CERTIFICATION REPORT FOR AREA 8, PHASE II AND THE AREA 6 TRIANGLE AREA

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FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

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LIST OF ACRONYMS AND ABBREVIATIONS

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A8PII	Area 8, Phase II
A6TA	Area 6 Triangle Area
ASCOC	area specific constituent of concern
ASL	analytical support level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CRDL	contract required detection limit
CU	certification unit
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FRL	final remediation level
HAMDC	highest allowable minimum detectable concentration
HPGe	high-purity germanium detector
LCS	laboratory control sample
MDC	minimum detectable concentration
μg/kg	milligrams per kilogram
NRRP	Natural Resource Restoration Plan
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
OSDF	On-Site Disposal Facility
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
RRF	Relative Response Factor
ROD	Record of Decision
SDFP	Soil and Disposal Facility Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
TPU	total propagated uncertainty
UCL	upper confidence level
V/FCN	Variance/Field Change Notice
V&V	verification and validation
WAC	Waste Acceptance Criteria

EXECUTIVE SUMMARY

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This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that existing soil contamination does not exceed the final remediation levels (FRLs) in Area 8, Phase II (A8PII) and the southern portion of the Area 6 Triangle Area (A6TA) at the Fernald Environmental Management Project (FEMP). On the basis of this reported information and supporting project files, DOE has determined that no remedial actions are required in these areas of the site, and therefore, they can be considered "certified." Upon approval from the regulatory agencies, DOE intends to proceed with the natural resource restoration planned for A8PII, as outlined in the Natural Resource Restoration Plan (NRRP, DOE 1998a).

A8PII was divided into four certification units (CUs), and an additional CU was established in the portion of A6TA south of the railroad corridor. CU delineation is described in the Certification Design Letter (CDL) for A8PII and the A6TA (DOE 1999a). Certification sampling was conducted in these areas of the site to verify that the certification criteria were achieved. These criteria state that: 1) the mean concentrations or activities of the primary area-specific constituents of concern (ASCOCs) within a CU are less than the FRLs at the 95 percent upper confidence level (UCL); and 2) no certification result can exceed two-times the FRL (i.e., the "hot spot" criterion). If either of these criteria is not met, then further investigation and possible excavation is required. If both of these criteria are met for a CU, than it can be released for development of the final land use. A8PII and the southern portion of A6TA will be considered certified when the U.S. Environmental Protection Agency (EPA) and Ohio Environmental Protection Agency (OEPA) agree that the certification criteria have been achieved within all five relevant CUs.

Based on historical data and precertification real-time scanning data, no above-FRL contamination was present within A8PII or A6TA soil. Therefore, certification began without conducting remedial activities. The A8PII and A6TA certification samples were analyzed at the FEMP on-site laboratory, following guidelines outlined in the Sitewide CERCLA Quality Assurance Project Plan (SCQ) (procedure FD-1000) and the Sitewide Excavation Plan (SEP) (DOE 1998c). Twelve samples per CU were analyzed and reported at the required analytical support level (ASL). Analytical data packages included sample results with associated quality assurance/quality control (QA/QC) data and all

applicable raw data. The data were also subjected to the required validation and verification process, which did not identify any significant quality concerns.

All A8PII CUs achieved the certification criteria, as did the A6TA CU. The determination of passing or failing certification was based on a review of certification sample analytical results from each CU against the certification criteria. Since none of the analytical results exceeded the associated FRL, statistical analyses were not necessary to determine if an ASCOC passed certification in any of the CUs. Based on these results, all five CUs under the scope of this certification effort achieved the certification criteria and no additional corrective actions were necessary.

DOE has restricted access to certified areas in order to maintain their integrity prior to development of the final land use. A FEMP procedure (EP-0008) has been developed to implement a process to protect certified areas from becoming recontaminated.

1.0 INTRODUCTION

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1.1 PURPOSE

This Certification Report presents the information and data used by the DOE to determine that existing soil contamination does not exceed the FRLs within A8PII and the portion of the A6TA south of the railroad corridor. As discussed in the CDL for A8PII and the A6TA, this soil is being certified in order to proceed with final land use activities (i.e., the Forest Demonstration Restoration Project). On the basis of this reported information, DOE considers remedial goals achieved in these portions of the site.

1.2 BACKGROUND

In the 1996 Operable Unit (OU) 5 Record of Decision (ROD) (DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based FRLs with final disposition of the excavated material in the On-Site Disposal Facility (OSDF) or at an off-site disposal facility if the material exceeds OSDF waste acceptance criteria (WAC). The OU5 Remedial Investigation Report (DOE 1995) defined the extent of soil contamination exceeding the FRLs, and in general, indicated widespread contamination occurring in approximately 430 acres of the 1050-acre FEMP. In the OU5 Remedial Action Work Plan (RAWP) (DOE 1996b), DOE committed to preparing a SEP to define the overall approach to implementing the soil and at- and below-grade debris cleanup obligations identified in the OU2, OU3, and OU5 RODs. In the SEP, the FEMP has been divided into distinct remedial areas and phases for soil remediation, based on the operable units' remediation schedule.

After all necessary remediation is completed with each area/phase, the soil will be certified as attaining all clean up goals (i.e., FRLs). The SEP describes the general soil remediation and certification process at the FEMP. According to the SEP, excavation Approach E was followed in A8PII. This same approach will also be followed in A6TA since it is considered an unimpacted area. Precertification activities were conducted within A8PII and A6TA during December 1998, and data indicated that no soil excavation activities were required. All precertification and certification activities for these areas were conducted in compliance with the SEP.

1.3 AREA DESCRIPTION

A8PII is an 18.56-acre area located on the northwest corner of the Fernald site. The only production related land use in this area was the removal of borrow material during plant construction, and it has been leased to a local farmer for cattle grazing. A8PII is being certified in order to begin work on the Forest Demonstration Restoration Project. A6TA is triangle-shaped piece of FEMP property that extends west of Paddys Run Road, and includes the railroad corridor leading from site. The southern 3.5-acre portion of A6TA (which excludes the railroad track corridor) is also being certified so that surface water draining from this area may be used in the Forest Demonstration Project. These areas of the FEMP site are shown in Figure 1.

1.4 SCOPE

The scope of this report includes the certification of A8PII and the southern portion of the A6TA. A8PII has been divided into four CUs, and one CU has been located in A6TA south of the railroad corridor. The certification design for these five CUs follows the general approach outlined in Section 3.4 of the SEP.

1.5 OBJECTIVES

The objectives of this Certification Report are:

- Describe the precertification findings
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present certification sampling results for the 5 CUs
- Present the statistical analysis showing that all 5 CUs have passed the certification criteria, including FRL attainment and hot spot criteria
- Describe access controls implemented to prevent recontamination.

1.6 REPORT FORMAT

This certification report is presented in five sections with supporting documentation and data in the appendices. These sections are as follows:

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Section 1.0	Introduction: purpose, background, area description, scope, and objectives of the report
Section 2.0	Certification Approach: the approach to sampling and analysis used for certification
Section 3.0	Overview of Field Activities: precertification scanning, certification sampling and changes to work scope
Section 4.0	Analytical Methodologies, Data Validation Processes, and Data Reduction
Section 5.0	Certification Evaluation and Conclusions
Section 6.0	Protection of Certified Areas
Appendix A	CU Maps and Statistics Tables
Appendix B	Certification Samples, Results and Statistics Tables

1.7 FEMP CERTIFICATION MASTER MAP

In order to track the status of certification at the FEMP, DOE will include a controlled map showing the status of the soil remediation areas and phased areas with all Certification Reports. This map is included in this Certification Report as Figure 1-2, and has been updated to reflect the status of A8PII.

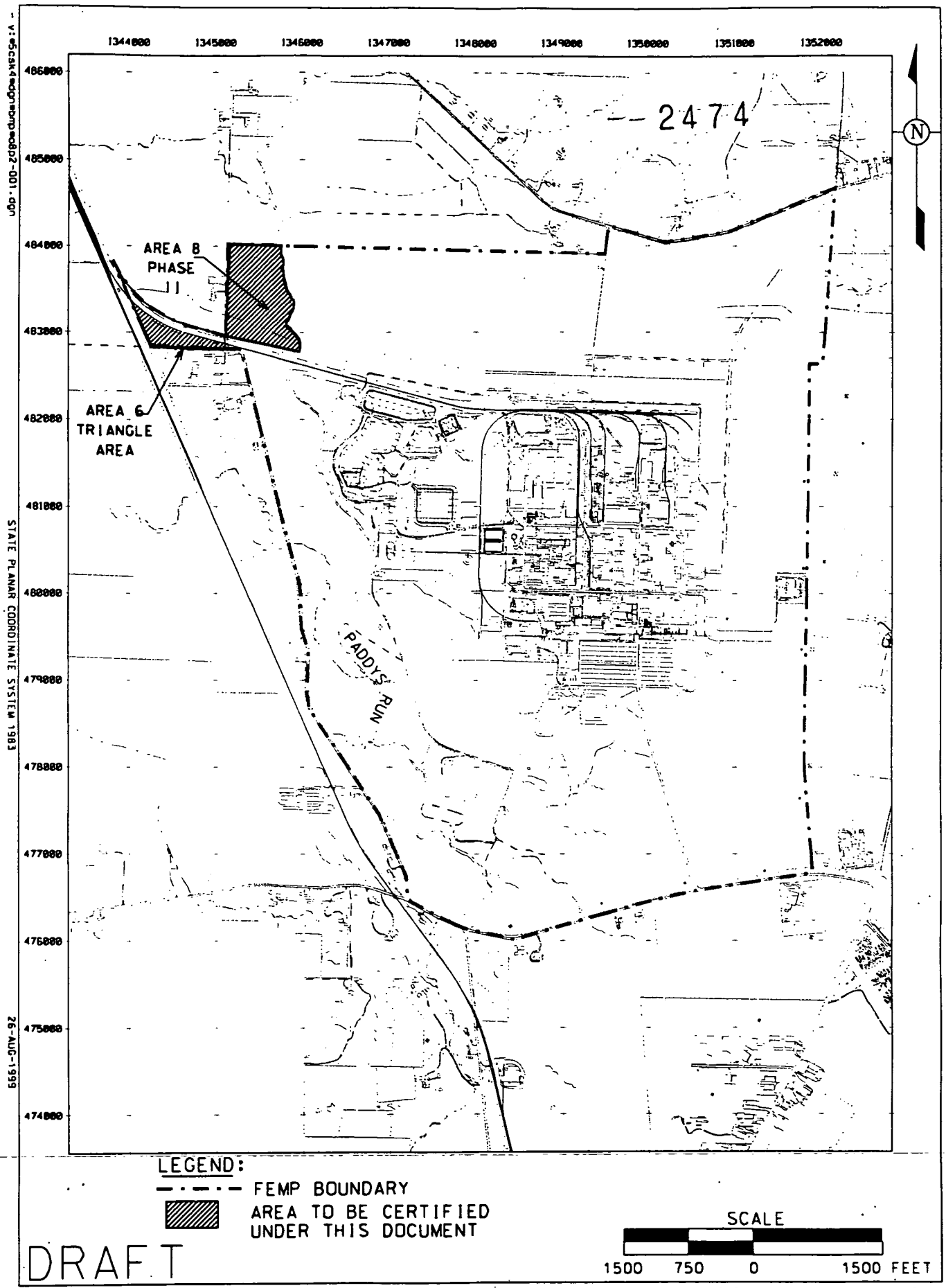

FIGURE 1-1. AREA 8, PHASE II AND AREA 6 TRIANGLE AREA LOCATION MAP

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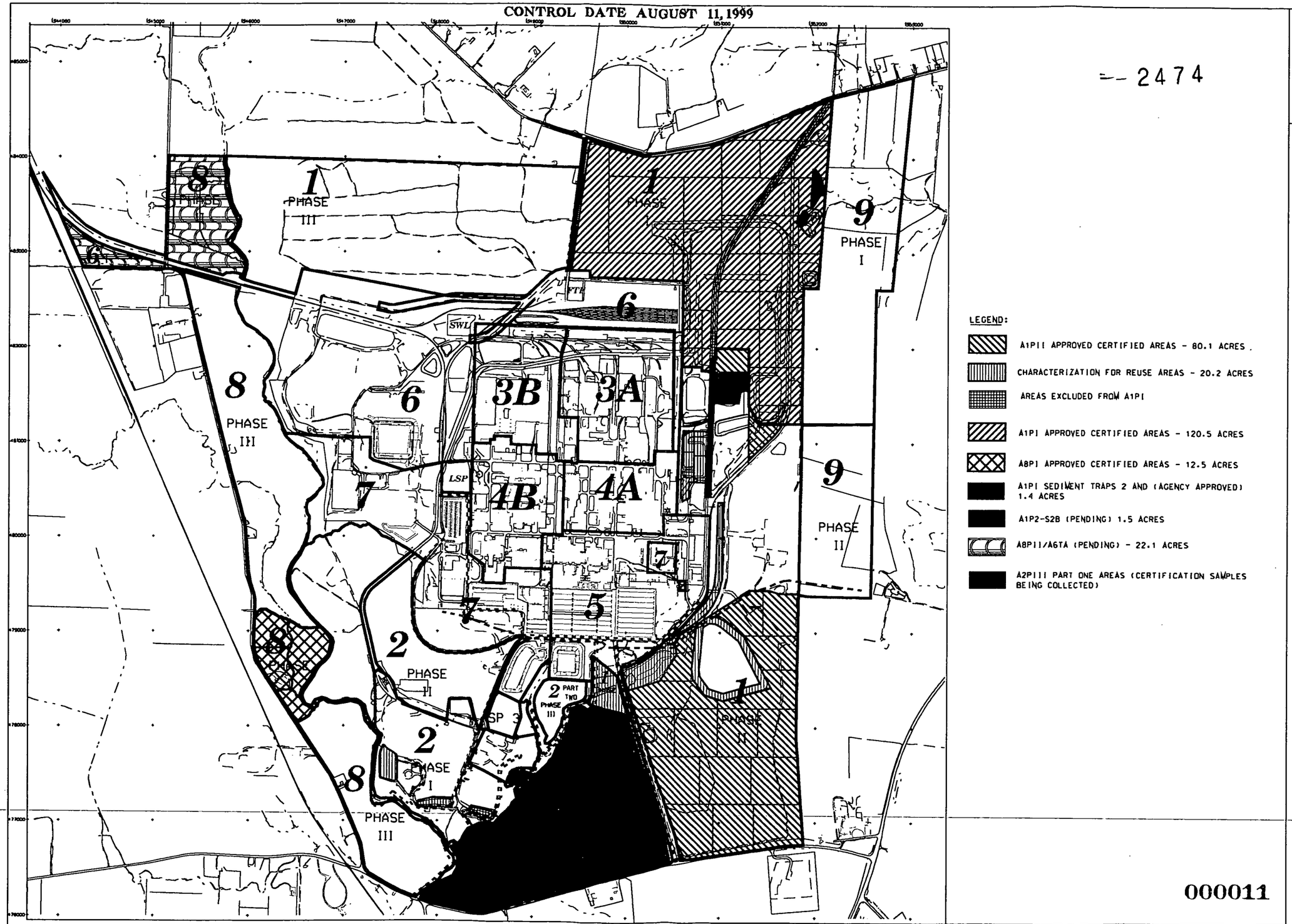

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FIGURE 1-2. CERTIFIED AND CHARACTERIZED FOR REUSE AREAS

2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the ASCOCs selection process, and the certification approach including CU establishment, sampling design, and statistical analysis. The general purpose of certification sampling is to verify that the mean concentrations or activities of primary ASCOCs remaining in the soil of a CU following remedial activities are less than the FRLs at the 95 percent UCL, and at the 90 percent UCL for secondary ASCOCs, although none are retained for A8PII or A6TA. The certification process also includes the hot spot criterion, which states that if any of the certification results exceeds two-times the FRL, further action is required, as discussed in Section 3.4.5 of the SEP. If the mean residual ASCOC concentrations or activities are below the FRLs within the respective confidence bounds, and the hot spot criterion is met, then the remedial objectives have been achieved for the CU. It can then be released for regrading, reseeding and development of a final land use. The general certification strategy is described in Section 3.4 of the SEP, and the A8PII/A6TA-specific strategy is described in the CDL for A8PII and the A6TA.

2.1.1 Selection of Area-Specific Contaminants of Concern

The OU5 ROD lists 80 soil constituents of concern (COCs) with established FRLs. These COCs were retained for further investigation based on a screening process that considered the presence of the constituent in site soil and the potential risk to a receptor exposed to soil containing that contaminant. Many of the COCs with established FRLs have a limited distribution in site soil, or the presence of the COC is based on high contract required detection limits (CRDLs). When FRLs were established for these COCs in the OU5 ROD, they were initially screened against site data presented on spatial maps to establish a picture of potential remediation areas.

By reviewing existing remedial investigation data presented on spatial distribution maps, it was possible to reduce the sitewide list of soil COCs from the 80 listed in the OU5 ROD to 30. This reduction was possible because the majority of the COCs with FRLs listed in the OU5 ROD have no detections on-site above their corresponding FRL, thus eliminating them from further consideration. The 30 remaining sitewide COCs account for over 99 percent of the combined risk to a site receptor model, and they comprise the list from which all of the remediation ASCOCs are drawn.

As stated in the SEP, the primary radiological COCs, i.e., total uranium, radium-226, radium-228, thorium-228, and thorium-232, will be retained sitewide as ASCOCs in each remediation area. The selection process for retaining secondary ASCOCs for a remediation area is driven by applying a set of decision criteria, as follows:

- It is listed as a soil COC in the OU5 ROD, and it is listed an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation.

2.1.2 ASCOC Selection Process for A8PII and A6TA

Though few samples were collected and analyzed, historical soil data from A8PII and A6TA show no FRL exceedences. Moreover, no above-FRL contamination is anticipated within these areas because: 1) process history and aerial photos indicated no production related land uses in the vicinity, 2) these areas are upwind of the Former Production Area, and 3) Paddys Run effectively isolates these portions of the site from surface water drainage that contaminated other portions of the site. As a result, only total uranium, radium-226, and radium-228, thorium-228, and thorium-232 (the five sitewide primary radiological ASCOCs) were retained as ASCOCs, as identified for A8PII and A6TA are summarized in Table 2-1. Note that no FRL exceedences for these COCs were identified in these parts of the site.

TABLE 2-1
ASCOC LIST FOR A8PII and A6TA CUs

ASCOC	FRL	Reason Retained
Total uranium	82 mg/kg	Retained as a sitewide primary ASCOC
Radium-226	1.7 pCi/g	Retained as a sitewide primary ASCOC
Radium-228	1.8 pCi/g	Retained as a sitewide primary ASCOC
Thorium-228	1.7 pCi/g	Retained as a sitewide primary ASCOC
Thorium-232	1.5 pCi/g	Retained as a sitewide primary ASCOC

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2.2 CERTIFICATION APPROACH

2.2.1 Certification Design

The certification design for A8PII CUs follows Approach E, as outlined in the draft final SEP. Based primarily on topography and drainage, A8PII has been divided into four Group 2 CUs, and one Group 2 CU was located within the southern portion of A6TA (see Figure 2-1). These CUs are as follows:

- **CU A8PII-01** (131,562 ft^2) - established to contain the berm of native soil along parts of the north and west boundary of A8PII.
- **CU A8PII-02** (248,860 ft^2) - established to contain the portion of A8PII where borrow material was excavated during construction of the FEMP. The precertification scan generally revealed lower total activity readings in these areas.
- **CU A8PII-03** (246,354 ft^2) - established to cover the east-central portion of A8PII, including a large portion of the riparian zone along Paddys Run.
- **CU A8PII-04** (181,677 ft^2) - established to contain the southern portion of A8PII separated by the drainage ditch.
- **CU A6TA-01** (153,064 ft^2) - established to cover A6TA south of the railroad corridor.

2.2.2 Sample Selection Process

In order to establish certification sampling locations, each CU was first divided into 16 sub-CUs. Within each sub-CU, 16 soil sample locations were randomly selected. As necessary, alternate locations were randomly selected to meet the minimum distance criterion. The minimum distance criterion is the smallest distance allowed between two sampling locations within a CU, and is a function of the CU size. The formula for calculating the minimum distance is presented in the SEP. All CUs in the scope of this report and the selected certification sampling locations for all the CUs are shown in Figure 2-2.

2.2.3 Certification Sampling and Analysis

Each sample was collected from the 0 to 6-inch (surface) soil interval at the designated and surveyed location. Four of the 16 locations (one per each quadrant of the CU) were randomly selected for archiving, and the other 12 locations were submitted for analysis. All samples were analyzed at the FDF on-site laboratory for the five primary ASCOCs using the gamma spectroscopy method.

2.2.4 Statistical Analysis

The statistical analysis of certification samples is discussed in Appendix G of the SEP. Per Section G.2.3 of the SEP, statistical analysis of certification results is not necessary to determine if an ASCOC passed certification in a CU if all of the results for that ASCOC in that CU were below the FRL. If any sample result(s) does exceed the associated FRL, then statistical analyses will be performed and two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal, the first criterion is to compare the 95 percent UCL on the mean of each primary ASCOC to its FRL, resulting in the pass/fail decision on each individual CU. If the data distribution was not normal or lognormal, the appropriate nonparametric approach discussed in Appendix G of the SEP, was used to evaluate the 95 percent UCL on the mean. The second criterion is related to the hot spot criterion, which states that if a certification sample for a primary radiological ASCOC exceeds two times the FRL, then further action is necessary per Section 3.4.5 and Figure 3-11 of the SEP. When the given UCL on the mean for each COC is less than its FRL and the hot spot criterion is met, the CU will be considered certified.

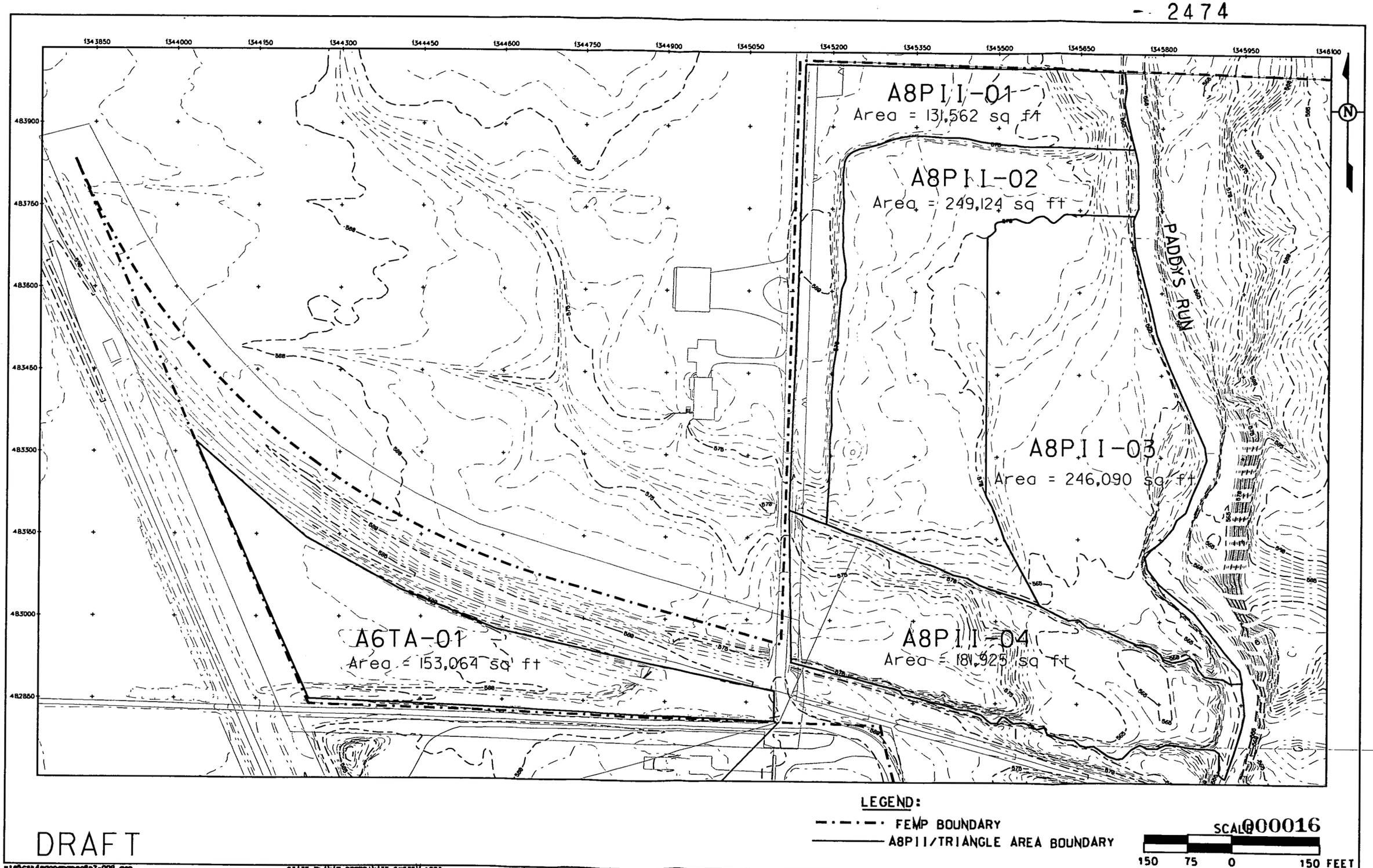

FIGURE 2-1. CERTIFICATION UNITS IDENTIFED WITHIN A8PII AND THE TRIANGLE AREA

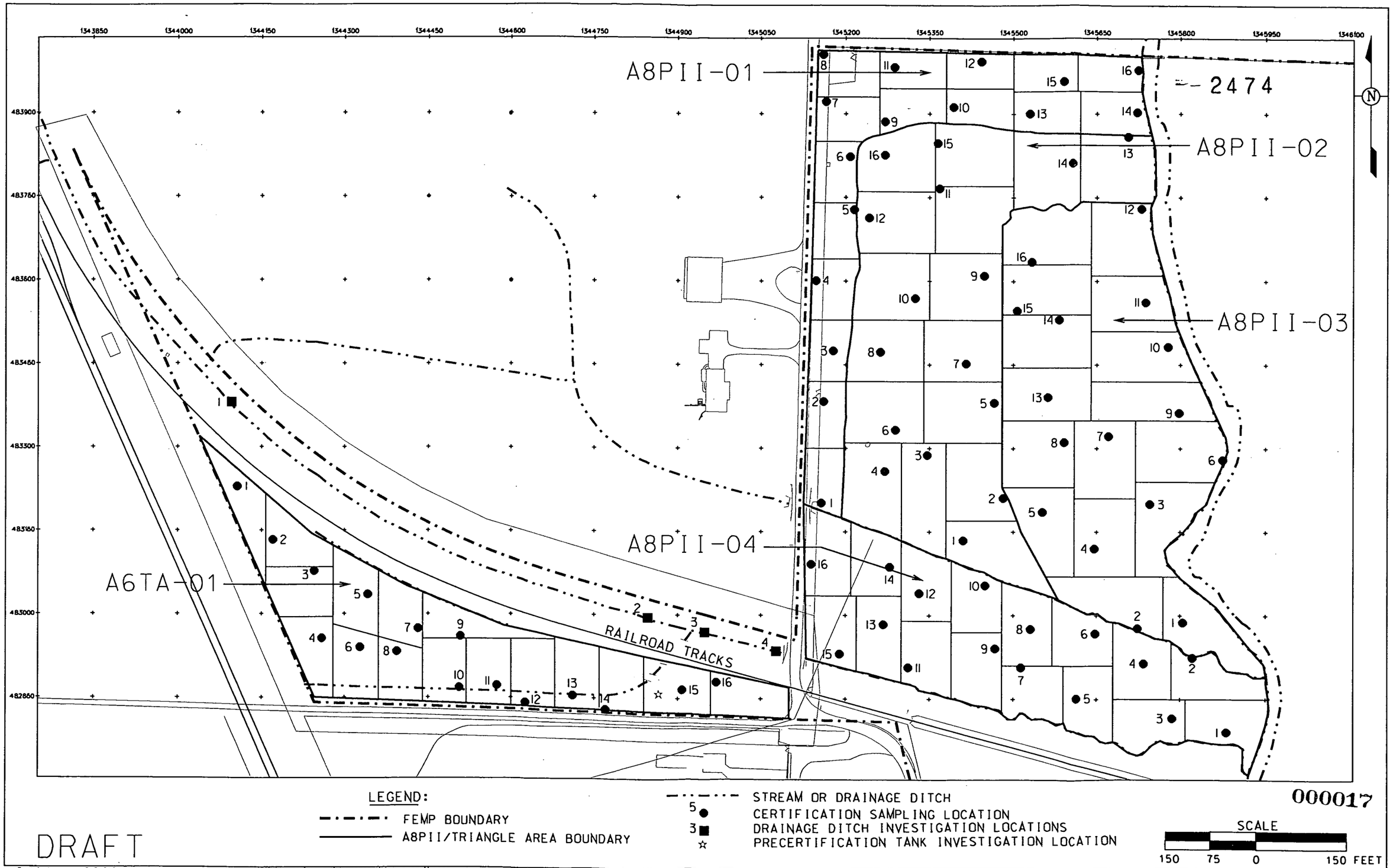

FIGURE 2-2. A8PII AND A6TA CUs, SUB-CUs, AND SOIL SAMPLING LOCATIONS

3.0 OVERVIEW OF FIELD ACTIVITIES

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3.1 DATA EVALUATION AND PRECERTIFICATION

Based on historical data and precertification surveys from A8PII/A6TA, no soil remediation activities were required prior to certification sampling. The historical and precertification real-time data from these parts of the FEMP site are discussed in detail in the CDL (DOE 1999a). The precertification scan revealed no "hot spots," and all high-purity germanium detector (HPGe) results were below the FRLs.

3.1.1 Precertification Physical Sample of Soil Beneath A6TA Tank

After precertification was completed and the CDL was submitted to the EPAs, an abandoned tank was discovered in A6TA near the culvert that connects the two drainage ditches just south of the railroad tracks. Upon removal, a small amount of liquid which appeared to be oil was found within the tank. To verify that none of the tank contents leaked into the underlying soil, a precertification physical soil sample was collected from the center of the location where the tank was found, then analyzed for potential tank contents. Most analytes were undetected, and those that were detected were well below the FRL; therefore, certification activities proceeded as planned. More discussion of this soil sample and the analytical results are presented in Appendix A of this Certification Report.

3.2 CHANGES TO SCOPE OF WORK

The scope of work for A8PII/A6TA certification sampling was documented in the final CDL, and there were no significant changes during field implementation. All final certification sampling locations and CU boundaries remained as identified in the CDL, and all analyses were carried out as planned. Some minor changes, as documented in Variance/Field Change Notices (V/FCNs) to the A8PII Certification Project Specific Plan (PSP, DOE 1999b) are as follows:

- HPGe measurements (specified in the certification PSP for comparability purposes) were not obtained at 5 of the locations due to standing water. The measurements were obtained at alternate locations only for cost comparison.

- The sample identification scheme was clarified because the scheme in Section 2.4.2.1 of the PSP was not consistent with Appendix B. The V/FCN noted that the IDs shown in Appendix B of the Certification PSP will be used, and it also noted that archive samples should have a "V" added to the ID.

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

The samples for A8PII were analyzed at the FEMP on-site laboratory, which meets requirements of the SCQ. The SCQ is the source for analytical methodologies (Appendix G), data validation and verification, and analytical and field QA/QC requirements.

For all the certification data, laboratory analysis met all requirements for ASL D. Because a lower level of detection (10 percent of the FRL) was used for all five target analytes, these analyses are classified as ASL E, though all ASL D analytical requirements were achieved per Appendix G of the SCQ. Also, the on-site laboratory prepared an ASL D data package, which included sample results with associated QA/QC data and all applicable raw data. Certification analytical results are provided in Appendix B, and a summary of the analytical methods follows.

4.1.1 Radiochemical Methods

The radiochemical analytical methods depended on the specific nuclides of interest. Performance-based specification criteria included highest allowable minimum detectable concentration (HAMDC), percent overall tracer/chemical recovery, percent matrix spike recovery, method blank concentration, percent recovery of laboratory control sample, and percent recovery for duplicate samples were specified for each analyte. Laboratories were required to meet these specifications using the methodologies described below.

Total Uranium

Samples were analyzed for uranium-238 using gamma spectrometry, and the results were used to calculate the total uranium value. The calculation used was as follows:

$$\text{Total uranium (mg/kg)} = (2.998544) \times \text{uranium-238 gamma spectrometry result (pCi/g)}$$

The validation qualifier assigned to the total uranium value was the same as the uranium-238 qualifier.

Radium-226

Samples were analyzed by gamma spectrometry, and radium-226 was quantified by measuring gamma rays emitted by members of its decay chain. This method does not require chemical separation, but the samples must be allowed a 20-day progeny ingrowth period before counting. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A8PII/A6TA certification results.

Radium-228

Following gamma spectrometry analysis, radium-228 was also quantified by measuring gamma rays emitted by members of its decay chain. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A8PII/A6TA certification results.

Isotopic Thorium

Isotopic thorium was also quantified by gamma spectrometry. The on-site laboratory used the same gamma ray emission lines and error weighted average methodology to calculate all A8PII/A6TA certification results.

4.2 DATA VERIFICATION AND VALIDATION

This section discusses the data verification and validation (V&V) process used to examine the quality of field and laboratory results. Data were qualified to indicate the level of data usability, or level of confidence in the reported analytical results. The EPA's National Functional Guidelines for Data Review (EPA 1994), as adapted and approved by EPA Region V, was used for this process.

Specific parameters associated with the data were evaluated during V&V to determine whether or not the data quality objectives were met. Five principal quality assurance parameters, i.e., precision, accuracy, completeness, comparability, and representativeness, were addressed during V&V. Field sampling and handling, laboratory analysis and reporting, and nonconformances and discrepancies in the data were examined to ensure compliance with appropriate and applicable procedures.

The V&V process evaluated the following parameters:

- Specific Field Forms for sample collection and handling
- Chain of Custody forms
- Completeness of Laboratory Data Deliverable.

The data validation process examined the analytical data to determine the level of confidence of the results. General areas examined that apply to all the chemical data include the following:

- Holding Times
- Instrument calibrations
- Calculation of results
- Matrix spike/matrix spike duplicate recoveries
- Laboratory/field duplicate precision
- Field/Laboratory Blank contamination
- Dry weight correction for solid samples
- Correct detection limits reported
- Laboratory control sample (LCS) recoveries and compliance with established limits.

Parameters unique to the evaluation of radiochemical analyses include:

- Calibration data for specific energies
- Background checks
- Relative Error ratios
- Tracer yields
- Detector efficiencies
- Background count correction.

For this project, all the radiological data were reviewed and validated for all criteria noted above. Per project requirements, a minimum 10 percent of the certification data were validated to validation Level D. This validation included the same review process as for ASL B, but included a systematic review of the raw data and recalculations. To meet this project requirement (as specified in the SEP and DQO SL-043), all analyses from one CU (CU A8PII-04) were validated to Level D, and the remaining data were validated to Level B.

Following V&V, qualifier codes were applied to specific data points, reflecting the level of confidence assigned to the particular datum. These codes can include the following:

- No qualification; the positive result or detection limit is confident as reported

J Positive result is estimated or imprecise; data point is usable for decision-making purposes. Positive results less than the contract required reporting limit are also qualified in this manner

R Positive result or detection limit is considered unreliable - data point should NOT be used for decision-making purposes

U Undetected result at the stated limit of detection

UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable for decision-making purposes

N Positive result is tentatively identified - that is, there is some question regarding the actual identification and quantification of the result. Compound reported is best professional judgement of the interpretation of the supporting data, such as mass spectra. Caution must be exercised with the use of this data

NV Not Validated. The results for this sample were not validated

Z This result, or detection limit in this analysis is not the best one to use; another analysis (e.g., the dilution or re-analysis) contains a more confident and usable result.

The V&V of this data set did not identify any problems. The majority of the results, including all radium-226, radium-228, thorium-228 and thorium-232 results, received no qualification (a "-" qualifier). Some of the uranium results received a "J" qualifier due to elevated uncertainty or a "U" qualifier when the result was reported at the minimum detectable concentration.

4.3 DATA REDUCTION

Each sample used to support the A8PII/A6TA certification decision was entered in the FEMP Sitewide Environmental Database (SED) with the following information.

Field Information

- Sample Identification Number - A unique number assigned to each discrete sample point
- Coordinate Information - Northing and Easting locations
- Certification Unit - Each sample is assigned to a CU based on location.

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Laboratory Information

For each sample result the following information is entered:

- Laboratory Result - The reported analytical value from the laboratory
- Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters non-detect values are assigned a U qualifier
- Total Propagated Uncertainty (TPU) - This value represents the uncertainty associated with the reported result. TPU includes the counting error, as well as uncertainty from other laboratory measurements and data reduction. (Applicable to radiological parameters only)
- Units - The units in which the Laboratory Result is reported.

Validation Information

- Validation Result - The result based on the validation process. During the validation process, sample results may be adjusted. If the laboratory result is less than the associated minimum detectable concentration (MDC) , the validation result becomes the MDC value
- Validation TPU - The TPU based on the validation process
- Validation Qualifier - The qualifier assigned as a result of the data validation process
- Validation Units - The units in which the Validation Result is reported.

Using the information as summarized above, the following actions were taken for data reduction of each CU data set.

1. All the data for each CU were queried from SED. All the data were used even if the CU had more than the minimum required data points (though this is not the case for any the CUs under this scope)
2. The data from the validation fields were used for statistical calculations
3. Data with a qualifier of R or Z was not used in the statistical calculations
4. The highest of the two duplicate results was used in the statistical calculations
5. One half of the non-detect (U or UJ) values was used in the statistical calculations.

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

5.1 CERTIFICATION RESULTS AND EVALUATION

All CUs for A8PII passed the certification criteria, as did the A6TA CU. The determination of successful certification or certification failure was based on a review of certification sample data from each CU against criteria discussed in Section 2.2.5. Therefore, all five CUs passed final certification relative to the average concentration of COCs and the two times FRL "hot spot" criterion. All five CUs passed on the first round of certification. No additional corrective actions were necessary, and the archives samples did not need to be analyzed. Final certification data are presented in Appendix B. [A review of the A8PII and A6TA certification results revealed no FRL exceedences for any of the ASCOCs in any of the CUs.]

5.2 A8PII/A6TA CERTIFICATION CONCLUSIONS

The five CUs have passed certification statistical analyses relative to the determination of average residual soil concentrations within applicable confidence bounds of all the ASCOCs, and relative to the two times FRL "hot spot" criterion. Based on these results, DOE has determined that the remedial objectives in the OU5 ROD have been achieved in A8PII and the applicable portion of A6TA. Therefore, upon EPA and OEPA concurrence, these portions the site will be released for final land.

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6.0 PROTECTION OF CERTIFIED AREAS

DOE has restricted access to certified areas in order to maintain their integrity prior to transferral for final land use. FEMP procedure EP-0008 has been developed to implement a process to protect certified areas from becoming recontaminated.

The procedure is summarized as follows:

- At the initiation of certification sampling activities for a remediation area, temporary fencing will be installed to delineate the perimeter of the "certified" area if existing fencing is not already present.
- Signs will be posted upon the perimeter at all possible access points to require access approval for entry into the "certified" area from the SDFP Natural Resources Group.
- To gain access to conduct work in a "certified" area, the personnel desiring admittance will submit a written request to the responsible project manager.
- Any equipment to be used within the "certified" area must be free of contamination. If the equipment is used off-road in an uncertified area, it must be washed and/or decontaminated per applicable requirements prior to entering a certified area.
- FEMP management team representatives must instruct general employees/operators on the entry and exit requirements for a "certified" area.

After EPA and OEPA agree the an area is certified, the area will be free for final land use. At that time, best management practices and administrative controls will be used to protect the area from contamination, and other controls will be implemented as needed.

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APPENDIX A

PRECERTIFICATION PHYSICAL SAMPLE - INVESTIGATION OF SOIL BENEATH THE TANK IN A6TA

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APPENDIX A
PRECERTIFICATION PHYSICAL SAMPLE - INVESTIGATION OF SOIL BENEATH THE TANK IN A6TA

A.1 BACKGROUND

A discarded tank was found along the railroad tracks in the A6TA. The tank's capacity was approximately 10 gallons, and it contained a small amount of liquid that appeared to be oil. Upon removal by Waste Pit Remedial Action Project personnel, it was verified that the container appeared to be in good condition and was not leaking.

As added verification that the tank did not leak contents into the soil, a precertification physical soil sample was collected and analyzed for possible tank contents (sample ID# A6TA-INV-1-P; the first investigation sample collected in A6TA precertification). The sample was collected from the center point of the former container location (coordinates N482858.5, E1344866.0) to a depth of 6 inches. Details of the sample collection are described in V/FCN 21100-PSP-0001-5. The soil sample was sent to Quanterra, a laboratory on the FEMP Approved Laboratories List, for analysis of volatile organic carbons, semi-volatile organic carbons, and polychlorinated biphenyl (PCBs). Results were subject to an ASL B data validation by the FEMP data validation team.

A.2 RESULTS AND DISCUSSION

The results from this soil analysis showed no results above the FRL for any of the parameters analyzed. Most results were undetected, and those that were detected were well below the FRL. As shown in Table A-1, all parameters analyzed in this soil sample are reported, including those parameters without a soil FRL.

A.2.1 Discussion of Data Qualified as Unusable

As shown on Table A-1, the results for three compounds were qualified as unusable during data validation. One of these compounds was 4-Methyl-2-pentanone, with results from one soil and one trip blank qualified as unusable. This was due to the low linear correlation co-efficient for the calibration of this compound generated by the laboratory. Method 8260 was used for this analysis, and 4-Methyl-2-pentanone is a notoriously difficult compound to analyze using this method because laboratories routinely have difficulty generating linear curves for this compound. Additionally, Method 8260 does not have any calibration criteria listed for this analyte. In looking at the raw data,

no peaks were noted for 4-Methyl-2-pentanone, and the laboratory demonstrated the ability to recover 4-Methyl-2-pentanone at 10 milligrams per kilogram (μg/kg) through the analysis of a standard. Therefore, despite 4-Methyl-2-pentanone not meeting validation calibration guidelines, there is no analytical evidence to support the finding that these non-detects are unusable, since the laboratory clearly demonstrated the ability to recover the compound of interest at the detection limit reported. Since no peaks for 4-Methyl-2-pentanone were detected, the results are technically non-detects.

Also, the results for Di-n-octylphthalate and Debenzo(a,h)anthracene were judged unusable by data validation due to high Internal Standard recoveries. Internal Standards essentially serve as calibration checks that automatically adjust for matrix interferences. Internal Standards are not part of the extraction process, but are added in to extracts or samples just prior to analysis. In Method 8270, the method used for these analyses, there are no criteria established for Internal Standard recoveries in samples. This being the case, Data Validation adopted criteria that have been established for the characteristic leachate procedure.

The Internal Standard area is used in the following equations, to first, determine the Relative Response Factor (RRF) and then the concentration of the analyte in the sample:

$$RRF = \frac{A_s \times C_{is}}{A_{is} \times C_s}$$

$$C_x = \frac{A_x \times C_{is}}{A_{is} \times RRF}$$

where: A_s = Area of the Standard
C_{is} = Concentration of the Internal Standard
A_{is} = Area of the Internal Standard
C_s = Concentration of the Internal Standard
C_x = Concentration of Unknown

As shown above, the relationship between the area of the Internal Standard and the concentration of the compound is inverse. That is, when the area of the Internal Standard is high, the effective

concentration of the compound is lowered, and vice-versa. Therefore, the bias in the reported concentration only occurs if the compound has been detected. In a review of the raw data, neither of the compounds were detected, therefore, no peak area for the compounds could be used in a concentration calculation. As a result, there is no bias in the undetected results. These data should not be qualified as unusable, and the results for both Di-n-octylphthalate and Debenzo(a,h)anthracene should technically be considered a non-detect.

A.3 CONCLUSION

The analytical results from this soil sample clearly demonstrate that no possible contents of the abandoned tank discovered in A6TA leaked into the underlying soil. Of the numerous parameters analyzed, most were not detected, and those that were detected were present at concentrations well below the FRL. Although the in-house data validation check revealed minor methodology issues with three of the analytical results, the data still demonstrate the COCs with data qualified as "unusable" were not present in the soil sample. Based on this finding, the A6TA soil certification effort continued as planned.

TABLE A-1

Analytical Results from the A6TA Precertification (Tank Investigation) Soil Sample

SAMPLE_ID	DATE	EAST_83	NORTH_83	DEPTH	PARAMETER	FRL	RESULT	UNITS	LAB_QUAL	VAL_QUAL
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,1,2-Trichloroethane	4300	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,1-Dichloroethene	410	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,2-Dichloroethane	160	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	3,3'-Dichlorobenzidine	550	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Methyl-2-pentanone	2500000	10	ug/kg	U	R
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Nitroaniline	150000	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Acetone	43000000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1254	130	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1260	130	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzene	850000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzo(a)anthracene	20000	160	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzo(a)pyrene	2000	210	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzo(b)fluoranthene	20000	200	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzo(k)fluoranthene	200000	170	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	bis(2-Ethylhexyl)phthalate	820000	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Bromodichloromethane	4000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Bromoform	31000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Bromomethane	8200000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Carbazole	12000	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Carbon disulfide	5000000	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Carbon Tetrachloride	2100	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Chlorobenzene	340000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Chloroform	45000	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Chrysene	2000000	200	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Dibenzo(a,h)anthracene	2000	330	ug/kg	U	R
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Di-n-octyl phthalate	1100000	330	ug/kg	U	R
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Ethylbenzene	5100000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Indeno(1,2,3-cd)pyrene	20000	180	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Methylene chloride	37000	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	N-Nitroso-di-n-propylamine	200	200	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	N-Nitrosodiphenylamine	51000	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Pentachlorophenol	2300	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Tetrachloroethene	3600	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Toluene	100000000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Trichloroethene	25000	10	ug/kg	U	UJ

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TABLE A-1
Analytical Results from the A6TA Precertification (Tank Investigation) Soil Sample

SAMPLE_ID	DATE	EAST_83	NORTH_83	DEPTH	PARAMETER	FRL	RESULT	UNITS	LAB_QUAL	VAL_QUAL
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Vinyl chloride	130	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Xylenes, Total	920000000	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,1,1-Trichloroethane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,1,2,2-Tetrachloroethane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,1-Dichloroethane	N/A	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,2,4-Trichlorobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,2-Dichlorobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,2-Dichloroethene (Total)	N/A	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,2-Dichloropropane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,3-Dichlorobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	1,4-Dichlorobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,2-oxybis(1-Chloropropane)	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4,5-Trichlorophenol	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4,6-Trichlorophenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4-Dichlorophenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4-Dimethylphenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4-Dinitrophenol	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,4-Dinitrotoluene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2,6-Dinitrotoluene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Butanone	N/A	10	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Chloronaphthalene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Chlorophenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Hexanone	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Methylnaphthalene	N/A	83	ug/kg	BJ	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Nitroaniline	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	2-Nitrophenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	3-Nitroaniline	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4,6-Dinitro-2-methylphenol	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Bromophenyl phenyl ether	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Chloro-3-methylphenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Chlorophenylphenyl ether	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	4-Nitrophenol	N/A	830	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Acenaphthene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Acenaphthylene	N/A	38	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Anthracene	N/A	330	ug/kg	U	U

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TABLE A-1
Analytical Results from the A6TA Precertification (Tank Investigation) Soil Sample

SAMPLE_ID	DATE	EAST_83	NORTH_83	DEPTH	PARAMETER	FRL	RESULT	UNITS	LAB_QUAL	VAL_QUAL
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1016	N/A	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1221	N/A	66	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1232	N/A	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1242	N/A	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Aroclor-1248	N/A	33	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Benzo(g,h,i)perylene	N/A	170	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	bis(2-Chloroethoxy)methane	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	bis(2-Chloroethyl)ether	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Butyl benzyl phthalate	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Chloroethane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Chloromethane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	cis-1,3-Dichloropropene	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Dibenzofuran	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Dibromochloromethane	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Diethyl phthalate	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Dimethyl phthalate	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Di-n-butyl phthalate	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Fluoranthene	N/A	230	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Fluorene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Hexachlorobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Hexachlorobutadiene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Hexachlorocyclopentadiene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Hexachloroethane	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Isophorone	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Naphthalene	N/A	170	ug/kg	BJ	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Nitrobenzene	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	o-Methylphenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	p-Chloroaniline	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Phenanthrene	N/A	140	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Phenol	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	p-Methylphenol (Cresol)	N/A	330	ug/kg	U	U
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Pyrene	N/A	190	ug/kg	J	J
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	Styrene	N/A	10	ug/kg	U	UJ
A6TA-INV-1-P	6-May-99	1344866.0	482858.5	0-0.5	trans-1,3-Dichloropropene	N/A	10	ug/kg	U	UJ

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APPENDIX B

CERTIFICATION SAMPLES, ANALYTICAL RESULTS AND STATISTICS TABLES

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TABLE B-1

Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-01	A8PII-01-C-1R	1-Jun-99	0-0.5	1345157	483202	Radium-226	0.868	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-1R-D	1-Jun-99	0-0.5	1345157	483202	Radium-226	0.783	pCi/g	-	DUPLICATE
A8PII-01	A8PII-01-C-1R	1-Jun-99	0-0.5	1345157	483202	Radium-228	0.764	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-1R-D	1-Jun-99	0-0.5	1345157	483202	Radium-228	0.684	pCi/g	-	DUPLICATE
A8PII-01	A8PII-01-C-1R	1-Jun-99	0-0.5	1345157	483202	Thorium-228	0.767	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-1R-D	1-Jun-99	0-0.5	1345157	483202	Thorium-228	0.68	pCi/g	-	DUPLICATE
A8PII-01	A8PII-01-C-1R	1-Jun-99	0-0.5	1345157	483202	Thorium-232	0.764	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-1R-D	1-Jun-99	0-0.5	1345157	483202	Thorium-232	0.684	pCi/g	-	DUPLICATE
A8PII-01	A8PII-01-C-1R	1-Jun-99	0-0.5	1345157	483202	Uranium, Total	3.511	ug/g	U	NORMAL
A8PII-01	A8PII-01-C-1R-D	1-Jun-99	0-0.5	1345157	483202	Uranium, Total	3.311	ug/g	U	DUPLICATE
A8PII-01	A8PII-01-C-11R	3-Jun-99	0-0.5	1345287	483983	Radium-226	0.929	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-11R	3-Jun-99	0-0.5	1345287	483983	Radium-228	0.992	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-11R	3-Jun-99	0-0.5	1345287	483983	Thorium-228	0.943	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-11R	3-Jun-99	0-0.5	1345287	483983	Thorium-232	0.992	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-11R	3-Jun-99	0-0.5	1345287	483983	Uranium, Total	5.795	ug/g	J	NORMAL
A8PII-01	A8PII-01-C-12R	3-Jun-99	0-0.5	1345443	483994	Radium-226	1.08	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-12R	3-Jun-99	0-0.5	1345443	483994	Radium-228	0.929	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-12R	3-Jun-99	0-0.5	1345443	483994	Thorium-228	0.875	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-12R	3-Jun-99	0-0.5	1345443	483994	Thorium-232	0.929	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-12R	3-Jun-99	0-0.5	1345443	483994	Uranium, Total	7.249	ug/g	-	NORMAL
A8PII-01	A8PII-01-C-13R	3-Jun-99	0-0.5	1345529	483901	Radium-226	0.765	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-13R	3-Jun-99	0-0.5	1345529	483901	Radium-228	0.794	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-13R	3-Jun-99	0-0.5	1345529	483901	Thorium-228	0.766	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-13R	3-Jun-99	0-0.5	1345529	483901	Thorium-232	0.794	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-13R	3-Jun-99	0-0.5	1345529	483901	Uranium, Total	5.899	ug/g	J	NORMAL
A8PII-01	A8PII-01-C-14R	3-Jun-99	0-0.5	1345721	483903	Radium-226	0.936	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-14R	3-Jun-99	0-0.5	1345721	483903	Radium-228	0.784	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-14R	3-Jun-99	0-0.5	1345721	483903	Thorium-228	0.789	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-14R	3-Jun-99	0-0.5	1345721	483903	Thorium-232	0.784	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-14R	3-Jun-99	0-0.5	1345721	483903	Uranium, Total	5.857	ug/g	J	NORMAL
A8PII-01	A8PII-01-C-16R	3-Jun-99	0-0.5	1345724	483979	Radium-226	0.823	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-16R	3-Jun-99	0-0.5	1345724	483979	Radium-228	0.781	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-16R	3-Jun-99	0-0.5	1345724	483979	Thorium-228	0.762	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-16R	3-Jun-99	0-0.5	1345724	483979	Thorium-232	0.781	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-16R	3-Jun-99	0-0.5	1345724	483979	Uranium, Total	4.358	ug/g	-	NORMAL
A8PII-01	A8PII-01-C-3R	1-Jun-99	0-0.5	1345178	483475	Radium-226	1.089	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-3R	1-Jun-99	0-0.5	1345178	483475	Radium-228	1.008	pCi/L	-	NORMAL

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TABLE B-1

Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-01	A8PII-01-C-3R	1-Jun-99	0-0.5	1345178	483475	Thorium-228	0.999	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-3R	1-Jun-99	0-0.5	1345178	483475	Thorium-232	1.008	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-3R	1-Jun-99	0-0.5	1345178	483475	Uranium, Total	3.697	ug/g	J	NORMAL
A8PII-01	A8PII-01-C-4R	1-Jun-99	0-0.5	1345147	483601	Radium-226	0.896	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-4R	1-Jun-99	0-0.5	1345147	483601	Radium-228	0.541	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-4R	1-Jun-99	0-0.5	1345147	483601	Thorium-228	0.528	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-4R	1-Jun-99	0-0.5	1345147	483601	Thorium-232	0.541	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-4R	1-Jun-99	0-0.5	1345147	483601	Uranium, Total	3.242	ug/g	U	NORMAL
A8PII-01	A8PII-01-C-5R	1-Jun-99	0-0.5	1345215	483728	Radium-226	0.509	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-5R	1-Jun-99	0-0.5	1345215	483728	Radium-228	0.424	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-5R	1-Jun-99	0-0.5	1345215	483728	Thorium-228	0.401	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-5R	1-Jun-99	0-0.5	1345215	483728	Thorium-232	0.424	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-5R	1-Jun-99	0-0.5	1345215	483728	Uranium, Total	3.357	ug/g	U	NORMAL
A8PII-01	A8PII-01-C-7R	1-Jun-99	0-0.5	1345165	483922	Radium-226	0.903	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-7R	1-Jun-99	0-0.5	1345165	483922	Radium-228	0.963	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-7R	1-Jun-99	0-0.5	1345165	483922	Thorium-228	0.967	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-7R	1-Jun-99	0-0.5	1345165	483922	Thorium-232	0.963	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-7R	1-Jun-99	0-0.5	1345165	483922	Uranium, Total	6.035	ug/g	-	NORMAL
A8PII-01	A8PII-01-C-8R	1-Jun-99	0-0.5	1345160	484006	Radium-226	1.024	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-8R	1-Jun-99	0-0.5	1345160	484006	Radium-228	0.662	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-8R	1-Jun-99	0-0.5	1345160	484006	Thorium-228	0.623	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-8R	1-Jun-99	0-0.5	1345160	484006	Thorium-232	0.662	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-8R	1-Jun-99	0-0.5	1345160	484006	Uranium, Total	3.31	ug/g	U	NORMAL
A8PII-01	A8PII-01-C-9R	1-Jun-99	0-0.5	1345270	483886	Radium-226	0.968	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-9R	1-Jun-99	0-0.5	1345270	483886	Radium-228	1.037	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-9R	1-Jun-99	0-0.5	1345270	483886	Thorium-228	1.02	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-9R	1-Jun-99	0-0.5	1345270	483886	Thorium-232	1.037	pCi/g	-	NORMAL
A8PII-01	A8PII-01-C-9R	1-Jun-99	0-0.5	1345270	483886	Uranium, Total	5.405	ug/g	J	NORMAL
A8PII-02	A8PII-02-C-1R	3-Jun-99	0-0.5	1345411	483135	Radium-226	0.909	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-1R	3-Jun-99	0-0.5	1345411	483135	Radium-228	0.829	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-1R	3-Jun-99	0-0.5	1345411	483135	Thorium-228	0.807	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-1R	3-Jun-99	0-0.5	1345411	483135	Thorium-232	0.829	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-1R	3-Jun-99	0-0.5	1345411	483135	Uranium, Total	4.638	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-10R	3-Jun-99	0-0.5	1345324	483569	Radium-226	0.928	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-10R	3-Jun-99	0-0.5	1345324	483569	Radium-228	0.919	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-10R	3-Jun-99	0-0.5	1345324	483569	Thorium-228	0.896	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-10R	3-Jun-99	0-0.5	1345324	483569	Thorium-232	0.919	pCi/g	-	NORMAL

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TABLE B-1

Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-02	A8PII-02-C-10R	3-Jun-99	0-0.5	1345324	483569	Uranium, Total	5.32	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-12R	3-Jun-99	0-0.5	1345242	483713	Radium-226	0.706	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-12R	3-Jun-99	0-0.5	1345242	483713	Radium-228	0.507	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-12R	3-Jun-99	0-0.5	1345242	483713	Thorium-228	0.496	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-12R	3-Jun-99	0-0.5	1345242	483713	Thorium-232	0.507	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-12R	3-Jun-99	0-0.5	1345242	483713	Uranium, Total	4.254	ug/g	J	NORMAL
A8PII-02	A8PII-02-C-13R	7-Jun-99	0-0.5	1345706	483859	Radium-226	0.889	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-13R	7-Jun-99	0-0.5	1345706	483859	Radium-228	0.775	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-13R	7-Jun-99	0-0.5	1345706	483859	Thorium-228	0.742	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-13R	7-Jun-99	0-0.5	1345706	483859	Thorium-232	0.775	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-13R	7-Jun-99	0-0.5	1345706	483859	Uranium, Total	4.551	ug/g	J	NORMAL
A8PII-02	A8PII-02-C-15R	3-Jun-99	0-0.5	1345365	483847	Radium-226	0.894	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-15R-D	3-Jun-99	0-0.5	1345365	483847	Radium-226	0.973	pCi/g	-	DUPLICATE
A8PII-02	A8PII-02-C-15R	3-Jun-99	0-0.5	1345365	483847	Radium-228	0.704	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-15R-D	3-Jun-99	0-0.5	1345365	483847	Radium-228	0.636	pCi/g	-	DUPLICATE
A8PII-02	A8PII-02-C-15R	3-Jun-99	0-0.5	1345365	483847	Thorium-228	0.686	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-15R-D	3-Jun-99	0-0.5	1345365	483847	Thorium-228	0.628	pCi/g	-	DUPLICATE
A8PII-02	A8PII-02-C-15R	3-Jun-99	0-0.5	1345365	483847	Thorium-232	0.704	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-15R-D	3-Jun-99	0-0.5	1345365	483847	Thorium-232	0.636	pCi/g	-	DUPLICATE
A8PII-02	A8PII-02-C-15R	3-Jun-99	0-0.5	1345365	483847	Uranium, Total	2.807	ug/g	U	NORMAL
A8PII-02	A8PII-02-C-15R-D	3-Jun-99	0-0.5	1345365	483847	Uranium, Total	2.885	ug/g	U	DUPLICATE
A8PII-02	A8PII-02-C-16R	3-Jun-99	0-0.5	1345270	483826	Radium-226	0.782	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-16R	3-Jun-99	0-0.5	1345270	483826	Radium-228	0.71	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-16R	3-Jun-99	0-0.5	1345270	483826	Thorium-228	0.706	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-16R	3-Jun-99	0-0.5	1345270	483826	Thorium-232	0.71	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-16R	3-Jun-99	0-0.5	1345270	483826	Uranium, Total	2.976	ug/g	U	NORMAL
A8PII-02	A8PII-02-C-3R	3-Jun-99	0-0.5	1345346	483288	Radium-226	0.913	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-3R	3-Jun-99	0-0.5	1345346	483288	Radium-228	0.704	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-3R	3-Jun-99	0-0.5	1345346	483288	Thorium-228	0.7	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-3R	3-Jun-99	0-0.5	1345346	483288	Thorium-232	0.704	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-3R	3-Jun-99	0-0.5	1345346	483288	Uranium, Total	5.018	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-4R	3-Jun-99	0-0.5	1345270	483259	Radium-226	0.815	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-4R	3-Jun-99	0-0.5	1345270	483259	Radium-228	0.636	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-4R	3-Jun-99	0-0.5	1345270	483259	Thorium-228	0.617	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-4R	3-Jun-99	0-0.5	1345270	483259	Thorium-232	0.636	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-4R	3-Jun-99	0-0.5	1345270	483259	Uranium, Total	4.281	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-5R	3-Jun-99	0-0.5	1345466	483382	Radium-226	0.721	pCi/g	-	NORMAL

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TABLE B-1

Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-02	A8PII-02-C-5R	3-Jun-99	0-0.5	1345466	483382	Radium-228	0.509	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-5R	3-Jun-99	0-0.5	1345466	483382	Thorium-228	0.5	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-5R	3-Jun-99	0-0.5	1345466	483382	Thorium-232	0.509	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-5R	3-Jun-99	0-0.5	1345466	483382	Uranium, Total	2.557	ug/g	U	NORMAL
A8PII-02	A8PII-02-C-6R	3-Jun-99	0-0.5	1345289	483333	Radium-226	0.763	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-6R	3-Jun-99	0-0.5	1345289	483333	Radium-228	0.57	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-6R	3-Jun-99	0-0.5	1345289	483333	Thorium-228	0.567	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-6R	3-Jun-99	0-0.5	1345289	483333	Thorium-232	0.57	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-6R	3-Jun-99	0-0.5	1345289	483333	Uranium, Total	2.689	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-7R	3-Jun-99	0-0.5	1345416	483452	Radium-226	0.694	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-7R	3-Jun-99	0-0.5	1345416	483452	Radium-228	0.567	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-7R	3-Jun-99	0-0.5	1345416	483452	Thorium-228	0.564	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-7R	3-Jun-99	0-0.5	1345416	483452	Thorium-232	0.567	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-7R	3-Jun-99	0-0.5	1345416	483452	Uranium, Total	3.722	ug/g	-	NORMAL
A8PII-02	A8PII-02-C-9R	3-Jun-99	0-0.5	1345448	483610	Radium-226	1.019	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-9R	3-Jun-99	0-0.5	1345448	483610	Radium-228	0.878	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-9R	3-Jun-99	0-0.5	1345448	483610	Thorium-228	0.851	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-9R	3-Jun-99	0-0.5	1345448	483610	Thorium-232	0.878	pCi/g	-	NORMAL
A8PII-02	A8PII-02-C-9R	3-Jun-99	0-0.5	1345448	483610	Uranium, Total	4.159	ug/g	-	NORMAL
A8PII-03	A8PII-03-C-1R	8-Jun-99	0-0.5	1345805	482988	Radium-226	0.751	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-1R	8-Jun-99	0-0.5	1345805	482988	Radium-228	0.778	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-1R	8-Jun-99	0-0.5	1345805	482988	Thorium-228	0.798	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-1R	8-Jun-99	0-0.5	1345805	482988	Thorium-232	0.778	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-1R	8-Jun-99	0-0.5	1345805	482988	Uranium, Total	3.567	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-10R	8-Jun-99	0-0.5	1345778	483482	Radium-226	0.683	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-10R-D	8-Jun-99	0-0.5	1345778	483482	Radium-226	0.769	pCi/g	-	DUPLICATE
A8PII-03	A8PII-03-C-10R	8-Jun-99	0-0.5	1345778	483482	Radium-228	0.782	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-10R-D	8-Jun-99	0-0.5	1345778	483482	Radium-228	0.787	pCi/g	-	DUPLICATE
A8PII-03	A8PII-03-C-10R	8-Jun-99	0-0.5	1345778	483482	Thorium-228	0.782	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-10R-D	8-Jun-99	0-0.5	1345778	483482	Thorium-228	0.755	pCi/g	-	DUPLICATE
A8PII-03	A8PII-03-C-10R	8-Jun-99	0-0.5	1345778	483482	Thorium-232	0.782	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-10R-D	8-Jun-99	0-0.5	1345778	483482	Thorium-232	0.787	pCi/g	-	DUPLICATE
A8PII-03	A8PII-03-C-10R	8-Jun-99	0-0.5	1345778	483482	Uranium, Total	3.561	ug/g	J	NORMAL
A8PII-03	A8PII-03-C-10R-D	8-Jun-99	0-0.5	1345778	483482	Uranium, Total	4.732	ug/g	J	DUPLICATE
A8PII-03	A8PII-03-C-12R	8-Jun-99	0-0.5	1345730	483730	Radium-226	0.929	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-12R	8-Jun-99	0-0.5	1345730	483730	Radium-228	0.835	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-12R	8-Jun-99	0-0.5	1345730	483730	Thorium-228	0.842	pCi/g	-	NORMAL

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TABLE B-1
Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL_QUAL	QA_TYPE
A8PII-03	A8PII-03-C-12R	8-Jun-99	0-0.5	1345730	483730	Thorium-232	0.835	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-12R	8-Jun-99	0-0.5	1345730	483730	Uranium, Total	3.701	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-13R	8-Jun-99	0-0.5	1345562	483392	Radium-226	0.664	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-13R	8-Jun-99	0-0.5	1345562	483392	Radium-228	0.713	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-13R	8-Jun-99	0-0.5	1345562	483392	Thorium-228	0.717	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-13R	8-Jun-99	0-0.5	1345562	483392	Thorium-232	0.713	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-13R	8-Jun-99	0-0.5	1345562	483392	Uranium, Total	3.563	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-15R	8-Jun-99	0-0.5	1345507	483547	Radium-226	0.732	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-15R	8-Jun-99	0-0.5	1345507	483547	Radium-228	0.699	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-15R	8-Jun-99	0-0.5	1345507	483547	Thorium-228	0.69	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-15R	8-Jun-99	0-0.5	1345507	483547	Thorium-232	0.699	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-15R	8-Jun-99	0-0.5	1345507	483547	Uranium, Total	3.586	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-16R	8-Jun-99	0-0.5	1345533	483635	Radium-226	0.957	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-16R	8-Jun-99	0-0.5	1345533	483635	Radium-228	0.902	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-16R	8-Jun-99	0-0.5	1345533	483635	Thorium-228	0.907	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-16R	8-Jun-99	0-0.5	1345533	483635	Thorium-232	0.902	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-16R	8-Jun-99	0-0.5	1345533	483635	Uranium, Total	3.644	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-2R	8-Jun-99	0-0.5	1345724	482977	Radium-226	0.812	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-2R	8-Jun-99	0-0.5	1345724	482977	Radium-228	0.646	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-2R	8-Jun-99	0-0.5	1345724	482977	Thorium-228	0.638	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-2R	8-Jun-99	0-0.5	1345724	482977	Thorium-232	0.646	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-2R	8-Jun-99	0-0.5	1345724	482977	Uranium, Total	3.487	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-4R	8-Jun-99	0-0.5	1345646	483120	Radium-226	0.727	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-4R	8-Jun-99	0-0.5	1345646	483120	Radium-228	0.788	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-4R	8-Jun-99	0-0.5	1345646	483120	Thorium-228	0.792	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-4R	8-Jun-99	0-0.5	1345646	483120	Thorium-232	0.788	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-4R	8-Jun-99	0-0.5	1345646	483120	Uranium, Total	4.422	ug/g	J	NORMAL
A8PII-03	A8PII-03-C-6R	8-Jun-99	0-0.5	1345875	483280	Radium-226	0.554	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-6R	8-Jun-99	0-0.5	1345875	483280	Radium-228	0.271	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-6R	8-Jun-99	0-0.5	1345875	483280	Thorium-228	0.262	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-6R	8-Jun-99	0-0.5	1345875	483280	Thorium-232	0.271	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-6R	8-Jun-99	0-0.5	1345875	483280	Uranium, Total	2.908	ug/g	U	NORMAL
A8PII-03	A8PII-03-C-7R	8-Jun-99	0-0.5	1345671	483322	Radium-226	0.943	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-7R	8-Jun-99	0-0.5	1345671	483322	Radium-228	0.907	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-7R	8-Jun-99	0-0.5	1345671	483322	Thorium-228	0.899	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-7R	8-Jun-99	0-0.5	1345671	483322	Thorium-232	0.907	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-7R	8-Jun-99	0-0.5	1345671	483322	Uranium, Total	5.091	ug/g	J	NORMAL

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Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-03	A8PII-03-C-8R	8-Jun-99	0-0.5	1345591	483311	Radium-226	0.953	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-8R	8-Jun-99	0-0.5	1345591	483311	Radium-228	0.856	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-8R	8-Jun-99	0-0.5	1345591	483311	Thorium-228	0.861	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-8R	8-Jun-99	0-0.5	1345591	483311	Thorium-232	0.856	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-8R	8-Jun-99	0-0.5	1345591	483311	Uranium, Total	3.787	ug/g	J	NORMAL
A8PII-03	A8PII-03-C-9R	8-Jun-99	0-0.5	1345798	483364	Radium-226	0.848	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-9R	8-Jun-99	0-0.5	1345798	483364	Radium-228	0.856	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-9R	8-Jun-99	0-0.5	1345798	483364	Thorium-228	0.85	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-9R	8-Jun-99	0-0.5	1345798	483364	Thorium-232	0.856	pCi/g	-	NORMAL
A8PII-03	A8PII-03-C-9R	8-Jun-99	0-0.5	1345798	483364	Uranium, Total	3.993	ug/g	U	NORMAL
A8PII-04	A8PII-04-C-10R	27-May-99	0-0.5	1345450	483054	Radium-226	0.806	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-10R	27-May-99	0-0.5	1345450	483054	Radium-228	0.913	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-10R	27-May-99	0-0.5	1345450	483054	Thorium-228	0.925	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-10R	27-May-99	0-0.5	1345450	483054	Thorium-232	0.913	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-10R	27-May-99	0-0.5	1345450	483054	Uranium, Total	5.232	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-12R	27-May-99	0-0.5	1345332	483040	Radium-226	0.844	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-12R-D	27-May-99	0-0.5	1345332	483040	Radium-226	0.093	pCi/g	-	DUPLICATE
A8PII-04	A8PII-04-C-12R	27-May-99	0-0.5	1345332	483040	Radium-228	0.778	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-12R-D	27-May-99	0-0.5	1345332	483040	Radium-228	0.814	pCi/g	-	DUPLICATE
A8PII-04	A8PII-04-C-12R	27-May-99	0-0.5	1345332	483040	Thorium-228	0.765	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-12R-D	27-May-99	0-0.5	1345332	483040	Thorium-228	0.808	pCi/g	-	DUPLICATE
A8PII-04	A8PII-04-C-12R	27-May-99	0-0.5	1345332	483040	Thorium-232	0.778	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-12R-D	27-May-99	0-0.5	1345332	483040	Thorium-232	0.814	pCi/g	-	DUPLICATE
A8PII-04	A8PII-04-C-12R	27-May-99	0-0.5	1345332	483040	Uranium, Total	2.901	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-12R-D	27-May-99	0-0.5	1345332	483040	Uranium, Total	3.683	ug/g	J	DUPLICATE
A8PII-04	A8PII-04-C-13R	27-May-99	0-0.5	1345268	482984	Radium-226	0.597	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-13R	27-May-99	0-0.5	1345268	482984	Radium-228	0.615	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-13R	27-May-99	0-0.5	1345268	482984	Thorium-228	0.606	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-13R	27-May-99	0-0.5	1345268	482984	Thorium-232	0.615	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-13R	27-May-99	0-0.5	1345268	482984	Uranium, Total	4.759	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-14R	27-May-99	0-0.5	1345279	483087	Radium-226	0.849	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-14R	27-May-99	0-0.5	1345279	483087	Radium-228	0.684	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-14R	27-May-99	0-0.5	1345279	483087	Thorium-228	0.679	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-14R	27-May-99	0-0.5	1345279	483087	Thorium-232	0.684	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-14R	27-May-99	0-0.5	1345279	483087	Uranium, Total	3.352	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-16R	27-May-99	0-0.5	1345139	483092	Radium-226	0.863	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-16R	27-May-99	0-0.5	1345139	483092	Radium-228	0.823	ug/g	-	NORMAL

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Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A8PII-04	A8PII-04-C-16R	27-May-99	0-0.5	1345139	483092	Thorium-228	0.794	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-16R	27-May-99	0-0.5	1345139	483092	Thorium-232	0.823	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-16R	27-May-99	0-0.5	1345139	483092	Uranium, Total	4.153	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-2R	27-May-99	0-0.5	1345822	482925	Radium-226	0.601	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-2R	27-May-99	0-0.5	1345822	482925	Radium-228	0.354	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-2R	27-May-99	0-0.5	1345822	482925	Thorium-228	0.345	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-2R	27-May-99	0-0.5	1345822	482925	Thorium-232	0.354	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-2R	27-May-99	0-0.5	1345822	482925	Uranium, Total	2.235	ug/g	U	NORMAL
A8PII-04	A8PII-04-C-3R	27-May-99	0-0.5	1345786	482816	Radium-226	0.677	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-3R	27-May-99	0-0.5	1345786	482816	Radium-228	0.687	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-3R	27-May-99	0-0.5	1345786	482816	Thorium-228	0.689	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-3R	27-May-99	0-0.5	1345786	482816	Thorium-232	0.687	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-3R	27-May-99	0-0.5	1345786	482816	Uranium, Total	2.176	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-4R	27-May-99	0-0.5	1345735	482914	Radium-226	0.788	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-4R	27-May-99	0-0.5	1345735	482914	Radium-228	0.877	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-4R	27-May-99	0-0.5	1345735	482914	Thorium-228	0.864	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-4R	27-May-99	0-0.5	1345735	482914	Thorium-232	0.877	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-4R	27-May-99	0-0.5	1345735	482914	Uranium, Total	5.934	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-5R	27-May-99	0-0.5	1345614	482852	Radium-226	0.78	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-5R	27-May-99	0-0.5	1345614	482852	Radium-228	0.861	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-5R	27-May-99	0-0.5	1345614	482852	Thorium-228	0.85	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-5R	27-May-99	0-0.5	1345614	482852	Thorium-232	0.861	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-5R	27-May-99	0-0.5	1345614	482852	Uranium, Total	3.589	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-6R	27-May-99	0-0.5	1345648	482968	Radium-226	0.801	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-6R	27-May-99	0-0.5	1345648	482968	Radium-228	0.898	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-6R	27-May-99	0-0.5	1345648	482968	Thorium-228	0.88	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-6R	27-May-99	0-0.5	1345648	482968	Thorium-232	0.898	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-6R	27-May-99	0-0.5	1345648	482968	Uranium, Total	6.357	ug/g	-	NORMAL
A8PII-04	A8PII-04-C-8R	27-May-99	0-0.5	1345531	482976	Radium-226	0.644	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-8R	27-May-99	0-0.5	1345531	482976	Radium-228	0.642	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-8R	27-May-99	0-0.5	1345531	482976	Thorium-228	0.618	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-8R	27-May-99	0-0.5	1345531	482976	Thorium-232	0.642	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-8R	27-May-99	0-0.5	1345531	482976	Uranium, Total	4.724	ug/g	J	NORMAL
A8PII-04	A8PII-04-C-9R	27-May-99	0-0.5	1345468	482941	Radium-226	0.85	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-9R	27-May-99	0-0.5	1345468	482941	Radium-228	0.967	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-9R	27-May-99	0-0.5	1345468	482941	Thorium-228	0.98	pCi/g	-	NORMAL
A8PII-04	A8PII-04-C-9R	27-May-99	0-0.5	1345468	482941	Thorium-232	0.967	pCi/g	-	NORMAL

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TABLE B-1

Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL_QUAL	QA_TYPE
A8PII-04	A8PII-04-C-9R	27-May-99	0-0.5	1345468	482941	Uranium, Total	5.256	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-1R	9-Jun-99	0-0.5	1344106	483229	Radium-226	0.349	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-1R	9-Jun-99	0-0.5	1344106	483229	Radium-228	0.156	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-1R	9-Jun-99	0-0.5	1344106	483229	Thorium-228	0.148	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-1R	9-Jun-99	0-0.5	1344106	483229	Thorium-232	0.156	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-1R	9-Jun-99	0-0.5	1344106	483229	Uranium, Total	1.993	ug/g	U	NORMAL
A6TA-01	A6TA-01-C-10R	9-Jun-99	0-0.5	1344507	482868	Radium-226	0.78	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-10R	9-Jun-99	0-0.5	1344507	482868	Radium-228	1.077	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-10R	9-Jun-99	0-0.5	1344507	482868	Thorium-228	1.094	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-10R	9-Jun-99	0-0.5	1344507	482868	Thorium-232	1.077	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-10R	9-Jun-99	0-0.5	1344507	482868	Uranium, Total	6.75	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-12R	9-Jun-99	0-0.5	1344626	482841	Radium-226	0.856	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-12R	9-Jun-99	0-0.5	1344626	482841	Radium-228	1.041	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-12R	9-Jun-99	0-0.5	1344626	482841	Thorium-228	1.016	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-12R	9-Jun-99	0-0.5	1344626	482841	Thorium-232	1.041	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-12R	9-Jun-99	0-0.5	1344626	482841	Uranium, Total	6.568	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-13R	9-Jun-99	0-0.5	1344712	482855	Radium-226	0.778	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-13R	9-Jun-99	0-0.5	1344712	482855	Radium-228	0.993	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-13R	9-Jun-99	0-0.5	1344712	482855	Thorium-228	0.968	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-13R	9-Jun-99	0-0.5	1344712	482855	Thorium-232	0.993	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-13R	9-Jun-99	0-0.5	1344712	482855	Uranium, Total	3.515	ug/g	U	NORMAL
A6TA-01	A6TA-01-C-14R	9-Jun-99	0-0.5	1344771	482830	Radium-226	0.988	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-14R	9-Jun-99	0-0.5	1344771	482830	Radium-228	1	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-14R	9-Jun-99	0-0.5	1344771	482830	Thorium-228	1.009	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-14R	9-Jun-99	0-0.5	1344771	482830	Thorium-232	1	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-14R	9-Jun-99	0-0.5	1344771	482830	Uranium, Total	3.161	ug/g	U	NORMAL
A6TA-01	A6TA-01-C-16R	9-Jun-99	0-0.5	1344970	482880	Radium-226	0.396	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-16R	9-Jun-99	0-0.5	1344970	482880	Radium-228	0.24	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-16R	9-Jun-99	0-0.5	1344970	482880	Thorium-228	0.223	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-16R	9-Jun-99	0-0.5	1344970	482880	Thorium-232	0.24	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-16R	9-Jun-99	0-0.5	1344970	482880	Uranium, Total	2.927	ug/g	U	NORMAL
A6TA-01	A6TA-01-C-2R	9-Jun-99	0-0.5	1344170	483133	Radium-226	1.013	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-2R	9-Jun-99	0-0.5	1344170	483133	Radium-228	1.104	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-2R	9-Jun-99	0-0.5	1344170	483133	Thorium-228	1.059	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-2R	9-Jun-99	0-0.5	1344170	483133	Thorium-232	1.104	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-2R	9-Jun-99	0-0.5	1344170	483133	Uranium, Total	6.471	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-4R	9-Jun-99	0-0.5	1344259	482956	Radium-226	0.993	pCi/g	-	NORMAL

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TABLE B-1
Area 8, Phase II and Area 6 Triangle Area Certification Data

CU	SAMPLE_ID	SAMPLE_DATE	DEPTH	EAST_83	NORTH_83	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A6TA-01	A6TA-01-C-4R	9-Jun-99	0-0.5	1344259	482956	Radium-228	1.054	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-4R	9-Jun-99	0-0.5	1344259	482956	Thorium-228	1.038	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-4R	9-Jun-99	0-0.5	1344259	482956	Thorium-232	1.054	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-4R	9-Jun-99	0-0.5	1344259	482956	Uranium, Total	5.801	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-5R	9-Jun-99	0-0.5	1344342	483035	Radium-226	1.141	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-5R	9-Jun-99	0-0.5	1344342	483035	Radium-228	1.071	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-5R	9-Jun-99	0-0.5	1344342	483035	Thorium-228	1.065	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-5R	9-Jun-99	0-0.5	1344342	483035	Thorium-232	1.071	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-5R	9-Jun-99	0-0.5	1344342	483035	Uranium, Total	7.136	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-6R	9-Jun-99	0-0.5	1344328	482940	Radium-226	1.009	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-6R-D	9-Jun-99	0-0.5	1344328	482940	Radium-226	1.072	pCi/g	-	DUPLICATE
A6TA-01	A6TA-01-C-6R	9-Jun-99	0-0.5	1344328	482940	Radium-228	1.071	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-6R-D	9-Jun-99	0-0.5	1344328	482940	Radium-228	1.063	pCi/g	-	DUPLICATE
A6TA-01	A6TA-01-C-6R	9-Jun-99	0-0.5	1344328	482940	Thorium-228	1.079	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-6R-D	9-Jun-99	0-0.5	1344328	482940	Thorium-228	1.038	pCi/g	-	DUPLICATE
A6TA-01	A6TA-01-C-6R	9-Jun-99	0-0.5	1344328	482940	Thorium-232	1.071	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-6R-D	9-Jun-99	0-0.5	1344328	482940	Thorium-232	1.063	pCi/g	-	DUPLICATE
A6TA-01	A6TA-01-C-6R	9-Jun-99	0-0.5	1344328	482940	Uranium, Total	6.274	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-6R-D	9-Jun-99	0-0.5	1344328	482940	Uranium, Total	5.084	ug/g	-	DUPLICATE
A6TA-01	A6TA-01-C-7R	9-Jun-99	0-0.5	1344432	482974	Radium-226	1.004	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-7R	9-Jun-99	0-0.5	1344432	482974	Radium-228	1.04	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-7R	9-Jun-99	0-0.5	1344432	482974	Thorium-228	1.02	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-7R	9-Jun-99	0-0.5	1344432	482974	Thorium-232	1.04	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-7R	9-Jun-99	0-0.5	1344432	482974	Uranium, Total	8.174	ug/g	-	NORMAL
A6TA-01	A6TA-01-C-9R	9-Jun-99	0-0.5	1344509	482960	Radium-226	0.878	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-9R	9-Jun-99	0-0.5	1344509	482960	Radium-228	1.055	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-9R	9-Jun-99	0-0.5	1344509	482960	Thorium-228	1.033	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-9R	9-Jun-99	0-0.5	1344509	482960	Thorium-232	1.055	pCi/g	-	NORMAL
A6TA-01	A6TA-01-C-9R	9-Jun-99	0-0.5	1344509	482960	Uranium, Total	5.495	ug/g	-	NORMAL

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TABLE B-2
Area 6 Triangle Area Drainage Ditch Investigation Results

SAMPLE_ID	SAMPLE_DATE	EAST_83	NORTH_83	DEPTH (ft)	PARAMETER	RESULT	UNITS	VAL. QUAL.	QA_TYPE
A6TA-INV-1	9-Jun-99	1344095.3	483380.8	0-0.5	Radium-226	0.813	pCi/g	-	NORMAL
A6TA-INV-1	9-Jun-99	1344095.3	483380.8	0-0.5	Radium-228	0.839	pCi/g	-	NORMAL
A6TA-INV-1	9-Jun-99	1344095.3	483380.8	0-0.5	Thorium-228	0.849	pCi/g	-	NORMAL
A6TA-INV-1	9-Jun-99	1344095.3	483380.8	0-0.5	Thorium-232	0.839	pCi/g	-	NORMAL
A6TA-INV-1	9-Jun-99	1344095.3	483380.8	0-0.5	Uranium, Total	3.644	ug/g	U	NORMAL
A6TA-INV-2	9-Jun-99	1344847.4	482995.4	0-0.5	Radium-226	0.733	pCi/g	-	NORMAL
A6TA-INV-2	9-Jun-99	1344847.4	482995.4	0-0.5	Radium-228	0.716	pCi/g	-	NORMAL
A6TA-INV-2	9-Jun-99	1344847.4	482995.4	0-0.5	Thorium-228	0.698	pCi/g	-	NORMAL
A6TA-INV-2	9-Jun-99	1344847.4	482995.4	0-0.5	Thorium-232	0.716	pCi/g	-	NORMAL
A6TA-INV-2	9-Jun-99	1344847.4	482995.4	0-0.5	Uranium, Total	3.376	ug/g	U	NORMAL
A6TA-INV-3	9-Jun-99	1344949.2	482969.1	0-0.5	Radium-226	0.954	pCi/g	-	NORMAL
A6TA-INV-3	9-Jun-99	1344949.2	482969.1	0-0.5	Radium-228	0.877	pCi/g	-	NORMAL
A6TA-INV-3	9-Jun-99	1344949.2	482969.1	0-0.5	Thorium-228	0.859	pCi/g	-	NORMAL
A6TA-INV-3	9-Jun-99	1344949.2	482969.1	0-0.5	Thorium-232	0.877	pCi/g	-	NORMAL
A6TA-INV-3	9-Jun-99	1344949.2	482969.1	0-0.5	Uranium, Total	3.716	ug/g	U	NORMAL
A6TA-INV-4	9-Jun-99	1345077.5	482935.8	0-0.5	Radium-226	0.744	pCi/g	-	NORMAL
A6TA-INV-4	9-Jun-99	1345077.5	482935.8	0-0.5	Radium-228	0.666	pCi/g	-	NORMAL
A6TA-INV-4	9-Jun-99	1345077.5	482935.8	0-0.5	Thorium-228	0.671	pCi/g	-	NORMAL
A6TA-INV-4	9-Jun-99	1345077.5	482935.8	0-0.5	Thorium-232	0.666	pCi/g	-	NORMAL
A6TA-INV-4	9-Jun-99	1345077.5	482935.8	0-0.5	Uranium, Total	3.686	ug/g	U	NORMAL

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Table B-3. Certification Statistics for CU A8PII-01

Station Number	RADIONUCLIDES				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
A8PII-01-C-01R	0.87 -	0.76 -	0.77 -	0.76 -	3.51 U
A8PII-01-C-01R-D	0.78 -	0.68 -	0.68 -	0.68 -	3.31 U
A8PII-01-C-03R	1.09 -	1.01 -	1.00 -	1.01 -	3.70 J
A8PII-01-C-04R	0.90 -	0.54 -	0.53 -	0.54 -	3.24 U
A8PII-01-C-05R	0.51 -	0.42 -	0.40 -	0.42 -	3.36 U
A8PII-01-C-07R	0.90 -	0.96 -	0.97 -	0.96 -	6.04 -
A8PII-01-C-08R	1.02 -	0.66 -	0.62 -	0.66 -	3.31 U
A8PII-01-C-09R	0.97 -	1.04 -	1.02 -	1.04 -	5.41 J
A8PII-01-C-11R	0.93 -	0.99 -	0.94 -	0.99 -	5.80 J
A8PII-01-C-12R	1.08 -	0.93 -	0.88 -	0.93 -	7.25 -
A8PII-01-C-13R	0.77 -	0.79 -	0.77 -	0.79 -	5.90 J
A8PII-01-C-14R	0.94 -	0.78 -	0.79 -	0.78 -	5.86 J
A8PII-01-C-16R	0.82 -	0.78 -	0.76 -	0.78 -	4.36 -
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.09 @	1.04 @	1.02 @	1.04 @	7.25 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	Pass	Pass	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Table B-4. Certification Statistics for CU A8PII-02

Station Number	RADIONUCLIDES				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
A8PII-02-C-01R	0.91 -	0.83 -	0.81 -	0.83 -	4.64 -
A8PII-02-C-03R	0.91 -	0.70 -	0.70 -	0.70 -	5.02 -
A8PII-02-C-04R	0.82 -	0.64 -	0.62 -	0.64 -	4.28 -
A8PII-02-C-05R	0.72 -	0.51 -	0.50 -	0.51 -	2.56 U
A8PII-02-C-06R	0.76 -	0.57 -	0.57 -	0.57 -	2.69 -
A8PII-02-C-07R	0.69 -	0.57 -	0.56 -	0.57 -	3.72 -
A8PII-02-C-09R	1.02 -	0.88 -	0.85 -	0.88 -	4.16 -
A8PII-02-C-10R	0.93 -	0.92 -	0.90 -	0.92 -	5.32 -
A8PII-02-C-12R	0.71 -	0.51 -	0.50 -	0.51 -	4.25 J
A8PII-02-C-13R	0.89 -	0.78 -	0.74 -	0.78 -	4.55 J
A8PII-02-C-15R	0.89 -	0.70 -	0.69 -	0.70 -	2.81 U
A8PII-02-C-15R-D	0.97 -	0.64 -	0.63 -	0.64 -	2.89 U
A8PII-02-C-16R	0.78 -	0.71 -	0.71 -	0.71 -	2.98 U
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.02 @	0.92 @	0.90 @	0.92 @	5.32 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	Pass	Pass	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est: Mean; Non-Parametric: Median).

Table B-5. Certification Statistics for CU A8PII-03

Station Number	RADIONUCLIDES				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
A8PII-03-C-01R	0.75 -	0.78 -	0.80 -	0.78 -	3.57 U
A8PII-03-C-02R	0.81 -	0.65 -	0.64 -	0.65 -	3.49 U
A8PII-03-C-04R	0.73 -	0.79 -	0.79 -	0.79 -	4.42 J
A8PII-03-C-06R	0.55 -	0.27 -	0.26 -	0.27 -	2.91 U
A8PII-03-C-07R	0.94 -	0.91 -	0.90 -	0.91 -	5.09 J
A8PII-03-C-08R	0.95 -	0.86 -	0.86 -	0.86 -	3.79 J
A8PII-03-C-09R	0.85 -	0.86 -	0.85 -	0.86 -	3.99 U
A8PII-03-C-10R	0.68 -	0.78 -	0.78 -	0.78 -	3.56 J
A8PII-03-C-10R-D	0.77 -	0.79 -	0.76 -	0.79 -	4.73 J
A8PII-03-C-12R	0.93 -	0.84 -	0.84 -	0.84 -	3.70 U
A8PII-03-C-13R	0.66 -	0.71 -	0.72 -	0.71 -	3.56 U
A8PII-03-C-15R	0.73 -	0.70 -	0.69 -	0.70 -	3.59 U
A8PII-03-C-16R	0.96 -	0.90 -	0.91 -	0.90 -	3.64 U
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	0.96 @	0.91 @	0.91 @	0.91 @	5.09 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	Pass	Pass	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Table B-6. Certification Statistics for CU A8PII-04

Station Number	RADIONUCLIDES				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
A8PII-04-C-02R	0.60 -	0.35 -	0.35 -	0.35 -	2.24 U
A8PII-04-C-03R	0.68 -	0.69 -	0.69 -	0.69 -	2.18 J
A8PII-04-C-04R	0.79 -	0.88 -	0.86 -	0.88 -	5.93 -
A8PII-04-C-05R	0.78 -	0.86 -	0.85 -	0.86 -	3.59 J
A8PII-04-C-06R	0.80 -	0.90 -	0.88 -	0.90 -	6.36 -
A8PII-04-C-08R	0.64 -	0.64 -	0.62 -	0.64 -	4.72 J
A8PII-04-C-09R	0.85 -	0.97 -	0.98 -	0.97 -	5.26 -
A8PII-04-C-10R	0.81 -	0.91 -	0.93 -	0.91 -	5.23 -
A8PII-04-C-12R	0.84 -	0.78 -	0.77 -	0.78 -	2.90 J
A8PII-04-C-12R-D	0.09 -	0.81 -	0.81 -	0.81 -	3.68 J
A8PII-04-C-13R	0.60 -	0.62 -	0.61 -	0.62 -	4.76 J
A8PII-04-C-14R	0.85 -	0.68 -	0.68 -	0.68 -	3.35 J
A8PII-04-C-16R	0.86 -	0.82 -	0.79 -	0.82 -	4.15 J
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	0.86 @	0.97 @	0.98 @	0.97 @	6.36 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	Pass	Pass	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:

(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.

(2) The maximum value of the two duplicates was used in all statistical equations.

(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.

(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).

Table B-7. Certification Statistics for CU A6TA-01

Station Number	RADIONUCLIDES				
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total
A6TA-01-C-01R	0.35 -	0.16 -	0.15 -	0.16 -	1.99 U
A6TA-01-C-02R	1.01 -	1.10 -	1.06 -	1.10 -	6.47 -
A6TA-01-C-04R	0.99 -	1.05 -	1.04 -	1.05 -	5.80 -
A6TA-01-C-05R	1.14 -	1.07 -	1.07 -	1.07 -	7.14 -
A6TA-01-C-06R	1.01 -	1.07 -	1.08 -	1.07 -	6.27 -
A6TA-01-C-06R-D	1.07 -	1.06 -	1.04 -	1.06 -	5.08 -
A6TA-01-C-07R	1.00 -	1.04 -	1.02 -	1.04 -	8.17 -
A6TA-01-C-09R	0.88 -	1.06 -	1.03 -	1.06 -	5.50 -
A6TA-01-C-10R	0.78 -	1.08 -	1.09 -	1.08 -	6.75 -
A6TA-01-C-12R	0.86 -	1.04 -	1.02 -	1.04 -	6.57 -
A6TA-01-C-13R	0.78 -	0.99 -	0.97 -	0.99 -	3.52 U
A6TA-01-C-14R	0.99 -	1.00 -	1.01 -	1.00 -	3.16 U
A6TA-01-C-16R	0.40 -	0.24 -	0.22 -	0.24 -	2.93 U
FRL	1.70	1.80	1.70	1.50	82.00
Units	pCi/g	pCi/g	pCi/g	pCi/g	ug/g
Confidence Level	95%	95%	95%	95%	95%
Max Result	1.14 @	1.10 @	1.09 @	1.10 @	8.17 @
Standardized Skewness	--	--	--	--	--
W-Statistic Probability*	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Estimated Mean	--	--	--	--	--
UCL on the Mean**	--	--	--	--	--
Non-Parametric Prob.	--	--	--	--	--
Est. Mean - Pass / Fail	Pass	Pass	Pass	Pass	Pass
2x Rule Pass / Fail	Pass	Pass	Pass	Pass	Pass
a posteriori Sample	--	--	--	--	--
Size calculation	--	--	--	--	--

Definition of Qualifiers
"J" = estimated result
"UJ" = not detected, estimated
"U" = not detected
" - " = no data qualifier
"NV" = not validated
"UNV" = not detected, not validated

NOTES:
(1) Maximum result did not exceed the FRL, therefore no statistics were generated and no other tests performed.
(2) The maximum value of the two duplicates was used in all statistical equations.
(3) * W-Statistic Probability is the highest calculated probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption. The test is performed on the raw data (untransformed) data (Normal) and the log-transformed data (LogNormal) to test for lognormality.
(4) ** Estimated Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median).