49.	10.	12/31

CV = 320. +/- 23. mg/l

Result	Uncer.	Date
336.	34.	6/19
312.	31.	6/19
366.	37.	6/19
319.	32.	6/19
325.	33.	6/19
322.	32.	9/05
320.	16.	12/31
333.	17.	12/31

Tot Alk: (82EPA 01)
CV = 21.7 +/- 1.5 mg/l

Result	Uncer.	Date
23.6	3.	12/07
21.5	2.2	12/19
19.8	2.	12/19
21.5	1.1	12/31
19.8	1.	12/31

Tot Alk: (cont)
CV = 74.7 +/- 2.0 mg/l

Result	Uncer.	Date
72.	3.	7/26
73.	7.	8/17
74.	7.	12/07
68.9	6.9	12/19
70.8	7.1	12/19
72.	7.2	12/19
70.8	7.1	12/19
70.8	3.6	12/31
68.9	3.4	12/31
70.8	3.6	12/31

F: (82EPA 01)
CV = 0.43 +/- 0.03 mg/l

Result	Uncer.	Date
0.43	0.04	8/31
0.42	0.04	8/31
0.38	0.04	9/06
0.38	0.04	9/21
0.44	0.04	10/05
0.46	0.04	10/15
0.47	0.04	10/15
0.52	0.05	11/08
0.47	0.05	11/26
0.45	0.04	12/17
0.45	0.04	12/17
0.45	0.04	12/28
0.46	0.04	12/28

****

EPA Trace Metals in Water

Ag: (78EPA 03)

CV = 24. ug/l

Result	Uncer.	Date
27.	3.	1/11
25.2	2.5	6/18
24.9	2.5	6/18
24.6	2.5	6/18
24.6	2.5	6/18
24.3	2.4	6/18
22.7	2.3	6/19
22.7	2.3	6/19

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Ag: (cont)

22.9	2.3	6/19
27.7	2.8	9/17
25.3	2.5	9/17
22.6	2.3	9/17
22.2	2.2	9/17
20.7	2.1	9/17
21.6	2.2	9/17
25.8	2.6	9/17
24.	2.4	11/19
24.	2.4	11/19
25.	2.5	11/19
25.	2.5	11/19

CV = 28. +/- 3. ug/l

Result	Uncer.	Date
28.7	2.9	6/18
29.2	2.9	6/18
28.2	2.8	6/19
29.	2.9	6/19
28.	2.8	11/19
28.	2.8	11/19

CV = 34. +/- 3. ug/l

Result	Uncer.	Date
33.8	3.4	6/18
33.2	3.3	6/18
33.8	3.4	6/19
35.	3.5	11/19
35.	3.5	11/19

Al: (75EPA 01) (81EPA 03)

CV = 106. +/- 15. ug/l

Result	Uncer.	Date
123.	50.	7/19
146.	100.	7/19

Al: (cont)

CV = 350. ug/l

Result	Uncer.	Date
434.	50.	7/19

CV = 450. +/- 40. ug/l

Result	Uncer.	Date
600.	100.	7/19
532.	100.	7/19

CV = 730. +/- 60. ug/l

Result	Uncer.	Date
830.	100.	7/19
730.	100.	7/19

As: (75EPA 01) (78EPA 03)

CV = 18. ug/l

Result	Uncer.	Date
17.	1.7	1/11
17.	2.	7/09

CV = 22. ug/l

Result	Uncer.	Date
22.	2.	7/05
20.	2.	7/09
20.	2.	7/09
20.1	2.	11/19
20.1	2.	11/19

CV = 40. ug/l

Result	Uncer.	Date
40.	4.	10/02
36.	4.	10/02
40.	4.	10/03
41.1	4.1	11/19
41.1	4.1	11/19

Ba: (78EPA 03)

CV = 142. ug/l

Result	Uncer.	Date
153.	30.	1/16
162.	50.	7/19
164.	50.	7/19
190.	50.	7/19
170.	50.	7/19
149.	15.	9/24
160.	16.	11/19
160.	16.	11/19

CV = 192. +/- 20. ug/l

Result	Uncer.	Date
220.	50.	7/19
190.	50.	7/19
208.	21.	11/19
208.	21.	11/19

CV = 335. ug/l

Result	Uncer.	Date
347.	35.	9/24
334.	33.	9/24
317.	32.	9/24
317.	70.	10/03
317.	70.	10/03

Cd: (75EPA 01)
(78EPA 03) (81EPA 03)

CV = 1.5 ug/l

Result	Uncer.	Date
1.5	0.2	1/05
1.9	0.38	5/03

CV = 2.5 +/- 0.3 ug/l

Result	Uncer.	Date
2.66	0.53	5/03

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Cd: (cont)

CV = 2.9 ug/l

Result	Uncer.	Date
2.85	0.56	5/03
2.85	0.56	5/03
2.5	0.3	6/28
3.2	0.3	6/28
2.92	0.29	9/17

CV = 3.3 +/- 0.4 ug/l

Result	Uncer.	Date
2.7	0.3	6/28
3.3	0.3	6/28
3.31	0.33	9/17
3.53	0.35	9/24

CV = 4.3 ug/l

Result	Uncer.	Date
3.81	0.76	5/03
4.	0.8	5/03
4.14	0.41	9/17
4.11	0.41	9/17
4.05	0.41	9/17
4.75	0.48	9/17

CV = 4.6 +/- 0.5 ug/l

Result	Uncer.	Date
3.8	0.4	6/28
4.47	0.45	9/17
3.72	0.37	9/17
4.41	0.44	9/24

CV = 9.1 +/- 1. ug/l

Result	Uncer.	Date
7.62	1.52	5/03
12.	2.	11/20
9.	2.	11/20
6.8	2.	12/03
6.8	2.	12/03
6.8	2.	12/03
6.8	2.	12/03
6.8	2.	12/03
6.8	2.	12/03

Cd: (cont)

CV = 10. ug/l

Result	Uncer.	Date
10.	1.	1/05
9.14	1.82	5/03
9.14	1.82	5/03
8.96	0.9	11/19
8.96	0.9	11/19

CV = 13. +/- 1.3 ug/l

Result	Uncer.	Date
12.	2.4	5/03

CV = 39. +/- 3. ug/l

Result	Uncer.	Date
35.9	7.18	5/03

CV = 50. ug/l

Result	Uncer.	Date
44.	4.	1/05
47.5	9.5	5/03

CV = 70. +/- 6. ug/l

Result	Uncer.	Date
66.6	13.3	5/03
63.	6.	12/28
63.	6.	12/28

CV = 73. +/- 5. ug/l

Result	Uncer.	Date
32.7	0.	11/02
32.7	0.	11/02

Cr: (75EPA 01)
(78EPA 03) (81EPA 03)

CV = 7.1 +/- 1. ug/l

Result	Uncer.	Date
7.5	0.8	7/19

Cr: (cont)

CV = 18. +/- 1.5 ug/l

Result	Uncer.	Date
17.3	1.7	7/19
16.9	1.7	7/19
17.	2.	7/19
17.	1.7	9/17
19.	1.9	11/19
19.	1.9	11/19

CV = 46. +/- 3.5 ug/l

Result	Uncer.	Date
44.9	4.5	11/19
44.9	4.5	11/19

CV = 80. +/- 8. ug/l

Result	Uncer.	Date
81.	8.	7/03
60.	6.	7/03
79.8	8.	11/19
79.8	8.	11/19

CV = 209. +/- 15. ug/l

Result	Uncer.	Date
192.	20.	6/27
193.	20.	6/27
170.	20.	7/03
160.	18.	7/03
159.	18.	7/03

Cu: (75EPA 01) (81EPA 03)

CV = 8. ug/l

Result	Uncer.	Date
9.8	1.	1/05

CV = 8.9 +/- 1.5 ug/l

Result	Uncer.	Date
11.	2.	12/21
7.	2.	12/21
11.	2.	12/21

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Cu: (cont)

CV = 40. ug/l

Result	Uncer.	Date
39.	4.	1/05
39.	4.	1/05
39.	4.	3/27
37.	4.	3/27
48.	5.	6/27
51.	5.	6/27

CV = 50. +/- 4. ug/l

Result	Uncer.	Date
51.	5.	9/17

CV = 102. +/- 7. ug/l

Result	Uncer.	Date
112.	10.	7/02
116.	10.	7/02
112.	10.	7/02
111.	10.	7/02
109.	10.	7/02
111.	10.	7/02
112.	10.	8/01
109.	10.	8/01
89.	9.	10/03
88.	9.	10/03
89.	9.	10/03
91.	9.	10/30
92.	9.	10/30

CV = 250. ug/l

Result	Uncer.	Date
253.	25.	1/05
270.	27.	3/27

Fe: (75EPA 01) (81EPA 03)

CV = 600. ug/l

Result	Uncer.	Date
618.	30.	7/19

CV = 678. +/- 50. ug/l

Result	Uncer.	Date
643.	60.	10/03
645.	60.	10/03
642.	60.	10/03
643.	60.	10/03
641.	60.	10/03
642.	60.	10/03
747.	70.	10/30

CV = 796. +/- 30. ug/l

Result	Uncer.	Date
785.	40.	7/19

CV = 900. +/- 40. ug/l

Result	Uncer.	Date
921.	50.	7/19

Hg: (75EPA 01) (78EPA 03)
(81EPA 03)

CV = 0.7 +/- 0.2 ug/l

Result	Uncer.	Date
0.5	0.08	11/26
0.67	0.1	11/26
0.5	0.08	11/26
0.5	0.08	11/26
0.67	0.1	11/26
0.5	0.08	11/26
0.5	0.08	11/26
0.67	0.1	11/26
0.84	0.15	11/26

CV = 1.4 +/- 0.3 ug/l

Result	Uncer.	Date
1.1	0.1	7/02
1.3	0.1	7/02

Hg: (cont)
CV = 3.5 +/- 0.4 ug/l

Result	Uncer.	Date
2.2	0.2	7/02
2.32	0.2	7/02
2.37	0.2	7/02

CV = 9.4 +/- 0.7 ug/l

Result	Uncer.	Date
10.9	2.	10/17
11.9	2.	10/17
11.7	2.	10/17
10.4	2.	10/17
12.4	2.	10/17
11.2	2.	10/17
10.	2.	10/18
10.	2.	10/18
10.	2.	10/18
10.	2.	10/18
8.4	1.5	10/18
9.7	1.9	11/06
8.7	1.5	11/06

Mn: (75EPA 01) (81EPA 03)
CV = 11. ug/l

Result	Uncer.	Date
12.	1.	1/05

CV = 13. +/- 2. ug/l

Result	Uncer.	Date
15.5	3.	12/31
14.7	3.	12/31

CV = 15. +/- 2. ug/l

Result	Uncer.	Date
20.4	2.	12/31
15.7	2.	12/31

CV = 55. ug/l

Result	Uncer.	Date
51.	5.	1/05

CV = 348. +/- 20. ug/l

Result	Uncer.	Date
327.	50.	7/19

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Mn: (cont)

CV = 350. ug/l

Result	Uncer.	Date
352.	35.	1/05
359.	50.	7/19

CV = 397. +/- 30. ug/l

Result	Uncer.	Date
400.	40.	6/27
403.	40.	6/27
372.	40.	6/27
395.	40.	6/27

CV = 500. +/- 40. ug/l

Result	Uncer.	Date
497.	50.	7/19

Ni: (75EPA 01)

CV = 30. +/- 4. ug/l

Result	Uncer.	Date
29.3	2.9	9/24

CV = 80. +/- 7. ug/l

Result	Uncer.	Date
68.	8.	8/10
83.	9.	8/10

CV = 152. +/- 10. ug/l

Result	Uncer.	Date
217.	20.	6/27
214.	20.	6/27
176.	18.	10/10
155.	18.	10/10
158.	18.	10/10
169.	18.	10/10
162.	18.	10/10
138.	15.	10/10

Pb: (75EPA 01) (76EPA 01)
(78EPA 03) (81EPA 03)

CV = 18. ug/l

Result	Uncer.	Date
19.	2.	1/05
17.	3.4	5/03
18.7	3.8	6/27
22.	2.	7/09
18.2	1.8	9/24

CV = 22. +/- 4. ppb

Result	Uncer.	Date
18.9	3.7	5/03
19.	3.8	5/03
20.7	4.1	5/03
21.6	4.3	5/03
17.6	3.5	6/27
20.4	4.1	6/27
22.	2.	7/09
21.	2.1	9/24

CV = 24. +/- 3. ug/l

Result	Uncer.	Date
19.	3.8	5/03

CV = 28. +/- 4. ug/l

Result	Uncer.	Date
28.	3.	7/09
29.4	2.9	11/19
29.4	2.9	11/19

CV = 30. ug/l

Result	Uncer.	Date
26.5	5.3	6/27

CV = 38. ug/l

Result	Uncer.	Date
36.	7.2	5/03
33.7	6.7	6/27
41.	4.	7/09
37.	3.7	9/24
37.4	3.7	9/24
33.8	3.4	9/24
46.3	1.5	10/03
46.3	1.5	10/03

Pb: (cont)

CV = 43. +/- 4. ug/l

Result	Uncer.	Date
44.4	8.8	5/03
39.	7.8	5/03
42.	8.4	5/03
50.8	10.2	6/27
34.9	7.	6/27
30.1	6.	6/27
39.	4.	7/09
54.	5.	11/20
54.	5.	11/20
30.	4.	11/20
37.	4.	11/20

CV = 45. +/- 4. ug/l

Result	Uncer.	Date
47.	5.	7/09

CV = 80. ug/l

Result	Uncer.	Date
78.	8.	1/05
70.	7.	1/05
85.8	17.2	5/03
74.2	14.8	6/27
72.4	14.5	6/27
82.	8.	7/09
80.4	8.	11/19
80.4	8.	11/19

CV = 120. +/- 12. ug/l

Result	Uncer.	Date
123.	24.	5/03
119.	10.	8/09
116.	10.	8/09
116.	10.	8/09
127.	10.	8/16
124.	10.	8/16
124.	10.	8/16

CV = 250. ug/l

Result	Uncer.	Date
290.	30.	1/05
258.	51.	5/03
252.	50.	6/27

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Pb: (cont)

CV = 352. +/- 30. ug/l

Result	Uncer.	Date
273.	25.	8/03
264.	25.	8/03
252.	25.	8/03
247.	25.	8/03
356.	40.	10/05
347.	40.	10/05
359.	40.	10/05
354.	40.	10/05
348.	40.	10/05
361.	40.	10/05
168.	20.	11/02
175.	20.	11/02

CV = 400. +/- 30. ug/l

Result	Uncer.	Date
377.	75.	5/03

CV = 435. +/- 20. ug/l

Result	Uncer.	Date
424.	84.	5/03
389.	79.	5/03
438.	87.	6/27
379.	75.	6/27

Se: (75EPA 01)
(78EPA 03) (81EPA 03)

CV = 3.5 ug/l

Result	Uncer.	Date
3.3	0.3	9/05

CV = 6. +/- 1. ug/l

Result	Uncer.	Date
5.8	0.6	9/05
5.8	0.5	9/24
6.6	0.7	9/05
6.3	0.6	9/05

Se: (cont)

5.8	0.6	9/05
6.2	0.6	9/05
5.9	0.6	9/05
6.3	0.6	9/05
5.6	0.6	9/05
6.7	0.7	9/05
6.6	0.6	9/24
5.8	0.5	9/24
6.3	0.6	9/24
5.2	0.5	9/24
6.2	0.6	9/24
6.7	0.6	9/24
5.9	0.5	9/24
7.3	0.7	9/24
7.1	0.7	11/19
7.1	0.7	11/19

CV = 7.3 ug/l

Result	Uncer.	Date
7.9	0.8	9/05
7.5	0.8	9/05
7.6	0.8	9/05
7.5	0.8	9/05
7.0	0.7	9/05
7.5	0.7	9/24
7.4	0.7	9/24
7.9	0.7	9/24
7.6	0.7	9/24
8.2	1.0	10/03
8.2	1.0	10/03

CV = 7.6 +/- 1. ug/l

Result	Uncer.	Date
7.1	0.7	9/05
7.1	0.7	9/24

CV = 11. +/- 1. ug/l

Result	Uncer.	Date
12.1	1.2	11/19
12.1	1.2	11/19

CV = 20. ug/l

Result	Uncer.	Date
28.	5.	1/16
18.3	1.8	9/05
19.5	2.	11/19
19.5	2.	11/19

Se: (cont)

CV = 30. +/- 3. ug/l

Result	Uncer.	Date
23.5	3.	8/14
23.6	3.	8/14
13.7	1.4	11/19
13.7	1.4	11/19

CV = 40. ug/l

Result	Uncer.	Date
44.	8.	1/16

CV = 44. +/- 4. ug/l

Result	Uncer.	Date
32.	4.	7/10
33.	4.	7/10
35.	4.	7/10
28.	4.	7/10

Zn: (75EPA 01) (81EPA 03)

CV = 10. +/- 2. ug/l

Result	Uncer.	Date
13.	2.	11/09
14.	2.	11/09
12.	2.	11/09
15.	2.	11/19
15.	2.	11/19
17.	2.	11/19
13.	2.	12/13
11.	2.	12/13

CV = 12. ug/l

Result	Uncer.	Date
8.9	0.9	6/27

CV = 60. ug/l

Result	Uncer.	Date
56.	6.	3/20
52.	5.	3/20
54.	5.	6/27

TABLE D-VI (cont)

****

EPA Trace Metals in Water
(cont)

Zn: (cont)

CV = 80. +/- 7. ug/l

Result	Uncer.	Date
87.	8.	8/15
87.	8.	8/15
88.	8.	8/15
81.3	8.	9/17

CV = 174. +/- 10. ug/l

Result	Uncer.	Date
134.	10.	6/15
154.	10.	6/15
181.	15.	7/02
115.	12.	7/02
120.	12.	7/02
178.	15.	7/02
184.	15.	7/03
142.	15.	7/03
158.	15.	7/03
180.	15.	8/01
183.	15.	8/01
179.	15.	10/03
177.	15.	10/03
177.	15.	10/03
175.	15.	10/03
177.	15.	10/03
177.	15.	10/03

CV = 200. ug/l

Result	Uncer.	Date
193.	20.	3/20
210.	20.	3/20
198.	20.	6/26
191.	20.	6/26

CV = 400. +/- 20. ug/l

Result	Uncer.	Date
404.	40.	12/26
406.	40.	12/26
413.	40.	12/26

****

EPA Nitrate/Fluoride-1

NO3: (77EPA 01)

CV = .97 mg/l

Result	Uncer.	Date
0.97	0.1	5/07

****

EPA Nitrate/Fluoride No. 1

F: (78EPA 04)

CV = 0.19 mg/l

Result	Uncer.	Date
0.2	0.02	3/06

NO3: (78EPA 04)

CV = 0.18 mg/l

Result	Uncer.	Date
0.16	0.02	3/06
0.19	0.02	3/06
0.14	0.05	5/07

****

EPA Nitrate/Fluoride-2

NO3: (77EPA 01)

CV = 44.7 mg/l

Result	Uncer.	Date
46.7	4.	5/07

****

EPA Nitrate/Fluoride No. 10

F: (78EPA 04)

CV = 1.12 mg/l

Result	Uncer.	Date
1.15	0.1	3/06
1.01	0.1	9/05
1.09	0.11	9/05

NO3: (78EPA 01)

CV = 5.84 mg/l

Result	Uncer.	Date
6.4	0.5	5/07
5.76	0.6	9/05
5.85	1.	12/31

****

EPA Nitrate/Fluoride No. 11

NO3: (78EPA 04)

CV = 45.6 mg/l

Result	Uncer.	Date
44.3	2.	2/13
46.6	4.	5/07
45.6	9.	12/31

TABLE D-VI (cont)

****

EPA Nutrients No. 1

NO3: (81EPA 02)

CV = 0.8 +/- 0.1 mg/l

Result	Uncer.	Date
0.91	0.13	3/09
0.79	0.13	3/09
0.66	0.13	3/09
0.93	0.01	3/20
0.93	0.01	3/20
0.66	0.01	3/20
0.8	0.01	3/20
0.81	0.08	3/29

****

EPA Nutrients No. 2

NH3-N: (81EPA 02)

CV = 1.52 +/- 0.1 mg/l

Result	Uncer.	Date
1.5	0.1	3/27
1.5	0.1	3/27
1.6	0.1	3/27
1.6	0.1	4/24
1.53	0.1	5/08
1.53	0.1	5/28

NO3: (81EPA 02)

CV = 7.04 mg/l

Result	Uncer.	Date
7.4	0.5	5/07

NO3-N: (81EPA 02)

CV = 1.61 +/- 0.1 mg/l

Result	Uncer.	Date
1.6	0.1	3/06
1.6	0.1	3/06
1.6	0.1	3/20
1.6	0.1	3/20
1.7	0.1	6/14
1.7	0.1	7/11
1.7	0.1	7/11
1.5	0.1	8/07

PO4: (81EPA 02)

CV = 0.83 +/- 0.08 mg/l

Result	Uncer.	Date
0.91	0.1	12/31
0.88	0.1	12/31

****

EPA Nutrients, Sample #4

NH3-N: (81EPA 02)

CV = 1.9 +/- 0.11 mg/l

Result	Uncer.	Date
1.84	0.2	8/01
1.94	0.2	8/01
1.93	0.2	8/01
1.92	0.2	9/27
1.91	0.2	10/09
1.90	0.2	10/25
1.95	0.2	11/09

NO3-N: (81EPA 02)

CV = 1.43 +/- 0.06 mg/l

Result	Uncer.	Date
1.26	0.1	10/03
1.52	0.1	10/19
1.44	0.1	11/06
1.36	0.1	11/19
1.31	0.1	11/19
1.34	0.1	11/21
1.37	0.1	11/21
1.42	0.1	12/07

P: (81EPA 02)

CV = 350. +/- 10. ug/l

Result	Uncer.	Date
370.	40.	8/03
357.	40.	8/03

****

EPA Nutrients, Sample #8

P: (81EPA 02)

CV = 1.37 +/- 0.06 mg/l

Result	Uncer.	Date
1.38	0.1	8/30
1.52	0.1	9/04
1.46	0.1	9/04
1.52	0.1	10/05
1.3	0.1	10/05
1.42	0.1	11/01

TABLE D-VI (cont)

****

EPA Cyanide in Water,
Sample #8

CN: (82EPA 01)

CV = 0.561 +/- 0.060 mg/l

Result	Uncer.	Date
0.50	0.05	8/12
0.51	0.05	8/12
0.52	0.05	9/10
0.52	0.05	9/10
0.48	0.05	10/12
0.47	0.05	10/12
0.49	0.05	10/12
0.47	0.05	10/12
0.47	0.05	10/12
0.49	0.05	11/07
0.49	0.05	12/27
0.48	0.05	12/27

****

EML Cs-137 in Water,
April 1980

Cs-137: (80EML 01)

CV = 1020. +/- 50. pCi/l

Result	Uncer.	Date
950.	194.	1/23
1316.	265.	1/23
1029.	207.	1/23
1003.	206.	1/23
955.	193.	1/23
1040.	210.	4/04
956.	193.	4/04
1130.	228.	4/04
1080.	219.	4/05
990.	200.	4/05
933.	189.	4/05
1000.	204.	4/05
1090.	121.	5/29
1005.	114.	8/21
1055.	132.	8/21
990.	118.	8/21
1000.	114.	8/21

Cs-137: (cont)

1050.	225.	9/25
976.	209.	9/25
1340.	279.	9/25
1080.	142.	11/07
918.	108.	11/07
1000.	116.	11/07
1000.	122.	11/07
944.	112.	11/07
965.	117.	11/07
943.	108.	11/07
1010.	118.	11/07
1210.	146.	11/07
1090.	130.	11/07
1050.	118.	11/07
986.	111.	11/07
972.	115.	11/07
1090.	125.	11/07
962.	122.	11/07
888.	103.	11/17
1018.	126.	11/17
933.	69.	11/17
1037.	123.	11/17
1032.	168.	11/24
1040.	174.	11/24
1012.	168.	11/24
1062.	125.	11/24
1047.	167.	11/24
948.	157.	11/24
1076.	125.	11/24
1176.	196.	11/24
971.	154.	11/24
1085.	177.	11/24
1012.	132.	12/09

****

EML Cs-137 in Soil, April 1980

Cs-137: (80EML 01)

CV = 0.72 +/- 0.07 pCi/g

Result	Uncer.	Date
0.56	0.12	1/23
0.77	0.16	1/23
0.68	0.15	1/23
0.77	0.15	1/23
0.7	0.16	2/06
0.60	0.13	2/06
0.56	0.12	2/06
0.74	0.15	2/06

Cs-137: (cont)

0.69	0.14	2/06
0.8	0.17	2/06
0.73	0.15	4/05
0.59	0.13	4/05
0.84	0.15	7/03
0.74	0.15	7/03
0.72	0.15	7/03
0.77	0.17	11/21
0.72	0.18	11/21
0.66	0.16	11/21
0.85	0.19	11/21
0.86	0.19	11/21
0.78	0.18	11/21
0.77	0.18	11/21
0.77	0.17	11/21
0.79	0.19	11/21
0.68	0.16	11/21
1.01	0.23	11/21

****

EML Radionuclides on
Air Filters Nov. 1983

Am-241: (84EML 01)

CV = 1.69 +/- 0.09 pCi/filter

Result	Uncer.	Date
1.57	0.16	1/17
1.68	0.14	1/17

Pu-239: (84EML 01)

CV = 2.12 +/- 0.15 pCi/filter

Result	Uncer.	Date
1.89	0.08	1/17
1.91	0.09	1/17

TABLE D-VI (cont)

****

EML Radionuclides on Soil
Nov 1983

Am-241: (84EML 01)

CV = 0.006 +/- 0.001 pCi/g

Result	Uncer.	Date
0.01	0.004	2/07
0.04	0.008	2/07

Cs-137: (84EML 01)

CV = 1.0 +/- 0.05 pCi/g

Result	Uncer.	Date
1.20	0.24	2/07
1.08	0.22	2/07

K-40: (84EML 01)

CV = 12.6 +/- 0.5 pCi/g

Result	Uncer.	Date
3.86	1.34	2/07
7.51	1.75	2/07
5.53	1.84	2/07

Pu-238: (84EML 01)
CV = 0.4 +/- 0.02 pCi/g

Result	Uncer.	Date
0.54	0.006	2/07
0.41	0.005	2/07

Pu-239: (84EML 01)
CV = 0.011 +/- 0.002 pCi/g

Result	Uncer.	Date
0.033	0.005	2/07
0.008	0.002	2/07
0.014	0.003	2/07

Ra-226: (84EML 01)

CV = 0.66 +/- 0.05 pCi/g

Result	Uncer.	Date
0.5	0.05	2/07
0.6	0.06	2/07
0.5	0.05	2/07

Sr-90: (84EML 01)

CV = 2.58 +/- 0.34 pCi/g

Result	Uncer.	Date
2.38	0.11	2/07
2.50	0.16	2/07
2.31	0.17	2/07

U: (84EML 01)

CV = 2.25 +/- 0.32 ppm

Result	Uncer.	Date
2.50	0.25	2/07
2.55	0.26	2/07
2.41	0.24	2/07

****

EML Radionuclides in Water
Nov. 1983

Am-241: (84EML 01)
CV = 26.0 +/- 3.9 pCi/l

Result	Uncer.	Date
5.22	0.28	1/17
5.1	0.3	1/17
4.86	0.32	1/17

Dilution error in orignial
above; correct data should Be:

26.1	1.4	1/17
25.5	1.5	1/17
24.3	1.6	1/17

Co-60: (84EML 01)

CV = 4470. +/- 89.4 pCi/l

Result	Uncer.	Date
4630.	928.	1/17
4380.	881.	1/17
4480.	901.	1/17

Cr-51: (84EML 01)

CV = 42300. +/- 2538. pCi/l

Result	Uncer.	Date
46700.	9360.	1/17
48100.	9640.	1/17
41000.	8220.	1/17

Cs-137: (84EML 01)

CV = 5460. +/- 200. pCi/l

Result	Uncer.	Date
5980.	1200.	1/17
5970.	1200.	1/17
5640.	1130.	1/17

H-3: (84EML 01)

CV = 69400. +/- 6246. pCi/l

Result	Uncer.	Date
89000.	9000.	1/17
90000.	9000.	1/17
89000.	9000.	1/17

Mn-54: (84EML 01)

CV = 4590. +/- 45.9 pCi/l

Result	Uncer.	Date
4920.	1480.	1/17
4970.	1490.	1/17
4630.	928.	1/17

TABLE D-VI (cont)

****

EML Radionuclides in Water
Nov. 1983 (cont)

Pu-239: (84EML 01)

CV = 15.0 +/- 1.95 pCi/l

Result	Uncer.	Date
13.4	0.6	1/17
13.	0.6	1/17
11.6	0.6	1/17

Sr-90: (84EML 01)

CV = 220. +/- 13.2 pCi/l

Result	Uncer.	Date
192.	4.	1/17
196.	5.	1/17
214.	8.	1/17

****

EML Radionuclides on Vegetation
Nov. 1983

Am-241: (84EML 01)

CV = 0.0113 +/- 0.001 pCi/g

Result	Uncer.	Date
0.015	0.004	1/17
0.018	0.005	1/17
0.013	0.004	1/17

Cs-137: (84EML 01)

CV = 1.38 +/- 0.03 pCi/g

Result	Uncer.	Date
1.74	0.35	1/17
1.67	0.34	1/17

K-40: (84EML 01)

CV = 13.9 +/- 0.7 pCi/g

Result	Uncer.	Date
4.32	1.24	1/17
4.15	1.68	1/17

****

EML Radionuclides in Tissue
Nov. 1983

Am-241: (84EML 01)

CV = 0.014 +/- 0.002 pCi/g

Result	Uncer.	Date
0.020	0.011	1/17
0.032	0.017	1/17
0.014	0.009	1/17

Cs-137: (84EML 01)
CV = 1.78 +/- 0.09 pCi/g

Result	Uncer.	Date
1.91	0.39	1/17
1.94	0.4	1/17

Pu-238: (84EML 01)
CV = 0.074 +/- 0.007 pCi/g

Result	Uncer.	Date
0.062	0.010	1/17
0.080	0.008	1/17
0.065	0.007	1/17

Pu-239: (84EML 01)
CV = 0.019 +/- 0.004 pCi/g

Result	Uncer.	Date
0.017	0.004	1/17
0.013	0.004	1/17
0.022	0.004	1/17

****

EML Radionuclides in Soil,
May 1984

Am-241: (84EML 01)

CV = .36 +/- .02 pCi/g

Result	Uncer.	Date
0.0007	0.0017	8/23
0.0003	0.0017	8/23
0.0038	0.0019	8/23

Cs-137: (84EML 01)

CV = 0.41 +/- 0.04 pCi/g

Result	Uncer.	Date
0.49	0.14	6/25
0.48	0.14	6/25
0.47	0.14	6/25

K-40: (84EML 01)

CV = 21. +/- 0.63 pCi/g

Result	Uncer.	Date
25.3	5.2	6/25
24.6	5.1	6/25
23.3	4.8	6/25

Pu-238: (84EML 01)

CV = 0.054 +/- 0.001 pCi/g

Result	Uncer.	Date
0.036	0.006	8/15
0.047	0.005	8/15
0.057	0.005	8/15

TABLE D-VI (cont)

****

EML Radionuclides in Soil,
May 1984 (cont)

Pu-239: (84EML 01)

CV = 3.13 +/- 0.12 pCi/g

Result	Uncer.	Date
3.32	0.11	8/15
2.40	0.08	8/15
2.43	0.13	8/15

Sr-90: (84EML 01)

CV = 0.233 +/- 0.028 pCi/g

Result	Uncer.	Date
0.14	0.06	7/09
0.20	0.03	7/09
0.33	0.06	7/09

U: (84EML 01)

CV = 3.7 +/- 0.3 ppm

Result	Uncer.	Date
3.66	0.18	6/22
3.71	0.19	6/22
3.57	0.18	6/22

****

EML Radionuclides in Water
May 1984

Cs-137: (84EML 01)

CV = 4590. +/- 50. pCi/l

Result	Uncer.	Date
4820.	493.	6/25
4800.	491.	6/25
4860.	497.	6/25

Pu-239: (84EML 01)

CV = 30. +/- 2. pCi/l

Result	Uncer.	Date
26.7	0.7	8/15
27.7	0.7	8/15
28.0	0.7	8/15

Sr-90: (84EML 01)

CV = 500. +/- 20. pCi/l

Result	Uncer.	Date
420.	20.	8/14
422.	11.	8/14
424.	17.	8/14

U: (84EML 01)

CV = 65. +/- 3. pCi/l

Result	Uncer.	Date
64.6	6.5	6/26
64.9	6.5	6/26
66.7	6.7	6/26

****

EML Radionuclides in
Vegetation, May 1984

Co-60: (84EML 01)

CV = 1.64 +/- 0.08 pCi/g

Result	Uncer.	Date
1.65	0.34	6/25
1.70	0.35	6/25
1.52	0.32	6/25

Cs-137: (84EML 01)

CV = 8.57 +/- 0.34 pCi/g

Result	Uncer.	Date
8.74	1.32	6/25
8.84	1.34	6/25
8.75	1.32	6/25

K-40: (84EML 01)

CV = 23.4 +/- 0.9 pCi/g

Result	Uncer.	Date
22.	4.6	6/25
21.	4.4	6/25
24.6	5.1	6/25

Pu-239: (84EML 01)

CV = 0.068 +/- 0.005 pCi/g

Result	Uncer.	Date
0.063	0.003	8/15
0.061	0.003	8/15
0.059	0.002	8/15

Sr-90: (84EML 01)

CV = 12.2 +/- 0.1 pCi/g

Result	Uncer.	Date
10.3	1.	8/14
12.4	0.7	8/14
12.1	0.7	8/14

TABLE D-VI (cont)

EML Radionuclides in Soil,
Nov. 1984

Co-60: (84EML 01)

CV = 0.91 +/- 0.02 pCi/g

Result	Uncer.	Date
0.97	0.20	12/31
0.98	0.20	12/31
0.89	0.18	12/31

Cs-137: (84EML 01)

CV = 0.46 +/- 0.02 pCi/g

Result	Uncer.	Date
0.46	0.08	11/21
0.45	0.09	11/21
0.41	0.09	11/21

Sr-90: (84EML 01)

CV = 11.3 +/- 0.8 pCi/g

Result	Uncer.	Date
10.1	0.4	12/28
8.6	0.4	12/29
8.2	0.4	12/29

U: (84EML 01)

CV = 2.42 +/- 0.10 ppm

Result	Uncer.	Date
2.55	0.2	12/01
2.57	0.2	12/01
2.56	0.2	12/01

Pu-239: (84EML 01)

CV = 0.0021 +/- 0.0003 pCi/g

Result	Uncer.	Date
0.0043	0.0010	12/31
0.0030	0.0010	12/31

EML Radionuclides in Water
Nov. 1984

Co-60: (84EML 01)

CV = 4460. +/- 180. pCi/l

Result	Uncer.	Date
5140.	775.	12/31
5020.	758.	12/31
5050.	762.	12/31

Cs-137: (84EML 01)

CV = 4550. +/- 180. pCi/l

Result	Uncer.	Date
4880.	736.	11/24
4840.	730.	11/24
4720.	710.	11/24

Mn-54: (84EML 01)

CV = 46400. +/- 1000. pCi/l

Result	Uncer.	Date
59100.	8890.	12/31
59700.	8980.	12/31
59700.	8970.	12/31

Sr-90: (84EML 01)

CV = 260. +/- 18. pCi/l

Result	Uncer.	Date
140.	20.	12/28
120.	30.	12/28
90.	20.	12/29

U: (84EML 01)

CV = 67. +/- 9. ppb

Result	Uncer.	Date
70.	7.	12/05
69.	7.	12/05
71.	7.	12/05

H-3: (84EML 01)

CV = 24800. +/- 700. pCi/l

Result	Uncer.	Date
53000.	1000.	12/31
53000.	1000.	12/31
51000.	1000.	12/31

Pu-239: (84EML 01)

CV = 50. +/- 10. pCi/l

Result	Uncer.	Date
40.9	6.0	12/31
41.4	6.0	12/31
41.0	6.0	12/31

Am-241: (84EML 01)

CV = 46. +/- 2. pCi/l

Result	Uncer.	Date
44.3	6.0	12/31
40.2	6.0	12/31
40.4	6.0	12/31

TABLE D-VI (cont)

****

EML Radionuclides on Air Filters
Nov. 1984

BE-7: (84EML 01)

CV = 5860. +/- 180. pCi/filter

Result	Uncer.	Date
6820.	1420.	12/31
6620.	1390.	12/31

Co-60: (84EML 01)

CV = 454. +/- 14. pCi/filter

Result	Uncer.	Date
570.	132.	12/31
571.	133.	12/31

Cs-137: (84EML 01)

CV = 533. +/- 16. pCi/filter

Result	Uncer.	Date
654.	105.	12/31
609.	100.	12/31

Mn-54: (84EML 01)

CV = 4710. +/- 140. pCi/filter

Result	Uncer.	Date
5580.	1120.	12/31
5710.	1150.	12/31

Sr-90: (84EML 01)

CV = 2.4 +/- 0.3 pCi/filter

Result	Uncer.	Date
2.0	0.3	12/31
2.1	0.3	12/31

Pu-239: (84EML 01)

CV = 4.95 +/- 1.04 pCi/filter

Result	Uncer.	Date
4.80	0.45	12/31
3.75	0.42	12/31

Am-241: (84EML 01)

CV = 6.22 +/- 0.19 pCi/filter

Result	Uncer.	Date
7.51	0.72	12/31
6.24	0.65	12/31

U: (84EML 01)

CV = 6.1 +/- 0.1 ug/filter

Result	Uncer.	Date
7.2	0.7	12/31
6.9	0.7	12/31

****

EML Radionuclides in
Vegetation, Nov. 1984

Co-60: (84EML 01)

CV = 29.0 +/- 0.6 pCi/g

Result	Uncer.	Date
29.2	4.3	12/31

Cs-137: (84EML 01)

CV = 158. +/- 3. pCi/g

Result	Uncer.	Date
117.	23.	11/20
157.	23.	12/31
134.	20.	12/31

Pu-239: (84EML 01)

CV = 1.22 +/- 0.05 pCi/g

Result	Uncer.	Date
1.44	0.21	12/31
1.14	0.17	12/31
1.73	0.26	12/31

****

EML Radionuclides in Tissue
Nov. 1984

Cs-137: (84EML 01)

CV = 1.00 +/- 0.002 pCi/g

Result	Uncer.	Date
1.02	0.21	11/20
1.15	0.18	12/31
1.05	0.16	12/31

Sr-90: (84EML 01)

CV = 3.1 +/- 0.25 pCi/g

Result	Uncer.	Date
2.44	0.3	12/31
3.00	0.4	12/31
2.67	0.3	12/31

Pu-239: (84EML 01)

CV = 0.024 +/- 0.001 pCi/g

Result	Uncer.	Date
0.017	0.003	12/31
0.023	0.003	12/31

TABLE D-VI (cont)

****

NIOSH PAT Round 76
Trace Metals on Air Filters

Cd: (84PAT 01)

CV = 5.4 +/- 0.33 ug/filter

Result	Uncer.	Date
5.7	0.6	6/01

CV = 8.9 +/- 0.4 ug/filter

Result	Uncer.	Date
9.1	0.9	6/01

CV = 11.6 +/- 0.6 ug/filter

Result	Uncer.	Date
11.9	1.2	6/01

CV = 15.9 +/- 0.8 ug/filter

Result	Uncer.	Date
15.8	1.6	6/01

Pb: (84PAT 01)

CV = 18.1 +/- 1.2 ug/filter

Result	Uncer.	Date
16.3	1.6	6/01

CV = 24.3 +/- 1.6 ug/filter

Result	Uncer.	Date
23.6	2.4	6/01

CV = 47. +/- 2.2 ug/filter

Result	Uncer.	Date
50.4	5.	6/01

CV = 59.6 +/- 3. ug/filter

Result	Uncer.	Date
67.8	6.8	6/01

Zn: (84PAT 01)

CV = 100.4 +/- 6.2 ug/filter

Result	Uncer.	Date
104.1	10.	6/01

CV = 130. +/- 7. ug/filter

Result	Uncer.	Date
131.6	13.	6/01

CV = 150.3 +/- 8.3 ug/filter

Result	Uncer.	Date
151.	15.	6/01

CV = 172.5 +/- 13.2 ug/filter

Result	Uncer.	Date
167.8	17.	6/01

****

NIOSH PAT Round 76 Organics
on Charcoal

Chloroform: (84PAT 01)

CV = 0.3082 +/- 0.045 mg/tube

Result	Uncer.	Date
0.322	0.03	6/01

CV = 0.4378 +/- 0.073 mg/tube

Result	Uncer.	Date
0.516	0.052	6/01

CV = 0.7104 +/- 0.068 mg/tube

Result	Uncer.	Date
0.785	0.08	6/01

CV = 1.0115 +/- 0.057 mg/tube

Result	Uncer.	Date
1.105	0.11	6/01

Methyl Chloroform: (84PAT 01)

CV = 1.0276 +/- 0.062 mg/tube

Result	Uncer.	Date
1.06	0.11	6/01

CV = 1.2016 +/- 0.115 mg/tube

Result	Uncer.	Date
1.243	0.12	6/01

CV = 1.3288 +/- 0.139 mg/tube

Result	Uncer.	Date
1.394	0.14	6/01

CV = 1.4895 +/- 0.332 mg/tube

Result	Uncer.	Date
1.735	0.18	6/01

****

NIOSH PAT Round 77 Trace Metals
on Air Filters

Cd: (84PAT 01)

CV = 4.9 +/- 0.23 ug/filter

Result	Uncer.	Date
4.7	0.5	6/01

CV = 7.7 +/- 0.33 ug/filter

Result	Uncer.	Date
8.1	0.8	6/01

CV = 10.9 +/- 0.5 ug/filter

Result	Uncer.	Date
11.5	1.1	6/01

CV = 19. +/- 2.5 ug/filter

Result	Uncer.	Date
19.7	0.8	6/01

TABLE D-VI (cont)

****

NIOSH PAT Round 77 Trace Metals
on Air Filters (cont)

Pb: (84PAT 01)

CV = 15.1 +/- 0.9 ug/filter

Result	Uncer.	Date
16.4	1.6	6/01

CV = 25.2 +/- 1.3 ug/filter

Result	Uncer.	Date
26.5	2.6	6/01

CV = 38.4 +/- 1.7 ug/filter

Result	Uncer.	Date
37.1	3.7	6/01

CV = 48.9 +/- 1.8 ug/filter

Result	Uncer.	Date
50.	5.	6/01

Zn: (84PAT 01)

CV = 92.4 +/- 4.8 ug/filter

Result	Uncer.	Date
83.6	8.	6/01

CV = 123.3 +/- 5.6 ug/filter

Result	Uncer.	Date
118.2	12.	6/01

CV = 181.1 +/- 9.3 ug/filter

Result	Uncer.	Date
183.1	18.	6/01

CV = 202.1 +/- 9.2 ug/filter

Result	Uncer.	Date
201.4	20.	6/01

****

NIOSH PAT Round 77 Organics
on Charcoal

Dichloroethane: (84PAT 01)

CV = 0.9862 +/- 0.071 mg/tube

Result	Uncer.	Date
0.7520	0.08	6/01

CV = 1.1927 +/- 0.072 mg/tube

Result	Uncer.	Date
0.9530	0.09	6/01

CV = 1.3739 +/- 0.089 mg/tube

Result	Uncer.	Date
1.2620	0.13	6/01

CV = 1.7944 +/- 0.114 mg/tube

Result	Uncer.	Date
1.1410	0.11	6/01

Carbon Tetrachloride: (84PAT 01)

CV = 0.3789 +/- 0.035 mg/tube

Result	Uncer.	Date
0.3550	0.04	6/01

CV = 0.4856 +/- 0.044 mg/tube

Result	Uncer.	Date
0.5390	0.05	6/01

CV = 0.6434 +/- 0.049 mg/tube

Result	Uncer.	Date
0.5490	0.06	6/01

CV = 1.0048 +/- 0.069 mg/tube

Result	Uncer.	Date
0.7840	0.08	6/01

Trichloroethylene: (84PAT 01)

CV = 0.6204 +/- 0.040 mg/tube

Result	Uncer.	Date
0.4570	0.05	6/01

CV = 0.7299 +/- 0.043 mg/tube

Result	Uncer.	Date
0.7250	0.07	6/01

CV = 0.9371 +/- 0.052 mg/tube

Result	Uncer.	Date
0.7710	0.08	6/01

CV = 1.0384 +/- 0.072 mg/tube

Result	Uncer.	Date
0.7680	0.08	6/01

****

NIOSH PAT Round 78 Metals
on Air Filters

Cd: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.04	0.01	11/05

CV = 7.9 +/- 0.33 ug/filter

Result	Uncer.	Date
7.84	0.5	11/05

CV = 9.6 +/- 0.33 ug/filter

Result	Uncer.	Date
9.48	0.5	11/05

CV = 12.5 +/- 0.7 ug/filter

Result	Uncer.	Date
12.7	1.0	11/05

CV = 16. +/- 1. ug/filter

Result	Uncer.	Date
16.27	0.42	11/05

TABLE D-VI (cont)

****

NIOSH PAT Round 78 Metals on Air Filters (cont)

Pb: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.06	0.33	11/05

CV = 20.2 +/- 1. ug/filter

Result	Uncer.	Date
20.4	0.41	11/05

CV = 32.5 +/- 1.3 ug/filter

Result	Uncer.	Date
31.05	1.5	11/05

CV = 36.3 +/- 1.3 ug/filter

Result	Uncer.	Date
34.8	3.	11/05

CV = 56.1 +/- 2.7 ug/filter

Result	Uncer.	Date
54.68	1.56	11/05

Zn: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
9.4	0.3	11/05

CV = 97.7 +/- 3.3 ug/filter

Result	Uncer.	Date
91.	6.	11/05

CV = 117.8 +/- 6.7 ug/filter

Result	Uncer.	Date
104.2	10.	11/05

Zn: (cont)

CV = 146.1 +/- 6.7 ug/filter

Result	Uncer.	Date
146.4	8.	11/05

CV = 197.1 +/- 6.7 ug/filter

Result	Uncer.	Date
184.2	9.	11/05

****

NIOSH PAT Round 78 Organics on Charcoal

Methyl Ethyl Ketone: (84PAT 01)

CV = Blank mg/tube

Result	Uncer.	Date
0.	0.	11/06

CV = 1.1873 +/- 0.107 mg/tube

Result	Uncer.	Date
1.1034	0.11	11/06

CV = 1.6984 +/- 0.177 mg/tube

Result	Uncer.	Date
1.8263	0.18	11/06

CV = 1.9562 +/- 0.15 mg/tube

Result	Uncer.	Date
2.2898	0.23	11/06

CV = 2.2296 +/- 0.187 mg/tube

Result	Uncer.	Date
2.3611	0.24	11/06

****

NIOSH PAT Round 79 Metals on Air Filters

Cd: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.04	0.04	11/07

CV = 5.5 +/- 0.23 ug/filter

Result	Uncer.	Date
5.58	0.4	11/07

CV = 9.7 +/- 0.4 ug/filter

Result	Uncer.	Date
9.93	0.6	11/07

CV = 11.4 +/- 0.5 ug/filter

Result	Uncer.	Date
11.64	0.9	11/07

CV = 12.5 +/- 0.5 ug/filter

Result	Uncer.	Date
12.84	0.8	11/07

Pb: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.21	0.45	11/07

CV = 12.8 +/- 0.9 ug/filter

Result	Uncer.	Date
12.59	0.5	11/07

CV = 28.5 +/- 1.3 ug/filter

Result	Uncer.	Date
29.32	1.06	11/07

TABLE D-VI (cont)

****

NIOSH PAT Round 79 Metals on Air Filters (cont)

Pb: (cont)

CV = 45.4 +/- 1.8 ug/filter

Result	Uncer.	Date
50.48	5.0	11/07

CV = 50.4 +/- 1.9 ug/filter

Result	Uncer.	Date
55.86	5.0	11/07

Zn: (84PAT 01)

CV = Blank ug/filter

Result	Uncer.	Date
1.9	0.04	11/07

CV = 84.4 +/- 4.6 ug/filter

Result	Uncer.	Date
83.5	4.1	11/07

CV = 120.3 +/- 5.8 ug/filter

Result	Uncer.	Date
120.7	6.9	11/07

CV = 121.3 +/- 5.9 ug/filter

Result	Uncer.	Date
121.9	6.0	11/07

CV = 209.6 +/- 7.9 ug/filter

Result	Uncer.	Date
199.5	12.	11/07

****

NIOSH PAT Round 79 Organics on Charcoal

Toluene: (84PAT 01)

CV = Blank mg/tube

Result	Uncer.	Date
0.	0.	11/07

CV = 0.8679 +/- 0.047 mg/tube

Result	Uncer.	Date
0.7999	0.08	11/07

CV = 1.2608 +/- 0.081 mg/tube

Result	Uncer.	Date
1.3495	0.14	11/07

CV = 1.3942 +/- 0.088 mg/tube

Result	Uncer.	Date
1.1102	0.12	11/07

CV = 1.6295 +/- 0.104 mg/tube

Result	Uncer.	Date
0.9008	0.10	11/07

****

NIOSH PAT Round 79 Organics on Charcoal

Benzene: (84PAT 01)

CV = Blank mg/tube

Result	Uncer.	Date
0.	0.	11/07

CV = 0.0899 +/- 0.0072 mg/tube

Result	Uncer.	Date
0.0975	0.01	11/07

Benzene: (cont)

CV = 0.1306 +/- 0.0082 mg/tube

Result	Uncer.	Date
0.1384	0.01	11/07

CV = 0.1539 +/- 0.01 mg/tube

Result	Uncer.	Date
0.1588	0.01	11/07

CV = 0.2153 +/- 0.012 mg/tube

Result	Uncer.	Date
0.2272	0.02	11/07

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o-Xylene: (84PAT 01)

CV = Blank mg/tube

Result	Uncer.	Date
0.	0.	11/07

CV = 0.7857 +/- 0.037 mg/tube

Result	Uncer.	Date
0.8916	0.09	11/07

CV = 0.8927 +/- 0.043 mg/tube

Result	Uncer.	Date
1.6536	0.16	11/07

CV = 1.1081 +/- 0.0.47 mg/tube

Result	Uncer.	Date
1.3919	0.14	11/07

CV = 1.3128 +/- 0.072 mg/tube

Result	Uncer.	Date
1.2904	0.13	11/07

TABLE D-VI (cont)

****

HSE-9 pH, TDS, Conductivity in Water

Conductivity: (84ADA 01)

CV = 303. +/- 30. umhos

Result	Uncer.	Date
293.	10.	8/13
303.	10.	8/31
310.	10.	9/17
303.	10.	9/24
295.	10.	9/24
302.	10.	11/02
299.	10.	11/06
294.	10.	11/26
286.	10.	11/26
293.	10.	12/11
296.	10.	12/17
290.	10.	12/26
300.	10.	12/26
293.	10.	12/31

PH: (84ADA 01)

CV = 6.87 +/- 0.06 Units

Result	Uncer.	Date
6.86	0.1	8/13
6.84	0.1	8/31
6.79	0.1	8/31
6.91	0.1	9/05
6.89	0.1	9/14
6.87	0.1	9/17
6.9	0.1	9/24
6.89	0.1	9/24
6.84	0.1	11/02
6.84	0.1	11/02
6.92	0.1	11/06
6.91	0.1	11/22
6.89	0.1	11/26
6.93	0.1	12/04
6.85	0.1	12/04
6.87	0.1	12/04
6.84	0.1	12/04
6.86	0.1	12/17
6.86	0.1	12/21

PH: (cont)

6.92	0.1	12/26
6.88	0.1	12/26
6.83	0.1	12/31
6.8	0.1	12/31

TDS: (84ADA 01)

CV = 293. +/- 20. mg/l

Result	Uncer.	Date
287.	20.	1/09
275.	20.	1/16
283.	20.	1/23
297.	20.	1/30
277.	20.	2/06
305.	20.	2/13
284.	20.	2/21
272.	20.	2/27
294.	20.	3/05
307.	20.	3/19
286.	20.	3/26
322.	20.	4/02
283.	20.	4/09
294.	20.	4/23
296.	20.	4/30
284.	20.	5/07
310.	20.	5/14
288.	20.	5/21
296.	20.	6/11
276.	20.	6/18
282.	20.	7/02
285.	20.	7/16
277.	20.	7/23
289.	20.	7/30
277.	20.	8/06
281.	20.	8/13
298.	20.	8/13
273.	20.	9/04
304.	20.	9/14
281.	20.	9/14
279.	20.	9/14
298.	20.	9/18
300.	20.	9/25
312.	20.	10/02
288.	20.	10/11
285.	20.	10/15
286.	20.	10/29
270.	20.	11/13
291.	20.	11/19
273.	20.	11/26
301.	20.	12/03

TDS: (cont)

298.	20.	12/10
314.	20.	12/11
300.	20.	12/17
295.	20.	12/26
289.	20.	12/31

****

HSE-9 COD in Water

COD: (84ADA 01)

CV = 500. +/- 20. mg/l

Result	Uncer.	Date
493.	20.	1/30
492.	20.	2/06
480.	20.	2/13
473.	20.	2/21
488.	20.	8/06
488.	20.	8/13
496.	20.	8/17
492.	20.	8/20
476.	20.	8/30
491.	20.	9/05
488.	20.	9/05
486.	20.	9/12
490.	20.	9/19
490.	20.	9/19
497.	20.	9/25
508.	20.	9/30
493.	20.	10/08
493.	20.	10/09
491.	20.	10/15
498.	20.	10/15
499.	20.	10/23
503.	20.	10/29
483.	20.	11/02
496.	20.	11/05
504.	20.	11/06
499.	20.	11/12
495.	20.	11/19
499.	20.	11/26
483.	20.	12/03
483.	20.	12/10
483.	20.	12/10
475.	20.	12/17
469.	20.	12/24
466.	20.	12/31

TABLE D-VI (cont)

****

HSE-9 Boron in Water

B: (84WAN 01)

CV = 10. +/- 1. mg/l

Result	Uncer.	Date
10.1	1.	2/08
10.7	1.	6/03
10.2	1.	8/05
10.1	1.	10/25
10.4	1.	12/12
10.	1.	12/12
10.	1.	12/12
10.	1.	12/12
10.2	1.	12/12
10.1	1.	12/12
10.3	1.	12/12
10.2	1.	12/12

B: (84ADA 02)

CV = 11. +/- 1. mg/l

Result	Uncer.	Date
11.3	1.	10/25

****

HSE-9 Tap Water

Ca:

CV = None Available (mg/l)

Result	Uncer.	Date
11.	1.1	11/19

K:

CV = None Available (mg/l)

Result	Uncer.	Date
2.3	0.23	12/12

Mg:

CV = None Available (mg/l)

Result	Uncer.	Date
3.11	0.31	11/27

Na:

CV = None Available (mg/l)

Result	Uncer.	Date
14.5	1.5	12/12

NO3:

CV = None Available (ppm)

Result	Uncer.	Date
0.8	0.08	3/06

SIO2:

CV = None Available (ppm)

Result	Uncer.	Date
91.	5.	3/07
91.	5.	3/07
81.	4.	3/29
81.	4.	3/29
79.1	4.	5/14
72.7	4.	5/14

SO4:

CV = None Available (mg/l)

Result	Uncer.	Date
2.46	0.25	11/19

****

HSE-9 Trace Metals
on Air Filters

Ag: (84GAU 01)

CV = 20. +/- 1.0 ug/filter

Result	Uncer.	Date
24.69	2.	12/13
20.36	2.	12/18

Al: (84GAU 01)

CV = 100.0 +/- 5.0 ug/filter

Result	Uncer.	Date
102.3	5.	12/18

As: (84GAU 01)

CV = 0.25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.142	0.018	10/02

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.62	0.05	8/07

CV = .6 +/- 0.03 ug/filter

Result	Uncer.	Date
0.53	0.05	8/07
0.45	0.05	11/05

CV = 0.9 +/- 0.05 ug/filter

Result	Uncer.	Date
0.95	0.08	8/21
1.19	0.09	12/20

CV = 1.0 +/- 0.05 ug/filter

Result	Uncer.	Date
1.2	0.1	12/18

TABLE D-VI (cont)

****

HSE-9 Trace Metals
on Air Filters (cont)

As: (cont)

CV = 40. +/- 2. ug/filter

Result	Uncer.	Date
48.	5.	12/04

CV = 50. +/- 3. ug/filter

Result	Uncer.	Date
50.5	5.	11/27

CV = 70. +/- 4. ug/filter

Result	Uncer.	Date
76.3	7.	12/04
71.7	7.	12/13
98.3	7.	12/13

CV = 100.0 +/- 5. ug/filter

Result	Uncer.	Date
117.8	10.	12/13
150.1	10.	12/13
101.3	10.	12/20

Ba: (84GAU 01)

CV = 50.0 +/- 2.0 ug/filter

Result	Uncer.	Date
53.02	5.	12/18

CV = 75. +/- 4. ug/filter

Result	Uncer.	Date
75.1	3.1	8/06

Be: (84GAU 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.04	0.06	8/14

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.22	0.01	8/14

CV = 0.25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.32	0.02	7/31
0.32	0.02	8/14
0.32	0.02	10/04

CV = 0.4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.42	0.06	8/14
0.51	0.05	8/14
0.51	0.05	8/14

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.51	0.05	11/20
0.54	0.05	11/20
0.54	0.05	12/13
0.54	0.05	12/13
0.52	0.05	12/18
0.61	0.05	12/18
0.73	0.06	12/18
0.86	0.07	12/20

CV = 0.75 +/- 0.04 ug/filter

Result	Uncer.	Date
0.65	0.06	8/14
0.87	0.08	8/14

CV = 0.9 +/- 0.1 ug/filter

Result	Uncer.	Date
1.03	0.03	7/31

Be: (cont)

CV = 1.0 +/- 0.1 ug/filter

Result	Uncer.	Date
1.09	0.04	8/14
0.98	0.05	8/24
0.98	0.06	8/24
0.88	0.08	12/04
1.09	0.09	12/04
1.17	0.09	12/13
1.09	0.09	12/18
1.14	0.10	12/18
1.2	0.11	12/20
1.17	0.11	12/20

CV = 1.5 +/- 0.1 ug/filter

Result	Uncer.	Date
1.53	0.15	8/24
1.47	0.15	11/20
1.21	0.14	12/04
1.78	0.15	12/18
1.76	0.16	12/18
1.48	0.15	12/18
1.96	0.18	12/18
1.69	0.17	12/20

CV = 2.0 +/- 0.1 ug/filter

Result	Uncer.	Date
1.95	0.2	8/14
1.9	0.2	8/24
2.06	0.2	8/24
2.12	0.17	11/05
1.95	0.2	11/20
2.27	0.2	11/27
2.11	0.2	12/04
2.06	0.2	12/04
2.1	0.2	12/12
2.44	0.2	12/13
1.77	0.2	12/13
1.86	0.2	12/13
2.6	0.2	12/18
2.36	0.2	12/19

CV = 2.5 +/- 0.1 ug/filter

Result	Uncer.	Date
2.65	0.08	11/02
2.50	0.07	11/02

TABLE D-VI (cont)

****

HSE-9 Trace Metals
on Air Filters (cont)

Be: (cont)

CV = 3. +/- 0.15 ug/filter

Result	Uncer.	Date
2.91	0.09	8/24

CV = 4. +/- 0.2 ug/filter

Result	Uncer.	Date
4.16	0.3	8/24
3.99	0.3	9/17
4.36	0.4	12/12

CV = 5.0 +/- 0.25 ug/filter

Result	Uncer.	Date
5.26	0.5	10/02
5.26	0.5	10/02
5.74	0.5	11/20
5.37	0.5	12/04
4.61	0.46	12/04

CV = 6. +/- 0.3 ug/filter

Result	Uncer.	Date
6.02	0.16	11/05
6.54	0.6	12/19

CV = 7.5 +/- 0.4 ug/filter

Result	Uncer.	Date
7.85	0.7	9/05
7.99	0.7	11/02
7.39	0.7	12/31

CV = 9. +/- 0.5 ug/filter

Result	Uncer.	Date
8.97	0.9	8/24
10.18	0.9	9/17
9.37	0.9	11/02
9.96	0.9	12/31

CV = 10. +/- 0.5 ug/filter

Result	Uncer.	Date
11.17	1.	9/17

Be: (cont)

CV = 15. +/- 0.8 ug/filter

Result	Uncer.	Date
15.72	1.5	8/24

CV = 20. +/- 1. ug/filter

Result	Uncer.	Date
22.48	2.	8/24
19.86	2.	12/19

Bi: (84GAU 01)

CV = 50. +/- 2. ug/filter

Result	Uncer.	Date
47.7	5.	12/04

Ca: (84GAU 01)

CV = 20. +/- 1. ug/filter

Result	Uncer.	Date
20.35	1.	12/18

Cd: (84GAU 01)

CV = Blank ug/filter

Result	Uncer.	Date
0.	0.	9/30

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.53	0.05	9/30

CV = 6. +/- 0.3 ug/filter

Result	Uncer.	Date
6.0	0.5	12/18

CV = 7.0 +/- 0.4 ug/filter

Result	Uncer.	Date
9.0	0.9	12/18

Cd: (cont)

CV = 7.6 +/- 0.4 ug/filter

Result	Uncer.	Date
7.21	0.5	11/07

CV = 10. +/- 0.5 ug/filter

Result	Uncer.	Date
10.47	0.5	11/07
10.	0.5	12/18

CV = 13. +/- 0.7 ug/filter

Result	Uncer.	Date
12.	1.	11/27
13.	1.	11/27

CV = 13.6 +/- 0.7 ug/filter

Result	Uncer.	Date
13.83	0.42	11/07

CV = 14. +/- 0.7 ug/filter

Result	Uncer.	Date
14.	1.	12/18

CV = 17. +/- 0.8 ug/filter

Result	Uncer.	Date
18.	1.	11/27

CV = 20. +/- 1. ug/filter

Result	Uncer.	Date
20.	2.	11/27
20.27	2.	11/27
20.59	2.	11/27
20.24	2.	12/18
20.49	2.	12/18

CV = 25. +/- 1.2 ug/filter

Result	Uncer.	Date
25.64	2.	11/05
26.59	2.	11/07

TABLE D-VI (cont)

****

HSE-9 Trace Metals
on Air Filters (cont)

Cd: (cont)

CV = 40.0 +/- 2. ug/filter

Result	Uncer.	Date
43.45	4.	11/27
44.53	4.	11/27
41.77	4.	12/18
40.42	4.	12/18

CV = 50. +/- 2.5 ug/filter

Result	Uncer.	Date
42.6	4.1	11/05

CV = 60.0 +/- 3. ug/filter

Result	Uncer.	Date
75.4	7.	12/20

Co: (84GAU 01)

CV = 0.1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.111	0.019	11/02
0.125	0.019	11/02
0.124	0.018	11/02
0.098	0.013	11/02
0.103	0.015	11/02
0.123	0.014	11/02

CV = 0.15 +/- 0.01 ug/filter

Result	Uncer.	Date
0.181	0.020	11/02
0.186	0.019	11/02
0.154	0.018	11/02
0.155	0.025	11/02

Co: (cont)

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.217	0.030	11/02
0.207	0.025	11/02
0.228	0.026	11/02
0.214	0.023	11/02

CV = 0.25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.21	0.03	11/02
0.258	0.03	11/02

Cr: (84GAU 01)

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.6	0.06	12/18

CV = 20.0 +/- 1. ug/filter

Result	Uncer.	Date
21.8	2.	12/18

CV = 40.0 +/- 2. ug/filter

Result	Uncer.	Date
43.5	4.	12/13

Cs: (84GAU 01)

CV = .1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.114	0.014	11/02
0.116	0.014	11/02
0.105	0.014	11/02
0.089	0.010	11/02
0.110	0.012	11/02
0.131	0.014	12/26
0.127	0.013	12/26
0.128	0.013	12/26
0.140	0.020	12/26

Cs: (cont)

CV = .2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.201	0.021	11/02
0.229	0.023	11/02
0.227	0.023	11/02

CV = .25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.269	0.027	11/02
0.28	0.03	12/26
0.29	0.03	12/26

CV = .4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.424	0.043	11/02
0.403	0.042	11/02
0.422	0.044	11/02
0.436	0.044	11/02
0.46	0.05	12/26
0.46	0.05	12/26

CV = .5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.547	0.057	11/02
0.525	0.053	11/02
0.528	0.054	11/02
0.55	0.06	12/26
0.55	0.06	12/26
0.54	0.05	12/26

CV = .6 +/- 0.03 ug/filter

Result	Uncer.	Date
0.599	0.061	11/02
0.633	0.064	11/02
0.622	0.063	11/02
0.61	0.06	12/26
0.62	0.06	12/26

CV = .75 +/- 0.04 ug/filter

Result	Uncer.	Date
0.74	0.07	12/26
0.72	0.07	12/26
0.74	0.07	12/26

TABLE D-VI (cont)

****

HSE-9 Trace Metals
on Air Filters (cont)

Cu: (84GAU 01)

CV = 30. +/- 1.5 ug/filter

Result	Uncer.	Date
33.68	3.	12/18

CV = 40.0 +/- 2. ug/filter

Result	Uncer.	Date
37.3	4.	12/18

Fe: (84GAU 01)

CV = 50.0 +/- 2.5 ug/filter

Result	Uncer.	Date
53.12	5.	12/18

Hf: (84GAU 01)

CV = .4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.439	0.075	10/04

CV = .75 +/- 0.04 ug/filter

Result	Uncer.	Date
0.756	0.122	10/04

In: (84GAU 01)

CV = .1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.098	0.011	9/25
0.102	0.010	9/25
0.103	0.011	9/25
0.101	0.011	11/08
0.122	0.013	11/08
0.101	0.011	11/08

In: (cont)

CV = .15 +/- 0.01 ug/filter

Result	Uncer.	Date
0.153	0.016	9/25
0.145	0.015	9/25
0.158	0.016	9/25
0.162	0.017	11/08
0.141	0.015	11/08

CV = .2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.201	0.02	9/25
0.199	0.02	9/25
0.210	0.022	9/25
0.204	0.021	11/08
0.219	0.022	11/08

CV = .25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.249	0.025	9/25

Mn: (84GAU 01)

CV = .1 +/- 0.01ug/filter

Result	Uncer.	Date
0.15	0.02	9/24
0.11	0.05	11/08
0.098	0.04	11/08

CV = .2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.24	0.03	9/24
0.26	0.03	9/24
0.18	0.05	11/08
0.23	0.05	11/08

CV = .25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.28	0.03	9/24

CV = .4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.43	0.05	9/24
0.42	0.04	9/24

Mn: (cont)

CV = .5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.52	0.05	9/24
0.46	0.07	11/08

CV = .6 +/- 0.03ug/filter

Result	Uncer.	Date
0.64	0.07	9/24
0.66	0.07	9/24
0.609	0.08	11/08
0.617	0.08	11/08

Ni: (84GAU 01)

CV = 40. +/- 2. ug/filter

Result	Uncer.	Date
40.68	0.26	9/18
41.53	1.18	11/02
41.9	4.	12/18

CV = 75 +/- 4. ug/filter

Result	Uncer.	Date
65.8	6.3	9/05

Os: (84GAU 01)

CV = .4 +/- 0.1 ug/filter

Result	Uncer.	Date
0.61	0.23	9/27

CV = 0.6 +/- 0.2 ug/filter

Result	Uncer.	Date
0.32	0.38	9/27

TABLE D-VI (cont)

****

HSE-9 Trace Metals
on Air Filters (cont)

Pb: (84GAU 01)

CV = 15. +/- 0.7 ug/filter

Result	Uncer.	Date
14.	1.	12/18

CV = 20.0 +/- 1.0 ug/filter

Result	Uncer.	Date
17.8	2.	11/27
19.5	2.	11/27
20.5	2.	12/18
22.7	2.	12/18
22.6	2.	12/18

CV = 25. +/- 1.5 ug/filter

Result	Uncer.	Date
25.4	0.13	11/05

CV = 29. +/- 1.5 ug/filter

Result	Uncer.	Date
30.	2.	12/18

CV = 31. +/- 1.5 ug/filter

Result	Uncer.	Date
32.	2.	11/27

CV = 40. +/- 2. ug/filter

Result	Uncer.	Date
34.2	1.1	11/05
45.5	1.5	11/07

CV = 41. +/- 2. ug/filter

Result	Uncer.	Date
49.	3.	12/18

CV = 49. +/- 2.5 ug/filter

Result	Uncer.	Date
48.	3.	11/27

Pb: (cont)

CV = 50.0 +/- 2.5ug/filter

Result	Uncer.	Date
52.73	5.	11/27
61.73	5.	11/27
49.18	5.	12/04
50.92	5.	12/13
54.17	5.	12/18
54.14	5.	12/18

CV = 57. +/- 2.8 ug/filter

Result	Uncer.	Date
71.	5.	11/27

CV = 60. +/- 3. ug/filter

Result	Uncer.	Date
61.2	3.	9/18
61.3	1.4	11/05
59.	3.	11/27

CV = 61. +/- 3. ug/filter

Result	Uncer.	Date
61.	4.	12/18

CV = 75 +/- 3.8 ug/filter

Result	Uncer.	Date
61.7	4.1	9/05
82.3	4.	11/07

Re: (80GAU 01)

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.185	0.028	9/27

CV = .75 +/- 0.04 ug/filter

Result	Uncer.	Date
0.55	0.08	9/27

Sb: (84GAU 01)

CV = 0.1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.109	0.011	11/05
0.122	0.012	11/05
0.12	0.02	12/26
0.11	0.02	12/26
0.114	0.013	12/26
0.116	0.013	12/26

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.201	0.020	11/05
0.219	0.021	11/05
0.199	0.021	11/05
0.208	0.021	11/05

CV = 0.25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.275	0.028	11/05
0.267	0.028	11/05
0.29	0.03	12/26
0.29	0.03	12/26
0.3	0.03	12/26

CV = 0.4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.438	0.044	11/05
0.445	0.045	11/05
0.435	0.05	12/26
0.446	0.05	12/26
0.445	0.05	12/26
0.465	0.05	12/26

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.49	0.05	12/26
0.50	0.05	12/26
0.51	0.05	12/26

TABLE D-VI (cont)

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HSE-9 Trace Metals
on Air Filters (cont)

Sb: (cont)

CV = 0.6 +/- 0.03 ug/filter

Result	Uncer.	Date
0.617	0.062	11/05
0.628	0.063	11/05
0.608	0.062	11/05
0.613	0.062	11/05
0.62	0.06	12/26
0.65	0.07	12/26

Ta: (84GAU 01)

CV = 0.1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.101	0.011	11/05
0.110	0.012	11/05
0.121	0.013	12/27
0.109	0.011	12/27
0.115	0.012	12/27
0.109	0.012	12/27

CV = 0.15 +/- 0.01 ug/filter

Result	Uncer.	Date
0.159	0.016	11/05
0.153	0.016	11/05
0.164	0.017	11/05
0.15	0.016	11/05
0.168	0.018	11/05
0.144	0.015	12/27
0.13	0.014	12/27
0.135	0.014	12/27

Ta: (cont)

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.228	0.024	11/05
0.208	0.022	11/05
0.214	0.022	11/05
0.219	0.023	11/05
0.218	0.023	11/05
0.233	0.024	11/05
0.192	0.021	11/05
0.197	0.021	11/05
0.230	0.024	11/05
0.200	0.020	11/05
0.206	0.021	11/05
0.205	0.021	11/05
0.199	0.020	11/05
0.224	0.023	12/27
0.218	0.022	12/27
0.215	0.022	12/27
0.223	0.024	12/27
0.238	0.024	12/27

CV = 0.25 +/- 0.01 ug/filter

Result	Uncer.	Date
0.172	0.071	10/04
0.249	0.025	11/05
0.28	0.03	12/27
0.263	0.027	12/27
0.29	0.03	12/27
0.264	0.027	12/27

CV = 0.75 +/- 0.04 ug/filter

Result	Uncer.	Date
0.926	0.157	10/04

Ti: (84GAU 01)

CV = 50. +/- 2.5 ug/filter

Result	Uncer.	Date
48.15	4.	10/02

U: (84GAU 01)

CV = 1000. +/- 50. NG/FILTER

Result	Uncer.	Date
1040.	100.	12/07

CV = 2000. +/- 100. NG/FILTER

Result	Uncer.	Date
2020.	200.	12/07

CV = 3000. +/- 150. NG/FILTER

Result	Uncer.	Date
3090.	300.	12/07

V: (84GAU 01)

CV = 0.1 +/- 0.01 ug/filter

Result	Uncer.	Date
0.099	0.011	9/25
0.111	0.016	11/08
0.127	0.017	11/08

CV = 0.2 +/- 0.01 ug/filter

Result	Uncer.	Date
0.22	0.027	9/25

CV = 0.4 +/- 0.02 ug/filter

Result	Uncer.	Date
0.417	0.047	11/08

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.485	0.05	9/25
0.501	0.056	11/08
0.504	0.056	11/08

CV = 0.6 +/- 0.03 ug/filter

Result	Uncer.	Date
0.598	0.06	9/25
0.59	0.066	11/08
0.597	0.067	11/08

TABLE D-VI (cont)

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HSE-9 Trace Metals
on Air Filters (cont)

W: (84GAU 01)

CV = 0.5 +/- 0.02 ug/filter

Result	Uncer.	Date
0.575	0.085	9/27
0.585	0.092	9/27

Zn: (84GAU 01)

CV = 50.0 +/- 2.5 ug/filter

Result	Uncer.	Date
60.7	6.	11/27
44.6	5.	11/27
46.	5.	12/18
51.7	5.	12/18

CV = 60. +/- 3. ug/filter

Result	Uncer.	Date
59.5	5.9	11/07

CV = 75. +/- 3.5 ug/filter

Result	Uncer.	Date
72.	6.2	11/05

CV = 90. +/- 4.5 ug/filter

Result	Uncer.	Date
93.1	8.1	11/05
92.6	8.8	11/07

CV = 100.0 +/- 5.0 ug/filter

Result	Uncer.	Date
117.3	10.	11/27
91.8	10.	11/27
94.7	10.	12/18
96.4	10.	12/18

Zn: (cont)

CV = 101. +/- 5. ug/filter

Result	Uncer.	Date
89.	7.	11/27

CV = 119. +/- 6. ug/filter

Result	Uncer.	Date
125.	10.	11/27

CV = 140. +/- 7. ug/filter

Result	Uncer.	Date
137.	10.	12/18

CV = 141. +/- 7. ug/filter

Result	Uncer.	Date
166.	15.	12/18

CV = 166. +/- 8. ug/filter

Result	Uncer.	Date
171.	10.	11/27

CV = 177.8 +/- 9. ug/filter

Result	Uncer.	Date
168.7	10.	11/07

CV = 179. +/- 9. ug/filter

Result	Uncer.	Date
180.	15.	12/18

CV = 216. +/- 11. ug/filter

Result	Uncer.	Date
202.	10.	11/27

CV = 235. +/- 12. ug/filter

Result	Uncer.	Date
260.	20.	12/18

****

HSE-9 Trace Metals in Urine

Cd: (84GAU 01)

CV = Blank mg/l

Result	Uncer.	Date
0.07	0.08	9/26
0.08	0.08	9/26
0.	0.08	10/15
0.02	0.08	12/04
0.02	0.08	12/13
0.04	0.08	12/18
0.06	0.08	12/18
0.02	0.08	12/20
0.03	0.08	12/31
0.	0.08	12/31

CV = 0.5 +/- 0.05 mg/l

Result	Uncer.	Date
0.5	0.1	9/26
0.45	0.1	12/31

CV = 0.8 +/- 0.05 mg/l

Result	Uncer.	Date
0.71	0.1	10/15

CV = 1. +/- 0.05 mg/l

Result	Uncer.	Date
1.03	0.1	12/18
1.13	0.1	12/18
1.27	0.11	12/31

CV = 1.2 +/- 0.06 mg/l

Result	Uncer.	Date
1.1	0.1	9/26
1.3	0.1	12/18

CV = 1.4 +/- 0.07 mg/l

Result	Uncer.	Date
1.51	0.15	12/04

TABLE D-VI (cont)

****

HSE-9 Trace Metals in Urine (cont)

Cd: (cont)

CV = 1.5 +/- 0.07 mg/l

Result	Uncer.	Date
1.5	0.15	12/20

CV = 2.0 +/- 0.1 mg/l

Result	Uncer.	Date
1.48	0.15	12/13

Hg: (84GAU 01)

CV = 0.08 +/- 0.01 ug/l

Result	Uncer.	Date
0.075	0.003	7/15

****

HSE-9 Plutonium in Urine

Pu-238: (84GAU 01)

CV = 0.060 +/- 0.003 pCi/sample

Result	Uncer.	Date
0.05	0.01	01/26
0.05	0.01	02/12
0.06	0.01	03/15
0.06	0.01	04/19
0.03	0.01	05/13
0.06	0.01	06/15
0.05	0.01	07/18
0.03	0.01	08/10
0.06	0.01	09/18
0.04	0.01	10/13
0.05	0.01	11/18
0.05	0.01	12/18
0.05	0.01	12/18

Pu-238: (cont)

CV = 0.120 +/- 0.006 pCi/sample

Result	Uncer.	Date
0.10	0.02	01/26
0.13	0.02	02/02
0.10	0.02	03/12
0.13	0.02	04/13
0.11	0.02	05/13
0.08	0.02	06/15
0.11	0.02	07/18
0.10	0.02	08/10
0.13	0.02	09/13
0.11	0.02	10/16
0.12	0.02	10/31
0.11	0.02	11/12
0.11	0.02	12/18
0.11	0.02	12/18

CV = 0.20 +/- 0.01 pCi/sample

Result	Uncer.	Date
0.18	0.02	01/26
0.17	0.02	02/02
0.17	0.02	03/02
0.16	0.02	04/13
0.18	0.02	05/15
0.17	0.02	06/15
0.19	0.02	07/31
0.16	0.02	08/18
0.17	0.02	09/10
0.18	0.02	10/18
0.20	0.02	12/18

CV = 0.40 +/- 0.02 pCi/sample

Result	Uncer.	Date
0.38	0.04	01/26
0.41	0.04	02/26
0.36	0.04	03/26
0.35	0.04	04/12
0.33	0.04	05/13
0.37	0.04	06/15
0.37	0.04	07/11
0.33	0.04	08/18
0.37	0.04	09/14
0.37	0.04	10/18
0.33	0.04	11/16
0.36	0.04	12/10

Pu-239: (84GAU 01)

CV = 0.060 +/- 0.003 pCi/sample

Result	Uncer.	Date
0.08	0.02	01/26
0.08	0.02	02/26
0.07	0.02	03/02
0.04	0.02	03/15
0.06	0.02	03/15
0.05	0.02	04/12
0.07	0.02	05/12
0.04	0.02	05/15
0.06	0.02	06/13
0.05	0.02	06/13
0.06	0.02	07/18
0.07	0.02	08/18
0.04	0.02	08/18
0.06	0.02	09/10
0.04	0.02	10/18
0.08	0.02	11/18
0.07	0.02	11/18
0.06	0.02	12/31

CV = 0.150 +/- 0.007 pCi/sample

Result	Uncer.	Date
0.14	0.02	01/26
0.14	0.02	02/02
0.16	0.02	02/02
0.13	0.02	03/15
0.17	0.02	04/31
0.13	0.02	04/31
0.10	0.02	05/13
0.20	0.02	06/13
0.15	0.02	07/18
0.14	0.02	08/18
0.15	0.02	09/10
0.14	0.02	10/18
0.18	0.02	10/18
0.14	0.02	11/11
0.17	0.02	12/18

TABLE D-VI (cont)

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HSE-9 Plutonium in Urine (cont)

Pu-239: (cont)

CV = 0.23 +/- 0.01 pCi/sample

Result	Uncer.	Date
0.24	0.02	01/26
0.21	0.02	01/26
0.22	0.02	02/02
0.27	0.02	03/15
0.22	0.02	04/15
0.23	0.02	05/12
0.27	0.02	06/13
0.26	0.02	08/18
0.19	0.02	09/10
0.23	0.02	10/18
0.25	0.02	11/17
0.21	0.02	12/18

CV = 0.46 +/- 0.02 pCi/sample

Result	Uncer.	Date
0.45	0.03	01/26
0.47	0.03	02/02
0.42	0.03	03/02
0.45	0.03	04/15
0.42	0.03	05/75
0.39	0.03	06/15
0.42	0.03	07/13
0.47	0.03	08/18
0.49	0.03	09/10
0.45	0.03	10/18
0.44	0.03	11/12
0.45	0.03	12/18

****

HSE-9 Uranium in Urine

U-235: (84GAU 01)

CV = Blank pCi/l

Result	Uncer.	Date
0.	4.	01/25
0.	4.	01/25
0.	4.	02/26
0.	4.	02/26
0.	4.	03/15
0.	4.	03/15
0.	4.	04/31
0.	4.	04/31
0.	4.	05/04
0.	4.	05/04
0.	4.	06/04
0.	4.	06/04
0.	4.	07/31
0.	4.	07/31
0.	4.	08/04
0.	4.	08/18
0.	4.	09/18
0.	4.	09/18
0.	4.	10/18
0.	4.	10/18
0.	4.	11/18
0.	4.	11/18
0.	4.	12/20
0.	4.	12/20

CV = 6.8 +/- 0.3 pCi/l

Result	Uncer.	Date
7.3	2.	01/25
7.2	2.	01/25
7.8	2.	02/26
7.0	2.	02/26
7.6	2.	03/15
6.3	2.	03/15
7.7	2.	04/31
6.0	2.	04/31
7.1	2.	05/11
4.3	2.	05/11
4.7	2.	06/04
5.7	2.	06/04
8.8	2.	07/24
6.3	2.	07/24
6.1	2.	08/04
6.9	2.	10/20
7.7	2.	12/22

U-235: (cont)

CV = 10.2 +/- 0.5 pCi/l

Result	Uncer.	Date
11.5	1.5	10/15
9.7	1.5	10/31
9.8	1.5	10/31
10.3	1.5	12/04
9.4	1.5	12/04

CV = 13.6 +/- 0.7 pCi/l

Result	Uncer.	Date
13.6	1.5	01/25
14.6	1.5	02/26
15.6	1.5	02/26
14.3	1.5	03/22
13.4	1.5	03/22
14.5	1.5	04/15
15.3	1.5	05/17
13.0	1.5	06/31
15.3	1.5	06/31
10.6	1.5	07/14
9.9	1.5	08/04
13.8	1.5	08/04
13.3	1.5	09/06
14.5	1.5	10/07
14.2	1.5	11/04
13.6	1.5	12/20
14.9	1.5	12/20

CV = 17.0 +/- 0.8 pCi/l

Result	Uncer.	Date
18.08	1.8	01/10
16.08	1.8	03/18
16.44	1.6	05/16
17.04	1.7	07/14
17.35	1.7	09/15
16.13	1.6	10/18
15.63	1.6	12/19

CV = 20.4 +/- 1.0 pCi/l

Result	Uncer.	Date
21.6	2.	02/26
24.7	2.	04/21
21.9	2.	06/24
18.6	2.	08/26
21.4	2.	11/20
19.1	2.	12/20

****

HSE-9 Uranium in Urine (cont)

U-235: (cont)

CV = 25.5 +/- 1.3 pCi/l

Result	Uncer.	Date
28.1	3.	01/25
27.6	3.	02/15
25.7	3.	03/04
22.8	3.	04/04
19.6	3.	05/31
25.1	3.	06/11
25.6	3.	07/18
22.7	3.	08/28
24.3	3.	09/17
25.0	3.	10/18
25.3	3.	11/12
25.5	3.	12/18
25.5	3.	12/18

CV = 34.0 +/- 1.7 pCi/l

Result	Uncer.	Date
35.3	3.	02/18
29.6	3.	04/11
31.6	3.	06/12
32.9	3.	08/14
32.8	3.	10/12
31.2	3.	11/16
36.1	3.	12/18

U-238: (84GAU 01)

CV = Blank ug/l

Result	Uncer.	Date
0.	4.	01/26
0.	4.	01/26
0.	4.	02/23
0.	4.	02/23
0.	4.	03/21
0.	4.	03/21
0.	4.	04/27
0.	4.	04/27
0.	4.	05/04
0.	4.	05/04
0.	4.	06/18

U-238: (cont)

0.	4.	06/18
0.	4.	07/20
0.	4.	07/20
0.	4.	08/15
0.	4.	08/15
0.	4.	09/31
0.	4.	09/31
0.	4.	10/30
0.	4.	10/30
0.	4.	11/13
0.	4.	11/13
0.	4.	12/18
0.	4.	12/18

CV = 8.48 +/- 0.42 ug/l

Result	Uncer.	Date
8.1	3.	01/28
7.8	3.	02/26
4.1	3.	03/23
9.4	3.	04/24
13.7	3.	05/21
7.7	3.	06/26
7.9	3.	07/20
4.0	3.	08/20
11.0	3.	09/15
9.6	3.	10/30
11.7	3.	11/11
11.1	3.	12/31
6.1	3.	12/31

CV = 12.7 +/- 0.6 ug/l

Result	Uncer.	Date
15.2	3.	01/26
11.5	3.	02/20
14.7	3.	03/21
11.5	3.	04/26
9.9	3.	05/18
12.9	3.	06/12
15.6	3.	07/18
11.5	3.	08/15
10.5	3.	09/21
19.7	3.	10/31
11.9	3.	11/13
8.3	3.	12/13

CV = 16.96 +/- 0.85 ug/l

Result	Uncer.	Date
17.3	4.	01/26
18.4	4.	02/26
12.3	4.	03/24
27.9	4.	04/27
21.4	4.	05/04
12.2	4.	06/04
15.6	4.	07/15
18.2	4.	08/21
19.8	4.	09/12
20.2	4.	10/30
18.3	4.	11/11
8.5	4.	12/18
19.1	4.	12/18

CV = 25.44 +/- 1.3 ug/l

Result	Uncer.	Date
18.6	4.	01/18
27.8	4.	03/28
24.1	4.	05/18
26.5	4.	07/20
15.3	4.	09/20
39.6	4.	10/13
24.7	4.	12/13

CV = 33.92 +/- 1.7 ug/l

Result	Uncer.	Date
32.3	5.	01/26
36.0	5.	02/26
33.0	5.	03/27
39.3	5.	04/27
38.1	5.	05/04
46.6	5.	06/04
33.8	5.	07/15
25.9	5.	08/18
29.1	5.	08/18
36.5	5.	09/30
32.1	5.	09/30
31.5	5.	10/13
31.2	5.	11/13
27.9	5.	12/18
34.0	5.	12/18

TABLE D-VI (cont)

****

HSE-9 Uranium in Urine (cont)

U-238: (cont)

CV = 42.4 +/- 2.1 ug/l

Result	Uncer.	Date
40.0	4.	9/26
43.3	4.	9/26
43.2	4.	9/26
41.0	4.	12/20
39.1	4.	12/20

CV = 50.88 +/- 2.5 ug/l

Result	Uncer.	Date
43.5	4.	11/27
49.8	4.	11/27
52.0	4.	12/04
45.6	4.	12/13
45.2	4.	12/18
47.3	4.	12/18

CV = 84.8 +/- 4.2 ug/l

Result	Uncer.	Date
89.39	5.	9/26

****

HSE-9 Tritium in Urine

H-3: (84GAU 01)

CV = 3.62 +/- 0.18 uCi/l

Result	Uncer.	Date
3.3	0.3	9/26
3.3	0.3	9/26
3.4	0.3	9/26
3.4	0.3	10/15
3.4	0.3	12/12
3.4	0.3	12/31
3.6	0.3	12/20

H-3: (cont)

CV = 3.88 +/- 0.19 uCi/l

Result	Uncer.	Date
3.6	0.3	01/04
3.6	0.3	02/13
3.6	0.3	02/13
3.5	0.3	02/13
3.5	0.3	04/18
3.2	0.3	04/18
3.6	0.3	06/16

CV = 7.2 +/- 0.4 uCi/l

Result	Uncer.	Date
6.8	0.4	9/26
7.0	0.4	9/26
6.5	0.4	9/26
6.5	0.4	10/15
6.9	0.4	12/12
6.7	0.4	12/20

CV = 7.75 +/- 0.4 uCi/l

Result	Uncer.	Date
7.1	0.4	01/04
6.4	0.4	03/18
6.4	0.4	03/18
6.7	0.4	05/12

CV = 10.8 +/- 0.5 uCi/l

Result	Uncer.	Date
10.3	0.5	7/25
10.7	0.5	9/26
10.3	0.5	9/30
10.0	0.5	10/15
10.4	0.5	12/12
10.0	0.5	12/20

CV = 11.63 +/- 0.58 uCi/l

Result	Uncer.	Date
11.0	0.5	01/04
10.4	0.5	02/13
10.4	0.5	04/18
9.9	0.5	04/18
10.6	0.5	06/11

H-3: (cont)

CV = 14.4 +/- 0.7 uCi/l

Result	Uncer.	Date
13.1	0.7	9/26
14.0	0.7	9/30
14.7	0.7	12/12
13.1	0.7	12/20

CV = 15.50 +/- 0.8 uCi/l

Result	Uncer.	Date
14.5	0.8	01/04
13.4	0.8	03/18
13.2	0.8	04/18
14.5	0.8	06/11

CV = 18.2 +/- 0.9 uCi/l

Result	Uncer.	Date
17.2	0.9	9/26
16.6	0.9	9/26
17.2	0.9	9/30
16.5	0.9	10/15
17.0	0.9	12/12
16.9	0.9	12/20
17.0	0.9	12/31

CV = 19.38 +/- 0.97 uCi/l

Result	Uncer.	Date
17.8	0.9	01/04
16.1	0.9	03/18
17.0	0.9	03/18
17.2	0.9	06/11

CV = 21.8 +/- 1.1 uCi/l

Result	Uncer.	Date
21.2	1.	9/26
20.2	1.	9/26
19.7	1.	9/26
22.3	1.	9/30
20.3	1.	10/15
19.9	1.	12/20

CV = 23.26 +/- 1.2 uCi/l

Result	Uncer.	Date
22.1	1.2	01/04
21.0	1.2	03/18
20.4	1.2	03/18
22.8	1.2	06/11

TABLE D-VI (cont)

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HSE-9 Tritium in Urine (cont)

H-3: (cont)

CV = 25.4 +/- 1.3 uCi/l

Result	Uncer.	Date
23.4	1.3	9/26
23.4	1.3	12/12
23.6	1.3	12/12
23.2	1.3	12/20

CV = 27.13 +/- 1.4 uCi/l

Result	Uncer.	Date
25.7	1.5	01/04
23.9	1.5	03/13
24.2	1.5	04/18
24.8	1.5	04/18
24.6	1.5	06/11

CV = 29.0 +/- 1.4 uCi/l

Result	Uncer.	Date
25.6	2.	9/26
25.9	2.	9/26
27.6	2.	9/26
27.2	2.	12/12
27.1	2.	12/12
27.2	2.	12/12
25.9	2.	12/20

CV = 31.01 +/- 1.6 uCi/l

Result	Uncer.	Date
27.4	2.	01/04
27.8	2.	03/18
28.4	2.	03/18
29.	2.	05/20

CV = 34.88 +/- 1.7 uCi/l

Result	Uncer.	Date
31.7	2.	12/04
30.2	2.	12/18
30.	2.	12/18
32.	2.	12/20

H-3: (cont)

CV = 36.2 +/- 1.8 uCi/l

Result	Uncer.	Date
32.7	2.5	9/26
30.3	2.5	9/26
34.6	2.5	9/26
29.6	2.5	12/12
33.	2.5	10/15
29.9	2.5	12/12
29.	2.5	12/20
32.1	2.5	12/20

CV = 38.76 +/- 1.9 uCi/l

Result	Uncer.	Date
37.1	3.	01/04
36.8	3.	03/18
33.7	3.	03/18
26.2	3.	05/20

****

HSE-9 Trichloroacetic Acid in Urine

Trichloroacetic Acid: (84GAU 01)

CV = Blank mg/l

Result	Uncer.	Date
0.	4.	1/26
0.	4.	2/26
0.	4.	3/15
0.	4.	4/31
0.	4.	5/31
0.	4.	6/31
0.	4.	7/04
0.	4.	8/13
0.	4.	9/13
0.	4.	10/18
0.	4.	12/18

CV = 2.94 +/- 0.3 mg/l

Result	Uncer.	Date
3.65	3.	2/13

Trichloroacetic Acid: (cont)

CV = 4.90 +/- 0.5 mg/l

Result	Uncer.	Date
5.29	1.	2/13

CV = 5.6 +/- 0.6 mg/l

Result	Uncer.	Date
4.96	1.	1/23

CV = 5.8 +/- 0.6 mg/l

Result	Uncer.	Date
5.36	1.	5/15
5.99	1.	9/17
6.37	1.	11/15

CV = 5.88 +/- 0.6 mg/l

Result	Uncer.	Date
7.15	1.5	3/15

CV = 7.4 +/- 0.7 mg/l

Result	Uncer.	Date
5.61	1.5	5/15
6.23	1.5	10/15

CV = 8.4 +/- 0.8 mg/l

Result	Uncer.	Date
4.	2.	12/18

CV = 8.8 +/- 0.9 mg/l

Result	Uncer.	Date
7.4	2.	6/13
7.3	2.	7/09
6.8	2.	7/09
9.7	2.	9/17
10.5	2.	12/31

CV = 9.80 +/- 1.0 mg/l

Result	Uncer.	Date
12.1	2.	3/15

CV = 10.5 +/- 1.0 mg/l

Result	Uncer.	Date
8.7	2.	1/23

TABLE D-VI (cont)

****

HSE-9 Trichloroacetic Acid in Urine (cont)

Trichloroacetic Acid: (cont)

CV = 11.8 +/- 1.2 mg/l

Result	Uncer.	Date
12.1	2.	6/13
10.2	2.	8/20
12.2	2.	10/15
14.0	2.	11/15

CV = 14.0 +/- 1.4 mg/l

Result	Uncer.	Date
4.	2.	12/18

CV = 14.8 +/- 1.5 mg/l

Result	Uncer.	Date
13.9	3.	6/13
11.7	3.	8/20
17.4	3.	12/31

****

HSE-9 Organics on Silica Gel

Methyl Ethyl Ketone: (84GAU 01)

CV = 0.805 +/- 0.08 mg/tube

Result	Uncer.	Date
0.67	0.1	11/05

CV = 1.61 +/- 0.16 mg/tube

Result	Uncer.	Date
1.56	0.2	11/05

CV = 4.02 +/- 0.4 mg/tube

Result	Uncer.	Date
3.94	0.4	11/05

Methyl Alcohol: (84GAU 01)

CV = 0.792 +/- 0.04 mg/tube

Result	Uncer.	Date
0.78	0.01	9/05

CV = 1.58 +/- 0.08 mg/tube

Result	Uncer.	Date
1.62	0.01	9/05

2,4-Dimethylphenol: (84GAU 01)

CV = 102. +/- 5. ug/tube

Result	Uncer.	Date
94.	9.	11/05

CV = 153. +/- 8. ug/tube

Result	Uncer.	Date
135.	13.	11/05

CV = 204. +/- 10. ug/tube

Result	Uncer.	Date
198.	20.	11/05

CV = 306. +/- 15. ug/tube

Result	Uncer.	Date
304.	25.	11/05

CV = 408. +/- 20. ug/tube

Result	Uncer.	Date
405.	30.	11/05

CV = 459. +/- 23. ug/tube

Result	Uncer.	Date
436.	30.	11/05

CV = 511. +/- 25. ug/tube

Result	Uncer.	Date
516.	40.	11/05

Phenol: (84GAU 01)

CV = 97. +/- 5. ug/tube

Result	Uncer.	Date
85.	8.	11/05

CV = 145. +/- 7. ug/tube

Result	Uncer.	Date
129.	13.	11/05

CV = 194. +/- 10. ug/tube

Result	Uncer.	Date
198.	20.	11/05

CV = 290. +/- 15. ug/tube

Result	Uncer.	Date
274.	25.	11/05

CV = 387. +/- 19. ug/tube

Result	Uncer.	Date
352.	30.	11/05

CV = 436. +/- 22. ug/tube

Result	Uncer.	Date
391.	35.	11/05

CV = 484. +/- 24. ug/tube

Result	Uncer.	Date
451.	40.	11/05

---

o-Ethylphenol (84GAU 01)

CV = 102. +/- 5. ug/tube

Result	Uncer.	Date
90.	9.	11/05

CV = 153. +/- 8. ug/tube

Result	Uncer.	Date
140.	14.	11/05

TABLE D-VI (cont)

****

HSE-9 Organics on Silica Gel
(cont)

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o-Ethylphenol (cont)

CV = 204. +/- 10. ug/tube

Result	Uncer.	Date
203.	20.	11/05

CV = 306. +/- 15. ug/tube

Result	Uncer.	Date
292.	25.	11/05

CV = 408. +/- 20. ug/tube

Result	Uncer.	Date
385.	35.	11/05

CV = 459. +/- 23. ug/tube

Result	Uncer.	Date
425.	40.	11/05

CV = 511. +/- 25. ug/tube

Result	Uncer.	Date
510.	40.	11/05

---

o-Cresol: (84GAU 01)

CV = 104. +/- 5. ug/tube

Result	Uncer.	Date
98.	9.	11/05

CV = 156. +/- 8. ug/tube

Result	Uncer.	Date
151.	15.	11/05

CV = 208. +/- 11. ug/tube

Result	Uncer.	Date
232.	20.	11/05

o-Cresol: (cont)

CV = 313. +/- 16. ug/tube

Result	Uncer.	Date
321.	30.	11/05

CV = 417. +/- 21. ug/tube

Result	Uncer.	Date
414.	35.	11/05

CV = 469. +/- 24. ug/tube

Result	Uncer.	Date
461.	40.	11/05

CV = 521. +/- 26. ug/tube

Result	Uncer.	Date
547.	50.	11/05

3,4-Dimethylphenol: (84GAU 01)

CV = 99. +/- 5. ug/tube

Result	Uncer.	Date
95.	9.	11/05

CV = 148. +/- 8. ug/tube

Result	Uncer.	Date
141.	14.	11/05

CV = 197. +/- 10. ug/tube

Result	Uncer.	Date
206.	20.	11/05

CV = 296. +/- 15. ug/tube

Result	Uncer.	Date
310.	30.	11/05

CV = 394. +/- 20. ug/tube

Result	Uncer.	Date
419.	40.	11/05

3,4-Dimethylphenol: (cont)

CV = 443. +/- 22. ug/tube

Result	Uncer.	Date
456.	40.	11/05

CV = 493. +/- 25. ug/tube

Result	Uncer.	Date
548.	50.	11/05

Anthracene: (84GAU 01)

CV = 25.15 +/- 2.5 ug/tube

Result	Uncer.	Date
28.	4.	12/31

CV = 50.3 +/- 5.0 ug/tube

Result	Uncer.	Date
52.	5.	12/31

CV = 75.45 +/- 7.5 ug/tube

Result	Uncer.	Date
77.	8.	12/31

CV = 125.75 +/- 12. ug/tube

Result	Uncer.	Date
141.	14.	12/31
131.	13.	12/31

CV = 150.9 +/- 15. ug/tube

Result	Uncer.	Date
170.	15.	12/31

TABLE D-VI (cont)

****

HSE-9 Organics on Silica Gel
(cont)

Benzo-b-fluoranthene: (84GAU 01)

CV = 27.75 +/- 2.8 ug/tube

Result	Uncer.	Date
19.	4.	12/31

CV = 55.5 +/- 5.6 ug/tube

Result	Uncer.	Date
37.	4.	12/31

CV = 83.25 +/- 8.3 ug/tube

Result	Uncer.	Date
57.	6.	12/31

CV = 138.75 +/- 14. ug/tube

Result	Uncer.	Date
67.	7.	12/31
98.	10.	12/31

CV = 166.5 +/- 17. ug/tube

Result	Uncer.	Date
118.	12.	12/31

Acenaphthylene: (84GAU 01)

CV = 24.9 +/- 2.5 ug/tube

Result	Uncer.	Date
31.	3.	12/31

CV = 49.8 +/- 5.0 ug/tube

Result	Uncer.	Date
58.	6.	12/31

CV = 74.7 +/- 7.5 ug/tube

Result	Uncer.	Date
92.	9.	12/31

Acenaphthylene: (cont)

CV = 124.5 +/- 12. ug/tube

Result	Uncer.	Date
152.	15.	12/31
135.	13.	12/31

CV = 149.4 +/- 15. ug/tube

Result	Uncer.	Date
169.	17.	12/31

Fluorene: (84GAU 01)

CV = 24.9 +/- 2.5 ug/tube

Result	Uncer.	Date
26.	4.	12/31

CV = 49.8 +/- 5.0 ug/tube

Result	Uncer.	Date
47.	5.	12/31

CV = 74.7 +/- 7.5 ug/tube

Result	Uncer.	Date
86.	9.	12/31

CV = 124.5 +/- 12. ug/tube

Result	Uncer.	Date
133.	13.	12/31
114.	12.	12/31

CV = 149.4 +/- 15. ug/tube

Result	Uncer.	Date
146.	15.	12/31

Naphthalene: (84GAU 01)

CV = 24.86 +/- 2.5 ug/tube

Result	Uncer.	Date
31.	3.	12/31

Naphthalene: (cont)

CV = 49.7 +/- 5.0 ug/tube

Result	Uncer.	Date
58.	6.	12/31

CV = 74.55 +/- 7.5 ug/tube

Result	Uncer.	Date
86.	8.	12/31

CV = 124.25 +/- 12. ug/tube

Result	Uncer.	Date
142.	14.	12/31
128.	10.	12/31

CV = 149.1 +/- 15. ug/tube

Result	Uncer.	Date
160.	15.	12/31

****

HSE-9 Organics on Charcoal

Ethylbenzene: (84GAU 01)

CV = 50.25 +/- 5.0 ug/tube

Result	Uncer.	Date
50.2	5.	12/31
47.5	5.	12/31

CV = 55.9 +/- 5.6 ug/tube

Result	Uncer.	Date
51.9	5.	12/31
61.6	6.	12/31

CV = 100.5 +/- 10. ug/tube

Result	Uncer.	Date
96.	10.	12/31
91.8	9.	12/31

CV = 111.7 +/- 11. ug/tube

Result	Uncer.	Date
104.	10.	12/31

TABLE D-VI (cont)

****

HSE-9 Organics on Charcoal
(cont)

Ethylbenzene: (cont)

CV = 150.75 +/- 15. ug/tube

Result	Uncer.	Date
149.	15.	12/31

CV = 167.6 +/- 17. ug/tube

Result	Uncer.	Date
154.	15.	12/31

CV = 201. +/- 20. ug/tube

Result	Uncer.	Date
201.	20.	12/31

CV = 223.4 +/- 22. ug/tube

Result	Uncer.	Date
204.	20.	12/31
276.	25.	12/31

CV = 251.25 +/- 25. ug/tube

Result	Uncer.	Date
229.	20.	12/31

CV = 279.3 +/- 28. ug/tube

Result	Uncer.	Date
298.	30.	12/31

CV = 301.5 +/- 30. ug/tube

Result	Uncer.	Date
326.	30.	12/31

CV = 390.9 +/- 39. ug/tube

Result	Uncer.	Date
376.	30.	12/31

Isopropyl Ether: (84GAU 01)

CV = 52.9 +/- 5.3 ug/tube

Result	Uncer.	Date
45.	5.	12/31
42.2	4.	12/31

CV = 100.1 +/- 10. ug/tube

Result	Uncer.	Date
79.2	9.	12/31

CV = 105.8 +/- 10. ug/tube

Result	Uncer.	Date
92.1	9.	12/31

CV = 158.7 +/- 16. ug/tube

Result	Uncer.	Date
128.	13.	12/31

CV = 200.2 +/- 20. ug/tube

Result	Uncer.	Date
183.	20.	12/31

CV = 211.6 +/- 21. ug/tube

Result	Uncer.	Date
171.	17.	12/31
196.	20.	12/31

CV = 264.5 +/- 26. ug/tube

Result	Uncer.	Date
225.	20.	12/31

CV = 370.3 +/- 37. ug/tube

Result	Uncer.	Date
355.	30.	12/31

Toluene: (84GAU 01)

CV = 52.4 +/- 5.3 ug/tube

Result	Uncer.	Date
50.4	5.	12/31
47.8	5.	12/31

CV = 57.15 +/- 5.7 ug/tube

Result	Uncer.	Date
60.6	5.	12/31
58.1	5.	12/31

CV = 104.8 +/- 10. ug/tube

Result	Uncer.	Date
96.4	10.	12/31

CV = 114.3 +/- 11. ug/tube

Result	Uncer.	Date
106.	9.	12/31
109.	10.	12/31

CV = 157.2 +/- 16. ug/tube

Result	Uncer.	Date
139.	15.	12/31

CV = 171.45 +/-17. ug/tube

Result	Uncer.	Date
166.	15.	12/31

CV = 209.6 +/- 21. ug/tube

Result	Uncer.	Date
185.	18.	12/31
244.	25.	12/31

CV = 228.6 +/- 23. ug/tube

Result	Uncer.	Date
244.	20.	12/31

CV = 262. +/- 26. ug/tube

Result	Uncer.	Date
260.	25.	12/31

TABLE D-VI (cont)

****

HSE-9 Organics on Charcoal
(cont)

Toluene: (cont)

CV = 285.75 +/- 28. ug/tube

Result	Uncer.	Date
251.	20.	12/31

CV = 342.9 +/- 34. ug/tube

Result	Uncer.	Date
360.	30.	12/31

CV = 366.8 +/- 37. ug/tube

Result	Uncer.	Date
336.	30.	12/31

CV = 1.0 +/- 0.1 mg/tube

Result	Uncer.	Date
1.02	0.1	10/26

CV = 2.0 +/- 0.2 mg/tube

Result	Uncer.	Date
2.07	0.2	10/26

CV = 3.0 +/- 0.3 mg/tube

Result	Uncer.	Date
3.07	0.3	10/26

Heptane: (84GAU 01)

CV = 48.9 +/- 4.9 ug/tube

Result	Uncer.	Date
52.1	5.	12/31
50.3	5.	12/31

CV = 49.3 +/- 4.9 ug/tube

Result	Uncer.	Date
42.6	5.	12/31
49.3	5.	12/31

Heptane: (cont)

CV = 97.8 +/- 9.8 ug/tube

Result	Uncer.	Date
92.9	9.	12/31
101.	10.	12/31

CV = 98.5 +/- 9.8 ug/tube

Result	Uncer.	Date
95.9	10.	12/31

CV = 146.7 +/- 15. ug/tube

Result	Uncer.	Date
154.	15.	12/31

CV = 147.8 +/- 15. ug/tube

Result	Uncer.	Date
128.	13.	12/31

CV = 195.6 +/- 20. ug/tube

Result	Uncer.	Date
213.	20.	12/31

CV = 197.0 +/- 20. ug/tube

Result	Uncer.	Date
170.	17.	12/31
216.	20.	12/31

CV = 244.5 +/- 24. ug/tube

Result	Uncer.	Date
225.	20.	12/31

CV = 246.3 +/- 25. ug/tube

Result	Uncer.	Date
235.	20.	12/31

CV = 293.4 +/- 29. ug/tube

Result	Uncer.	Date
323.	30.	12/31

CV = 344.8 +/- 34. ug/tube

Result	Uncer.	Date
335.	30.	12/31

2,3,4-Trimethylpentane: (84GAU 01)

CV = 46.5 +/- 4.6 ug/tube

Result	Uncer.	Date
46.6	5.	12/31
43.7	5.	12/31

CV = 93. +/- 9.3 ug/tube

Result	Uncer.	Date
82.6	9.	12/31
87.8	9.	12/31

CV = 139.5 +/- 14. ug/tube

Result	Uncer.	Date
134.	15.	12/31

CV = 186. +/- 19. ug/tube

Result	Uncer.	Date
185.	20.	12/31

CV = 232.5 +/- 23. ug/tube

Result	Uncer.	Date
199.	20.	12/31

CV = 279. +/- 28. ug/tube

Result	Uncer.	Date
286.	30.	12/31

Benzene: (84GAU 01)

CV = 53.9 +/- 5.4 ug/tube

Result	Uncer.	Date
51.	5.	12/31

CV = 54.0 +/- 5.4 ug/tube

Result	Uncer.	Date
39.5	4.	12/31

TABLE D-VI (cont)

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HSE-9 Organics on Charcoal
(cont)

Benzene: (cont)

CV = 59.45 +/- 5.9 ug/tube

Result	Uncer.	Date
51.7	5.	12/31
49.9	5.	12/31

CV = 107.9 +/- 11. ug/tube

Result	Uncer.	Date
105.	10.	12/31

CV = 118.9 +/- 12. ug/tube

Result	Uncer.	Date
86.8	9.	12/31
109.	10.	12/31

CV = 130. +/- 13. ug/tube

Result	Uncer.	Date
138.	15.	10/26

CV = 161.9 +/- 16. ug/tube

Result	Uncer.	Date
127.	13.	12/31

CV = 178.35 +/- 18. ug/tube

Result	Uncer.	Date
167.	15.	12/31

CV = 215.8 +/- 22. ug/tube

Result	Uncer.	Date
221.	20.	12/31
174.	17.	12/31

CV = 237.8 +/- 24. ug/tube

Result	Uncer.	Date
218.	20.	12/31

Benzene: (cont)

CV = 260. +/- 26. ug/tube

Result	Uncer.	Date
285.	30.	10/26

CV = 269.8 +/- 27. ug/tube

Result	Uncer.	Date
244.	25.	12/31

CV = 297.25 +/- 30. ug/tube

Result	Uncer.	Date
222.	20.	12/31

CV = 356.7 +/- 36. ug/tube

Result	Uncer.	Date
318.	30.	12/31

CV = 377.7 +/- 38. ug/tube

Result	Uncer.	Date
365.	30.	12/31

CV = 390. +/- 39. ug/tube

Result	Uncer.	Date
404.	40.	10/26

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o-Xylene: (84GAU 01)

CV = 53.9 +/- 5.4 ug/tube

Result	Uncer.	Date
47.	5.	12/31
50.3	5.	12/31

CV = 54.15 +/- 5.4 ug/tube

Result	Uncer.	Date
51.3	5.	12/31
48.8	5.	12/31

CV = 107.8 +/- 11. ug/tube

Result	Uncer.	Date
94.2	9.	12/31

o-Xylene: (cont)

CV = 108.3 +/- 11. ug/tube

Result	Uncer.	Date
94.4	9.	12/31
98.2	10.	12/31

CV = 161.7 +/- 16. ug/tube

Result	Uncer.	Date
143.	14.	12/31

CV = 162.45 +/- 16. ug/tube

Result	Uncer.	Date
152.	15.	12/31

CV = 215.6 +/- 22. ug/tube

Result	Uncer.	Date
186.	20.	12/31
251.	25.	12/31

CV = 216.6 +/- 22. ug/tube

Result	Uncer.	Date
201.	20.	12/31

CV = 269.5 +/- 27. ug/tube

Result	Uncer.	Date
272.	30.	12/31

CV = 270.75 +/- 27. ug/tube

Result	Uncer.	Date
232.	20.	12/31

CV = 324.9 +/- 32. ug/tube

Result	Uncer.	Date
329.	30.	12/31

CV = 377.3 +/- 38. ug/tube

Result	Uncer.	Date
327.	30.	12/31

CV = 2.0 +/- 0.2 mg/tube

Result	Uncer.	Date
2.00	0.2	10/26

TABLE D-VI (cont)

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HSE-9 Organics on Charcoal (cont)

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o-Xylene (cont)

CV = 4.0 +/- 0.4 mg/tube

Result	Uncer.	Date
4.06	0.4	10/26

CV = 6.0 +/- 0.6 mg/tube

Result	Uncer.	Date
6.14	0.6	10/26

1,2,4-Trimethylbenzene: (84GAU 01)

CV = 49.1 +/- 4.9 ug/tube

Result	Uncer.	Date
47.9	5.	12/31
47.1	5.	12/31

CV = 55.25 +/- 5.5 ug/tube

Result	Uncer.	Date
53.7	5.	12/31
51.3	5.	12/31

CV = 98.2 +/- 9.8 ug/tube

Result	Uncer.	Date
88.3	9.	12/31

CV = 110.5 +/- 11. ug/tube

Result	Uncer.	Date
99.8	9.	12/31
103.	10.	12/31

CV = 147.3 +/- 15. ug/tube

Result	Uncer.	Date
137.	13.	12/31

CV = 165.75 +/- 16. ug/tube

Result	Uncer.	Date
160.	15.	12/31

1,2,4-Trimethylbenzene: (cont)

CV = 196.4 +/- 20. ug/tube

Result	Uncer.	Date
181.	18.	12/31
244.	25.	12/31

CV = 221. +/- 22. ug/tube

Result	Uncer.	Date
215.	20.	12/31

CV = 245.5 +/- 25. ug/tube

Result	Uncer.	Date
268.	25.	12/31

CV = 276.25 +/- 28. ug/tube

Result	Uncer.	Date
255.	20.	12/31

CV = 331.5 +/- 33. ug/tube

Result	Uncer.	Date
352.	30.	12/31

CV = 343.7 +/- 34. ug/tube

Result	Uncer.	Date
307.	30.	12/31

Chloroform: (84GAU 01)

CV = 2.97 +/- 0.3 ug/tube

Result	Uncer.	Date
3.39	0.3	11/27
3.27	0.3	11/27
3.5	0.3	11/27

CV = 5.94 +/- 0.6 ug/tube

Result	Uncer.	Date
6.42	0.6	11/27
7.96	0.7	11/27

CV = 8.90 +/- 0.9 ug/tube

Result	Uncer.	Date
9.52	0.9	11/27
10.59	1.0	11/27

Methyl Chloroform: (84GAU 01)

CV = 0.67 +/- 0.07 ug/tube

Result	Uncer.	Date
0.68	0.07	11/27
0.64	0.06	11/27
0.79	0.08	11/27
0.71	0.07	11/27

CV = 1.34 +/- 0.13 ug/tube

Result	Uncer.	Date
1.42	0.14	11/27
1.46	0.15	11/27

CV = 2.01 +/- 0.2 ug/tube

Result	Uncer.	Date
2.19	0.2	11/27
2.07	0.2	11/27

CV = 334.4 +/- 33. ug/tube

Result	Uncer.	Date
384.	40.	12/18

CV = 668.8 +/- 67. ug/tube

Result	Uncer.	Date
683.	70.	12/18

Carbon Tetrachloride: (84GAU 01)

CV = 0.792 +/- 0.08 mg/tube

Result	Uncer.	Date
0.74	0.07	12/18

CV = 1.585 +/- 0.16 mg/tube

Result	Uncer.	Date
1.43	0.14	12/18
1.76	0.18	12/18

CV = 2.378 +/- 0.24 mg/tube

Result	Uncer.	Date
2.31	0.23	12/18

TABLE D-VI (cont)

****

HSE-9 Organics on Charcoal (cont)

Dichloroethane: (84GAU 01)

CV = 0.628 +/- 0.07 mg/tube

Result	Uncer.	Date
0.57	0.06	12/18

CV = 1.255 +/- 0.12 mg/tube

Result	Uncer.	Date
1.42	0.14	12/18
1.08	0.11	12/18

CV = 1.882 +/- 0.19 mg/tube

Result	Uncer.	Date
1.77	0.18	12/18

Trichloroethylene: (84GAU 01)

CV = 0.728 +/- 0.07 mg/tube

Result	Uncer.	Date
0.63	0.06	12/18

CV = 1.456 +/- 0.14 mg/tube

Result	Uncer.	Date
1.49	0.15	12/18
1.22	0.12	12/18

CV = 2.184 +/- 0.21 mg/tube

Result	Uncer.	Date
1.94	0.19	12/18

1-Octanol: (84GAU 01)

CV = 8.27 +/- 0.83 mg/tube

Result	Uncer.	Date
5.95	0.60	12/20

****

HSE-9 Organics in Water

Formaldehyde: (84GAU 01)

CV = 1. +/- 0.1 mg/l

Result	Uncer.	Date
1.06	0.11	11/05
0.70	0.07	11/20

CV = 2. +/- 0.2 mg/l

Result	Uncer.	Date
2.12	0.2	7/25

CV = 3. +/- 0.3 mg/l

Result	Uncer.	Date
3.33	0.2	7/25
3.2	0.32	11/20

CV = 4. +/- 0.4 mg/l

Result	Uncer.	Date
3.41	0.34	11/05

Ethyl Propionate: (84GAU 01)

CV = 0.132 +/- 0.013 mg/l

Result	Uncer.	Date
0.14	0.02	11/05

CV = 0.136 +/- 0.014 mg/l

Result	Uncer.	Date
0.24	0.02	11/05

CV = 0.266 +/- 0.027 mg/l

Result	Uncer.	Date
0.33	0.04	11/05

CV = 0.27 +/- 0.03 mg/l

Result	Uncer.	Date
0.31	0.03	11/05

Toluene: (84GAU 01)

CV = 0.032 +/- 0.003 mg/l

Result	Uncer.	Date
0.11	0.02	11/05

CV = 0.033 +/- 0.003 mg/l

Result	Uncer.	Date
0.085	0.01	11/05

CV = 0.065 +/- 0.006 mg/l

Result	Uncer.	Date
0.082	0.01	11/05

CV = 0.066 +/- 0.007 mg/l

Result	Uncer.	Date
0.063	0.01	11/05

Acetone: (84GAU 01)

CV = 0.588 +/- 0.06 mg/l

Result	Uncer.	Date
0.54	0.05	11/05

CV = 0.607 +/- 0.06 mg/l

Result	Uncer.	Date
0.68	0.07	11/05

CV = 1.187 +/- 0.12 mg/l

Result	Uncer.	Date
1.22	0.12	11/05

CV = 1.203 +/- 0.12 mg/l

Result	Uncer.	Date
1.4	0.14	11/05

TABLE D-VI (cont)

****

HSE-9 Organics in Water

Phenol: (84GAU 01)

CV = 10. +/- 1. mg/l

Result	Uncer.	Date
10.1	0.2	8/14

CV = 20. +/- 2. mg/l

Result	Uncer.	Date
19.3	1.1	8/14

CV = 60. +/- 6. mg/l

Result	Uncer.	Date
62.9	0.	12/20

****

HSE-9 Major Anions in Water

Cl: (84GAU 01)

CV = 3.63 +/- 0.04 mg/l

Result	Uncer.	Date
4.	1.	11/07

NO3: (84GAU 01)

CV = 1.47 +/- 0.07 mg/l

Result	Uncer.	Date
1.63	0.5	11/07

SO4: (84GAU 01)

CV = 4.07 +/- 0.02 mg/l

Result	Uncer.	Date
3.73	0.37	11/19

SO4: (cont)

CV = 6.79 +/- 0.03 mg/l

Result	Uncer.	Date
6.07	0.61	11/19

CV = 20.37 +/- 1.0 mg/l

Result	Uncer.	Date
20.7	2.1	11/19

****

HSE-9 Major Cations in Water

Ca: (84GAU 01)

CV = 10. +/- 0.5 mg/l

Result	Uncer.	Date
9.83	0.98	11/19

K: (84GAU 01)

CV = 4. +/- 0.2 mg/l

Result	Uncer.	Date
4.34	0.43	12/12

CV = 6. +/- 0.3 mg/l

Result	Uncer.	Date
6.44	0.64	12/12

CV = 10. +/- 0.5 mg/l

Result	Uncer.	Date
10.	1.	12/12

Mg: (84GAU 01)

CV = 2. +/- 0.1 mg/l

Result	Uncer.	Date
1.95	0.2	11/27
2.02	0.2	11/27

Mg: (cont)

CV = 4. +/- 0.2 mg/l

Result	Uncer.	Date
3.96	0.4	11/27

Na: (84GAU 01)

CV = 45.92 +/- 2.2 mg/l

Result	Uncer.	Date
47.2	4.7	12/12

CV = 65.6 +/- 3.3 mg/l

Result	Uncer.	Date
66.8	6.7	12/12
66.8	6.7	12/12

****

HSE-9 Cs-137 in Water

Cs-137: (84GAU 01)

CV = 107.9 +/- 6. pCi/l

Result	Uncer.	Date
130.	27.5	11/24
132.	25.3	11/24

CV = 143.9 +/- 7. pCi/l

Result	Uncer.	Date
150.	28.7	11/24
177.	33.2	11/24

TABLE D-VI (cont)

****

HSE-9 Trace Metals in Water

Ba: (84GAU 01)

CV = 4.0 +/- UG/ML

Result	Uncer.	Date
3.62	0.	12/20

U: (83H-8 01)
CV = 170. +/- 15. ppb

Result	Uncer.	Date
161.9	16.2	4/06
159.5	16.	5/10
179.6	18.	6/26
175.9	17.6	6/26

****

HSE-9 Polychlorinated Biphenyls on Fluorisil

Mixed PCB's: (84GAU 01)
CV = 8.6 +/- 0.9 ug/tube

Result	Uncer.	Date
8.4	1.7	11/20

****

HSE-9 Nitric Acid in Water

HNO3: (84GAU 01)
CV = 94.67 +/- 5. mg/l

Result	Uncer.	Date
90.	8.	12/04
102.	9.	12/13

CV = 142.0 +/- 7. mg/l

Result	Uncer.	Date
125.	10.	12/04

****

HSE-9 Organics in Gas Badge

Heptane: (84GAU 01)

CV = 0.137 +/- 0.007 mg/tube

Result	Uncer.	Date
0.165	0.02	11/27

****

HSE-9 PCB's in Oil

Aroclor 1260: (85GAU 03)

CV = 45.8 +/- 2.2 mg/l

Result	Uncer.	Date
49.	4.	9/18
50.	0.	10/02
38.	7.6	11/20

****

Battelle Radionuclides in Artificial Urine

Am-241: (84BAT 01)

CV = 0.181 +/- 0.03 pCi/l

Result	Uncer.	Date
0.171	0.02	12/31
0.156	0.02	12/31
0.145	0.02	12/31

CV = 0.73 +/- 0.11 pCi/l

Result	Uncer.	Date
0.707	0.07	12/31
0.681	0.07	12/31
0.736	0.07	12/31

Co-60: (84BAT 01)

CV = 202. +/- 4. pCi/l

Result	Uncer.	Date
350.	70.	12/31
240.	50.	12/31
56.	79.	12/31
35.	77.	12/31
248.	95.	12/31
330.	70.	12/31

CV = 1158. +/- 23. pCi/l

Result	Uncer.	Date
1250.	200.	12/31
920.	211.	12/31
1120.	251.	12/31
1260.	250.	12/31
1190.	262.	12/31
1110.	250.	12/31

Cs-137: (84BAT 01)

CV = 234. +/- 5. pCi/l

Result	Uncer.	Date
210.	60.	12/31
220.	60.	12/31
210.	60.	12/31
238.	77.	12/31
209.	70.	12/31
261.	79.	12/31

CV = 1351. +/- 27. pCi/l

Result	Uncer.	Date
1450.	250.	12/31
1420.	250.	12/31
1320.	275.	12/31
1400.	250.	12/31
1460.	302.	12/31
1390.	289.	12/31

TABLE D-VI (cont)

****

Battelle Radionuclides in
Artificial Urine (cont)

H-3: (84BAT 01)

CV = 11.75 +/- 1.76 nCi/l

Result	Uncer.	Date
15.3	2.	12/31
16.5	2.	12/31
16.	2.	12/31
13.1	1.4	12/31

CV = 153.8 +/- 23.1 nCi/l

Result	Uncer.	Date
176.	17.	12/31
178.	18.	12/31
179.	18.	12/31
157.	16.	12/31

CV = 1492.0 +/- 223.8 nCi/l

Result	Uncer.	Date
1686.	170.	12/31
1678.	170.	12/31
1704.	170.	12/31
1520.	150.	12/31

Pu-239: (84BAT 01)

CV = 0.182 +/- 0.03 pCi/l

Result	Uncer.	Date
0.170	0.02	12/31
0.183	0.02	12/31
0.167	0.02	12/31

CV = 0.721 +/- 0.11 pCi/l

Result	Uncer.	Date
0.70	0.07	12/31
0.64	0.06	12/31
0.57	0.06	12/31

U: (84BAT 01)

CV = 16.7 +/- 2.51 pCi/l

Result	Uncer.	Date
14.7	1.5	12/31
15.7	1.5	12/31
14.3	1.5	12/31

CV = 52.07 +/- 7.81 ug/l

Result	Uncer.	Date
48.1	5.	12/31
47.6	5.	12/31
45.5	5.	12/31

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TABLE D-VII

REFERENCES FOR INDIVIDUAL CONSTITUENT CONCENTRATIONS IN QUALITY ASSURANCE MATERIALS MEASURED BY HSE-9 IN 1984

Code	N	Reference
64NBS	02	National Bureau of Standards (1964), Certificate of Analysis, SRM 4921-C, Sodium-22.
72NBS	01	National Bureau of Standards (1972), Certificate of Analysis, SRM 610, Trace Elements in Glass.
73FLA	01	F. J. Flanagan (1973), 1972 Values for International Geochemical Reference Samples, Geochimica et Cosmochimica Acta 37: 1189-1200.
74NBS	01	National Bureau of Standards (1974), Certificate of Analysis, SRM 1632, Trace Elements in Coal.
75EPA	01	Environmental Protection Agency (1975), EPA Quality Control Samples for Trace Metals Analyses, Quality Assurance Branch, EMSL-Cincinatti.
75NBS	03	National Bureau of Standards (1975), Certificate of Analysis, SRM 4350, Environmental Radioactivity Standard: River Sediment.
75NBS	06	National Bureau of Standards (1975), Certificate of Analysis, SRM 2675, Beryllium on Filter Media.
76EPA	01	Environmental Protection Agency (1976), Quality Control Check Samples for Water Pollution, EMSL-Cincinnati.
76NBS	01	National Bureau of Standards (1976), Certificate of Analysis, SRM 1570, Trace Elements in Spinach.
76NBS	02	National Bureau of Standards (1976), Certificate of Analysis, SRM 1573, Tomato Leaves.
76NBS	03	National Bureau of Standards (1976), Certificate of Analysis, SRM 1575, Pine Needles.
77EPA	01	Environmntal Protection Agency (1977), Water Supply Quality Control Check Samples for Nitrate/Fluoride, Quality Assurance Branch, EMSL-Cincinatti.
77ING	01	J. C. Ingles, R. Sutarno, W. S. Bowman, and G. Faye (1977), Radioactive Ores DH-1, DL-1, BL-1, BL-2, BL-3, BL-4: Certified Reference Materials, CANMET Report 77-64.
77NBS	01	National Bureau of Standards (1977), Certificate of Analysis, SRM 1571, Orchard Leaves.

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Code	N	Reference
77NBS	02	National Bureau of Standards (1977), Certificate of Analysis, SRM 1642A, Mercury in Water, ng/mL.
77NBS	03	National Bureau of Standards (1977), Certificate of Analysis, SRM 1577, Bovine Liver.
78EPA	01	Environmental Protection Agency (1978), Quality Control Samples for Nutrients.
78EPA	03	Environmental Protection Agency (1978), Water Supply Quality Control Check Samples for Trace Metals.
78EPA	04	Environmental Protection Agency (1978), Water Supply Quality Control Check Samples for Nitrate/Fluoride, EMSL-Cincinatti.
78NBS	01	National Bureau of Standards (1978), Certificate of Analysis, SRM 1632A, Trace Elements in Coal (Bituminous).
78NBS	02	National Bureau of Standards (1978), Certificate of Analysis, SRM 2676A, Metals of Filter Media (Cd, Pb, Mn, Zn).
78NBS	03	National Bureau of Standards (1978), Certificate of Analysis, SRM 1648, Urban Particulate Matter.
78NBS	05	National Bureau of Standards (1978), Certificate of Analysis, SRM 1567, Wheat Flour.
78NBS	06	National Bureau of Standards (1978), Certificate of Analysis, SRM 1568, Rice Flour.
78NBS	11	National Bureau of Standards (1978), Certificate of Analysis, SRM 2661A, Benzene on Charcoal.
79NBS	01	National Bureau of Standards (1979), Certificate of Analysis, SRM 4926-C, Hydrogen-3; Dilution of Master Solution by HSE-8.
79NBS	02	National Bureau of Standards (1979), Certificate of Analysis, SRM 1633A, Trace Elements in Coal Fly Ash.
79NBS	04	National Bureau of Standards (1979), Certificate of Analysis, SRM 1635, Trace Elements in Coal (Subbituminous).
80EML	01	Environmental Measurements Laboratory (1980), Private Communication.
80NBS	01	National Bureau of Standards (1980), Certificate of Analysis, SRM 1643A, Trace Elements in Water.
80STE	02	H. F. Steger (1980), Certified Reference Materials, CANMET Report 80-6E.

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Code	N	Reference
81EPA	02	Environmental Protection Agency (1981), EPA Water Pollution Quality Control Samples, EMSL-Cincinnati.
81EPA	03	Environmental Protection Agency (1981), EPA Water Pollution Quality Control Check Samples for Trace Metals, EMSL-Cincinnati.
81GLA	05	E. S. Gladney and W. E. Goode (1981), Elemental Concentrations in Eight New United States Geological Survey Rock Standards--A Review, Geostandards Newsletter 5: 31-64.
81GLA	06	E. S. Gladney (1981), Comparison of Methods for Calculation of Recommended Elemental Concentration Values for Canadian Certified Reference Materials Project Standards SY-2, SY-3, and MRG-1, Los Alamos Scientific Laboratory report LA-8770-MS.
81H-8	03	Group HSE-8, Environmental Surveillance Group (1981), Assumption of Natural Isotopic Abundance for Uranium.
81NBS	01	National Bureau of Standards (1981), Certificate of Analysis, SRM 4353, Environmental Radioactivity, Rocky Flats Soil No. 1.
81NBS	02	National Bureau of Standards (1981), Certificate of Analysis, SRM 4350B, Environmental Radioactivity, River Sediment.
81NBS	03	National Bureau of Standards (1981), Certificate of Analysis, SRM 278, Obsidian Rock.
81NBS	04	National Bureau of Standards (1981), Certificate of Analysis, SRM 688, Basalt Rock.
82EPA	01	Environmental Protection Agency (1982), Quality Control Samples for Water Pollution, EMSL-Cincinnati.
82NBS	01	National Bureau of Standards (1982), Certificate of Analysis, SRM 1646, Estuarine Sediment (Revised 6/7/82).
82NBS	03	National Bureau of Standards (1982), Certificate of Analysis, SRM 1572, Citrus Leaves (Revised 12/20/82).
82NBS	06	National Bureau of Standards (1982), Certificate of Analysis, SRM 1577A, Bovine Liver (Revised 06/15/82).
82NBS	08	National Bureau of Standards (1982), Certificate, Standard Reference Material 1642b, Mercury in Water-ng/mL.
82NBS	10	National Bureau of Standards (1982), Certificate, SRM 4355, Peruvian Soil, Environmental Radioactivity.

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Code	N	Reference
82NBS	11	National Bureau of Standards (1982), Certificate of Analysis, SRM 1645, River Sediment (Revised).
83GLA	04	E. S. Gladney, C. E. Burns, and I. Roelandts (1983), 1982 Compilation of Elemental Concentrations in Eleven United States Geological Survey Rock Standards, Geostandards Newsletter 7: 2-236.
83H-8	01	Group HSE-8, Environmental Surveillance (1983), In-House Quality Control.
83NBS	01	National Bureau of Standards (1983), Certificate of Analysis, SRMS 2682, 2863, 2684, and 2685, Sulfur in Coal.
83NBS	02	National Bureau of Standards (1983), Certificate of Analysis, SRM 1566, Oyster Tissue.
84ADA	01	W. H. Adams (1984), HSE-9 In-House Quality Control Standard for pH, TDS, and Conductivity, Standard Methods, 15th Edition, p. 29.
84ADA	02	W. H. Adams (1984), HSE-9 In-House Boron Standard.
84BAT	01	Battelle Pacific Northwest Laboratories (1984), Bioassay Intercomparison Study.
84EML	01	Environmental Measurements Laboratory (1984), Quality Assessment Program, Department of Energy, New York.
84EPA	01	Environmental Protection Agency (1984), Quality Assurance Check Samples, EMSL-Las Vegas.
84GAU	01	M. A. Gautier (1984), HSE-9 In-House Quality Assurance Samples.
84GLA	04	E. S. Gladney, C. E. Burns, D. R. Perrin, I. Roelandts, and T. E. Gills (1984), 1982 Compilation of Elemental Concentrations in NBS Biological, Geological, and Environmental Standard Reference Materials, NBS Special Publication 260-88.
84GLA	06	E. S. Gladney, C. E. Burns, and I. Roelandts (1985), 1983 Compilation of Elemental Concentration Data for CCRMP Reference Soil Samples SO-1 to SO-4, Geostandards Newsletter 9: 35-68.
84GLA	09	E. S. Gladney, C. E. Burns, and I. Roelandts (1984), 1982 Compilation of Elemental Concentration Data for the United States Geological Survey's Geochemical Exploration Reference Samples GXR-1 to GXR-6, Geostandards Newsletter 8: 119-154.
84GLA	12	E. S. Gladney (1984), Interim Calculations of Compiled Values from SRMS Literature Database.

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Code	N	Reference
84NBS	01	National Bureau of Standards (1984), Certificate of Analysis, SRM 1584, Priority Pollutant Phenols in Methanol.
84NBS	05	National Bureau of Standards (1984), Certificate, SRM 1643B, Trace Elements in Water.
84PAT	01	Proficiency Analytical Testing Program, National Institute for Occupational Safety and Health (1984).
84PER	01	D. Perrin (1984), HSE-9 Dilution of Master NBS Solution SRM 4926C.
84WAN	01	L. A. Wangen (1984), HSE-9 In-House Boron in Water Quality Control.

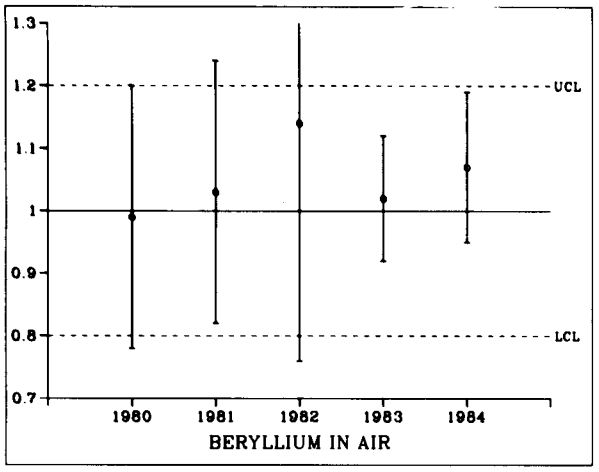
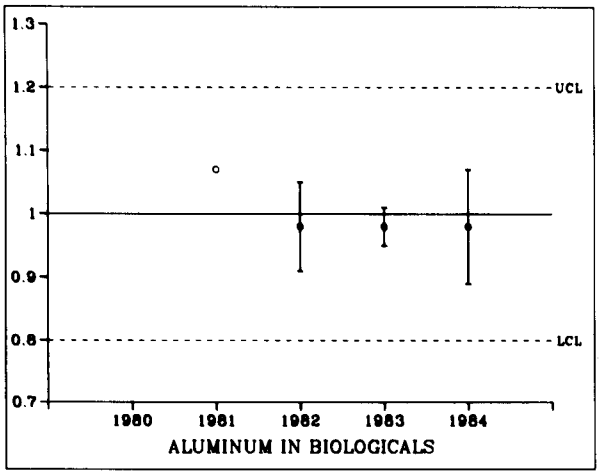


Fig. D-1. Five-year trends in quality assurance data for soil, water, biologicals, urine, and air particulates.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LCL
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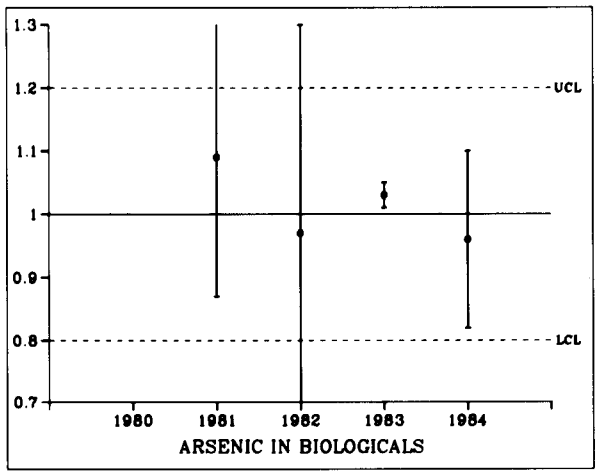
1981
1982
1983
1984
ALUMINUM IN BIOLOGICALS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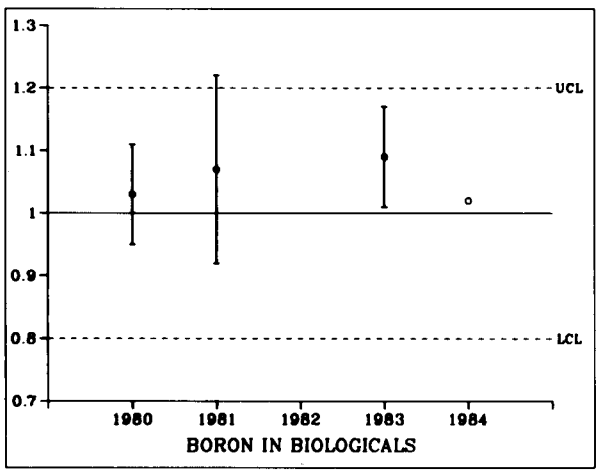
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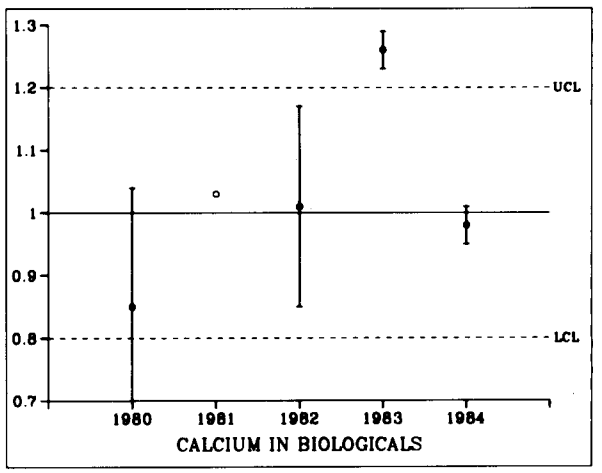
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1982
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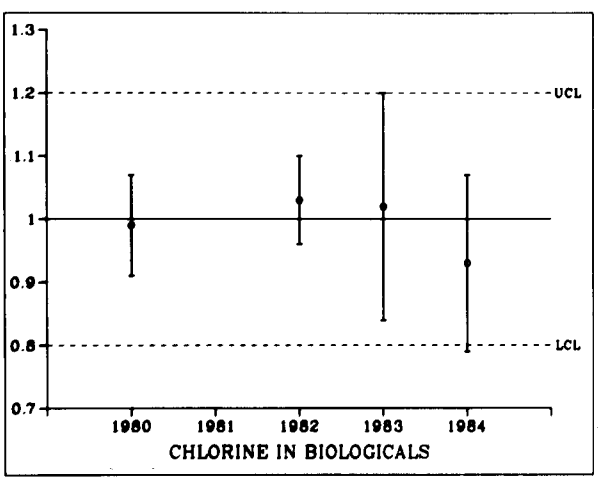
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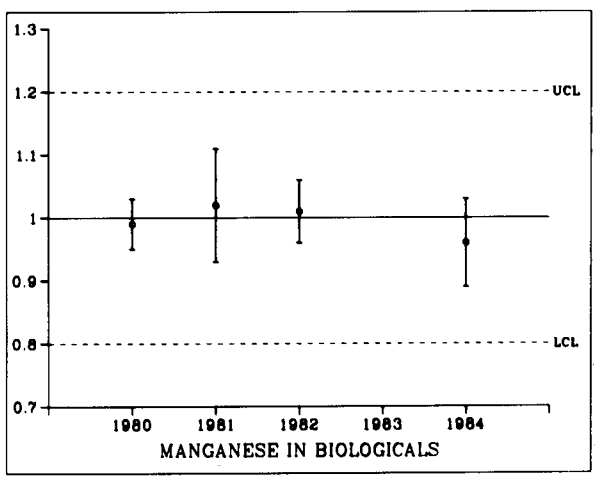
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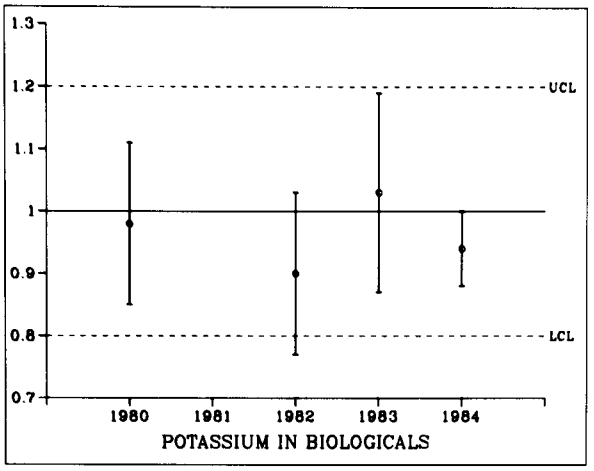
MANGANESE IN BIOLOGICALS

Fig. D-1 (cont)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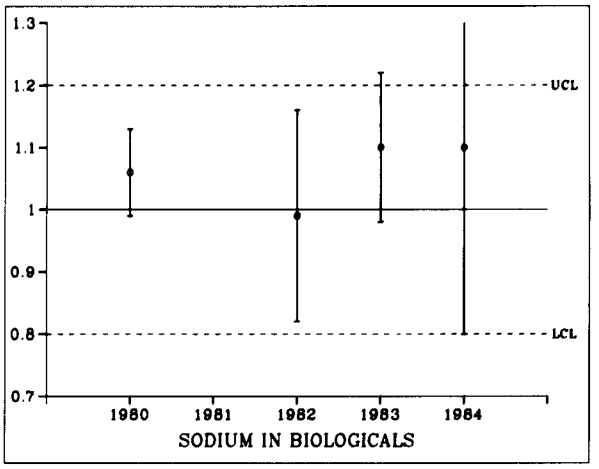
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LCL
1980
1981
1982
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1984
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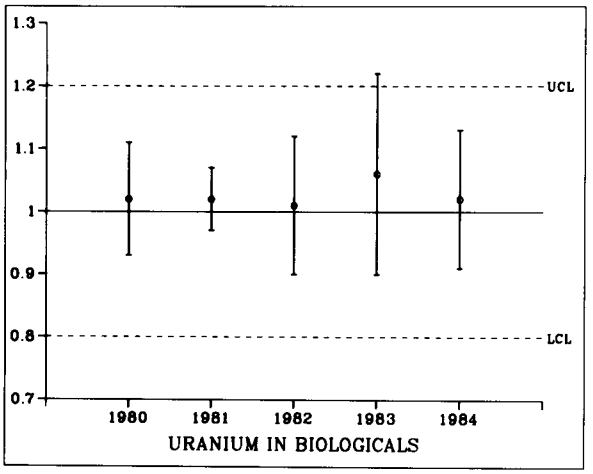
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LCL
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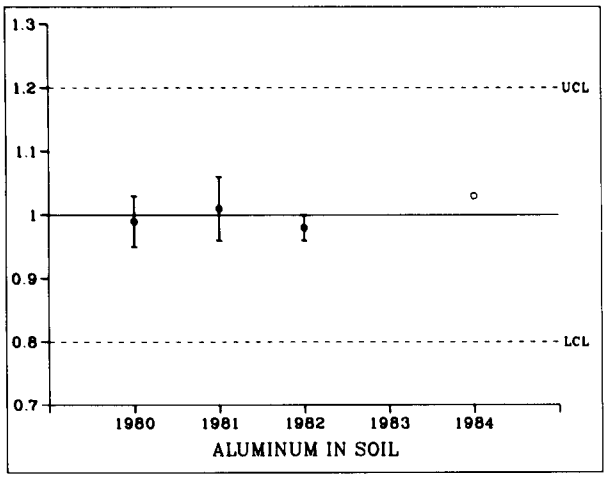
1982
1983
1984
URANIUM IN BIOLOGICALS

Fig. D-1 (cont)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1984
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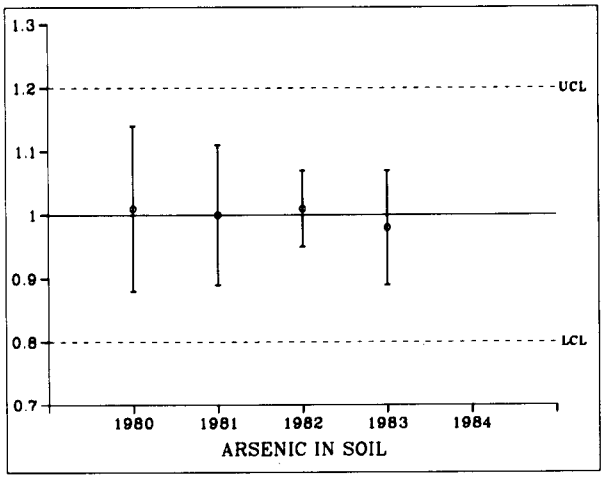
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1984
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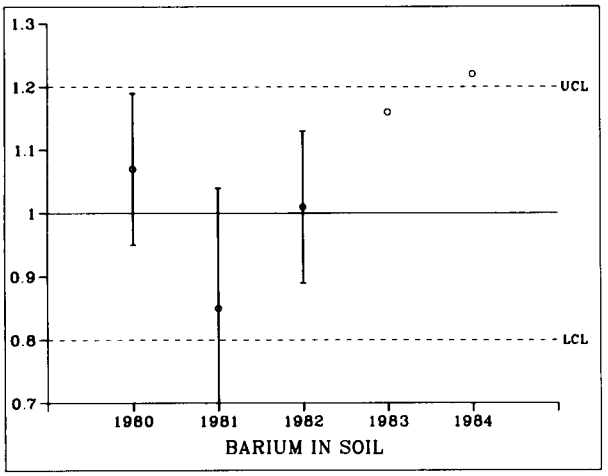
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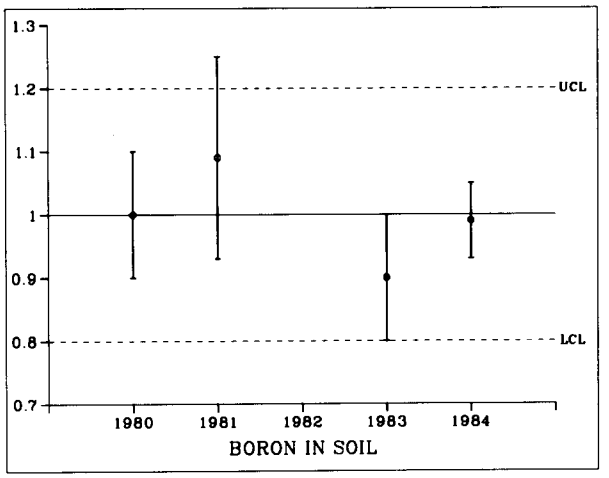
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1984
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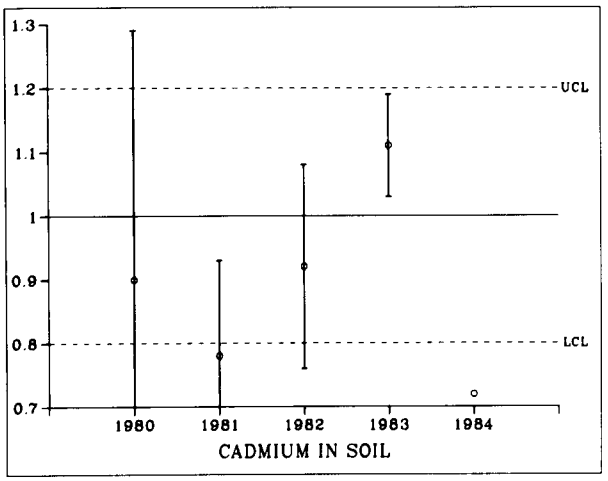
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1984
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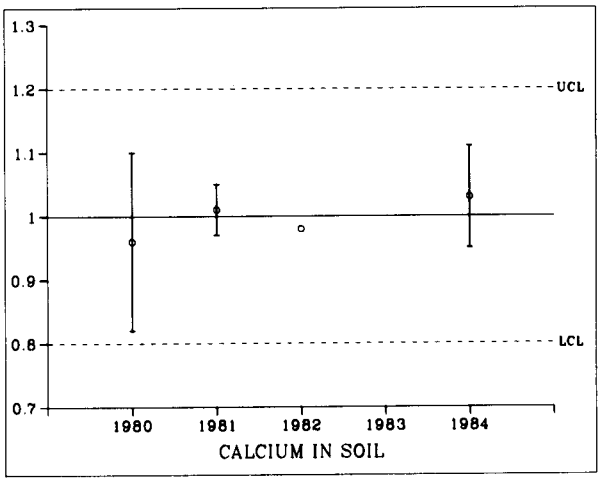
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UCL
LCL
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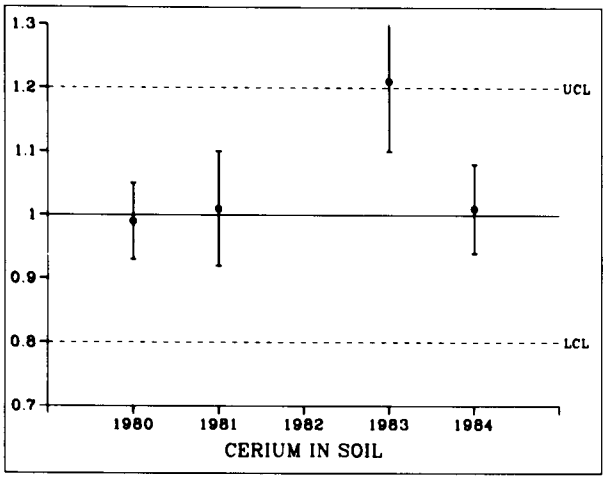
1983
1984
CALCIUM IN SOIL

Fig. D-1 (cont)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1984
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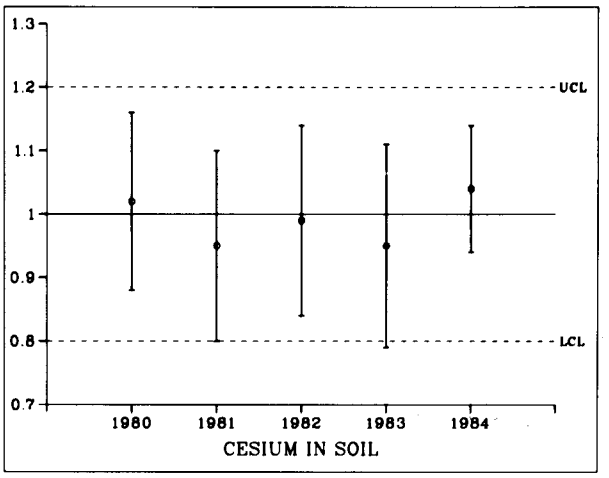
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1983
1984
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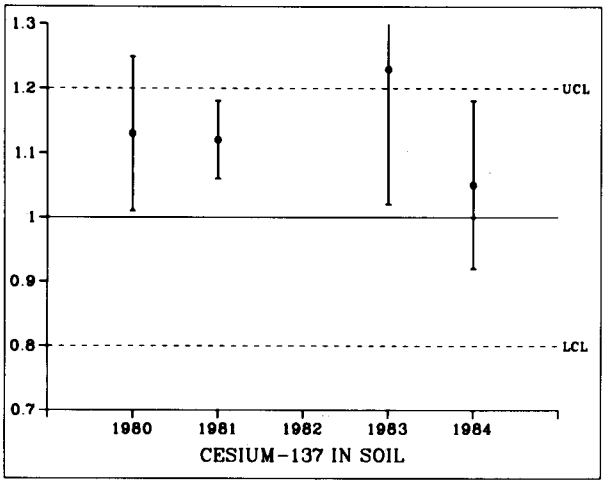
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UCL
LCL
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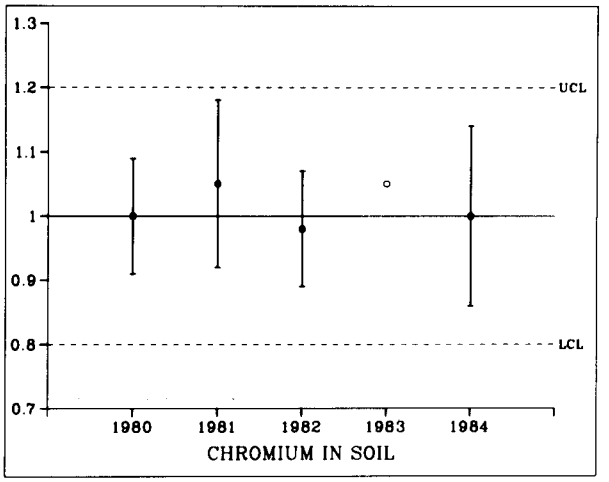
1982
1983
1984
CESIUM-137 IN SOIL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LCL
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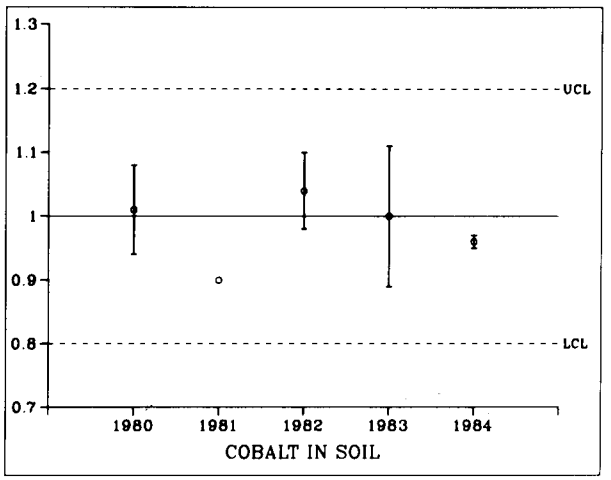
1982
1983
1984
CHROMIUM IN SOIL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UCL
LCL
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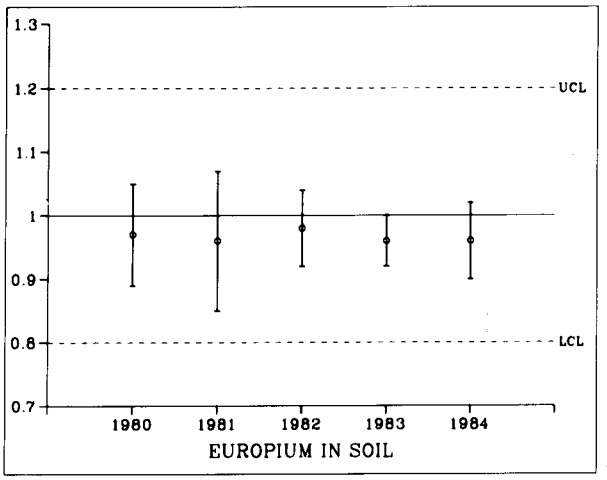
1982
1983
1984
COBALT IN SOIL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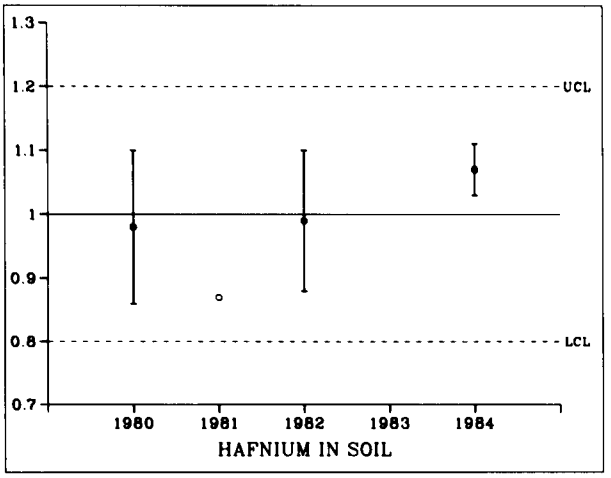
UCL
LCL
1980
1981
1982
1983
1984
EUROPIUM IN SOIL

Fig. D-1 (cont)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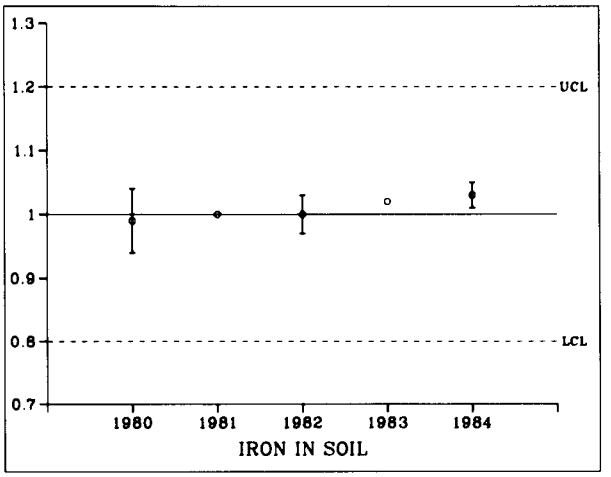
UCL
LCL
1980
1981
1982
1983
1984
HAFNIUM IN SOIL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UCL
LCL
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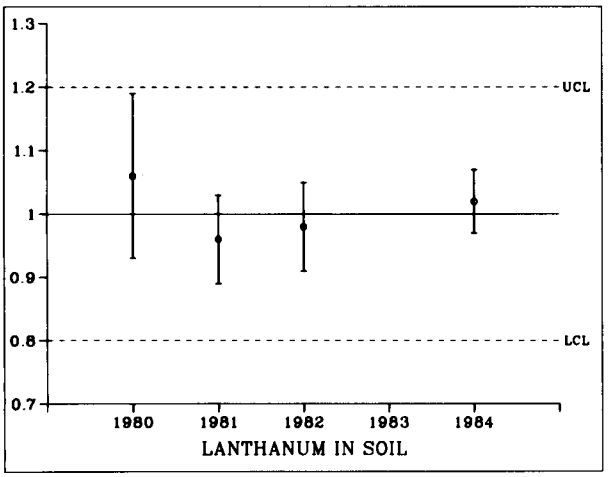
1983
1984
IRON IN SOIL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LCL
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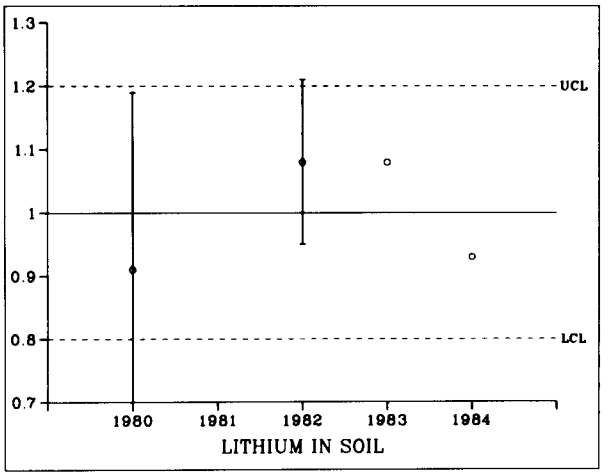
1983
1984
LANTHANUM IN SOIL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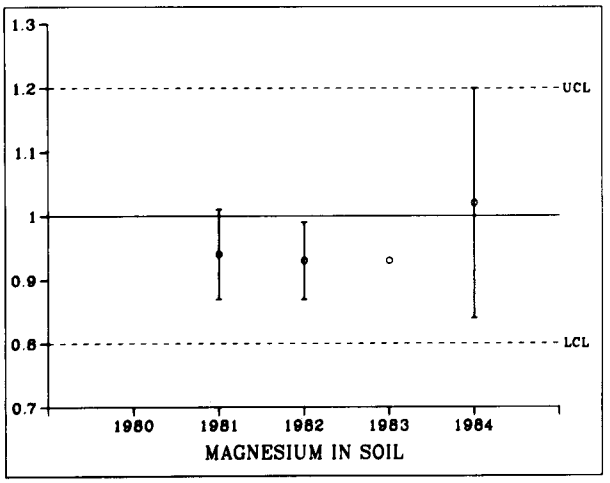
UCL
LCL
1980
1981
1982
1983
1984
LITHIUM IN SOIL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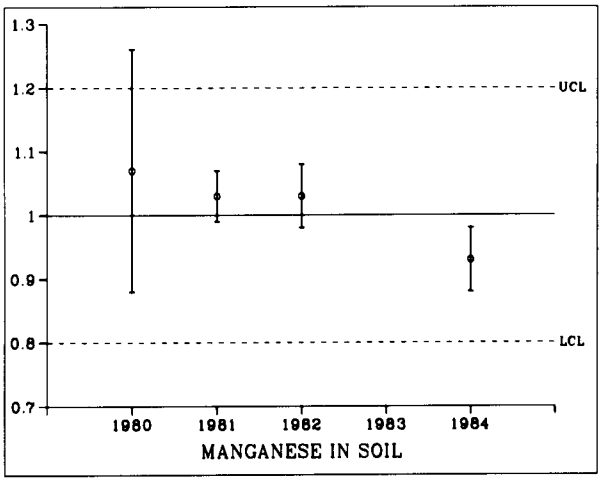
UCL
LCL
1980
1981
1982
1983
1984
MAGNESIUM IN SOIL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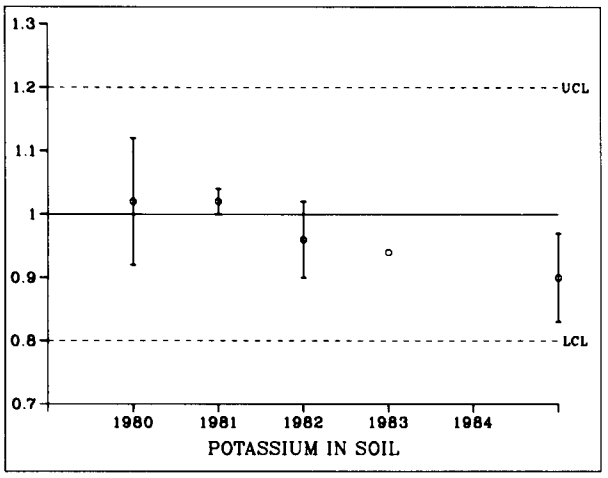
UCL
LCL
1980
1981
1982
1983
1984
MANGANESE IN SOIL

Fig. D-1 (cont)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UCL
LCL
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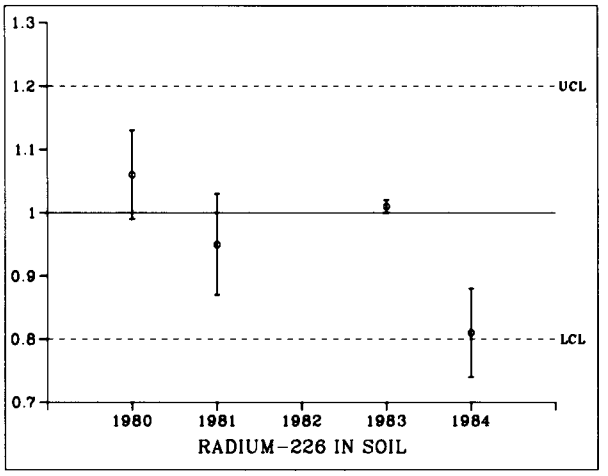
1981
1982
1983
1984
POTASSIUM IN SOIL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LCL
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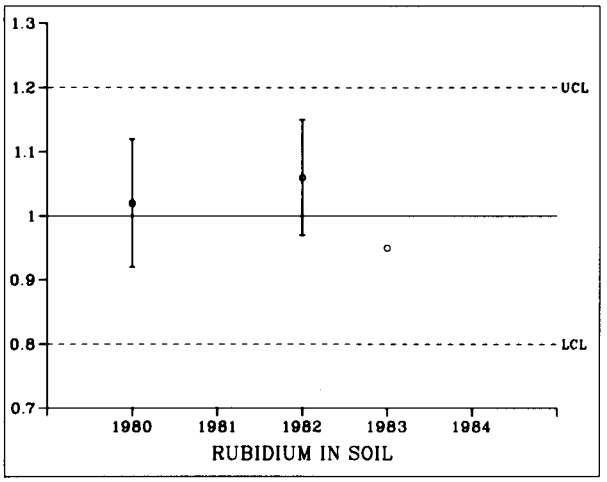
1984
RADIUM-226 IN SOIL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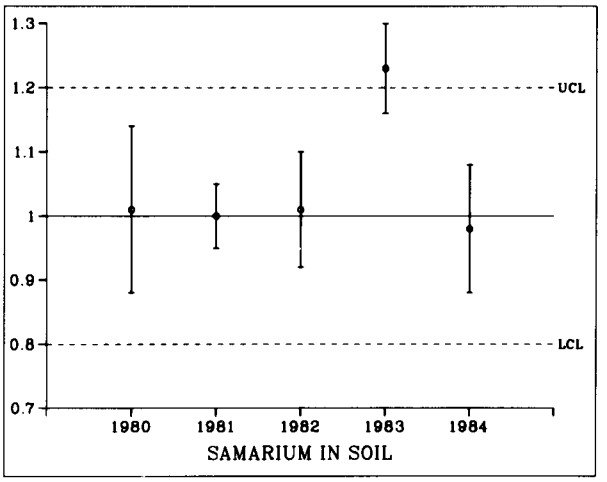
LCL
1980
1981
1982
1983
1984
RUBIDIUM IN SOIL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UCL
LCL
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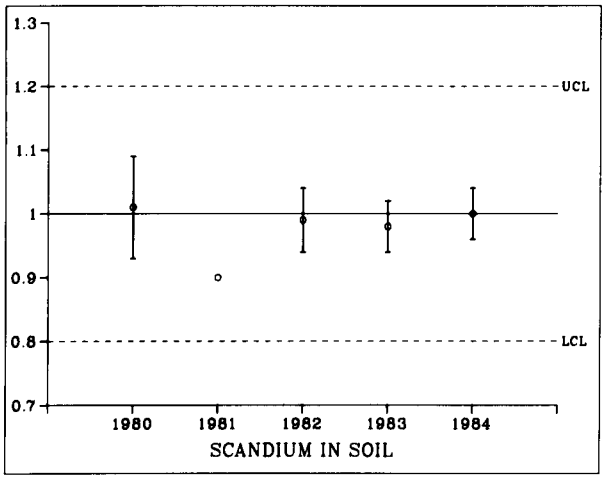
1981
1982
1983
1984
SAMARIUM IN SOIL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UCL
LCL
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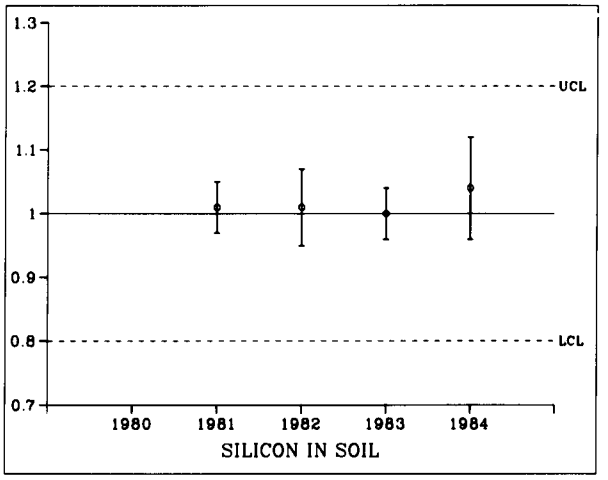
1981
1982
1983
1984
SCANDIUM IN SOIL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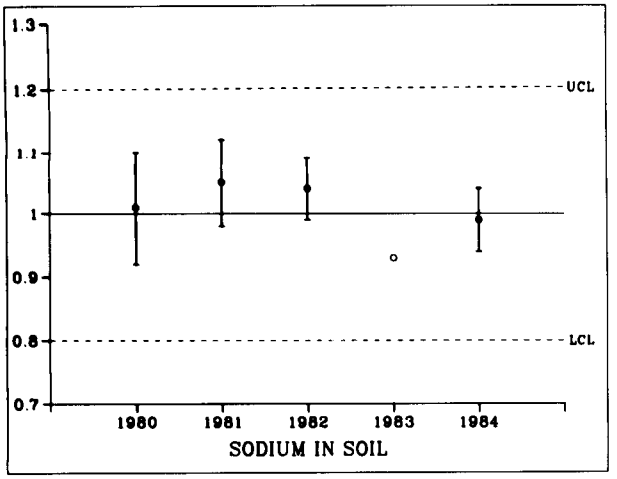
UCL
LCL
1980
1981
1982
1983
1984
SILICON IN SOIL

Fig. D-1 (cont)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UCL
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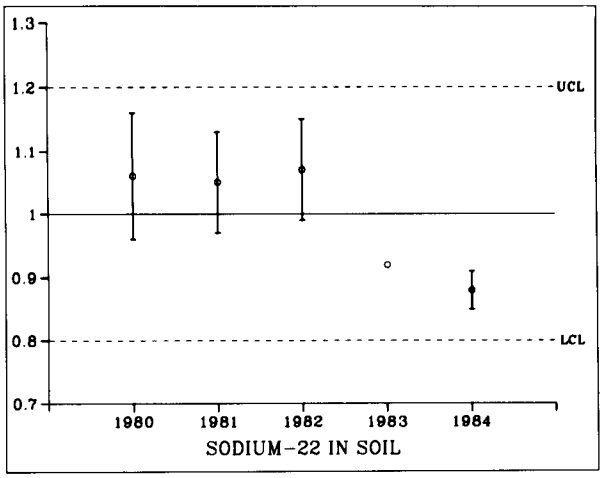
1983
1984
SODIUM IN SOIL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LCL
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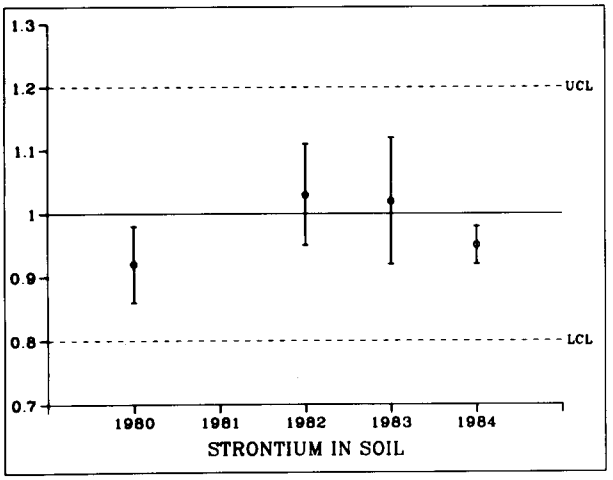
1981
1982
1983
1984
SODIUM-22 IN SOIL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UCL
LCL
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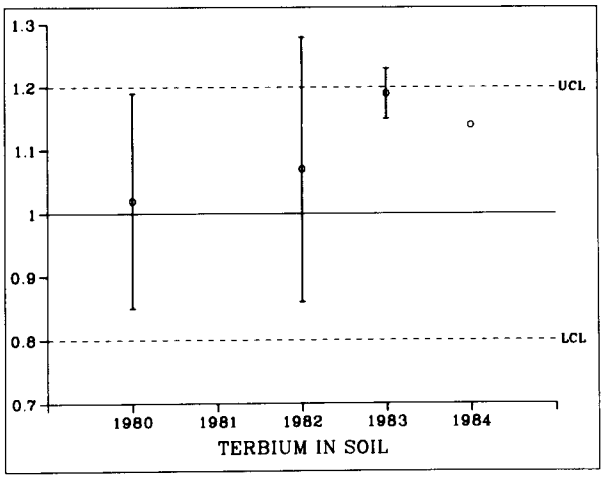
1981
1982
1983
1984
STRONTIUM IN SOIL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UCL
LCL
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1981
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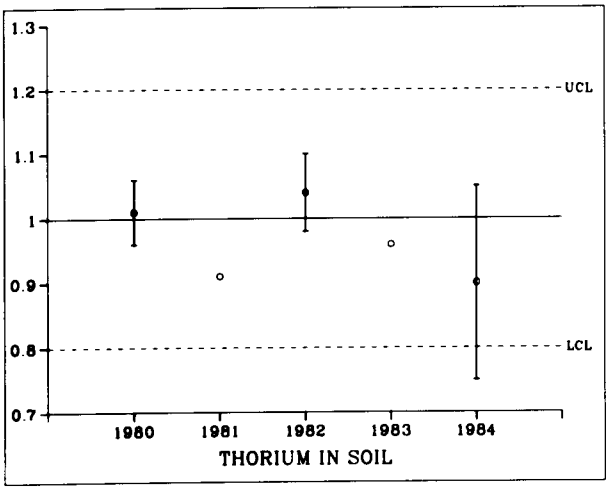
1983
1984
TERBIUM IN SOIL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LCL
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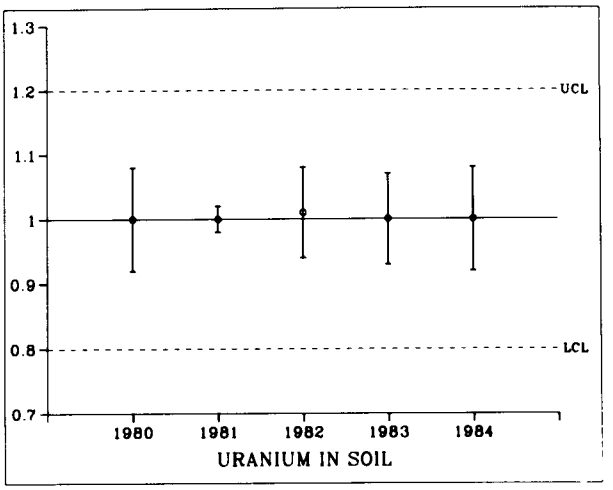
1982
1983
1984
THORIUM IN SOIL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UCL
LCL
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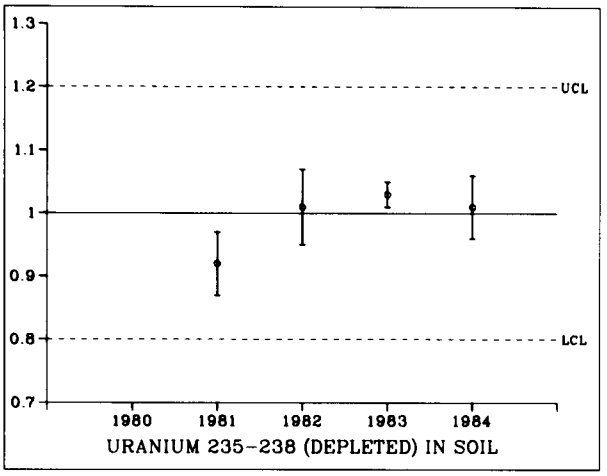
1981
1982
1983
1984
URANIUM IN SOIL

Fig. D-1 (cont)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LCL
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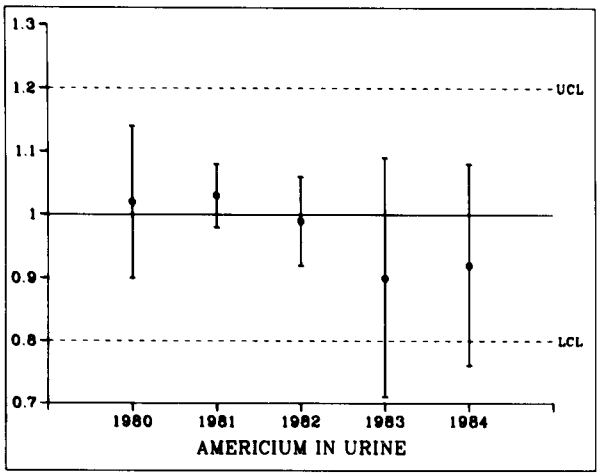
1981
1982
1983
1984
URANIUM 235-238 (DEPLETED) IN SOIL

Fig. D-1 (cont)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LCL
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1984
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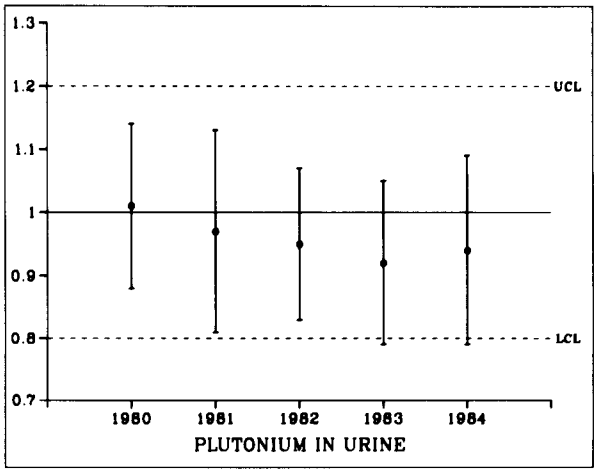
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LCL
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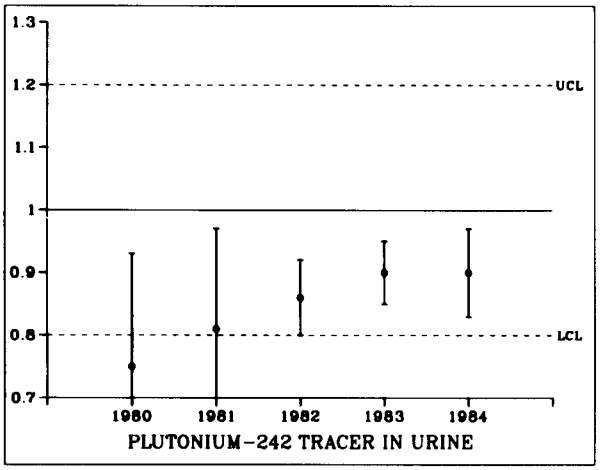
1981
1982
1983
1984
PLUTONIUM IN URINE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LCL
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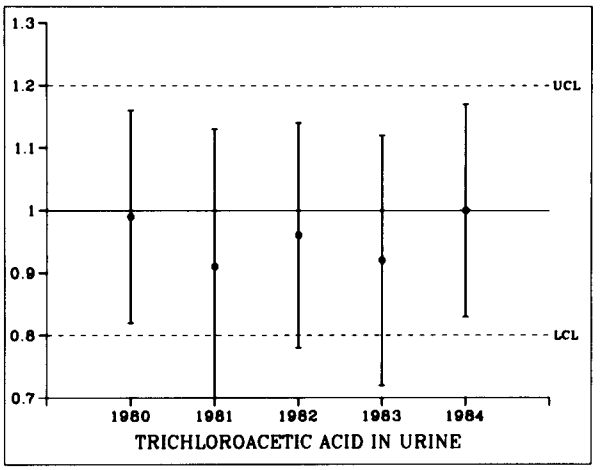
1982
1983
1984
PLUTONIUM-242 TRACER IN URINE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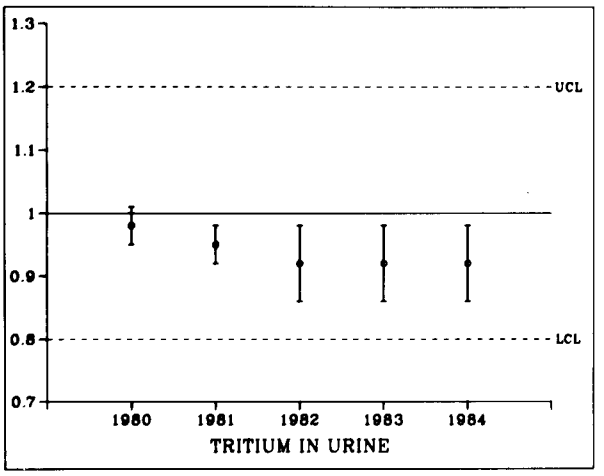
0.7
UCL
LCL
1980
1981
1982
1983
1984
TRICHLOROACETIC ACID IN URINE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UCL
LCL
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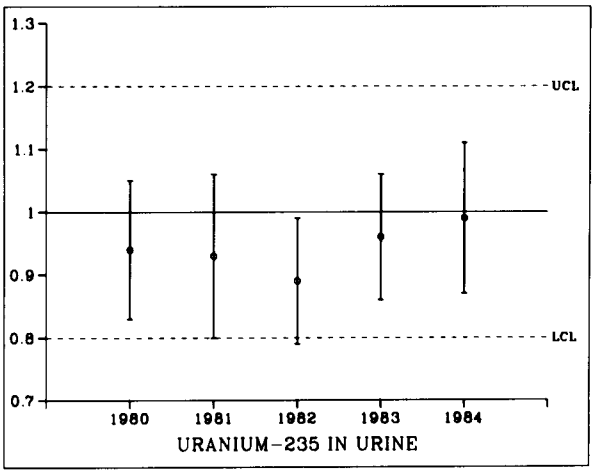
1981
1982
1983
1984
TRITIUM IN URINE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LCL
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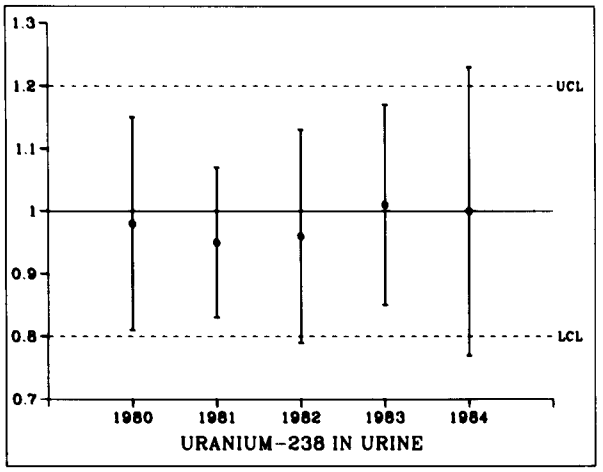
1981
1982
1983
1984
URANIUM-235 IN URINE

Fig. D-1 (cont)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0.7
UCL
LCL
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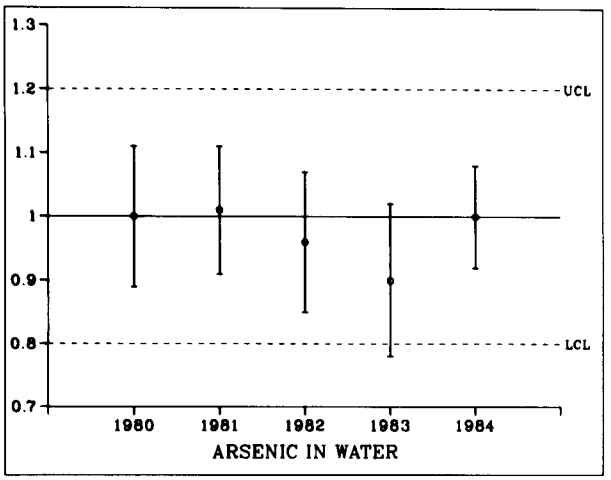
1981
1982
1983
1984
URANIUM-238 IN URINE

Fig. D-1 (cont)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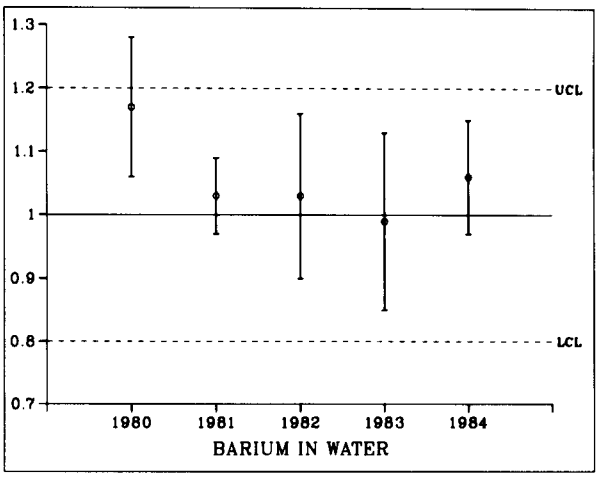
0.7
UCL
LCL
1980
1981
1982
1983
1984
ARSENIC IN WATER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1.2
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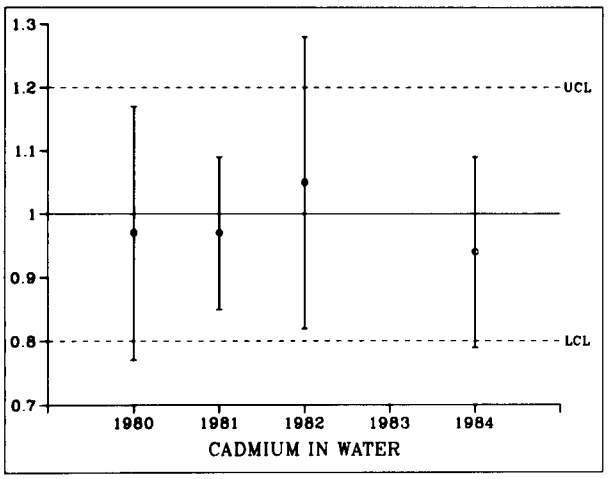
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
BARIUM IN WATER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0.9
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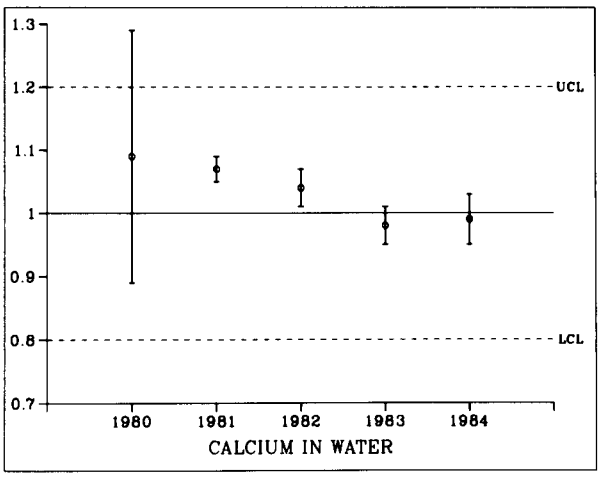
0.7
UCL
LCL
1980
1981
1982
1983
1984
CADMIUM IN WATER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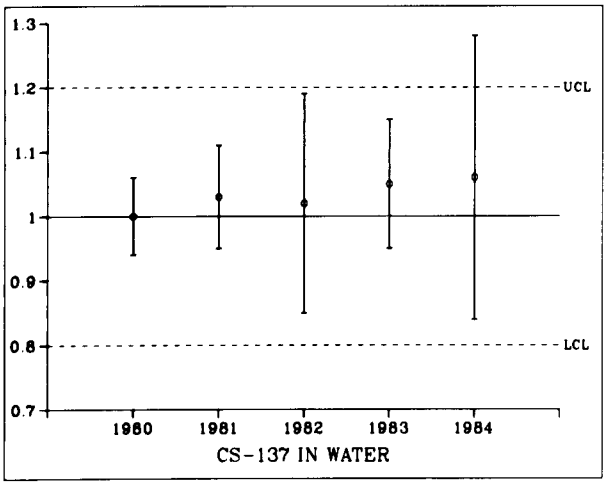
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
CALCIUM IN WATER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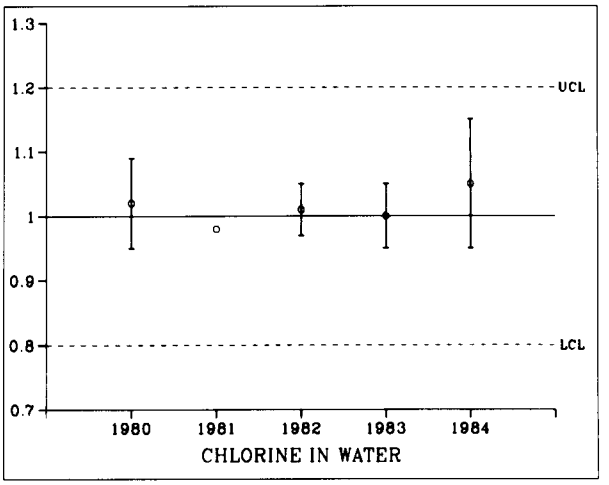
UCL
LCL
1980
1981
1982
1983
1984
CS-137 IN WATER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1.2
1.1
1
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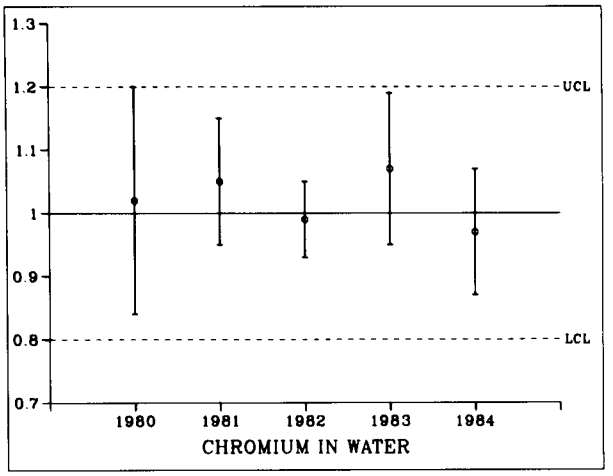
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
CHLORINE IN WATER

Fig. D-1 (cont)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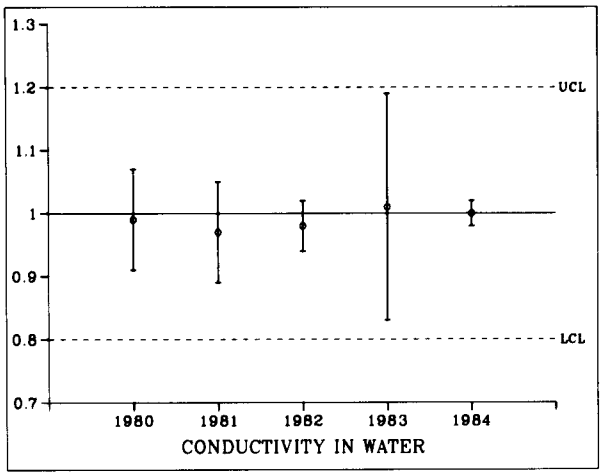
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
CHROMIUM IN WATER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1.2
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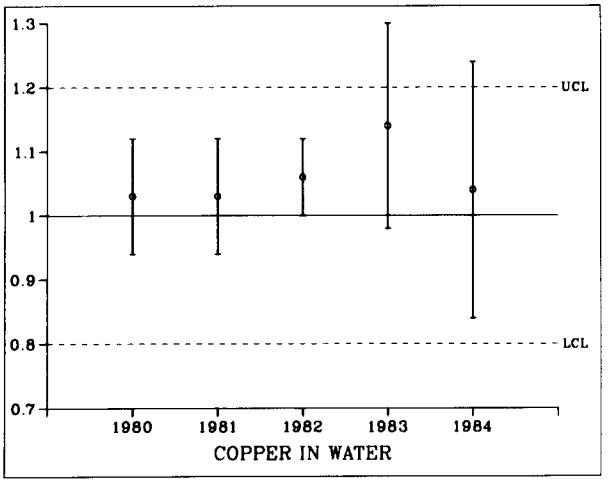
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
CONDUCTIVITY IN WATER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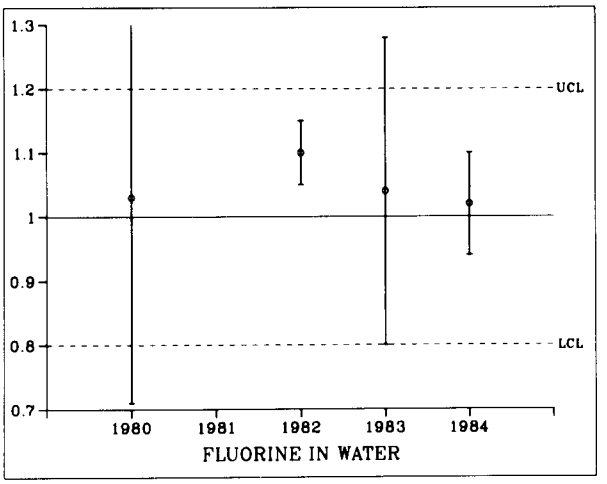
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
COPPER IN WATER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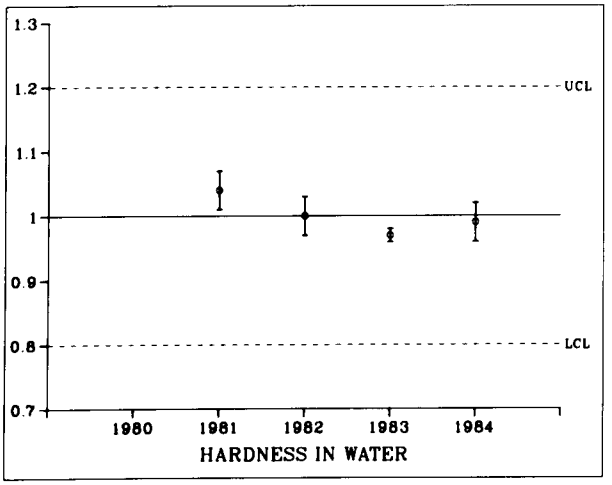
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
FLUORINE IN WATER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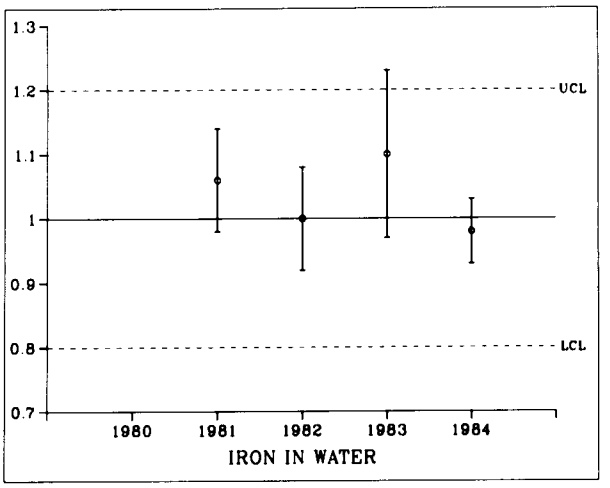
0.7
UCL
LCL
1980
1981
1982
1983
1984
HARDNESS IN WATER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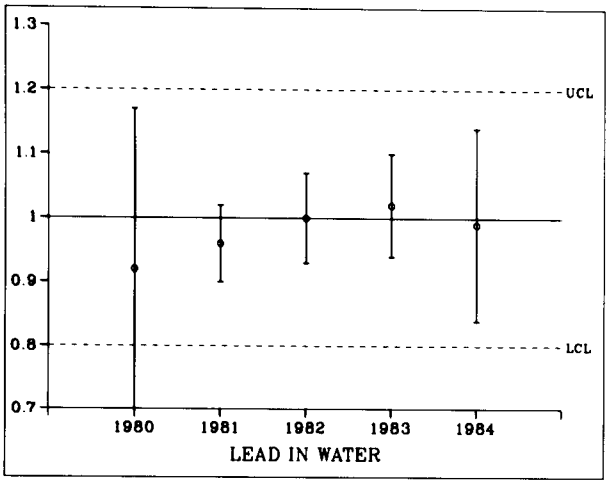
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
IRON IN WATER

Fig. D-1 (cont)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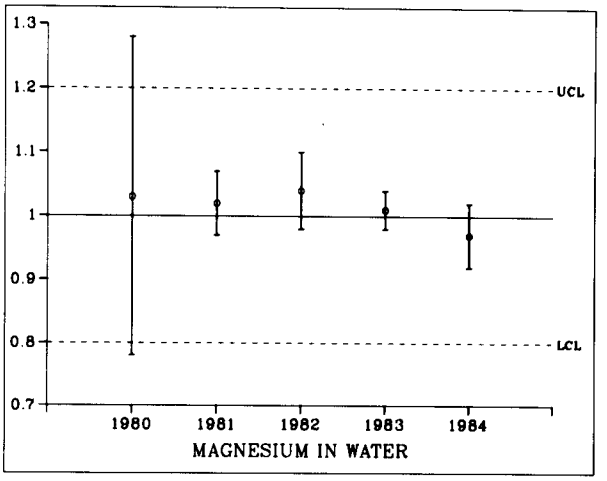
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
LEAD IN WATER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1.2
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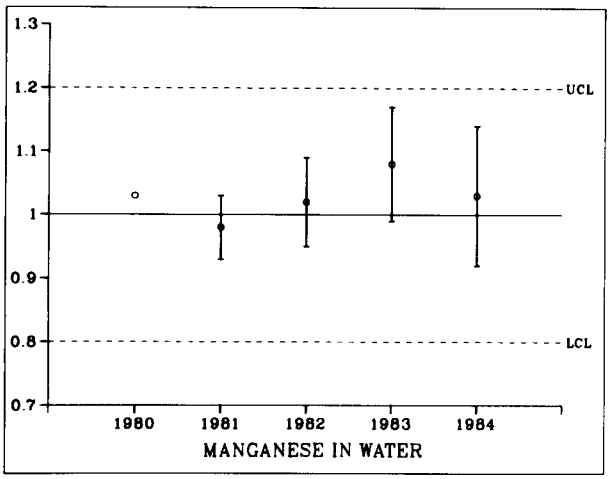
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
MAGNESIUM IN WATER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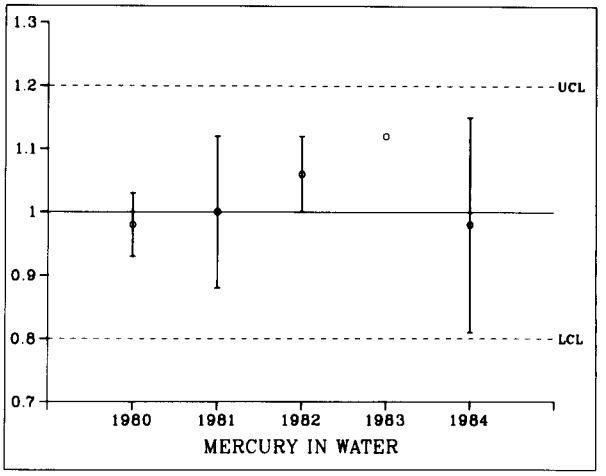
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
MANGANESE IN WATER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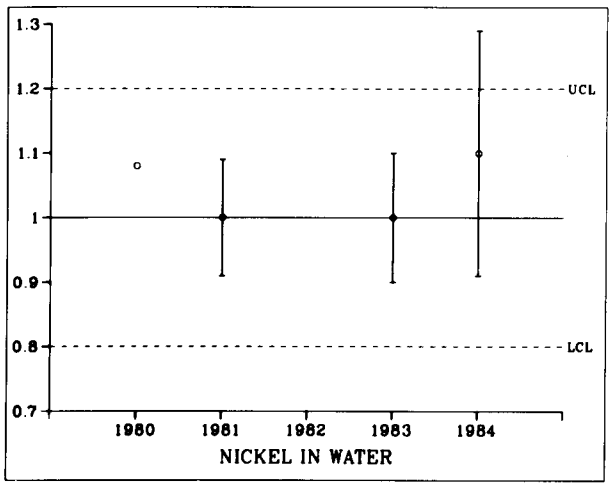
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
MERCURY IN WATER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0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
NICKEL IN WATER

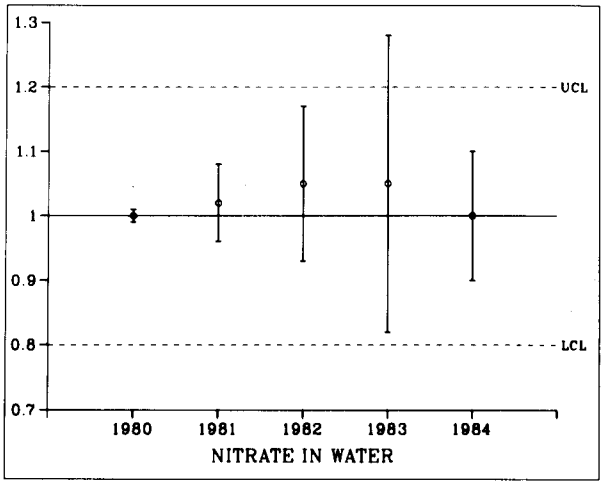
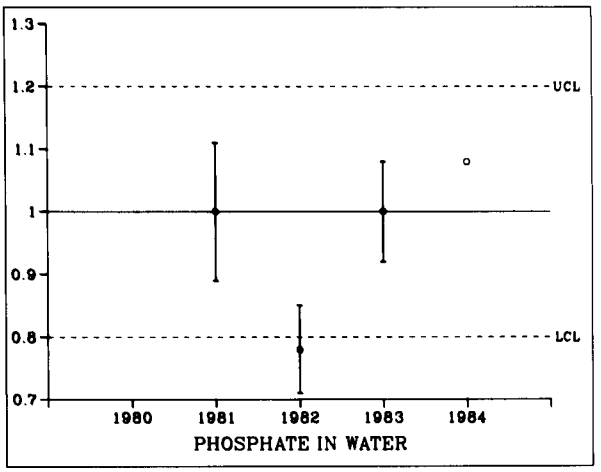

1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
NITRATE IN WATER

Fig. D-1 (cont)


1.3
1.2
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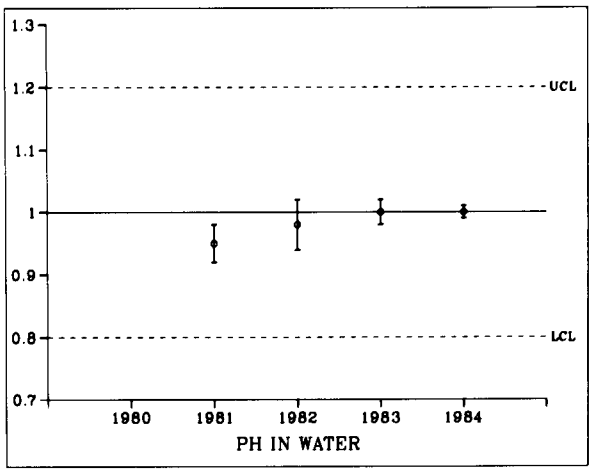
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
PHOSPHATE IN WATER


1.3
1.2
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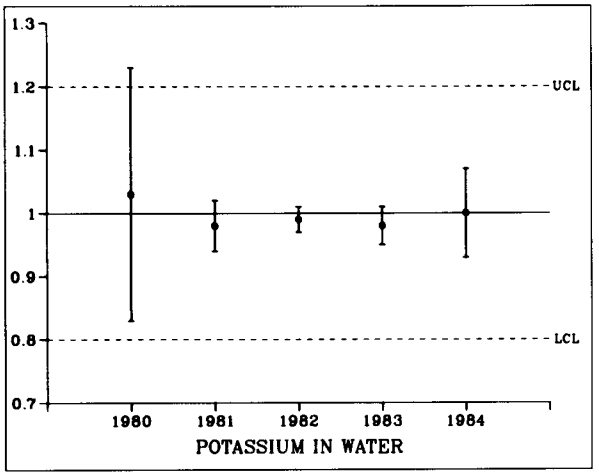
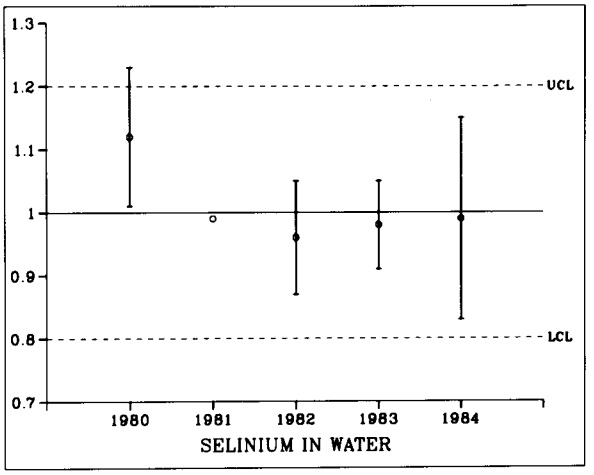
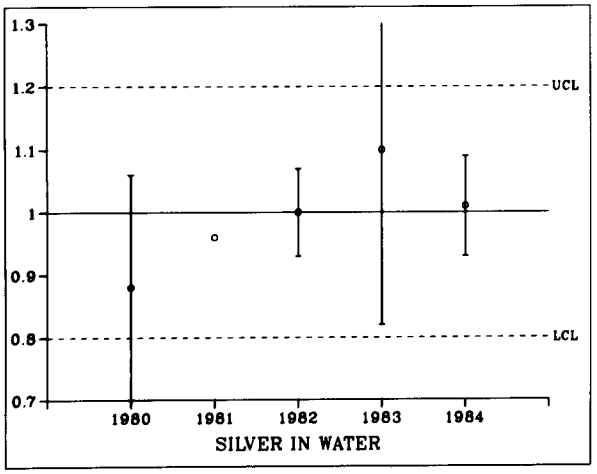
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
PH IN WATER


1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
POTASSIUM IN WATER


1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
SELINIUM IN WATER


1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
SILVER IN WATER

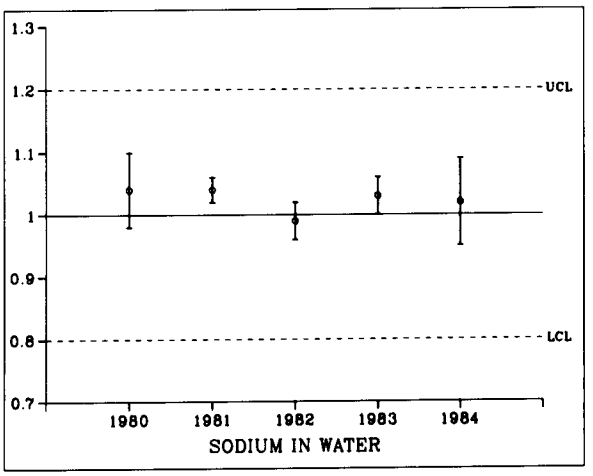
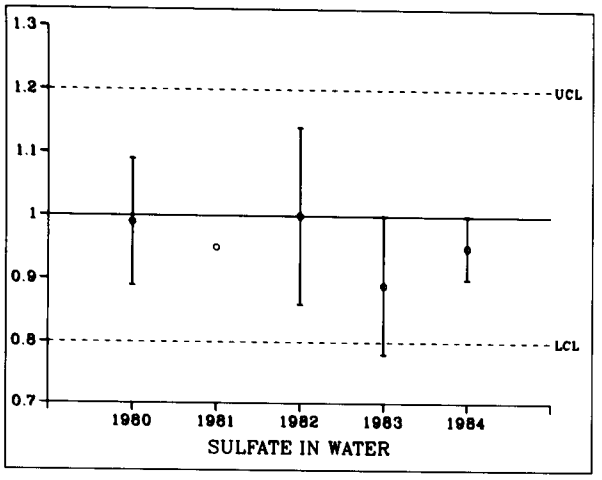
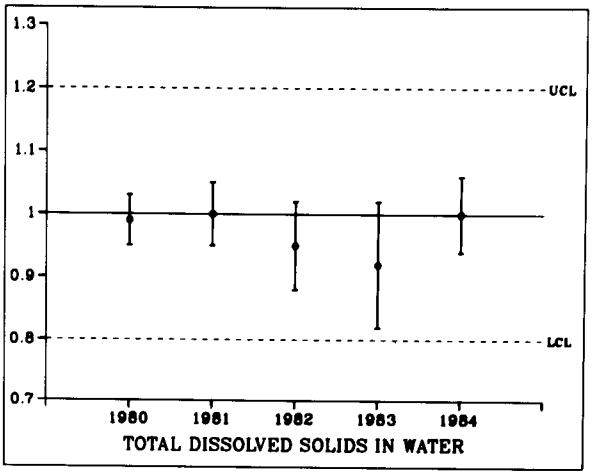

1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
SODIUM IN WATER

Fig. D-1 (cont)


1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
SULFATE IN WATER


1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
TOTAL DISSOLVED SOLIDS IN WATER

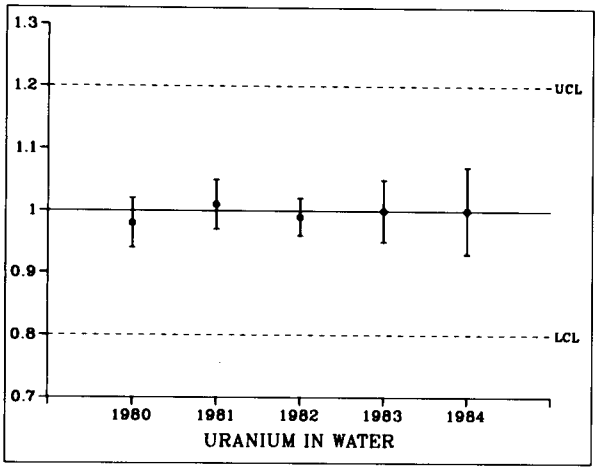

1.3
1.2
1.1
1
0.9
0.8
0.7
UCL
LCL
1980
1981
1982
1983
1984
URANIUM IN WATER

Fig. D-1 (cont)

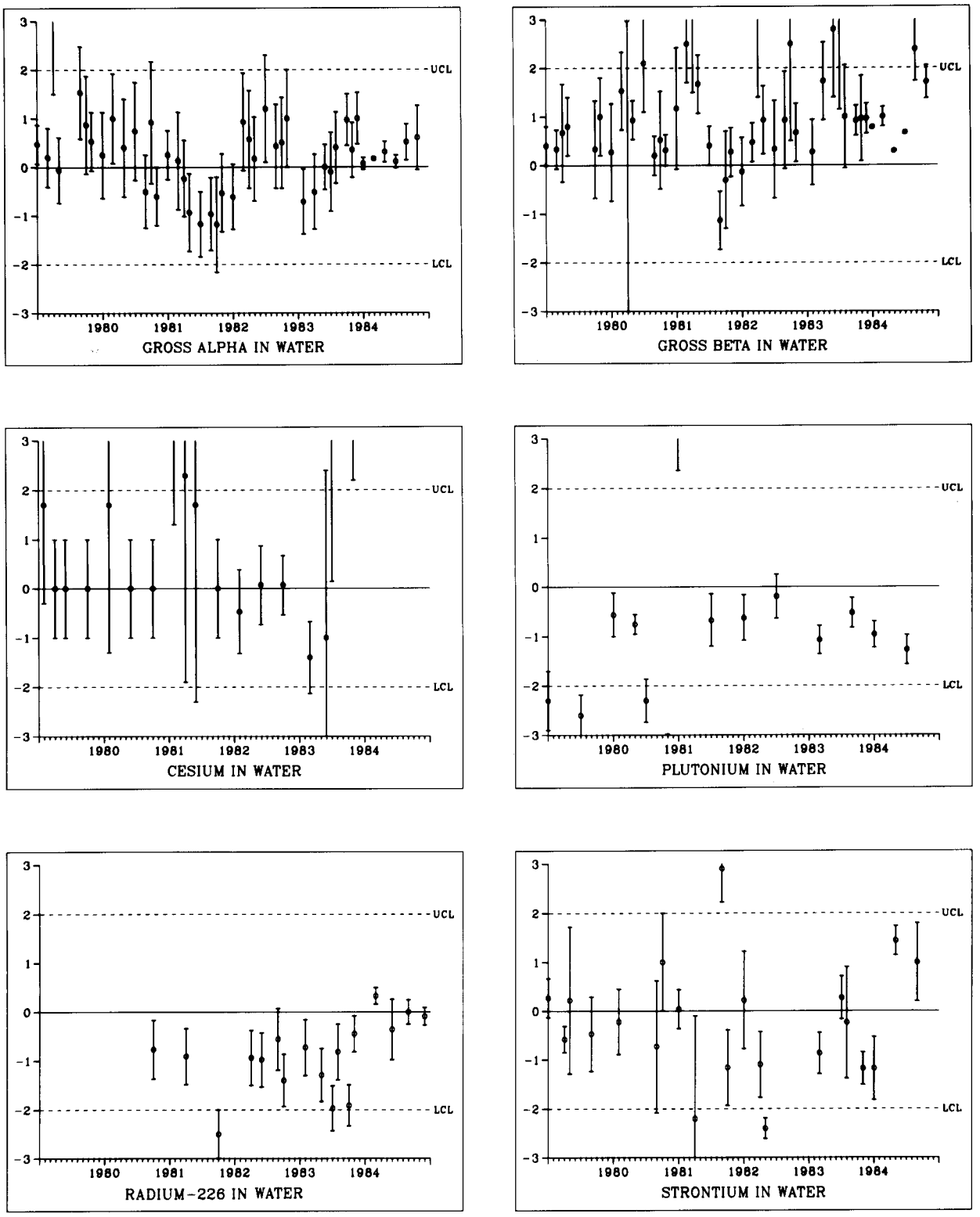


Fig. D-2. Five-year trends in EPA Radiochemical Quality Assurance Program for waters and air filters.

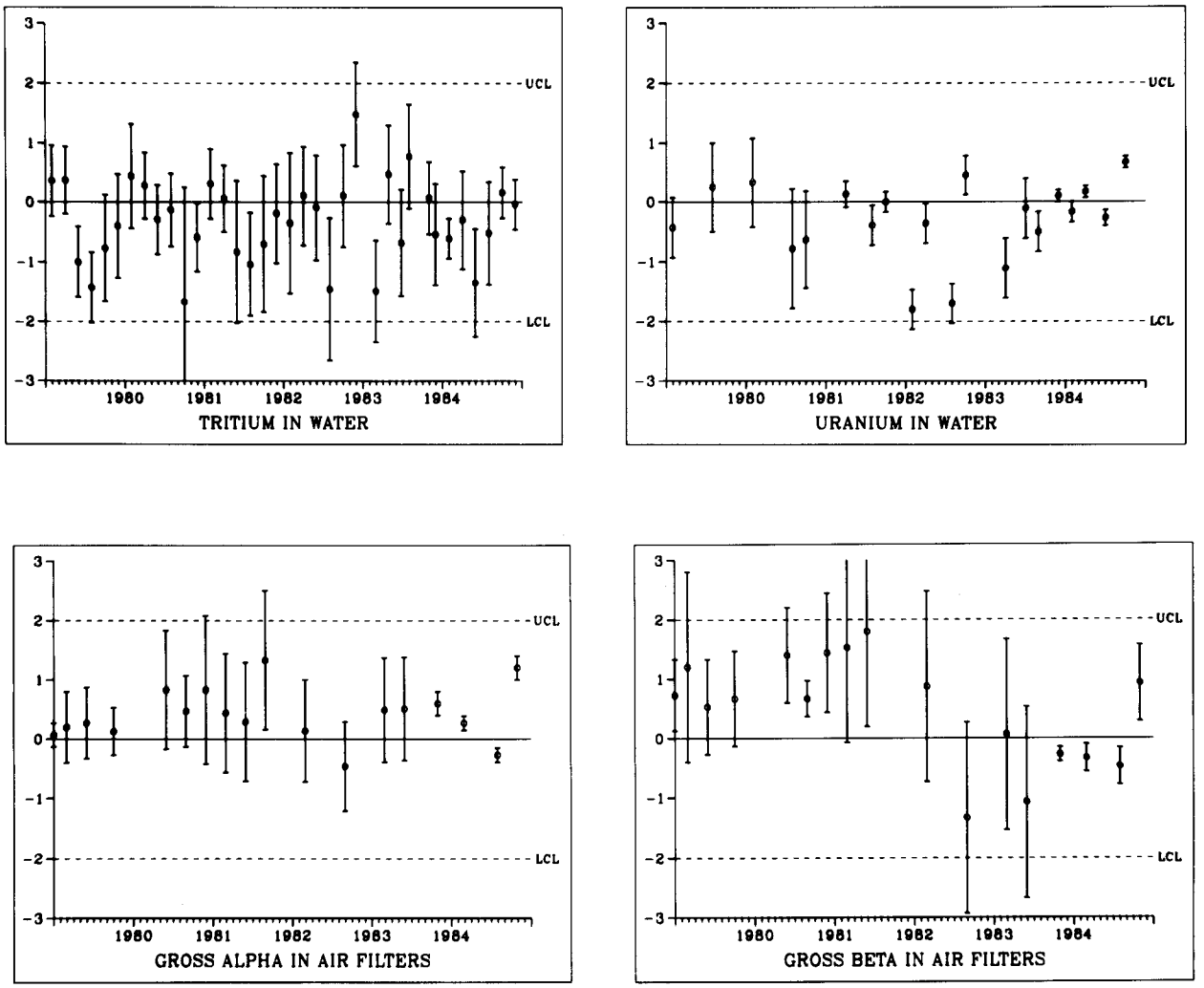


Fig. D-2 (cont)

Note: The position of each data point is determined by dividing the difference between the HSE-9 and EPA values by the expected standard deviation given by EPA. The size of the error bar is determined by dividing the HSE-9 standard deviation by the EPA standard deviation. In most cases, the HSE-9 mean is within one standard deviation of the agency value and our error bars overlap the agency mean value. For environmental levels of radioactivity, this is a good record.

APPENDIX E

SUMMARY OF ANALYSES COMPLETED BY HSE-9 IN 1984

TABLE E-I

RADIOCHEMICAL ANALYSES COMPLETED BY HSE-9 IN 1984

Analysis	Total
Gross Alpha	4129
Gross Beta	1981
Gross Gamma	1889
GSCAN	473
H-3	4017
Be-7	36
Na-22	39
K-40	8
Cr-51	6
Mn-54	39
Co-57	34
Co-58	1
Co-60	38
Zn-65	6
Rb-83	34
Sr-89	960
Sr-90	1193
Ru-106	6
I-131	9
Cs-134	49
Cs-137	962
Ra-226	18
Th-228	61
Th-230	61
Th-232	61
U-234	265
U-235	804
U-238	804
Pu-238	4693
Pu-239+240	4766
Am-241	1589
Grand Total	29116

TABLE E-II

STABLE ELEMENT ANALYSES COMPLETED BY HSE-9 IN 1984

Analysis	Total	Analysis	Total
Ag	273	N2	1
Al	198	N2O	2
As	763	Na	1129
ASH	263	Nd	31
Asbestos	33	NH3-N	2402
Au	28	NH4	4
B	46	Ni	223
Ba	466	NO2	2
Be	870	NO2-N	448
Bi	3	NO3-N	1754
Br	129	O2	8
Ca	888	Os	20
Cd	1392	P	1372
Ce	140	P Alk	242
Cl	1018	Pb	1596
Cl2	126	pH	711
CN	374	PO4	99
Co	307	Rb	62
CO2	2	Re	8
CO3	95	S	2
COD	191	Sb	275
COND	725	Sc	221
Cr	834	Se	522
Cr(+6)	243	Si	96
Cs	1116	Silica (quartz)	11
Cu	1413	Sm	184
Density	29	SO2	2
Dy	72	SO4	676
Er	38	Sr	262
Eu	189	Ta	295
F	1150	Tb	58
Fe	1112	TDS	485
Gd	13	Th	133
H2O+	29	Ti	6
Hard	314	Tm	38
HCO3	95	Total Carbon	1
Hf	117	TOC	1
Hg	983	Tot Alk	254
HNO3	4	Total Cations	240
Ho	38	TSS	432
I	61	U	1888
In	198	U-235/238	60
K	994	V	251
La	174	W	8
Li	235	Yb	149
Lu	78	Zn	1124
Mg	555		
Mn	480	Grand Total	36393
Mo	3		

TABLE E-III

ORGANIC ANALYSES COMPLETED BY HSE-9 IN 1984

Compound	CAS No.	Total
Acenaphthene	83329	193
Acenaphthylene	208968	193
Acetone	67641	14
Acetylene	74862	2
Acridine	260946	193
Amines	A20	3
Anthracene	120127	198
Azulene	275514	193
Benz-a-anthracene	56553	193
Benzene	71432	225
2,3-Benzofluorene	A9	193
Benzo-a-pyrene	50328	193
1,2-Benzofluorene	238846	193
Benzo-e-pyrene	192972	193
Benzo-ghi-perylene	191242	193
Benzo-k-fluoranthene	207089	193
1,1'-Biphenyl	92524	193
Bromodichloromethane	75274	2
Bromoform	75252	2
Carbazole	86748	193
Carbon Tetrachloride	56235	18
Chlorodane	57749	3
Chlorodibromomethane	124481	2
Chloroform	67663	24
Cholinesterase	A6	118
Chrysene	218019	193
m-Cresol	108394	97
o-Cresol	95487	97
p-Cresol	106445	1
Cyclohexane	110827	216
1,2:3,4-Dibenzanthracene	A8	193
Dibenz-a,h-anthracene	53703	193
Dichlorofifluoromethane	75718	19
Dichloroethane	107062	18
Diethylhexylphthlate	117817	15
Di-(2-ethylhexyl)sebacate (DENS)	122623	70
9,10-Dihydroanthracene	A11	193
9,10-Dihrdrophenanthrene	A12	193
9,10-Dimethylanthracene	A13	193
7,12-Dimethyl Benz-a-anthracene	57976	193
1,2-Dimethylnaphthalene	573988	199
1,3-Dimethylnaphthalene	575417	205
1,4-Dimethylnaphthalene	571584	198
1,5-Dimethylnaphthalene	571619	195
1,8-Dimethylnaphthalene	569415	196
2,3-Dimethylnaphthalene	581408	195
2,6-Dimethylnaphthalene	581420	193

TABLE E-III (cont)

Compound	CAS No.	Total
2,7-Dimethylnaphthalene	582161	199
2,3-Dimethylphenol	526750	97
2,4-Dimethylphenol	105679	97
2,6-Dimethylphenol	576261	97
3,4-Dimethylphenol	95658	97
9,10-Diphenylanthracene	1499101	193
Durene	95932	193
Ethylbenzene	100414	216
1-Ethylnaphthalene	1127760	199
m-Ethylphenol	620177	97
o-Ethylphenol	90006	97
p-Ethylphenol	1230709	97
Ethyl Propionate	105373	12
Formaldehyde	50000	55
Fluoranthene	206440	193
Fluorene	86737	210
Heptane	142825	221
Hexane	110543	216
Identifications		219
Indan	496117	193
Indene	95136	244
Isopropyl Ether	108203	216
Isoquinoline	119653	199
Methane	74828	2
p-Methoxyphenol	150765	1
Methyl Alcohol	67561	15
2-Methyl Anthracene	613127	193
9-Methyl Anthracene	A24	193
2-Methyl Biphenyl	643583	193
4-Methyl Biphenyl	A10	193
3-Methylchloanthracene	56495	193
Methyl Chloroform	71556	48
Methylene Diamine	A23	4
Methylene Chloride	75092	3
Methyl Ethyl Ketone	78933	20
1-Methyl Fluorene	1730376	193
3-Methylheptane	589811	216
3-Methylhexane	589344	216
1-Methyl Naphthalene	90120	215
1-Methyl Naphthalene	91576	221
3-Methylpentane	96140	216
1-Methyl Phenanthrene	832699	193
Naphthalene	91203	242
Nicotine	54115	4
Nitrophenol	88755	1
n-Octane	111659	216
1-Octanol	111875	1
Odor	A21	5
Oleic Acid	112801	13

TABLE E-III (cont)

Compound	CAS No.	Total
Organics	A7	23
Pentachlorophenol	87865	7
Perhydrofluorene	5744036	203
Perhydropyrene	2435850	194
Perylene	198550	193
Phenanthrene	85018	204
Phenanthridine	229878	193
Phenol	108952	127
9-Phenylanthracene	A15	193
Phenylnaphthalene	605027	193
Polychlorinated Biphenyls	A2	43
Pyrene	129000	193
Polymers	A17	3
Quinoline	91225	193
Stoddard Solution	A16	3
2,3,7,8-Tetrachlorodibenzodioxin	1746016	5
2,3,7,8-Tetrachlorodibenzofuran	A22	5
Tetraethylene Glycol	A18	14
Toluene	108883	236
Total Trihalomethanes	A1	16
Trichloroacetic Acid	76039	50
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	3
1,2,4-Trichlorobenzene	120821	17
Trichloroethylene	79016	13
1,2,4-Trimethylbenzene	95636	216
2,2,5-Trimethylhexane	3522949	216
2,3,4-Trimethylpentane	565753	216
Triphenylene	217594	193
Volatiles	A19	5
o-Xylene	95476	224
Grand Total		16446

APPENDIX F

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA FOR 1984

TABLE F-I

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA FIRST QUARTER 1984

32 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	36.09 $\pm$ 2.56	0.7	1.0	0.8
2	31.92 $\pm$ 1.97	0.1	0.4	1.5
3	34.88 $\pm$ 0.91	0.4	0.5	0.6
4	35.62 $\pm$ 1.15	0.8	1.0	1.3
5	35.56 $\pm$ 1.16	0.7	1.3	0.7
6	35.15 $\pm$ 1.89	0.6	0.7	0.2
7	36.50 $\pm$ 1.70	0.6	0.3	0.3
8	35.14 $\pm$ 1.63	0.4	0.8	0.3
9	36.90 $\pm$ 1.39	0.8	1.3	0.8
10	38.08 $\pm$ 2.36	0.6	0.8	0.7
11	32.63 $\pm$ 1.57	0.7	0.6	0.7
12	35.92 $\pm$ 1.79	0.5	0.4	0.5
13	34.39 $\pm$ 1.00	0.9	0.6	1.3
14	35.11 $\pm$ 0.74	0.3	0.3	0.4
15	35.69 $\pm$ 2.12	0.7	0.8	1.8
16	34.82 $\pm$ 0.90	0.8	0.6	1.0

48 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	34.19 $\pm$ 1.05	0.5	0.7	0.3
2	37.25 $\pm$ 1.73	0.3	0.6	0.2
3	34.76 $\pm$ 1.82	1.2	0.6	1.3
4	37.82 $\pm$ 1.47	0.6	0.5	0.4
5	39.98 $\pm$ 1.88	0.8	0.5	1.7
6	34.61 $\pm$ 2.03	0.8	0.8	1.3
7	36.25 $\pm$ 1.47	1.0	0.7	0.6
8	39.84 $\pm$ 1.25	0.6	0.5	1.1
9	34.30 $\pm$ 1.68	0.8	0.3	1.0
10	37.40 $\pm$ 1.69	0.6	0.4	0.5
11	38.51 $\pm$ 1.60	0.8	1.4	1.2
12	40.82 $\pm$ 1.02	0.8	0.3	0.8
13	36.00 $\pm$ 1.74	0.6	1.0	0.8
14	37.57 $\pm$ 2.61	0.8	1.0	0.8
15	33.96 $\pm$ 1.29	0.6	0.9	0.6
16	35.30 $\pm$ 1.72	0.5	0.4	0.2

TABLE F-II

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA SECOND QUARTER 1984

32 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	35.28 $\pm$ 2.02	0.7	0.8	1.3
2	31.41 $\pm$ 1.58	0.4	0.5	1.7
3	33.53 $\pm$ 1.94	0.6	0.3	1.0
4	34.38 $\pm$ 1.55	0.9	0.3	1.6
5	34.27 $\pm$ 1.60	0.7	1.5	0.7
6	33.98 $\pm$ 1.33	0.7	0.5	0.1
7	34.96 $\pm$ 1.92	0.7	0.5	0.6
8	34.14 $\pm$ 0.91	0.7	0.5	1.4
9	35.09 $\pm$ 1.90	0.1	0.8	0.9
10	36.65 $\pm$ 1.24	1.1	0.7	1.1
11	31.89 $\pm$ 0.99	0.6	0.7	0.7
12	34.50 $\pm$ 1.11	0.1	0.7	0.6
13	33.36 $\pm$ 1.79	0.6	0.7	0.6
14	33.71 $\pm$ 1.29	0.6	0.7	1.0
15	35.15 $\pm$ 1.21	1.0	0.3	0.7
16	33.61 $\pm$ 1.01	0.1	0.5	0.4

48 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	33.44 $\pm$ 1.94	0.7	0.6	0.9
2	36.40 $\pm$ 1.87	0.6	0.7	0.6
3	33.98 $\pm$ 1.43	0.3	0.6	1.1
4	36.24 $\pm$ 0.99	0.3	1.1	1.1
5	37.17 $\pm$ 0.81	1.4	1.1	1.0
6	34.27 $\pm$ 1.80	1.0	0.9	0.9
7	34.66 $\pm$ 1.90	0.9	1.0	0.9
8	38.69 $\pm$ 1.23	0.6	0.4	0.6
9	33.08 $\pm$ 1.24	0.9	1.4	0.7
10	36.54 $\pm$ 1.47	0.7	0.6	0.6
11	37.31 $\pm$ 0.94	0.9	0.9	1.0
12	39.45 $\pm$ 2.45	0.3	0.6	0.4
13	35.10 $\pm$ 1.46	0.7	0.7	1.1
14	36.03 $\pm$ 0.89	0.9	1.0	0.9
15	33.21 $\pm$ 0.96	0.3	0.6	1.0
16	34.10 $\pm$ 1.20	1.0	0.1	1.0

TABLE F-III

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA THIRD QUARTER 1984

32 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	35.15 ± 2.4	0.5	0.3	0.7
2	30.83 ± 1.2	0.3	0.1	1.7
3	33.45 ± 1.8	0.4	0.2	1.2
4	34.22 ± 1.4	0.4	1.5	0.9
5	33.80 ± 1.9	0.2	2.0	1.1
6	33.79 ± 1.7	0.1	0.5	0.5
7	34.97 ± 1.2	0.6	0.6	0.9
8	34.33 ± 2.0	0.8	0.5	0.9
9	35.18 ± 0.9	0.2	0.6	1.3
10	36.75 ± 1.7	0.6	1.0	1.0
11	31.78 ± 1.3	0.3	0.8	0.8
12	34.45 ± 0.9	0.5	0.7	1.1
13	33.16 ± 2.0	1.0	0.4	1.0
14	33.51 ± 0.8	0.6	0.4	1.5
15	35.02 ± 1.5	1.1	0.6	1.3
16	33.28 ± 1.2	0.5	0.7	0.6

48 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	32.88 ± 0.9	1.0	1.7	0.7
2	35.57 ± 1.0	0.4	0.4	0.4
3	33.98 ± 0.6	1.2	1.7	1.2
4	36.37 ± 1.3	0.4	0.3	1.0
5	36.82 ± 1.1	1.0	0.7	3.0
6	33.59 ± 1.7	0.7	0.8	0.4
7	34.79 ± 1.8	0.4	0.8	0.3
8	38.75 ± 1.2	0.3	0.9	0.3
9	32.89 ± 2.0	1.0	1.7	0.9
10	36.05 ± 1.5	0.6	0.0	1.2
11	37.13 ± 1.0	0.9	1.8	0.8
12	38.90 ± 1.7	0.8	0.7	1.3
13	34.98 ± 1.3	0.4	0.8	1.0
14	35.98 ± 1.0	0.8	0.4	0.7
15	33.49 ± 1.4	0.1	0.2	0.3
16	33.94 ± 0.7	1.1	0.7	0.6

TABLE F-IV

ALPHA SPECTROMETER CALIBRATION AND BACKGROUND DATA FOURTH QUARTER 1984

32 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	35.00 ± 1.57	3.0	4.0	6.0
2	30.82 ± 1.50	2.0	3.0	5.0
3	33.13 ± 1.31	4.0	3.0	4.0
4	34.53 ± 0.97	3.0	4.0	5.0
5	33.96 ± 1.50	1.0	5.0	5.0
6	34.03 ± 1.37	2.0	2.0	4.0
7	34.85 ± 0.99	2.0	2.0	3.0
8	33.67 ± 1.17	4.0	3.0	6.0
9	34.98 ± 0.92	1.0	1.0	3.0
10	36.39 ± 0.84	2.0	2.0	4.0
11	32.32 ± 0.88	3.0	2.0	5.0
12	34.50 ± 1.38	3.0	2.0	4.0
13	33.59 ± 2.16	1.0	3.0	4.0
14	33.67 ± 1.71	2.0	2.0	5.0
15	35.21 ± 1.27	2.0	2.0	4.0
16	33.30 ± 1.17	3.0	2.0	4.0

48 Alpha Spectrometer

Calibration (17 min) N=10		Background (60 000 s) N=10 $\bar{X}$ Counts Per 20 Channels		
Detector	$\bar{X}$ Efficiency $\pm$ 3σ	^{242}Pu	^{239}Pu	^{238}Pu
1	33.08 ± 2.16	3.0	3.0	3.0
2	35.50 ± 1.10	3.0	3.0	5.0
3	34.42 ± 3.38	3.0	2.0	4.0
4	36.62 ± 1.56	7.0	3.0	4.0
5	36.68 ± 1.27	3.0	2.0	12.0
6	34.29 ± 1.71	2.0	2.0	2.0
7	34.67 ± 0.91	3.0	3.0	3.0
8	37.93 ± 1.33	2.0	2.0	2.0
9	32.50 ± 2.17	3.0	3.0	4.0
10	35.89 ± 0.95	3.0	2.0	5.0
11	36.47 ± 3.13	4.0	3.0	5.0
12	37.46 ± 2.30	6.0	3.0	6.0
13	35.25 ± 2.12	4.0	2.0	2.0
14	36.33 ± 3.95	2.0	2.0	4.0
15	33.63 ± 1.51	4.0	3.0	4.0
16	34.31 ± 1.63	2.0	1.0	1.0

TABLE F-V

CALIBRATION DATA FOR THE 16 ROUTINE CALIBRATION PLATES

Plate No.	D/M/30 min Mean		Std Dev[a]	D/M/30 min Mean		Std Dev[b]
1	1442	±	7	1438	±	8
2	1443	±	9	1440	±	5
3	1444	±	8	1450	±	6
4	1449	±	8	1453	±	4
5	1443	±	21	1440	±	5
6	1445	±	12	1441	±	6
7	1446	±	9	1446	±	4
8	1457	±	8	1447	±	5
9	1439	±	11	1452	±	6
10	1450	±	10	1452	±	4
11	1463	±	11	1465	±	10
12	1442	±	17	1454	±	3
13	1463	±	21	1458	±	5
14	1442	±	18	1440	±	20
15	1458	±	5	1453	±	4
16	1450	±	10	1433	±	6

$$\text{D/M of std plate} = \frac{\text{counts}}{\text{time} \times \text{eff}} = \frac{\text{counts}}{30 \times 0.5119}$$

[a]Third quarter 1984. Ten analyses included in the mean.
[b]Fourth quarter 1984. Ten analyses included in the mean.

Note: In June 1984 we began using a set of 16 electroplated standards to routinely calibrate all alpha counting equipment. These standards contain ^{241}Am, ^{239}Pu, and ^{242}Pu. The 16 standards are being routinely counted on the gas-flow proportional counter, which is calibrated with NBS SRM 4906-B15.

TABLE F-VI

CALIBRATION DATA FOR THE 16 PLATES AS A SET

Date	No. of Calibrations	Eff. (%)	D/M/30 min Mean		Std Dev[a]
6-27-84	6	51.19	1449	±	15
8-14-84	5	51.19	1446	±	7
9-25-84	6	51.23	1446	±	14
11-08-84	6	51.22	1449	±	12
12-20-84	6	51.19	1448	±	13

[a]All 16 plates.

APPENDIX G

SUMMARY OF SPIKE RECOVERY IN BIOASSAY AND WASTE-WATER ANALYSES FOR 1984

TABLE G-I

PLUTONIUM-238 SPIKE RECOVERY AS A FUNCTION OF CONCENTRATION AFTER CORRECTION FOR PLUTONIUM-242 RECOVERY

Spike Level pCi/Sample	Mean Std Dev	No. of Samples	RSD (%)
0.06	82 +- 16	13	20
0.12	93 +- 11	15	12
0.20	89 +- 11	14	11
0.40	89 +- 8	16	9

TABLE G-II

PLUTONIUM-239 SPIKE RECOVERY AS A FUNCTION OF CONCENTRATION AFTER CORRECTION FOR PLUTONIUM-242 RECOVERY

Spike Level pCi/Sample	Mean Std Dev	No. of Samples	RSD (%)
0.06	96 +- 23	13	24
0.15	99 +- 12	14	12
0.23	99 +- 7	13	7
0.46	96 +- 4	15	4
1.47	89 +- 13	15	15

TABLE G-III

TRITIUM SPIKE RECOVERY AS A FUNCTION OF CONCENTRATION

Spike Level μCi/L	Mean Std Dev	No. of Samples	RSD (%)
3.38	95 +- 8	15	9
6.76	91 +- 3	12	3
10.13	92 +- 3	10	3
13.51	92 +- 4	7	4
16.89	92 +- 2	5	2

TABLE G-IV

URANIUM-235 SPIKE RECOVERY AS A FUNCTION OF CONCENTRATION

Spike Level pCi/L	Mean Std Dev	No. of Samples	RSD (%)
6.8	97 +- 16	19	16
10.2	100 +- 8	5	8
13.6	101 +- 11	19	11
17.0	98 +- 5	7	5
20.4	103 +- 10	8	10
25.5	93 +- 12	13	13
34.0	96 +- 7	7	7

TABLE G-V

URANIUM-238 SPIKE RECOVERY AS A FUNCTION OF CONCENTRATION

Spike Level μG/L	Mean Std Dev	No. of Samples	RSD (%)
8.48	101 +- 30	16	30
12.72	102 +- 23	14	23
16.96	103 +- 27	15	26
25.44	99 +- 30	7	30
33.92	100 +- 15	15	15
42.40	97 +- 5	5	5
50.88	93 +- 6	6	6

TABLE G-VI

SPIKE RECOVERIES FOR WASTE WATER ANALYSES

Analyte	No. of Determinations	Mean Std Dev
Ag	25	90 +- 13
Am	50	64 +- 6
As	54	97 +- 11
Cd	236	90 +- 24
COD	34	98 +- 2
Cr	2	81 +- 2
Cu	410	98 +- 4
F	20	98 +- 6
Fe	208	96 +- 13
Hg	200	101 +- 6
Ni	10	125 +- 40
NH3-N	49	98 +- 6
NO3-N	42	99 +- 6
Pb	208	85 +- 20
Pu	50	65 +- 9
Se	14	83 +- 7
U	50	58 +- 11
Zn	314	95 +- 14

TABLE G-VII

COMPARISON OF HSE-9 SPIKED SAMPLES WITH NIOSH PAT SAMPLES

ROUND 76—FIRST QUARTER 1984

METALS

	Lead		Cadmium		Zinc	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	99	97	93	102	93	100
	98	119	97	106	103	101
	105	90	109	103	121	104
	89	107	101	99	117	97
	102		100		88	
	126		106		105	
	123		111		89	
	98	—	103	—	92	—
$\bar{X} \pm 1\sigma$	105 ± 13	103 ± 13	103 ± 6	103 ± 3	101 ± 13	101 ± 3

SOLVENTS

	Chloroform		Methyl Chloroform	
	HSE-9	PAT	HSE-9	PAT
	114	118	109	105
	108	111	101	103
	114	109	106	103
	107	104	96	116
	110		103	
	134		118	
	118		109	
	119	—	106	—
$\bar{X} \pm 1\sigma$	116 ± 9	111 ± 6	106 ± 7	107 ± 6

ROUND 77—SECOND QUARTER 1984

METALS

	Lead		Cadmium		Zinc	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	108	97	101	96	95	90
	108	109	102	105	96	101
	91	102	94	104	111	100
	119	105	120	106	118	96
	105		103		100	
	100		102		98	
	114		104		92	
	113	—	101	—	103	—
$\bar{X} \pm 1\sigma$	107 ± 9	103 ± 5	103 ± 7	103 ± 5	102 ± 9	97 ± 5

SOLVENTS

	Carbon Tetrachloride		Trichloroethylene		1.2 Dichlorethane	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	94	85	87	82	90	80
	90	78	84	74	86	76
	97	94	89	74	94	64
	111	111	102	99	113	92
$\bar{X}$ 1σ	98 ± 9	92 ± 14	90 ± 8	82 ± 12	91 ± 12	78 ± 12

ROUND 78—THIRD QUARTER 1984

METALS

	Lead		Cadmium		Zinc	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	97	98	96	99	96	100
	102	96	103	102	103	88
	102	91	85	102	96	93
		101		101		93
$\bar{X} \pm 1\sigma$	100 ± 3	97 ± 4	95 ± 9	101 ± 1	98 ± 4	94 ± 5

SOLVENTS

	Methyl Ethyl Ketone	
	HSE-9	PAT
	84	108
	98	106
	97	93
		117
$\bar{X} \pm 1\sigma$	93 ± 8	106 ± 10

ROUND 79—FOURTH QUARTER 1984

METALS

	Lead		Cadmium		Zinc	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	102	111	99	102	96	99
	102	98	95	102	95	100
	114	111	105	102	103	95
	110	103	106	102	99	101
$\bar{X} \pm 1\sigma$	107 ± 6	106 ± 7	101 ± 5	102 ± 0	98 ± 4	99 ± 3

SOLVENTS

	Benzene		o-Xylene		Toluene	
	HSE-9	PAT	HSE-9	PAT	HSE-9	PAT
	103	108	102	100	101	101
	107	106	100	100	101	100
	107	106	101	102	102	103
	106	103		103		102
$\bar{X} \pm 1\sigma$	106 ± 2	106 ± 2	101 ± 1	101 ± 2	101 ± 1	101 ± 1

APPENDIX H

QA DATA ON WATER SAMPLE QUALITY PARAMETERS FOR 1984

TABLE H-I

SUMMARY OF INDIVIDUAL SAMPLE WATER QUALITY RATIOS FOR NATURAL WATERS FOR 1984

(meq Cation/meq Anion) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	0.991	0.045	2
2	28	1.026	0.032	
Annual	95	0.001	0.045	2

(meq Hardness/Sum meq Ca + Mg) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	1.002	0.049	2
2	27	1.040	0.029	1
Annual	94	1.013	0.047	3

(TDS/Sum of Solids) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	1.011	0.049	3
2	28	1.049	0.042	4
Annual	95	1.022	0.050	7

(Conductivity/Sum of Contributing Conductivities) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	0.987	0.041	2
2	28	1.010	0.029	
Annual	95	0.994	0.041	2

TABLE H-I (cont)

(0.01 Conductivity/meq Cations) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	1.041	0.117	18/16
2	28	0.974	0.041	1/1
Annual	95	1.023	0.105	19/17

(0.01 Conductivity/mq Anions) Ratio

Sample Set	Number Samples	Average Ratio	Std Dev	Outliers Justified[a]
1	67	1.033	0.104	14/13
2	28	0.998	0.057	2/1
Annual	95	1.022	0.094	16/14

[a]Outliers have a ratio outside 1.00 +- 0.10.

TABLE H-II

QA DATA ON WATER SAMPLE QUALITY PARAMETERS FOR NATURAL WATER SAMPLES FOR 1984

SAMPLE ID	C/A	HARD/CA+MG	0.01COND/C	0.01COND/A	TDS/SCS	COND/SICOND
84.03575	0.939	0.985	1.030	0.968	1.011	1.026
76	0.978	1.063	1.030	1.008	0.976	1.028
78	0.983	0.978	0.947	0.931	0.919	0.962
79	0.926	0.938	1.031	0.955	0.964	1.023
80	0.986	1.008	0.995	0.980	1.008	1.049
81	0.971	1.022	0.994	0.965	1.032	1.002
82	0.953	1.114	1.008	0.961	0.980	1.011
83	1.036	0.964	0.942	0.976	0.965	1.010
85	0.996	0.957	0.973	0.969	1.019	0.994
86	0.997	0.952	0.962	0.959	1.037	0.981
87	0.971	0.961	0.982	0.954	1.035	0.995
88	1.015	0.988	1.002	1.017	1.043	1.029
89	1.003	1.050	0.929	0.932	1.023	0.960
90	0.983	0.966	1.013	0.996	0.989	1.022
93	1.002	0.943	0.976	0.978	1.027	1.014
94	0.973	1.009	1.002	0.994	0.925	1.026
95	0.962	0.983	1.033	0.994	1.009	1.047
96	1.003	1.045	0.958	0.961	0.937	0.983
97	1.043	1.049	0.928	0.969	0.957	0.972
98	1.015	1.062	0.958	0.973	0.942	0.993
84.03600	1.065	0.929	0.961	1.024	1.085	0.970
83	0.997	0.964	0.948	0.945	0.950	0.966
84.03500	1.048	0.980	0.946	0.990	1.052	0.910
01	1.056	0.982	0.954	1.007	0.944	0.961
02	1.035	0.959	0.977	1.011	1.041	0.959
03	1.071	0.947	0.930	0.996	1.038	0.933
04	0.942	1.051	1.084	1.021	1.021	1.002
05	0.910	1.020	1.148 *	1.045	1.040	1.005
06	0.963	1.007	1.056	1.017	0.997	1.054
07	0.997	0.980	0.915	0.913	0.995	0.905
08	0.956	1.079	0.999	0.955	1.023	1.003
09	1.014	0.941	1.012	1.025	1.047	0.970
10	0.998	1.059	0.942	0.940	1.034	0.963
11	0.987	0.971	0.999	0.986	1.035	1.010
38	1.072	0.994	0.959	1.028	1.11	0.879
39	1.001	0.993	0.933	0.933	1.002	0.955
40	1.009	0.979	0.997	1.006	0.933	1.019
41	0.943	1.079	0.986	0.922	0.947	0.981
42	0.919	0.985	0.996	0.915	0.930	0.984
44	1.025	0.992	0.920	0.943	0.923	0.971
45	0.929	1.016	1.077	1.001	0.951	0.983
46	0.994	0.990	1.059	1.052	1.055	0.972

TABLE H-II (cont)

SAMPLE ID	C/A	HARD/CA+MG	0.01COND/C	0.01COND/A	TDS/SCS	COND/SICOND
84.03047	1.063	1.039	0.942	1.000	0.946	0.938
48	0.982	1.041	1.256 *	1.233 *	1.021	1.002
49	0.950	0.964	1.135 *	1.078	1.046	0.972
50	0.880	1.085	1.122	0.987	1.117	0.833
51	1.112	0.969	0.969	1.078	1.004	0.924
84.03553	0.982	0.984	1.156 *	1.135 *	1.027	1.035
54	0.995	0.959	1.080	1.075	1.047	0.949
56	0.960	1.215	1.684	1.611	1.13	1.076
57	0.997	1.027	1.148 *	1.145 *	0.998	1.000
58	0.913	1.038	1.099	1.004	0.995	0.964
59	0.951	1.055	1.121 *	1.066	0.973	0.968
60	0.959	1.056	1.236 *	1.185 *	1.049	1.047
61	1.002	0.995	1.130 *	1.132 *	1.029	0.969
62	0.999	0.992	1.034	1.033	1.018	0.972
63	1.016	1.002	1.071	1.089	0.939	1.018
64	1.001	0.941	1.154 *	1.156 *	0.978	1.001
65	0.974	1.023	1.078	1.050	1.067	0.905
66	1.055	0.961	1.129 *	1.191 *	1.079	1.004
67	0.973	0.986	1.112 *	1.082	1.010	1.013
68	1.057	0.986	1.066	1.127 *	1.064	1.017
69	0.916	1.017	1.210 *	1.108 *	1.033	1.024
70	0.960	0.982	1.144 *	1.098 *	1.031	1.001
71	0.967	0.955	1.175 *	1.135 *	1.010	1.030
72	0.988	0.970	1.101 *	1.088 *	1.054	0.959
73	1.057	0.993	1.116 *	1.179 *	1.095	1.020
84.05164	1.040	1.011	0.961	0.999	1.062	1.013
65	0.998	1.073	0.977	0.976	1.070	0.995
66	1.001	1.065	0.961	0.962	0.997	0.981
67	1.023	1.040	0.982	1.004	1.009	1.034
68	1.022	1.012	1.049	1.072	1.040	1.058
69	1.003	1.034	0.966	0.970	1.107	0.980
70	1.016	1.104	0.952	0.967	1.083	0.986
71	1.017	1.036	0.988	1.005	1.104	1.033
72	1.028	1.060	0.972	0.999	1.101	1.013
73	1.019	1.050	1.023	1.042	1.003	1.049
74	1.009	1.017	0.963	0.972	1.025	0.998
75	1.053	1.066	0.951	1.001	1.020	1.005
76	1.049	0.992	0.962	1.009	0.979	1.015
77	1.040	1.010	1.004	1.044	1.015	1.054
78	1.040	0.993	0.932	0.970	1.085	0.967
79	1.031	0.992	0.936	0.964	1.037	0.991
80	0.953	1.074	0.981	0.935	0.967	1.000
81	1.085	1.055	0.967	1.049	1.054	1.054
82	1.023	1.051	0.966	0.988	0.981	1.023
83	1.012	1.066	0.976	0.988	1.047	1.020

TABLE H-II (cont)

SAMPLE ID	C/A	HARD/CA+MG	0.01COND/C	0.01COND/A	TDS/SCS	COND/SICOND
84.05184	1.005	1.055	0.913	0.917	1.067	0.972
85	1.023	0.454 QNS	0.955	0.978	1.044	1.009
86	1.026	1.031	0.965	0.990	1.073	0.991
87	0.947	1.031	0.947	0.897	1.107	0.955
88	1.089	1.042	0.905	0.986	1.098	0.972
89	1.080	1.056	1.125 *	1.216 *	1.101	1.045
84.05271	1.051	1.000	0.971	1.021	1.055	1.038
72	1.040	1.070	0.981	1.021	1.053	1.021
SET I						
N	67	67	67	67	67	67
AVG	0.991	1.002	1.041	1.033	1.011	0.987
STD DEV	0.0455	0.049	0.117	0.104	0.049	0.0406
OUTLIERS	2	2	18	14	3	2
JUSTIFIED			16	13		
SET II						
N	28	27	28	28	28	28
AVG	1.026	1.040	0.974	0.998	1.049	1.010
STD DEV	0.032	0.029	0.041	0.057	0.042	0.029
OUTLIERS	0	2	1	2	4	0
JUSTIFIED			1	1		
TOTAL						
N	95	94	95	95	95	95
AVG	1.001	1.013	1.023	1.022	1.022	0.994
STD DEV	0.0448	0.0474	0.1048	0.0938	0.0504	0.0405
OUTLIERS	2	3	19	16	7	2
JUSTIFIED			17	14		

Notes: * = Justifiable outliers.
Sample 84.03556 had a high OH^- concentration, causing poor ratios.
Sample 84.03550 historically has had NH_4^+, accounting for its poor ratios.
Sample 84.05185 was QNS such that total hardness could not be rerun, but the values for the other ratios indicate that is the determination in error.

TABLE H-III

SUMMARY OF WASTE-WATER CHEMISTRY WATER QUALITY RATIOS FOR 1984

	50RL			50FC			257RC			257FC		
Date	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE
Jan 2-8	0.996	0.988	0.992	0.944	0.938	0.995	1.054				0.851	
Jan 9-15	0.967	0.944	0.982	1.290	1.008	0.780						
Jan 16-22	0.976	0.952	0.975	1.030	0.949	0.920						
Jan 23-31	0.952	0.939	0.987	0.920	0.993	1.079	0.896	0.967	1.079	0.951	0.968	1.058
Feb 1-5	1.077	1.034	0.960	1.050	1.020	0.971	1.000	1.001	1.001	0.936	0.963	1.028
Feb 6-12	1.003	0.972	0.969	0.993	1.009	1.017	0.892	0.981	1.100	0.946	0.996	1.054
Feb 13-20	1.082	1.103	1.020	1.010	0.990	0.981	1.009	1.072	1.063	1.033	1.047	1.014
Feb 21-28	1.018	1.025	1.007	0.973	0.943	0.970	1.042	1.070	1.027	0.929	0.981	1.056
Mar 1-4	0.957	0.966	1.010	0.994	1.015	1.023	0.912	0.986	1.081	0.873	0.947	1.085
Mar 5-11	0.977	0.965	0.988	0.928			0.855	0.912	1.067	0.755	0.822	1.090
Mar 12-18	0.965			1.073			0.996	0.988	1.005	0.929	0.915	0.985
Mar 19-25	0.942			0.995			0.956	0.966	1.011	1.016	1.011	1.003
Mar 26-31	0.933			0.997	0.967	0.971	0.989	0.999	1.010	1.193	1.172	0.982
Apr 1-8	0.932	0.914	0.980	1.026			0.983	0.967	0.984	0.834	0.839	1.007
Apr 9-15	1.037	1.030	0.980	0.938	1.023	1.091	0.952	0.972	1.021	0.976	0.979	1.003
Apr 16-22	1.079	1.049	0.972	0.968	1.095	1.131	0.960	0.920	0.961	0.990	1.007	1.021
Apr 23-30	0.924	0.904	0.978	1.040	1.014	0.975	0.980	0.996	1.014	0.970	1.005	1.035
May 1-6	1.136	1.087	0.957	1.095	1.078	0.985	1.060	1.016	0.958	1.020	1.047	1.022
May 7-13	0.927	0.960	1.036	0.926	0.926	1.000	0.980	0.951	0.966	0.970	0.992	1.021
May 14-20	1.188	1.132	0.953	1.057	1.088	1.029	1.020	1.077	1.050	1.030	1.016	0.988
May 21-30	0.955	1.001	1.049	1.012	1.061	1.049						
June 1-4	1.053	1.072	1.018	0.946	0.997	1.054	0.970	0.969	0.995	0.960	0.962	1.003
June 5-10	0.965	0.965	1.000	0.994	0.932	0.938	1.010	1.008	0.999	0.980	0.982	1.002
June 11-17	0.942	0.998	1.060	0.870	0.927	1.063	0.850	0.939	1.107	0.970	0.959	0.984
June 18-24	0.961						0.900	1.006	1.117	0.910	0.994	1.089
June 25-30	1.007	0.989	0.982	0.963	0.948	0.984	0.970	0.917	0.944	1.110	1.026	0.922
July 1-8	0.937	1.156	1.233	1.000	0.979	0.979	1.020	1.110	1.086	1.000	1.004	1.004
July 9-15	1.062	1.084	1.021	1.003	1.097	1.094	1.040	1.103	1.063	1.06	1.103	1.042
July 16-22	0.957	1.015	1.061	0.916	0.959	1.047	0.951	1.050	1.162	1.006	1.110	1.103
July 23-31	0.935	0.989	1.058	1.040	1.023	0.984						
Aug 1-5	0.910	0.971	1.067	1.280	0.966	0.754						
Aug 6-12	0.897	1.117	1.231	1.134	1.050	0.927	0.980	1.009	1.034	0.910	0.949	1.037
Aug 13-19	1.054	1.015	0.963	1.051	1.091	1.036	1.020	1.022	0.998	0.970	0.992	1.019
Aug 20-26	0.999	0.993	0.995	0.965	0.963	0.997	0.860	0.976	1.131			0.906
Aug 27-31	0.954	1.005	1.053	0.979	1.016	1.038	1.060	1.056	0.993	0.960	0.942	0.986
Sept 1-9	0.944	0.970	1.028	1.002	1.000	0.998						
Sept 10-16	0.982	0.983	1.001	1.004			1.240	1.270	1.022	0.990	0.990	1.005
Sept 17-23	0.972	0.919	0.946	0.946	1.004	1.061						
Sept 24-30	1.060	1.044	0.985	1.049	1.052	1.003	0.980	1.030	1.049	0.960	1.004	1.049
Oct 1-8	0.939	0.927	0.987	0.980	0.998	1.018	0.900	0.960	1.068	0.960	0.970	1.015
Oct 9-14	1.107	1.145	1.034	0.930	0.956	1.029						
Oct 15-21	1.012	1.035	1.023	0.922	0.871	0.945	1.010	0.994	0.983	0.900	0.891	0.995

TABLE H-III (cont)

	50RL			50FC			257RC			257FC		
Date	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE	C/A	C/CIE	A/CIE
Oct 22-30	1.000	1.035	1.035	0.955	0.980	1.027	0.980	0.992	1.008	0.980	0.979	0.998
Nov 1-4	0.904	0.842	0.931	0.881	0.770	0.874	0.800	0.835	1.038	0.910	0.924	1.018
Nov 5-11	0.869	0.950	1.093	0.845	0.825	0.977	0.900	0.909	1.014	0.940	0.988	1.049
Nov 12-18	0.865	0.878	1.015	1.069	1.003	0.939						
Nov 19-25	1.070	1.133	1.059	0.893	0.941	1.054	1.070	1.133	1.059	1.050	1.073	1.021
Nov 26-30			1.062			0.992						
Dec 1-9			1.037			0.995	0.820	0.870	1.065	0.620	0.670	1.083
Dec 10-16			1.038			1.082						
Dec 17-23			1.023			1.021	0.820	0.870	1.059		0.848	
Dec 24-31	0.870	1.068	1.230			1.058						
Mean	0.948	1.006	1.022	0.997	0.987	0.999	0.942	0.997	1.036	0.959	0.972	1.021
Std Dev	0.070	0.073	0.066	0.087	0.068	0.071	0.165	0.080	0.050	0.093	0.088	0.041
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