REVISION 0

POST-REMEDIAL ACTION REPORT FOR THE ACCESSIBLE SOILS WITHIN THE ST. LOUIS DOWNTOWN SITE PLANT 1 PROPERTY

ST. LOUIS, MISSOURI

September 10, 2004

U.S. Army Corps of Engineers
St. Louis District Office
Formerly Utilized Sites Remedial Action Program

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ACRONYMS AND ABBREVIATIONS

Ac-227	actinium-227
AD	Averted Dose
AEC	Atomic Energy Commission
ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
ARAR	applicable or relevant and appropriate requirement
ASTM	American Society for Testing and Materials
B_{AD}	benefit from averted dose
BNA	basic, neutral, acidic extraction procedures
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	centimeter
COC	contaminant of concern
CQCP	Contractor Quality Control Plan
cu yds	cubic yards
DCGL	Derived Concentration Guideline Level
DOD	Department of Defense
DOE	Department of Energy
dpm	disintegrations per minute
DQA	Data Quality Assessment
DQO	Data Quality Objectives
DT-4	Gunther Salt Vicinity Property
DT-6	Heintz Steel and Manufacturing Vicinity Property
DT-7	Midwest Waste Vicinity Property
DT-9	Terminal Railroad Vicinity Property
DT-10	Thomas and Proetz Vicinity Property
DT-11	City of Venice, Illinois Vicinity Property
DT-12	Burlington Northern Santa Fe Vicinity Property
EPA	Environmental Protection Agency
EPC	exposure point concentration
FSSP	Final Status Survey Plan
ft	foot
FUSRAP	Formerly Utilized Sites Remedial Action Program
FWV	field work variance
HISS	Hazelwood Interim Storage Site
HPS	Health Physics Society
HTZ	hot zone
IT	IT Corporation
LBGR	Lower Bound of the Gray Region
m^2	square meters
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimal Detectable Activity
MED	Manhattan Engineer District
mg/kg	milligrams per kilogram
mrem	millirem
NA	not available

ACRONYMS AND ABBREVIATIONS (Cont'd)

NMSS	Nuclear Material Safeguards and Security
NRC	Nuclear Regulatory Commission
O&M	Operation and Maintenance
OU	operable unit
pCi/g	picoCuries per gram
Pa-231	protactinium-231
PCB	polychlorinated biphenyl
PW	present worth
QAAP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QCP	Quality Control Plan
Ra-226	radium-226
Ra-228	radium-228
RAC	Remedial Action Contractor
RAWD	Remedial Activity Work Description
RESRAD	Residual (RES) Radioactive (RAD)
RG	remediation goal
ROD	Record of Decision
SAG	Sampling and Analysis Guide
SDG	sample delivery group
SLDS	St. Louis Downtown Site
SOR_N	sum of ratios (net)
SU	Survey Unit
TCLP	toxicity characteristic leaching procedure
Th-230	thorium-230
Th-232	thorium-232
TOX	Total Organic Halides
TSS	total suspended solids
U-238	uranium-238
UE	Unshored Excavation
USACE	U. S. Army Corps of Engineers
VC	Verification Contractor
WAC	Waste Acceptance Criteria
WASD	Work Area-Specific Description
WDIA	Work Description of Isolated Areas
WRS	Wilcoxon Rank Sum

PROJECT ABSTRACT

Site Name and Operable Unit:	St. Louis Downtown Site (SLDS) Accessible Soils Operable Unit
Location:	St. Louis, Missouri
Regulatory Oversight:	United States Environmental Protection Agency, Region 7 and Missouri Department of Natural Resources
Contractor Oversight:	United States Army Corps of Engineers (USACE), St. Louis District
Remedial Action Contractor: Verification Contractor:	Shaw Environmental, Inc. Science Applications International Corporation
Waste Source:	Manhattan Engineer District/ United States Atomic Energy Commission (MED/AEC) Operations
Contaminants:	Radiological [three decay series: uranium (U-238), thorium (Th-232), and uranium (U-235)]
Technology:	Remediation by excavation of MED/AEC contaminated soils.
Remediation Type:	The *Record of Decision for the St. Louis Downtown Site, St. Louis, Missouri* (USACE 1998a) for the SLDS addresses contamination in accessible soils by excavation & out-of-state disposal.
Purpose/Significance of Application:	Excavation of soils to reduce MED/AEC contaminant concentrations and backfill with clean soils.
Type/Quantity of Media Treated:	Soil Excavated: 2,490 cubic yards Excavation Water Treated: 1,256,020 gallons
Period of Operation:	Excavation & Restoration: 7/26/00 to 10/08/03 Ground-water monitoring: Ongoing.
Regulatory Requirements/Remediation Goals:	In accordance with the ROD, reduce MED/AEC contaminants in soils as summarized below. 1) Excavation of accessible soils according to the ARAR-based composite cleanup criteria of 5/15 pCi/g above background for Ra-226, Ra-228, Th-232, and Th-230, and 50 pCi/g above background for U-238 in the uppermost 1.8 m (6 ft) throughout the OU, 2) Protactinium-231 (Pa-231) and actinium-227 (Ac-227) will be included in the analyses for the post-remedial action residual risk, and 3) Public doses will be less than 25 mrem/yr as required by 10 CFR 20 Subpart E. Residual risk will be within the CERCLA target risk range. Compliance with concentration-based RGs, when multiple radiological contaminants are present, is shown by the use of a "sum-of-the-ratios" (SOR) calculation. The SOR shall be < 1.0.

PROJECT ABSTRACT (Cont'd)

Results:	The residual radioactivity in accessible soils at SLDS Plant 1 meets all requirements specified in the ROD. This conclusion is the result of comparison of ROD remediation goals (RGs) with the residual site conditions in accessible areas. The concentration-based RGs for Th-230, Ra-226, Th-232, Ra-228, and U-238 are satisfied, noting that no SOR_N value exceeds the limit of 1.0 when averaged over the survey unit, the average SOR_N for systematic and biased samples in Class 1 and Class 2 areas is 0.40 and 0.05, respectively, and no Ra-226 concentration averaged over 100 square meters exceeds 15 pCi/g. The dose-based ARAR from 10 CFR 20 Subpart E, *Radiological Criteria for License Termination* has been satisfied, noting that the residual dose calculated for Plant 1 over the entire site is $\leq$ 1.6 mrem/yr for all modeled scenarios without regard to cover. The highest dose calculated for any survey unit is 7.5 mrem/yr. Residual site risks meet the CERCLA target risk range of 10^{-4} to 10^{-6} without regard to the existence of cover materials and are fully protective of human health and the environment. The SLDS Plant 1 survey units also satisfy the MARSSIM statistical requirements since they passed the Wilcoxon Rank Sum statistical test as required. Soil concentrations comply with 40 CFR 192 unrestricted release criteria. All Plant 1 survey units meet criteria for release without restrictions in accordance with the ROD. Treated excavated water at Plant 1 had no known impact on the protected and monitored Mississippi Alluvial Aquifer. There are an estimated 9,585m^2 of inaccessible soils remaining within the Plant 1 area.
Cost:	Total Actual Costs: $5,132,286
Description:	From 1942 until 1957, Mallinckrodt Chemical Works was contracted by the MED and the AEC to process uranium ore for the production of uranium metal. Residuals of the process containing elevated levels of radium, thorium, and/or uranium were released into the environment. At various times from 1942 to 1957, Plants 1, 2, 4 (now Plant 10), 6, and 7 were involved in the development of uranium-processing techniques or the processing of uranium compounds or uranium-bearing ores. Process residues from these operations were stored at the St. Louis Airport Site and subsequently translocated to the Hazelwood Interim Storage Site. Mallinckrodt Plants 1 and 2 were decontaminated from 1948 through 1950 to the criteria then in effect, and the AEC released these plants for use without radiological restrictions in 1951. Plants 4, 6, and 7 were subsequently decontaminated and decommissioned by 1961 and returned to Mallinckrodt Chemical Works for unrestricted use. Soil characterization results indicated that the areas associated with MED/AEC activities were principally effected by radionuclides. Metals were also detected but are generally co-located with the radionuclides. The ROD addresses remediation of these MED/AEC wastes at the SLDS and was signed in August, 1998. Excavation of accessible soils occurred throughout Plant 1. Excavated soils were loaded into rail cars and shipped to a properly permitted out-of-state disposal facility. Inaccessible soils are beyond the scope of work specified by the existing ROD but will be addressed by a future ROD. Remedial activities were performed from July 2000 to October 2003.

1.0 INTRODUCTION

The remedial action contractor (RAC); under the direction of the U.S. Army Corps of Engineers (USACE), St. Louis District, Formerly Utilized Sites Remedial Action Program (FUSRAP), has successfully designed and completed a remedial action at the Mallinckrodt Plant 1 property within the St. Louis Downtown Site (SLDS), St. Louis, Missouri. The SLDS consists of the Mallinckrodt Chemical Plant property and the surrounding vicinity properties. The remedial action consisted of excavating soils at Plant 1 to reduce MED/AEC contaminant concentrations, and backfilling with clean soils. The remedial action began in July 2000 and was completed in October 2003. This Post-Remedial Action Report summarizes the work that was performed.

The RAC performed the site investigation of Plant 1 beginning in May of 1999 and the remedial action design was completed in July of 2003. The Mallinckrodt Inc. (Mallinckrodt) Plant 1 is located within the City of St. Louis, Missouri and within the SLDS. The plant is bounded on the east by the Terminal Railroad Association Vicinity Property (DT-9) and Hall Street, on the west by North Second Avenue, on the south by Mallinckrodt Street, and on the north by Salisbury Street and the City of Venice, Illinois Vicinity Property (DT-11). The area from which the final status survey data were collected is approximately 1.95 hectares (4.8 acres) and is shown on Figure C-1-1. The Mallinckrodt Plant 1 is situated in an industrial area of the city and is currently in commercial use. Numerous buildings are located on the property.

From 1942 until 1957, the Manhattan Engineer District (MED) and the US Atomic Energy Commission (AEC) contracted Mallinckrodt Chemical Works to process uranium ore for the production of uranium metal. At times from 1942 to 1957, Mallinckrodt Plants 1, 2, 4 (now Plant 10), 6, and 7 (Figure C-1-1) were involved in the development of uranium-processing techniques or processing of uranium compounds or uranium-bearing ores. Residuals of the process that contained elevated levels of radium, thorium, and/or uranium were released into the environment. Plants 1 and 2 were decontaminated during 1948 through 1950 to criteria then in effect, and the AEC released them for use without radiological restrictions in 1951.

Oak Ridge National Laboratory completed an initial radiological survey of the SLDS in 1977. The results of the survey indicated that alpha and beta-gamma contamination levels exceeded the existing current U.S. Department of Energy (DOE) guidelines for the release of the SLDS without radiological restrictions. The DOE contracted Bechtel National Inc. to complete a remedial investigation between 1986 and 1990. During this time, Bechtel National Inc. collected soil samples on the Mallinckrodt property.

The remedial actions taken at the SLDS were conducted under the FUSRAP. The FUSRAP was created to identify, investigate, and cleanup or otherwise control residual contamination remaining at sites where work had been performed as part of the nation's early atomic energy program and sites added by Congressional action which are contaminated with materials similar to early atomic energy program materials. In June 1990, the U. S. Environmental Protection Agency (EPA) Region 7, and the DOE entered into a Comprehensive Environmental Response, Compensation, and Liability Act Section 120 Federal Facilities Agreement. On October 13, 1997, the U.S. Congress transferred responsibility for FUSRAP from the DOE to the USACE through the 1998 Energy and Water Development Appropriations Act. Accessible soils within Plant 1 are part of the SLDS Accessible Soils Operable Unit (OU).

The remediation of Plant 1 represents only a portion of the remedial action that will occur at the SLDS. Therefore, the general mobilization activities of establishing the project construction office, equipment/materials storage yard(s), water treatment plant, contaminated soils storage

and loadout facility, and other facilities common to all of the SLDS remediation activities are not discussed in this report.

As required by the ROD (USACE 1998a), final status surveys were performed within Plant 1 in accordance with the protocols established in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (DOD 2000). The MARSSIM is a multi-agency document that describes a consistent approach for planning, performing, and assessing final status surveys to meet established dose or risk-based release criteria. The USACE implemented final status surveys at Plant 1 in accordance with the *Radiological Final Status Survey Plan for Accessible Soil Within Plant 1, Plant 2 and the City Property at the St. Louis Downtown Site* (USACE 1999a).

2.0 OPERABLE UNIT BACKGROUND

The selected remedy, as excerpted from the ROD, (USACE 1998a) for the Accessible Soils OU includes the below listed elements.

1. Excavation of accessible soils according to the applicable or relevant and appropriate requirement (ARAR)-based composite cleanup criteria of 5/15 picoCuries per gram (pCi/g) (surface/subsurface) above background for Ra-226, Ra-228, Th-232, and Th-230, and 50 pCi/g above background for U-238 in the uppermost 6 feet of soil throughout the OU.
2. Application of remediation goals for radiological contaminants to soil concentrations above background consistent with the ARAR 40 Code of Federal Regulations (CFR) 192, from which they are derived.
3. Verification of compliance with soil contamination criteria by methods that are compatible with the MARSSIM for soils being cleaned up in the OU, effective when MARSSIM is published.
4. Final determination of whether institutional controls and use restrictions are necessary, based on calculations of post-remedial action risk derived from actual residual conditions. Conduct five-year reviews per the National Oil and Hazardous Substances Pollution Contingency Plan for residual conditions that are unsuitable for unrestricted use.
5. Inclusion of protactinium Pa-231 and actinium Ac-227 in the analyses for the post-remedial action residual site risk.
6. Public doses will be less than 25 mrem/yr as required by 10 CFR 20 Subpart E. Residual risk will be within the CERCLA target risk range (about 10^{-4} to 10^{-6}).
7. Remediation of contaminated sediments in sewers and drains considered to be accessible, along with the soils.

The MARSSIM provides a nationally consistent approach "for planning, performing and assessing final status surveys to meet established dose or risk-based release criteria." The MARSSIM expresses such a concentration-based release criterion as the Derived Concentration Guideline Level (DCGL). Typically, each radionuclide DCGL corresponds to a dose-based RG. However, in the presence of multiple radionuclides, the total of the DCGLs for all radionuclides would exceed the release criterion. In this case, the individual DCGLs need to be adjusted to account for the presence of multiple radionuclides contributing to the total dose.

The unity rule, represented in the expression below, is satisfied when radionuclide mixtures yield a combined fractional concentration limit that is less than or equal to one.

$$\frac{C_1}{DCGL_1} + \frac{C_2}{DCGL_2} + \frac{C_n}{DCGL_n} \leq 1$$

where

C = concentration
$DCGL$ = guideline value for each individual radionuclide (1,2, ..., n)

The evaluation criteria that were used by the verification contractor (VC) to confirm that the remediation goals were achieved at Plant 1 are provided below.

1. The concentrations of MED/AEC radiological contaminants were verified to be below the concentration-based limits in the top 0.15m (0.5ft) of soil.

$$SOR = \left(\frac{Greater\ of\ Th-230\ and\ Ra-226}{5\ pCi/g}\right)+\left(\frac{Greater\ of\ Th-232\ and\ Ra-228}{5\ pCi/g}\right)+\left(\frac{U-238}{50\ pCi/g}\right)$$

   The SOR must be < 1.0.

2. The concentrations of MED/AEC radiological contaminants were verified to be below the concentration-based limits in the 0.15m (0.5ft) to 1.83m (6 ft) soil interval.

$$SOR = \left(\frac{Greater\ of\ Th-230\ and\ Ra-226}{15\ pCi/g}\right)+\left(\frac{Greater\ of\ Th-232\ and\ Ra-228}{15\ pCi/g}\right)+\left(\frac{U-238}{50\ pCi/g}\right)$$

   The SOR must be < 1.0.

3. The concentrations of MED/AEC radiological contaminants were verified to be below the concentration-based limits in soils deeper than 1.83m (6 ft).

$$SOR = \left(\frac{Ra-226}{50\ pCi/g}\right)+\left(\frac{Th-230}{100\ pCi/g}\right)+\left(\frac{U-238}{150\ pCi/g}\right)$$

   The SOR must be < 1.0.

4. Any small areas of elevated radioactivity were verified to be below hot spot criteria (as developed using MARSSIM guidance).
5. Surface soil sample results were examined to ensure that they satisfy the Wilcoxon Rank Sum (WRS) statistical test as described in MARSSIM.
6. The residual dose to the modeled commercial/industrial worker was calculated and verified to be ≤ 25 mrem/yr (consistent with the assessment methods described in the SLDS FS, Appendix C).
7. Consolidated materials subject to final status survey were evaluated to insure that surface contamination levels would not result in an exposure that exceeded 25 mrem/yr for scenarios of current and future unrestricted use.

Inaccessible soils and associated structures are to be addressed in a future ROD. Plant 1 inaccessible soils locations are described in Section 5 and Appendix C. Remediation of contaminated sediments in accessible sewers and drains will be addressed in a future action under a site wide sewer study.

3.0 CONSTRUCTION ACTIVITIES

During the Plant 1 pre-design investigation activities described in the *Pre-Design Investigation Summary Report, Plant 1, St. Louis Downtown Site, St. Louis Missouri* (IT 1999), one deep location (greater than 4 feet deep) and 11 isolated shallow locations (less than 4 feet deep) of elevated radiological activity were initially identified. These locations are shown on reference drawing P1-2 of the *Plant 1 Remedial Action Work Area-Specific Description and Design Package, Rev. 1, FUSRAP St. Louis Downtown Site, St. Louis, Missouri* (Plant 1 WASD) (IT 2000b). The original issue of the design document was revised to change the type of excavation shoring from the conventional sheet piling to an improved system that uses slide-rail shoring in order to eliminate the use of pile driving equipment adjacent to buildings in Plant 1 that house vibration-sensitive laboratory equipment. The one area of contamination greater than 4 feet deep was located near the northwest corner of Plant 1 in the former Building K foundation (K-Pad) area. The 11 locations of contamination less than 4 feet deep are numbered 1 through 11 and are located north and southeast of the K-Pad area. All of the Plant 1 excavation locations are shown on Figure C-1-2.

The plan for remediation of contaminated soil at the K-Pad was addressed in the Plant 1 WASD (IT 2000b) and associated Field Work Variances (FWVs) 57, 60, 61, 64, 68, and 85. The plan for remediation of contaminated soil at Locations 1 through 11 was addressed in the *Remedial Action Work Description for Isolated Areas of Elevated Radiological Activity, Plants 1 and 2, Rev. 1, St. Louis Downtown Site St. Louis, Missouri,* (WDIA) (IT 2000c) and associated FWVs 35, 44, 63, 67, 69, 93, and 101.

Two additional locations of elevated radiological activity were subsequently identified in Plant 1 at the Yard 9 wastewater Lift Station pipe pedestal west of the TVW foundation pad and at the loading dock rail spur south of Building X. Remediation plans for these two locations were addressed in FWV 116 for the pipe pedestal area and FWVs 119 and 124 for the Building X loading dock rail spur. These FWVs are also associated with the WDIA.

Each of the 11 shallow locations of elevated radiological activity initially identified were excavated separately except for Location 9, which was excavated with the deep contamination at the K-Pad when contamination was found to connect the two locations. As remediation progressed, the 12 locations described in the Plant 1 WASD (IT 2000b) and WDIA (IT 2000c) evolved into 34 excavation areas. This increase in the number of excavation areas was required to remediate contamination in accordance with the design requirements, and to reduce adverse effects on Mallinckrodt operations. These 34 excavation areas and the two additional areas subsequently identified and remediated (for a total of 36 excavations) are shown on Figures C-1-3, C-1-4, C-1-5, and are referenced in the discussion below. The required adjustments to the Plant 1 WASD and the WDIA for the final excavation/remediation requirements are described below.

- **K-pad location** - The K-pad location was subdivided into eight excavation areas to facilitate the use of the slide-rail shoring system in the limited work area that also required some utility rerouting. The eight excavation areas were designated in a manner as shown below.

  Strip 1; Strip 2 (Strip 2 was split into two separate areas, Cell 1 and Cell 2, to facilitate water management required by ground-water infiltration and leaking sewers adjacent to the excavation); Strip 3; Unshored Excavation (UE)-3 (excavation

depth 4 feet or less); UE-4; UE-5; and, UE-6, as shown on Figure C-1-3 in Appendix C-1.

- **Location 1** - This location was split into two separate excavations to reduce adverse effects on Mallinckrodt operations, as follows: Area 1 West and Area 1 East as shown on Figure C-1-3 in Appendix C-1.
- **Location 2** - One excavation area was designated as Area 2 as shown on Figure C-1-4, in Appendix C-1.
- **Location 3** - Five excavation areas were designated as shown below.

  Area 3. Small Area 3A (the Small Area 3A excavation was an extension of Area 3). Bent 11 Sewer Trench (the Bent 11 Sewer Trench excavation was identified during excavation in the area by Mallinckrodt. When contaminated soil was encountered, the USACE directed the RAC to complete the excavation and to ensure remaining soils meet the ROD remedial goals). Bent 11 (the Bent 11 excavation area was identified during excavation by Mallinckrodt. When contaminated soil was encountered, the USACE directed the RAC to complete the excavation and to ensure remaining soils meet the ROD remedial goals). The fifth excavation area was designated the Building 8 North Area (this excavation was an extension of the Bent 11 excavation. This area was addressed after the Bent 11 excavation was released to Mallinckrodt by the USACE) as shown on Figure C-1-4 in Appendix C-1.
- **Location 4** - This location was split into two excavation areas to facilitate Mallinckrodt operations and to minimize traffic impacts east of Building 26. The two areas were designated as follows: Area 4 and Area 4 West as shown on Figure C-1-5 in Appendix C-1.
- **Location 5** - Three excavation areas were designated as follows: Area 5, Containment Pad, and Pump Pad Stairway Area as shown on Figure C-1-5 in Appendix C-1.
- **Location 6** - The Location 6 excavation was split into four separate excavations to facilitate Mallinckrodt operations in and around the eastern-most security gate for Building 6, as follows: Area 6 North, Area 6 South, Area 6 South-South, and Area 6 West as shown on Figure C-1-5 in Appendix C-1.
- **Locations 7 and 8** - Locations 7 and 8 were initially combined into one excavation area: Area 7/8. This area was later split into two excavation areas; Area 7/8 and Area 7/8 W, to facilitate Mallinckrodt operations in and around Building 6 as shown on Figure C-1-5 in Appendix C-1.
- **Location 9** – This area was included with the K-pad Strip 1 excavation, as shown on Figure C-1-3 in Appendix C-1.
- **Location 10** - One excavation area was designated as Area 10 as shown on Figure C-1-4 in Appendix C-1.
- **Location 11** - Six excavation areas were designated.

  Four excavation areas in the original location (to facilitate Mallinckrodt operations in and around Building X and the Loading Dock area) as follows: Area 11 North-North, Area 11 North, Area 11 South, and Area 11 South-South.

Two additional excavations were designated Yard 4 North and Yard 4 South (the Yard 4 solvent dike excavation area was identified during Mallinckrodt excavation to build a containment curbing. When contaminated soil was encountered, the USACE directed the RAC to complete the excavation and to ensure remaining soils meet ROD remedial goals) as shown on Figure C-1-5 in Appendix C-1.

The original remedial action locations, including the K-Pad location and locations 1 through 11 in Plant 1 were subdivided into 34 excavation areas for the reasons indicated. The two additional locations described by FWVs 116 and 119 were remediated as two excavation areas. The as-built location of the Building X loading dock rail spur area is shown on Figure C-1-5 in Appendix C-1, and the as-built location of the pipe pedestal area near the TVW pad is shown on Figure C-1-6 in Appendix C-1.

Construction activities for all of the excavation areas within Plant 1 were very similar. Since the excavations took place within an active chemical plant, close coordination with the plant personnel was required. Areas identified as requiring remediation were found to be covered with either asphalt or concrete paving. The presence of cover material required saw cutting and excavation of paving to allow the excavations to progress. Once the various excavations were backfilled, the surface was restored to the as-found condition.

The general sequence of construction activities followed at each excavation consisted of the below listed elements.

1. A civil survey of the location, including utilities, building(s), foundation(s), and structure(s) was conducted to document existing conditions.
2. Exclusion zone(s), contamination reduction zone(s), and traffic control(s) were established as required.
3. Surface water controls were installed as required.
4. Paving was cut and removed as required.
5. Utilities were rerouted as required.
6. Excavation proceeded with shoring installed as required.
7. Soils exceeding ROD RGs were excavated and transported to the soil load-out area. These contaminated soils were then either loaded directly into railcars or stockpiled for future load-out and transportation to the final disposal facility.
8. Gamma walkover surveys and soil sampling at biased locations within the excavations were performed by the Remedial Action contractor radiation protection technicians who guided the excavation, identified locations of contaminated soil, and identified when it was suspected that the ROD criteria had been met and no further excavation was required.
9. If the biased samples indicated that the ROD remediation criteria were not met and additional excavation was required, Steps 6, 7, and 8 were repeated until the excavation was ready for final status survey sampling.
10. If the ROD criteria were not met and the contaminated soil was inaccessible for remediation because it was located adjacent to or beneath permanent structures (e.g., buildings or support for overhead structures), the USACE was consulted and an evaluation was conducted to estimate the average level of residual contamination.

11. After completing the excavation, a civil survey of the excavation limits and contours was performed prior to final status survey sampling. Preferential pathway analysis and sampling was also performed upon completion of each excavation and this information was furnished to the USACE. (See Figure C-1-7 for locations of the preferential pathway samples taken in Plant 1).
12. The RAC provided the USACE with as-built drawings, the most recent results of biased sampling, and additional information about contaminated soil that was inaccessible for remediation, if applicable, as a part of a request for final status survey.
13. Following USACE authorization, a final status survey was performed that consisted of a gamma walkover survey and soil sampling at biased locations within the survey area.
14. If the biased sample results indicated that ROD remediation criteria had not been met and the areas required additional excavation, Steps 6 through 13 were repeated.
15. If the biased sample results showed satisfactory results, the final status survey samples were then collected at locations defined by a systematic grid in accordance with the MARSSIM.
16. After evaluating the final status survey sample results in accordance with the Final Status Survey Plan, the required backfill authorization paperwork was prepared and provided to the USACE for concurrence and approval.
17. The exclusion and contamination reduction zone postings were removed, and traffic controls were established as required for the backfilling operation.
18. Any re-routed utilities were restored as required.
19. Backfilling of the excavation proceeded using specified compaction requirements. Approximately 430 cubic yards (cu yds) of crushate were placed as deep backfill in a portion of UE-5 (See Figure C1-3).
20. The surface of the remediated area was restored to its as-found condition.
21. Erosion and safety controls were removed, and the remediated location(s) were released to Mallinckrodt plant personnel after inspection and approval by the USACE and Mallinckrodt.

Approximately 0.3 acres (1,350 square meters) of surface area was affected by the Plant 1 remediation activities. This surface area represents about 5 % of the total surface area of Plant 1. An estimated 2,490 bank cu yds of contaminated soils were excavated and shipped to out-of-state disposal facilities. A breakdown of the excavation quantities by area is given in Table 3-1.

Table 3-1 Excavation Area Information

Location No.	Excavation Area	Area (square meters)	Bank Volume of Soil Removed (cubic yards)
Plant 1, No. 1	Area 1 West	17.26	19.90
Plant 1, No. 1	Area 1 East	9.68	10.30
Plant 1, No. 2	Area 2	44.73	36.50
Plant 1, No. 10	Area 10	2.19	0.90
Plant 1, No. 3	Area 3	14.60	21.40
Plant 1, No. 3	Area 3A	10.18	11.20
Plant 1, No. 3	Bent 11	11.48	32.10
Plant 1, No. 3	Bent 11 Sewer Extension	6.02	10.10

Table 3-1 Excavation Area Information (Cont'd)

Location No.	Excavation Area	Area (square meters)	Bank Volume of Soil Removed (cubic yards)
Plant 1, No. 3	Bent 11 Sewer Trench	9.53	28.20
Plant 1, No. 4	Area 4		
Plant 1, No. 4	Area 4 West	13.66	22.50
Plant 1, No. 5	Area 5	32.96	42.80
Plant 1, No. 5	Containment Pad	85.00	98.00
Plant 1, No. 5	Pump Pad Stairway	2.30	0.80
Plant 1, No. 6	Area 6 North	21.55	23.70
Plant 1, No. 6	Area 6 South	53.09	87.20
Plant 1, No. 6	Area 6 West	23.17	32.50
Plant 1, No. 6	Area 6 South South	34.05	44.80
Plant 1, Nos. 7 & 8	Area 7/8	36.53	100.40
Plant 1, Nos. 7 & 8	Area 7/8 West	2.52	1.00
Plant 1, No. 11	Yard 4 Solvent Dike North	32.01	10.80
Plant 1, No. 11	Yard 4 Solvent Dike South	17.67	12.70
Plant 1, No. 11	Area 11 South	21.12	16.60
Plant 1, No. 11	Area 11 South	30.25	31.50
Plant 1, No. 11	Area 11 North	42.12	47.70
Plant 1, No. 11	Area 11 North	29.17	30.50
Plant 1, No. 11	Area 11 North	5.17	7.11
Plant 1, K-Pad	Strip 1	97.35	279.60
Plant 1, K-Pad	Strip 2, Cell 1	50.68	149.10
Plant 1, K-Pad	Strip 2, Cell 2	54.51	157.90
Plant 1, K-Pad	Strip 3	36.86	131.50
Plant 1, K-Pad	UE 3	14.66	18.70
Plant 1, K-Pad	UE 4	11.07	34.30
Plant 1, K-Pad	UE 5	211.24	727.80
Plant 1, K-Pad	UE 6	109.00	129.10
Plant 1, TVW Pad	Pipe Pedestal	4.6	1.0
Plant 1, Bldg. X	Rail Spur	149.1	80.0
TOTAL	(36 locations)	1,347.08	2,490.21

The Plant 1 remedial action included many challenges since the work areas were in the most active part of an operating chemical plant complex. The K-Pad excavation area was closely confined on all sides, thereby limiting the size of the construction area. Minimal laydown/storage area outside the footprint of the construction area was available and equipment access was limited to a confined location. Three of the plant's most active buildings - the main quality control laboratory (Building 25), the main power plant (Building C), and the plant cafeteria (Building L), were located on the north, east, and south sides of the K-Pad, respectively. North Second Avenue, located west of the K-Pad excavation area, was used daily for coal truck deliveries to the Building C coal-conveying equipment. Because of the limited space available in the K-Pad area, traffic patterns for remediation materials and soil hauling required close coordination with Mallinckrodt's daily coal deliveries and frequent deliveries to many of the Plant 1 buildings. This coordination required, in some cases, rerouting and/or detouring of Mallinckrodt traffic. In those instances where alternate routes were not available for

Mallinckrodt coal deliveries, very close coordination was necessary to efficiently schedule the competing uses for the same areas.

The nature of the materials excavated also effected the construction operations. The area of the K-Pad included about 6 feet of heterogeneous fill above the native soils, in addition to abandoned foundations and underground utilities that remained after the demolition of former buildings in the area. Excavation methods and efficiencies were adversely influenced by these subsurface features as well as other plant constraints in this limited area. These unanticipated subsurface features and other plant constraints complicated construction requirements, adding the tasks of dewatering and handling and disposal of additional construction debris, and further limiting work space availability. Since the chemical plant has been in operation since 1867, remnants from two or three generations of buildings and utilities could be expected to be encountered in most areas.

Remediation operations were also effected at Locations 3, 6, 7, and 8 adjacent to buildings where special security requirements were enforced. Work inside the fenced security areas adjacent to these buildings required advance notice to arrange for security escorts. Remediation operations at Locations 4, 5, and 11 adjacent to Building X and the Plant 2 Tank Farm were in high-plant-traffic areas, and work in these areas had to be closely coordinated to reduce the effect on plant operations. Excavations in high-traffic areas were usually subdivided so that at least one lane of the street/alley way was open to traffic at all times. As described earlier in this section; 14 original locations that include the K-Pad, locations 1 through 11, and two additional locations of contamination identified during and subsequent to the pre-design investigation activities (IT 2000a, 2000b) were subdivided and increased to 36 locations to stage construction activities to reduce adverse effects on plant operations.

Two facilities were used for disposal of the contaminated soils, as listed below.

Envirocare of Utah
Interstate 80, Exit 49
Grantsville, Utah 84029

U.S. Ecology Idaho, Inc.
(Formerly Envirosafe of Idaho)
10.5 Miles NW on Hwy 78, Lemely Rd
Grand View, ID 83624

4.0 CHRONOLOGY OF EVENTS

In an effort to simplify the chronology of events, only the date that the excavation was started and the date the excavation was approved for backfill have been shown. Each excavation area required separate site preparation, pavement removal, excavation, backfill, and site restoration as discussed above. This information is given in Table 4-1.

Table 4-1 Construction Events

Date	Chronology of Event
August 27, 1998	ROD signed.
May 3, 1999	Plant 1 Preparation for Site Investigation
June 30, 1999	Prepare Conceptual Design
October 20, 1999	Published WDIA (IT 2000b)
December 9, 1999	Published Pre-Design Investigation Summary Report (IT 1999)
December 15, 1999	Plant 1 Design Complete
June 8, 2000	Alternative Shoring Design
June 27, 2000	USACE Review
July 13, 2000	Published Plant 1 WASD (IT 2000a)
July 26, 2000	K-Pad, Strip 1 Start Excavation
August 17, 2000	K-Pad, Strip 3 Start Excavation
August 22, 2000	K-Pad, Strip 1 Approved for Backfill
August 24, 2000	Plant 1 Small Area 3A (Building 8) Start Excavation
August 29, 2000	Plant 1 Area 10 Start Excavation
September 15, 2000	K-Pad, Strip 3 Approved for Backfill
September 15, 2000	Plant 1 Area 10 Approved for Backfill
September 18, 2000	K-Pad, Unshored Excavation 5 (UE-5) Start Excavation
September 18, 2000	Plant 1 Area 2 Start Excavation
October 6, 2000	Plant 1 Area 2 Approved for Backfill
October 16, 2000	Plant 1 Area 7/8 Start Excavation
November 10, 2000	Plant 1 Bent 11 Sewer Extension Start Excavation
November 10, 2000	Plant 1 Bent 11 Start Excavation
November 29, 2000	Plant 1 Bent 11 Approved for Backfill
December 11, 2000	K-Pad, UE-5 Approved for Backfill
December 11, 2000	Plant 1 Area 7/8 Approved for Backfill
December 12, 2000	Plant 1 Bent 11 Sewer Trench Start Excavation
January 15, 2001	K-Pad, Strip 2, Cell 1 Start Excavation
January 17, 2001	Plant 1 Yard 4 Solvent Dike South Start Excavation
January 25, 2001	K-Pad, UE-4 Start Excavation
January 31, 2001	K-Pad, UE-6 Start Excavation
January 31, 2001	Plant 1 Area 3 Start Excavation
January 31, 2001	Plant 1 Bent 11 Sewer Trench Approved for Backfill
February 6, 2001	K-Pad, Strip 2, Cell 1 Approved for Backfill
February 14, 2001	K-Pad, Strip 2, Cell 2 Start Excavation
February 22, 2001	Plant 1 Area 3 Approved for Backfill
February 23, 2001	K-Pad, UE-4 Approved for Backfill
March 9, 2001	Plant 1 Area 4 Start Excavation
March 12, 2001	K-Pad, UE-6 Approved for Backfill
March 16, 2001	K-Pad, Strip 2, Cell 2 Approved for Backfill
March 29, 2001	K-Pad, UE-3 Start Excavation
May 15, 2001	K-Pad, UE-3 Approved for Backfill
April 3, 2001	Plant 1 Yard 4 Solvent Dike North Start Excavation
April 12, 2001	Plant 1 Small Area 3A (Building 8) Approved for Backfill
April 12, 2001	Plant 1 Area 4 Approved for Backfill
April 12, 2001	Plant 1 Bent 11 Sewer Extension Approved for Backfill

Table 4-1 Construction Events (Cont'd)

Date	Chronology of Event
May 3, 2001	Plant 1 Yard 4 Solvent Dike North Approved for Backfill
May 7, 2001	Plant 1 Yard 4 Solvent Dike South Approved for Backfill
May 11, 2001	Plant 1 Area 1 West Start Excavation
May 21, 2001	Plant 1 Area 11 North North Start Excavation
May 21, 2001	Plant 1 Area 4 West Start Excavation
May 21, 2001	Plant 1 Area 11 North Start Excavation
May 24, 2001	Plant 1 Area 5 Start Excavation
June 13, 2001	Plant 1 Area 11 North Approved for Backfill
June 19, 2001	Plant 1 Area 11 South Start Excavation
June 27, 2001	Plant 1 Area 6 North Start Excavation
July 16, 2001	Plant 1 Area 11 North North Approved for Backfill
July 19, 2001	Plant 1 Area 4 West Approved for Backfill
August 6, 2001	Plant 1 Area 11 South South Start Excavation
August 8, 2001	Plant 1 Area 5 Approved for Backfill
August 9, 2001	Plant 1 Area 11 South Approved for Backfill
August 13, 2001	Plant 1 Area 1 East Start Excavation
August 21, 2001	Plant 1 Area 6 North Approved for Backfill
August 27, 2001	Plant 1 Area 6 South Start Excavation
August 27, 2001	Plant 1 Area 5 Containment Pad Start Excavation
September 6, 2001	Plant 1 Area 1 West Approved for Backfill
September 14, 2001	Plant 1 Area 1 East Approved for Backfill
September 19, 2001	Plant 1 Area 11 South South Approved for Backfill
November 8, 2001	Plant 1 Area 5 Containment Pad Approved for Backfill
November 20, 2001	Plant 1 Area 6 South Approved for Backfill
December 19, 2001	Plant 1 Pump Pad Stairway Area Start Excavation
December 19, 2001	Plant 1 Area 7/8 W Start Excavation
January 2, 2002	Plant 1 Area 6 South South Start Excavation
January 7, 2002	Plant 1 Area 6 West Start Excavation
February 5, 2002	Plant 1 Area 6 West Approved for Backfill
February 8, 2002	Plant 1 Area 6 South South Approved for Backfill
February 25, 2002	Plant 1 Pump Pad Stairway Area Approved for Backfill
March 13, 2002	Plant 1 Area 7/8 W Approved for Backfill
June 9, 2003	Plant 1 TVW Pipe Pedestal Area Start Construction
July 9, 2003	Plant 1 TVW Pipe Pedestal Area Approved for Backfill
August 26, 2003	Plant 1 Bldg. X Loading Dock Rail Spur Area Start Excavation
September 30, 2003	Plant 1 Bldg. X Loading Dock Rail Spur Area Approved for Backfill

5.0 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

5.1 Performance Standards

Remedial action objectives specify the media-specific COCs, potential exposure pathways, and remediation criteria for the OU. The ROD established the remedial action objectives at the SLDS. These remedial action objectives were applied to Plant 1.

The COCs at Plant 1 consisted of radionuclides only. Identified radionuclide COCs included Ra-226, Ra-228, Th-230, Th-232, U-238, and decay products of U-235 and U-238 (including Ac-227 and Pa-231). The ROD established radiological soil remediation criteria for net concentrations of the COCs at three separate depth intervals. Remediation criteria are applied by summing the contribution from each of the individual radionuclides using the SOR method. The combined contributions of the COC to the ratio must be less than one. The SOR equations for the three depth intervals are provided below.

For the upper 0.15 m (0.5ft) the SOR equation is shown below.

$$\frac{\text{greater of Ra - 226 or Th - 230}}{5} + \frac{\text{greater of Ra - 228 or Th - 232}}{5} + \frac{\text{U - 238}}{50}(\text{all isotopes above background})$$

For soils greater than 0.15 m (0.5 ft) to 1.83 m (6 ft), the SOR equation is shown below.

$$\frac{\text{greater of Ra - 226 or Th - 230}}{15} + \frac{\text{greater of Ra - 228 or Th - 232}}{15} + \frac{\text{U - 238}}{50}(\text{all isotopes above background})$$

For soils deeper than 1.83 m (6 ft), the SOR equation is shown below.

$$\frac{\text{Ra} - 226}{50} + \frac{\text{Th - 230}}{100} + \frac{\text{U - 238}}{150}(\text{all isotopes above background})$$

The ROD remediation criteria for Plant 1 were met, in most cases, by the excavation and out-of-state disposal of approximately 2,490 bank cubic yards of soil based on the construction requirements shown on drawing P1-2 from the Plant 1 WASD (IT 2000b) and the above-noted remediation criteria. However, there were several small areas of soil observed to contain radionuclides at concentrations above ROD remediation criteria, but they were not accessible for remediation. The locations of these inaccessible areas in Plant 1 are shown on Figure C-1-8 and described further in Appendix C. There are an estimated 9,585m^2 of inaccessible soils area within Plant 1.

FWVs were utilized as the official mechanism to implement and document changes to the Plant 1 WASD and WDIA, and were reviewed and approved by the USACE before the change was implemented in the field. The FWV logs are retained in the Project files.

Six FWVs to the Plant 1 WASD and ten FWVs to the WDIA were submitted, approved, and documented in the FWV log as shown on Table 5-1.

Table 5-1 Field Work Variances

FWV No.	Effected Document	Subject	Date Submitted	Date Approved
35	WDIA, Rev. 1	Include Isolated areas in Plant 2	1/13/00	1/20/00
44	WDIA, Rev. 1	Asphalt instead of concrete at KCL pad	3/9/00	3/10/00
57	Plant 1 WASD, Rev. 1	Changes to text, specifications & drawings	7/26/00	7/28/00
60	Plant 1 WASD, Rev. 1	Strip excavation sequence changed	8/11/00	8/15/00
61	Plant 1 WASD, Rev. 1	Fuel powered pump vs. diesel	8/10/00	8/14/00
63	WDIA, Rev. 1	Amend survey request for final status survey	8/24/00	8/25/00
64	Plant 1 WASD, Rev. 1	Amend engineered backfill requirement	8/25/00	8/25/00
67	WDIA, Rev. 1	Schedule and concrete specification changes to plan	9/13/00	9/15/00
68	Plant 1 WASD, Rev. 1	Reroute MH-40 to MH-13	10/11/00	10/12/00
69	WDIA, Rev. 1	Delete sand cone requirements – final lift	10/11/00	10/16/00
85	Plant 1 WASD, Rev. 1	Change specification 02551 – roller size	5/18/01	5/18/01
93	WDIA, Rev. 1	Containment pad and Building 25 access	8/20/01	8/21/01
101	WDIA, Rev. 1	Area 6 South fencing modifications	12/17/01	12/18/01
116	WDIA, Rev. 1	Remediate around pipe pedestal near TVW Pad	5/16/03	5/19/03
119	WDIA, Rev. 1	Remediate rail spur area near Bldg. X loading dock	7/8/03	7/9/03
124	WDIA, Rev. 1	Revise drawing 775575-E345 re fencing and haul routes	8/26/03	8/28/03

During the Plant 1 remedial action, quality control audits were performed as required. Four non-conformance reports were issued over the duration of the Plant 1 remedial action. These non-conformance reports concerned proper use of personal protective equipment, contamination area controls, protection of clean areas when sampling adjacent contaminated areas, and contaminated material load-out. Corrective actions were taken and verified to ensure that proper procedures were followed by all personnel, and all non-conformance reports were resolved without adverse effect on the remediation.

5.2 Quality Assurance and Quality Control

A goal provided in the *Plant 1 Quality Control Plan* (QCP) (IT 2000a) was to verify that the Plant 1 remedial and construction activities were conducted in accordance with the specified requirements. The requirements for these activities are presented in the Plant 1 WASD (IT 2000b) for the K-Pad excavation area and the WDIA (IT 2000c) for the isolated areas in Plant 1. The objectives were met and are summarized in the below listed items.

- Inspection and verification testing was performed to ensure that remedial and construction activities were performed in accordance with applicable specifications and requirements presented in the Plant 1 WASD and the WDIA.
- Any remedial design variance that occurred during the remedial and/or construction activities, and the effects of the variance upon the system's design and/or performance, was evaluated.
- Complete documentation was prepared and maintained during and after construction/remediation activities to demonstrate that the requirements of the Plant 1 WASD and the WDIA were met.

The QCP was used in conjunction with *the Contractor Quality Control Plan FUSRAP St. Louis Downtown Site, St. Louis, Mo.* (CQCP) (IT 2001). The chapters of the CQCP applicable to the scope of work performed at Plant 1 during implementation of the remediation and site restoration activities can be found in the QCP. Additionally, project plans and construction specifications effecting the quality of the project were incorporated by reference in the QCP. Also, in accordance with the QCP, variances to the original design included in the Plant 1 WASD were documented and authorized by FWVs.

Multiple activities were performed to achieve the desired data quality in this project. Data Quality Objectives (DQOs) were established to guide the implementation of the field sampling and laboratory analysis as discussed in Appendix C of this report. A quality assurance program was established to standardize procedures and to document activities. This program provided a means to detect and correct any deficiencies in the process. Data was subjected to verification and validation review, which identified and qualified problems related to the analysis. These review steps provided in the *Sampling and Analysis Guide for the St. Louis Site* (SAG)(USACE 2000) contribute to the final Data Quality Assessment (DQA), which defines that data used in the investigation met the criteria, and are employed appropriately.

The Quality Assurance Project Plan (QAPP), contained within the SAG, established requirements for both field and laboratory QC procedures. In general, analytical laboratory QC duplicates, field duplicates, matrix spikes, laboratory control samples, method blanks, and inter-laboratory accuracy samples (i.e., split precision) were required for every 20 samples (or less) of each matrix and analyte. A primary goal of the QA program was to ensure that the quality of results for all environmental measurements was appropriate for their intended use. To this end, a QAPP and standardized field procedures were compiled to guide the investigation. Through the process of readiness review, training, equipment calibration, QC implementation, and detailed documentation, the project has successfully accomplished the goals set by the QA program. Appendix C-2, *Quality Control Summary Report*, presents the field duplicate and split results.

6.0 FINAL INSPECTION AND CERTIFICATIONS

6.1 Inspections

The QCP (IT 2000a) and CQCP (IT 2001) were the quality controlling documents for remedial actions at Plant 1. Quality control was maintained through a four-phase inspection system and associated checklists. The four-phase inspection system consisted of preparatory, initial, follow-up and final inspections of each definable feature of work. The definable features of work for Plant 1 were site preparation, site excavation/sampling, utility modification/rerouting, final status survey/sampling, site backfill, utility and surface restoration.

The objective of the preparatory inspection was to establish and document that required preliminary activities necessary to start an activity had been completed. Preparatory inspections were documented on a Preparatory Inspection Form that is retained in the RAC's total environmental restoration contract program office central files in Kansas City.

Initial inspections were conducted at the start of definable features of work to document that the work was initiated in accordance with the specified requirements. Initial inspections were documented on Initial Inspection Forms that are retained in the project files.

Follow-up inspections on work activities were completed to document that work activities continued to be performed in accordance with specified requirements. Follow-up inspections were documented in the Daily Quality Control Reports that are retained in the project files.

Prior to the USACE authorizing an excavated location to be backfilled, a final status survey was conducted to confirm that remedial actions were successfully completed and that the ROD remediation criteria were met. Radiological surveys and sample collection were conducted in accordance with the Final Status Survey Plan (FSSP) (USACE 1999a) based on the MARSSIM guidance for remedial actions at radiologically contaminated sites.

The final status survey consisted of a gamma walkover survey, soil sampling at biased locations and, finally, soil sampling at locations defined by a systematic sampling grid in accordance with the FSSP. Following completion of the excavation activities, the project Radiation Safety Officer submitted a Final Status Survey Request to notify the USACE that an area was ready for final status survey sampling. At the direction of the USACE, verification contractor (VC) performed the gamma walkover survey and collected biased and systematic samples. The sampling locations were then documented by civil survey, and the samples were submitted to the Hazelwood Interim Storage Site Radiological Laboratory along with quality control samples as required by the FSSP (USACE 1999a) under chain-of-custody requirements.

Upon receipt of written notification that the location identified in the final status survey request was authorized for backfill by the USACE, site restoration activities commenced to complete restoration of the location. Copies of the backfill authorization for each location can be found in the project files.

A final inspection for each excavation area was conducted by the RAC, USACE, and Mallinckrodt at the conclusion of site restoration, and provided closure for the remediation activities for each location within Plant 1. Final inspections were documented on final inspection forms that are retained in the project files.

A listing of the final inspections as they relate to the various excavation areas within Plant 1 are provided in Table 6-1.

Table 6-1 Final Inspections

Excavation Area	Name on Final Inspection Report	Date
Plant 1, Area 1 West	Site Restoration/Pavement for Elevated Area 1 Final Inspection	11/19/01
Plant 1, Area 1 East	Site Restoration/Pavement for Elevated Area 1 Final Inspection	11/19/01
Plant 1, Area 2	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Area 10	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Area 3	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Small Area 3A (Bldg. 8)	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Bent 11	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Bent 11 Sewer Extension	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Bent 11 Sewer Trench	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Area 4	Site Restoration/Pavement for Elevated Area 4 Final Inspection	9/24/01
Plant 1, Area 4 West	Site Restoration/Pavement for Elevated Area 4 Final Inspection	9/24/01
Plant 1, Area 5	Site Restoration/Pavement for Elevated Area 5 Final Inspection	9/14/01
Plant 1, Area 5 Containment Pad	Site Restoration/Pavement for Spill Containment Pad (EA5 East) Final Inspection	1/04/02
Plant 1, Pump Pad Stairway	Site Restoration/Pavement for Pump Pad Stairway (EA 5 East) Final Inspection	1/04/02
Plant 1, Area 6 North	Site Restoration/Pavement for Elevated Area 6 Pre-Final Inspection	3/12/02
Plant 1, Area 6 South	Site Restoration/Pavement for Elevated Area 6 Pre-Final Inspection	3/12/02
Plant 1, Area 6 West	Site Restoration/Pavement for Elevated Area 6 Pre-Final Inspection	3/12/02
Plant 1, Area 6 South South	Site Restoration/Pavement for Elevated Area 6 Pre-Final Inspection	3/12/02
Plant 1, Area 7/8	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	5/16/01
Plant 1, Area 7/8 West	Plant 1 Completed Elevated Areas Activities Restoration Final Inspection	3/14/02
Plant 1, Yard 4 Solvent Dike North	Site Restoration/Pavement for Plant 1,Yard 4 South Final Inspection	8/16/01
Plant 1, Yard 4 Solvent Dike South	Site Restoration/Pavement for Plant 1, Yard 4 North Final Inspection	8/16/01
Plant 1, Area 11 South South	Site Restoration/Pavement for Elevated Area 11 Final	1/04/02
Plant 1, Area 11 South	Site Restoration/Pavement for Elevated Area 11 Final Inspection	1/04/02
Plant 1, Area 11 North	Site Restoration/Pavement for Elevated Area 11 Final Inspection	1/04/02
Plant 1, Area 11 North North	Site Restoration/Pavement for Elevated Area 11 Final Inspection	1/04/02
K-Pad Strip 1	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01

Table 6-1 Final Inspections (Cont'd)

Excavation Area	Name on Final Inspection Report	Date
K-Pad Strip 2, Cell 1	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad Strip 2, Cell 2	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad Strip 3	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad UE 3	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad UE 4	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad UE 5	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
K-Pad UE 6	Site Restoration/Pavement for Plant 1/K-Pad Final Inspection	8/16/01
Pipe Pedestal Area	Site Restoration/Pavement for Plant1/TVW Pipe Pedestal Area	7/14/03
Bldg. X Loading Dock Rail Spur	Site Restoration for Bldg. X Loading Dock Rail Spur Area	10/8/03

6.2 Health and Safety

No health and safety problems were encountered during the Plant 1 construction activities. Personal protective equipment was required for personnel who performed remedial construction activities at Plant 1. The determination of appropriate equipment was made prior to the work taking place, and the personal protective equipment level was adjusted when necessary to ensure proper protection of workers at all times. The required Mallinckrodt and FUSRAP construction safety permits were obtained prior to performance of a work task that required a permit.

6.3 Certification of Completion

The remedial actions in this report are only a portion of the work required to demonstrate achievement of the selected remedy in the ROD. The final inspection reports for each Plant 1 location document the completion of remedial actions. Upon completion of remedial actions at all of the SLDS OUs, a final certification of completion will be issued.

7.0 OPERATION AND MAINTENANCE ACTIVITIES

Operation and maintenance of the areas remediated by USACE or its contractors are not necessary because they were remediated to unrestricted use criteria. Operation and maintenance of the restored surfaces (i.e. asphalt, concrete and/or gravel) are the responsibility of Mallinckrodt by their acceptance of the final inspection reports.

8.0 SUMMARY OF PROJECT COSTS

A summary of project costs for Plant 1 remediation is provided in Table 8-1. A more detailed cost breakdown is provided in Appendix B.

Table 8-1 Cost Summary

Remedial Action Cost Item	ROD Estimate[1] (1998 $$)	ROD Estimate[2] (2003 $$)	Actual Cost (2003 $$)
Capital Cost	$1,764,040	$1,912,820	$5,132,286
Operating Cost	-------	-------	-------
Total Cost	$1,764,040	$1,912,820	$5,132,286
Projected Future Operation & Maintenance Cost	$292,800	$317,530	None

Notes:

(1) The ROD estimate for the Plant 1 capital cost was extrapolated from the plant-wide FS estimate by using the FS cost per cubic yard of material removed and the actual volume of material excavated at Plant 1. The post-remedial action O&M cost is also based on the FS O&M estimate per plant-wide cubic yard and extrapolated for the actual volume of excavation at Plant 1.

(2) Record of Decision/Feasibility Study cost was adjusted from 1998 dollars to 2003 dollars using average 1998 and average 2003 Engineering News Record building cost index factors for remedial action costs and projected operation and maintenance costs.

9.0 OBSERVATIONS AND LESSONS LEARNED

During the remediation of the Plant 1 areas, lessons learned from the completion of the Plant 2 remedial activities were successfully implemented including excavation water management, procedures to be followed when encountering unanticipated buried utilities and/or abandoned foundations, and the use of more comprehensive final status surveys and updated final status surveys if additional contamination was identified during the survey process.

Additional lessons learned during remedial activities at Plant 1 are described below.

An accurate view of the Plant 1 site history would have prevented several remedial action schedule delays. Specifically, at the K-Pad, Strip 2 excavation, an abandoned building wall and foundation were unearthed at a depth of approximately 8 feet below ground surface, and at Area 7/8 and Area 4, former building foundations were encountered at approximately 3 feet to 4 feet below ground surface. During planning for the Plant 1 WASD (IT 2000a), the property owner (Mallinckrodt) was contacted for this information but no specific information was available. However, potential delays associated with the obstructions were reduced by close coordination with Mallinckrodt to determine the historical use for the foundations and any effect their excavation could have on present or future Mallinckrodt activities. Equipment necessary to excavate buried foundations was available and staged at the SLDS, reducing delays associated with additional equipment mobilization.

During the remediation of the original Locations 1 through 11 (see Figures C-1-3, C-1-4, and C-1-5), most of the excavations increased in size both vertically and horizontally. To reduce adverse effects on Mallinckrodt operations, it was sometimes necessary to subdivide locations into several excavation areas for phased excavation. Prior to beginning an excavation, the RAC coordinated with Mallinckrodt to determine the horizontal limits of the individual excavation areas that would reduce adverse effects on Mallinckrodt operations, and the excavation limits at each location were staged accordingly. This close coordination reduced adverse cost and schedule effects on the overall completion of the Plant 1 remedial action even though the number of excavation areas grew from 14 to 36, as discussed in Section 3.

The use of slide rail shoring in lieu of the originally designed sheet pile system at the K-Pad excavation was instrumental in minimizing adverse effects on the schedule caused by water management issues. Use of the slide rail shoring system facilitated the progress of excavation by controlling and limiting the excavation area that was open. Accordingly, the volume of water to be managed was minimized. By using the slide rail shoring system, sheet-pile-driving vibrations (with the potential to adversely effect Mallinckrodt operations in adjacent buildings) were avoided. The slide rail shoring system was also more economical than sheet pile for this application.

10.0 OPERABLE UNIT CONTACT INFORMATION

Remedial Action Contractor: **Primary Contact Name and Title:** John Eberlin, Project Manager **Company Name:** Shaw Environmental, Inc. **Address:** 110 James S. McDonnell Blvd., Hazelwood, MO 63042 **Phone Number:** (314) 895-2251
Verification Contractor: **Company Name:** Science Applications International Company (SAIC) **Address:** 8421 St. John Industrial Drive, St. Louis, MO 63114 **Phone Number:** (314) 770-3000
Analytical Laboratory: **Company Name:** USACE FUSRAP Lab (operated by Science Applications International Corporation) Lab QA/QC by Severn Trent Laboratory **Address:** 8945 Latty Ave., Berkeley, MO 63134 **Phone Number:** (314) 260- 3901
Project Management: **For the Government:** **Name:** USACE St. Louis District, FUSRAP Program Office **Address:** 8945 Latty Avenue, Berkeley, MO 63134 **Phone Number:** (314) 260-3905 **U.S.E.P.A. Region:** 7

11.0 REFERENCES

ANSI 1999, *Surface and Volume Radioactivity Standards for Clearance,* ANSI/HPS N13.12, American National Standard, August.

DoD 2000, *Multi-Agency Radiation Survey and Site Investigation Manual (MARISSM),* Rev. 1 NUREG-1575, EPA 402-R-97-016, U.S. Department of Defense, U. S. Department of Energy, U. S. Environmental Protection Agency and U. S. Nuclear Regulatory Commission, August.

IT 1999, *Pre-Design Investigation Summary Report, Plant 1, St. Louis Downtown Site, St. Louis,* Missouri, International Technology Corporation.

IT 2000a, *Plant 1 Quality Control Plan, FUSRAP St. Louis Downtown Site,* International Technology Corporation.

IT 2000b, *Plant 1 Remedial Action Work Area-Specific Description and Design Package, Rev. 1, St. Louis Downtown Site,* International Technology Corporation.

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APPENDIX A

COST AND PERFORMANCE FACTORS

APPENDIX A: COST AND PERFORMANCE FACTORS

Cost and performance of the remedial action in Plant 1 were effected by several general construction conditions including types of soil being removed, water handling, and construction logistics in the middle of an operating chemical plant. These construction conditions have been discussed in Sections 5 and 9; the most significant being the increase in construction areas from the design number of 14 to the as-built number of 36, and requirements for additional equipment and its impact on the construction period. Other cost and performance factors are summarized in Table A-1. All sampling and analysis met the requirements of the *Sampling and Analysis Guide for the St. Louis Downtown Site, St. Louis, MO* (USACE 2000).

Table A-1

Performance Topic	Type of Information
Types of samples collected:	
Pre-Design Samples	
Radiological	• Radiological soil samples were analyzed for the St. Louis Downtown Site (SLDS) radiological contaminants of concern (COC).
Waste Characterization	• Waste characterization soil samples were analyzed to compare with disposal facility Waste Acceptance Criteria (WAC).
Hot Zone (HTZ) Samples	• Hot zone (HTZ) soil samples were analyzed for the SLDS radiological COCs.
Class I and Preferential Pathway Samples	• Class I and preferential pathway soil samples were analyzed for the SLDS radiological and chemical COCs.
Class II Samples	• Class II soil samples were analyzed for the SLDS radiological and chemical COCs.
Sample frequency and protocol for:	
Pre-Design & Radiological Samples	• Pre-design samples were collected by the RAC during pre-design activities. These activities took place from May 1999 through November 1999. Samples were collected using a truck mounted-drill rig outfitted with 3 in. diameter 2-foot-long split spoons or a CME-type 5 foot split barrel sampler. Radiological samples were collected in areas of Plant 1 to bound the extent of contamination in support of the remedial design.
Waste Characterization	• Waste characterization samples were collected to confirm that the waste met the WAC of the disposal facility. Sample frequency and protocol specified by WAC.
HTZ Samples	• HTZ samples were collected by the verification contractor and the remedial action contractor in and around excavation areas to document the condition of excavations before final status survey (Class I) sampling. Samples were collected using hand scoop methods in all excavation areas, and a skid-steer mounted drill rig outfitted with 3 in. diameter 2-foot-long split spoons, where needed.

Table A-1 (Cont'd)

Performance Topic	Type of Information
Treated Excavation Water Samples	• Samples of treated water removed from excavations were collected by the RAC after treatment at the SLDS water treatment plant located at Plant 7S.
Class I and Preferential Pathway Samples	• Class I samples were collected by either the VC or the RAC in excavation areas to document compliance with the Record of Decision (ROD) remediation criteria. Preferential pathway samples were collected by the RAC in excavation areas to determine if contamination above the ROD remediation criteria had migrated outside of the excavation boundaries. Samples were collected using the hand scoop or a hand auger.
Class II Samples	• Class II samples were collected by the RAC in Plant 1 outside of Class I areas using a truck-mounted drill rig outfitted with 3-inch-diameter 2-foot-long split spoon or a CME-type 5-foot split barrel sampler.
Quantity of material treated: Class I Excavation Areas	• Approximately 2,490 bank cubic yards of soil were excavated during the Plant 1 remedial activities and transported for disposal.
Excavation Water Treated	• Approximately 1,256,020 gallons of excavation water were treated during the Plants 1 remedial activities and discharged to the local water treatment municipality.
Cleanup goals and/or remediation objectives: Class I, Class II, and Preferential Pathway Samples	The remediation objectives for all samples were as provided below. • For surface soils that are 0-6 inches in depth, the sum of the ratios of the concentration in soils do not exceed 5 picoCuries per gram (pCi/g) for the greater of Ra-226 or Th-230, 5 pCi/g for the greater of Ra-228 or Th-232, and 50 pCi/g for U-238. • For subsurface soils that are greater than 6 in. in depth, the sum of the ratios of the concentration in soils do not exceed 15 pCi/g for the greater of Ra-226 or Th-230, 15 pCi/g for the greater of Ra-228 or Th-232, and 50 pCi/g for U-238. • For surface soils that are within 6 in. of depth, 5 pCi/g of Ra-226, Th-230, Ra-228, or Th-232, and 50 pCi/g for U-238 averaged over any 100m2. • For subsurface soils that are greater than 6 in. in depth, 15 pCi/g of Ra-226, Th-230, Ra-228, or Th-232, and 50 pCi/g for U-238 averaged over any 100m2. • The residual dose from the soils containing Nuclear Regulatory Commission-licensed materials commingled with Manhattan Engineer District (MED)/ Atomic Energy Commission (AEC) related wastes should not exceed 25 mrem/yr. • The residual risk for soils containing Nuclear Regulatory Commission-licensed materials commingled with MED/AEC related wastes should not exceed the CERCLA risk range (about 10^{-4} to 10^{-6}).

Table A-1 (Cont'd)

Performance Topic	Type of Information
Comparison with cleanup goals/remediation objectives:	
Class I, Class 2, and Preferential Pathway Samples	The residual radioactivity in accessible areas at SLDS Plant 1 meet all requirements specified in the ROD. This conclusion is the result of comparison of ROD RGs and the residual site conditions in accessible areas. The concentration-based RGs for Th-230, Ra-226, Th-232, Ra-228, and U-238 are satisfied, noting that no SOR_N value exceeds the limit of 1.0 when averaged over the SU (the average SOR_N for systematic and biased samples in Class 1 and Class 2 areas is approximately 0.40 and 0.05, respectively) and no Ra-226 concentration averaged over $100m^2$ exceeds 15 pCi/g. The dose-based ARAR from 10 CFR 20 Subpart E, *Radiological Criteria for License Termination*, has been satisfied, noting that the residual dose calculated for Plant 1 over the entire site is $\leq$ 1.6 mrem/yr for all modeled scenarios without regard to cover. The SUs also satisfy the statistical requirements with all survey units requiring WRS testing passing the WRS test. Soil concentrations comply with 40 CFR 192 unrestricted release criteria.
Method of analysis:	• The radiological samples were analyzed via ASTM C999-90 and C998-90.
Pre-Design Samples	
Radiological	• The waste characterization samples were analyzed by the following Environmental Protection Agency (EPA) methods: 8080 (TCLP Pesticides), 8260A (TCLP Volatiles), 8150 Toxicity Leaching Characteristic Procedure (TCLP) Herbicides, 6010 (TCLP Metals), 8270 (TCLP basic, neutral acidic extraction procedures (BNA), 8082 polychlorinated biphenyl (PCBs), 300 (Anions), 9015 (pH), 9095 (Paint Filter Test), 1010 (Flashpoint), 9020 (TOX), 9010 (Reactivity), and 9030 (Reactivity-Sulfide).
Waste Characterization	• The radiological samples were analyzed in accordance with ASTM C999-90 and C998-90.
HTZ Samples	
Treated Excavation Water Samples	• The treated excavation water samples were analyzed by Co-precipitation Method for Gross Alpha and Beta Radioactivity in Drinking Water Formerly Utilized Sites Remedial Action Program (FUSRAP ML-018.1, EPA-600/4-80-032, Standard Methods for Examination of Water and Wastewater) for gross alpha and beta activity. Total uranium was determined by KPA, total suspended solids by Determination of Total Suspended Solids (TSS) (FUSRAP ML-023.1, Method 2540D, TSS), isotopic thorium by alpha spectroscopy method FUSRAP ML-005.1 (Fusion and Chemical Separation), isotopic uranium by alpha spectroscopy method FUSRAP ML-015.1 (Fusion and Chemical Separation) and isotopic radium by alpha spectroscopy method FUSRAPML-006.1 (Fusion and Chemical Separation).
Class I and Preferential Pathway Samples	• The radiological samples were analyzed by ASTM C999-90 and C998-90.
Class II Samples	• The radiological samples were analyzed by ASTM C999-90 and C998-90.

Quality assurance and quality control: Class I Samples Class II Samples	• The data quality objectives established in the Final Status Survey Plan for Class I and Class II samples require that 5 percent of the total number of samples be duplicated and split with another laboratory.

APPENDIX B

PROJECT COSTS

A breakdown of project costs is provided in Table B-1.

Site: FUSRAP-SLDS
Location: St. Louis, MO.
Description: Remediation of Plant 1 Soils at the Mallinckrodt Plant in St. Louis, MO.
Phase: Final
Date: 9/30/03

Table B-1 Project Costs

Cost Element	Amount – 2003 Dollars
Area Preparation	$185,590
Excavation	$1,198,322
Engineering During Construction	$176,873
Transportation	$495,754
Sampling	$134,930
Class 2 Hot Spots	$1,109,008
Restoration	$350,773
Post-Remedial Action Report	$47,500
Remedial Design	$239,908
Project Management	$575,916
Construction Management	$617,712
Institutional Controls	$0
Total Remedial Action Cost	**$5,132,286**

APPENDIX C

FINAL STATUS SURVEY EVALUATION

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C.1 INTRODUCTION

This appendix presents the design, data quality assessment (DQA), and results for the St. Louis Downtown Site (SLDS) Plant 1 final status survey. The DQA determines whether the final status survey was an adequate test of the defined remediation goals (RGs) and whether the data associated with each survey unit (SU) satisfies those goals. The final status survey was performed in accordance with the *Radiological Final Status Survey Plan for Accessible Soil within Plant 1, Plant 2, and the City Property at the St. Louis Downtown Site, St. Louis Missouri* (FSSP) (USACE 1999a) and using the guidance provided in the *NMSS Decommissioning Standard Review Plan* (NRC 2000) and the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) (DoD 2000).

A final status survey was performed over the nine Plant 1 land area SUs. These surveys included a gamma walkover survey and the collection of approximately 403 systematic and biased soil samples. During the final status surveys conducted on land areas, alpha and beta scan surveys and approximately 290 (each) total alpha activity and total beta activity measurements were taken on consolidated materials surfaces within the remediated areas. The intent of the final status survey was to determine whether the area satisfies concentration-based and dose-based RGs as defined in the *Record of Decision for the St. Louis Downtown Site* (ROD) (USACE 1998a) and that residual risk for the soils containing Nuclear Regulatory Commissioned-licensed materials commingled with MED/AEC related wastes do not exceed the CERCLA risk range (about $10^{-6} - 10^{-4}$). The NRC criterion is an applicable requirement in the ROD and is included in the FFSP to be consistent with RGs for the SLDS. The dose-based RG is provided below.

> *The residual radiological dose shall not exceed the Nuclear Regulatory Commission (NRC) dose limit of 25 millirem per year (mrem/yr), as defined in 10 Code of Federal Regulations (CFR) Part 20 Subpart E.*

Due to the potential presence of multiple contaminants, concentration-based RGs are defined using sum of the ratios (*SOR*) calculations for Ra-226, Ra-228, Th-230, Th-232, and U-238: the major radionuclides of interest at the site. The SOR calculations for surface (top 0.15 m or 0.5 ft.) subsurface (between 0.15 m and 1.83 m or 6 ft) and as low as reasonably achievable (ALARA) criteria (below 1.83 m or 6 ft) are provided in the expressions below.

$$SOR_{N\text{-less tha }0.15\,m} = \frac{(\text{greater of } Th-230_N \text{ or } Ra-226_N)}{5\ pCi/g} + \frac{(\text{greater of } Th-232_N \text{ or } Ra-228_N)}{5\ pCi/g} + \frac{U-238_N}{50\ pCi/g}$$

$$SOR_{N\text{-}0.15\,m\text{ to }1.83\,m} = \frac{(\text{higher of } Th-230_N \text{ or } Ra-226_N)}{15\ pCi/g} + \frac{(\text{higher of } Th-232_N \text{ or } Ra-228_N)}{15\ pCi/g} + \frac{U-238_N}{50\,pCi/g}$$

For soils deeper than 1.8 m (6 ft), the ALARA criteria may be used at the discretion of the USACE to release an area with future land use restrictions (i.e., institutional controls) to ensure protectiveness. The ALARA analysis was used as a basis for determining whether it is appropriated to incur additional costs to achieve the reduction in dose and risk by the removal of additional soils whose concentrations are below RGs.

$$SOR_{N\text{-greater than }1.83\,m} = \frac{Ra-226_N}{50\,pCi/g} + \frac{Th-230_N}{100\,pCi/g} + \frac{U-238_N}{150\,pCi/g}$$

The subscript "N" in the SOR equations represents net concentration(s) above background. To demonstrate compliance with RGs, the net concentration of each of the major radionuclides of

interest is divided by the respective RG for that radionuclide to determine a ratio to the guideline. Background was determined using 32 samples collected near the SLDS (USACE 1999b). To satisfy the concentration-based RGs, the SOR must not exceed 1.0 averaged over each survey unit. When one or more sample results within a survey unit have SORs > 1 the Wilcoxon Rank Sum (WRS) statistical test is used to further demonstrate that the survey unit as a whole, meets the concentration-based RG.

In addition, no 100-m^2 area in a Class 1 survey unit may exceed an average Ra-226 concentration of 5 pCi/g for surface soils to a depth of 15 cm and 15 pCi/g for subsurface soils between 15 cm to 1.8 m in depth.

Administrative limits for Plant 1 consolidated materials can be found in the FSSP and were adopted from the American National Standard ANSI/HPS N13.12 – 1999, *Surface and Volume Radioactivity* Standards *for Clearance* (ANSI 1999). The ANSI standard provides surface activity criteria that are protective of the public health and the environment for clearance of items and materials under unrestricted use conditions.

A DQA is a scientific and statistical evaluation that determines if site data are of the right type, quality, and quantity to support the intended use (DoD 2000). The DQA process is based on guidance from Chapter 8 and Appendix E in MARSSIM and follows guidance from the U.S. Environmental Protection Agency *Guidance for Data Quality Assessment, Practical Method for Data Analysis* (USEPA 2000). The five steps in the DQA process are repeated below.

1. Review the final status survey design, including Data Quality Objectives (DQOs),
2. Conduct a preliminary data review,
3. Select a statistical test,
4. Verify the assumptions of the statistical test, and
5. Draw conclusions from the data.

Each step is discussed in the following sections. The DQA demonstrates that each Plant 1 SU satisfied concentration-based RGs, dose-based RGs, and statistical tests as outlined in the FSSP and supports releasing each unit without restriction. If a survey unit did not satisfy the concentration-based and dose-based RGs, or statistical tests, additional material would have been removed and the final status survey repeated. The evaluation of site data is provided in Section C.5.

C.2 FINAL STATUS SURVEY UNITS

In accordance with MARSSIM guidance, Plant 1 was divided into Class 1 areas (areas that had radioactive contamination prior to remediation), Class 2 areas (areas that had a potential for radioactive contamination due to its proximity to contaminated areas, but is not expected to exceed the RG), and Class 3 areas (areas not expected to contain residual radioactivity or those expected to contain levels of residual radioactivity at a small fraction of the RG).

The final status surveys were designed so that Class 1, 2, and 3 SUs in Plant 1 were limited to 1,000m^2 +10%, 5,000m^2 +10%, and 50,000m^2 +10%, respectively. The Class 1 and Class 2 SU sizes selected by the USACE for the FSS were limited to one-half of the MARSSIM recommended maximum areal limits. This approach was selected by the USACE based on input received from Mallinckrodt and state regulators.

Plant 1 was broken into nine land based survey units, consisting of two soils Class 1 units (SU-1A and SU-1B), six Class 2 units (SU-2A through SU-2F) and one Class 3 unit (SU-3). The

surface area of SU-1A and SU-1B is approximately 700m^2 and 660m^2, respectively. The surface area of Class 2 SU-2A through SU-2C is approximately 5,400m^2 and for SU-2D through SU-2F is approximately 5,100m^2. The surface area for the Class 3 SU-3 is approximately 20,000m^2. Survey unit 1C (SU-1C) is a Class 1 area consisting of consolidated material surfaces and has a surface area of approximately 90m^2. A description of all survey units is included in Table C-1 below. Figure C1-2 in Attachment C-1 illustrates the Plant 1 and associated SU boundaries.

Table C-1 Survey Unit Descriptions

SU No. (Final)	Class	Description
1A	1	Area A Excavation Surface Soils.
1B	1	Area B Excavation Surface Soils.
1C	1	Consolidated Material Surfaces.
2A	2	Area A Top Interval Soils, subsurface materials in the first 6 in below cover material.
2B	2	Area A Middle Interval Soils, subsurface materials 24-30 in below cover material.
2C	2	Area A Lower Interval Soils, subsurface materials 48-54 in below cover material.
2D	2	Area B Top Interval Soils, subsurface materials in the first 6 in below cover material.
2E	2	Area B Middle Interval Soils, subsurface materials 24-48 in below cover material.
2F	2	Area B Lower Interval Soils, subsurface materials 48-54 in below cover material.
3	3	Cover Material

C.2.1 Class 1 Survey Units

The Class 1 SUs (SU-1A and SU-1B) consisted of remediated land areas (i.e., excavations) and the surface of consolidated materials (SU-1C) located within the remediated areas. SU-1A and SU-1B consist of several remediated areas located in Area A and Area B of Plant 1, as shown on Figure C1-2 in Attachment C-1. The remediated areas were split into two SUs in order to comply with the stated maximum Class 1 SU size limit. The data from the various remediated areas were combined within the same plant area, as described in the FSSP. The land area survey unit sampling results were compared to ROD RGs as discussed in Section C.5 and C.7.

All excavations (i.e., Class 1 Areas) have six inches or greater of backfill and therefore the soil sample data in Class 1 SUs were compared to the subsurface RG (15/15/50).

The total combined area of SU-1C is approximately 90m^2. The consolidated materials SU-1C measurement results were compared to the surface activity guideline of 600dpm/100cm^2 total alpha and 6000 dpm/100cm^2 total beta radioactivity as discussed in Section C.6.

C.2.2 Class 2 Survey Units

The Plant 1 Class 2 SUs consisted of all accessible subsurface soils of the plant (to a depth of 6 ft) exclusive of the remediated areas (i.e., Class 1 SUs). The Class 2 areas at the plant were divided into two main areas (Areas A and B) in order to comply with the stated maximum Class 2 SU size limits. The two Class 2 areas were further separated into six SUs by area and depth below cover materials to allow comparison of data with ROD RGs in relevant 24-inch layers. For example, SU-2A samples were collected in Area A in the first 6 inches below the cover materials, SU-2B samples were collected in Area A at the next sampling interval 18 to 24 in

below SU-2A, etc. A description of Class 2 SU locations and depth of samples is located in Table C-1. The Class 2 SUs are shown on Figure C1-2 in Attachment C-1.

All Class 2 sample results were compared to the subsurface RG (15/15/50) in accordance with the SLDS ROD. Additionally, supplemental guidance contained in NUREG-1727, *NMSS Decommissioning Standard Review Plan* (NRC 2000) was used to demonstrate comparisons for areas that were beneath a pavement surface. NRC 2000 states that if residual radioactivity is primarily beneath paving, it should be surveyed as subsurface residual radioactivity. The Class 2 SUs sampling results are compared to ROD RGs as discussed in Section C.5 and C.7.

C.2.3 Class 3 Survey Unit

The cover material (e.g., concrete and asphalt) over the Class 2 soil areas at Plant 1 and Plant 2 were classified as one Class 3 area. Borings of the Class 3 cover material were analyzed via volumetric methods. The Plant 1 and Plant 2 portions of the survey unit were evaluated in this report.

All sample results in the Class 3 SU were compared to the surface RG (5/5/50). The Class 3 SU sampling results are discussed in Section C.5. The Class 3 SU is shown on Figure C1-9 in Attachment C-1.

C.3 VERIFICATION SURVEY MEASUREMENTS

Ten types of measurements/samples were collected during the final status survey to determine whether the remedial action had met the remedial action objectives. These consisted of the below listed elements.

1. Surface gamma scans of land areas to identify potential locations of elevated activity,
2. Class 1 verification samples collected in the first 6 inches of excavation surfaces,
3. Investigation samples, collected at 24-inch depth intervals below a Class 1 excavation surface, to a maximum depth of 6 ft below grade,
4. Biased soil samples collected in areas of potential elevated activity in Class 1 areas,
5. Class 2 verification soil samples collected within the first 6 inches below cover materials,
6. Class 2 verification soil samples collected 18 inches below the first interval, addition samples at 18 inch intervals were collected down to a maximum depth of 6 ft below grade,
7. Class 3 verification cover material samples,
8. Preferential pathway soil samples collected where a means for contamination transport was identified,
9. Surface alpha and beta radioactivity scans on consolidated materials surfaces within Class 1 remediation areas, and
10. Fixed point measurements of total alpha and total beta activity on consolidated material surfaces with in Class 1 remediation areas.

Of these, the subsurface soil samples collected in the first 6 inches of excavation surfaces (Item 2), investigational subsurface soil samples collected at 24-inch depth intervals (Item 3), subsurface biased soil samples collected on excavation surfaces (Item 4), subsurface soil samples collected in the first 6 inches below cover material (Item 5), subsurface soil samples collected at 24-inch depth intervals below cover (Item 6), samples of cover material (Item 7), and fixed point measurements of total alpha and total beta activity on consolidated materials (Item 10) were used to compare against the appropriate RG. The other measurements were taken to identify potential locations of elevated activity (Items 1 and 9) or to identify potential contamination transport pathways (Item 8). Accessible areas that contained residual radioactivity above RGs were investigated and remediated, as appropriate.

C.3.1 Surface Soil Gamma Scans

Screening gamma scans were performed over 100% of accessible Class 1, Class 2, and Class 3 SUs. Sodium iodide radiation detection instruments were used to detect areas of elevated activity during the excavation of contaminated soils. When a Class 1 area was completely excavated, a 100% walkover survey was also performed with the sodium iodide radiation detection instrument and documented prior to the collection of confirmation samples. Locations exceeding the action level established in the FSSP were investigated and either sampled or remediated, as appropriate. If additional soils were removed, the area was re-scanned and sampled, as appropriate, to demonstrate the effectiveness of remedial action.

C.3.2 Field Instrument Detection Sensitivity

The field radiation detection survey instruments (and their functional and performance specifications) used during the surveys are listed in Table C-2 below. Detection sensitivities were determined following the guidance of NUREG-1507 (NRC 1998) and are derived in the *Final Status Survey Plan for Accessible Soil within Mallinckrodt Property and the Vicinity Properties, Excluding Plants 1, 2 and the City Property at the St. Louis Downtown Site* (USACE 2002). The alpha and beta scan and static measurement sensitivities are presented for concrete, which was the predominant consolidated material in Plant 1. The sensitivities presented were derived using typical instrument parameters and are well below the RG for soil and surface activity criterion for consolidated materials.

Table C-2 Radiological Field Survey Instruments

Description	Application	Detection Sensitivity[1]
Ludlum Model 44-10; 2-inch × 2-inch NaI gamma scintillation detector	Gamma scans of all surfaces	Th-230 = 1120 pCi/g; Ra-226 = 1.2 pCi/g; and U-natural = 40 pCi/g.
Ludlum Model 2221; Scaler/ratemeter (with earphones)	Readout instrument for gamma scintillation detector	N/A
Ludlum Model 2360 coupled with a Ludlum 43-89 (ZnS plastic scintillator). Effective area 125cm^2	Beta surface scan on concrete. Beta static measurement on concrete. Alpha surface scan on concrete. Alpha static measurement on concrete.	1780 dpm/100cm^2 at 2 inches per second. 1111 dpm/100cm^2. 342 dpm/100cm^2 at 2 inches per second. 314 dpm/100cm^2.

[1] Minimum detectable concentrations (MDCs) shown in table were calculated for areas without surface cover (i.e., rock asphalt, concrete, etc.) based on increased knowledge of site-specific parameters. Values shown differ from those listed in the FSSP and can be found in (USACE 2002).

C.3.3 Soil Samples

Soil samples were collected in a systematic grid for all Class 1 and 2 SUs. Excavation surface samples were collected in Class 1 SUs to determine whether the remedial action (i.e., excavation) was successful. In Class 2 SUs, samples were collected to verify that the area satisfied the RGs without remediation. The number and location of samples collected in each SU were derived using MARSSIM guidance as described in the FSSP.

Due to the historical common use of porous fill at SLDS, contamination may have had the potential to distribute non-uniformly in subsurface materials. Therefore, the final status survey incorporated systematic sampling of soils in Plant 1 areas at depth intervals representative of 24-inch layers extending to 6 ft below pre-remediation grade. Sample borings collected at systematic sample locations were scanned to determine if subsurface pockets of contamination existed in the SU. Soil samples were collected at 24-inch depth intervals (6-inch samples collected 18 inches to 24 inches below the previous sample) unless scanning indicated elevated contamination levels in other locations of the boring. If soil contamination in excess of the subsurface RG was identified, further investigation, re-classification, and/or remediation was conducted, as appropriate, to demonstrate compliance with ROD remedial goals. The survey included the following listed elements.

- In Class 1 SUs, a sample was collected over an interval of the first 6 inches below the excavation surface at all systematic sampling locations. Systematic sampling depths were extended to collect additional samples at 24-inch intervals until a total depth below original grade of 6 ft was reached. If the excavation was greater than 6 feet deep, then only an excavation surface sample was collected at that location. The majority of the excavations were greater than 6 ft in depth. One hundred percent of the Class 1 samples were subjected to laboratory analysis.

- Class 1 excavations were inspected by a professional geologist for potential migration pathways. An additional subsurface sample was collected below the excavation if a means for contamination transport was identified (e.g., ash fill, utility lines). In addition to the preferential pathway samples, utility trenches, sewer lines, and other subsurface structures and areas accessible to workers were scanned and sampled (where material was available to sample). Soil and sludge in excess of RGs was removed. One hundred percent of the preferential pathway samples were subjected to laboratory analysis.

- Biased samples were collected in Class 1 excavations to investigate areas of potential elevated activity that were indicated during the gamma walkover surveys. Biased samples were typically collected in the first 6 inches of the excavation surface. One hundred percent of the biased samples were subjected to laboratory analysis.

- In Class 2 SUs, a sample was collected over an interval of the first 6 inches below cover materials and at 24-inch intervals at all systematic sampling locations until a depth below original grade of 6 ft was attained. One hundred percent of the Class 2 samples were subjected to laboratory analysis.

- In the Class 3 SU, samples were collected over an interval of the first 6 inches of cover material. One hundred percent of the Class 3 samples were subjected to laboratory analysis.

C.3.4 Alpha and Beta Scan Measurements

Alpha and beta scans were performed over 100% of accessible Class 1 consolidated material (e.g., concrete, piping, utility lines) surfaces. Ludlum 43-89 scintillation detection instruments were used to detect areas of elevated activity during the surveys. When Class 1 areas were excavated and consolidated materials were exposed that would remain inplace, a 100% alpha and beta scan survey was performed with the scintillation detection instrument and documented. All instrumentation was required to have current calibration (within the past 12 months). Daily field performance checks were conducted in accordance with instrument use procedures. The performance checks were performed prior to daily field activities and at any time the instrument response appeared questionable.

C.3.5 Alpha and Beta Surface Activity Fixed-Point Measurements

One total alpha and one total beta surface activity (fixed point) measurements was collected, at a minimum, in each one-meter square area of the consolidated material. The fixed-point measurement locations were taken at the areas of maximum count rate seen during the surface scans. The measurements were used to demonstrate that the SU satisfied the surface activity guideline. All instrumentation was required to have current calibration (within the past 12 months). Daily field performance checks were conducted in accordance with instrument use procedures. The performance checks were performed prior to daily field activities and at any time the instrument response appeared questionable.

C.4 REVIEW FINAL STATUS SURVEY DESIGN

The FSSP specifies the design for the Plant 1 final status survey. The design states the DQOs, the basis for the DQOs, the expected radiological conditions at the site, the number and location of sampling points, and the requirements for demonstrating compliance with the RGs. The following list provides the key components of the Plant 1 survey design.

- The probability that a SU will pass when the average SOR is greater than 1.0 (Type I error) and the probability that a SU will fail when the average SOR is less than 1.0 (Type II error) were each set to 0.05.

- For planning purposes, the concentration ratios of Ra-226, Th-230, Th-232, and U-238 (normalized to Ra-226) were set to 1.0 : 2.1 : 0.17 : 5.2, respectively, based on survey data from a previous Plant 10 excavation (USACE 1999a).

- The standard deviations (arithmetic or geometric, as appropriate) for Ra-226, Th-230, Th-232, and U-238 were calculated to be 1.9 picocuries per gram (pCi/g), 3.0 pCi/g, 1.9 pCi/g and 35.1 pCi/g, respectively, based on survey data from a previous Plant 10 excavation (USACE 1999a).

- The evaluation of small areas of elevated activity was based on the dose assessment

approach outlined in the Feasibility Study (USACE 1998a) and consistent with (Morton 1998).

- The concentration-based RG was set to 1.0 using the SOR approach.

Using this information, and considering that potential site contaminants are present in background, it was estimated that approximately 32 SU samples would satisfy WRS statistical requirements. The evaluation for areas with elevated activity demonstrated that the sample density of 32 samples was adequate (i.e., no additional samples were required). The survey design was based on Class 1 SUs not exceeding 1,000m^2 (+10%), so each sample would represent approximately 31.3m^2 with a grid spacing of approximately 6.0 m. The survey design was also based on Class 2 SUs not exceeding 5,000m^2 (+10%), so each sample would represent approximately 156m^2 with a grid spacing of 13.4m. The survey design was based on Class 3 SUs not exceeding 50,000m^2 with samples placed randomly per the FSSP.

C.5 DATA EVALUATION

A data review provides a preliminary attempt to identify patterns and anomalies in the data and may provide an early indication of whether a survey unit will pass or fail statistical tests (i.e., whether additional material should be removed). This review includes four components.

1. A review of data quality indicators,
2. A comparison of survey unit data to the concentration-based RGs,
3. A comparison of survey unit data to reference area data and a review of relevant parameters (e.g., mean, median, standard deviation, etc.), and
4. A residual dose and risk assessment for each survey unit, the site as a whole, and small areas of elevated activity, if necessary.

The FSSP utilized Plant 10 data to determine the number of data points needed for statistical testing (i.e., WRS test). Since the FSSP was originally developed, data have been collected to support the final status survey design used at Plant 1. This new data includes 32 samples from the reference background areas (USACE 1999b) located to the north and south of SLDS and actual data collected from Plant 1. The DQA utilizes this more current data to evaluate final status survey results.

C.5.1 Data Quality Indicators

Data was reviewed for precision, accuracy, representativeness, completeness, and comparability. These indicators are summarized in Section 4.6 of the final status survey plan and are presented in detail in the quality assurance section of the *Sampling and Analysis Guide for the St. Louis Site* (USACE 2000).

Precision and accuracy are determined by the analysis of field duplicate samples and split samples. Precision is measured by comparing the analytical results of the field duplicates, which are samples taken at the same location as the sample they duplicate and analyzed in the same laboratory. Accuracy is measured by comparing the results of split samples, which are aliquots of

samples analyzed by a separate laboratory. Plant 1 split samples were analyzed by an independent contract laboratory.

In general, radionuclides were detected at low levels (near background). At low levels, small differences in observed results would result in large relative percent differences. The FSSP requires a data quality investigation of results that are at least 50% of the RGs. As a result, the relative percent difference (RPD) is only applied to analytical results that are at least 50% of the RGs.

The data quality objectives (DQOs) established in the FSSP require that 5% of the total number of samples be duplicated and split with another laboratory. A total of 15 splits and 15 duplicates were obtained from 237 verification samples collected during the final status survey meeting this DQO. Due to remediation or plant boundary adjustments some parent and duplicate/split samples were removed from the final status survey data set. The duplicate/split sample results were still used for the quality control data assessment even though the parent sample had been removed from the final status survey data set. Although the parent sample had been removed from the final status survey evaluation the intended purpose of the QA samples was to aid in the determination of laboratory quality and therefore is considered an appropriate practice to use the data to determine if data quality (i.e., precision and accuracy) is acceptable for its intended purpose.

Field duplicate and split sample results were evaluated to assess the general precision and accuracy obtained during the course of these investigations. Isotopic values for U-238, Th-230, Th-232, Ra-226, and Ra-228 were compared for the 15 field duplicate pairs and 15 quality assurance (QA) split sample pairs. Evaluation criteria were set at a relative percent difference (RPD) of ± 35% or less at 50% of the RG. Based on these evaluation criteria, 97% of the field duplicate comparisons indicated acceptable precision, and 92% of the QA split sample comparisons indicated acceptable accuracy. Given the inherent heterogeneity of soils and the low levels of activity being measured (most values were determined at levels below 5 pCi/g), the precision and accuracy for this work are considered acceptable and the data are useable for their intended purpose.

Representativeness, comparability, and completeness are subjective decisions based on the sampling strategy and the ability of the data to meet requirements. Data were collected according to the FSSP using a MARSSIM random-start systematic grid sampling technique to ensure representativeness of the data to actual site conditions. The data were collected and analyzed according to the methods presented in the sampling and analysis plan. The data were verification and validated according to the QAPP. Thorium-230 gamma spectroscopy analytes in one sample were rejected due to the uncertainty being greater that 100% of the reported activity. Ninety-nine percent of the data were acceptable for statistical testing. The detailed results of the quality control analysis for SLDS Plant 1 data are provided in Attachment C-2, Plant 1 Quality Control Summary Report.

C.5.2 Comparison To Concentration-Based RGs

There are two concentration-based RGs at SLDS Plant 1. First, the areal average Ra-226 concentration cannot exceed 15 pCi/g over any 100-m^2 area in remediated areas (5 pCi/g at the surface) as described in Section C.1. Second, the average SOR over the entire SU cannot exceed 1.0 as described in Section C.1. Results from the Class 1 SUs must also satisfy the WRS test and the dose-based RG for small areas of elevated activity. To ensure that all RGs are satisfied, each

RG was considered explicitly for each SU. However, if all results in a SU are below the concentration-based RGs, the SU passes all remedial goals (i.e., concentration-based RGs, dose-based RGs, and statistical tests) and no further evaluations are required.

Class 1 and Class 2 systematic sample locations, Class 1 subsurface investigation samples, and biased sample locations are shown in Figures C-1-3 to C-1-6 in Attachment C-1. Class 3 randomly selected sample locations are shown in Figure C1-9 in Attachment C-1. Sample locations for the Preferential Pathways samples are shown on Figure C1-8 in Attachment C-1. Maps showing areas scanned (walkover surveys) are located in Attachment C-7. The entire Plant 1 data set, including qualifiers, and MDAs is presented in Attachment C-3. Data from the Plant 1 SUs and the SLDS reference areas are summarized in Attachment C-4. The concentrations listed are reported values that may be below the minimum detectable activity (MDA) or detection error. Attachment C-4 provides SOR calculations, a means for comparison to reference area data, and a summary of survey unit data. In Attachment C-4, the net SOR value (SOR_N) represents the SOR after background is subtracted as required by the concentration-based RGs. The gross SOR value (SOR_G) includes background and is used only for completing the WRS test. It is assumed that all Class 1 and Class 2 SUs will be covered with at least 15 cm (6 inches) of cover or backfill and therefore, subsurface RGs are applicable. The SOR_N was based on the surface RG in the Class 3 SU for the cover material samples.

The mean SOR_N for each SU was well below the RG of 1.0 (SORs ranged between 0.02 – 0.54). The Class 1 subsurface and preferential pathway samples have a mean SOR_N of 0.09 and 0.21, respectively. All data is summarized in Attachment C-4. Results indicate that no individual sample result in the Class 2 and Class 3 SUs (SU-2A through SU-3) exceeds the SOR_N cleanup RG of 1.0. The WRS test is not required if the difference between the largest SU gross measurement (i.e., SOR_G) and the smallest reference area measurement is less than the DCGL. The results indicate that only SU-1A requires a WRS test.

No 100-m^2 area in remediated areas (i.e., Class 1 SUs) may exceed an average Ra-226 concentration of 15 pCi/g. If no individual sample exceeds an SOR_N of 1.0, then the Ra-226 concentration cannot exceed 15 pCi/g. A total of twenty individual sample results in the SU-1A and SU-1B exceed an SOR_N of 1.0. These samples have SOR_N values ranging from 1.00 to 4.14 and are evaluated in Attachment C-5. The samples exceeding an SOR_N of 1 were averaged with the surrounding samples within a 100-m^2 area to determine the average SOR_N for the 100-m^2 area. Many Class 1 excavations were isolated and smaller than 100m^2. Therefore, the average SOR_N may be an area that is less than 100m^2. This is a conservative approach because using the surrounding areas (i.e., Class 2 Area) would lower the average SOR_N per 100m^2. Although SU-1A and SU-1B contain individual sample results with an SOR_N greater than 1.0, when averaged with adjacent sample results the SUs satisfy the concentration-based 100-m^2 RG. Although elevated samples in SU-1A and SU-1B satisfy the 100-m^2 RG for Ra-226, the WRS test was also performed on verification sample data, as necessary, as an additional verification that the concentration-based RG is satisfied (see Section C. 5.3). All elevated sample results are evaluated further in Section C.7 as part of the residual dose and risk assessment.

C.5.3 Statistical Test

Because the radionuclide contaminant of concern is present in background, the WRS test is selected as the appropriate statistical test. Per MARSSIM the completion of the WRS test is only required in SU-1A since it is the only unit in which the highest gross SU measurement minus the

lowest reference area measurement results in a $SOR_G > 1.0$. SU-1A passes the WRS test. WRS test results are in Attachment C-6.

As described in Section C.1, the survey design used data from a site near the Plant 1 to calculate the number of samples necessary to satisfy statistical tests. Once site-specific data (i.e., Plant 1 final status survey data) were available, these calculations were repeated to confirm that enough samples were collected. Using the standard deviations for Th-230, Th-232, Ra-226, and U-238 from the SU data summary in Attachment C-4 and repeating the steps outlined in the FSSP, the calculations to obtain the number of samples required for the WRS test for SU-1A are presented below. Calculations were repeated for all other survey units using the same approach.

The relative shift (Δ/σ) was calculated given values for the SOR_N, lower bound of the gray region (LBGR), and standard deviation (σ). The SOR_N was set to 1.0, so the LBGR = SOR_N /2 = 0.5. The value for Δ was therefore, SOR_N - LBGR = (1.0) - (0.5) = 0.5. The specific values of σ for SU-1A are Ra-226, 1.37 pCi/g; U-238, 14.35 pCi/g; Th-230, 2.1 pCi/g and Th-232, 0.38 pCi/g. Using these values, the weighted standard deviation was calculated as shown below.

$$\sigma = \sqrt{\left(\frac{\sigma_{Ra-226}}{DCGL_{Ra-226}}\right)^2 + \left(\frac{\sigma_{U-238}}{DCGL_{U-238}}\right)^2 + \left(\frac{\sigma_{Th-230}}{DCGL_{Th-230}}\right) + \left(\frac{\sigma_{Th-232}}{DCGL_{Th-232}}\right)} = \sqrt{\left(\frac{1.37}{15}\right)^2 + \left(\frac{14.35}{50}\right)^2 + \left(\frac{2.1}{15}\right)^2 + \left(\frac{.38}{15}\right)^2} = 0.33$$

Using this value and a $\Delta = 0.5$, the relative shift (Δ/σ) for the survey unit was calculated to be 1.5. This value falls within the MARSSIM recommended range of 1 to 3 for Δ/σ. From Table 5.3 in MARSSIM and given 0.05 for the Type I error and 0.05 for the Type II error, the number of systematic samples required for the survey unit was estimated to be 18. Thirty-seven samples were actually collected from SU-1A. This calculation (post remediation) shows that more than enough samples were collected to satisfy the WRS statistical test in SU-1A. Using the same approach, it was determined that more than enough samples were collected in all SUs, as shown in Table C-3 below.

Table C-3 Number of Samples Required

Survey Unit[1]	Class	Minimum Systematic Samples Required	Number of Systematic Samples Collected
1A	1	18	37
1B	1	10	33
2A	2	10	22
2B	2	10	21
2C	2	10	24
2D	2	10	24
2E	2	10	24
2F	2	10	22
3	3	10	34
Reference Area	N/A	32	32

[1] Survey units are described in Table C-1.

The design (i.e., pre-remediation) estimates of the number of systematic samples for each SU, necessary to satisfy WRS testing, was approximately thirty. The Class 2 area SUs fell short of the number of design samples due to remediation areas (i.e., reclassified as Class 1) and the adjustment of the Plant 1 boundaries, which excluded several samples. The original Plant 1

boundary to be investigated included portions of the streets on the north, south, and east sides of the Plant and for this evaluation was adjusted to exclude these areas. However, this DQA shows that a sufficient number of samples were collected in each SU to satisfy statistical requirements and that ample reference area samples were available. Based on this information, the methods used to assess Plant 1 survey units are sufficient and the ROD RGs are satisfied for accessible areas.

C.5.4 Comparison To The Reference Area And Evaluation Of Parameters

Although each SU satisfies RGs based on average SOR_N values alone, an additional evaluation of site data was performed to complete the DQA. Attachment C-3 lists sample results for systematic final status survey sample data, biased sample data and reference area data (reference data are discussed in detail in USACE 1999b). The data shows that U-238, Th-230, and Ra-226 are the primary contaminants of concern and the U-238 concentrations generally dominate the Ra-226 and Th-230 concentrations. That is, of the twenty SOR_N results greater than 1.0, only three of the Ra-226 and three of the Th-230 concentrations are greater than the U-238 concentration. (Recall that the SOR_N calculation considers the greater of Th-230 or Ra-226.) Results for other radionuclides are generally within the range of background and contribute negligibly to SOR_N calculations.

As discussed in section C.5.3 a WRS test was performed on the systematic final status survey data. The test indicated that at the 95% confidence level the results did not cxcccd thc concentration based RG.

The comparison of final status survey data to reference area data and evaluation of parameters confirm that data are sufficient to assess the pending release of the Plant 1 accessible areas.

C.6 CONSOLIDATED MATERIALS EVALUATION

The fixed-point measurements on consolidated materials (e.g., concrete foundations, utility lines, asphalt) were compared to the American National Standard ANSI/HPS N13.12 – 1999, *Surface and Volume Radioactivity Standards for Clearance* (ANSI 1999). The guidelines for consolidated materials are 600 dpm/100cm^2 total alpha activity and 6000 dpm/ 100cm^2 total beta activity as discussed in Section C.1. The average criteria was met for SU-1C (i.e., surface activity measurements).

The Area 1 West excavation was adjacent to Building 25 in Plant 1. During remediation the foundation of Building 25 was exposed and surface activity measurements indicated activity above the guideline. The areas of elevated activity were removed to the extent possible due to structural concerns. One area exceeded the maximum criteria of 10 times the average guideline. RESRAD –Build was used to model the contamination to estimate a dose that a receptor may be exposed to as a result of the residual contamination. Table C-4 provides the input parameters used in modeling the scenario as well as the exposure point concentrations. The results of the assessment indicated less than 0.1 mrem/year dose. This dose is consistent with the ROD cleanup criteria.

Table C-4 Parameters for RESRAD-BUILD Building Occupancy Scenario (Resident)

Parameter	Value	Justification
	Time Parameter	
Exposure Duration	365 days	NUREG/CR-5512, Volume 1, Section 3.2.1
Indoor Fraction	0.66	16.4 hours/day; 350 days/year EPA 1997
Evaluation Time	0 year; 1 year	RESRAD-BUILD Default
Building Parameters		
Number of Rooms	1	RESRAD-BUILD Default
Deposition Velocity	0.01 m/sec	RESRAD-BUILD Default
Resuspension Rate	5.0 E-07 sec^{-1}	RESRAD-BUILD Default
Building Exchange Rate	0.8 hr^{-1}	RESRAD-BUILD Default Consistent with value of 0.75 hr^{-1} for conditioned spaces (cited by American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.)
Room Area	100 m^2	NUREG/CR-5512, Volume 1, Section 6.2.1
Room Height	2.5 m	RESRAD-BUILD Default Consistent with NUREG/CR-6697 most likely value of 2.4 m
Room Exchange Rate	0.8 hr^{-1}	RESRAD-BUILD Default Same as building exchange rate due to single room
In/Out Flow Rate	200 m^3/hr	Room volume (250 m^3) * Room exchange rate (0.8 hr^{-1})
Receptor Parameters		
Number of Receptors	1	RESRAD-BUILD Default
Room # Location	1	RESRAD-BUILD Default
Time Fraction	1	RESRAD-BUILD Default
Breathing Rate	23 m^3/day	NUREG/CR-6697 Table 5.1-1
Ingestion Rate	1 E-04 m^2/hr	RESRAD-BUILD Default (Approximate midpoint between NUREG/CR-6697 min. and max values)
Receptor Location	5m, 5m, 1m	Located in center of room at height of 1m
Shielding Parameters		
Thickness	0	
Density	Not Applicable	
Material	Not Applicable	
Source Parameters		
Number of Sources	1	Floor
Room # location	1	
Source Type	Area	Surface contamination only
Direction	Floor (z)	
Location	Floor: 5m, 5m, 0m;	Entire floor is uniformly contaminated.
Geometry: Area	100 m^2	
Air Release Fraction	0.1	Most likely value. NUREG/CR-6697
Direct Ingestion	0 g/hr	RESRAD-BUILD Default
Removable Fraction	0.2	Most likely value. NUREG/CR-6697

TABLE C-4 Parameters For Resrad-Build Building Occupancy Scenario (Resident) (Cont'd)

Parameter	Value	Justification
Lifetime	10,000 days	Most likely value. NUREG/CR-6697
Radionuclides Concentration	AC-227=2 pCi/m^2; PA-231 = 2 pCi/m^2; Ra-226 = 18 pCi/m^2; Ra-228 = 525 pCi/m^2; Th-228 = 10 pCi/m^2; Th-230 = 25 pCi/m^2; Th-232 = 8 pCi/m^2; U-234 = 54 pCi/m^2; U-235 = 3 pCi/m^2; U-238 = 54 pCi/m^2.	Site-specific Data

The Area 4 West excavation, near the southwest corner of Building 26, exposed a abandoned concrete foundation and surface activity measurements were taken. The beta measurements exceeded the gross beta guideline when averaged over 1 m^2. RESRAD –Build was used to model the contamination to estimate a dose that a receptor may be exposed to as a result of the residual contamination. The results of the assessment indicated less than 0.1 mrem/yr dose. This dose is consistent with the ROD cleanup criteria.

The results of individual measurements are listed in Attachment C-8, Table 8-1. Although surface activity measurements satisfied the criteria, a sign test was also performed as an additional verification that the SU passed criteria. The sign test was used because no reference area measurements were collected for the consolidated materials. SU-1C passes the sign test. The results of the sign test are presented in Attachment C-8, Table 2.

C.7 RESIDUAL DOSE AND RISK ASSESSMENT

In addition to evaluating the data against the RGs established by the ROD, a conservative site-specific dose and risk assessment was performed using the industrial/utility worker and industrial/construction worker exposure scenarios defined in the SLDS Feasibility Study (FS) (USACE 1998c). The industrial/utility worker may participate in utility work or other intrusive outdoor activities around the site. The industrial/construction worker is modeled as a typical site worker who spends most of the time indoors. An additional on-site resident scenario was developed as requested by regulators. This on-site residential receptor is modeled as a potential future receptor in case the current land uses of Plant 1 areas change from industrial to residential. The exposure pathways applicable to the dose and risk assessment for all scenarios were external gamma, soil ingestion, and inhalation of particulates. The plant ingestion pathway was also considered for the on-site resident. RESRAD Version 6.21 was used to calculate dose and risk to the potential receptors. The RESRAD non-default parameters used for the residential scenario were selected to be consistent with the scenarios defined in the SLDS Feasibility Study if they were applicable to the residential scenario. The receptor scenarios are defined in the following:

1. Onsite Residential Receptor: The onsite receptor is modeled as potential future receptor in case the current land uses for Plant 1 areas changes to residential. The residential receptor is

assumed to live on site for 350 days per year for 30 years (EPA 2000). The resident is assumed to spend 16.4 hours indoor and 2.0 hours outdoor (EPA 1997). Among outdoor activities, the resident is assumed to spend 0.2 hours for gardening. Based on NUREG/CR 5512, the inhalation rate during indoor, outdoor, and gardening are 0.9, 1.4, and 1.7 m^3/hr respectively, so the weighted inhalation rate for the residential receptor is 8,400 m^3/yr. Similarly, the mass loading factor is determined to be 5.9E-06, based on the fraction of time spend by the receptor for each activity. Because the child and adult ingestion rates and exposure duration varies, exposure to the resident via ingestion of soil/sediment (43.8 g/yr) is based on a weighted average of the respective child and adult parameters. The assumptions (EPA 1997) used in this weighted average are:

- The child ingests 200 mg of soil per day, over a 6 year time period
- The adult ingests 100 mg of soil per day, over a 24 year time period.

The resident is assumed to consume 42.7 kg/yr of fruits and vegetable, and 4.6 kg/yr of leafy vegetables (EPA 2000).

2. Industrial/Utility Worker: The industrial/utility worker may participate in utility work or other intrusive outdoor activities around the site. It is assumed that the construction worker is exposed one time that takes place over an 80-hour period for a year. An inhalation rate of 1.4 m^3 per hour, a soil ingestion rate of 480 mg per day and a mass loading of 2E-4 mg/m^3 are assumed, based on NUREG/CR-5512 and *Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil* (ANL 1993).

3. Industrial/Construction Receptor: The industrial/construction worker is modeled as a typical site worker who spends most of the time indoors. The worker is at the site for 250 days per year for 25 years (EPA 1997). During a standard year, the industrial worker is assumed to spend 1600 hours indoors and 400 hours outdoors plus 125 hours (0.5 hours per day) indoors to account for possibility of eating lunch on site, early daily arrival or late daily departure. Assuming $4/5^{th}$ of time spent indoors with a soil ingestion rate of 50 mg/day (same as industrial scenario) and $1/5^{th}$ time outdoors with a rate of 480 mg/day (same as excavation scenario), the industrial worker ingests 136 mg of soil per day. The construction worker characteristics are added to the standard industrial receptor to emphasize (based on guidance from Mallinckrodt) the potential for site workers to routinely be in contact with bare soils. Based on NUREG/CR 5512, the indoor and outdoor inhalation rates for the receptor are 0.9 and 1.4 m^3 per hour respectively, so the weighted inhalation rate for the receptor is 8710 m^3/yr.

Table C-5 lists the RESRAD non-default site-specific physical parameters and the exposure parameters used for all receptors in the RESRAD computer code.

The exposure point concentrations (EPC) of the radionuclides used in the dose and risk assessment were developed by subtracting average background concentrations from the smaller of the appropriate UCL-95 and maximum detected concentration. The appropriate UCL-95 for a radionuclide was determined based on the statistical distribution of the sampling results for that radionuclide. The probability plot method was used to identify the statistical distribution of the sampling results for the radionuclide. Background was based on the 32 samples collected from the reference areas. If the UCL-95 concentration was less than the average background, the EPC was set to zero to avoid negative dose estimates. Dose and risk were explicitly calculated for

each survey unit and the overall site. The results are summarized in Table C-6. Dose and risk were explicitly calculated for each small area containing elevated activity. The results are summarized in Table C-7. The residual dose and risk were calculated assuming direct contact with contaminated soils without regard to the existence of clean backfill and/or existing cover material.

Results indicate that doses and risks are below the limits described in the ROD. The maximum industrial/construction worker dose and risk estimates for a single survey unit (SU-1A) were 2.7 mrem/yr and 4E-05, respectively. The maximum industrial/utility worker dose and risk are less than 1.0 mrem/yr and 9 E-08, respectively. Maximum residential dose and risk were 7.5 mrem/yr and 1 E-4, respectively. When averaging across the Plant 1 property, doses and risks to the utility worker, construction worker, and on-site resident were less than or equal to 2 mrem/yr and 2 E-05, respectively.

The 19 samples with the elevated concentrations were evaluated to determine if, under a worst-case scenario, the receptors would be subject to an unacceptable risk or could receive an unacceptable dose while exposed to small areas of elevated activity. Dose and risk results for each sample with a $SOR_N > 1$ are presented in Table C-7.

In summary, doses and risks calculated for accessible areas in each individual SU and averaged over Plant 1 satisfy the ROD RGs at SLDS Plant 1. RESRAD output files for all modeled scenarios as well geographical and analytical attributes of individual samples are on file as part of the administrative record for the SLDS.

Table C-5 Relevant Non-default SLDS Plant 1 Exposure Parameters

PARAMETER	Units	Industrial/ Utility Worker	Industrial / Construction Worker	Onsite Residential
Class 1A	m^2	700	700	700
Class 1B	m^2	656	656	656
Class 2A	m^2	5400	5400	5400
Class 2B	m^2	4944	4944	4944
Thickness of contamination zone	m	Surface = 0.15; Subsurface = 2	Surface = 0.15; Subsurface = 2	Surface = 0.15; Subsurface = 2
Cover Thickness	m	Surface=0; Subsurface =0.15	Surface=0; Subsurface =0.15	Surface=0; Subsurface =0.15
Contaminant zone Erosion Rate	m/yr	0.00006	0.00006	0.00006
Density of contaminated zone	g/cm^3	1.28 (For clay loam soil)	1.28 (For clay loam soil)	1.28 (For clay loam soil)
Contaminated zone total porosity		0.42	0.42	0.42
Contamination zone hydraulic conductivity	m/yr	3.048	3.048	3.048
Contaminated zone b parameter		10.4	10.4	10.4
Precipitation	m/yr	0.92	0.92	0.92
Irrigation	m/yr	0	0	0
Runoff Co-efficient		0.8	0.8	0.8
Exposure Duration	yr	1	25	30
Inhalation rate	m^3/yr	12,300	8,710	8,400
Mass loading for inhalation	g/m^3	2E-4	2E-4	5.9E-06
Fraction of time indoors	-	0	0.1969	0.655
Fraction of time outdoors	-	0.0091	0.04566	0.0799
Soil ingestion rate	g/yr	175.2	49.64	43.8
Fruit, vegetable, and grain consumption	kg/yr	NA	NA	42.7
Leafy vegetable consumption	kg/yr	NA	NA	4.66
Shielding factor, inhalation	-	0.5	0.5	0.5

NA = Not applicable for this receptor scenario

Table C-6 Residual Dose and Risk Above Background

Class	Soil	Survey Unit	Construction Worker			Utility Worker			Onsite Resident		
			Maximum Dose[1]	Year at Max Dose	Maximum Risk	Maximum Dose[1]	Year at Max Dose	Maximum Risk	Maximum Dose[1]	Year at Max Dose	Maximum Risk
1	Surface	1A	2.7	0	4.0E-05	0.20	0	9.0E-08	7.5	0	1.0E-04
1	Surface	1B	2.1	0	6.0E-05	0.20	0	8.0E-08	6.2	0	1.0E-04
1	Subsurface	1	0.2	1000	3.0E-06	0.01	1000	7.0E-09	1.2	1000	2.0E-05
2	Surface	2A	0.3	246	5.0E-06	0.02	0	9.0E-09	0.8	288	2.0E-05
2	Subsurface	2BC	0.2	1000	3.0E-06	0.01	1000	6.0E-09	0.8	1000	2.0E-05
2	Surface	2D	0.1	0	1.0E-06	0.01	0	4.0E-09	0.3	388	1.0E-05
2	Subsurface	2EF	0.2	1000	3.0E-06	0.009	1000	6.0E-09	0.8	1000	2.0E-05
SITE	**Surface**	---	0.5	0	1.0E-06	0.03	0	2.0E-08	1.3	0	2.0E-05
SITE	**Subsurface**	---	0.2	1000	6.0E-06	0.01	1000	3.0E-09	0.8	0	6.0E--06
SITE			0.6	0	1.0E-06	0.03	0	2.0E-08	1.6	0	2.0E-05

[1] Unit of dose is mrem/year.

Table C-7 Dose and Risk Estimates for Areas of Elevated Activity

SAMPLE ID	SOR_N	Area (m^2)	Construction Worker			Utility Worker			Onsite Resident		
			Maximum Dose[1]	Year at Max Dose	Maximum Risk	Maximum Dose[1]	Year at Max Dose	Maximum Risk	Maximum Dose[1]	Year at Max Dose	Maximum Risk
HTZ00166	1.84	1	0.5	0	4.0E-06	0.04	0	1.0E-08	0.6	0	1.0E-05
HTZ00167	1.12	1	0.3	0	2.0E-06	0.02	0	6.0E-09	0.3	0	5.0E-06
HTZ00168	1.67	1	0.5	0	3.0E-06	0.04	0	1.0E-08	0.7	0	8.0E-06
HTZ00322	1.09	3	0.3	0	3.0E-06	0.02	0	8.0E-09	0.6	310	1.0E-05
HTZ00343	2.72	1	1.3	0	1.0E-05	0.10	0	3.0E-08	1.9	0	3.0E-05
HTZ00344	1.90	3	1.1	0	3.0E-05	0.07	0	3.0E-08	1.9	10	3.0E-05
HTZ00441	1.26	4	0.7	3	8.0E-06	0.05	0.94	2.0E-08	1.4	7.6	2.0E-05
HTZ00442	1.03	2	0.5	9.4	6.0E-06	0.04	5.9	1.0E-08	1.0	15.9	2.0E-05
HTZ00476	1.27	0.5	2.6	0	5.0E-05	0.10	0	1.0E-07	7.5	0	1.0E-04
HTZ00494	1.32	1	2.9	0	5.0E-05	0.20	0	1.0E-07	8.0	0	2.0E-04
HTZ00518	4.17	1	1.4	0	1.0E-05	0.10	0	3.0E-08	1.8	0	3.0E-05
HTZ00671	3.27	1.5	1.1	0	2.0E-05	0.07	0	3.0E-08	2.2	16.7	5.0E-05
HTZ00694	1.09	1	0.5	0	4.0E-06	0.03	0	1.0E-08	0.6	15.4	1.0E-05
HTZ27393	1.96	1	0.7	0	5.0E-06	0.05	0	2.0E-08	0.8	0	1.0E-05
HTZ27395	1.05	1	0.5	0	5.0E-06	0.03	0	1.0E-08	0.8	0	1.0E-05
SLD06139	1.10	4.5	0.7	15.3	1.0E-05	0.05	0	2.0E-08	1.6	24.9	3.0E-05
SLD06476	1.42	23.6	2.0	0	2.0E-05	0.10	0	6.0E-08	4.7	0	6.0E-05
HTZ27419	1.23	1	0.3	0	2.0E-06	0.20	0	8.0E-09	0.5	0	6.0E-06
HTZ66310	1.23	1	2.7	0	5.0E-05	0.10	0	1.0E-07	7.8	0	2.0E-04

[1] Unit of dose is mrem/year.

C.8 INACCESSIBLE AREA EVALUATION

The approach used to delineate the inaccessible soils at Plant 1 was derived directly from the ROD definition of accessible soils. The ROD defines accessible soils as soils that are not beneath buildings or other permanent structures (e.g., active rail lines, roadways, the levee). The ROD states that inaccessible soils containing MED/AEC contamination and associated buildings and structures are excluded from the scope of the ROD because they do not present a significant threat in their current configuration and because activities critical to the continued operation of the Mallinckrodt facility prevent excavation beneath the encumbrances. Inaccessible soils at Plant 1 are not within the scope of the SLDS ROD and will be addressed at a later time.

Areas shown as inaccessible on Figure C-1-8 in Attachment C-1 include those that do not meet the definition of an accessible area as defined in the ROD. Buildings are defined as the footprint of the structure, supporting soil beneath the footprint, and soil adjacent to the building necessary for structural stability of the building. Roadways and rail lines are defined as the applicable right-of-way and supporting soil.

There are ten areas of soil observed to contain radionuclides at concentrations above ROD concentration-based RGs, but were not accessible for remediation. These locations are shown on Figure C1-8 in Attachment C-1, and are discussed below.

1. The inaccessible area located adjacent to Strip 2, Cell 1 of the K-pad excavation near the northwest corner of Building C could not be excavated without compromising the integrity of the adjacent building foundation.

2. The inaccessible area located at the south end of Strip 2, Cell 2 of the K-pad excavation could not be excavated due to the presence of a large abandoned concrete foundation in a confined area where removal could have compromised the integrity of the building foundation.

3. The inaccessible area located adjacent to Building L in the southern portion of UE-4 could not be remediated without disturbing the utilities adjacent to the building of this foundation.

4. The inaccessible area located near the northwest corner of Building 8 adjacent to the Bent 11 excavation could not be excavated without compromising the integrity of the Building 8 foundation that is supported by old rubble footings from a previously removed building.

5. An inaccessible area is located beneath a stair-support column footing in Area 3A west of Building 8.

6. An inaccessible area is located beneath the containment curb adjacent to a substation in Area 3 west of Building 8. This area could not be remediated without disturbing the foundation of this permanent structure.

7. The inaccessible area adjacent to Area 7/8 W is under a diked containment area. Removal of soil there would have affected operations in the adjacent building.

8. The inaccessible area adjacent to Area 6 South extends under Building 26. This area could not be remediated without jeopardizing the integrity of that building.

9. An inaccessible area is located adjacent to the north and west sides of a diked containment area and an electrical control panel. Remediation there would have compromised this containment area, and its required use for plant operation.

10. The inaccessible area located north of Area 11 adjacent to the concrete ramp going to the Building X loading dock could not be remediated without disturbing the foundation of this permanent structure.

Three areas of inaccessible soil were investigated during the remediation of Plant 1 by collecting horizontal boring soil samples beneath permanent structures. The areas include the soil adjacent to Area 1 East and Area 1 West beneath Building 25 and the soils to the east of the Containment Pad excavation beneath the stairway and tank containment structures.

The interface between Area 1 East excavation and the soil below the foundation of Building 25 was investigated by advancing four horizontal borings to the north a distance of 5 ft beneath Building 25. The average radionuclide concentrations are 0.0 pCi/g for Ra-226, 0.2 pCi/g for Ra-228, 0.1 pCi/g for Th-230, 0.3 pCi/g for Th-232, and 32.1 pCi/g for U-238.

The interface between Area 1 West excavation and the soil below the foundation of Building 25 was investigated by advancing two horizontal borings to the north a distance of 5 ft beneath Building 25 and collecting two sidewall surface samples (i.e., 0-15 cm). The average radionuclide concentrations are 1.06 pCi/g for Ra-226, 1.17 pCi/g for Ra-228, 2.20 pCi/g for Th-230, 1.20 pCi/g for Th-232, and 36.01 pCi/g for U-238.

The area to the east of the Containment Pad excavation extending beneath the pump pad, stairway supports, and chemical spill containment for the alcohol tank was investigated by advancing seven horizontal borings from 0.60 m (2 ft) to 1.50 m (5 ft.). The boring span was approximately 16.7 m (55 ft) from north to south. The average radionuclide concentrations are 9.1 pCi/g for Ra-226, 0.87 pCi/g for Ra-228, 11.03 pCi/g for Th-230, 0.91 pCi/g for Th-232, and 11.32 pCi/g for U-238.

There is an estimated 9,585m^2 of inaccessible soils in Plant 1. Of that, about 80m^2 of the area has some amount of limited sampling information available.

C.9 ALARA ANALYSIS

Elevated areas of soils having an SOR > 1 can be left in place and still meet the RGs. An ALARA analysis was used as a basis for determining whether it was appropriate to incur additional costs to achieve the reduction in dose and risk by the removal of additional soils whose concentrations are below RGs. An evaluation was performed consistent with NRC *NMSS Decommissioning Standard Review Plan NUREG-1727* (NCR 2000) as a measure of the cost effectiveness of leaving soils in the accessible areas of Plant 1 that exhibit an SOR in excess of 1.0. Soil samples with an SOR in excess of 1.0 are listed in Table C-6. Leaving soils with SORs > 1 may be ALARA according to the NRC guidance, if the benefits of remediation are less than the cost of remediation. Then the levels of residual radioactivity are ALARA without taking the additional remedial action. NUREG-1727 gives the formula for calculating the benefit from averted dose as provided below.

where

$$B_{AD} = \$2{,}000 \times PW(AD_{collective})$$

B_{AD}	=	benefit from averted dose for a remedial action
$2,000	=	value in dollars of a person-rem averted
$PW(AD_{collective})$	=	present worth of future collective averted dose.

The present worth of the future averted collective dose can be calculated from the equation shown below.

$$PW(AD_{collective}) = P_D \times A \times 0.025 \times F \times \frac{Conc}{DCGL_W} \times \frac{1 - e^{-(r+\lambda)N}}{r + \lambda}$$

where

P_D	=	population density for the critical group scenario in people/m^2, 0.0004 from DG-4006
A	=	area being evaluated in m^2, 62 m^2 is used as the sum of the areas exceeding an SOR of 1.
0.025	=	annual dose to an average member of the critical group from residual radioactivity at the concentration-based RG in rem/yr.
F	=	fraction of the residual activity removed by the remedial action; in this case F = 1 to represent all areas exceeding an SOR of 1.
Conc	=	average concentration of residual radioactivity in the area being evaluated (pCi/g). The area weighted SOR_N for the elevated accessible soil areas of Plant 1 is 1.43.
$DCGL_W$	=	derived concentration guideline; in this case, $SOR_N = 1$.
r	=	monetary discount rate; 0.03/yr as recommended by DG-4006.
λ	=	radiological decay constant. U-238 was chosen as the representative decay constant because this would give the most conservative result (highest present worth factor) = 1.55 E-10/yr.
N	=	number of years over which the collective dose will be calculated; 1000 as recommended by NUREG-1727.

Although the SOR = 1 value that was used as the concentration-based RG for Plant 1 is not based on the 25 mrem standard used in the equation, using 0.025 is a conservative approach (the calculated doses from the elevated areas are all less than or equal to 8.0 mrem/yr). Using these equations, the benefit from the averted dose (B_{AD}) was calculated to be $60.

The cost of remediating the remaining areas was based on actual costs incurred by remediation contractors during similar projects in the St. Louis district, but does not include overhead, mobilization, and other related costs that NUREG-1727 allows to be considered in an ALARA analysis. The estimated cost of excavation, transportation, and disposal of the remaining elevated areas is approximately $11,000. The cost of further remediation greatly exceeds the economic benefit of the averted dose. Therefore the action is ALARA.

C.10 CONCLUSIONS

The USACE and EPA determined that selective excavation and disposal was the most appropriate remedy for groundwater and accessible soil at SLDS based upon consideration of the requirements of CERCLA, a detailed analysis of the alternatives, and extensive public participation and comment. The remedy for Plant 1 addressed soil contaminated with radioactivity related to MED/AEC uranium manufacturing and processing at the SLDS.

The residual radioactivity in accessible areas at SLDS Plant 1 meets all requirements specified in the ROD. This conclusion is the result of comparison of ROD RGs and the residual site condition in accessible areas.

ATTACHMENT C-1

PLANT 1 FINAL STATUS SURVEY UNITS AND SOIL SAMPLING LOCATIONS FIGURES

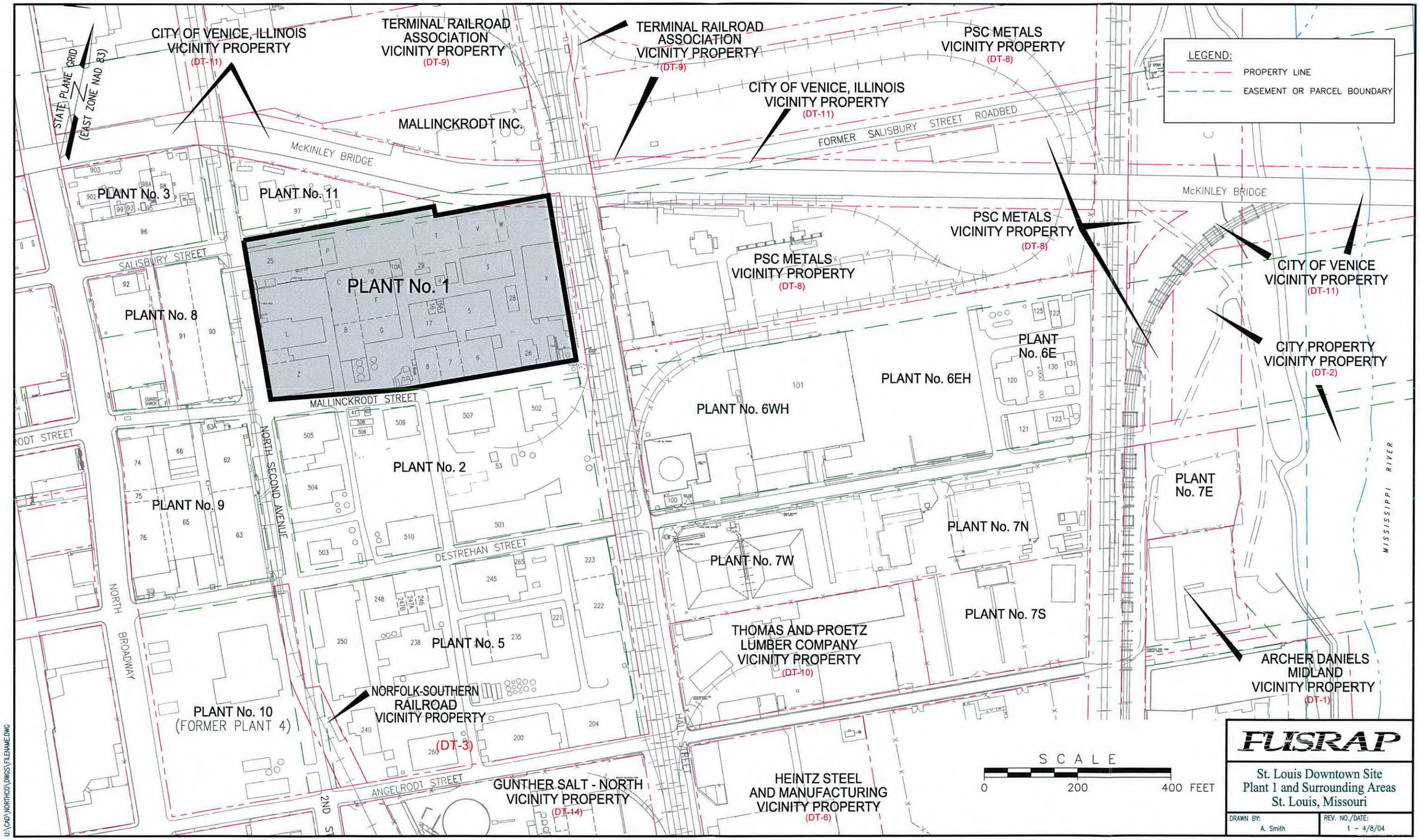
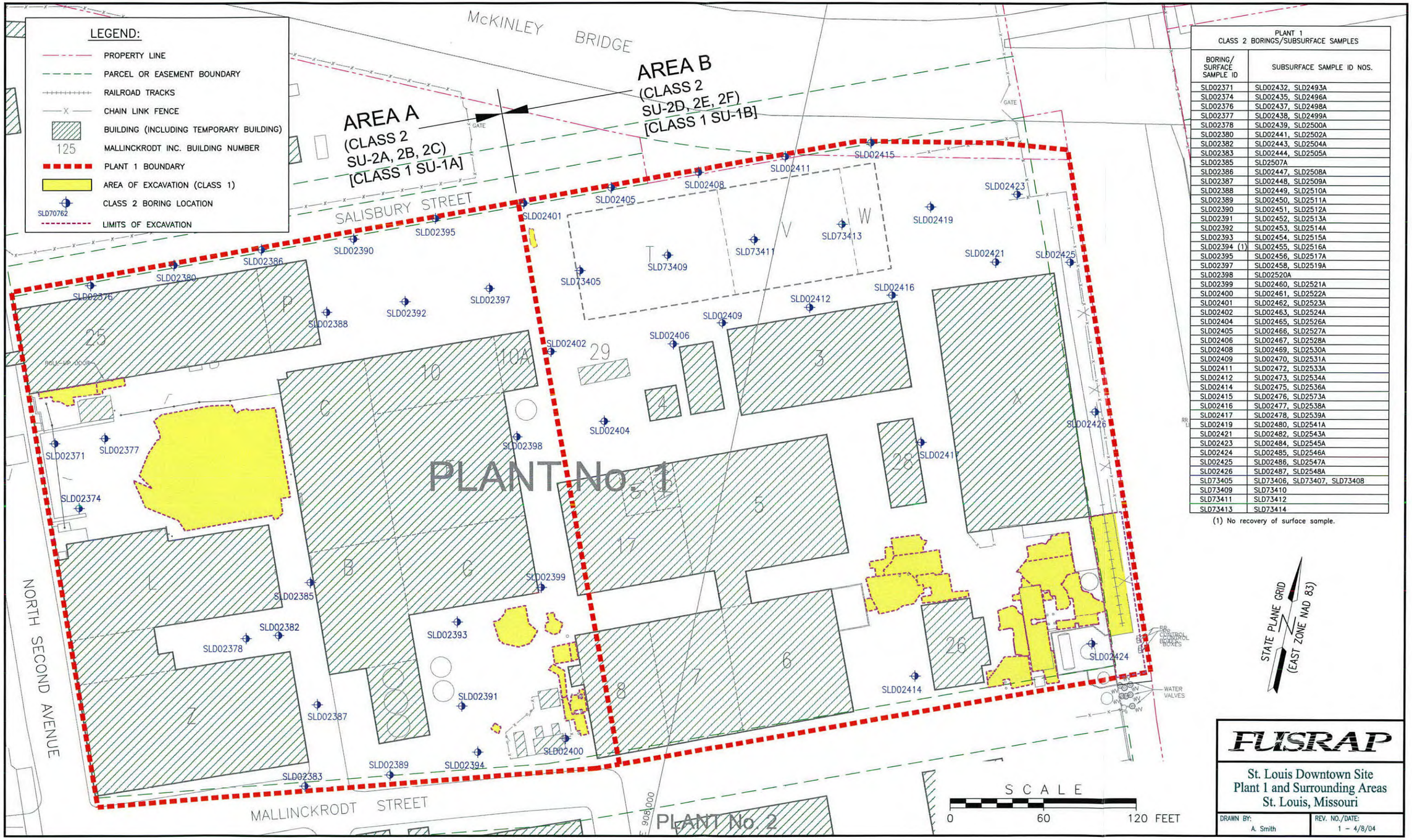


Figure C1-1. Mallinckrodt Property



PLANT 1
CLASS 2 BORINGS/SUBSURFACE SAMPLES

BORING/ SURFACE SAMPLE ID	SUBSURFACE SAMPLE ID NOS.
SLD02371	SLD02432, SLD2493A
SLD02374	SLD02435, SLD2496A
SLD02376	SLD02437, SLD2498A
SLD02377	SLD02438, SLD2499A
SLD02378	SLD02439, SLD2500A
SLD02380	SLD02441, SLD2502A
SLD02382	SLD02443, SLD2504A
SLD02383	SLD02444, SLD2505A
SLD02385	SLD2507A
SLD02386	SLD02447, SLD2508A
SLD02387	SLD02448, SLD2509A
SLD02388	SLD02449, SLD2510A
SLD02389	SLD02450, SLD2511A
SLD02390	SLD02451, SLD2512A
SLD02391	SLD02452, SLD2513A
SLD02392	SLD02453, SLD2514A
SLD02393	SLD02454, SLD2515A
SLD02394 (1)	SLD02455, SLD2516A
SLD02395	SLD02456, SLD2517A
SLD02397	SLD02458, SLD2519A
SLD02398	SLD02520A
SLD02399	SLD02460, SLD2521A
SLD02400	SLD02461, SLD2522A
SLD02401	SLD02462, SLD2523A
SLD02402	SLD02463, SLD2524A
SLD02404	SLD02465, SLD2526A
SLD02405	SLD02466, SLD2527A
SLD02406	SLD02467, SLD2528A
SLD02408	SLD02469, SLD2530A
SLD02409	SLD02470, SLD2531A
SLD02411	SLD02472, SLD2533A
SLD02412	SLD02473, SLD2534A
SLD02414	SLD02475, SLD2536A
SLD02415	SLD02476, SLD2573A
SLD02416	SLD02477, SLD2538A
SLD02417	SLD02478, SLD2539A
SLD02419	SLD02480, SLD2541A
SLD02421	SLD02482, SLD2543A
SLD02423	SLD02484, SLD2545A
SLD02424	SLD02485, SLD2546A
SLD02425	SLD02486, SLD2547A
SLD02426	SLD02487, SLD2548A
SLD73405	SLD73406, SLD73407, SLD73408
SLD73409	SLD73410
SLD73411	SLD73412
SLD73413	SLD73414

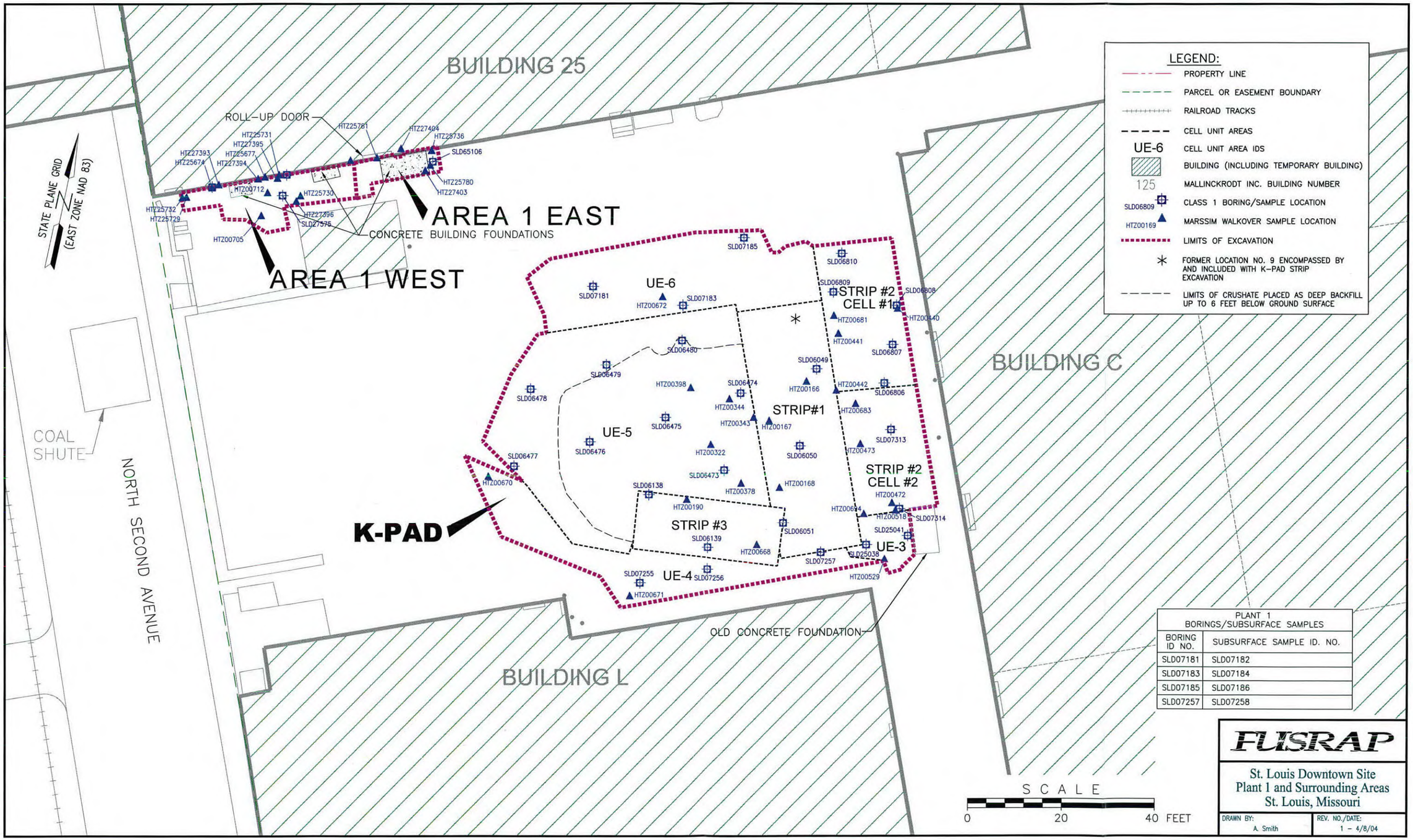
(1) No recovery of surface sample.

FUSRAP

St. Louis Downtown Site
Plant 1 and Surrounding Areas
St. Louis, Missouri

DRAWN BY:	REV. NO./DATE:
A. Smith	1 – 4/8/04

Figure C1-2. Excavation Areas and Class 2 Sample Locations



PLANT 1
BORINGS/SUBSURFACE SAMPLES

BORING ID NO.	SUBSURFACE SAMPLE ID. NO.
SLD07181	SLD07182
SLD07183	SLD07184
SLD07185	SLD07186
SLD07257	SLD07258

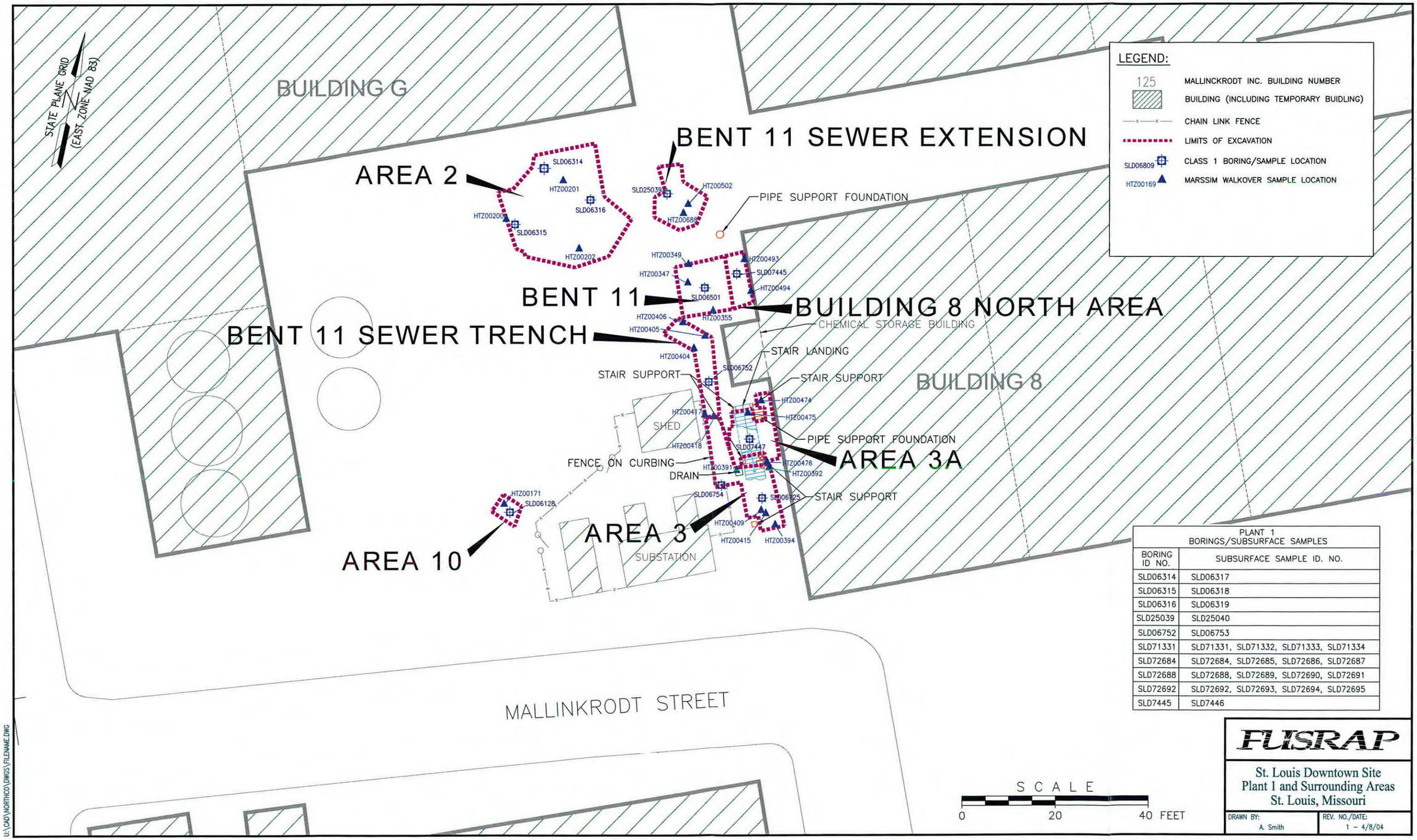
FUSRAP

St. Louis Downtown Site
Plant 1 and Surrounding Areas
St. Louis, Missouri

DRAWN BY: A. Smith
REV. NO./DATE: 1 – 4/8/04

Figure C1-3. Class 1 Survey Unit 1A Samples (1 of 2)

ken.pitts



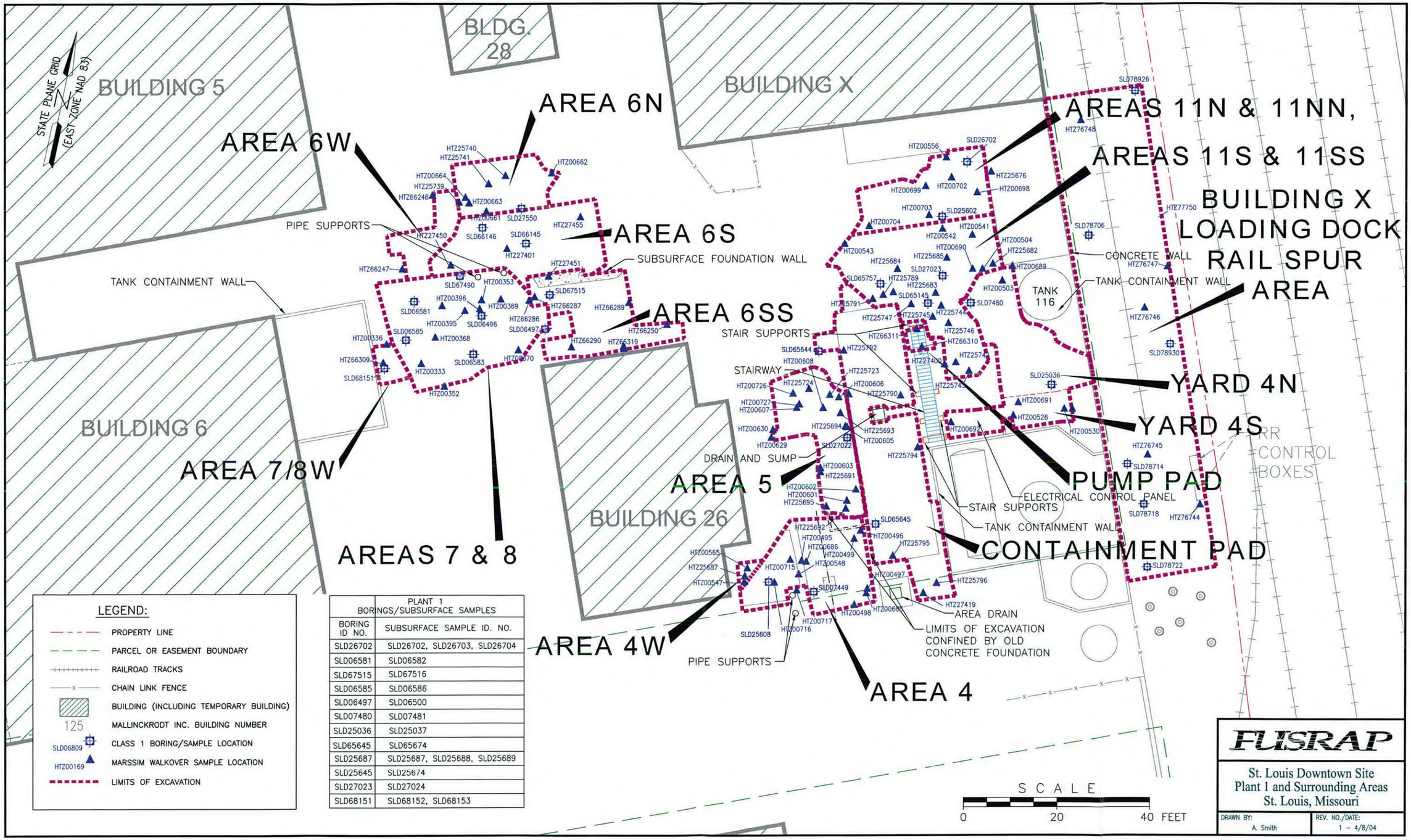
PLANT 1 BORINGS/SUBSURFACE SAMPLES	
BORING ID NO.	SUBSURFACE SAMPLE ID. NO.
SLD06314	SLD06317
SLD06315	SLD06318
SLD06316	SLD06319
SLD25039	SLD25040
SLD06752	SLD06753
SLD71331	SLD71331, SLD71332, SLD71333, SLD71334
SLD72684	SLD72684, SLD72685, SLD72686, SLD72687
SLD72688	SLD72688, SLD72689, SLD72690, SLD72691
SLD72692	SLD72692, SLD72693, SLD72694, SLD72695
SLD7445	SLD7446

FUSRAP

St. Louis Downtown Site
Plant 1 and Surrounding Areas
St. Louis, Missouri

DRAWN BY:	REV. NO./DATE:
A. Smith	1 – 4/8/04

Figure C1-4. Class 1 Survey Unit 1A Samples (2 of 2)



LEGEND:

- PROPERTY LINE
- PARCEL OR EASEMENT BOUNDARY
- RAILROAD TRACKS
- CHAIN LINK FENCE
- BUILDING (INCLUDING TEMPORARY BUILDING)
- 125 — MALLINCKRODT INC. BUILDING NUMBER
- SLD06809 — CLASS 1 BORING/SAMPLE LOCATION
- HTZ00169 — MARSSIM WALKOVER SAMPLE LOCATION
- LIMITS OF EXCAVATION

PLANT 1 BORINGS/SUBSURFACE SAMPLES	
BORING ID NO.	SUBSURFACE SAMPLE ID. NO.
SLD26702	SLD26702, SLD26703, SLD26704
SLD06581	SLD06582
SLD67515	SLD67516
SLD06585	SLD06586
SLD06497	SLD06500
SLD07480	SLD07481
SLD25036	SLD25037
SLD65645	SLD65674
SLD25687	SLD25687, SLD25688, SLD25689
SLD25645	SLD25674
SLD27023	SLD27024
SLD68151	SLD68152, SLD68153

FUSRAP

St. Louis Downtown Site
Plant 1 and Surrounding Areas
St. Louis, Missouri

DRAWN BY: A. Smith
REV. NO./DATE: 1 – 4/8/04

Figure C1-5. Class 1 Survey Unit 1B Samples (1 of 2)

craig butler

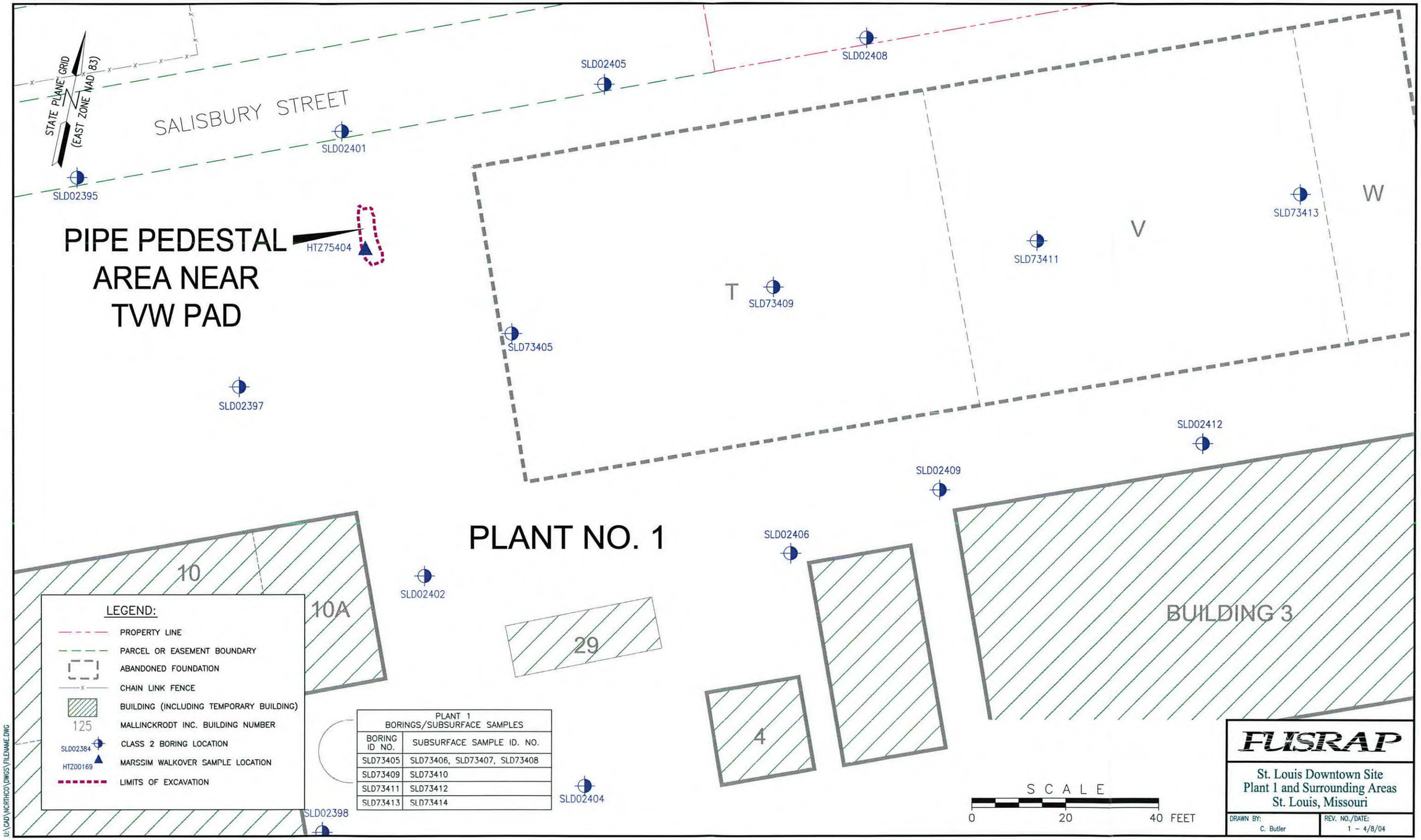


Figure C1-6. Class 1 Survey Unit 1B Samples (2 of 2)

Figure C1-7. Preferential Pathway Sample Locations

Figure C1-8. Inaccessible Areas

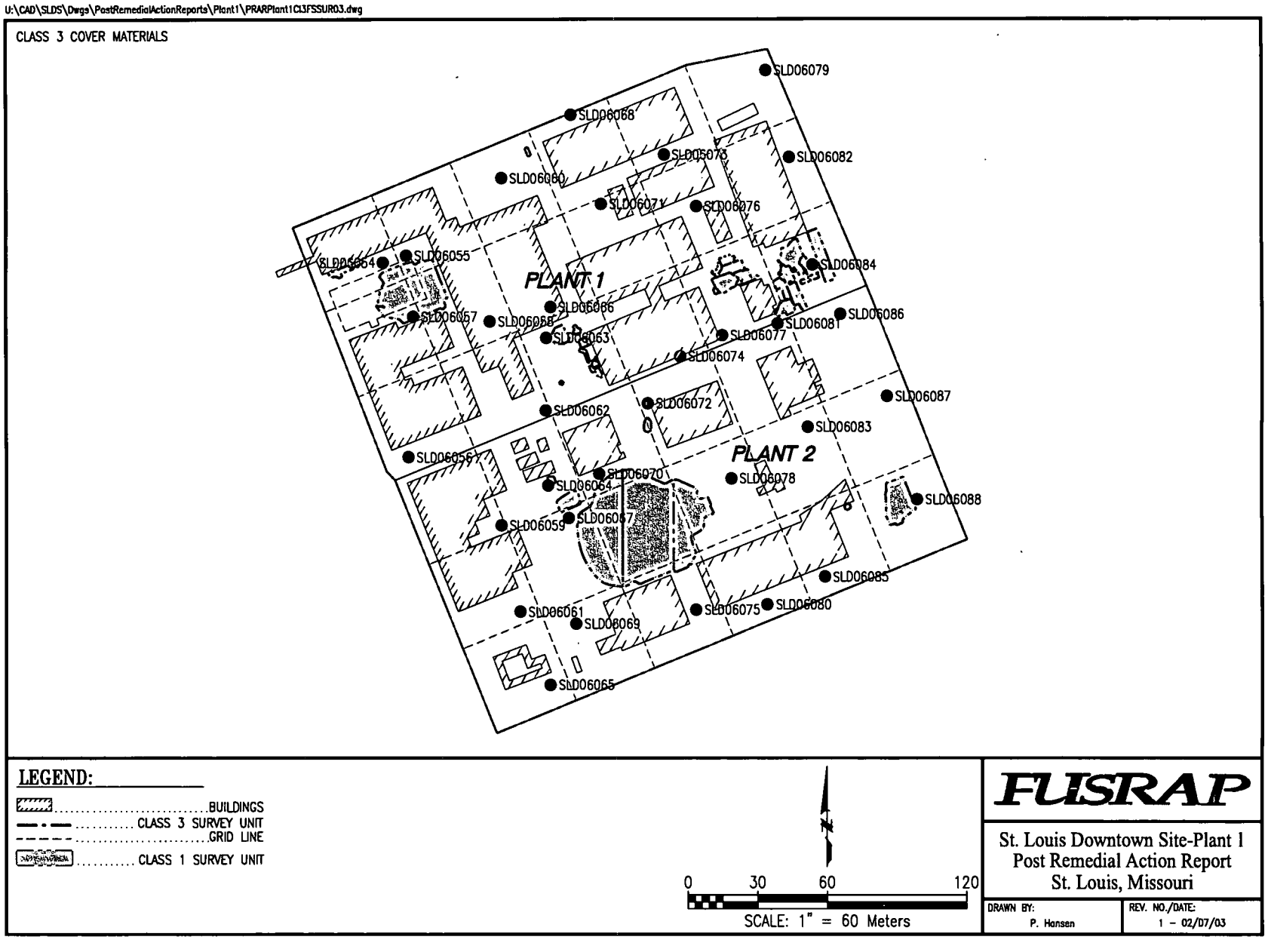


Figure C1-9. MARSSIM Class 3 Final Status Survey Unit at SLDS Plant 1 and Plant 2

ATTACHMENT C-2

PLANT 1 QUALITY CONTROL SUMMARY REPORT

PLANT 1
QUALITY CONTROL SUMMARY REPORT

C-2.1 INTRODUCTION

C-2.1.1 Project Description

Class 1, 2 and 3 final status survey sampling for Plant 1 at the St. Louis Downtown Site. Sampling was conducted in accordance with *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) protocols and the *Radiological Final Status Survey Plan for Accessible Soil within Plant 1, Plant 2, and the City Property at the St. Louis Downtown Site* (USACE 1999a).

C-2.1.2 Project Objectives

The intent of the final status survey was to determine whether each survey unit satisfies concentration-based and dose-based criteria as defined in the SLDS ROD.

C-2.1.3 Project Implementation

The scope of work for this sampling was submitted to the USACE in December 1999 and authorized in July 2000. The sampling was conducted from July 2000 until March 2002. Radiological analyses were conducted by the onsite FUSRAP laboratory at the HISS with QA split samples being analyzed by Severn-Trent Laboratories.

C-2.1.4 Purpose of this Report

The primary intent of this assessment is to illustrate that data generated for this sampling can withstand scientific scrutiny, are appropriate for their intended purpose, are technically defensible, and are of known and acceptable sensitivity, precision, and accuracy.

C-2.2 QUALITY ASSURANCE PROGRAM

A Quality Assurance Project Plan (QAPP) was developed for this project and is part of the *Sampling and Analysis Guide for the St. Louis Site* (SAG)(USACE 2000) for St. Louis Sites. The QAPP established requirements for both field and laboratory QC procedures. In general, analytical laboratory QC duplicates, matrix spikes, laboratory control samples, method blanks were required for every 20 samples or less of each matrix and analyte.

A primary goal of the QA program was to ensure that the quality of results for all environmental measurements was appropriate for their intended use. To this end, a QAPP and standardized field procedures were compiled to guide the investigation. Through the process of readiness review, training, equipment calibration, QC implementation, and detailed documentation, the project has successfully accomplished the goals set by the QA Program.

EPA "definitive" data has been reported including the following basic information:

a. laboratory case narratives
b. sample results
c. laboratory method blank results
d. laboratory control standard results
e. laboratory sample matrix spike recoveries
f. laboratory duplicate results

g. surrogate recoveries (VOCs, SVOCs, Pesticide/PCBs)
h. sample extraction dates
i. sample analysis dates

This information from the laboratory, along with field information, provides the basis for subsequent data evaluation relative to sensitivity, precision, accuracy, representativeness and completeness. These parameters have been presented in Section C-2.4.

C-2.3 DATA VALIDATION

This project implemented the use of data validation checklists to facilitate laboratory data validation. These checklists were completed by the project designated validation staff and were reviewed by the project laboratory coordinator. Data validation checklists for each laboratory sample delivery group (SDG) have been retained with laboratory data deliverables by SAIC.

C-2.3.1 Laboratory Data Validation

Analytical data generated for this project have been subjected to a process of data verification, validation, and review. Several criteria have been established against which the data are compared and from which a judgment is rendered regarding the acceptance and qualification of the data. Because it is beyond the scope of this report to cite those criteria, the reader is directed to: SAIC Quality Assurance Technical Procedure Volume I, TP-DM-300-7, *Data Management* (SAIC 2004).

Upon receipt of field and analytical data, verification staff performed a systematic examination of the reports, following standardized data package checklists, to ensure the content, presentation, and administrative validity of the data. In conjunction with data package verification, laboratory electronic data diskettes were available. These diskette deliverables were subjected to review and verification against the hardcopy deliverable. Both a structural and technical assessment of the laboratory-delivered electronic reports was performed. The structural evaluation ensured that all required data had been reported and contract specified requirements were met (i.e., analytical holding times, contractual turnaround times, etc.).

During the validation phase of the review and evaluation process, data were subjected to a systematic technical review by examining all field and analytical QC results and laboratory documentation, following appropriate guidelines for laboratory data validation. These data validation guidelines define the technical review criteria, methods for evaluation of the criteria, and actions to be taken resulting from the review of these criteria. The primary objective of this phase was to assess and summarize the quality and reliability of the data for the intended use and to document factors that may affect the usability of the data. Data verification/validation included but was not necessarily limited to the below listed parameters:

Method Requirements

Requirements for all methods.
- Holding time information and methods requested
- Discussion of laboratory analysis, including any laboratory problems

Radiochemical Analysis
- Sample results
- Initial calibration
- Efficiency check
- Background determinations
- Spike recovery results
- Internal standard results (tracers or carriers)
- Duplicate results
- Self-absorption factor (α,β)
- Cross-talk factor (α,β)
- LCS
- Run log

As an end result of this phase of the review, the data were qualified based on the technical assessment of the validation criteria. Qualifiers were applied to each field and analytical result to indicate the usability of the data for its intended purpose. The majority of estimated values were assigned to analyte concentrations observed between the reporting level and method detection levels. All data has been appropriately identified and qualified.

C-2.3.2 Definition of Data Qualifiers (Flags)

During the data validation process, all laboratory data were assigned appropriate data validation flags and reason codes. Validation flags consisted of the below listed elements:

"=" Positive Result.

"U" When the material was analyzed for, but not detected above the level of the associated value.

"J" When the associated value is an estimated quantity. Indicating there is cause to question accuracy or precision of the reported value.

"UJ" When the analyte was analyzed for, but not detected, above the associated value, however, the reported value is an estimate and demonstrates an decreased knowledge of its accuracy or precision.

"R" When the analyte value reported is unusable. The integrity of the analyte's identification, accuracy, precision, or sensitivity have raised significant question as to the reality of the information presented.

SAIC validation flagging codes and copies of validation checklists and qualified data forms are on-file with the analytical laboratory deliverable.

C-2.4 DATA EVALUATION

C-2.4.1 Accuracy

Accuracy provides a gauge or measure of the agreement between an observed result and the true value for an analysis. Analytical accuracy is evaluated by measuring the agreement between an analytical result and its

known or true value. This is generally determined through use of laboratory control samples (LCSs), matrix spike (MS) analysis, and performance evaluation (PE) samples. Accuracy, as measured through the use of LCSs, determines the methods implementation of accuracy independent of sample matrix, as well as document laboratory analytical process control. Accuracy determined by the MS is a function of both matrix and analytical process.

C-2.4.1.1 Radiological Parameters

Individual sample chemical yields and LCS recoveries were within the ± 25% criteria for the verification samples, and the data can be used for its intended purpose.

C-2.4.1.2 Inter-Laboratory Accuracy

As a measure of analytical accuracy, relative percent differences (RPD) for split sample pairs for the two radiological analytical groups (i.e., alpha spectroscopy and gamma spectroscopy) were employed, using an independent contract laboratory. Sample homogeneity, analytical method performance, and the quantity of analyte being measured all contribute to this measure of sample analytical accuracy.

As the RPD approaches zero, complete agreement is achieved between the split sample pairs. When one or both sample values were between the quantitation level and less than five times the analyte reporting level, the normalized absolute difference (NAD) was evaluated. If both samples were not detected for a given analyte, precision was considered acceptable.

The analytical accuracy (i.e., split precision) between the FUSRAP laboratory and the contract laboratory met the SAG goal of ensuring that 90% of the Plant 1 verification samples were within either the ±35% criteria for relative percent difference (RPD) data quality indicator (DQI) or < 1.96 for the normalized absolute difference (NAD) DQI (Tables C-2-1 and C-2-2). Samples that are outside of the control limits are shaded.

Table C-2-1. Split Precision Among Alpha Spectroscopy Analyses

Alpha Spec.	TH-228		TH-230		TH-232	
Parent ID/Field Dup. ID	RPD	NAD	RPD	NAD	RPD	NAD
SLD01126/SLD21126	6.25%	NA	NA	1.13	8.00%	NA
SLD02389/SLD22389	10.91%	NA	16.22%	NA	15.56%	NA
SLD02419/SLD22419	NA	1.39	0.56%	NA	3.83%	NA
SLD02430/SLD22430	8.00%	NA	9.19%	NA	NA	1.08
SLD02440/SLD22440	18.98%	NA	4.99%	NA	NA	0.63
SLD02460IT/SLD22460	NA	0.59	19.24%	NA	NA	1.25
SLD02470IT/SLD22470	NA	0.69	NA	0.56	18.18%	NA
SLD02475IT/SLD22475	NA	0.54	7.45%	NA	NA	0.60
SLD06060/SLD06060-2	NA	0.67	4.00%	NA	NC	NC
SLD06475/SLD06475-2	NC	NC	NA	0.92	21.46%	NA
SLD07445/SLD07445-2	NA	0.85	NA	1.65	25.00%	NA
SLD25039/SLD25039-2	NA	1.08	NA	1.12	NA	0.95
SLD27550/SLD27550-2	NC	NC	11.55%	NA	NC	NC
SLD65644/SLD65644-2	27.83%	NA	NA	2.21	13.48%	NA
SLD71332/SLD71332-2	NA	1.35	2.25%	NA	10.60%	NA

NC – Value not calculated due to one or both of the results were non-detected.
NA – Not applicable.

Table C-2-2. Split Precision Among Gamma Spectroscopy Analyses

Gamma Spec.	AC-227		AM-241		CS-137		K-40		PA-231		RA-226		RA-228		U-235		U-238	
Parent ID/Field Dup. ID	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
SLD01126/SLD21126	NC	NC	NC	NC	NC	NC	NA	2.13	NC	NC	19.90%	NA	NC	NC	NC	NC	NC	NC
SLD02389/SLD22389	NC	NC	NC	NC	NC	NC	4.69%	NA	NC	NC	6.62%	NC	8.26%	NA	NC	NC	NC	NC
SLD02419/SLD22419	NC	NC	NC	NC	NC	NC	25.78%	NA	NC	NC	46.23%	4.73	76.50%	4.9	NC	NC	NC	NC
SLD02430/SLD22430	NC	NC	NC	NC	NC	NC	13.18%	NA	NC	NC	4.69%	NC	15.76%	NA	NC	NC	NC	NC
SLD02440/SLD22440	NC	NC	NC	NC	NC	NC	3.84%	NA	NC	NC	17.65%	NA	21.95%	NA	NC	NC	NC	NC
SLD02460IT/SLD22460	NC	NC	NC	NC	NC	NC	7.35%	NA	NC	NC	18.13%	NA	6.22%	NA	NC	NC	39.20%	NA
SLD02470IT/SLD22470	NC	NC	NC	NC	NC	NC	1.81%	NA	NC	NC	15.11%	NA	18.00%	NA	NC	NC	NC	NC
SLD02475IT/SLD22475	NC	NC	NC	NC	NC	NC	3.12%	NA	NC	NC	10.73%	NA	13.04%	NA	NC	NC	NC	NC
SLD06060/SLD06060-2	NC	NC	NC	NC	NC	NC	NA	1.8	NC	NC	NA	1.31	NC	NC	NC	NC	NC	NC
SLD06475/SLD06475-2	NC	NC	NC	NC	NC	NC	28.48%	NA	NC	NC	12.68%	NA	NC	NC	NC	NC	NC	NC
SLD07445/SLD07445-2	NC	NC	NC	NC	NC	NC	15.73%	NA	NC	NC	82.76%	3.83	NA	0.53	85.90%	2.77	NC	NC
SLD25039/SLD25039-2	NC	NC	NC	NC	NC	NC	20.90%	NA	NC	NC	4.88%	NA	7.00%	NA	NC	NC	NC	NC
SLD27550/SLD27550-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1.90%	NA	NC	NC	NC	NC
SLD65644/SLD65644-2	NC	NC	NC	NC	NC	NC	8.21%	NA	NC	NC	67.15%	6.05	5.50%	NA	NC	NC	NC	NC
SLD71332/SLD71332-2	NC	NC	NC	NC	NC	NC	12.88%	NA	NC	NC	46.92%	3.92	24.10%	NA	NC	NC	NA	0.73

NC – Value not calculated due to one or both of the results were non-detected.
NA – Not applicable.

C-2.4.2 Precision

C-2.4.2.1 Laboratory Precision

To evaluate precision within the on-site laboratory, lab duplicate samples were employed at a frequency of one duplicate per sample batch (no more than one duplicate per thirteen samples). As a measure of analytical precision, relative percent differences (RPD) for laboratory duplicate sample pairs for the two radiological analytical groups (i.e., alpha spectroscopy and gamma spectroscopy) were employed at the time of verification and validation.

RPD and/or NAD values for all analytes were within the ±35% window of acceptance for the verification samples. Data tables are not provided in this summary report, as the data is inspected and results are documented in the sample delivery group packages at the time of verification.

C-2.4.2.2 Field Precision

Field duplicate samples were collected to ascertain the contribution to variability (i.e., precision) due to the combination of environmental media, sampling consistency, and analytical precision. The field duplicates were collected from the same spatial and temporal conditions as the primary environmental sample. Soil samples were collected from the same sampling device, after homogenization for all analytes.

For the fifteen field duplicate samples taken for the verification activities, the NAD and RPD values indicated good precision for the data. Four of the samples exhibited poor precision with RPD and NAD greater than their respective acceptance limits, as indicated by the shading in Tables C-2-3 and C-2-4. These samples and their representative field duplicates have been qualified as estimated; however, they can still be used for their intended purpose and are considered usable since the analytical results for each analyte in both samples were below the remedial goal.

Table C-2-3. Field Duplicate Precision Among Alpha Spectroscopy Analyses

Alpha Spec. Parent ID/Field Dup. ID	TH-228		TH-230		TH-232	
	RPD	NAD	RPD	NAD	RPD	NAD
SLD01126/SLD11126	NA	0.98	NA	1.29	2.35%	NA
SLD02389/SLD12389	NA	0.86	7.41%	NA	NA	0.79
SLD02419/SLD12419	NA	0.98	1.42%	NA	NA	0.71
SLD02430/SLD12430	15.67%	NA	NA	0.62	2.37%	NA
SLD02440/SLD12440	NA	0.80	13.26%	NA	NA	1.19
SLD02460IT/SLD12460	NA	0.58	NA	0.62	NA	1.07
SLD02470IT/SLD12470	14.41%	NA	NA	1.18	NA	0.62
SLD02475IT/SLD12475	NC	NC	NC	NC	NC	NC
SLD06060/SLD06060-1	NC	NC	11.40%	NA	NC	NC
SLD06475/SLD06475-1	23.00%	NA	3.11%	NA	7.46%	NA
SLD07445/SLD07445-1	5.29%	NA	11.65%	NA	NA	0.81
SLD25039/SLD25039-1	12.88%	NA	24.14%	NA	2.60%	NA
SLD27550/SLD27550-1	24.89%	NA	25.35%	NA	10.43%	NA
SLD65644/SLD65644-1	29.82%	NA	29.00%	NA	NC	NC
SLD71332/SLD71332-1	NC	NC	7.43%	NA	17.81%	NA

NC – Value not calculated due to one or both of the results were non-detected.
NA – Not applicable.

Table C-2-4. Field Duplicate Precision Among Gamma Spectroscopy Analyses

Gamma Spec.	AC-227		AM-241		CS-137		K-40		PA-231		RA-226		RA-228		U-235		U-238	
Parent ID/Field Dup. ID	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD	RPD	NAD
SLD01126/SLD11126	NC	NC	NC	NC	NC	NC	39.85%	2.13	NC	NC	6.90%	NA	25.35%	NA	NC	NC	NC	NC
SLD02389/SLD12389	NC	NC	NC	NC	NC	NC	4.69%	NA	NC	NC	7.41%	NA	9.09%	NA	NC	NC	NC	NC
SLD02419/SLD12419	NC	NC	NC	NC	NC	NC	25.78%	NA	NC	NC	41.60%	4.87	24.56%	NA	NC	NC	NC	NC
SLD02430/SLD12430	NC	NC	NC	NC	NC	NC	13.18%	NA	NC	NC	6.22%	NA	NC	NC	NC	NC	NC	NC
SLD02440/SLD12440	NC	NC	NC	NC	NC	NC	3.84%	NA	NC	NC	8.99%	NA	12.87%	NA	NC	NC	NC	NC
SLD02460IT/SLD12460	NC	NC	NC	NC	NC	NC	7.35%	NA	NC	NC	3.15%	NA	7.14%	NA	27.96%	NA	16.38%	NA
SLD02470IT/SLD12470	NC	NC	NC	NC	NC	NC	1.81%	NA	NC	NC	13.13%	NA	1.82%	NA	NC	NC	NC	NC
SLD02475IT/SLD12475	NC	NC	NC	NC	NC	NC	3.12%	NA	NC	NC	8.70%	NA	2.06%	NA	NC	NC	NC	NC
SLD06060/SLD06060-I	NC	NC	NC	NC	NC	NC	3.16%	NA	NC	NC	6.19%	NA	9.52%	NA	NC	NC	NC	NC
SLD06475/SLD06475-I	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1.02%	NA	4.12%	NA	181.70%	8.7
SLD07445/SLD07445-I	13.48%	NA	NC	NC	NC	NC	15.60%	NA	NC	NC	11.19%	NA	25.70%	NA	2.17%	NA	23.01%	NA
SLD25039/SLD25039-I	NC	NC	NC	NC	NC	NC	9.58%	NA	NC	NC	3.89%	NA	12.56%	NA	NC	NC	NC	NC
SLD27550/SLD27550-I	NC	NC	NC	NC	NC	NC	1.83%	NA	NC	NC	11.04%	NA	3.77%	NA	NC	NC	NC	NC
SLD65644/SLD65644-I	NC	NC	NC	NC	NC	NC	1.94%	NA	NC	NC	55.50%	6.44	3.24%	NA	NC	NC	NC	NC
SLD71332/SLD71332-I	NC	NC	NC	NC	NC	NC	10.44%	NA	NC	NC	16.02%	NA	21.34%	NA	NC	NC	3.99%	NA

NC – Value not calculated due to one or both of the results were non-detected.
NA – Not applicable.

C-2.4.3 Sensitivity

Determination of minimum detectable values allows the investigation to assess the relative confidence which can be placed in a value in comparison to the magnitude or level of analyte concentration observed. The closer a measured value comes to the minimum detectable concentration, the less confidence and more variation the measurement will have. Project sensitivity goals were expressed as quantitation level goals in the *Radiological Final Status Survey Plan for Accessible Soil within Plant 1, Plant 2, and the City Property at the St. Louis Downtown Site* (USACE 1999a). These levels were achieved or exceeded throughout the analytical process.

C-2.4.4 Representativeness and Comparability

Representativeness expresses the degree to which data accurately reflect the analyte or parameter of interest for an environmental site and is the qualitative term most concerned with the proper design of a sampling program. Factors that affect the representativeness of analytical data include proper preservation, holding times, use of standard sampling and analytical methods, and determination of matrix or analyte interferences. Sample preservation, analytical methodologies, and soil sampling methodologies were documented to be adequate and consistently applied.

Comparability, like representativeness, is a qualitative term relative to a project data set as an individual. These investigations employed appropriate sampling methodologies, site surveillance, use of standard sampling devices, uniform training, documentation of sampling, standard analytical protocols/procedures, QC checks with standard control limits, and universally accepted data reporting units to ensure comparability to other data sets. Through the proper implementation and documentation of these standard practices, the project has established the confidence that the data will be comparable to other project and programmatic information.

C-2.4.5 Completeness

Usable data are defined as those data, which pass individual scrutiny during the verification and validation process and are accepted for unrestricted use. The data quality objective of achieving 90% completeness, as defined in the *Radiological Final Status Survey Plan for Accessible Soil within Plant 1, Plant 2, and the City Property at the St. Louis Downtown Site* (USACE 1999a) was satisfied with the project producing valid results for 100% of the sample analyses performed and successfully collected.

A total of 237 systematic verification and 166 biased soil samples were collected with approximately 3,580 discrete analyses (i.e., analytes) being obtained, reviewed, and integrated into the assessment. The project produced acceptable results for 100% of the sample analyses performed.

C-2.5 DATA QUALITY ASSESSMENT SUMMARY

The overall quality of the Plant 1 PRAR information meets or exceeds the established project objectives. Through proper implementation of the project data verification, validation, and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable, but estimated when necessary. Data that have been estimated have concentrations/activities that are below the quantitation limit or are indicative of accuracy, precision, or sensitivity being less than desired but adequate for interpretation.

Data produced for this characterization demonstrates that it can withstand scientific scrutiny, is appropriate for its intended purpose, is technically defensible, and is of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of Quality Assurance and Quality Control measures. The environmental information presented has an established confidence, which allows utilization for the project objectives and provides data for future needs.

ATTACHMENT C-3

PLANT 1 FINAL STATUS SURVEY SOIL SAMPLE DATA

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1A	HTZ00166	=	0.60	0.16	U	0.71	0.86	=	1.34	0.05	=	1.08	0.08	=	2.56	0.20	=	46.17	3.24	=	1.49	0.35	=	15.91	0.29	=	0.80	0.09
1A	HTZ00167	=	0.58	0.18	U	0.59	0.93	=	1.78	0.05	=	0.94	0.08	=	1.34	0.23	=	22.90	3.15	=	1.47	0.31	=	12.11	0.26	=	1.25	0.30
1A	HTZ00168	=	0.65	0.19	U	0.55	1.00	=	1.18	0.06	=	0.97	0.09	=	2.57	0.24	=	48.75	4.05	=	1.91	0.29	=	12.72	0.13	=	1.34	0.13
1A	HTZ00171	U	0.37	0.68	U	-0.15	3.67	=	4.15	0.23	=	1.47	0.32	U	0.40	0.66	U	7.50	16.08	=	2.04	0.31	=	3.90	0.31	J	0.88	0.14
1A	HTZ00190	U	0.13	0.21	U	0.05	0.93	=	1.11	0.06	=	1.16	0.09	=	0.34	0.20	=	6.08	4.41	=	1.23	0.14	=	3.02	0.14	J	0.85	0.23
1A	HTZ00200	U	0.05	0.14	U	-0.14	0.63	=	1.39	0.04	=	0.20	0.06	U	0.03	0.15	U	1.17	2.96	J	0.43	0.37	=	1.71	0.34	U	0.83	0.35
1A	HTZ00201	U	-0.05	0.29	U	0.00	1.38	=	7.82	0.09	J	0.68	0.12	U	0.22	0.32	U	5.07	5.97	=	1.74	0.30	=	3.18	0.36	=	1.07	0.14
1A	HTZ00202	U	0.17	0.29	U	0.23	1.27	=	3.12	0.08	J	0.67	0.11	U	0.08	0.29	U	3.52	5.70	=	1.14	0.36	=	2.62	0.27	=	1.40	0.14
1A	HTZ00322	U	0.29	0.28	U	-0.39	1.09	=	1.58	0.07	=	0.98	0.12	=	1.17	0.25	=	22.28	5.15	=	1.23	0.48	=	12.01	0.36	=	0.75	0.13
1A	HTZ00343	=	3.00	0.28	=	3.83	1.38	=	5.06	0.09	=	0.85	0.13	=	3.29	0.37	=	55.89	5.28	=	1.62	0.28	=	26.34	0.15	=	0.97	0.12
1A	HTZ00344	U	0.12	0.25	U	0.07	1.21	=	0.84	0.07	=	0.97	0.12	=	4.80	0.33	=	95.22	5.38	=	1.24	0.22	=	1.61	0.12	=	1.12	0.28
1A	HTZ00347	=	0.79	0.26	U	1.11	1.49	=	5.22	0.09	=	1.16	0.13	=	1.04	0.31	=	16.00	5.74	J	0.87	0.36	=	11.52	0.36	=	0.85	0.26
1A	HTZ00349	=	0.72	0.36	U	0.57	1.93	=	9.83	0.12	=	1.11	0.17	=	0.75	0.39	=	9.99	7.84	=	2.07	0.35	=	6.20	0.35	J	0.81	0.14
1A	HTZ00355	=	0.53	0.16	U	0.96	0.85	=	2.36	0.05	=	0.78	0.13	=	0.94	0.18	=	14.15	3.51	J	0.92	0.30	=	12.18	0.30	=	1.00	0.33
1A	HTZ00378	J	0.24	0.23	U	0.00	1.02	=	0.97	0.06	=	1.01	0.10	U	0.13	0.21	U	1.61	5.30	J	0.68	0.25	=	2.06	0.19	=	0.71	0.12
1A	HTZ00391	U	0.53	0.38	U	0.86	1.83	=	9.94	0.11	=	0.87	0.16	U	0.50	0.41	U	4.27	7.78	J	0.90	0.37	=	4.73	0.25	J	0.87	0.22
1A	HTZ00392	U	0.26	0.37	U	-0.59	1.65	=	10.10	0.11	=	0.88	0.15	U	0.30	0.38	U	0.57	7.99	=	1.30	0.27	=	3.88	0.15	J	0.28	0.15
1A	HTZ00394	U	0.64	0.32	U	0.34	1.41	=	6.04	0.09	=	0.88	0.13	J	0.37	0.30	U	3.97	6.78	=	1.95	0.35	=	4.31	0.31	J	1.05	0.16
1A	HTZ00398	U	0.41	0.19	U	0.08	0.74	=	0.90	0.05	=	0.82	0.07	=	0.63	0.16	=	12.35	3.69	=	1.44	0.30	=	1.58	0.30	=	0.46	0.27
1A	HTZ00404	=	0.31	0.18	U	0.03	0.71	=	1.02	0.04	=	0.69	0.06	U	0.05	0.15	U	1.14	3.41	J	0.73	0.34	=	1.17	0.14	J	0.88	0.23
1A	HTZ00405	J	0.45	0.35	U	0.13	1.44	=	7.39	0.09	=	1.27	0.13	J	0.37	0.30	U	5.28	5.95	=	1.72	0.37	=	4.17	0.23	=	0.58	0.11
1A	HTZ00406	U	0.60	0.35	U	0.49	1.45	=	5.34	0.08	=	1.30	0.13	J	0.38	0.29	U	5.37	6.24	=	1.42	0.31	=	6.66	0.37	=	1.31	0.23
1A	HTZ00409	U	0.31	0.29	U	-0.17	1.24	=	9.15	0.08	=	0.80	0.09	=	0.45	0.27	U	4.62	5.38	J	1.13	0.48	=	2.47	0.16	=	0.41	0.33
1A	HTZ00415	U	0.19	0.21	U	0.28	0.94	=	7.25	0.06	=	0.59	0.09	U	0.05	0.21	U	0.97	4.21	=	1.44	0.40	=	4.81	0.18	=	0.87	0.13

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1A	HTZ00417	U	0.30	0.20	U	-0.17	0.78	=	2.85	0.05	=	0.93	0.07	J	0.24	0.17	U	2.58	3.22	J	0.91	0.33	=	4.77	0.28	=	0.56	0.12
1A	HTZ00418	U	0.07	0.20	U	0.10	0.77	=	2.36	0.05	=	0.73	0.07	J	0.19	0.17	U	2.24	3.36	=	1.80	0.40	=	3.60	0.16	=	0.97	0.14
1A	HTZ00440	U	0.26	0.19	U	0.27	0.84	=	1.37	0.05	=	1.19	0.08	U	0.23	0.20	U	1.99	3.66	=	0.93	0.13	=	3.67	0.13	=	1.13	0.12
1A	HTZ00441	=	0.35	0.20	U	0.58	1.05	=	1.52	0.06	=	1.04	0.10	=	2.38	0.28	=	53.49	4.26	J	0.96	0.31	=	5.04	0.14	=	1.39	0.16
1A	HTZ00442	U	0.36	0.24	U	0.47	1.01	=	1.35	0.06	=	1.06	0.10	=	2.45	0.26	=	48.25	3.88	J	0.82	0.32	U	2.92	0.39	=	1.27	0.12
1A	HTZ00472	U	0.16	0.26	U	-0.05	1.20	=	0.90	0.08	=	1.50	0.11	=	2.30	0.30	=	44.39	5.48	J	0.88	0.28	=	2.42	0.13	=	0.86	0.12
1A	HTZ00473	U	0.28	0.29	U	-0.14	1.20	=	1.00	0.08	=	1.12	0.13	=	0.81	0.28	=	15.97	6.75	=	1.32	0.43	=	2.95	0.32	=	1.42	0.23
1A	HTZ00474	U	0.25	0.33	U	0.99	1.44	=	5.83	0.09	=	1.19	0.12	=	0.62	0.33	=	11.28	6.08	=	1.74	0.31	=	6.89	0.17	J	1.74	0.15
1A	HTZ00475	U	0.49	0.42	U	0.32	1.92	=	12.95	0.12	=	1.15	0.17	U	0.38	0.43	=	7.80	6.96	=	1.35	0.27	=	4.63	0.33	J	0.83	0.41
1A	HTZ00476	U	0.39	0.46	U	0.21	2.11	=	20.81	0.14	=	1.02	0.18	U	0.60	0.49	U	4.08	8.47	=	1.63	0.39	=	6.19	0.16	=	1.09	0.13
1A	HTZ00493	=	0.69	0.35	U	1.07	1.77	=	12.19	0.11	=	0.90	0.15	U	0.55	0.42	U	5.94	7.08	=	0.94	0.12	=	2.93	0.28	=	0.71	0.13
1A	HTZ00494	=	1.90	0.43	U	0.34	2.23	=	21.55	0.14	=	0.91	0.18	=	0.83	0.50	U	4.62	8.79	=	1.10	0.34	=	5.36	0.25	=	1.07	0.13
1A	HTZ00502	J	0.15	0.14	UJ	0.11	0.75	=	3.17	0.05	=	1.01	0.06	=	0.34	0.16	=	3.33	2.89	=	1.44	0.35	=	4.09	0.16	=	1.45	0.14
1A	HTZ00518	=	0.40	0.28	U	1.04	1.24	=	1.02	0.07	=	0.76	0.12	=	11.34	0.41	=	197.20	3.59	J	1.25	0.34	=	5.58	0.63	J	0.99	0.08
1A	HTZ00529	U	0.16	0.27	U	-0.11	1.16	=	2.13	0.08	=	1.08	0.10	=	1.52	0.27	=	26.86	4.58	=	1.06	0.23	=	4.52	0.13	=	1.00	0.13
1A	HTZ00668	U	0.14	0.19	U	0.50	0.88	=	1.75	0.05	=	0.43	0.08	U	0.33	0.21	U	2.18	3.89	=	1.05	0.51	=	3.51	0.16	=	1.58	0.22
1A	HTZ00670	U	0.10	0.26	U	0.23	1.18	=	2.36	0.07	=	0.80	0.10	J	0.28	0.24	U	3.84	5.71	=	1.06	0.15	=	3.33	0.28	=	1.15	0.16
1A	HTZ00671	U	0.75	0.63	U	1.39	2.77	=	5.69	0.16	=	1.32	0.27	U	0.52	0.54	U	3.85	12.55	=	1.55	0.44	=	49.76	0.18	=	0.27	0.25
1A	HTZ00672	=	0.53	0.18	U	0.31	0.66	=	0.97	0.04	=	0.96	0.06	U	0.13	0.14	U	1.18	3.43	=	1.65	0.13	=	1.55	0.13	=	0.40	0.13
1A	HTZ00681	U	0.35	0.18	U	0.43	0.77	=	0.92	0.04	=	1.02	0.07	=	0.70	0.15	=	12.84	3.15	J	0.91	0.42	=	2.46	0.32	=	0.31	0.14
1A	HTZ00683	=	0.39	0.20	UJ	0.35	0.77	=	1.10	0.05	=	1.02	0.07	U	0.13	0.16	U	0.90	4.12	=	1.41	0.27	=	2.27	0.32	=	1.11	0.29
1A	HTZ00688	U	0.22	0.18	U	0.26	0.77	=	3.13	0.05	=	1.04	0.07	=	0.28	0.16	U	3.04	3.13	=	1.32	0.34	=	3.05	0.14	=	1.16	0.14
1A	HTZ00694	U	0.48	0.26	UJ	0.06	1.09	=	1.08	0.07	=	1.01	0.10	=	2.70	0.30	=	53.86	3.99	=	1.39	0.31	=	2.13	0.23	=	0.81	0.13
1A	HTZ00705	U	0.14	0.28	U	0.31	1.30	=	0.94	0.85	=	0.92	0.15	=	1.57	0.31	=	40.99	5.63	=	1.50	0.12	=	1.98	0.12	=	1.32	0.14
1A	HTZ00712	U	-0.03	0.23	U	-0.11	0.99	=	0.84	0.66	=	1.20	0.11	U	0.16	0.26	=	5.21	4.53	=	1.23	0.22	=	1.77	0.12	=	0.62	0.32

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1A	HTZ25674	U	0.09	0.18	U	0.42	0.80	=	0.78	0.55	=	0.81	0.08	=	1.73	0.22	=	35.51	3.17	=	1.22	0.19	=	1.81	0.19	=	0.39	0.21
1A	HTZ25677	U	0.13	0.24	U	0.45	1.09	=	1.04	0.71	J	1.36	0.11	=	0.61	0.25	=	16.04	4.09	=	1.66	0.23	=	2.12	0.23	=	1.04	0.13
1A	HTZ25729	U	0.41	0.19	U	-0.07	0.75	=	0.89	0.46	J	1.01	0.07	=	0.41	0.15	=	9.02	3.51	=	1.52	0.30	J	2.00	0.30	=	1.02	0.13
1A	HTZ25730	U	0.42	0.22	U	-0.40	0.78	=	1.11	0.51	J	1.28	0.08	=	0.85	0.17	=	16.13	3.72	=	2.25	0.28	J	1.85	0.16	=	1.53	0.12
1A	HTZ25731	U	0.25	0.19	U	-0.26	0.79	=	1.20	0.54	J	1.30	0.08	=	1.60	0.18	=	33.97	3.60	=	1.16	0.33	J	1.51	0.33	=	1.14	0.15
1A	HTZ25736	U	0.46	0.28	U	0.56	1.09	=	1.19	0.71	J	1.27	0.10	=	0.84	0.26	=	18.46	4.56	=	1.58	0.35	=	1.37	0.13	=	1.38	0.41
1A	HTZ25780	UJ	0.08	0.16	UJ	0.16	0.65	=	1.17	0.04	=	0.69	0.06	=	1.26	0.14	=	26.17	0.61	=	1.24	0.35	=	1.55	0.11	J	0.83	0.04
1A	HTZ25781	U	0.17	0.16	UJ	-0.01	0.58	=	0.86	0.04	=	0.97	0.06	=	1.22	0.14	=	23.20	0.60	=	1.26	0.27	=	1.37	0.12	=	0.62	0.12
1A	HTZ27393	UJ	0.02	0.25	UJ	-0.26	1.24	=	0.87	0.09	=	1.06	0.12	=	4.31	0.35	=	99.14	4.05	=	0.88	0.29	=	1.33	0.12	=	0.46	0.16
1A	HTZ27394	UJ	0.00	0.25	UJ	0.39	1.12	=	1.01	0.07	=	1.35	0.11	=	1.25	0.26	=	22.26	2.72	=	1.37	0.30	=	1.79	0.23	=	2.17	0.20
1A	HTZ27395	UJ	0.12	0.29	UJ	0.81	1.32	=	1.16	0.09	=	1.34	0.12	=	2.55	0.35	=	51.87	3.58	=	2.03	0.28	=	1.84	0.28	=	1.84	0.18
1A	HTZ27396	U	0.49	0.16	UJ	-0.01	0.56	=	0.70	0.03	=	1.07	0.05	=	0.22	0.12	=	4.59	0.42	=	1.06	0.34	=	1.43	0.31	J	2.30	0.18
1A	HTZ27403	U	0.31	0.23	UJ	0.35	0.95	J	1.05	0.06	J	0.77	0.09	=	0.78	0.22	=	17.60	1.47	=	1.24	0.28	=	1.86	0.24	=	1.13	0.15
1A	HTZ27404	U	0.42	0.25	UJ	-0.10	0.84	=	1.45	0.05	J	0.65	0.08	U	0.24	0.21	=	3.94	0.61	J	0.87	0.33	=	1.89	0.28	=	0.94	0.13
1A	SLD06049	U	0.12	0.17	U	0.25	0.73	=	0.90	0.04	=	0.92	0.07	J	0.20	0.17	=	4.59	2.77	=	1.71	0.31	=	2.28	0.17	=	1.55	0.12
1A	SLD06050	U	0.19	0.18	U	-0.24	0.80	=	0.76	0.05	=	1.12	0.08	U	0.14	0.18	U	1.74	3.83	=	2.02	0.14	=	2.48	0.14	=	1.21	0.12
1A	SLD06051	U	0.24	0.19	U	0.44	0.83	=	0.92	0.05	=	1.14	0.12	=	1.40	0.18	=	27.25	3.32	=	1.34	0.30	=	3.44	0.14	=	0.71	0.21
1A	SLD06125	U	0.19	0.28	U	0.61	1.22	=	3.45	0.08	=	1.03	0.11	U	0.29	0.29	U	4.02	5.35	=	1.42	0.33	=	3.55	0.37	=	0.87	0.28
1A	SLD06128	U	0.04	0.25	U	0.19	1.10	=	2.94	0.07	=	1.01	0.11	=	0.46	0.25	=	9.67	4.45	=	1.56	0.38	J	2.75	0.14	=	1.17	0.14
1A	SLD06138	U	0.26	0.56	U	1.50	2.77	=	1.61	0.17	=	1.39	0.30	U	0.21	0.65	U	9.59	14.09	=	2.03	0.32	=	10.88	0.27	=	0.76	0.49
1A	SLD06139	U	0.52	0.85	U	-1.24	3.66	=	2.12	0.24	=	1.25	0.38	=	1.97	0.67	=	25.49	17.00	=	1.58	0.29	=	10.57	0.29	=	1.08	0.15
1A	SLD06314	J	0.20	0.20	U	0.65	1.07	=	1.71	0.07	J	0.78	0.11	=	0.89	0.23	=	14.76	3.75	=	1.03	0.36	=	4.92	0.25	=	1.26	0.23
1A	SLD06315	U	0.11	0.21	U	-0.05	0.94	=	3.22	0.06	J	0.47	0.09	U	0.22	0.22	U	2.26	3.78	=	1.03	0.25	=	1.96	0.30	J	0.67	0.25
1A	SLD06316	U	0.06	0.18	U	0.15	0.90	=	1.11	0.06	J	0.60	0.09	U	0.07	0.20	U	1.05	4.55	J	0.74	0.13	=	1.11	0.23	J	1.33	0.14
1A	SLD06473	U	0.04	0.19	U	0.25	0.83	=	1.10	0.05	=	1.08	0.09	J	0.26	0.19	U	3.28	4.21	J	1.63	0.49	J	2.22	0.29	J	0.56	0.29

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1A	SLD06474	U	0.04	0.25	U	-0.19	1.11	=	1.04	0.07	=	1.08	0.10	=	1.93	0.27	=	37.77	4.75	J	1.80	0.44	J	2.39	0.49	J	0.83	0.28
1A	SLD06475	U	0.10	0.20	U	0.00	0.90	=	0.96	0.06	=	0.99	0.09	=	0.95	0.21	=	20.63	4.19	J	1.27	0.32	J	2.61	0.32	J	1.05	0.11
1A	SLD06475-2	U	-0.27	0.73	U	-0.30	4.20	=	1.09	0.25	U	1.55	1.10	U	1.32	0.15	U	30.50	5.10	=	1.27	0.32	=	1.59	0.25	=	1.63	0.18
1A	SLD06476	U	0.10	0.23	U	-0.01	1.05	=	1.05	0.07	=	1.06	0.12	=	3.35	0.30	=	69.69	4.42	J	1.55	0.32	J	2.59	0.15	J	0.41	0.19
1A	SLD06477	U	0.15	0.21	U	0.38	0.91	=	1.05	0.06	=	0.99	0.09	U	0.19	0.22	U	3.68	4.22	J	1.28	0.37	J	3.04	0.17	J	1.13	0.15
1A	SLD06478	U	0.14	0.16	U	0.14	0.69	=	0.93	0.04	=	0.77	0.10	U	0.00	0.14	U	1.13	3.41	J	1.47	0.34	J	2.39	0.29	J	1.25	0.15
1A	SLD06479	U	0.10	0.17	U	-0.02	0.76	=	0.90	0.05	=	0.92	0.07	U	0.08	0.16	U	1.53	4.19	J	1.54	0.34	J	3.08	0.34	J	0.30	0.11
1A	SLD06480	U	0.04	0.19	U	0.43	0.84	=	0.88	0.05	=	0.97	0.08	U	0.16	0.18	U	2.58	3.72	J	1.08	0.16	J	1.85	0.16	J	1.49	0.16
1A	SLD06501	U	0.24	0.28	U	0.83	1.09	=	1.81	0.07	=	0.66	0.10	=	0.47	0.23	=	6.59	4.49	=	1.01	0.14	=	6.78	0.27	=	1.50	0.16
1A	SLD06752	U	0.19	0.27	U	0.28	1.19	=	1.89	0.07	=	0.99	0.11	U	0.06	0.26	U	0.96	5.56	=	1.50	0.29	=	2.27	0.24	=	1.17	0.17
1A	SLD06754	U	0.19	0.52	U	0.20	2.34	=	1.17	0.16	=	0.89	0.15	U	0.25	0.56	U	10.43	10.85	J	0.87	0.39	=	3.29	0.13	J	1.67	0.16
1A	SLD06806	U	0.11	0.28	U	0.19	1.11	=	1.15	0.07	=	1.10	0.10	=	2.18	0.28	=	45.01	4.45	J	0.94	0.29	=	3.83	0.16	=	0.92	0.16
1A	SLD06807	U	0.56	0.22	U	-0.03	0.80	=	0.98	0.05	=	1.35	0.09	U	0.22	0.18	U	3.81	3.87	=	2.06	0.44	=	2.04	0.18	=	0.62	0.32
1A	SLD06808	U	0.12	0.27	U	0.69	1.20	=	1.59	0.08	=	1.26	0.11	J	0.27	0.25	U	5.03	6.70	=	1.24	0.38	=	3.63	0.35	J	1.54	0.17
1A	SLD06809	U	0.34	0.21	U	0.78	0.83	=	0.87	0.05	=	1.21	0.08	J	0.26	0.17	=	5.39	3.75	J	1.06	0.39	=	2.57	0.36	=	0.94	0.13
1A	SLD06810	U	0.47	0.22	U	0.12	0.76	=	1.00	0.05	=	1.17	0.08	=	0.32	0.16	=	5.29	3.58	=	1.23	0.29	=	2.45	0.34	=	0.99	0.13
1A	SLD07181	U	0.08	0.23	U	0.25	1.08	=	1.00	0.07	=	0.91	0.09	U	0.07	0.22	U	1.68	4.69	=	1.46	0.29	=	2.34	0.13	=	2.07	0.29
1A	SLD07183	U	0.09	0.25	U	0.13	1.10	=	0.98	0.07	=	1.00	0.11	U	0.45	0.26	U	3.67	5.21	=	1.29	0.14	=	1.80	0.14	=	1.28	0.13
1A	SLD07185	U	0.15	0.25	U	0.47	1.10	=	1.16	0.07	=	0.97	0.10	U	0.17	0.25	U	2.48	4.90	=	1.71	0.28	=	3.19	0.33	J	0.77	0.14
1A	SLD07255	U	0.08	0.18	U	-0.10	0.80	=	0.99	0.05	=	0.76	0.07	U	0.11	0.18	U	1.43	3.77	=	0.97	0.26	=	2.19	0.12	J	1.21	0.15
1A	SLD07256	U	0.20	0.22	U	0.06	0.96	=	1.39	0.06	=	0.98	0.09	=	0.57	0.23	=	14.20	3.67	=	0.84	0.28	=	3.21	0.11	=	1.22	0.13
1A	SLD07257	U	0.13	0.20	U	-0.03	0.87	=	1.91	0.06	=	0.47	0.09	J	0.28	0.21	=	4.07	3.53	J	0.74	0.43	=	2.57	0.31	J	0.95	0.16
1A	SLD07313	U	0.38	0.17	U	0.33	0.71	=	0.77	0.04	=	1.15	0.06	=	0.25	0.13	=	5.10	3.07	=	1.68	0.29	=	2.19	0.13	=	0.45	0.15
1A	SLD07314	U	0.38	0.17	U	0.28	0.67	=	0.85	0.04	=	1.07	0.06	=	0.28	0.13	=	4.40	3.18	=	0.94	0.30	=	1.51	0.12	=	1.06	0.30
1A	SLD07445	=	0.95	0.27	U	0.41	1.46	=	8.21	0.09	=	1.01	0.12	=	0.93	0.33	=	12.89	5.50	=	0.97	0.43	=	4.36	0.30	J	0.79	0.31

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1A	SLD07445-2	U	1.60	1.40	U	-1.90	5.70	=	19.80	0.40	J	1.60	0.90	=	2.33	0.26	U	15.40	3.90	=	0.52	0.20	=	2.19	0.14	=	1.00	0.14
1A	SLD07447	U	0.14	0.17	U	0.11	0.74	=	2.97	0.04	=	0.77	0.07	J	0.24	0.15	U	2.35	3.48	=	1.15	0.36	=	2.72	0.32	J	1.04	0.13
1A	SLD25038	U	0.10	0.13	U	0.28	0.54	=	0.80	0.03	=	0.85	0.05	=	0.81	0.13	=	16.10	2.42	J	0.94	0.35	=	1.90	0.26	=	0.18	0.12
1A	SLD25039	U	0.58	0.49	U	0.31	2.20	=	3.78	0.14	=	1.10	0.22	U	0.25	0.41	U	2.13	8.56	=	1.57	0.16	=	5.57	0.35	=	0.26	0.23
1A	SLD25039-2	U	1.13	0.88	UJ	-0.05	3.20	=	3.60	0.21	=	1.18	0.34	=	0.34	0.13	U	2.90	2.00	=	0.80	0.08	=	3.62	0.09	=	0.30	0.12
1A	SLD25041	U	0.17	0.16	U	0.38	0.69	=	2.01	0.04	=	0.93	0.06	J	0.21	0.15	=	3.43	2.79	J	1.14	0.49	=	3.47	0.35	=	0.20	0.14
1A	SLD27575	UJ	-0.07	0.20	UJ	0.13	0.93	=	0.89	0.06	=	1.08	0.09	=	0.95	0.22	=	18.60	2.20	=	1.47	0.30	=	1.95	0.30	J	1.28	0.06
1A	SLD65106	U	0.14	0.21	UJ	0.50	0.94	J	0.95	0.06	J	0.83	0.10	=	0.93	0.23	=	19.25	2.59	=	1.22	0.37	=	2.40	0.15	=	1.61	0.34
1B	HTZ00333	U	0.11	0.22	U	0.02	0.97	=	6.00	0.06	=	0.83	0.10	J	0.23	0.21	U	2.92	4.19	=	1.06	0.26	=	2.15	0.34	J	0.66	0.15
1B	HTZ00336	=	0.55	0.30	U	0.38	1.51	=	7.62	0.10	=	0.54	0.16	U	0.57	0.37	U	5.10	5.74	J	0.89	0.43	=	11.30	0.30	J	0.79	0.13
1B	HTZ00352	=	0.50	0.27	U	0.12	1.41	=	6.48	0.09	=	0.89	0.11	U	0.31	0.32	U	3.37	5.42	=	1.31	0.35	=	7.16	0.16	=	1.34	0.17
1B	HTZ00353	=	0.91	0.37	U	-0.13	1.92	=	13.61	0.12	=	0.76	0.15	U	0.48	0.43	U	2.86	7.80	=	1.16	0.36	=	5.95	0.30	=	1.67	0.16
1B	HTZ00368	U	0.14	0.19	U	0.17	0.79	=	1.23	0.05	=	0.95	0.08	U	0.00	0.17	U	1.65	3.37	=	1.56	0.34	=	1.31	0.15	J	1.17	0.13
1B	HTZ00369	=	1.11	0.22	U	1.10	1.15	=	7.36	0.07	=	0.85	0.10	U	0.52	0.27	U	3.58	4.35	=	1.45	0.37	=	6.69	0.33	=	1.03	0.13
1B	HTZ00370	U	0.46	0.27	U	0.20	1.12	=	3.54	0.07	=	1.23	0.10	U	0.10	0.24	U	2.25	4.34	=	1.32	0.34	=	3.41	0.15	=	0.97	0.32
1B	HTZ00395	=	0.44	0.19	U	0.17	1.05	=	3.96	0.06	=	0.82	0.09	J	0.27	0.21	U	2.22	4.04	=	1.22	0.31	=	4.83	0.21	J	0.49	0.25
1B	HTZ00396	=	0.32	0.21	U	0.32	0.84	=	1.55	0.05	=	0.94	0.08	U	0.18	0.18	U	1.10	3.93	=	1.10	0.31	=	2.20	0.14	=	0.65	0.13
1B	HTZ00495	U	0.06	0.16	U	0.45	0.67	=	1.12	0.04	=	0.72	0.07	U	0.10	0.16	U	1.97	3.24	J	0.70	0.29	=	2.02	0.24	=	1.17	0.15
1B	HTZ00496	U	0.09	0.16	U	0.55	0.72	=	0.92	0.04	=	0.70	0.07	=	0.43	0.16	=	7.11	2.95	=	0.97	0.26	=	2.04	0.22	=	1.19	0.13
1B	HTZ00497	U	0.07	0.17	U	-0.07	0.71	=	1.30	0.05	=	0.88	0.07	U	0.16	0.18	U	4.14	4.25	=	1.03	0.36	=	3.82	0.27	=	0.55	0.13
1B	HTZ00498	U	0.11	0.23	U	0.08	0.99	=	2.64	0.06	=	0.85	0.09	J	0.32	0.22	=	4.45	4.06	=	0.92	0.27	=	3.75	0.12	J	1.25	0.28
1B	HTZ00499	=	0.74	0.24	U	0.71	1.31	=	6.05	0.08	=	0.84	0.11	=	0.60	0.29	=	10.38	5.01	=	1.76	0.30	=	6.05	0.25	=	0.89	0.14
1B	HTZ00503	=	0.19	0.14	UJ	0.22	0.59	=	1.23	0.04	=	0.51	0.06	UJ	0.05	0.12	U	0.81	2.93	J	0.60	0.25	=	1.10	0.26	J	1.47	0.13
1B	HTZ00504	=	0.37	0.16	U	0.56	0.81	=	4.72	0.05	=	0.69	0.07	J	0.24	0.18	U	2.20	3.16	=	1.99	0.33	=	4.23	0.28	=	0.49	0.15
1B	HTZ00526	U	0.40	0.20	U	0.31	0.83	=	2.09	0.05	=	0.90	0.08	=	1.84	0.19	=	32.12	3.73	J	1.01	0.29	=	3.70	0.15	J	0.82	0.14

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1B	HTZ00530	U	0.14	0.22	U	-0.08	0.99	=	1.43	0.07	=	0.93	0.10	=	1.84	0.25	=	36.64	3.76	=	1.38	0.26	=	2.47	0.14	J	1.02	0.07
1B	HTZ00541	U	0.13	0.19	U	0.41	0.88	=	1.33	0.54	=	0.89	0.08	J	0.27	0.19	=	4.16	4.08	=	1.72	0.32	=	2.95	0.14	=	1.43	0.35
1B	HTZ00542	U	0.45	0.23	UJ	0.36	1.26	=	3.07	0.75	=	1.10	0.11	U	0.29	0.29	U	3.04	5.33	=	1.54	0.25	=	8.87	0.30	=	1.47	0.17
1B	HTZ00543	U	0.24	0.31	U	0.39	1.49	=	4.44	0.91	=	1.06	0.14	J	0.39	0.31	=	7.14	6.52	=	1.62	0.43	=	5.69	0.38	=	0.85	0.52
1B	HTZ00547	U	0.19	0.31	U	0.81	1.37	=	3.11	0.88	=	0.98	0.12	=	0.48	0.28	=	6.65	5.10	=	1.00	0.20	=	1.50	0.10	=	0.84	0.24
1B	HTZ00548	U	0.20	0.20	U	0.29	0.91	=	2.28	0.56	=	0.83	0.11	U	0.19	0.21	U	2.42	3.62	=	1.24	0.22	=	2.49	0.22	=	0.89	0.14
1B	HTZ00556	=	0.45	0.20	U	-0.02	1.06	=	3.54	0.71	J	0.84	0.09	U	0.20	0.26	U	4.01	4.23	J	0.57	0.29	=	4.60	0.25	J	1.19	0.15
1B	HTZ00565	U	0.54	0.45	U	0.72	2.05	=	4.92	1.24	J	0.30	0.21	UJ	0.28	0.42	U	3.97	8.75	J	0.14	0.13	=	1.75	0.23	J	0.73	0.27
1B	HTZ00601	U	-0.07	0.17	U	0.09	0.82	=	1.42	0.53	J	0.62	0.08	=	0.37	0.18	=	6.17	3.39	=	1.46	0.39	=	5.32	0.18	J	1.44	0.14
1B	HTZ00602	U	0.19	0.19	U	0.31	0.90	=	1.88	0.64	J	0.63	0.10	=	1.30	0.23	=	26.92	4.33	J	0.72	0.30	=	4.37	0.27	J	1.56	0.16
1B	HTZ00603	=	1.92	0.34	U	1.16	1.83	=	12.46	1.15	J	0.72	0.15	=	0.88	0.45	=	6.80	6.62	J	0.51	0.14	=	14.17	0.14	J	0.88	0.09
1B	HTZ00605	U	0.08	0.24	U	0.75	1.08	=	1.47	0.71	J	0.84	0.11	=	1.42	0.26	=	27.83	4.51	=	1.13	0.28	=	4.40	0.23	J	1.09	0.15
1B	HTZ00606	U	-0.11	0.28	U	-0.04	1.28	=	7.41	0.87	J	0.62	0.11	U	0.19	0.32	U	5.02	5.61	J	0.61	0.36	=	6.99	0.27	J	1.46	0.16
1B	HTZ00607	=	0.85	0.25	U	1.88	1.37	=	6.49	0.86	J	0.73	0.11	=	0.52	0.29	=	5.32	5.17	J	0.47	0.31	=	6.69	0.13	J	1.48	0.27
1B	HTZ00608	U	0.14	0.18	U	0.32	0.83	=	1.82	0.54	J	0.61	0.08	=	0.60	0.19	=	11.17	3.36	J	0.83	0.23	=	4.57	0.13	J	1.09	0.31
1B	HTZ00614	U	0.42	0.30	U	1.29	1.37	=	5.56	0.86	J	0.73	0.13	J	0.38	0.30	U	3.88	6.68	J	1.50	0.36	=	9.64	0.17	J	0.64	0.12
1B	HTZ00629	U	0.44	0.29	U	0.28	1.21	=	5.10	0.80	J	0.53	0.10	U	0.17	0.28	U	0.48	4.78	J	0.43	0.35	J	2.42	0.24	J	0.91	0.12
1B	HTZ00630	=	1.10	0.36	U	-0.32	1.96	=	11.03	1.24	J	0.38	0.15	U	0.43	0.45	U	4.31	7.02	J	0.32	0.30	J	4.92	0.13	UJ	0.22	0.15
1B	HTZ00661	U	0.33	0.16	U	-0.08	0.58	=	1.20	0.37	J	0.86	0.06	J	0.13	0.12	U	1.27	3.01	=	0.85	0.11	=	1.62	0.11	=	0.87	0.32
1B	HTZ00662	U	0.27	0.18	U	0.42	0.70	=	2.51	0.43	J	0.76	0.06	U	0.14	0.15	U	1.87	3.48	J	0.99	0.36	=	2.09	0.33	J	1.15	0.17
1B	HTZ00663	U	0.32	0.18	U	0.16	0.70	=	1.98	0.44	J	0.92	0.07	U	0.17	0.16	U	2.90	3.14	=	1.25	0.33	=	1.69	0.28	=	1.43	0.14
1B	HTZ00664	U	0.28	0.20	U	0.06	0.91	=	5.01	0.56	J	0.81	0.08	=	0.35	0.18	U	3.45	3.68	=	1.55	0.29	=	2.74	0.25	=	0.05	0.13
1B	HTZ00685	U	0.10	0.21	U	-0.08	0.88	=	1.55	0.06	=	0.95	0.08	J	0.32	0.19	U	3.04	3.70	J	1.30	0.38	=	2.93	0.18	J	0.97	0.13
1B	HTZ00686	=	0.24	0.15	U	0.02	0.78	=	1.06	0.05	=	0.60	0.07	J	0.24	0.16	U	3.17	3.43	J	0.98	0.36	=	3.01	0.17	J	0.84	0.12
1B	HTZ00689	U	0.10	0.15	U	0.50	0.68	=	1.83	0.04	=	0.50	0.06	U	0.09	0.13	U	1.81	3.27	J	0.61	0.24	=	1.35	0.13	J	1.32	0.22

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1B	HTZ00690	=	0.19	0.13	U	0.46	0.69	=	1.71	0.04	=	0.59	0.06	U	0.12	0.14	U	1.49	2.87	=	1.16	0.12	=	2.23	0.30	J	0.21	0.22
1B	HTZ00691	U	0.29	0.28	U	0.12	1.21	=	1.68	0.07	=	0.89	0.11	=	1.51	0.29	=	32.17	4.89	J	0.87	0.38	=	6.75	0.15	=	0.88	0.13
1B	HTZ00692	U	0.19	0.21	U	-0.14	1.06	=	2.48	0.07	=	0.85	0.09	=	0.58	0.24	=	8.24	4.68	=	1.16	0.35	=	2.21	0.13	J	1.08	0.13
1B	HTZ00698	U	0.08	0.20	U	0.22	0.89	=	1.08	0.06	=	0.77	0.09	=	0.37	0.19	=	3.91	3.78	=	1.56	0.32	=	4.53	0.23	=	0.94	0.31
1B	HTZ00699	U	0.17	0.20	U	0.34	0.91	=	2.15	0.06	=	0.58	0.09	UJ	0.14	0.21	U	2.95	4.21	=	0.93	0.33	=	4.47	0.21	=	1.89	0.15
1B	HTZ00702	UJ	0.08	0.16	U	0.43	0.68	=	0.75	0.45	=	0.46	0.07	UJ	0.05	0.15	U	1.36	3.28	J	0.54	0.31	=	1.34	0.17	J	0.92	0.21
1B	HTZ00703	U	0.22	0.20	UJ	-0.51	0.87	=	1.05	0.52	=	0.95	0.08	U	0.23	0.20	U	1.45	3.86	=	1.18	0.42	=	2.31	0.15	J	1.07	0.15
1B	HTZ00704	U	0.29	0.23	UJ	-0.42	0.92	=	2.46	0.63	=	0.71	0.09	UJ	0.08	0.22	U	3.90	4.35	=	1.51	0.29	=	4.07	0.16	=	1.08	0.18
1B	HTZ00715	U	0.06	0.16	U	0.06	0.68	=	1.12	0.44	J	0.54	0.07	U	0.03	0.16	UJ	1.29	3.42	=	0.97	0.35	=	2.18	0.33	J	1.13	0.24
1B	HTZ00716	U	-0.02	0.17	U	0.36	0.77	=	1.10	0.50	J	0.81	0.07	U	0.03	0.18	U	2.43	3.30	=	1.07	0.23	=	1.19	0.27	=	1.61	0.14
1B	HTZ00717	U	0.05	0.19	U	0.73	0.83	=	1.08	0.54	J	0.91	0.08	=	0.33	0.19	=	6.75	3.50	J	0.73	0.30	=	1.35	0.14	J	0.06	0.16
1B	HTZ00726	U	0.42	0.26	U	-0.03	1.09	=	2.45	0.66	=	0.79	0.10	J	0.31	0.23	U	3.32	4.59	=	0.98	0.30	=	7.62	0.14	J	1.47	0.27
1B	HTZ00727	U	0.20	0.22	U	-0.07	0.94	=	1.80	0.58	=	0.74	0.08	J	0.27	0.20	U	3.54	4.01	=	0.91	0.29	=	4.49	0.13	=	0.18	0.12
1B	HTZ25676	U	0.06	0.17	U	0.13	0.73	=	1.00	0.46	J	0.71	0.07	U	0.15	0.16	U	2.29	3.33	=	1.60	0.35	J	2.07	0.35	=	0.75	0.22
1B	HTZ25682	U	0.02	0.18	U	0.32	0.85	=	2.02	0.04	J	0.49	0.07	U	0.19	0.19	U	1.60	1.03	=	1.04	0.38	J	2.64	0.14	J	0.83	0.11
1B	HTZ25683	U	0.21	0.23	U	-0.15	1.00	=	2.67	0.66	J	0.81	0.09	U	0.23	0.24	U	2.73	4.03	=	0.99	0.36	J	2.27	0.12	=	0.52	0.27
1B	HTZ25684	U	0.16	0.23	U	0.16	0.96	=	2.31	0.61	J	0.77	0.09	U	0.11	0.22	UJ	0.83	4.74	J	0.90	0.43	=	7.68	0.43	J	0.54	0.28
1B	HTZ25685	U	0.22	0.22	U	0.74	0.96	=	2.32	0.61	J	0.75	0.09	U	0.10	0.22	U	2.05	4.09	=	1.05	0.32	=	4.28	0.14	=	0.66	0.13
1B	HTZ25687	U	0.18	0.20	U	0.20	0.82	=	1.11	0.53	J	0.86	0.08	U	-0.02	0.19	U	1.29	4.09	=	1.43	0.30	J	1.59	0.25	=	0.47	0.14
1B	HTZ25691	U	0.12	0.19	U	-0.04	0.81	=	1.21	0.56	J	0.65	0.07	=	0.54	0.18	=	7.79	3.34	=	1.41	0.35	=	2.52	0.24	=	1.21	0.15
1B	HTZ25692	U	0.20	0.21	U	-0.13	0.94	=	2.21	0.61	J	0.61	0.08	=	0.36	0.21	=	5.39	3.97	J	0.92	0.28	=	8.17	0.15	J	0.94	0.03
1B	HTZ25693	U	0.01	0.22	U	0.15	0.96	=	1.88	0.68	J	0.63	0.16	=	0.84	0.23	=	15.19	4.22	=	1.05	0.28	=	3.29	0.13	J	0.82	0.22
1B	HTZ25694	U	0.01	0.23	U	0.06	1.05	=	1.31	0.74	J	0.91	0.11	=	2.04	0.26	=	36.30	4.59	=	1.07	0.30	=	2.66	0.26	=	0.53	0.25
1B	HTZ25695		0.66	0.27		0.52	1.41		6.47	0.91		0.73	0.12		0.46	0.33		3.33	5.27		1.12	0.28		8.05	0.32		0.35	0.14
1B	HTZ25723	U	0.25	0.24	U	0.11	1.07	=	4.90	0.75	J	0.88	0.09	=	0.67	0.27	=	12.98	4.20	=	1.42	0.40	=	9.29	0.14	J	1.08	0.36

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1B	HTZ25724	=	0.52	0.19	U	0.74	0.98	=	3.26	0.63	J	0.63	0.09	U	0.34	0.24	U	2.20	4.14	=	1.31	0.37	=	8.32	0.14	J	1.07	0.13
1B	HTZ25739	U	0.50	0.24	U	-0.21	0.93	=	3.39	0.59	J	1.19	0.08	=	0.41	0.19	=	6.11	4.31	J	0.86	0.38	=	2.41	0.32	=	0.89	0.11
1B	HTZ25740	U	0.08	0.17	U	0.54	0.80	=	1.12	0.50	J	0.70	0.08	U	0.06	0.19	U	1.46	3.88	J	0.82	0.26	=	1.49	0.22	J	0.64	0.13
1B	HTZ25741	U	0.38	0.20	U	0.27	0.90	=	0.89	0.54	J	0.92	0.08	U	0.13	0.19	U	1.55	3.51	=	1.09	0.26	=	1.63	0.12	=	0.34	0.13
1B	HTZ25742	U	0.18	0.14	U	-0.21	0.56	=	1.35	0.37	J	0.26	0.05	U	0.08	0.13	U	0.81	2.84	J	0.81	0.33	=	2.27	0.15	J	0.70	0.12
1B	HTZ25743	U	0.38	0.25	U	0.55	1.04	=	5.92	0.65	J	0.90	0.09	U	0.26	0.23	U	3.31	5.01	=	1.56	0.35	=	4.42	0.29	J	0.64	0.12
1B	HTZ25744	U	0.12	0.13	U	0.04	0.51	=	1.13	0.32	J	0.45	0.05	U	0.11	0.11	U	1.00	2.76	J	0.83	0.34	=	1.50	0.25	J	0.83	0.13
1B	HTZ25745	=	0.93	0.20	U	0.75	0.99	=	7.73	0.67	J	0.54	0.09	U	0.47	0.24	U	-1.64	4.28	J	0.67	0.31	=	3.11	0.23	J	0.96	0.12
1B	HTZ25746	=	0.67	0.18	U	0.31	0.96	=	3.99	0.60	J	0.42	0.08	U	0.46	0.23	U	2.33	3.87	=	1.09	0.32	=	5.38	0.27	J	0.61	0.24
1B	HTZ25747	=	0.51	0.12	U	1.13	0.76	=	2.02	0.41	J	0.72	0.06	=	0.33	0.14	=	3.95	2.61	=	1.20	0.27	=	9.35	0.30	=	0.95	0.12
1B	HTZ25789	=	1.10	0.27	U	2.12	1.54	=	9.35	0.08	=	0.34	0.13	U	0.32	0.35	U	3.19	3.33	J	0.68	0.33	=	4.14	0.23	J	0.77	0.13
1B	HTZ25790	U	0.14	0.20	U	0.71	0.86	=	1.24	0.05	=	0.61	0.08	=	0.57	0.20	=	8.38	2.21	J	0.87	0.38	=	5.20	0.13	J	0.98	0.13
1B	HTZ25791	U	0.27	0.23	U	0.12	0.96	=	2.37	0.05	=	0.60	0.09	U	0.14	0.23	J	3.07	2.33	J	0.48	0.12	=	2.34	0.12	J	0.66	0.13
1B	HTZ25792	U	0.26	0.22	U	0.11	0.93	=	1.23	0.06	=	1.01	0.08	U	0.04	0.20	U	0.98	2.26	=	1.33	0.26	=	1.73	0.26	=	1.57	0.15
1B	HTZ25794	U	0.15	0.23	U	0.42	1.04	=	1.66	0.06	=	1.08	0.10	=	0.36	0.24	=	6.72	2.64	=	1.39	0.27	=	1.59	0.12	=	1.27	0.31
1B	HTZ25795	U	0.22	0.19	U	-0.34	0.81	=	1.03	0.05	=	0.91	0.07	U	0.13	0.19	U	1.38	2.21	=	1.49	0.36	=	1.64	0.16	=	0.85	0.19
1B	HTZ25796	U	0.33	0.22	U	0.36	0.90	=	1.42	0.05	=	0.92	0.08	=	0.38	0.21	=	8.92	2.36	=	1.13	0.25	=	5.23	0.12	=	0.49	0.40
1B	HTZ27400	U	0.36	0.19	UJ	0.44	0.77	=	3.90	0.05	=	0.58	0.08	U	0.17	0.17	=	1.62	0.54	=	1.35	0.46	=	2.98	0.25	=	1.85	0.17
1B	HTZ27401	U	0.20	0.20	UJ	0.13	0.81	=	2.38	0.05	=	0.48	0.08	U	0.17	0.20	J	1.74	1.07	J	0.78	0.32	=	3.95	0.24	J	1.16	0.15
1B	HTZ27419	=	0.26	0.17	UJ	0.54	0.89	=	2.51	0.05	=	1.08	0.08	=	1.31	0.20	=	25.74	0.78	=	1.85	0.13	=	12.91	0.13	=	0.95	0.10
1B	HTZ27450	U	0.33	0.31	UJ	0.27	1.32	=	5.43	0.07	=	0.81	0.12	J	0.33	0.29	J	4.03	1.65	=	1.22	0.40	=	3.59	0.37	=	0.77	0.20
1B	HTZ27451	UJ	0.18	0.30	UJ	0.81	1.43	=	5.93	0.08	=	0.75	0.11	UJ	0.08	0.30	J	1.94	1.68	J	0.89	0.38	J	2.39	0.26	J	0.98	0.10
1B	HTZ27455	U	0.16	0.18	U	0.63	0.81	=	2.09	0.05	=	0.96	0.07	=	0.28	0.17	=	5.41	1.77	=	1.22	0.33	=	2.35	0.14	=	0.30	0.12
1B	HTZ66247	U	0.27	0.21	U	0.16	0.94	=	2.42	0.06	=	0.81	0.08	U	0.09	0.21	=	1.83	1.15	=	1.22	0.25	=	2.55	0.13	=	0.94	0.10
1B	HTZ66248	U	0.44	0.29	U	0.16	1.24	=	5.20	0.07	=	0.75	0.11	U	0.23	0.29	U	1.56	1.57	=	1.21	0.15	=	2.69	0.15	J	0.76	0.11

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1B	HTZ66250	U	0.06	0.22	U	0.84	0.97	=	2.63	0.05	=	0.84	0.09	U	0.06	0.22	J	2.14	1.72	=	1.38	0.16	=	5.04	0.08	=	0.21	0.26
1B	HTZ66286	=	0.36	0.15		0.75	0.81	U	5.55	0.04	=	0.39	0.06	U	0.15	0.18	=	2.06	0.56	=	1.92	0.34	=	4.09	0.26	J	1.14	0.06
1B	HTZ66287	=	0.45	0.18	U	0.45	0.91	=	6.72	0.05	=	0.63	0.08	U	0.26	0.21	=	2.11	0.65	=	1.18	0.24	=	3.95	0.13	=	0.81	0.30
1B	HTZ66289	=	0.80	0.24	U	1.76	1.36	=	8.32	0.07	=	0.98	0.10	=	0.80	0.28	=	9.68	0.90	=	1.01	0.18	=	12.50	0.07	=	1.10	0.12
1B	HTZ66290	U	0.14	0.23	U	0.02	1.05	=	1.21	0.06	=	1.10	0.09	U	0.04	0.22	J	1.97	1.25	=	1.54	0.07	=	2.51	0.28	=	0.94	0.07
1B	HTZ66309	U	0.20	0.16	U	0.43	0.68	=	2.59	0.04	=	0.69	0.06	=	0.24	0.14	=	3.44	0.47	=	1.88	0.31	=	3.05	0.31	=	1.59	0.14
1B	HTZ66310	=	0.72	0.33	U	0.06	1.63	=	21.07	0.09	=	0.64	0.14	U	0.26	0.36	=	2.14	1.15	=	1.67	0.15	=	2.67	0.54	J	1.43	0.06
1B	HTZ66311	=	0.89	0.34	U	0.98	1.74	=	16.45	0.09	=	0.89	0.15	U	0.56	0.38	J	1.68	1.22	=	3.09	0.40	=	5.50	0.44	J	1.37	0.24
1B	HTZ66319	=	0.31	0.16	U	0.58	0.82	=	5.17	0.04	=	0.52	0.06	=	0.30	0.17	=	2.37	0.55	=	1.69	0.14	=	4.90	0.14	J	1.23	0.14
1B	HTZ76744	J	0.19	0.15	UJ	-0.17	0.65	=	3.44	0.06	=	0.58	0.06	J	0.34	0.33	=	3.66	0.56	=	0.98	0.36	=	5.24	0.14	J	0.75	0.14
1B	HTZ76745	UJ	0.09	0.18	UJ	0.04	0.76	=	2.73	0.07	=	1.15	0.07	=	1.32	0.41	=	28.54	0.83	=	2.30	0.26	=	3.94	0.14	=	1.11	0.26
1B	HTZ76746	UJ	0.10	0.19	UJ	0.19	0.83	=	5.67	0.06	=	1.28	0.07	=	0.72	0.41	=	6.67	0.68	=	1.29	0.31	=	5.89	0.14	=	1.77	0.26
1B	HTZ76748	=	0.37	0.20	U	0.89	1.05	=	14.30	0.08	=	0.76	0.08	U	0.42	0.54	=	4.99	0.83	=	2.04	0.26	=	10.99	0.26	J	0.68	0.14
1B	HTZ75404	U	2.79	0.35	U	0.83	1.06	=	4.68	0.08	=	1.04	0.09	U	0.01	0.52	=	4.85	2.64	J	0.71	0.17	=	3.85	0.17	J	0.64	0.17
1B	SLD06496	U	0.13	0.28	U	0.26	1.21	=	2.77	0.07	=	0.98	0.11	U	0.01	0.26	U	3.14	5.64	=	1.05	0.36	=	1.78	0.15	=	0.69	0.12
1B	SLD06497	U	0.13	0.23	U	0.02	0.95	=	1.92	0.06	=	0.72	0.08	U	0.15	0.20	U	1.71	3.84	=	1.61	0.31	=	2.40	0.26	=	1.32	0.14
1B	SLD06581	U	0.20	0.26	U	0.34	1.06	=	2.43	0.07	=	0.71	0.10	U	0.06	0.23	U	0.95	4.03	=	1.24	0.27	=	3.57	0.43	=	0.86	0.20
1B	SLD06583	U	0.11	0.29	U	0.45	1.19	=	1.21	0.08	=	0.97	0.12	U	0.07	0.25	U	0.73	5.62	=	1.41	0.14	=	1.38	0.25	=	1.11	0.26
1B	SLD06585	U	0.21	0.24	U	0.01	0.97	=	3.14	0.06	=	0.62	0.09	U	0.19	0.24	U	2.28	4.46	J	0.75	0.37	=	3.62	0.35	J	1.27	0.31
1B	SLD07449	U	0.07	0.17	U	-0.30	0.69	=	0.82	0.05	=	0.86	0.07	J	0.17	0.16	U	2.72	3.33	J	1.06	0.34	=	1.13	0.29	J	0.51	0.15
1B	SLD07480	U	0.15	0.18	UJ	0.19	0.79	=	0.98	0.05	=	0.62	0.07	U	0.14	0.15	UJ	0.64	3.49	J	0.85	0.27	J	0.95	0.27	J	0.76	0.30
1B	SLD25036	U	0.40	0.17	U	0.08	0.68	=	1.04	0.04	=	0.78	0.06	=	1.36	0.15	=	24.17	3.07	J	0.96	0.45	=	2.25	0.34	=	0.11	0.09
1B	SLD25602	U	0.00	0.20	U	-0.30	0.89	=	1.46	0.56	J	0.88	0.09	UJ	0.11	0.20	UJ	1.33	4.54	=	1.54	0.27	=	4.34	0.15	=	1.13	0.15
1B	SLD25608	U	0.08	0.20	U	0.22	0.92	=	1.21	0.55	J	0.87	0.09	U	0.13	0.20	U	1.45	4.15	=	0.91	0.23	=	1.96	0.23	J	1.14	0.15
1B	SLD26702	U	0.10	0.20	U	0.15	0.91	=	1.02	0.57	J	0.97	0.08	U	-0.02	0.20	UJ	1.18	4.35	=	1.04	0.30	=	1.93	0.22	=	0.78	0.13

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
1B	SLD27022	U	0.13	0.19	U	0.39	0.86	=	0.91	0.56	J	0.77	0.08	=	0.52	0.20	=	10.79	3.75	=	2.28	0.41	J	3.10	0.34	J	1.00	0.15
1B	SLD27023	U	0.19	0.24	U	0.43	1.09	=	1.05	0.67	J	1.12	0.10	U	0.20	0.26	=	6.40	4.29	=	2.21	0.42	J	3.27	0.14	=	1.06	0.12
1B	SLD27550	U	0.34	0.30	U	0.44	1.17	=	1.54	0.74	J	1.08	0.10	U	0.27	0.28	U	1.89	5.47	J	1.02	0.46	=	1.55	0.15	=	0.91	0.10
1B	SLD27550-2	UJ	-0.22	0.46	U	0.60	3.00	UJ	1.54	0.13	=	1.06	0.76	U	-0.13	0.15	U	0.80	1.40	U	0.94	0.13	J	1.74	0.10	UJ	0.97	0.11
1B	SLD65145	U	0.34	0.17	U	-0.28	0.60	=	1.05	0.04	=	0.96	0.06	U	0.08	0.14	=	1.12	0.45	=	1.35	0.27	=	1.60	0.12	=	0.63	0.29
1B	SLD65644	U	0.23	0.31	UJ	0.23	1.36	=	3.66	0.07	=	0.94	0.12	UJ	0.00	0.30	J	2.11	1.72	=	1.31	0.23	=	3.08	0.12	=	1.07	0.14
1B	SLD65644-2	UJ	0.21	0.50	UJ	0.30	2.40	=	1.82	0.15	=	0.89	0.68	J	0.18	0.09	U	1.20	1.40	=	0.99	0.09	J	0.98	0.10	=	0.95	0.13
1B	SLD65645	U	0.52	0.35	UJ	-0.11	1.49	=	1.21	0.08	=	0.82	0.14	=	1.00	0.28	=	13.94	1.92	=	1.13	0.30	=	4.53	0.12	J	1.43	0.15
1B	SLD65757	U	2.74	0.14	=	1.44	0.75	=	1.45	0.03	=	0.82	0.06	U	0.92	0.22	J	1.44	0.59	=	1.02	0.28	=	2.87	0.28	J	1.49	0.18
1B	SLD66145	U	0.20	0.15	U	-0.14	0.63	=	2.57	0.04	=	0.58	0.05	=	0.34	0.14	=	4.97	0.48	=	1.52	0.45	=	2.75	0.28	=	1.73	0.17
1B	SLD66146	U	0.31	0.14	U	0.09	0.56	=	1.37	0.04	=	0.74	0.05	U	0.03	0.12	=	1.25	0.38	=	1.15	0.32	=	1.54	0.24	=	1.32	0.14
1B	SLD67490	U	0.16	0.20	U	0.61	0.89	=	1.11	0.05	=	0.90	0.08	U	0.02	0.18	U	0.94	1.07	=	1.22	0.14	=	1.45	0.17	=	0.36	0.26
1B	SLD67515	U	0.10	0.12	U	0.34	0.54	=	0.90	0.03	=	0.73	0.05	U	0.04	0.11	=	1.40	0.37	=	1.65	0.30	=	1.71	0.16	J	1.35	0.14
1B	SLD68151	UJ	0.02	0.13	UJ	0.15	0.55	=	0.79	0.03	=	0.91	0.05	UJ	0.04	0.13	UJ	0.56	1.07	=	0.69	0.17	=	1.24	0.17	=	1.39	0.15
1B	SLD78706	U	0.35	0.32	UJ	0.19	1.37	=	4.84	0.12	=	1.23	0.13	=	1.32	0.68	=	29.39	1.97	=	1.06	0.34	=	4.62	0.34	=	1.52	0.29
1B	SLD78714	U	0.21	0.21	UJ	-0.10	0.87	=	1.92	0.08	=	0.79	0.08	UJ	0.12	0.46	=	3.97	1.16	=	1.63	0.46	=	3.90	0.15	=	1.53	0.15
1B	SLD78718	=	0.29	0.20	U	0.96	1.09	=	3.94	0.09	=	0.68	0.09	U	0.39	0.51	=	3.37	1.30	J	2.10	0.29	=	8.00	0.34	=	1.24	0.29
1B	SLD78722	=	0.23	0.13	UJ	0.23	0.67	=	3.63	0.05	=	0.58	0.06	UJ	0.12	0.32	=	3.08	0.46	J	1.37	0.30	=	5.66	0.13	=	1.14	0.13
1B	SLD78926	U	0.14	0.14	UJ	-0.24	0.61	=	2.65	0.05	=	0.69	0.05	U	0.23	0.31	=	4.25	0.52	=	1.30	0.25	=	2.42	0.14	J	0.55	0.14
1B	SLD78930	UJ	0.05	0.12	UJ	0.24	0.53	=	1.38	0.05	=	0.82	0.05	UJ	-0.13	0.26	=	1.21	0.43	=	2.39	0.26	=	3.16	0.14	=	1.11	0.26
2A	SLD02371	U	0.27	0.30	U	0.66	1.32	=	2.02	0.07	=	0.69	0.13	U	0.15	0.29	UJ	1.53	5.94	=	0.75	0.20	=	1.45	0.24	J	0.98	0.26
2A	SLD02374	U	0.21	0.20	U	0.45	0.91	=	1.17	0.06	=	1.08	0.09	U	0.13	0.19	UJ	0.62	4.60	=	2.12	0.27	=	2.50	0.15	=	0.72	0.14
2A	SLD02376	U	0.14	0.15	U	0.12	0.65	=	1.07	0.04	=	0.46	0.07	U	0.02	0.16	UJ	0.82	2.68	J	0.81	0.27	J	1.20	0.11	J	0.17	0.30
2A	SLD02377	U	0.07	0.43	U	-0.73	2.09	=	1.48	0.14	=	1.03	0.25	U	0.35	0.40	UJ	1.80	11.14	=	1.43	0.32	=	2.89	0.16	=	1.33	0.30
2A	SLD02378	U	0.10	0.18	U	0.23	0.80	=	1.62	0.05	=	0.58	0.08	U	0.07	0.18	U	1.70	3.33	=	1.17	0.38	=	3.93	0.31	J	1.07	0.27

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2A	SLD02380	U	0.11	0.20	U	0.29	0.93	=	1.35	0.06	=	0.59	0.09	U	0.05	0.22	U	1.64	3.87	J	0.59	0.24	=	2.17	0.24	J	1.16	0.41
2A	SLD02382	U	0.16	0.25	U	-0.52	1.12	=	3.54	0.07	=	1.22	0.11	=	0.37	0.24	U	3.04	4.50	=	2.33	0.30	=	4.58	0.36	=	0.81	0.14
2A	SLD02383	U	-0.06	0.20	U	-0.04	1.01	=	0.99	0.07	=	1.02	0.11	U	0.10	0.22	U	-1.24	5.12	J	0.93	0.13	J	1.22	0.13	=	0.53	0.16
2A	SLD02385	=	0.15	0.12	U	0.36	0.62	=	1.02	0.04	=	0.47	0.06	U	0.08	0.15	U	1.65	2.68	J	0.60	0.47	=	1.95	0.32	=	1.23	0.15
2A	SLD02386	U	0.13	0.17	U	0.11	0.73	=	1.77	0.04	=	0.55	0.06	U	0.15	0.16	U	2.39	2.94	=	0.92	0.35	=	3.32	0.26	=	1.42	0.22
2A	SLD02387	U	0.00	0.20	U	-0.36	0.97	=	2.29	0.06	=	0.70	0.09	U	0.13	0.23	UJ	1.38	4.77	J	1.02	0.51	=	4.20	0.51	J	1.73	0.16
2A	SLD02388	U	0.00	0.19	U	0.10	0.81	=	1.19	0.05	=	0.51	0.08	U	0.03	0.19	U	1.27	3.90	=	1.08	0.29	=	1.48	0.29	=	0.99	0.16
2A	SLD02389	U	0.08	0.16	U	0.10	0.70	=	0.78	0.05	=	0.63	0.07	U	0.02	0.17	U	1.80	3.23	J	0.78	0.25	J	1.40	0.25	J	1.16	0.16
2A	SLD02390	U	0.14	0.16	U	0.51	0.76	=	1.43	0.04	=	0.63	0.06	U	0.21	0.18	U	2.37	2.66	J	0.73	0.32	=	2.14	0.15	=	1.17	0.12
2A	SLD02391	U	0.08	0.14	U	-0.11	0.61	=	1.10	0.04	=	0.38	0.06	J	0.16	0.15	U	1.90	2.98	J	0.95	0.42	=	1.54	0.38	=	1.04	0.13
2A	SLD02392	U	0.02	0.13	U	-0.01	0.61	=	0.73	0.04	=	0.42	0.06	U	0.02	0.14	U	0.35	2.99	=	1.08	0.32	=	1.19	0.27	J	1.02	0.15
2A	SLD02393	U	0.18	0.21	U	0.02	0.93	=	1.96	0.06	=	0.95	0.08	U	0.18	0.23	U	2.37	4.26	=	1.01	0.44	=	2.85	0.33	=	1.43	0.15
2A	SLD02395	U	0.04	0.15	U	0.23	0.68	=	1.25	0.04	=	0.62	0.06	U	0.12	0.17	U	0.98	2.92	J	1.05	0.32	J	1.85	0.27	J	1.06	0.15
2A	SLD02397	U	0.08	0.17	U	0.39	0.79	=	1.47	0.05	=	0.57	0.08	U	0.12	0.17	U	1.46	4.07	=	1.13	0.26	=	2.63	0.14	=	0.81	0.10
2A	SLD02398	U	0.06	0.16	U	-0.04	0.68	=	1.40	0.05	=	0.44	0.07	U	0.06	0.17	U	1.17	3.54	J	1.00	0.40	=	2.32	0.19	J	0.90	0.14
2A	SLD02399	U	0.21	0.28	U	-0.30	1.19	=	3.28	0.08	=	1.11	0.12	=	0.37	0.28	J	3.84	5.72	=	1.63	0.25	=	4.23	0.30	=	0.93	0.15
2A	SLD02400	U	0.26	0.22	U	0.04	0.90	=	2.47	0.06	=	0.91	0.09	U	0.15	0.22	J	4.00	4.22	=	1.27	0.21	=	1.88	0.21	=	0.61	0.26
2B	SLD02432	U	0.08	0.19	U	0.00	0.81	=	1.37	0.05	=	0.87	0.08	U	0.16	0.18	U	1.93	3.65	=	0.87	0.25	=	0.83	0.25	J	0.90	0.12
2B	SLD02435	U	-0.06	0.19	U	0.12	0.89	=	1.13	0.06	=	1.10	0.09	U	0.06	0.20	U	1.56	3.88	=	2.46	0.34	=	1.78	0.16	=	1.17	0.14
2B	SLD02437	U	0.00	0.19	U	-0.01	0.86	=	1.13	0.06	=	0.54	0.08	U	0.04	0.20	U	2.65	3.24	J	0.78	0.12	J	1.37	0.26	J	0.80	0.12
2B	SLD02438	U	0.07	0.20	U	0.14	0.84	=	0.76	0.06	=	0.84	0.08	U	0.13	0.18	U	1.88	4.35	=	1.29	0.32	J	0.66	0.14	=	0.98	0.13
2B	SLD02439	U	0.11	0.14	U	0.21	0.65	=	0.67	0.04	=	0.52	0.07	J	0.18	0.13	U	0.95	3.46	=	1.12	0.13	=	1.78	0.26	=	1.81	0.16
2B	SLD02441	U	0.12	0.17	U	-0.08	0.74	=	0.97	0.05	=	0.97	0.07	U	-0.06	0.17	U	1.51	3.60	=	0.72	0.11	=	1.25	0.24	=	1.28	0.15
2B	SLD02443	U	0.06	0.16	U	0.19	0.75	=	1.27	0.04	=	0.68	0.07	J	0.17	0.16	U	1.12	3.73	=	1.72	0.37	=	1.81	0.14	=	1.25	0.34
2B	SLD02444	U	0.04	0.20	U	0.48	1.03	=	0.93	0.06	=	1.02	0.10	J	0.24	0.18	UJ	0.68	5.30	J	1.38	0.13	J	2.46	0.13	=	0.96	0.15

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2B	SLD02447	U	0.06	0.20	U	0.40	0.92	=	0.98	0.06	=	0.99	0.09	U	0.07	0.20	U	1.43	4.35	=	1.28	0.27	=	2.20	0.15	=	1.07	0.13
2B	SLD02448	U	0.11	0.16	U	-0.27	0.69	=	0.89	0.05	=	0.68	0.07	U	0.13	0.16	U	0.93	3.96	J	0.83	0.42	=	1.41	0.42	=	0.92	0.14
2B	SLD02449	U	0.22	0.37	U	-0.60	1.69	=	0.76	0.12	=	0.68	0.21	U	0.03	0.36	U	-3.82	9.39	J	0.70	0.17	=	0.84	0.14	J	1.21	0.14
2B	SLD02450	U	0.13	0.17	U	0.37	0.80	=	0.99	0.05	=	1.02	0.07	U	0.48	0.19	U	2.71	3.12	J	1.15	0.36	J	1.76	0.25	J	1.42	0.26
2B	SLD02451	U	0.15	0.17	U	0.33	0.75	=	0.90	0.05	=	0.94	0.06	U	0.09	0.17	U	1.10	3.29	J	1.26	0.30	J	1.86	0.16	J	0.87	0.24
2B	SLD02452	U	0.15	0.22	U	0.27	1.01	=	1.91	0.06	=	0.81	0.09	U	0.15	0.23	U	1.18	4.26	=	0.91	0.28	=	2.57	0.28	=	1.21	0.11
2B	SLD02453IT	U	0.13	0.19	U	0.00	0.84	=	0.95	0.05	=	0.92	0.08	U	0.02	0.19	U	1.41	3.51	J	1.00	0.41	=	1.77	0.34	J	0.83	0.13
2B	SLD02454IT	U	0.14	0.21	U	-0.18	0.91	=	1.61	0.06	=	0.97	0.09	U	0.14	0.22	U	2.07	3.98	=	1.36	0.15	=	2.36	0.15	J	0.23	0.13
2B	SLD02455IT	U	0.08	0.16	U	0.38	0.73	=	0.85	0.05	=	0.94	0.07	J	0.17	0.16	U	2.00	3.32	J	1.43	0.17	J	1.54	0.17	J	0.26	0.18
2B	SLD02456IT	U	0.15	0.15	U	0.07	0.66	=	0.90	0.04	=	0.74	0.06	U	0.01	0.16	U	1.13	2.95	J	0.58	0.30	J	1.10	0.13	J	0.75	0.12
2B	SLD02458IT	U	0.35	0.21	U	0.09	0.96	=	1.31	0.06	=	0.95	0.10	U	0.20	0.22	U	1.39	5.12	=	1.40	0.13	=	2.48	0.13	=	0.55	0.14
2B	SLD02460IT	U	0.14	0.30	U	0.38	1.35	=	3.55	0.09	=	1.16	0.12	=	0.53	0.29	=	8.06	5.59	=	1.83	0.16	=	4.16	0.29	=	0.77	0.23
2B	SLD02461IT	U	0.09	0.21	U	0.26	0.95	=	1.46	0.06	=	0.70	0.08	U	0.07	0.21	U	2.62	4.26	J	0.80	0.22	=	1.83	0.12	J	0.54	0.15
2C	SLD2493A	U	0.20	0.18	U	-0.09	0.72	=	1.15	0.05	=	0.66	0.07	U	0.08	0.17	U	1.79	2.64	J	0.51	0.24	=	1.40	0.24	J	0.24	0.26
2C	SLD2496A	U	0.20	0.22	U	0.04	0.97	=	1.06	0.06	=	1.21	0.10	UJ	0.10	0.20	U	1.75	5.16	=	1.73	0.38	=	2.10	0.15	=	0.29	0.26
2C	SLD2498A	U	0.07	0.17	U	0.07	0.72	=	1.03	0.05	=	0.73	0.07	U	0.13	0.17	U	1.73	3.45	J	0.59	0.26	J	1.87	0.12	J	0.04	0.12
2C	SLD2499A	U	0.15	0.17	U	0.30	0.75	=	0.75	0.05	=	0.80	0.07	U	0.05	0.17	U	1.16	3.31	=	1.19	0.15	=	1.75	0.15	J	0.24	0.13
2C	SLD2500A	U	0.11	0.21	U	0.34	0.96	=	2.17	0.06	=	0.71	0.08	U	0.15	0.20	U	2.80	5.28	=	1.51	0.28	=	2.86	0.29	=	0.13	0.24
2C	SLD2502A	U	0.11	0.18	U	0.48	0.77	=	0.97	0.05	=	0.91	0.08	U	0.18	0.17	U	2.06	3.59	J	0.99	0.24	J	1.73	0.20	J	0.14	0.33
2C	SLD2504A	U	0.07	0.19	U	0.13	0.89	=	1.57	0.05	=	0.78	0.08	U	0.15	0.20	U	3.03	3.12	=	1.36	0.27	=	2.36	0.27	=	0.06	0.15
2C	SLD2505A	U	0.08	0.20	U	-0.04	0.96	=	1.00	0.06	=	1.08	0.09	U	0.02	0.20	UJ	1.25	4.70	J	1.70	0.30	J	1.77	0.15	=	0.09	0.27
2C	SLD2507A	U	0.05	0.25	U	0.33	1.11	=	1.80	0.07	=	0.65	0.10	U	-0.02	0.25	U	1.66	4.43	=	0.83	0.16	=	2.87	0.34	=	0.18	0.16
2C	SLD2508A	U	0.14	0.20	U	0.21	0.79	=	1.06	0.05	=	0.98	0.08	U	0.06	0.19	U	2.76	3.25	=	1.35	0.27	=	1.88	0.27	=	0.14	0.25
2C	SLD2509A	U	0.06	0.15	U	0.24	0.68	=	0.80	0.04	=	0.63	0.07	U	0.02	0.15	U	1.03	3.76	J	0.99	0.34	=	1.31	0.34	=	0.46	0.26
2C	SLD2510A	U	0.22	0.19	U	0.26	0.90	=	0.83	0.05	=	0.90	0.09	U	0.06	0.19	U	0.85	4.42	=	1.33	0.29	=	1.48	0.13	=	0.44	0.15

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2C	SLD2511A	U	0.10	0.18	U	0.01	0.77	=	0.88	0.05	=	0.97	0.07	U	0.12	0.18	U	1.57	3.42	J	1.50	0.40	J	1.58	0.28	J	0.30	0.16
2C	SLD2512A	U	0.17	0.20	U	-0.25	0.88	=	1.53	0.06	=	1.01	0.08	U	0.12	0.21	U	1.04	4.41	J	1.79	0.41	J	2.07	0.37	J	0.40	0.30
2C	SLD2513A	U	0.12	0.17	U	0.37	0.70	=	0.88	0.04	=	0.82	0.07	U	0.10	0.16	U	1.30	3.07	J	1.32	0.46	=	1.54	0.32	=	0.10	0.14
2C	SLD2514A	U	0.11	0.20	U	0.30	0.90	=	1.10	0.05	=	0.96	0.09	U	-0.01	0.20	U	1.83	4.47	=	1.29	0.33	=	2.24	0.18	=	0.26	0.12
2C	SLD2515A	U	0.18	0.19	U	0.43	0.82	=	1.62	0.05	=	0.78	0.12	U	0.14	0.19	U	1.19	3.22	=	1.52	0.28	=	3.91	0.15	=	0.46	0.24
2C	SLD2516A	U	0.15	0.18	U	0.22	0.80	=	0.97	0.05	=	1.03	0.07	J	0.23	0.18	=	6.16	3.27	J	1.73	0.49	J	1.13	0.35	J	0.43	0.40
2C	SLD2517A	U	0.16	0.18	U	0.37	0.82	=	1.02	0.05	=	0.95	0.08	U	0.19	0.19	U	2.85	3.91	J	1.29	0.26	J	1.59	0.14	J	0.42	0.13
2C	SLD2519A	U	0.11	0.20	U	0.07	0.90	=	1.68	0.05	=	0.92	0.08	U	0.08	0.20	U	1.50	3.92	=	1.50	0.47	=	2.28	0.34	=	0.51	0.13
2C	SLD2520A	U	0.33	0.27	U	0.70	1.15	=	3.27	0.07	=	1.11	0.10	J	0.37	0.26	=	6.02	4.44	=	1.43	0.28	=	2.98	0.16	J	0.53	0.30
2C	SLD2521A	U	0.13	0.20	U	0.18	0.87	=	1.19	0.06	=	0.82	0.08	=	0.36	0.20	=	5.55	3.68	=	1.37	0.29	=	3.21	0.34	=	0.04	0.26
2C	SLD2522A	U	0.09	0.16	U	0.20	0.73	J	0.80	0.04	=	0.85	0.07	=	0.21	0.16	U	1.87	3.52	=	1.62	0.13	=	1.99	0.32	=	0.19	0.13
2D	SLD02401	U	0.14	0.15	U	0.21	0.64	=	0.96	0.04	=	0.49	0.06	U	0.12	0.13	U	1.28	2.79	J	1.47	0.27	=	1.51	0.27	J	0.50	0.11
2D	SLD02402	U	0.08	0.13	U	-0.01	0.64	=	0.89	0.04	=	0.31	0.06	J	0.10	0.13	U	1.07	2.65	J	0.44	0.34	=	1.63	0.16	J	1.38	0.14
2D	SLD02404	U	0.06	0.22	U	0.62	1.02	=	3.03	0.06	=	0.77	0.09	U	0.21	0.23	U	2.17	4.50	=	1.04	0.23	=	4.10	0.12	=	1.02	0.22
2D	SLD02405	U	0.14	0.16	U	0.42	0.67	=	1.41	0.04	=	0.46	0.06	U	0.19	0.16	U	1.98	2.53	J	0.90	0.15	J	3.52	0.33	J	0.85	0.26
2D	SLD02406	U	0.05	0.12	U	-0.16	0.54	=	0.62	0.04	=	0.31	0.05	U	0.06	0.12	U	0.88	2.83	=	0.93	0.38	=	1.27	0.17	=	1.24	0.23
2D	SLD02408	U	0.06	0.10	U	0.11	0.46	=	0.74	0.03	=	0.26	0.04	U	0.08	0.10	U	1.11	1.87	J	0.81	0.45	J	1.39	0.31	J	1.79	0.17
2D	SLD02409	U	0.22	0.23	U	0.03	0.99	=	3.31	0.07	=	0.94	0.09	U	0.55	0.24	U	3.48	4.25	=	1.01	0.27	=	5.63	0.14	=	1.19	0.30
2D	SLD02411	U	0.12	0.13	U	0.19	0.55	=	0.65	0.04	=	0.39	0.05	U	0.09	0.11	U	1.01	2.97	J	0.64	0.14	J	1.09	0.32	=	1.47	0.18
2D	SLD02412	U	0.18	0.20	U	0.31	0.85	=	2.86	0.05	=	0.97	0.08	U	0.18	0.19	U	2.73	3.70	=	0.92	0.36	=	2.99	0.12	=	1.73	0.33
2D	SLD02414	U	0.17	0.23	U	0.41	1.08	=	1.72	0.06	=	0.76	0.17	U	0.17	0.24	U	3.52	4.21	J	0.86	0.49	=	3.24	0.27	J	1.18	0.16
2D	SLD02415	U	0.08	0.19	U	-0.21	0.80	=	1.20	0.06	=	0.71	0.08	U	0.07	0.19	U	2.93	4.79	=	1.77	0.42	=	2.65	0.29	=	1.24	0.23
2D	SLD02416	U	0.16	0.15	U	-0.19	0.57	=	0.99	0.04	=	0.74	0.06	U	0.11	0.13	U	1.12	2.82	=	0.93	0.31	=	1.52	0.38	=	1.30	0.14
2D	SLD02417	U	0.07	0.11	U	0.22	0.52	=	0.85	0.03	=	0.44	0.05	J	0.11	0.10	U	1.12	2.52	J	0.74	0.13	=	1.81	0.13	=	1.53	0.14
2D	SLD02419	U	0.23	0.17	U	0.21	0.79	=	1.58	0.05	=	0.50	0.07	U	0.14	0.17	U	1.62	3.17	=	0.61	0.32	=	3.54	0.27	=	1.23	0.13

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2D	SLD02421	U	0.06	0.16	U	0.34	0.73	=	1.03	0.04	=	0.45	0.07	U	0.10	0.17	U	0.37	3.29	=	0.60	0.39	=	1.97	0.16	J	1.40	0.13
2D	SLD02423	U	0.05	0.16	U	0.10	0.67	=	1.59	0.04	=	0.36	0.07	J	0.20	0.15	U	1.92	2.99	J	0.60	0.34	=	2.97	0.28	J	1.05	0.17
2D	SLD02424	U	0.14	0.20	U	0.27	0.91	=	0.83	0.06	=	0.79	0.08	=	0.52	0.19	=	9.61	4.94	=	1.13	0.25	=	1.00	0.21	=	0.76	0.15
2D	SLD02425	U	0.17	0.20	U	0.29	0.95	=	1.52	0.06	=	0.88	0.10	J	0.23	0.20	U	2.80	4.96	=	1.51	0.18	=	2.25	0.39	=	1.30	0.29
2D	SLD02426	U	0.07	0.17	U	0.08	0.73	=	1.43	0.05	=	0.36	0.06	U	0.23	0.19	U	2.99	3.17	=	0.98	0.19	=	4.25	0.35	J	0.90	0.12
2D	SLD73405	U	0.16	0.15	U	0.44	0.67	=	1.04	0.06	=	0.72	0.06	=	0.41	0.29	=	6.06	0.49	=	1.54	0.27	=	1.56	0.27	J	0.98	0.15
2D	SLD73409	U	0.17	0.18	U	-0.05	0.72	=	1.92	0.07	=	0.90	0.06	U	0.00	0.34	=	1.39	0.50	=	1.72	0.34	=	2.12	0.15	J	1.01	0.29
2D	SLD73411	U	0.02	0.07	U	0.08	0.30	=	0.47	0.03	=	0.14	0.03	U	0.09	0.15	=	0.27	0.19	J	0.18	0.16	=	0.82	0.30	J	0.00	0.16
2D	SLD73413	U	0.05	0.16	U	0.09	0.71	=	2.69	0.07	=	0.71	0.06	U	0.21	0.34	=	1.16	0.50	=	1.78	0.38	=	2.20	0.32	J	1.07	0.17
2E	SLD02462IT	U	0.26	0.17	U	-0.05	0.70	=	0.92	0.04	=	0.94	0.07	U	-0.02	0.15	U	0.93	3.67	J	1.06	0.13	=	1.29	0.35	=	0.64	0.12
2E	SLD02463IT	U	0.15	0.22	U	0.33	0.97	=	1.70	0.06	=	0.86	0.08	U	0.03	0.21	U	2.22	4.25	J	1.00	0.27	=	2.50	0.27	J	0.70	0.13
2E	SLD02465IT	U	0.07	0.20	U	0.36	0.93	=	2.08	0.06	=	0.81	0.09	U	0.19	0.21	U	3.29	3.91	=	1.40	0.38	=	2.23	0.35	J	0.97	0.17
2E	SLD02466IT	U	0.15	0.19	U	0.06	0.83	=	1.03	0.06	=	0.74	0.08	U	0.05	0.19	U	2.21	4.06	J	1.54	0.32	J	1.64	0.27	J	0.45	0.29
2E	SLD02467IT	U	0.29	0.18	U	0.09	0.72	=	0.99	0.05	=	0.92	0.07	U	0.14	0.16	U	1.30	3.78	=	1.04	0.43	=	1.37	0.15	=	0.05	0.13
2E	SLD02469IT	U	0.14	0.13	U	-0.06	0.53	=	0.94	0.04	=	0.53	0.05	U	0.07	0.12	U	1.06	2.35	J	0.79	0.36	J	1.51	0.25	=	1.25	0.11
2E	SLD02470IT	U	0.31	0.20	U	-0.18	0.83	=	1.21	0.05	=	1.09	0.08	U	0.13	0.18	U	1.33	4.20	=	1.86	0.16	=	1.13	0.16	=	0.97	0.15
2E	SLD02472IT	U	0.13	0.13	U	0.15	0.67	=	0.83	0.04	=	0.44	0.07	U	0.15	0.16	U	0.72	3.45	J	0.68	0.15	=	1.23	0.41	J	0.98	0.13
2E	SLD02473IT	U	0.09	0.15	U	0.12	0.71	=	0.80	0.04	=	0.84	0.07	U	0.24	0.15	U	0.67	3.28	=	1.07	0.30	=	1.47	0.30	=	0.98	0.16
2E	SLD02475IT	U	0.09	0.21	U	0.31	0.96	=	1.08	0.06	=	0.98	0.09	U	0.18	0.22	U	1.50	4.43	=	0.85	0.68	J	1.81	0.31	J	1.00	0.15
2E	SLD02476IT	U	0.14	0.20	U	0.20	0.91	=	1.29	0.05	=	0.73	0.08	U	0.14	0.19	=	3.49	3.46	=	1.01	0.39	=	3.04	0.26	=	1.66	0.18
2E	SLD02477IT	U	0.32	0.17	U	-0.11	0.66	=	0.94	0.04	=	0.88	0.06	U	0.16	0.15	U	1.02	3.47	=	1.68	0.31	=	1.99	0.17	=	1.22	0.31
2E	SLD02478	U	0.08	0.20	U	0.14	0.88	=	0.97	0.06	=	0.67	0.09	U	0.33	0.19	U	1.42	4.42	J	0.89	0.28	=	1.17	0.24	=	1.03	0.13
2E	SLD02480	U	0.11	0.18	U	-0.19	0.67	=	0.87	0.04	=	0.85	0.06	=	0.15	0.14	U	1.21	3.94	J	1.44	0.11	=	1.32	0.25	=	1.09	0.32
2E	SLD02482	U	0.06	0.15	U	0.17	0.68	=	1.00	0.04	=	0.46	0.06	U	0.10	0.15	U	1.74	3.16	J	0.89	0.34	=	2.03	0.29	J	1.13	0.18
2E	SLD02484	U	0.06	0.19	U	-0.23	0.82	=	1.33	0.06	=	0.75	0.08	U	0.08	0.18	U	1.38	4.28	J	0.96	0.16	=	2.33	0.16	J	1.07	0.17

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2E	SLD02485	U	0.14	0.20	U	0.11	0.83	=	0.86	0.05	=	0.73	0.08	=	0.68	0.18	=	13.36	3.59	J	1.04	0.33	=	1.51	0.37	J	1.15	0.14
2E	SLD02486	U	0.12	0.18	U	-0.22	0.81	=	0.88	0.05	=	0.80	0.07	U	0.08	0.17	U	1.88	4.10	=	1.62	0.17	=	1.39	0.37	=	0.43	0.13
2E	SLD02487	U	0.12	0.19	U	0.26	0.87	=	1.19	0.06	=	0.89	0.08	U	0.10	0.20	U	1.91	4.08	J	0.52	0.16	=	1.40	0.34	J	0.65	0.22
2E	SLD73406	U	0.12	0.2	U	0.38	0.82	=	1.85	0.08	=	1.23	0.07	U	0.09	0.38	J	1.2	0.55	=	1.64	0.41	=	1.97	0.26	=	1.1	0.14
2E	SLD73410	U	0.2	0.16	U	0.19	0.73	=	1.55	0.07	=	1	0.07	U	0.12	0.32	=	0.88	0.47	=	1.6	0.32	=	1.43	0.38	=	1.38	0.32
2E	SLD73412	U	0.13	0.12	U	0.03	0.52	=	1.26	0.05	=	0.67	0.05	U	0.05	0.24	=	1.27	0.34	=	1.34	0.34	=	1.73	0.18	=	1.46	0.18
2E	SLD73414	U	0.16	0.17	U	0.46	0.71	=	1.68	0.07	=	0.95	0.06	U	-0.09	0.31	=	1.19	0.47	=	1.26	0.36	=	1.53	0.36	J	0.72	0.16
2F	SLD02546	U	0.16	0.20	U	0.18	0.90	=	0.95	0.06	=	0.96	0.08	=	0.26	0.18	=	6.07	5.02	=	1.28	0.15	=	1.81	0.28	=	0.86	0.13
2F	SLD2523A	U	0.16	0.19	U	0.03	0.83	=	0.99	0.05	=	1.07	0.08	U	0.10	0.17	U	1.36	4.00	J	1.53	0.40	=	1.26	0.16	J	0.65	0.48
2F	SLD2524A	U	0.24	0.53	U	-0.49	2.52	=	2.49	0.17	=	0.95	0.25	J	0.28	0.54	U	4.28	13.99	J	1.10	0.38	=	3.69	0.33	J	0.65	0.29
2F	SLD2526A	U	0.22	0.51	U	-1.02	2.23	=	1.37	0.19	=	0.93	0.26	U	0.04	0.44	U	3.78	12.87	=	1.20	0.24	=	1.48	0.24	=	0.18	0.24
2F	SLD2527A	U	0.09	0.20	U	0.23	0.92	=	1.20	0.05	=	1.08	0.08	U	0.04	0.21	U	0.49	3.77	J	1.24	0.31	J	1.97	0.31	J	1.30	0.33
2F	SLD2528A	U	0.19	0.16	U	0.05	0.63	=	0.88	0.04	=	0.94	0.06	U	0.16	0.13	U	1.25	3.13	=	1.27	0.26	=	1.38	0.14	=	1.14	0.32
2F	SLD2530A	U	0.15	0.14	U	0.10	0.64	=	0.96	0.04	=	0.89	0.06	U	0.10	0.14	U	1.23	1.91	=	1.85	0.14	J	1.43	0.31	=	1.09	0.25
2F	SLD2531A	U	0.15	0.14	U	-0.04	0.64	=	0.87	0.04	=	0.84	0.06	U	0.08	0.13	U	1.21	3.13	=	1.91	0.41	=	2.00	0.15	=	1.02	0.26
2F	SLD2533A	U	0.06	0.19	U	0.33	0.91	=	0.93	0.05	=	0.83	0.07	U	0.07	0.18	U	1.68	4.41	=	1.09	0.34	=	1.37	0.14	=	1.25	0.14
2F	SLD2534A	U	0.12	0.16	U	0.06	0.72	=	0.81	0.04	=	0.76	0.07	U	0.10	0.15	U	0.94	3.82	=	0.91	0.31	=	1.38	0.26	=	0.92	0.13
2F	SLD2536A	U	0.08	0.19	U	0.09	0.92	=	1.03	0.06	=	1.02	0.09	U	0.12	0.21	U	1.55	4.66	=	1.27	0.30	=	1.71	0.25	=	1.51	0.15
2F	SLD2538A	U	0.13	0.18	U	-0.12	0.70	=	0.89	0.05	=	1.02	0.07	U	0.06	0.15	U	0.92	4.02	=	1.39	0.38	=	1.37	0.40	=	1.69	0.24
2F	SLD2539A	U	0.04	0.10	U	-0.05	0.44	=	0.80	0.03	=	0.26	0.04	J	0.11	0.09	U	0.75	2.09	J	0.47	0.18	=	2.36	0.40	J	1.01	0.25
2F	SLD2541A	U	0.12	0.20	U	0.79	0.83	=	1.28	0.05	=	0.93	0.08	J	0.20	0.16	U	1.27	4.72	J	1.47	0.13	=	1.61	0.42	=	0.44	0.13
2F	SLD2543A	U	0.04	0.13	U	-0.08	0.61	=	0.81	0.04	=	0.41	0.06	U	0.09	0.14	U	1.76	2.78	J	0.88	0.32	=	1.60	0.36	J	0.46	0.13
2F	SLD2545A	U	0.04	0.19	U	0.14	0.88	=	0.95	0.05	=	0.88	0.09	U	0.10	0.19	U	0.59	4.64	J	0.71	0.14	=	1.55	0.14	=	1.47	0.16
2F	SLD2547A	U	0.14	0.21	U	0.20	0.90	=	1.01	0.06	=	0.83	0.08	U	0.00	0.21	U	1.49	4.73	=	1.35	0.16	=	1.70	0.45	=	1.62	0.32
2F	SLD2548A	U	0.06	0.19	U	0.13	0.78	=	0.84	0.05	=	0.80	0.08	U	0.10	0.19	U	1.98	3.10	=	1.46	0.15	=	1.54	0.33	=	1.29	0.15

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
2F	SLD2573A	U	0.12	0.17	U	0.15	0.76	=	1.02	0.05	=	0.77	0.08	U	0.10	0.16	U	2.76	4.07	=	1.53	0.15	=	2.57	0.32	=	1.26	0.34
2F	SLD73407	U	0.22	0.19	U	-0.05	0.76	=	2.32	0.07	=	1.13	0.07	U	0.25	0.37	=	3.71	0.56	=	1.73	0.3	=	2.66	0.13	=	1.82	0.13
2F	SLD73408	U	0.17	0.17	U	0.13	0.69	=	1.85	0.07	=	0.94	0.06	U	-0.21	0.29	=	1.29	0.48	=	1.34	0.31	=	1.54	0.14	J	0.87	0.14
3	SLD06054	U	-0.03	0.08	U	0.03	0.42	=	0.30	0.02	=	0.13	0.03	U	0.04	0.08	U	0.22	1.69	U	0.36	0.36	J	0.39	0.28	U	0.66	0.31
3	SLD06055	U	0.05	0.10	U	0.22	0.40	=	0.42	0.03	=	0.14	0.04	U	0.04	0.09	U	0.38	1.91	U	0.23	0.31	=	0.98	0.14	U	0.86	0.15
3	SLD06056	U	0.01	0.09	U	-0.04	0.38	=	0.40	0.03	=	0.14	0.04	U	0.09	0.09	U	0.64	1.93	J	0.74	0.31	=	1.20	0.31	J	1.10	0.16
3	SLD06057	U	0.10	0.10	U	0.27	0.45	=	0.51	0.03	=	0.15	0.04	U	0.07	0.10	U	0.23	2.14	J	0.30	0.27	J	0.30	0.23	U	1.09	0.22
3	SLD06058	U	0.02	0.08	U	-0.18	0.30	=	0.35	0.02	=	0.12	0.04	U	0.02	0.09	U	0.86	1.71	U	0.28	0.38	J	0.89	0.29	J	1.24	0.12
3	SLD06059	U	0.02	0.09	U	-0.04	0.38	=	0.32	0.03	J	0.17	0.04	U	0.03	0.10	U	0.74	2.20	U	0.19	0.13	=	0.95	0.24	U	0.78	0.27
3	SLD06060	U	0.04	0.08	U	-0.01	0.39	=	0.47	0.03	=	0.10	0.04	U	0.12	0.09	U	0.64	2.18	J	0.40	0.37	J	1.02	0.27	U	1.11	0.23
3	SLD06060-1	U	-0.34	0.43	U	-0.70	2.10	U	0.59	0.35	U	-0.02	0.39	U	-0.22	0.13	U	-0.89	1.10	J	0.16	0.15	=	0.58	0.07	J	0.85	0.14
3	SLD06060-2	U	-0.20	0.38	U	-0.40	2.20	=	0.75	0.13	U	-0.01	0.43	U	0.17	0.12	U	-0.69	1.40	J	0.17	0.15	=	0.98	0.15	J	0.65	0.14
3	SLD06061	U	0.06	0.09	U	0.01	0.41	=	0.54	0.02	=	0.09	0.04	U	0.04	0.08	U	0.67	1.93	J	0.27	0.12	=	0.98	0.12	J	1.02	0.13
3	SLD06062	U	-0.01	0.09	U	0.04	0.47	=	0.58	0.03	=	0.17	0.04	U	0.03	0.10	U	1.00	2.09	=	0.89	0.27	=	0.90	0.12	J	0.84	0.13
3	SLD06063	U	0.03	0.08	U	0.06	0.39	=	0.37	0.02	J	0.16	0.05	U	0.05	0.09	U	0.55	2.36	J	0.38	0.34	J	0.56	0.12	J	0.40	0.11
3	SLD06064	U	0.03	0.09	U	-0.04	0.39	=	0.34	0.02	=	0.14	0.03	U	0.12	0.09	U	0.72	1.95	J	0.63	0.37	=	1.37	0.15	J	1.88	0.27
3	SLD06065	U	0.06	0.08	U	0.08	0.41	=	0.57	0.03	U	0.07	0.05	U	0.02	0.08	U	0.70	1.69	J	0.19	0.17	=	1.30	0.17	U	0.60	0.11
3	SLD06066	U	-0.01	0.08	U	0.04	0.44	=	0.41	0.03	=	0.16	0.04	U	0.00	0.10	U	1.02	2.31	J	0.31	0.14	=	1.02	0.14	U	1.56	0.16
3	SLD06067	U	-0.04	0.10	U	-0.32	0.45	=	0.61	0.03	J	0.11	0.05	J	0.12	0.11	U	0.64	2.99	U	0.10	0.28	=	1.50	0.28	U	0.84	0.42
3	SLD06068	U	0.01	0.10	U	-0.09	0.47	=	0.54	0.03	=	0.10	0.04	J	0.12	0.09	U	0.42	2.13	U	0.00	0.40	=	1.25	0.15	U	0.49	0.11
3	SLD06069	U	0.02	0.08	U	0.10	0.38	=	0.42	0.02	=	0.11	0.04	=	0.07	0.07	U	0.42	1.49	J	0.50	0.31	J	0.78	0.14	J	2.16	0.15
3	SLD06070	U	0.05	0.09	U	0.15	0.41	=	0.45	0.02	=	0.11	0.04	U	0.01	0.08	U	0.49	1.91	UJ	0.29	0.46	=	1.92	0.35	U	0.93	0.13
3	SLD06071	U	0.02	0.09	U	-0.07	0.39	=	0.55	0.03	=	0.07	0.04	U	0.01	0.10	U	0.59	2.07	U	0.01	0.34	=	1.25	0.14	U	0.92	0.18
3	SLD06072	U	0.01	0.09	U	-0.09	0.42	=	0.42	0.03	J	0.08	0.04	U	0.01	0.10	U	0.51	2.47	J	0.58	0.14	=	1.05	0.14	J	1.10	0.12
3	SLD06073	U	0.00	0.08	U	0.22	0.42	=	0.44	0.04	=	0.15	0.03	U	0.01	0.08	U	0.98	1.35	U	0.17	0.15	J	0.61	0.15	J	0.92	3.79

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
3	SLD06074	U	-0.02	0.39	U	-0.96	2.07	=	0.52	0.13	U	0.27	0.32	U	0.17	0.42	U	0.11	14.37	U	0.24	0.16	J	0.92	0.36	J	0.69	0.16
3	SLD06075	U	0.07	0.10	U	-0.30	0.43	=	0.42	0.03	J	0.19	0.05	U	0.03	0.10	U	0.34	2.47	J	0.66	0.40	=	1.18	0.16	J	0.83	0.13
3	SLD06076	U	0.01	0.09	U	-0.06	0.41	=	0.35	0.03	=	0.11	0.04	U	-0.01	0.09	U	0.57	1.81	J	0.35	0.26	J	0.67	0.14	U	1.16	0.27
3	SLD06077	U	-0.01	0.09	U	0.12	0.41	=	0.32	0.03	J	0.15	0.04	U	0.07	0.10	U	0.79	2.25	J	0.52	0.22	=	1.10	0.12	J	0.35	0.16
3	SLD06078	U	0.04	0.08	U	0.05	0.35	=	0.32	0.02	=	0.16	0.03	U	0.05	0.07	U	0.36	1.69	UJ	0.24	0.35	J	0.95	0.13	J	0.38	0.15
3	SLD06079	U	-0.01	0.12	U	0.00	0.61	=	1.04	0.04	=	0.28	0.05	U	0.06	0.14	U	1.11	2.96	J	0.68	0.46	=	4.85	0.37	J	1.15	0.33
3	SLD06080	U	0.02	0.14	U	0.08	0.69	=	0.73	0.04	J	0.34	0.06	U	0.13	0.14	U	0.89	4.14	J	0.36	0.24	J	0.84	0.13	J	0.94	0.27
3	SLD06081	U	0.04	0.13	U	0.54	0.59	=	0.46	0.04	J	0.20	0.07	U	0.08	0.14	U	0.97	3.27	J	0.44	0.39	=	1.70	0.23	J	0.86	0.26
3	SLD06082	U	0.04	0.12	U	-0.01	0.55	=	0.88	0.04	=	0.21	0.05	U	0.15	0.13	U	1.16	2.25	J	0.66	0.30	=	2.09	0.36	J	0.82	0.18
3	SLD06083	U	0.00	0.07	U	-0.07	0 31	=	0.31	0.02	=	0.15	0.03	U	0.02	0.07	U	0.38	1.62	J	0.52	0.41	=	1.04	0.14	U	1.10	0.25
3	SLD06084	U	0.04	0.11	U	-0.05	0 44	=	0.35	0.03	=	0.16	0.05	=	0.26	0.10	=	3.63	2.12	U	0.37	0.38	J	0.83	0.29	U	0.70	0.21
3	SLD06085	U	0.03	0.09	U	-0.15	0 36	=	0.30	0.02	=	0.16	0.04	U	0.04	0.08	U	0.42	1.83	J	0.56	0.54	J	0.60	0.44	J	0.87	0.15
3	SLD06086	U	0.10	0.14	U	0.07	0 59	=	0.95	0.04	=	0.47	0.08	U	0.11	0.12	U	1.42	3.09	J	0.70	0.32	=	1.49	0.24	J	0.52	0.16
3	SLD06088	U	0.02	0.07	U	-0.18	0 35	=	0.32	0.02	=	0.12	0.03	U	0.04	0.08	U	0.38	1.40	J	0.46	0.29	J	0.69	0.29	U	0.96	0.12
PP	HTZ25732	U	0.35	0.23	U	0.36	0.92	=	0.95	0.56	J	1.07	0.09	U	0.23	0.22	U	4.85	4.96	=	1.65	0.28	=	1.69	0.28	=	1.17	0.13
PP	SLD07314	U	0.38	0.17	U	0.28	0.67	=	0.85	0.04	=	1.07	0.06	=	0.28	0.13	=	4.40	3.18	=	0.94	0.30	=	1.51	0.12	=	1.80	0.22
PP	SLD26664	U	0.18	0.24	UJ	0.50	0.98	=	1.32	0.64	=	0.77	0.09	U	0.22	0.24	U	2.40	4.40	J	0.83	0.34	=	2.05	0.23	=	1.01	0.16
PP	SLD26665	UJ	-0.01	0.15	UJ	0.09	0.73	=	0.69	0.48	=	0.30	0.06	=	0.27	0.17	=	7.53	2.78	UJ	0.04	0.27	J	0.76	0.15	J	1.89	0.15
PP	SLD26666	U	0.22	0.39	UJ	-0.68	1.69	=	1.45	1.17	=	0.99	0.17	=	1.79	0.42	=	33.55	7.39	=	1.36	0.27	=	2.53	0.14	J	1.26	0.14
PP	SLD26667	UJ	0.14	0.52	UJ	-0.57	2.34	U	1.03	1.48	=	1.25	0.21	=	1.27	0.49	=	33.81	9.33	=	1.95	0.38	=	2.66	0.32	J	1.44	0.17
PP	SLD26669	UJ	0.03	0.08	UJ	-0.21	0.42	=	0.40	0.29	U	0.06	0.06	UJ	0.07	0.11	U	1.20	1.93	J	0.30	0.13	J	0.68	0.25	UJ	1.12	0.43
PP	SLD26671	UJ	0.22	0.53	UJ	0.31	2.28	U	1.17	1.42	=	1.03	0.22	=	0.91	0.50	=	18.07	7.60	J	0.96	0.49	J	1.11	0.51	=	1.63	0.25
PP	SLD26672	U	0.03	0.17	U	-0.12	0.86	=	0.81	0.48	U	0.02	0.10	U	0.06	0.19	UJ	0.88	4.13	U	0.50	0.54	J	1.00	0.25	J	1.33	0.12
PP	SLD26673	U	0.05	0.49	U	0.53	2.14	U	1.05	1.34	=	1.10	0.21	U	0.30	0.47	UJ	0.89	12.46	=	1.54	0.36	=	1.82	0.25	J	0.76	0.32
PP	SLD26674	U	0.73	0.34	U	0.98	1.47	=	6.37	0.94	=	0.48	0.13	U	0.42	0.36	UJ	2.49	6.83	J	0.35	0.25	=	12.03	0.14	J	1.07	0.36

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
PP	SLD26675	U	0.32	0.64	U	1.00	2.70	=	3.81	1.78	=	1.06	0.25	U	0.27	0.61	UJ	5.23	11.56	=	0.93	0.24	=	5.31	0.13	=	1.09	0.13
PP	SLD26676	U	0.51	0.69	U	1.89	3.11	=	6.79	1.96	=	0.75	0.28	U	0.01	0.66	U	0.18	13.91	J	0.76	0.29	=	4.81	0.24	=	0.99	0.13
PP	SLD26705	U	0.11	0.16	U	0.01	0.69	=	1.45	0.43	J	0.21	0.07	U	0.13	0.18	U	2.02	2.70	U	0.27	0.29	U	1.53	0.12	U	1.49	0.18
PP	SLD26706	U	0.18	0.20	U	0.01	0.86	UJ	1.78	0.59	J	0.76	0.08	U	0.47	0.21	U	13.58	3.59	=	0.84	0.13	U	5.43	0.25	=	0.87	0.29
PP	SLD26707	U	0.15	0.21	U	-0.10	0.97	U	1.70	0.60	U	0.99	0.10	U	0.39	0.23	U	2.71	4.03	J	1.08	0.25	J	1.96	0.13	U	1.15	0.27
PP	SLD26708	U	0.07	0.18	U	-0.08	0.88	U	1.82	0.55	=	0.93	0.08	J	0.21	0.20	U	5.83	3.72	J	1.42	0.29	UJ	5.76	0.24	U	1.71	0.16
PP	SLD26709	U	0.12	0.22	U	0.81	1.04	=	2.21	0.63	J	0.84	0.08	U	0.13	0.23	U	3.50	4.65	UJ	0.86	0.28	J	4.24	0.23	UJ	0.89	0.24
PP	SLD26710	U	0.15	0.18	U	0.13	0.76	=	2.02	0.50	=	0.58	0.07	U	0.18	0.18	U	2.79	3.21	=	1.71	0.32	=	4.42	0.15	=	1.20	0.25
PP	SLD27007	U	0.21	0.26	U	-1.09	1.23	=	1.72	0.77	J	0.79	0.14	U	0.19	0.28	U	3.88	6.57	J	0.78	0.29	=	3.23	0.12	=	1.07	0.26
PP	SLD27020	U	0.24	0.17	U	0.03	0.71	=	1.07	0.48	J	1.14	0.07	=	1.69	0.17	=	33.57	3.21	=	1.12	0.27	J	2.59	0.15	=	1.12	0.13
PP	SLD27168	U	0.01	0.10	U	-0.09	0.42	U	0.28	0.30	J	0.09	0.04	U	0.02	0.10	U	0.63	1.96	UJ	0.06	0.16	J	0.35	0.31	UJ	0.73	0.12
PP	SLD27169	U	0.52	0.53	U	0.39	2.32	=	3.17	1.32	J	0.77	0.24	U	0.04	0.48	U	3.28	11.31	=	1.23	0.14	=	3.28	0.27	=	1.16	0.25
PP	SLD27170	U	0.05	0.12	U	-0.07	0.61	=	0.42	0.38	J	0.13	0.05	U	0.02	0.13	UJ	0.57	3.32	J	0.31	0.23	J	0.68	0.23	J	1.80	0.22
PP	SLD27171	U	0.01	0.12	U	-0.02	0.55	=	0.79	0.36	U	0.09	0.08	U	0.09	0.13	U	1.60	2.59	UJ	0.04	0.46	J	1.00	0.21	J	0.81	0.30
PP	SLD27172	U	0.24	0.20	U	0.20	0.87	=	1.58	0.55	J	0.72	0.08	U	0.25	0.20	U	1.32	3.88	J	0.61	0.27	=	1.88	0.12	J	0.63	0.11
PP	SLD27541	J	0.28	0.18	U	0.18	0.69	=	1.04	0.47	J	0.84	0.07	=	1.82	0.16	=	37.84	3.31	J	0.87	0.21	J	1.29	0.11	J	0.92	0.15
PP	SLD27542	=	0.24	0.10	U	0.29	0.57	=	0.89	0.34	J	0.47	0.05	=	0.34	0.11	=	5.93	2.51	J	0.65	0.39	=	1.17	0.27	J	1.37	0.15
PP	SLD27543	J	0.23	0.15	U	0.01	0.60	=	2.22	0.40	J	0.39	0.06	U	0.09	0.14	U	1.61	2.98	J	0.64	0.33	=	1.85	0.15	J	0.85	0.15
PP	SLD27544	J	0.22	0.21	U	-0.20	0.92	=	3.52	0.58	J	0.66	0.08	U	0.07	0.19	U	2.55	4.60	J	0.80	0.13	=	1.39	0.28	J	0.70	0.15
PP	SLD27546	J	0.22	0.16	U	-0.19	0.62	=	0.72	0.40	J	0.23	0.06	U	0.01	0.13	UJ	0.38	3.14	J	0.50	0.31	J	0.81	0.32	J	0.95	0.14
PP	SLD28060	U	0.36	0.17	UJ	-0.35	0.64	=	0.82	0.04	=	0.83	0.06	=	0.92	0.15	=	18.98	0.61	=	1.10	0.33	=	1.82	0.13	J	0.58	0.07
PP	SLD28061	UJ	0.05	0.13	UJ	0.00	0.51	=	0.91	0.03	=	0.39	0.05	=	0.23	0.11	=	3.49	0.39	=	1.17	0.34	=	1.60	0.14	J	1.04	0.11
PP	SLD28063	U	0.39	0.19	UJ	0.06	0.71	=	1.01	0.05	=	1.13	0.06	=	1.04	0.16	=	20.97	0.66	=	1.37	0.13	=	1.66	0.13	=	1.14	0.07
PP	SLD28064	U	0.43	0.19	UJ	-0.05	0.66	=	1.45	0.04	=	0.82	0.06	=	0.61	0.15	=	12.82	0.58	=	0.87	0.23	=	2.46	0.13	=	1.24	0.04
PP	SLD28583	U	0.39	0.18	UJ	0.42	0.68	=	1.58	0.04	=	0.92	0.07	=	0.41	0.15	=	5.79	0.51	J	0.76	0.23	=	1.54	0.12	=	0.57	0.11

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
PP	SLD65112	U	0.13	0.16	UJ	-0.21	0.51	=	0.96	0.04	=	0.89	0.05	=	0.25	0.11	=	4.12	0.42	=	1.40	0.37	=	1.70	0.28	=	0.90	0.15
PP	SLD65113	U	0.42	0.16	UJ	-0.06	0.59	=	1.35	0.04	=	0.89	0.06	=	0.85	0.14	=	18.08	0.52	=	1.27	0.34	=	6.88	0.12	=	1.12	0.28
PP	SLD65115	U	0.48	0.20	UJ	0.05	0.84	=	5.38	0.05	=	0.87	0.08	U	0.17	0.19	=	1.77	0.59	J	0.88	0.25	=	2.93	0.25	J	0.35	0.20
PP	SLD65118	U	0.22	0.12	UJ	0.07	0.50	=	0.93	0.03	=	0.59	0.05	=	0.19	0.10	=	2.07	0.35	J	0.87	0.25	=	1.52	0.13	J	1.59	0.13
PP	SLD65119	U	0.24	0.14	UJ	-0.03	0.59	=	1.67	0.03	=	0.53	0.06	=	0.63	0.13	=	11.44	0.48	=	1.04	0.26	=	7.41	0.12	J	1.16	0.14
PP	SLD65143	U	0.45	0.17	UJ	0.16	0.57	=	1.03	0.03	=	0.91	0.05	=	0.56	0.12	=	8.62	0.47	=	1.56	0.23	=	5.24	0.23	J	1.63	0.30
PP	SLD65144	=	0.38	0.14	UJ	0.30	0.75	=	3.18	0.04	=	0.62	0.06	=	0.36	0.15	=	3.97	0.50	=	1.09	0.39	=	6.15	0.37	J	1.07	0.11
PP	SLD65219	U	0.20	0.24	UJ	-0.14	0.91	=	1.30	0.06	=	0.57	0.10	U	0.07	0.22	=	1.90	1.17	J	0.81	0.29	J	2.03	0.13	J	1.62	0.15
PP	SLD65881	U	0.26	0.20	UJ	0.05	0.75	=	1.16	0.05	=	1.16	0.07	UJ	-0.02	0.18	U	1.54	1.88	=	1.31	0.38	J	2.23	0.28	=	0.88	0.28
PP	SLD65882	UJ	0.03	0.11	UJ	-0.14	0.49	=	0.87	0.03	J	0.11	0.04	UJ	0.04	0.12	UJ	0.33	1.22	=	2.13	0.37	J	2.39	0.17	=	0.98	0.16
PP	SLD65883	U	0.16	0.16	UJ	0.06	0.68	=	1.26	0.04	=	0.56	0.06	UJ	0.01	0.16	UJ	0.60	1.73	J	0.68	0.43	J	1.99	0.19	J	1.17	0.26
PP	SLD65884	UJ	0.05	0.15	UJ	-0.28	0.64	=	2.18	0.04	J	0.29	0.05	UJ	0.06	0.17	U	1.36	1.71	J	1.10	0.35	J	1.66	0.16	J	0.73	0.15
PP	SLD65885	U	0.28	0.22	UJ	-0.23	0.96	=	4.90	0.06	J	0.19	0.09	J	0.26	0.24	U	1.52	2.47	U	0.36	0.39	J	3.77	0.29	J	1.13	0.28
PP	SLD65886	=	0.36	0.18	UJ	-0.05	0.95	=	4.33	0.05	=	1.09	0.08	=	0.51	0.22	=	9.19	2.35	=	2.24	0.38	=	8.66	0.38	=	1.29	0.29
PP	SLD65887	U	0.12	0.17	UJ	0.35	0.77	=	1.38	0.05	=	0.59	0.07	U	0.14	0.19	U	1.31	1.96	J	1.97	0.33	J	3.20	0.40	J	1.22	0.13
PP	SLD65888	U	0.23	0.27	UJ	0.76	1.25	=	4.17	0.07	=	1.18	0.11	UJ	0.22	0.30	J	4.93	2.83	=	1.77	0.33	=	4.77	0.39	=	1.12	0.30
PP	SLD65889	U	0.14	0.18	UJ	0.24	0.79	=	1.70	0.05	=	0.66	0.07	J	0.24	0.19	U	1.80	1.85	J	0.78	0.52	J	3.36	0.42	=	0.58	0.32
PP	SLD65895	U	0.10	0.11	U	0.32	0.48	=	0.80	0.03	=	0.88	0.04	=	0.47	0.11	=	9.22	0.98	=	1.22	0.28	=	1.38	0.28	=	0.77	0.13
PP	SLD67469	U	0.24	0.21	U	-0.12	0.94	=	5.74	0.05	=	0.77	0.09	U	0.18	0.22	J	2.51	1.74	=	1.26	0.23	=	3.60	0.10	=	1.39	0.26
PP	SLD67470	U	0.06	0.21	U	-0.33	0.89	=	1.63	0.06	=	0.86	0.08	U	0.08	0.22	J	1.76	1.66	=	1.17	0.20	=	1.57	0.20	=	1.39	0.15
PP	SLD67471	U	0.11	0.20	U	-0.02	0.86	=	2.34	0.05	=	0.88	0.08	=	0.59	0.20	=	12.38	1.65	=	1.16	0.27	=	8.26	0.10	=	1.05	0.25
PP	SLD67472	U	0.02	0.18	U	0.02	0.82	=	1.61	0.05	=	0.61	0.07	U	0.12	0.20	J	2.22	1.56	=	1.03	0.10	=	1.93	0.10	=	1.12	0.26
PP	SLD67473	U	0.01	0.13	U	-0.05	0.62	=	0.97	0.03	=	0.10	0.05	U	0.13	0.14	J	1.11	1.02	J	0.39	0.12	=	1.69	0.12	J	1.03	0.13
PP	SLD67474	U	0.18	0.22	U	-0.01	0.97	=	1.23	0.06	=	0.60	0.09	U	0.10	0.23	U	0.35	1.89	=	0.98	0.31	=	1.59	0.10	=	1.42	0.26
PP	SLD67475	U	0.05	0.17	U	0.27	0.72	=	1.25	0.04	=	0.37	0.06	U	0.08	0.17	J	1.89	1.28	J	0.55	0.32	=	2.69	0.11	=	0.60	0.18

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
PP	SLD67476	U	0.03	0.14	U	0.20	0.61	=	1.08	0.04	=	0.16	0.05	U	0.10	0.14	J	1.12	1.10	J	0.58	0.31	=	2.09	0.23	U	1.36	0.13
PP	SLD78882	U	0.126	0.21	UJ	0.31	0.96	=	2.13	0.09	=	0.94	0.08	UJ	0.03	0.45	=	3.23	1.20	=	1.91	0.13	J	2.43	0.25	=	1.01	0.25
PP	SLD78883	J	0.27	0.26	UJ	0.47	1.16	=	4.50	0.10	=	0.89	0.11	U	0.40	0.56	=	7.24	1.49	=	1.79	0.35	=	6.50	0.26	=	1.55	0.26
PP	SLD78884	U	0.21	0.21	UJ	0.29	0.87	=	2.35	0.08	=	0.67	0.08	UJ	0.30	0.46	=	6.11	1.13	=	0.91	0.24	=	4.44	0.24	=	0.87	0.13
PP	SLD78885	U	0.09	0.17	UJ	0.11	0.74	=	2.64	0.07	=	0.38	0.07	UJ	0.04	0.37	=	2.52	0.91	=	1.02	0.26	=	4.68	0.14	J	0.36	0.14
SS	SLD06126	U	0.11	0.21	U	0.46	0.92	=	1.15	0.06	=	0.73	0.09	U	0.09	0.20	U	2.64	4.97	=	1.21	0.32	J	2.40	0.43	=	0.95	0.17
SS	SLD06127	U	0.19	0.20	U	0.10	0.86	=	1.07	0.05	=	0.80	0.08	=	0.34	0.18	U	3.20	3.73	=	1.05	0.25	J	1.60	0.25	=	0.37	0.17
SS	SLD06129	U	0.08	0.21	U	-0.05	0.91	=	2.04	0.05	=	0.86	0.08	J	0.24	0.19	U	1.89	3.82	=	1.29	0.31	J	2.22	0.31	=	0.85	0.14
SS	SLD06130	U	0.18	0.17	U	-0.01	0.70	=	1.05	0.04	=	0.69	0.07	U	0.16	0.17	U	1.33	3.88	=	1.50	0.38	J	2.28	0.13	=	0.87	0.12
SS	SLD06317	U	0.02	0.21	U	-0.07	0.96	=	1.28	0.06	J	0.55	0.10	U	0.09	0.22	U	1.49	5.43	=	1.37	0.37	=	1.49	0.33	J	0.60	0.15
SS	SLD06318	U	0.02	0.59	U	1.58	2.99	=	6.03	0.19	U	0.52	0.45	U	0.03	0.57	U	2.40	11.36	=	1.48	0.45	=	3.07	0.15	J	0.93	0.36
SS	SLD06319	U	0.03	0.08	U	-0.17	0.38	J	0.29	0.03	J	0.08	0.04	U	0.04	0.09	U	0.25	1.96	J	0.36	0.32	J	0.63	0.17	U	0.06	0.17
SS	SLD06500	U	0.27	0.20	U	0.52	0.78	=	0.69	0.05	=	0.74	0.08	U	0.07	0.16	U	0.62	3.49	=	1.36	0.38	=	2.07	0.17	=	1.07	0.13
SS	SLD06582	U	0.24	0.14	U	0.23	0.53	=	1.22	0.04	=	0.48	0.05	J	0.15	0.13	U	0.96	2.42	=	1.48	0.39	J	2.50	0.35	J	1.38	0.27
SS	SLD06584	U	0.30	0.22	U	-0.09	0.84	=	0.85	0.05	=	0.94	0.08	U	0.06	0.18	U	1.35	4.21	J	0.80	0.31	=	1.23	0.23	=	1.22	0.27
SS	SLD06586	U	0.43	0.43	U	0.20	1.76	=	1.11	0.12	=	0.65	0.19	U	0.03	0.33	U	0.45	8.97	=	1.69	0.40	J	2.30	0.36	J	0.50	0.14
SS	SLD06753	U	0.20	0.22	U	0.19	0.91	=	1.58	0.06	=	0.80	0.09	J	0.32	0.25	U	3.53	4.78	J	0.63	0.32	=	1.93	0.24	=	1.08	0.13
SS	SLD06755	U	0.19	0.24	U	0.36	1.02	=	1.08	0.07	=	0.76	0.10	J	0.30	0.22	=	4.75	4.41	J	1.00	0.39	=	1.10	0.16	J	1.20	0.16
SS	SLD07182	U	0.27	0.50	U	0.72	2.17	=	1.12	0.16	=	0.90	0.22	U	0.21	0.47	U	1.90	9.92	=	1.30	0.30	=	1.37	0.14	=	0.62	0.12
SS	SLD07184	U	0.14	0.24	U	0.11	1.01	=	0.93	0.07	=	1.05	0.10	U	0.19	0.23	=	5.07	4.94	=	1.38	0.13	=	1.76	0.13	=	1.17	0.15
SS	SLD07186	U	0.22	0.21	U	-0.26	0.93	=	1.15	0.06	=	0.92	0.09	U	0.06	0.21	U	2.38	4.02	J	0.82	0.23	=	1.67	0.31	=	0.80	0.14
SS	SLD07258	U	0.28	0.27	U	-0.10	1.16	=	2.30	0.08	=	0.88	0.13	=	1.78	0.30	=	32.78	4.04	=	1.40	0.27	=	3.17	0.12	J	0.95	0.16
SS	SLD07448	U	0.10	0.13	U	0.24	0.60	=	1.29	0.04	=	0.69	0.05	=	0.29	0.12	=	4.64	2.29	=	1.16	0.39	=	1.60	0.16	=	0.95	0.21
SS	SLD07481	UJ	0.06	0.17	UJ	0.05	0.74	=	0.96	0.05	=	0.79	0.07	UJ	0.01	0.16	U	1.29	3.43	=	1.18	0.30	=	1.44	0.25	=	0.93	0.28
SS	SLD25037	U	0.33	0.16	U	0.23	0.65	=	1.45	0.04	=	0.77	0.06	=	0.67	0.14	=	12.20	2.72	=	1.38	0.14	=	2.49	0.14	J	0.11	0.04

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
SS	SLD25040	U	0.26	0.23	U	0.47	0.91	=	2.50	0.06	=	1.00	0.09	J	0.24	0.18	=	4.50	4.22	=	1.44	0.42	=	5.01	0.34	=	0.12	0.17
SS	SLD25603	U	-0.02	0.18	U	-0.29	0.80	=	1.82	0.52	J	0.74	0.09	U	0.18	0.20	U	1.66	4.12	=	1.51	0.37	=	2.42	0.42	J	1.98	0.17
SS	SLD26703	U	0.09	0.18	U	0.70	0.87	=	1.03	0.49	J	0.95	0.07	U	0.10	0.17	U	1.11	4.01	=	1.08	0.14	=	2.28	0.14	=	0.51	0.29
SS	SLD26704	U	0.15	0.20	U	0.46	0.89	=	1.08	0.52	J	0.94	0.08	U	0.10	0.19	U	1.28	4.15	=	1.17	0.32	=	1.06	0.22	=	1.37	0.16
SS	SLD27024	U	0.42	0.58	U	-0.84	2.70	=	1.82	1.51	J	0.79	0.25	U	0.24	0.55	U	9.05	14.40	J	0.93	0.50	J	1.74	0.40	J	0.73	0.12
SS	SLD27345	U	0.12	0.19	U	-0.18	0.90	=	1.11	0.54	J	0.75	0.09	U	0.14	0.20	U	2.07	3.78	J	0.87	0.42	J	2.08	0.24	=	1.60	0.37
SS	SLD65107	UJ	0.69	0.22	UJ	0.35	0.74	J	1.04	0.05	J	1.16	0.07	UJ	0.14	0.16	=	2.13	0.53	=	1.50	0.24	=	1.61	0.13	=	0.48	0.12
SS	SLD65673	U	0.28	0.23	UJ	0.51	1.00	=	0.95	0.07	=	1.01	0.10	U	0.14	0.22	J	1.20	1.16	=	1.73	0.29	=	1.65	0.13	J	1.27	0.15
SS	SLD65674	U	0.21	0.19	U	0.80	0.87	=	0.89	0.05	=	0.93	0.08	UJ	0.03	0.18	=	2.07	1.05	=	1.25	0.28	=	1.68	0.13	=	1.42	0.18
SS	SLD67516	U	0.18	0.14	U	0.33	0.55	=	0.79	0.03	=	1.01	0.05	U	0.07	0.12	J	0.84	0.40	=	1.05	0.22	=	1.18	0.22	=	1.03	0.16
SS	HTZ25747	=	0.51	0.12	U	1.13	0.76	=	2.02	0.41	J	0.72	0.06	=	0.33	0.14	=	3.95	2.61	=	1.20	0.27	=	9.35	0.30	=	0.88	0.23
SS	SLD78707	U	0.15	0.18	UJ	-0.27	0.79	=	1.07	0.08	=	0.89	0.07	UJ	0.03	0.37	=	2.06	1.00	=	1.63	0.26	=	2.12	0.26	=	0.91	0.14
SS	SLD78708	U	0.17	0.18	UJ	-0.15	0.77	=	1.06	0.07	=	0.89	0.07	U	0.35	0.39	=	5.75	1.05	=	1.84	0.41	=	2.88	0.13	=	1.27	0.13
SS	SLD78709	U	0.16	0.19	UJ	0.42	0.86	=	1.20	0.07	=	0.88	0.08	J	0.42	0.38	=	4.83	1.10	=	2.28	0.26	=	2.88	0.26	=	1.27	0.14
SS	SLD78715	U	0.13	0.23	UJ	0.50	1.05	=	2.08	0.09	=	0.95	0.09	J	0.47	0.46	=	7.85	1.28	=	1.21	0.26	J	1.97	0.26	=	1.12	0.14
SS	SLD78716	U	0.13	0.21	UJ	0.01	0.87	=	1.49	0.08	=	1.02	0.09	U	0.31	0.44	J	1.93	1.09	=	1.63	0.35	J	3.10	0.26	=	0.96	0.31
SS	SLD78717	UJ	0.10	0.20	UJ	0.56	0.99	=	1.55	0.09	=	0.93	0.09	UJ	0.12	0.43	J	2.10	1.14	=	1.86	0.33	J	3.32	0.13	=	0.94	0.13
SS	SLD78719	U	0.13	0.23	UJ	-0.02	0.99	=	2.31	0.09	=	0.99	0.09	=	0.76	0.49	=	8.53	1.38	J	2.05	0.30	=	3.36	0.16	=	1.35	0.16
SS	SLD78720	U	0.15	0.20	UJ	-0.06	0.83	=	1.36	0.08	=	0.84	0.08	UJ	0.05	0.39	J	1.48	1.09	J	1.63	0.12	J	2.10	0.22	=	1.09	0.22
SS	SLD78721	UJ	0.10	0.19	UJ	0.49	0.89	=	1.33	0.07	=	0.93	0.08	UJ	-0.05	0.38	J	1.31	1.08	J	1.29	0.33	J	1.92	0.13	=	1.18	0.13
SS	SLD78723	UJ	0.08	0.18	UJ	-0.13	0.80	=	1.41	0.08	=	0.78	0.07	UJ	0.17	0.39	=	2.17	0.99	J	1.26	0.14	J	1.95	0.14	=	1.14	0.25
SS	SLD78724	=	0.23	0.18	UJ	0.48	0.81	=	4.71	0.07	=	1.12	0.07	=	0.50	0.39	=	7.39	0.57	J	2.26	0.23	=	5.05	0.13	=	1.02	0.13
SS	SLD78725	U	0.17	0.19	UJ	0.44	0.84	=	1.29	0.08	=	0.88	0.08	UJ	0.11	0.39	=	2.05	0.98	J	1.20	0.14	J	2.35	0.14	=	1.24	0.26
SS	SLD78927	UJ	0.09	0.13	UJ	-0.27	0.53	=	2.52	0.05	=	0.62	0.05	U	0.27	0.28	=	2.80	0.48	=	1.14	0.34	=	3.61	0.14	J	0.85	0.26
SS	SLD78928	U	0.30	0.19	UJ	0.03	0.80	=	5.79	0.07	=	1.09	0.07	UJ	0.32	0.43	=	4.94	0.66	=	1.74	0.36	=	4.73	0.25	=	1.52	0.25

Survey Unit	Sample ID	Ac-227			Pa-231			Ra-226			Ra-228			U-235			U-238			Th-228			Th-230			Th-232		
		Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA	Q	Result	MDA
SS	SLD78929	U	0.09	0.12	UJ	0.05	0.47	=	1.15	0.04	=	0.86	0.05	UJ	-0.05	0.25	=	0.91	0.43	=	1.35	0.32	=	1.76	0.13	J	0.76	0.13
SS	SLD78931	U	0.22	0.12	UJ	0.04	0.52	=	1.18	0.05	=	0.91	0.05	UJ	0.15	0.26	=	0.90	0.43	=	2.18	0.32	=	2.74	0.15	=	1.27	0.27
SS	SLD78932	UJ	0.06	0.12	UJ	0.10	0.52	=	1.47	0.05	=	0.83	0.05	UJ	-0.01	0.27	=	1.08	0.44	=	1.97	0.31	=	2.13	0.26	=	0.96	0.31
SS	SLD78933	UJ	0.04	0.17	UJ	0.24	0.74	=	2.69	0.06	=	0.89	0.06	U	0.37	0.38	=	2.63	0.59	=	1.38	0.28	=	2.20	0.28	=	1.27	0.15

ATTACHMENT C-4

PLANT 1 FINAL STATUS SURVEY SOIL SAMPLE DATA SUMMARY

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - Class 1 SU-1A

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		2.84	4.37	16.98	0.92	1.18	0.99	1.31	0.32	0.29	0.77	0.54
Median		1.19	2.74	5.67	0.43	1.16	1.01	1.28	0.23	0.25	0.55	0.33
Standard Deviation		3.70	5.76	26.27	1.39	0.33	0.23	0.37	0.37	0.53	0.68	0.68
Sytematic Std. Dev.		1.32	2.03	13.87	0.70	0.37	0.21	0.35	0.19	0.40	0.33	0.33
Number of samples		104	104	104	104	104	104	104	104	104		
Student $t_{(n-1)}$ test		1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66		
Student $H_{(n,s)}$ test												
Maximum		21.55	49.76	197.20	11.34	1.98	1.50	2.25	3.00	3.83	4.40	4.17
Range		20.85	48.65	196.63	11.34	1.81	1.30	1.82	3.07	5.07	4.26	4.17
Detects		104	104	60	69	104	104	104	19	1		
Distribution		X	L	L	L	N	N	L	L	L		
UCL (normal)		**3.44**	**5.31**	**21.25**	**1.14**	**1.23**	**1.02**	**1.37**	**0.38**	**0.38**		
UCL (Lognormal)		3.14	4.66	25.09	1.18			1.38	0.41	0.60		
UCL (Z-statistics)		3.51										
UCL-95(Selected)		3.51	4.66	25.09	1.18	1.23	1.02	1.38	0.41	0.60		
EPC		**0.73**	**2.71**	**23.65**	**1.09**	**0.14**	**0.07**	**0.22**	**0.27**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
HTZ00166	Biased	1.34	15.91	46.17	2.56	1.37	1.08	1.49	0.60	0.71	2.08	1.84
HTZ00167	Biased	1.78	12.11	22.90	1.34	1.23	0.94	1.47	0.58	0.59	1.35	1.12
HTZ00168	Biased	1.18	12.72	48.75	2.57	1.05	0.97	1.91	0.65	0.55	1.89	1.67
HTZ00171	Biased	4.15	3.90	7.50	0.40	0.98	1.47	2.04	0.37	-0.15	0.52	0.29
HTZ00190	Biased	1.11	3.02	6.08	0.34	0.72	1.16	1.23	0.13	0.05	0.40	0.18
HTZ00200	Biased	1.39	1.71	1.17	0.03	0.17	0.20	0.43	0.05	-0.14	0.15	0.00
HTZ00201	Biased	7.82	3.18	5.07	0.22	1.33	0.68	1.74	-0.05	0.00	0.71	0.42
HTZ00202	Biased	3.12	2.62	3.52	0.08	1.07	0.67	1.14	0.17	0.23	0.35	0.09
HTZ00322	Biased	1.58	12.01	22.28	1.17	1.16	0.98	1.23	0.29	-0.39	1.32	1.09
HTZ00343	Biased	5.06	26.34	55.89	3.29	1.23	0.85	1.62	3.00	3.83	2.96	2.72
HTZ00344	Biased	0.84	1.61	95.22	4.80	1.42	0.97	1.24	0.12	0.07	2.11	1.90
HTZ00347	Biased	5.22	11.52	16.00	1.04	1.73	1.16	0.87	0.79	1.11	1.20	0.97
HTZ00349	Biased	9.83	6.20	9.99	0.75	0.99	1.11	2.07	0.72	0.57	0.93	0.65
HTZ00355	Biased	2.36	12.18	14.15	0.94	1.04	0.78	0.92	0.53	0.96	1.16	0.94
HTZ00378	Biased	0.97	2.06	1.61	0.13	0.81	1.01	0.68	0.24	0.00	0.24	0.02
HTZ00391	Biased	9.94	4.73	4.27	0.50	0.90	0.87	0.90	0.53	0.86	0.81	0.53
HTZ00392	Biased	10.10	3.88	0.57	0.30	0.93	0.88	1.30	0.26	-0.59	0.75	0.49
HTZ00394	Biased	6.04	4.31	3.97	0.37	0.61	0.88	1.95	0.64	0.34	0.54	0.27
HTZ00398	Biased	0.90	1.58	12.35	0.63	1.02	0.82	1.44	0.41	0.08	0.42	0.22
HTZ00404	Biased	1.02	1.17	1.14	0.05	0.85	0.69	0.73	0.31	0.03	0.16	0.00
HTZ00405	Biased	7.39	4.17	5.28	0.37	1.24	1.27	1.72	0.45	0.13	0.68	0.41
HTZ00406	Biased	5.34	6.66	5.37	0.38	1.79	1.30	1.42	0.60	0.49	0.67	0.44
HTZ00409	Biased	9.15	2.47	4.62	0.45	1.19	0.80	1.13	0.31	-0.17	0.78	0.49

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
HTZ00415	Biased	7.25	4.81	0.97	0.05	1.47	0.59	1.44	0.19	0.28	0.60	0.32
HTZ00417	Biased	2.85	4.77	2.58	0.24	1.73	0.93	0.91	0.30	-0.17	0.48	0.25
HTZ00418	Biased	2.36	3.60	2.24	0.19	1.18	0.73	1.80	0.07	0.10	0.36	0.13
HTZ00440	Biased	1.37	3.67	1.99	0.23	1.24	1.19	0.93	0.26	0.27	0.37	0.14
HTZ00441	Biased	1.52	5.04	53.49	2.38	1.30	1.04	0.96	0.35	0.58	1.49	1.26
HTZ00442	Biased	1.35	2.92	48.25	2.45	1.53	1.06	0.82	0.36	0.47	1.26	1.03
HTZ00472	Biased	0.90	2.42	44.39	2.30	1.23	1.50	0.88	0.16	-0.05	1.15	0.93
HTZ00473	Biased	1.00	2.95	15.97	0.81	1.40	1.12	1.32	0.28	-0.14	0.61	0.38
HTZ00474	Biased	5.83	6.89	11.28	0.62	1.05	1.19	1.74	0.25	0.99	0.76	0.54
HTZ00475	Biased	12.95	4.63	7.80	0.38	0.76	1.15	1.35	0.49	0.32	1.10	0.82
HTZ00476	Biased	20.81	6.19	4.08	0.60	1.30	1.02	1.63	0.39	0.21	1.56	1.27
HTZ00493	Biased	12.19	2.93	5.94	0.55	0.90	0.90	0.94	0.69	1.07	0.99	0.72
HTZ00494	Biased	21.55	5.36	4.62	0.83	1.23	0.91	1.10	1.90	0.34	1.61	1.32
HTZ00502	Biased	3.17	4.09	3.33	0.34	1.81	1.01	1.44	0.15	0.11	0.46	0.23
HTZ00518	Biased	1.02	5.58	197.20	11.34	1.25	0.76	1.25	0.40	1.04	4.40	4.17
HTZ00529	Biased	2.13	4.52	26.86	1.52	1.07	1.08	1.06	0.16	-0.11	0.91	0.69
HTZ00668	Biased	1.75	3.51	2.18	0.33	0.98	0.43	1.05	0.14	0.50	0.34	0.12
HTZ00670	Biased	2.36	3.33	3.84	0.28	1.00	0.80	1.06	0.10	0.23	0.37	0.14
HTZ00671	Biased	5.69	49.76	3.85	0.52	1.66	1.32	1.55	0.75	1.39	3.50	3.27
HTZ00672	Biased	0.97	1.55	1.18	0.13	1.21	0.96	1.65	0.53	0.31	0.21	0.01
HTZ00681	Biased	0.92	2.46	12.84	0.70	1.03	1.02	0.91	0.35	0.43	0.49	0.27
HTZ00683	Biased	1.10	2.27	0.90	0.13	1.09	1.02	1.41	0.39	0.35	0.24	0.03
HTZ00688	Biased	3.13	3.05	3.04	0.28	1.15	1.04	1.32	0.22	0.26	0.35	0.11
HTZ00694	Biased	1.08	2.13	53.86	2.70	1.55	1.01	1.39	0.48	0.06	1.32	1.09
HTZ00705	Biased	0.94	1.98	40.99	1.57	1.09	0.92	1.50	0.14	0.31	1.02	0.79
HTZ00712	Biased	0.84	1.77	5.21	0.16	1.24	1.20	1.23	-0.03	-0.11	0.30	0.09
HTZ25674	Biased	0.78	1.81	35.51	1.73	0.80	0.81	1.22	0.09	0.42	0.88	0.68
HTZ25677	Biased	1.04	2.12	16.04	0.61	1.34	1.36	1.66	0.13	0.45	0.55	0.33
HTZ25729	Biased	0.89	2.00	9.02	0.41	1.34	1.01	1.52	0.41	-0.07	0.40	0.17
HTZ25730	Biased	1.11	1.85	16.13	0.85	1.67	1.28	2.25	0.42	-0.40	0.56	0.33
HTZ25731	Biased	1.20	1.51	33.97	1.60	1.00	1.30	1.16	0.25	-0.26	0.87	0.67
HTZ25736	Biased	1.19	1.37	18.46	0.84	1.03	1.27	1.58	0.46	0.56	0.55	0.36
HTZ25780	Biased	1.17	1.55	26.17	1.26	0.58	0.69	1.24	0.08	0.16	0.67	0.49
HTZ25781	Biased	0.86	1.37	23.20	1.22	1.31	0.97	1.26	0.17	-0.01	0.64	0.45
HTZ27393	Biased	0.87	1.33	99.14	4.31	0.86	1.06	0.88	0.02	-0.26	2.14	1.96
HTZ27394	Biased	1.01	1.79	22.26	1.25	1.42	1.35	1.37	0.00	0.39	0.66	0.44
HTZ27395	Biased	1.16	1.84	51.87	2.55	1.74	1.34	2.03	0.12	0.81	1.28	1.05
HTZ27396	Biased	0.70	1.43	4.59	0.22	0.83	1.07	1.06	0.49	-0.01	0.26	0.07
HTZ27403	Biased	1.05	1.86	17.60	0.78	1.07	0.77	1.24	0.31	0.35	0.55	0.32
HTZ27404	Biased	1.45	1.89	3.94	0.24	1.17	0.65	0.87	0.42	-0.10	0.28	0.06
SLD06049	Sytematic	0.90	2.28	4.59	0.20	1.17	0.92	1.71	0.12	0.25	0.32	0.09
SLD06050	Sytematic	0.76	2.48	1.74	0.14	1.91	1.12	2.02	0.19	-0.24	0.33	0.10
SLD06051	Sytematic	0.92	3.44	27.25	1.40	1.52	1.14	1.34	0.24	0.44	0.88	0.64
SLD06125	Sytematic	3.45	3.55	4.02	0.29	1.30	1.03	1.42	0.19	0.61	0.40	0.17
SLD06128	Sytematic	2.94	2.75	9.67	0.46	1.02	1.01	1.56	0.04	0.19	0.46	0.22
SLD06138	Sytematic	1.61	10.88	9.59	0.21	1.51	1.39	2.03	0.26	1.50	1.02	0.79
SLD06139	Sytematic	2.12	10.57	25.49	1.97	1.69	1.25	1.58	0.52	-1.24	1.33	1.10
SLD06314	Sytematic	1.71	4.92	14.76	0.89	1.01	0.78	1.03	0.20	0.65	0.69	0.46
SLD06315	Sytematic	3.22	1.96	2.26	0.22	0.44	0.47	1.03	0.11	-0.05	0.29	0.05
SLD06316	Sytematic	1.11	1.11	1.05	0.07	0.46	0.60	0.74	0.06	0.15	0.14	0.00
SLD06473	Sytematic	1.10	2.22	3.28	0.26	1.47	1.08	1.63	0.04	0.25	0.31	0.08
SLD06474	Sytematic	1.04	2.39	37.77	1.93	1.62	1.08	1.80	0.04	-0.19	1.02	0.79
SLD06475	Sytematic	0.96	2.61	20.63	0.95	1.29	0.99	1.27	0.10	0.00	0.67	0.44
SLD06476	Sytematic	1.05	2.59	69.69	3.35	1.13	1.06	1.55	0.10	-0.01	1.64	1.42

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD06477	Sytematic	1.05	3.04	3.68	0.19	1.98	0.99	1.28	0.15	0.38	0.41	0.18
SLD06478	Sytematic	0.93	2.39	1.13	0.00	1.14	0.77	1.47	0.14	0.14	0.26	0.03
SLD06479	Sytematic	0.90	3.08	1.53	0.08	1.26	0.92	1.54	0.10	-0.02	0.32	0.09
SLD06480	Sytematic	0.88	1.85	2.58	0.16	1.01	0.97	1.08	0.04	0.43	0.24	0.02
SLD06501	Sytematic	1.81	6.78	6.59	0.47	1.05	0.66	1.01	0.24	0.83	0.65	0.43
SLD06752	Sytematic	1.89	2.27	0.96	0.06	1.09	0.99	1.50	0.19	0.28	0.24	0.02
SLD06754	Sytematic	1.17	3.29	10.43	0.25	0.78	0.89	0.87	0.19	0.20	0.49	0.27
SLD06806	Sytematic	1.15	3.83	45.01	2.18	1.37	1.10	0.94	0.11	0.19	1.25	1.02
SLD06807	Sytematic	0.98	2.04	3.81	0.22	1.49	1.35	2.06	0.56	-0.03	0.31	0.08
SLD06808	Sytematic	1.59	3.63	5.03	0.27	0.87	1.26	1.24	0.12	0.69	0.43	0.21
SLD06809	Sytematic	0.87	2.57	5.39	0.26	1.15	1.21	1.06	0.34	0.78	0.36	0.14
SLD06810	Sytematic	1.00	2.45	5.29	0.32	1.71	1.17	1.23	0.47	0.12	0.38	0.15
SLD07181	Sytematic	1.00	2.34	1.68	0.07	0.89	0.91	1.46	0.08	0.25	0.25	0.03
SLD07183	Sytematic	0.98	1.80	3.67	0.45	1.07	1.00	1.29	0.09	0.13	0.26	0.05
SLD07185	Sytematic	1.16	3.19	2.48	0.17	1.00	0.97	1.71	0.15	0.47	0.33	0.11
SLD07255	Sytematic	0.99	2.19	1.43	0.11	0.73	0.76	0.97	0.08	-0.10	0.23	0.02
SLD07256	Sytematic	1.39	3.21	14.20	0.57	1.03	0.98	0.84	0.20	0.06	0.57	0.34
SLD07257	Sytematic	1.91	2.57	4.07	0.28	0.76	0.47	0.74	0.13	-0.03	0.30	0.09
SLD07313	Sytematic	0.77	2.19	5.10	0.25	1.16	1.15	1.68	0.38	0.33	0.33	0.10
SLD07314	Sytematic	0.85	1.51	4.40	0.28	1.80	1.07	0.94	0.38	0.28	0.31	0.11
SLD07445	Sytematic	8.21	4.36	12.89	0.93	0.81	1.01	0.97	0.95	0.41	0.87	0.60
SLD07447	Sytematic	2.97	2.72	2.35	0.24	0.92	0.77	1.15	0.14	0.11	0.31	0.07
SLD25038	Sytematic	0.80	1.90	16.10	0.81	1.44	0.85	0.94	0.10	0.28	0.54	0.32
SLD25039	Sytematic	3.78	5.57	2.13	0.25	1.56	1.10	1.57	0.58	0.31	0.52	0.29
SLD25041	Sytematic	2.01	3.47	3.43	0.21	1.46	0.93	1.14	0.17	0.38	0.40	0.17
SLD27575	Sytematic	0.89	1.95	18.60	0.95	0.82	1.08	1.47	-0.07	0.13	0.57	0.35
SLD65106	Sytematic	0.95	2.40	19.25	0.93	1.14	0.83	1.22	0.14	0.50	0.62	0.39

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - Class 1 SU-1B

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		3.23	3.86	5.33	0.35	0.95	0.78	1.18	0.33	0.32	0.47	0.25
Median		2.15	3.05	2.95	0.24	0.95	0.79	1.13	0.21	0.24	0.41	0.18
Standard Deviation		3.11	2.57	7.40	0.39	0.32	0.21	0.43	0.41	0.43	0.28	0.27
Systematic Std. Dev.		1.10	1.56	6.88	0.39	0.33	0.22	0.45	0.49	0.37	0.20	0.18
Number of samples		131	131	131	131	131	131	131	131	131		
Student $t_{(n-1)}$ test		1.658	1.658	1.658	1.658	1.658	1.658	1.658	1.658	1.658		
Maximum		21.07	14.17	36.64	2.04	1.89	1.63	3.09	2.79	2.12	1.50	1.23
Range		20.32	13.22	38.28	2.17	1.84	1.37	2.95	2.90	2.63	1.38	1.23
Detects		130	131	61	51	131	131	131	31	1		
Distribution		L	L	L	L	N	L	L	L	L		
UCL (normal)		3.68	4.23	6.40	0.40	0.99	0.81	1.24	0.39	0.38		
UCL (Lognormal)		3.47	4.17	5.54	0.44		0.82	1.28	0.39	0.61		
UCL-95(Selected)		**3.47**	**4.17**	**5.54**	**0.44**	**0.99**	**0.82**	**1.28**	**0.39**	**0.61**		
EPC		**0.69**	**2.23**	**4.10**	**0.35**	**0.00**	**0.00**	**0.12**	**0.25**	**0.00**		

SampleID	Sample Type	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
HTZ00333	Biased	6.00	2.15	2.92	0.23	0.81	0.83	1.06	0.11	0.02	0.51	0.24
HTZ00336	Biased	7.62	11.30	5.10	0.57	0.53	0.54	0.89	0.55	0.38	0.89	0.70
HTZ00352	Biased	6.48	7.16	3.37	0.31	1.16	0.89	1.31	0.50	0.12	0.62	0.39
HTZ00353	Biased	13.61	5.95	2.86	0.48	1.17	0.76	1.16	0.91	-0.13	1.04	0.76
HTZ00368	Biased	1.23	1.31	1.65	0.00	1.02	0.95	1.56	0.14	0.17	0.19	0.00
HTZ00369	Biased	7.36	6.69	3.58	0.52	1.43	0.85	1.45	1.11	1.10	0.66	0.38
HTZ00370	Biased	3.54	3.41	2.25	0.10	1.06	1.23	1.32	0.46	0.20	0.36	0.13
HTZ00395	Biased	3.96	4.83	2.22	0.27	0.50	0.82	1.22	0.44	0.17	0.42	0.21
HTZ00396	Biased	1.55	2.20	1.10	0.18	1.38	0.94	1.10	0.32	0.32	0.26	0.04
HTZ00495	Biased	1.12	2.02	1.97	0.10	1.01	0.72	0.70	0.06	0.45	0.24	0.02
HTZ00496	Biased	0.92	2.04	7.11	0.43	0.90	0.70	0.97	0.09	0.55	0.34	0.12
HTZ00497	Biased	1.30	3.82	4.14	0.16	1.17	0.88	1.03	0.07	-0.07	0.42	0.18
HTZ00498	Biased	2.64	3.75	4.45	0.32	0.80	0.85	0.92	0.11	0.08	0.40	0.18
HTZ00499	Biased	6.05	6.05	10.38	0.60	0.98	0.84	1.76	0.74	0.71	0.68	0.45
HTZ00503	Biased	1.23	1.10	0.81	0.05	0.30	0.51	0.60	0.19	0.22	0.13	0.00
HTZ00504	Biased	4.72	4.23	2.20	0.24	1.28	0.69	1.99	0.37	0.56	0.44	0.18
HTZ00526	Biased	2.09	3.70	32.12	1.84	0.96	0.90	1.01	0.40	0.31	0.95	0.73
HTZ00530	Biased	1.43	2.47	36.64	1.84	0.92	0.93	1.38	0.14	-0.08	0.96	0.74
HTZ00541	Biased	1.33	2.95	4.16	0.27	1.21	0.89	1.72	0.13	0.41	0.36	0.13
HTZ00542	Biased	3.07	8.87	3.04	0.29	1.18	1.10	1.54	0.45	0.36	0.73	0.50
HTZ00543	Biased	4.44	5.69	7.14	0.39	1.42	1.06	1.62	0.24	0.39	0.62	0.39
HTZ00547	Biased	3.11	1.50	6.65	0.48	0.87	0.98	1.00	0.19	0.81	0.41	0.13
HTZ00548	Biased	2.28	2.49	2.42	0.19	1.21	0.83	1.24	0.20	0.29	0.30	0.06
HTZ00556	Biased	3.54	4.60	4.01	0.20	0.83	0.84	0.57	0.45	-0.02	0.44	0.23
HTZ00565	Biased	4.92	1.75	3.97	0.28	0.23	0.30	0.14	0.54	0.72	0.43	0.19
HTZ00601	Biased	1.42	5.32	6.17	0.37	0.26	0.62	1.46	-0.07	0.09	0.52	0.32
HTZ00602	Biased	1.88	4.37	26.92	1.30	0.75	0.63	0.72	0.19	0.31	0.88	0.67
HTZ00603	Biased	12.46	14.17	6.80	0.88	0.55	0.72	0.51	1.92	1.16	1.13	0.92

SampleID	Sample Type	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
HTZ00605	Biased	1.47	4.40	27.83	1.42	0.77	0.84	1.13	0.08	0.75	0.91	0.69
HTZ00606	Biased	7.41	6.99	5.02	0.19	0.54	0.62	0.61	-0.11	-0.04	0.64	0.41
HTZ00607	Biased	6.49	6.69	5.32	0.52	0.64	0.73	0.47	0.85	1.88	0.60	0.39
HTZ00608	Biased	1.82	4.57	11.17	0.60	0.70	0.61	0.83	0.14	0.32	0.57	0.37
HTZ00614	Biased	5.56	9.64	3.88	0.38	0.97	0.73	1.50	0.42	1.29	0.78	0.56
HTZ00629	Biased	5.10	2.42	0.48	0.17	0.45	0.53	0.43	0.44	0.28	0.38	0.15
HTZ00630	Biased	11.03	4.92	4.31	0.43	0.05	0.38	0.32	1.10	-0.32	0.85	0.61
HTZ00661	Biased	1.20	1.62	1.27	0.13	1.25	0.86	0.85	0.33	-0.08	0.22	0.01
HTZ00662	Biased	2.51	2.09	1.87	0.14	0.97	0.76	0.99	0.27	0.42	0.27	0.02
HTZ00663	Biased	1.98	1.69	2.90	0.17	1.52	0.92	1.25	0.32	0.16	0.29	0.06
HTZ00664	Biased	5.01	2.74	3.45	0.35	0.98	0.81	1.55	0.28	0.06	0.47	0.19
HTZ00685	Biased	1.55	2.93	3.04	0.32	1.13	0.95	1.30	0.10	-0.08	0.33	0.10
HTZ00686	Biased	1.06	3.01	3.17	0.24	1.07	0.60	0.98	0.24	0.02	0.34	0.11
HTZ00689	Biased	1.83	1.35	1.81	0.09	0.43	0.50	0.61	0.10	0.50	0.19	0.01
HTZ00690	Biased	1.71	2.23	1.49	0.12	0.65	0.59	1.16	0.19	0.46	0.22	0.02
HTZ00691	Biased	1.68	6.75	32.17	1.51	1.08	0.89	0.87	0.29	0.12	1.17	0.94
HTZ00692	Biased	2.48	2.21	8.24	0.58	0.86	0.85	1.16	0.19	-0.14	0.39	0.15
HTZ00698	Biased	1.08	4.53	3.91	0.37	1.21	0.77	1.56	0.08	0.22	0.46	0.23
HTZ00699	Biased	2.15	4.47	2.95	0.14	0.71	0.58	0.93	0.17	0.34	0.40	0.20
HTZ00702	Biased	0.75	1.34	1.36	0.05	0.66	0.46	0.54	0.08	0.43	0.16	0.00
HTZ00703	Biased	1.05	2.31	1.45	0.23	0.86	0.95	1.18	0.22	-0.51	0.25	0.03
HTZ00704	Biased	2.46	4.07	3.90	0.08	1.10	0.71	1.51	0.29	-0.42	0.42	0.19
HTZ00715	Biased	1.12	2.18	1.29	0.03	0.78	0.54	0.97	0.06	0.06	0.22	0.02
HTZ00716	Biased	1.10	1.19	2.43	0.03	1.11	0.81	1.07	-0.02	0.36	0.20	0.02
HTZ00717	Biased	1.08	1.35	6.75	0.33	0.85	0.91	0.73	0.05	0.73	0.29	0.11
HTZ00726	Biased	2.45	7.62	3.32	0.31	0.65	0.79	0.98	0.42	-0.03	0.63	0.42
HTZ00727	Biased	1.80	4.49	3.54	0.27	1.02	0.74	0.91	0.20	-0.07	0.44	0.21
HTZ25676	Biased	1.00	2.07	2.29	0.15	1.25	0.71	1.60	0.06	0.13	0.27	0.04
HTZ25682	Biased	2.02	2.64	1.60	0.19	0.88	0.49	1.04	0.02	0.32	0.27	0.05
HTZ25683	Biased	2.67	2.27	2.73	0.23	0.85	0.81	0.99	0.21	-0.15	0.29	0.05
HTZ25684	Biased	2.31	7.68	0.83	0.11	0.83	0.77	0.90	0.16	0.16	0.58	0.38
HTZ25685	Biased	2.32	4.28	2.05	0.10	1.07	0.75	1.05	0.22	0.74	0.40	0.17
HTZ25687	Biased	1.11	1.59	1.29	-0.02	1.40	0.86	1.43	0.18	0.20	0.23	0.02
HTZ25691	Biased	1.21	2.52	7.79	0.54	0.75	0.65	1.41	0.12	-0.04	0.37	0.17
HTZ25692	Biased	2.21	8.17	5.39	0.36	0.66	0.61	0.92	0.20	-0.13	0.70	0.49
HTZ25693	Biased	1.88	3.29	15.19	0.84	0.79	0.63	1.05	0.01	0.15	0.58	0.36
HTZ25694	Biased	1.31	2.66	36.30	2.04	0.97	0.91	1.07	0.01	0.06	0.97	0.75
HTZ25695	Biased	6.47	8.05	3.33	0.46	1.12	0.73	1.12	0.66	0.52	0.68	0.45
HTZ25723	Biased	4.90	9.29	12.98	0.67	0.85	0.88	1.42	0.25	0.11	0.94	0.72
HTZ25724	Biased	3.26	8.32	2.20	0.34	0.81	0.63	1.31	0.52	0.74	0.65	0.44
HTZ25739	Biased	3.39	2.41	6.11	0.41	0.97	1.19	0.86	0.50	-0.21	0.43	0.15
HTZ25740	Biased	1.12	1.49	1.46	0.06	0.71	0.70	0.82	0.08	0.54	0.18	0.00
HTZ25741	Biased	0.89	1.63	1.55	0.13	0.87	0.92	1.09	0.38	0.27	0.20	0.00
HTZ25742	Biased	1.35	2.27	0.81	0.08	0.28	0.26	0.81	0.18	-0.21	0.19	0.02
HTZ25743	Biased	5.92	4.42	3.31	0.26	1.05	0.90	1.56	0.38	0.55	0.53	0.25
HTZ25744	Biased	1.13	1.50	1.00	0.11	0.49	0.45	0.83	0.12	0.04	0.15	0.00
HTZ25745	Biased	7.73	3.11	-1.64	0.47	0.65	0.54	0.67	0.93	0.75	0.53	0.33
HTZ25746	Biased	3.99	5.38	2.33	0.46	0.46	0.42	1.09	0.67	0.31	0.44	0.25
HTZ25747	Biased	2.02	9.35	3.95	0.33	0.95	0.72	1.20	0.51	1.13	0.77	0.54
HTZ25789	Biased	9.35	4.14	3.19	0.32	0.41	0.34	0.68	1.10	2.12	0.71	0.47
HTZ25790	Biased	1.24	5.20	8.38	0.57	0.87	0.61	0.87	0.14	0.71	0.57	0.36
HTZ25791	Biased	2.37	2.34	3.07	0.14	0.56	0.60	0.48	0.27	0.12	0.26	0.06
HTZ25792	Biased	1.23	1.73	0.98	0.04	0.97	1.01	1.33	0.26	0.11	0.20	0.00
HTZ25794	Biased	1.66	1.59	6.72	0.36	1.13	1.08	1.39	0.15	0.42	0.32	0.11
HTZ25795	Biased	1.03	1.64	1.38	0.13	1.39	0.91	1.49	0.22	-0.34	0.23	0.02
HTZ25796	Biased	1.42	5.23	8.92	0.38	1.27	0.92	1.13	0.33	0.36	0.61	0.38
HTZ27400	Biased	3.90	2.98	1.62	0.17	1.09	0.58	1.35	0.36	0.44	0.37	0.08

SampleID	Sample Type	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
HTZ27401	Biased	2.38	3.95	1.74	0.17	0.71	0.48	0.78	0.20	0.13	0.35	0.14
HTZ27419	Biased	2.51	12.91	25.74	1.31	1.19	1.08	1.85	0.26	0.54	1.45	1.23
HTZ27450	Biased	5.43	3.59	4.03	0.33	1.25	0.81	1.22	0.33	0.27	0.53	0.24
HTZ27451	Biased	5.93	2.39	1.94	0.08	0.89	0.75	0.89	0.18	0.81	0.49	0.22
HTZ27455	Biased	2.09	2.35	5.41	0.28	1.45	0.96	1.22	0.16	0.63	0.36	0.13
HTZ66247	Biased	2.42	2.55	1.83	0.09	1.47	0.81	1.22	0.27	0.16	0.30	0.07
HTZ66248	Biased	5.20	2.69	1.56	0.23	0.49	0.75	1.21	0.44	0.16	0.43	0.16
HTZ66250	Biased	2.63	5.04	2.14	0.06	0.99	0.84	1.38	0.06	0.84	0.44	0.22
HTZ66286	Biased	5.55	4.09	2.06	0.15	0.82	0.39	1.92	0.36	0.75	0.47	0.20
HTZ66287	Biased	6.72	3.95	2.11	0.26	1.00	0.63	1.18	0.45	0.45	0.56	0.28
HTZ66289	Biased	8.32	12.50	9.68	0.80	1.02	0.98	1.01	0.80	1.76	1.09	0.87
HTZ66290	Biased	1.21	2.51	1.97	0.04	1.43	1.10	1.54	0.14	0.02	0.30	0.07
HTZ66309	Biased	2.59	3.05	3.44	0.24	1.47	0.69	1.88	0.20	0.43	0.37	0.14
HTZ66310	Biased	21.07	2.67	2.14	0.26	0.85	0.64	1.67	0.72	0.06	1.50	1.23
HTZ66311	Biased	16.45	5.50	1.68	0.56	0.84	0.89	3.09	0.89	0.98	1.19	0.92
HTZ66319	Biased	5.17	4.90	2.37	0.30	0.89	0.52	1.69	0.31	0.58	0.45	0.22
HTZ75404	Biased	4.68	3.85	4.85	0.01	0.64	1.04	0.71	2.79	0.83	0.48	0.20
SLD06496	Sytematic	2.77	1.78	3.14	0.01	1.89	0.98	1.05	0.13	0.26	0.37	0.09
SLD06497	Sytematic	1.92	2.40	1.71	0.15	1.26	0.72	1.61	0.13	0.02	0.28	0.05
SLD06581	Sytematic	2.43	3.57	0.95	0.06	1.12	0.71	1.24	0.20	0.34	0.33	0.11
SLD06583	Sytematic	1.21	1.38	0.73	0.07	1.63	0.97	1.41	0.11	0.45	0.22	0.04
SLD06585	Sytematic	3.14	3.62	2.28	0.19	0.76	0.62	0.75	0.21	0.01	0.34	0.13
SLD07449	Sytematic	0.82	1.13	2.72	0.17	0.85	0.86	1.06	0.07	-0.30	0.19	0.03
SLD07480	Sytematic	0.98	0.95	0.64	0.14	0.70	0.62	0.85	0.15	0.19	0.12	0.00
SLD25036	Sytematic	1.04	2.25	24.17	1.36	1.19	0.78	0.96	0.40	0.08	0.71	0.48
SLD25602	Sytematic	1.46	4.34	1.33	0.11	1.48	0.88	1.54	0.00	-0.30	0.41	0.19
SLD25608	Sytematic	1.21	1.96	1.45	0.13	0.64	0.87	0.91	0.08	0.22	0.22	0.00
SLD26702	Sytematic	1.02	1.93	1.18	-0.02	0.84	0.97	1.04	0.10	0.15	0.22	0.00
SLD27022	Sytematic	0.91	3.10	10.79	0.52	1.08	0.77	2.28	0.13	0.39	0.49	0.26
SLD27023	Sytematic	1.05	3.27	6.40	0.20	1.32	1.12	2.21	0.19	0.43	0.43	0.20
SLD27550	Sytematic	1.54	1.55	1.89	0.27	1.21	1.08	1.02	0.34	0.44	0.22	0.02
SLD65145	Sytematic	1.05	1.60	1.12	0.08	0.96	0.96	1.35	0.34	-0.28	0.19	0.00
SLD65644	Sytematic	3.66	3.08	2.11	0.00	0.95	0.94	1.31	0.23	0.23	0.35	0.09
SLD65645	Sytematic	1.21	4.53	13.94	1.00	0.62	0.82	1.13	0.52	-0.11	0.64	0.42
SLD65757	Sytematic	1.45	2.87	1.44	0.92	0.66	0.82	1.02	2.74	1.44	0.27	0.06
SLD66145	Sytematic	2.57	2.75	4.97	0.34	1.13	0.58	1.52	0.20	-0.14	0.36	0.13
SLD66146	Sytematic	1.37	1.54	1.25	0.03	0.94	0.74	1.15	0.31	0.09	0.19	0.00
SLD67490	Sytematic	1.11	1.45	0.94	0.02	1.14	0.90	1.22	0.16	0.61	0.19	0.00
SLD67515	Sytematic	0.90	1.71	1.40	0.04	0.81	0.73	1.65	0.10	0.34	0.20	0.00
SLD68151	Sytematic	0.79	1.24	0.56	0.04	0.94	0.91	0.69	0.02	0.15	0.16	0.00
SLD78706	Sytematic	4.84	4.62	29.39	1.32	1.52	1.23	1.06	0.35	0.19	1.01	0.77
SLD78714	Sytematic	1.92	3.90	3.97	0.12	1.53	1.63	1.63	0.21	-0.10	0.45	0.23
SLD78718	Sytematic	3.94	8.00	3.37	0.39	1.24	0.68	2.10	0.29	0.96	0.68	0.45
SLD78722	Sytematic	3.63	5.66	3.08	0.12	1.14	0.58	1.37	0.23	0.23	0.51	0.28
SLD78926	Sytematic	2.65	2.42	4.25	0.23	0.55	0.69	1.30	0.14	-0.24	0.31	0.09
SLD78930	Sytematic	1.38	3.16	1.21	-0.13	1.11	0.82	2.39	0.05	0.24	0.31	0.08

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2A (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.61	2.41	1.67	0.14	0.94	0.71	1.11	0.11	0.07	0.26	0.06
Median		1.41	2.16	1.65	0.13	0.89	0.63	1.02	0.11	0.10	0.25	0.03
Standard Deviation		0.74	1.06	1.13	0.11	0.45	0.26	0.44	0.09	0.33	0.10	0.08
Number of samples		22	22	22	22	22	22	22	22	22	22	22
Student $t_{(n-1)}$ test		1.721	1.721	1.721	1.721	1.721	1.721	1.721	1.721	1.721		
Maximum		3.54	4.58	4.00	0.37	2.16	1.22	2.33	0.27	0.66	0.51	0.28
Range		2.81	3.39	5.24	0.35	1.81	0.84	1.74	0.33	1.39	0.40	0.28
Detects		22	22	2	3	22	22	22	1	0		
Distribution		L	L	L	L	L	L	L	L	L		
UCL (normal)		1.88	2.80	2.09	0.18	1.11	0.80	1.27	0.14	0.19		
UCL (Lognormal)		1.91	2.89	2.43	0.24	1.67	0.82	1.28	0.19	0.65		
UCL-95(Selected)		1.91	2.89	2.43	0.24	1.67	0.82	1.28	0.19	0.65		
EPC		**0.00**	**0.95**	**0.99**	**0.15**	**0.58**	**0.00**	**0.12**	**0.05**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD02371	Grab	2.02	1.45	1.53	0.15	0.40	0.69	0.75	0.27	0.66	0.21	0.00
SLD02374	Grab	1.17	2.50	0.62	0.13	1.88	1.08	2.12	0.21	0.45	0.30	0.09
SLD02376	Grab	1.07	1.20	0.82	0.02	0.60	0.46	0.81	0.14	0.12	0.14	0.00
SLD02377	Grab	1.48	2.89	1.80	0.35	1.56	1.03	1.43	0.07	-0.73	0.33	0.10
SLD02378	Grab	1.62	3.93	1.70	0.07	0.84	0.58	1.17	0.10	0.23	0.35	0.14
SLD02380	Grab	1.35	2.17	1.64	0.05	0.49	0.59	0.59	0.11	0.29	0.22	0.02
SLD02382	Grab	3.54	4.58	3.04	0.37	2.16	1.22	2.33	0.16	-0.52	0.51	0.28
SLD02383	Grab	0.99	1.22	-1.24	0.10	0.93	1.02	0.93	-0.06	-0.04	0.12	0.00
SLD02385	Grab	1.02	1.95	1.65	0.08	0.92	0.47	0.60	0.15	0.36	0.22	0.00
SLD02386	Grab	1.77	3.32	2.39	0.15	1.10	0.55	0.92	0.13	0.11	0.34	0.11
SLD02387	Grab	2.29	4.20	1.38	0.13	0.92	0.70	1.02	0.00	-0.36	0.37	0.15
SLD02388	Grab	1.19	1.48	1.27	0.03	0.69	0.51	1.08	0.00	0.10	0.17	0.00
SLD02389	Grab	0.78	1.40	1.80	0.02	0.83	0.63	0.78	0.08	0.10	0.18	0.01
SLD02390	Grab	1.43	2.14	2.37	0.21	1.16	0.63	0.73	0.14	0.51	0.27	0.04
SLD02391	Grab	1.10	1.54	1.90	0.16	0.35	0.38	0.95	0.08	-0.11	0.17	0.01
SLD02392	Grab	0.73	1.19	0.35	0.02	0.38	0.42	1.08	0.02	-0.01	0.11	0.00
SLD02393	Grab	1.96	2.85	2.37	0.18	1.15	0.95	1.01	0.18	0.02	0.31	0.08
SLD02395	Grab	1.25	1.85	0.98	0.12	0.94	0.62	1.05	0.04	0.23	0.21	0.00
SLD02397	Grab	1.47	2.63	1.46	0.12	0.86	0.57	1.13	0.08	0.39	0.26	0.05
SLD02398	Grab	1.40	2.32	1.17	0.06	0.82	0.44	1.00	0.06	-0.04	0.23	0.03
SLD02399	Grab	3.28	4.23	3.84	0.37	1.10	1.11	1.63	0.21	-0.30	0.43	0.21
SLD02400	Grab	2.47	1.88	4.00	0.15	0.70	0.91	1.27	0.26	0.04	0.31	0.05

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2B (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.20	1.80	1.64	0.14	1.09	0.86	1.18	0.11	0.12	0.23	0.04
Median		0.98	1.78	1.43	0.13	1.08	0.92	1.15	0.11	0.14	0.24	0.02
Standard Deviation		0.62	0.77	1.97	0.14	0.42	0.18	0.45	0.08	0.26	0.10	0.07
Number of samples		21	21	21	21	21	21	21	21	21	21	21
Student $t_{(n-1)}$ test		1.725	1.725	1.725	1.725	1.725	1.725	1.725	1.725	1.725		
Maximum		3.55	4.16	8.06	0.53	2.07	1.16	2.46	0.35	0.48	0.58	0.35
Range		2.88	3.50	11.88	0.59	1.77	0.64	1.88	0.41	1.08	0.55	0.35
Dctccts		21	21	1	5	21	21	21	0	0		
Distribution		X	L	X	L	L	L	L	L	L		
UCL (normal)		**1.44**	**2.09**	**2.52**	**0.20**	**1.25**	**0.93**	**1.35**	**0.14**	**0.22**		
UCL (Lognormal)		1.427	2.19	2.39	0.31	1.345	0.94	1.38	0.165	0.41		
UCL (Z-statistics)		1.44		2.49								
UCL-95(Selected)		1.44	2.19	2.52	0.31	1.345	0.94	1.38	0.165	0.41		
EPC		**0.00**	**0.25**	**1.08**	**0.22**	**0.25**	**0.00**	**0.22**	**0.02**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD02432	Grab	1.37	0.83	1.93	0.16	0.3	0.87	0.87	0.08	0.00	0.19	0.01
SLD02435	Grab	1.13	1.78	1.56	0.06	1.49	1.10	2.46	-0.06	0.12	0.25	0.03
SLD02437	Grab	1.13	1.37	2.65	0.04	0.69	0.54	0.78	0.00	-0.01	0.19	0.02
SLD02438	Grab	0.76	0.66	1.88	0.13	1.32	0.84	1.29	0.07	0.14	0.18	0.02
SLD02439	Grab	0.67	1.78	0.95	0.18	1.07	0.52	1.12	0.11	0.21	0.21	0.00
SLD02441	Grab	0.97	1.25	1.51	-0.06	0.86	0.97	0.72	0.12	-0.08	0.18	0.00
SLD02443	Grab	1.27	1.81	1.12	0.17	1.38	0.68	1.72	0.06	0.19	0.24	0.02
SLD02444	Grab	0.93	2.46	0.68	0.24	1.11	1.02	1.38	0.04	0.48	0.25	0.04
SLD02447	Grab	0.98	2.20	1.43	0.07	1.22	0.99	1.28	0.06	0.40	0.26	0.03
SLD02448	Grab	0.89	1.41	0.93	0.13	1.27	0.68	0.83	0.11	-0.27	0.20	0.01
SLD02449	Grab	0.76	0.84	-3.82	0.03	0.50	0.68	0.70	0.22	-0.60	0.02	0.00
SLD02450	Grab	0.99	1.76	2.71	0.48	1.08	1.02	1.15	0.13	0.37	0.24	0.03
SLD02451	Grab	0.90	1.86	1.10	0.09	1.67	0.94	1.26	0.15	0.33	0.26	0.04
SLD02452	Grab	1.91	2.57	1.18	0.15	1.20	0.81	0.91	0.15	0.27	0.27	0.05
SLD02453IT	Grab	0.95	1.77	1.41	0.02	0.92	0.92	1.00	0.13	0.00	0.21	0.00
SLD02454IT	Grab	1.61	2.36	2.07	0.14	0.62	0.97	1.36	0.14	-0.18	0.26	0.04
SLD02455IT	Grab	0.85	1.54	2.00	0.17	1.54	0.94	1.43	0.08	0.38	0.25	0.04
SLD02456IT	Grab	0.90	1.10	1.13	0.01	0.94	0.74	0.58	0.15	0.07	0.16	0.00
SLD02458IT	Grab	1.31	2.48	1.39	0.20	0.99	0.95	1.40	0.35	0.09	0.26	0.04
SLD02460IT	Grab	3.55	4.16	8.06	0.53	2.07	1.16	1.83	0.14	0.38	0.58	0.35
SLD02461IT	Grab	1.46	1.83	2.62	0.07	0.62	0.70	0.80	0.09	0.26	0.22	0.02

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2C (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.27	2.08	2.29	0.13	1.09	0.88	1.32	0.14	0.21	0.26	0.05
Median		1.06	1.88	1.75	0.12	1.13	0.90	1.36	0.12	0.22	0.25	0.03
Standard Deviation		0.57	0.69	1.56	0.10	0.37	0.15	0.34	0.06	0.21	0.06	0.05
Number of samples		23	23	23	23	23	23	23	23	23		
Student $t_{(n-1)}$ test		1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717		
Maximum		3.27	3.91	6.16	0.37	1.63	1.21	1.79	0.33	0.70	0.41	0.18
Range		2.52	2.78	5.31	0.39	1.28	0.58	1.28	0.28	0.95	0.24	0.18
Detects		23	23	4	5	23	23	23	1	0		
Distribution		X	L	L	L	N	L	N	L	N		
UCL (normal)		1.46	2.32	2.82	0.16	1.24	0.93	1.46	0.16	0.33		
UCL (Lognormal)		1.44	2.34	2.83	0.21		0.94		0.16			
UCL (Z-statistics)		1.45										
UCL-95(Selected)		1.46	2.34	2.83	0.21	1.24	0.94	1.46	0.16	0.33		
EPC		0.00	0.40	1.39	0.12	0.15	0.00	0.30	0.02	0.00		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD2493A	Grab	1.15	1.4	1.79	0.08	0.57	0.66	0.51	0.2	-0.09	0.17	0.01
SLD2496A	Grab	1.06	2.10	1.75	0.10	1.61	1.21	1.73	0.20	0.04	0.28	0.05
SLD2498A	Grab	1.03	1.87	1.73	0.13	0.48	0.73	0.59	0.07	0.07	0.21	0.01
SLD2499A	Grab	0.75	1.75	1.16	0.05	0.90	0.80	1.19	0.15	0.30	0.20	0.00
SLD2500A	Grab	2.17	2.86	2.80	0.15	1.12	0.71	1.51	0.11	0.34	0.32	0.09
SLD2502A	Grab	0.97	1.73	2.06	0.18	0.35	0.91	0.99	0.11	0.48	0.22	0.01
SLD2504A	Grab	1.57	2.36	3.03	0.15	1.16	0.78	1.36	0.07	0.13	0.30	0.06
SLD2505A	Grab	1.00	1.77	1.25	0.02	1.63	1.08	1.70	0.08	-0.04	0.25	0.04
SLD2507A	Grab	1.80	2.87	1.66	-0.02	0.63	0.65	0.83	0.05	0.33	0.27	0.07
SLD2508A	Grab	1.06	1.88	2.76	0.06	1.62	0.98	1.35	0.14	0.21	0.29	0.06
SLD2509A	Grab	0.80	1.31	1.03	0.02	1.07	0.63	0.99	0.06	0.24	0.18	0.00
SLD2510A	Grab	0.83	1.48	0.85	0.06	0.95	0.90	1.33	0.22	0.26	0.18	0.00
SLD2511A	Grab	0.88	1.58	1.57	0.12	1.43	0.97	1.50	0.10	0.01	0.23	0.03
SLD2512A	Grab	1.53	2.07	1.04	0.12	1.27	1.01	1.79	0.17	-0.25	0.24	0.02
SLD2513A	Grab	0.88	1.54	1.30	0.10	1.42	0.82	1.32	0.12	0.37	0.22	0.02
SLD2514A	Grab	1.10	2.24	1.83	-0.01	1.49	0.96	1.29	0.11	0.30	0.29	0.05
SLD2515A	Grab	1.62	3.91	1.19	0.14	0.88	0.78	1.52	0.18	0.43	0.34	0.13
SLD2516A	Grab	0.97	1.13	6.16	0.23	0.98	1.03	1.73	0.15	0.22	0.27	0.10
SLD2517A	Grab	1.02	1.59	2.85	0.19	1.17	0.95	1.29	0.16	0.37	0.24	0.03
SLD2519A	Grab	1.68	2.28	1.50	0.08	0.73	0.92	1.50	0.11	0.07	0.24	0.02
SLD2520A	Grab	3.27	2.98	6.02	0.37	1.13	1.11	1.43	0.33	0.70	0.41	0.17
SLD2521A	Grab	1.19	3.21	5.55	0.36	1.29	0.82	1.37	0.13	0.18	0.41	0.18
SLD2522A	Grab	0.80	1.99	1.87	0.21	1.22	0.85	1.62	0.09	0.20	0.25	0.02

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2D (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.45	2.39	2.29	0.18	0.87	0.58	1.00	0.12	0.16	0.27	0.07
Median		1.20	2.12	1.62	0.14	0.87	0.50	0.93	0.12	0.19	0.29	0.08
Standard Deviation		0.81	1.22	2.05	0.14	0.35	0.24	0.44	0.06	0.22	0.10	0.08
Number of samples		23	23	23	23	23	23	23	23	23	23	23
Student $t_{(n-1)}$ test		1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717		
Maximum		3.31	5.63	9.61	0.55	1.63	0.97	1.78	0.23	0.62	0.52	0.29
Range		2.84	4.81	9.34	0.55	1.63	0.83	1.60	0.21	0.83	0.45	0.29
Dctccts		23	23	2	6	23	23	23	0	0		
Distribution		L	L	L	L	L	L	L	L	L		
UCL (normal)		1.74	2.83	3.02	0.23	1.00	0.67	1.16	0.14	0.24	0.27	0.07
UCL (Lognormal)		1.88	3.15	3.68	0.28	1.05	0.71	1.21	0.16	0.41		
UCL (Z-statistics)												
UCL-95(Selected)		1.88	3.15	3.68	0.28	1.05	0.71	1.21	0.16	0.41		
EPC		0.00	1.21	2.24	0.19	0.00	0.00	0.05	0.02	0.00		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD02401	Grab	0.96	1.51	1.28	0.12	0.87	0.49	1.47	0.14	0.21	0.18	0.00
SLD02402	Grab	0.89	1.63	1.07	0.10	0.52	0.31	0.44	0.08	-0.01	0.16	0.00
SLD02404	Grab	3.03	4.10	2.17	0.21	0.96	0.77	1.04	0.06	0.62	0.38	0.16
SLD02405	Grab	1.41	3.52	1.98	0.19	0.87	0.46	0.90	0.14	0.42	0.33	0.12
SLD02406	Grab	0.62	1.27	0.88	0.06	0.95	0.31	0.93	0.05	-0.16	0.17	0.00
SLD02408	Grab	0.74	1.39	1.11	0.08	0.37	0.26	0.81	0.06	0.11	0.14	0.00
SLD02409	Grab	3.31	5.63	3.48	0.55	1.17	0.94	1.01	0.22	0.03	0.52	0.29
SLD02411	Grab	0.65	1.09	1.01	0.09	0.85	0.39	0.64	0.12	0.19	0.15	0.00
SLD02412	Grab	2.86	2.99	2.73	0.18	0.87	0.97	0.92	0.18	0.31	0.32	0.10
SLD02414	Grab	1.72	3.24	3.52	0.17	0.76	0.76	0.86	0.17	0.41	0.34	0.13
SLD02415	Grab	1.20	2.65	2.93	0.07	1.08	0.71	1.77	0.08	-0.21	0.31	0.08
SLD02416	Grab	0.99	1.52	1.12	0.11	1.26	0.74	0.93	0.16	-0.19	0.21	0.01
SLD02417	Grab	0.85	1.81	1.12	0.11	0.67	0.44	0.74	0.07	0.22	0.19	0.00
SLD02419	Grab	1.58	3.54	1.62	0.14	1.33	0.50	0.61	0.23	0.21	0.36	0.13
SLD02421	Grab	1.03	1.97	0.37	0.10	0.56	0.45	0.60	0.06	0.34	0.18	0.00
SLD02423	Grab	1.59	2.97	1.92	0.20	0.83	0.36	0.60	0.05	0.10	0.29	0.08
SLD02424	Grab	0.83	1.00	9.61	0.52	1.05	0.79	1.13	0.14	0.27	0.33	0.16
SLD02425	Grab	1.52	2.25	2.80	0.23	1.63	0.88	1.51	0.17	0.29	0.31	0.08
SLD02426	Grab	1.43	4.25	2.99	0.23	0.41	0.36	0.98	0.07	0.08	0.37	0.18
SLD73405	Grab	1.04	1.56	6.06	0.41	0.98	0.72	1.54	0.16	0.44	0.29	0.09
SLD73409	Grab	1.92	2.12	1.39	0.00	1.01	0.90	1.72	0.17	-0.15	0.24	0.01
SLD73411	Grab	0.47	0.82	0.27	0.09	0.00	0.14	0.18	0.02	0.08	0.07	0.00
SLD73413	Grab	2.69	2.2	1.16	0.21	1.07	0.71	1.78	0.05	0.09	0.27	0.02

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2E (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.18	1.70	2.05	0.14	1.01	0.82	1.18	0.15	0.10	0.23	0.03
Median		1.03	1.51	1.33	0.12	1.00	0.84	1.06	0.13	0.12	0.21	0.01
Standard Deviation		0.36	0.48	2.57	0.15	0.35	0.19	0.36	0.08	0.20	0.06	0.05
Number of samples		23	23	23	23	23	23	23	23	23		
Student $t_{(n-1)}$ test		1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717	1.717		
Maximum		2.08	3.04	13.36	0.68	2.04	1.23	1.86	0.32	0.46	0.43	0.24
Range		1.28	1.91	12.69	0.77	1.59	0.79	1.34	0.26	0.69	0.30	0.24
Detects		23	23	2	2	23	23	23	0	0		
Distribution		L	L	X	L	L	L	L	L	L		
UCL (normal)		1.31	1.87	2.97	0.19	1.14	0.88	1.31	0.18	0.17		
UCL (Lognormal)		1.32	1.86	2.58	0.21	1.17	0.91	1.33	0.19	0.40		
UCL (Z-statistics)				2.96								
UCL-95(Selected)		1.32	1.86	2.96	0.21	1.17	0.91	1.33	0.19	0.40		
EPC		**0.00**	**0.00**	**1.52**	**0.12**	**0.08**	**0.00**	**0.17**	**0.05**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD02462IT	Grab	0.92	1.29	0.93	-0.02	1.28	0.94	1.06	0.26	-0.05	0.19	0.01
SLD02463IT	Grab	1.70	2.50	2.22	0.03	1.17	0.86	1.00	0.15	0.33	0.29	0.06
SLD02465IT	Grab	2.08	2.23	3.29	0.19	0.77	0.81	1.40	0.07	0.36	0.27	0.06
SLD02466IT	Grab	1.03	1.64	2.21	0.05	0.80	0.74	1.54	0.15	0.06	0.21	0.02
SLD02467IT	Grab	0.99	1.37	1.30	0.14	1.21	0.92	1.04	0.29	0.09	0.20	0.01
SLD02469IT	Grab	0.94	1.51	1.06	0.07	1.22	0.53	0.79	0.14	-0.06	0.20	0.01
SLD02470IT	Grab	1.21	1.13	1.33	0.13	0.95	1.09	1.86	0.31	-0.18	0.18	0.01
SLD02472IT	Grab	0.83	1.23	0.72	0.15	0.45	0.44	0.68	0.13	0.15	0.13	0.00
SLD02473IT	Grab	0.80	1.47	0.67	0.24	1.06	0.84	1.07	0.09	0.12	0.18	0.00
SLD02475IT	Grab	1.08	1.81	1.50	0.18	0.79	0.98	0.85	0.09	0.31	0.22	0.00
SLD02476IT	Grab	1.29	3.04	3.49	0.14	1.00	0.73	1.01	0.14	0.20	0.34	0.11
SLD02477IT	Grab	0.94	1.99	1.02	0.16	1.22	0.88	1.68	0.32	-0.11	0.23	0.01
SLD02478	Grab	0.97	1.17	1.42	0.33	1.04	0.67	0.89	0.08	0.14	0.18	0.00
SLD02480	Grab	0.87	1.32	1.21	0.15	0.95	0.85	1.44	0.11	-0.19	0.18	0.00
SLD02482	Grab	1.00	2.03	1.74	0.10	0.51	0.46	0.89	0.06	0.17	0.20	0.01
SLD02484	Grab	1.33	2.33	1.38	0.08	0.76	0.75	0.96	0.06	-0.23	0.23	0.03
SLD02485	Grab	0.86	1.51	13.36	0.68	0.93	0.73	1.04	0.14	0.11	0.43	0.24
SLD02486	Grab	0.88	1.39	1.88	0.08	2.04	0.80	1.62	0.12	-0.22	0.27	0.07
SLD02487	Grab	1.19	1.40	1.91	0.10	0.51	0.89	0.52	0.12	0.26	0.19	0.01
SLD73406	Grab	1.85	1.97	1.20	0.09	1.10	1.23	1.64	0.12	0.38	0.24	0.02
SLD73410	Grab	1.55	1.43	0.88	0.12	1.38	1.00	1.60	0.20	0.19	0.21	0.02
SLD73412	Grab	1.26	1.73	1.27	0.05	1.46	0.67	1.34	0.13	0.03	0.24	0.02
SLD73414	Grab	1.68	1.53	1.19	-0.09	0.72	0.95	1.26	0.16	0.46	0.20	0.00

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - SU-2F (Class 2)

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.15	1.81	1.92	0.10	1.15	0.87	1.28	0.13	0.04	0.24	0.04
Median		0.96	1.60	1.36	0.10	1.21	0.93	1.28	0.13	0.09	0.21	0.02
Standard Deviation		0.48	0.58	1.42	0.10	0.37	0.21	0.35	0.06	0.33	0.06	0.05
Number of samples		21	21	21	21	21	21	21	21	21	21	21
Student $t_{(n-1)}$ test		1.725	1.725	1.725	1.725	1.725	1.725	1.725	1.725	1.725		
Maximum		2.49	3.69	6.07	0.28	1.82	1.13	1.91	0.24	0.79	0.39	0.17
Range		1.69	2.43	5.58	0.49	1.46	0.87	1.44	0.20	1.81	0.23	0.17
Detects		21	21	1	4	21	21	21	0	0		
Distribution		X	X	L	L	N	X	N	L	L		
UCL (normal)		1.34	2.14	2.46	0.14	1.27	0.95	1.41	0.15	0.16		
UCL (Lognormal)		1.28	2.13	2.99	0.18		1.00		0.17	0.33		
UCL (Z-statistics)		1.30	2.13				0.94					
UCL-95(Selected)		1.30	2.14	2.99	0.18	1.27	1.00	1.41	0.14	0.33		
EPC		**0.00**	**0.20**	**1.55**	**0.09**	**0.18**	**0.05**	**0.25**	**0.00**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD2523A	Grab	0.99	1.26	1.36	0.10	1.12	1.07	1.53	0.16	0.03	0.19	0.01
SLD2524A	Grab	2.49	3.69	4.28	0.28	0.58	0.95	1.10	0.24	-0.49	0.39	0.17
SLD2526A	Grab	1.37	1.48	3.78	0.04	0.77	0.93	1.20	0.22	-1.02	0.24	0.05
SLD2527A	Grab	1.20	1.97	0.49	0.04	1.73	1.08	1.24	0.09	0.23	0.26	0.04
SLD2528A	Grab	0.88	1.38	1.25	0.16	1.32	0.94	1.27	0.19	0.05	0.21	0.02
SLD2530A	Grab	0.96	1.43	1.23	0.10	1.39	0.89	1.85	0.15	0.10	0.21	0.02
SLD2531A	Grab	0.87	2.00	1.21	0.08	1.39	0.84	1.91	0.15	-0.04	0.25	0.02
SLD2533A	Grab	0.93	1.37	1.68	0.07	1.05	0.83	1.09	0.06	0.33	0.19	0.00
SLD2534A	Grab	0.81	1.38	0.94	0.10	1.12	0.76	0.91	0.12	0.06	0.19	0.00
SLD2536A	Grab	1.03	1.71	1.55	0.12	1.03	1.02	1.27	0.08	0.09	0.21	0.01
SLD2573A	Grab	1.02	2.57	2.76	0.10	1.23	0.77	1.53	0.12	0.15	0.31	0.08
SLD2538A	Grab	0.89	1.37	0.92	0.06	1.42	1.02	1.39	0.13	-0.12	0.20	0.02
SLD2539A	Grab	0.80	2.36	0.75	0.11	0.60	0.26	0.47	0.04	-0.05	0.21	0.03
SLD2541A	Grab	1.28	1.61	1.27	0.20	1.36	0.93	1.47	0.12	0.79	0.22	0.02
SLD2543A	Grab	0.81	1.60	1.76	0.09	0.36	0.41	0.88	0.04	-0.08	0.17	0.01
SLD2545A	Grab	0.95	1.55	0.59	0.10	1.35	0.88	0.71	0.04	0.14	0.21	0.02
SLD2546	Grab	0.95	1.81	6.07	0.26	1.21	0.96	1.28	0.16	0.18	0.32	0.10
SLD2547A	Grab	1.01	1.70	1.49	0.00	1.03	0.83	1.35	0.14	0.20	0.21	0.00
SLD2548A	Grab	0.84	1.54	1.98	0.10	1.39	0.80	1.46	0.06	0.13	0.23	0.03
SLD73407	Grab	2.32	2.66	3.71	0.25	1.82	1.13	1.73	0.22	-0.05	0.37	0.14
SLD73408	Grab	1.85	1.54	1.29	-0.21	0.87	0.94	1.34	0.17	0.13	0.21	0.00

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR (5/5/50)	SOR (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 and Plant 2 Class 3

Statistic	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean	0.48	1.15	0.73	0.07	0.28	0.16	0.40	0.02	-0.02	0.30	0.02
Median	0.42	1.00	0.64	0.05	0.25	0.15	0.37	0.02	0.00	0.27	0.00
Standard Deviation	0.18	0.76	0.59	0.06	0.17	0.08	0.21	0.03	0.23	0.16	0.10
Number of samples	34	34	34	34	34	34	34	34	34		
Maximum	1.04	4.85	3.63	0.26	0.65	0.47	0.89	0.10	0.54	1.08	0.58
Range	0.74	4.55	3.52	0.27	0.61	0.40	0.89	0.14	1.50	0.97	0.58
Student $t_{(n-1)}$ test	1.692	1.692	1.692	1.692	1.692	1.692	1.692	1.692	1.692		
Student $H_{(n,s)}$ test											
Detects	34	34	1	4	19	32	22	0	0		
UCL (normal)	**0.53**	**1.37**	**0.91**	**0.08**	**0.33**	**0.18**	**0.46**	**0.03**	**0.05**		

Sample ID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn	Loc
SLD06054	Grab	0.30	0.39	0.22	0.04	0.14	0.13	0.36	-0.03	0.03	0.11	0.00	PL-1
SLD06055	Grab	0.42	0.98	0.38	0.04	0.24	0.14	0.23	0.05	0.22	0.25	0.00	PL-1
SLD06056	Grab	0.40	1.20	0.64	0.09	0.29	0.14	0.74	0.01	-0.04	0.31	0.00	PL-1
SLD06057	Grab	0.51	0.30	0.23	0.07	0.04	0.15	0.30	0.10	0.27	0.14	0.00	PL-1
SLD06058	Grab	0.35	0.89	0.86	0.02	0.24	0.12	0.28	0.02	-0.18	0.24	0.00	PL-1
SLD06059	Grab	0.32	0.95	0.74	0.03	0.13	0.17	0.19	0.02	-0.04	0.24	0.00	PL-2
SLD06060	Grab	0.47	1.02	0.64	0.12	0.14	0.10	0.40	0.04	-0.01	0.24	0.00	PL-1
SLD06061	Grab	0.54	0.98	0.67	0.04	0.18	0.09	0.27	0.06	0.01	0.25	0.00	PL-2
SLD06062	Grab	0.58	0.90	1.00	0.03	0.26	0.17	0.89	-0.01	0.04	0.25	0.00	PL-1
SLD06063	Grab	0.37	0.56	0.55	0.05	0.30	0.16	0.38	0.03	0.06	0.18	0.00	PL-1
SLD06064	Grab	0.34	1.37	0.72	0.12	0.37	0.14	0.63	0.03	-0.04	0.36	0.00	PL-2
SLD06065	Grab	0.57	1.30	0.70	0.02	0.12	0.07	0.19	0.06	0.08	0.30	0.00	PL-2
SLD06066	Grab	0.41	1.02	1.02	0.00	0.20	0.16	0.31	-0.01	0.04	0.26	0.00	PL-1
SLD06067	Grab	0.61	1.50	0.64	0.12	0.06	0.11	0.10	-0.04	-0.32	0.33	0.00	PL-2
SLD06068	Grab	0.54	1.25	0.42	0.12	0.09	0.10	0.00	0.01	-0.09	0.28	0.00	PL-1
SLD06069	Grab	0.42	0.78	0.42	0.07	0.30	0.11	0.50	0.02	0.10	0.22	0.00	PL-2
SLD06070	Grab	0.45	1.92	0.49	0.01	0.18	0.11	0.29	0.05	0.15	0.43	0.00	PL-2
SLD06071	Grab	0.55	1.25	0.59	0.01	0.14	0.07	0.01	0.02	-0.07	0.29	0.00	PL-1
SLD06072	Grab	0.42	1.05	0.51	0.01	0.46	0.08	0.58	0.01	-0.09	0.31	0.00	PL-2
SLD06073	Grab	0.44	0.61	0.98	0.01	0.44	0.15	0.17	0.00	0.22	0.23	0.00	PL-1
SLD06074	Grab	0.52	0.92	0.11	0.17	0.30	0.27	0.24	-0.02	-0.96	0.25	0.00	PL-1
SLD06075	Grab	0.42	1.18	0.34	0.03	0.40	0.19	0.66	0.07	-0.30	0.32	0.00	PL-2
SLD06076	Grab	0.35	0.67	0.57	-0.01	0.10	0.11	0.35	0.01	-0.06	0.17	0.00	PL-1
SLD06077	Grab	0.32	1.10	0.79	0.07	0.26	0.15	0.52	-0.01	0.12	0.29	0.00	PL-1
SLD06078	Grab	0.32	0.95	0.36	0.05	0.46	0.16	0.24	0.04	0.05	0.29	0.00	PL-2
SLD06079	Grab	1.04	4.85	1.11	0.06	0.43	0.28	0.68	-0.01	0.00	1.08	0.58	PL-1
SLD06080	Grab	0.73	0.84	0.89	0.13	0.42	0.34	0.36	0.02	0.08	0.27	0.00	PL-2
SLD06081	Grab	0.46	1.70	0.97	0.08	0.51	0.20	0.44	0.04	0.54	0.46	0.00	PL-2
SLD06082	Grab	0.88	2.09	1.16	0.15	0.53	0.21	0.66	0.04	-0.01	0.55	0.03	PL-1
SLD06083	Grab	0.31	1.04	0.38	0.02	0.04	0.15	0.52	0.00	-0.07	0.25	0.00	PL-2
SLD06084	Grab	0.35	0.83	3.63	0.26	0.19	0.16	0.37	0.04	-0.05	0.28	0.04	PL-1
SLD06085	Grab	0.30	0.60	0.42	0.04	0.65	0.16	0.56	0.03	-0.15	0.26	0.00	PL-2
SLD06086	Grab	0.95	1.49	1.42	0.11	0.65	0.47	0.70	0.10	0.07	0.46	0.00	PL-2
SLD06088	Grab	0.32	0.69	0.38	0.04	0.18	0.12	0.46	0.02	-0.18	0.18	0.00	PL-2

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - Preferential Pathway

Statistic	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean	1.91	3.01	6.47	0.34	0.88	0.67	1.01	0.21	0.11	0.39	0.21
Median	1.42	2.07	2.75	0.22	0.87	0.75	0.95	0.20	0.04	0.30	0.13
Standard Deviation	1.48	2.24	8.71	0.41	0.51	0.33	0.50	0.15	0.41	0.25	0.23
Number of samples	66	66	66	66	66	66	66	66	66	66	66
Student $t_{(n-1)}$ test	1.669	1.669	1.669	1.669	1.669	1.669	1.669	1.669	1.669		
Student $H_{(n,s)}$ test											
Maximum	6.79	12.03	37.84	1.82	2.30	1.25	2.24	0.73	1.89	0.94	0.73
Range	6.70	11.68	37.66	1.84	2.25	1.23	2.20	0.74	2.98	0.89	0.73
Detects	59	63	35	40	59	62	58	8	0		
UCL (normal)	**2.21**	**3.47**	**8.26**	**0.43**	**0.99**	**0.74**	**1.11**	**0.24**	**0.19**		

SampleID	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn	Location
SLD07314	0.85	1.51	4.4	0.28	1.8	1.07	0.94	0.38	0.28	0.31	0.11	Strip 2, Cell 2
SLD26664	1.32	2.05	2.40	0.22	0.91	0.77	0.83	0.18	0.50	0.25	0.03	Plant 1 (EA #11)
SLD26665	0.69	0.76	7.53	0.27	0.22	0.30	0.04	-0.01	0.09	0.22	0.12	Plant 1 (EA #1)
SLD26666	1.45	2.53	33.55	1.79	0.87	0.99	1.36	0.22	-0.68	0.91	0.68	Plant 1 (EA #1)
SLD26667	1.03	2.66	33.81	1.27	1.15	1.25	1.95	0.14	-0.57	0.94	0.72	Plant 1 (EA #1)
SLD26669	0.40	0.68	1.20	0.07	0.05	0.06	0.30	0.03	-0.21	0.07	0.00	Plant 1 (EA #1)
SLD26671	1.17	1.11	18.07	0.91	1.15	1.03	0.96	0.22	0.31	0.52	0.34	Plant 1 (EA #1)
SLD26672	0.81	1.00	0.88	0.06	0.27	0.02	0.50	0.03	-0.12	0.10	0.00	Plant 1 (EA #4 West)
SLD26673	1.05	1.82	0.89	0.30	0.40	1.10	1.54	0.05	0.53	0.21	0.01	Plant 1 (EA #4 West)
SLD26674	6.37	12.03	2.49	0.42	0.31	0.48	0.35	0.73	0.98	0.88	0.69	Plant 1 (EA #4 West)
SLD26675	3.81	5.31	5.23	0.27	1.11	1.06	0.93	0.32	1.00	0.53	0.31	Plant 1 (EA #4 West)
SLD26676	6.79	4.81	0.18	0.01	0.97	0.75	0.76	0.51	1.89	0.52	0.27	Plant 1 (EA #4 West)
SLD26705	1.45	1.53	2.02	0.13	0.21	0.21	0.27	0.11	0.01	0.16	0.01	Plant 1 (EA #5)
SLD26706	1.78	5.43	13.58	0.47	0.88	0.76	0.84	0.18	0.01	0.69	0.48	Plant 1 (EA #5)
SLD26707	1.70	1.96	2.71	0.39	1.08	0.99	1.08	0.15	-0.10	0.26	0.03	Plant 1 (EA #5)
SLD26708	1.82	5.76	5.83	0.21	0.81	0.93	1.42	0.07	-0.08	0.56	0.34	Plant 1 (EA #5)
SLD26709	2.21	4.24	3.50	0.13	0.94	0.84	0.86	0.12	0.81	0.42	0.19	Plant 1 (EA #5)
SLD26710	2.02	4.42	2.79	0.18	1.89	0.58	1.71	0.15	0.13	0.48	0.25	Plant 1 (EA #5)
SLD27007	1.72	3.23	3.88	0.19	0.92	0.79	0.78	0.21	-1.09	0.35	0.13	Plant 1 (EA #11 South)
SLD27020	1.07	2.59	33.57	1.69	1.07	1.14	1.12	0.24	0.03	0.92	0.70	Plant 1 (EA #1)
SLD27168	0.28	0.35	0.63	0.02	0.06	0.09	0.06	0.01	-0.09	0.04	0.00	Plant 1 (EA #6N)
SLD27169	3.17	3.28	3.28	0.04	1.47	0.77	1.23	0.52	0.39	0.38	0.15	Plant 1 (EA #6N)
SLD27170	0.42	0.68	0.57	0.02	0.18	0.13	0.31	0.05	-0.07	0.07	0.00	Plant 1 (EA #6N)

SampleID	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn	Location
SLD27171	0.79	1.00	1.60	0.09	0.39	0.09	0.04	0.01	-0.02	0.12	0.00	Plant 1 (EA #6N)
SLD27172	1.58	1.88	1.32	0.25	0.75	0.72	0.61	0.24	0.20	0.20	0.00	Plant 1 (EA #6N)
HTZ25732	0.10	1.69	4.85	0.23	1.17	1.07	1.65	0.35	0.36	0.29	0.08	Plant 1 (Area #1 West)
SLD27541	1.04	1.29	37.84	1.82	0.83	0.84	0.87	0.28	0.18	0.90	0.73	Plant 1 (Area #1 West)
SLD27542	0.89	1.17	5.93	0.34	0.52	0.47	0.65	0.24	0.29	0.23	0.09	Plant 1 (EA #11S South)
SLD27543	2.22	1.85	1.61	0.09	0.54	0.39	0.64	0.23	0.01	0.22	0.00	Plant 1 (EA #11S South)
SLD27544	3.52	1.39	2.55	0.07	0.66	0.66	0.80	0.22	-0.20	0.33	0.07	Plant 1 (EA #11S South)
SLD27546	0.72	0.81	0.38	0.01	0.47	0.23	0.50	0.22	-0.19	0.09	0.00	Plant 1 (EA #11S South)
SLD28060	0.82	1.82	18.98	0.92	0.53	0.83	1.10	0.36	-0.35	0.56	0.35	Plant 1 (EA #1 East)
SLD28061	0.91	1.60	3.49	0.23	0.35	0.39	1.17	0.05	0.00	0.20	0.04	Plant 1 (EA #1 East)
SLD28063	1.01	1.66	20.97	1.04	1.07	1.13	1.37	0.39	0.06	0.61	0.40	Plant 1 (EA #1 East)
SLD28064	1.45	2.46	12.82	0.61	1.02	0.82	0.87	0.43	-0.05	0.49	0.26	Plant 1 (EA #1 East)
SLD28583	1.58	1.54	5.79	0.41	1.53	0.92	0.76	0.39	0.42	0.32	0.12	Plant 1 (EA #1 East)
SLD65112	0.96	1.70	4.12	0.25	1.38	0.89	1.40	0.13	-0.21	0.29	0.07	Plant 1 (EA #5 Chem Pad)
SLD65113	1.35	6.88	18.08	0.85	0.89	0.89	1.27	0.42	-0.06	0.88	0.66	Plant 1 (EA #5 Chem Pad)
SLD65115	5.38	2.93	1.77	0.17	0.64	0.87	0.88	0.48	0.05	0.45	0.18	Plant 1 (EA #5 Chem Pad)
SLD65118	0.93	1.52	2.07	0.19	0.34	0.59	0.87	0.22	0.07	0.18	0.01	Plant 1 (EA #5 Chem Pad)
SLD65119	1.67	7.41	11.44	0.63	0.70	0.53	1.04	0.24	-0.03	0.77	0.56	Plant 1 (EA #5 Chem Pad)
SLD65143	1.03	5.24	8.62	0.56	0.64	0.91	1.56	0.45	0.16	0.58	0.36	Plant 1 (EA #5 Chem Pad)
SLD65144	3.18	6.15	3.97	0.36	0.83	0.62	1.09	0.38	0.30	0.54	0.33	Plant 1 (EA #5 Chem Pad)
SLD65219	1.30	2.03	1.90	0.07	0.61	0.57	0.81	0.20	-0.14	0.21	0.02	Plant 1 (EA #5 Chem Pad)
SLD65881	1.16	2.23	1.54	-0.02	1.57	1.16	1.31	0.26	0.05	0.28	0.05	Plant 1 (EA #6S)
SLD65882	0.87	2.39	0.33	0.04	1.27	0.11	2.13	0.03	-0.14	0.25	0.04	Plant 1 (EA #6S)
SLD65883	1.26	1.99	0.60	0.01	0.85	0.56	0.68	0.16	0.06	0.20	0.00	Plant 1 (EA #6S)
SLD65884	2.18	1.66	1.36	0.06	0.49	0.29	1.10	0.05	-0.28	0.21	0.00	Plant 1 (EA #6S)
SLD65885	4.90	3.77	1.52	0.26	0.46	0.19	0.36	0.28	-0.23	0.39	0.14	Plant 1 (EA #6S)
SLD65886	4.33	8.66	9.19	0.51	2.17	1.09	2.24	0.36	-0.05	0.91	0.67	Plant 1 (EA #6S)
SLD65887	1.38	3.20	1.31	0.14	1.84	0.59	1.97	0.12	0.35	0.36	0.13	Plant 1 (EA #6S)
SLD65888	4.17	4.77	4.93	0.22	2.30	1.18	1.77	0.23	0.76	0.57	0.34	Plant 1 (EA #6S)
SLD65889	1.70	3.36	1.80	0.24	1.85	0.66	0.78	0.14	0.24	0.38	0.15	Plant 1 (EA #5 Chem Pad)
SLD65895	0.80	1.38	9.22	0.47	1.16	0.88	1.22	0.10	0.32	0.35	0.16	Plant 1 (EA #5 Chem Pad)
SLD67469	5.74	3.60	2.51	0.18	0.95	0.77	1.26	0.24	-0.12	0.50	0.22	Plant 1 (EA #6W)
SLD67470	1.63	1.57	1.76	0.08	0.95	0.86	1.17	0.06	-0.33	0.21	0.01	Plant 1 (EA #6W)
SLD67471	2.34	8.26	12.38	0.59	0.77	0.88	1.16	0.11	-0.02	0.86	0.64	Plant 1 (EA #6W)
SLD67472	1.61	1.93	2.22	0.12	0.98	0.61	1.03	0.02	0.02	0.24	0.02	Plant 1 (EA #6W)
SLD67473	0.97	1.69	1.11	0.13	0.30	0.10	0.39	0.01	-0.05	0.15	0.00	Plant 1 (EA #6S South)
SLD67474	1.23	1.59	0.35	0.10	0.94	0.60	0.98	0.18	-0.01	0.18	0.00	Plant 1 (EA #6S South)
SLD67475	1.25	2.69	1.89	0.08	0.76	0.37	0.55	0.05	0.27	0.27	0.06	Plant 1 (EA #6S South)
SLD67476	1.08	2.09	1.12	0.10	0.21	0.16	0.58	0.03	0.20	0.18	0.01	Plant 1 (EA #6S South)

Reference Area Data Summary

Statistic	Ra-226 (pCi/g)	Th-230 (pCi/g)	U-238 (pCi/g)	U-235 (pCi/g)	Th-232 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Ac-227 (pCi/g)	Pa-231 (pCi/g)	SOR_B (5/5/50)	SOR_B (15/15/50)
Mean	2.78	1.94	1.44	0.09	1.09	0.95	1.16	0.14	0.89	0.82	0.29
Median	2.53	1.66	1.16	0.08	1.07	0.97	1.10	0.11	0.98	0.76	0.27
UCL-95	3.04	2.18	1.67	0.12	1.18	1.00	1.26	0.18	1.12	-	-
St. Dev	0.89	0.76	0.75	0.08	0.29	0.17	0.35	0.14	0.76	0.21	0.08
Range	3.93	3.19	3.19	0.33	1.25	0.82	1.59	0.80	2.55	0.95	0.35
Detects	32	32	32	0	32	32	32	7	13	-	-
No. Samples (m)	32	32	32	32	32	32	32	32	32	32	32

Survey Unit Data Summary Plant 1 - Class 1 Area Subsurface Samples

Statistic		Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
Mean		1.61	2.27	3.58	0.22	1.04	0.84	1.38	0.18	0.19	0.30	0.09
Median		1.21	2.11	2.07	0.15	1.09	0.88	1.37	0.16	0.15	0.25	0.04
Standard Deviation		1.14	0.95	4.99	0.29	0.27	0.19	0.40	0.12	0.38	0.14	0.13
Number of samples		48	48	48	48	48	48	48	48	48	48	48
Student $t_{(n-1)}$ test		1.677	1.677	1.677	1.677	1.677	1.677	1.677	1.677	1.677		
Maximum		6.03	5.05	32.78	1.78	1.52	1.16	2.28	0.69	1.58	0.93	0.71
Range		5.74	4.42	32.53	1.83	1.46	1.08	1.92	0.71	2.42	0.87	0.71
Detects		49	39	29	15	48	48	49	2	0		
Distribution		X	L	L	L	N	X	L	L	L		
UCL (normal)		1.89	2.50	4.79	0.29	1.11	0.88	1.48	0.21	0.28		
UCL (Lognormal)		1.84	2.71	4.53	0.37		0.95	1.51	0.25	0.80		
UCL (Z-statistics)		1.89					0.88					
UCL-95(Selected)		1.89	2.71	4.53	0.37	1.11	0.95	1.51	0.25	0.80		
EPC		**0.00**	**0.77**	**3.09**	**0.28**	**0.02**	**0.00**	**0.35**	**0.11**	**0.00**		

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD06126	Grab	1.15	2.40	2.64	0.09	1.14	0.73	1.21	0.11	0.46	0.29	0.06
SLD06127	Grab	1.07	1.60	3.20	0.34	1.09	0.80	1.05	0.19	0.10	0.24	0.04
SLD06129	Grab	2.04	2.22	1.89	0.24	1.25	0.86	1.29	0.08	-0.05	0.27	0.04
SLD06130	Grab	1.05	2.28	1.33	0.16	0.92	0.69	1.50	0.18	-0.01	0.24	0.02
SLD06317	Grab	1.28	1.49	1.49	0.09	0.60	0.55	1.37	0.02	-0.07	0.17	0.00
SLD06318	Grab	6.03	3.07	2.40	0.03	0.93	0.52	1.48	0.02	1.58	0.51	0.24
SLD06319	Grab	0.29	0.63	0.25	0.04	0.06	0.08	0.36	0.03	-0.17	0.05	0.00
SLD06500	Grab	0.69	2.07	0.62	0.07	1.44	0.74	1.36	0.27	0.52	0.25	0.03
SLD06582	Grab	1.22	2.50	0.96	0.15	0.77	0.48	1.48	0.24	0.23	0.24	0.04
SLD06584	Grab	0.85	1.23	1.35	0.06	1.33	0.94	0.80	0.30	-0.09	0.20	0.02
SLD06586	Grab	1.11	2.30	0.45	0.03	1.07	0.65	1.69	0.43	0.20	0.23	0.02
SLD06753	Grab	1.58	1.93	3.53	0.32	0.99	0.80	0.63	0.20	0.19	0.27	0.04
SLD06755	Grab	1.08	1.10	4.75	0.30	0.51	0.76	1.00	0.19	0.36	0.22	0.07
SLD07182	Grab	1.12	1.37	1.90	0.21	1.20	0.90	1.30	0.27	0.72	0.21	0.02
SLD07184	Grab	0.93	1.76	5.07	0.19	1.12	1.05	1.38	0.14	0.11	0.29	0.08
SLD07186	Grab	1.15	1.67	2.38	0.06	1.06	0.92	0.82	0.22	-0.26	0.23	0.02
SLD07258	Grab	2.30	3.17	32.78	1.78	0.73	0.88	1.40	0.28	-0.10	0.93	0.71
SLD07448	Grab	1.29	1.60	4.64	0.29	1.37	0.69	1.16	0.10	0.24	0.29	0.08
SLD07481	Grab	0.96	1.44	1.29	0.01	0.95	0.79	1.18	0.06	0.05	0.19	0.00
SLD25037	Grab	1.45	2.49	12.20	0.67	0.73	0.77	1.38	0.33	0.23	0.46	0.25
SLD25040	Grab	2.50	5.01	4.50	0.24	1.09	1.00	1.44	0.26	0.47	0.50	0.27
SLD25603	Grab	1.82	2.42	1.66	0.18	1.09	0.74	1.51	-0.02	-0.29	0.27	0.04
SLD26703	Grab	1.03	2.28	1.11	0.10	1.16	0.95	1.08	0.09	0.70	0.25	0.03
SLD26704	Grab	1.08	1.06	1.28	0.10	1.32	0.94	1.17	0.15	0.46	0.19	0.02

SampleID	Sample	Ra-226	Th-230	U-238	U-235	Th-232	Ra-228	Th-228	Ac-227	Pa-231	SORg	SORn
SLD27024	Grab	1.82	1.74	9.05	0.24	0.62	0.79	0.93	0.42	-0.84	0.36	0.15
SLD27345	Grab	1.11	2.08	2.07	0.14	1.04	0.75	0.87	0.12	-0.18	0.25	0.02
SLD65107	Grab	1.04	1.61	2.13	0.14	1.43	1.16	1.50	0.69	0.35	0.25	0.04
SLD65673	Grab	0.95	1.65	1.20	0.14	0.77	1.01	1.73	0.28	0.51	0.20	0.00
SLD65674	Grab	0.89	1.68	2.07	0.03	0.98	0.93	1.25	0.21	0.80	0.22	0.01
SLD67516	Grab	0.79	1.18	0.84	0.07	1.10	1.01	1.05	0.18	0.33	0.17	0.00
SLD78707	Grab	1.07	2.12	2.06	0.03	0.91	0.89	1.63	0.15	-0.27	0.24	0.02
SLD78708	Grab	1.06	2.88	5.75	0.35	1.27	0.89	1.84	0.17	-0.15	0.39	0.16
SLD78709	Grab	1.20	2.88	4.83	0.42	1.27	0.88	2.28	0.16	0.42	0.37	0.14
SLD78715	Grab	2.08	1.97	7.85	0.47	1.12	0.95	1.21	0.13	0.50	0.37	0.13
SLD78716	Grab	1.49	3.10	1.93	0.31	0.96	1.02	1.63	0.13	0.01	0.31	0.09
SLD78717	Grab	1.55	3.32	2.10	0.12	0.94	0.93	1.86	0.10	0.56	0.33	0.10
SLD78719	Grab	2.31	3.36	8.53	0.76	1.35	0.99	2.05	0.13	-0.02	0.49	0.25
SLD78720	Grab	1.36	2.10	1.48	0.05	1.09	0.84	1.63	0.15	-0.06	0.24	0.01
SLD78721	Grab	1.33	1.92	1.31	-0.05	1.18	0.93	1.29	0.10	0.49	0.23	0.01
SLD78723	Grab	1.41	1.95	2.17	0.17	1.14	0.78	1.26	0.08	-0.13	0.25	0.02
SLD78724	Grab	4.71	5.05	7.39	0.50	1.02	1.12	2.26	0.23	0.48	0.56	0.34
SLD78725	Grab	1.29	2.35	2.05	0.11	1.24	0.88	1.20	0.17	0.44	0.28	0.05
SLD78927	Grab	2.52	3.61	2.80	0.27	0.85	0.62	1.14	0.09	-0.27	0.35	0.14
SLD78928	Grab	5.79	4.73	4.94	0.32	1.52	1.09	1.74	0.30	0.03	0.59	0.30
SLD78929	Grab	1.15	1.76	0.91	-0.05	0.76	0.86	1.35	0.09	0.05	0.19	0.00
SLD78931	Grab	1.18	2.74	0.90	0.15	1.27	0.91	2.18	0.22	0.04	0.28	0.06
SLD78932	Grab	1.47	2.13	1.08	-0.01	0.96	0.83	1.97	0.06	0.10	0.23	0.01
SLD78933	Grab	2.69	2.20	2.63	0.37	1.27	0.89	1.38	0.04	0.24	0.32	0.05

ATTACHMENT C-5

PLANT 1 EVALUATION OF 100-m^2 REMEDIATION GOAL

Evaluation of 100m^2 Remediation Goal				
Survey Unit	**Sample Number**	**SOR_N**	**Effective Area (m^2)**	**Area Weighted Average**
SU-1A	HTZ00166	1.82	1.0	0.29
	HTZ00168	1.64	1.0	
	HTZ00167	1.09	1.0	
	SLD06051	0.62	31.3	
	SLD06050	0.07	31.3	
	SLD06049	0.07	31.3	
SU-1A	SLD06139	1.07	4.5	0.84
	SLD06138	0.76	4.5	
	HTZ00190	0.16	1.0	
SU-1A	HTZ00476	1.24	0.5	0.19
	HTZ00474	0.52	1.0	
	HTZ00475	0.79	0.5	
	SLD07447	0.05	8.0	
SU-1A	HTZ00343	2.7	1.0	0.71
	HTZ00344	1.89	3.0	
	HTZ00322	1.07	3.0	
	SLD06476	1.39	23.6	
	SLD06474	0.77	23.6	
	SLD06475	0.42	23.6	
	SLD06479	0.07	23.6	
	HTZ00378	0	2.0	
	HTZ00398	0.21	1.0	
SU-1A	SLD06806	0.99	8.8	0.39
	HTZ00441	1.24	4.0	
	HTZ00442	1	2.0	
	SLD06807	0.07	8.8	
	SLD06808	0.18	8.8	
	SLD06809	0.11	8.8	
	SLD06810	0.13	8.8	
	HTZ00440	0.12	1.0	
SU-1A	HTZ00694	1.07	1.0	0.57
	HTZ00518	4.14	1.0	
	SLD25038	0.3	6.0	
	SLD25041	0.15	6.0	
	HTZ00529	0.67	1.0	
SU-1A	HTZ00671	3.25	1.5	0.21
	HTZ00668	0.1	3.0	
	HTZ00670	0.12	1.5	
	SLD07255	0.00	18.0	
	SLD07256	0.32	18.0	
	SLD07257	0.07	18.0	
SU-1A	HTZ00494	1.30	1.0	0.72
	HTZ00493	0.70	1.0	
	SLD07445	0.58	4.0	

Survey Unit	Sample Number	SOR_N	Effective Area (m^2)	Area Weighted Average
SU-1A	HTZ27395	1.03	1.0	0.44
	HTZ27393	1.95	1.0	
	HTZ27394	0.42	2.0	
	HTZ27396	0.05	1.0	
	SLD27575	0.33	7.7	
	HTZ25731	0.65	1.0	
	HTZ25730	0.31	2.0	
	HTZ25674	0.65	1.0	
	HTZ25729	0.15	2.0	
	HTZ25732	0.06	1.0	
	HTZ25677	0.31	1.0	
	HTZ25736	0.34	3.0	
	HTZ00705	0.77	2.0	
	HTZ00712	0.07	1.0	
SU-1B	HTZ27419	1.20	1.0	0.26
	SLD65644	0.07	16.0	
	SLD65757	0.05	16.0	
	SLD65645	0.40	39.0	
	HTZ25795	0.01	1	
	HTZ25796	0.37	4	
	HTZ25794	0.09	2.0	
	HTZ25792	0.00	1.0	
	HTZ25791	0.04	1.0	
	HTZ25790	0.34	2.0	
	HTZ25789	0.45	2.0	
SU-1B	HTZ66310	1.21	1.0	0.11
	HTZ66311	0.91	1.0	
	SLD65757	0.04	16.0	
	HTZ25791	0.04	1.0	
	HTZ25789	0.45	2.0	
	HTZ25790	0.34	2.0	
	HTZ25792	0.00	0.5	
	HTZ00692	0.13	1.0	
	SLD07480	0.00	29	
	HTZ00614	0.54	3.0	
	HTZ25684	0.36	1.5	
	HTZ25683	0.03	1.0	
	SLD27023	0.17	20	
	HTZ00606	0.39	0.5	
	HTZ00605	0.67	1.0	
	HTZ27400	0.06	1.0	
	HTZ25685	0.15	2.0	
	SLD65757	0.04	16.0	
	HTZ25723	0.70	1.0	
	HTZ00503	0.00	0.5	
	HTZ00690	0.00	1.0	
	SLD65145	0.00	14.0	
	HTZ00692	0.13	0.5	
	HTZ25742	0.00	1.0	
	HTZ25743	0.23	1.0	
	HTZ25744	0.00	1.0	
	HTZ25745	0.31	1.0	
	HTZ25747	0.53	1.0	

ATTACHMENT C-6

PLANT 1 WRS TESTS

Plant 1 Survey Unit 1A WRS Test

Sample #	Sample ID	Data[1]	Area	Adjusted Data	Ranks	Reference Area Ranks (W_r)
1	SLD00001	0.2	R	1.2	49	49
2	SLD00002	0.2	R	1.2	50	50
3	SLD00022	0.3	R	1.3	60	60
4	SLD00023	0.3	R	1.3	58	58
5	SLD00041	0.3	R	1.3	57	57
6	SLD00042	0.3	R	1.3	63	63
7	SLD00043	0.3	R	1.3	64	64
8	SLD00044	0.3	R	1.3	68	68
9	SLD00061	0.3	R	1.3	67	67
10	SLD00062	0.3	R	1.3	59	59
11	SLD00063	0.2	R	1.2	44	44
12	SLD00081	0.3	R	1.3	56	56
13	SLD00082	0.3	R	1.3	62	62
14	SLD00083	0.2	R	1.2	45	45
15	SLD00101	0.4	R	1.4	71	71
16	SLD00102	0.4	R	1.4	70	70
17	SLD00103	0.3	R	1.3	61	61
18	SLD00121	0.3	R	1.3	69	69
19	SLD00122	0.3	R	1.3	54	54
20	SLD00123	0.3	R	1.3	65	65
21	SLD00141	0.5	R	1.5	73	73
22	SLD00142	0.5	R	1.5	72	72
23	SLD00143	0.2	R	1.2	47	47
24	SLD00144	0.3	R	1.3	52	52
25	SLD00161	0.2	R	1.2	40	40
26	SLD00162	0.2	R	1.2	46	46
27	SLD00181	0.2	R	1.2	43	43
28	SLD00201	0.3	R	1.3	53	53
29	SLD00202	0.3	R	1.3	55	55
30	SLD00241	0.2	R	1.2	41	41
31	SLD00242	0.2	R	1.2	48	48
32	SLD00243	0.2	R	1.2	42	42
33	SLD06049	0.3	S	0.3	14	0
34	SLD06050	0.3	S	0.3	16	0
35	SLD06051	0.9	S	0.9	36	0
36	SLD06125	0.4	S	0.4	20	0
37	SLD06128	0.5	S	0.5	24	0
38	SLD06138	1.0	S	1.0	38	0
39	SLD06139	1.3	S	1.3	66	0
40	SLD06314	0.7	S	0.7	34	0
41	SLD06315	0.3	S	0.3	5	0
42	SLD06316	0.1	S	0.1	1	0
43	SLD06473	0.3	S	0.3	12	0
44	SLD06474	1.0	S	1.0	39	0
45	SLD06475	0.7	S	0.7	32	0
46	SLD06476	1.6	S	1.6	74	0
47	SLD06477	0.4	S	0.4	21	0
48	SLD06478	0.3	S	0.3	4	0
49	SLD06479	0.3	S	0.3	13	0
50	SLD06501	0.7	S	0.7	31	0
51	SLD06752	0.2	S	0.2	3	0
52	SLD06754	0.5	S	0.5	25	0
53	SLD06806	1.2	S	1.2	51	0
54	SLD06807	0.3	S	0.3	11	0
55	SLD06808	0.4	S	0.4	22	0
56	SLD06809	0.4	S	0.4	17	0
57	SLD06810	0.4	S	0.4	18	0
58	SLD07255	0.2	S	0.2	2	0
59	SLD07256	0.6	S	0.6	29	0
60	SLD07257	0.3	S	0.3	6	0
61	SLD07313	0.3	S	0.3	15	0
62	SLD07314	0.3	S	0.3	8	0
63	SLD07445	0.9	S	0.9	35	0
64	SLD07447	0.3	S	0.3	7	0
65	SLD25038	0.5	S	0.5	28	0
66	SLD25039	0.5	S	0.5	27	0
67	SLD25041	0.4	S	0.4	19	0
68	SLD27575	0.6	S	0.6	30	0
69	SLD78706	1.0	S	1.0	37	0
70	SLD78714	0.5	S	0.5	23	0
71	SLD78718	0.7	S	0.7	33	0
72	SLD78722	0.5	S	0.5	26	0
73	SLD78926	0.3	S	0.3	9.5	0
74	SLD78930	0.3	S	0.3	9.5	0
				SUM=	2775	1804
				Critical Value=	1351	

1 Data points for the SU(s) are gross values (includes background).
Data points for the Reference Area (R) are background values.

ATTACHMENT C-7

PLANT 1 FINAL STATUS SURVEY WALKOVER SURVEY MAPS

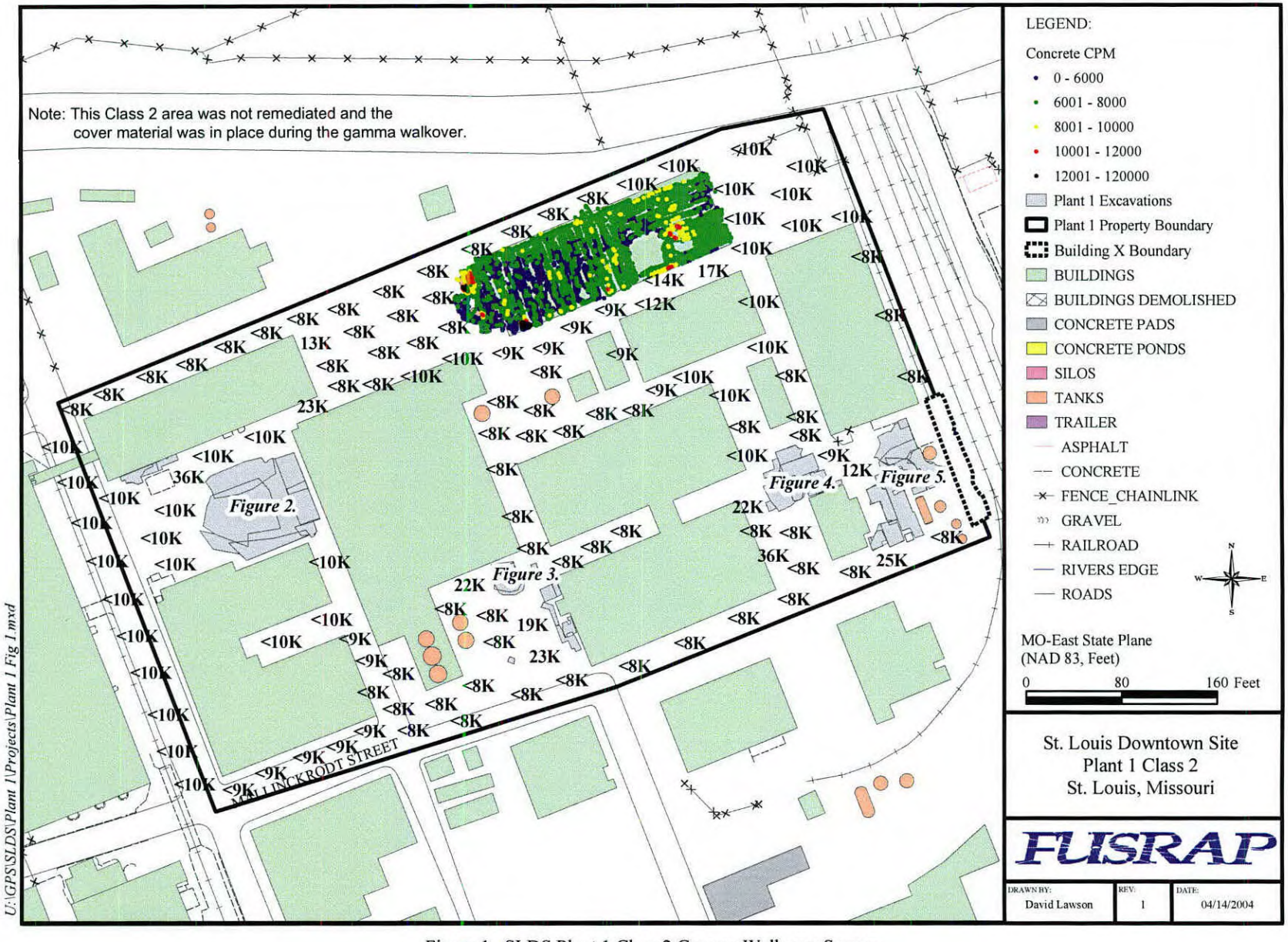


Figure 1. SLDS Plant 1 Class 2 Gamma Walkover Survey

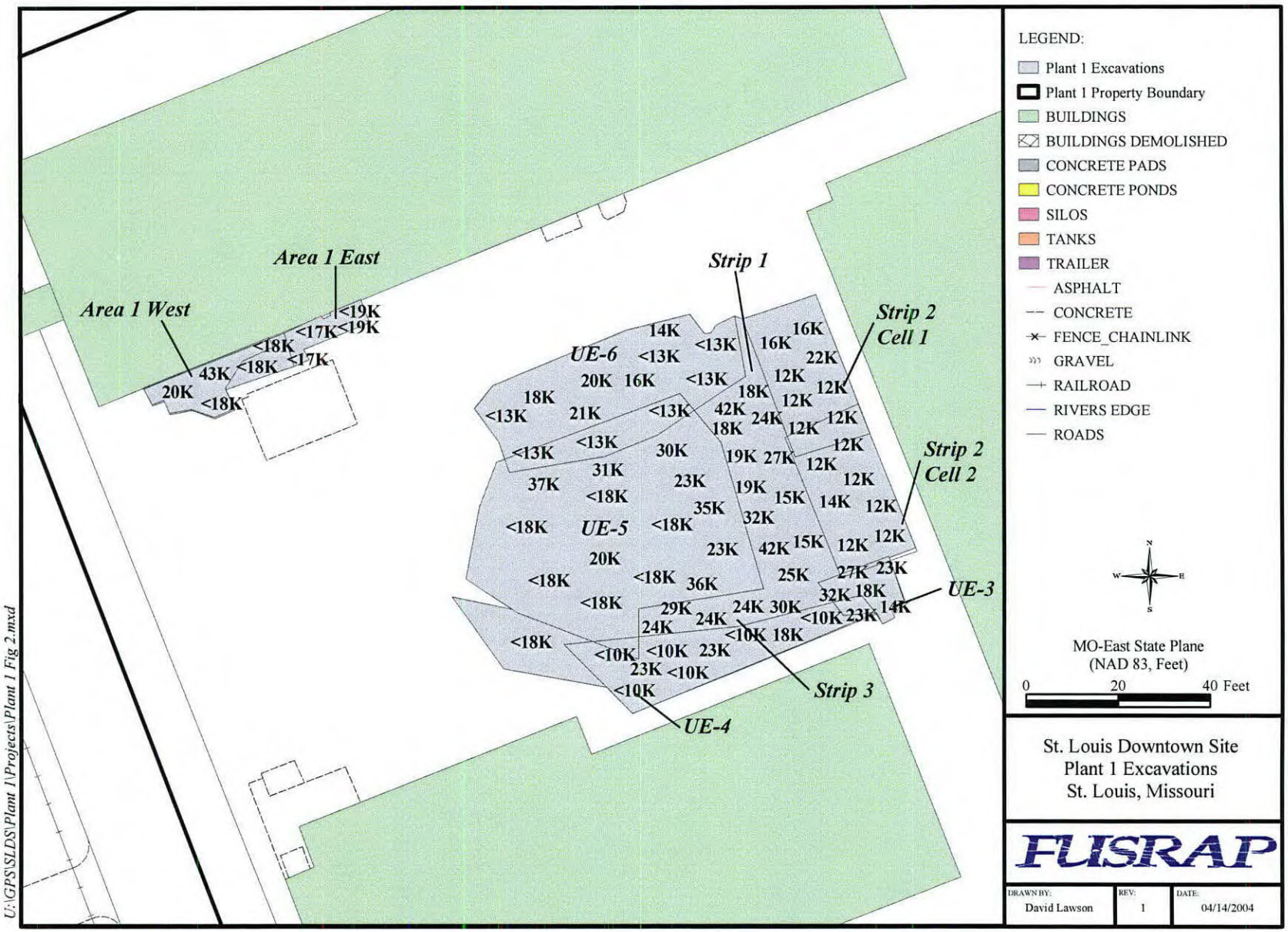


Figure 2. SLDS Plant 1 Excavation Gamma Walkover Survey

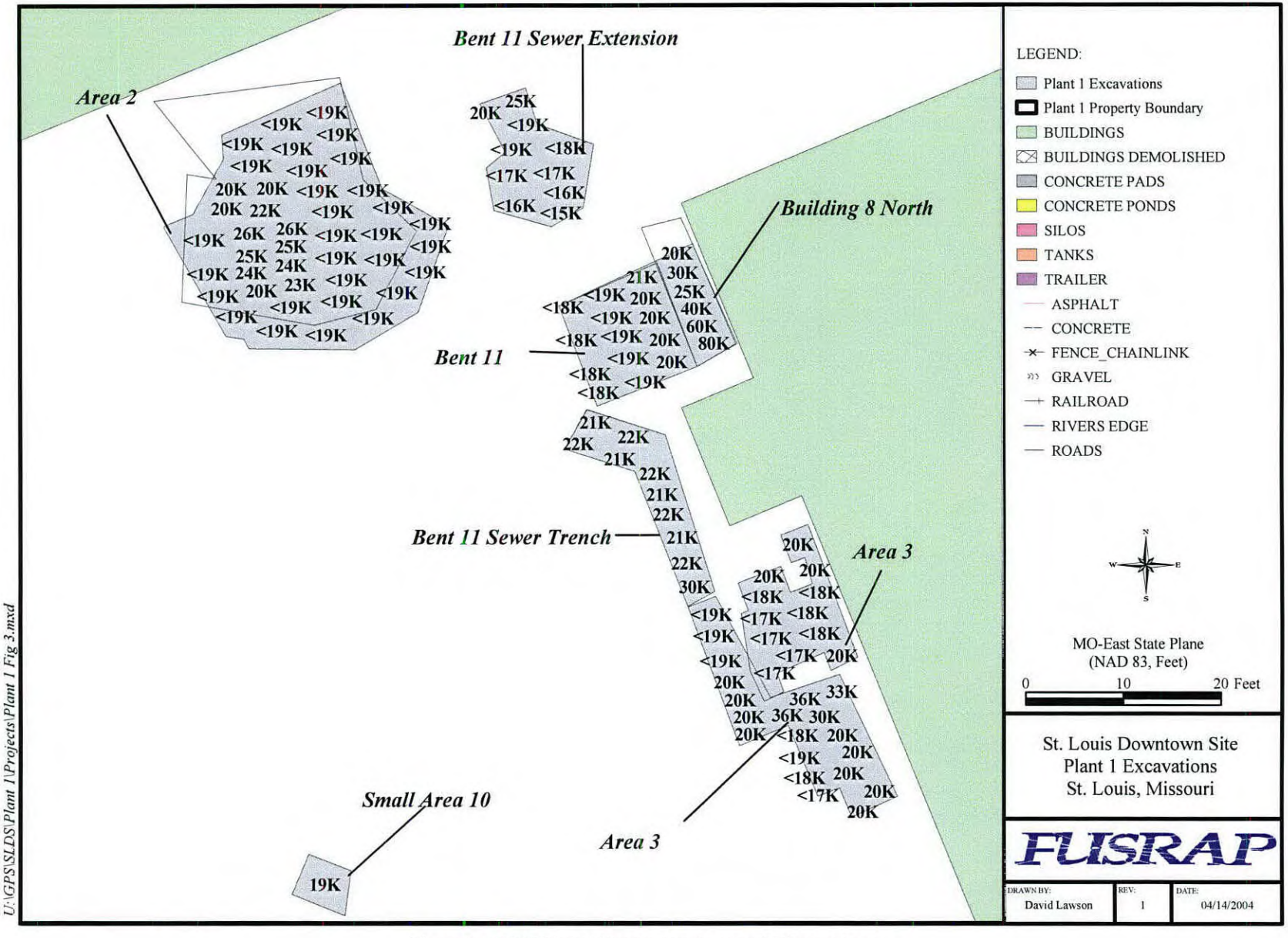


Figure 3. SLDS Plant 1 Excavation Gamma Walkover Survey

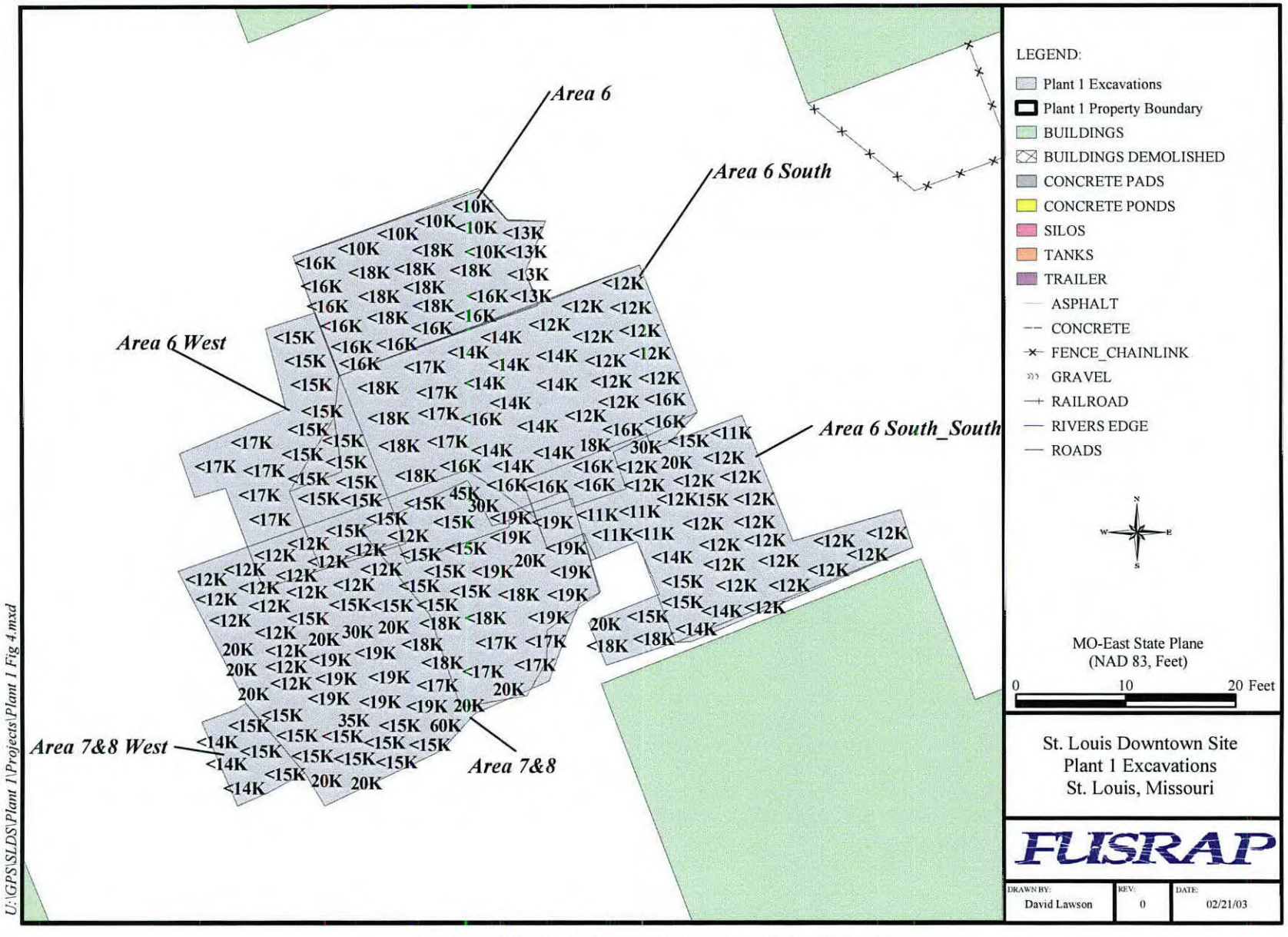


Figure 4. SLDS Plant 1 Excavation Gamma Walkover Survey

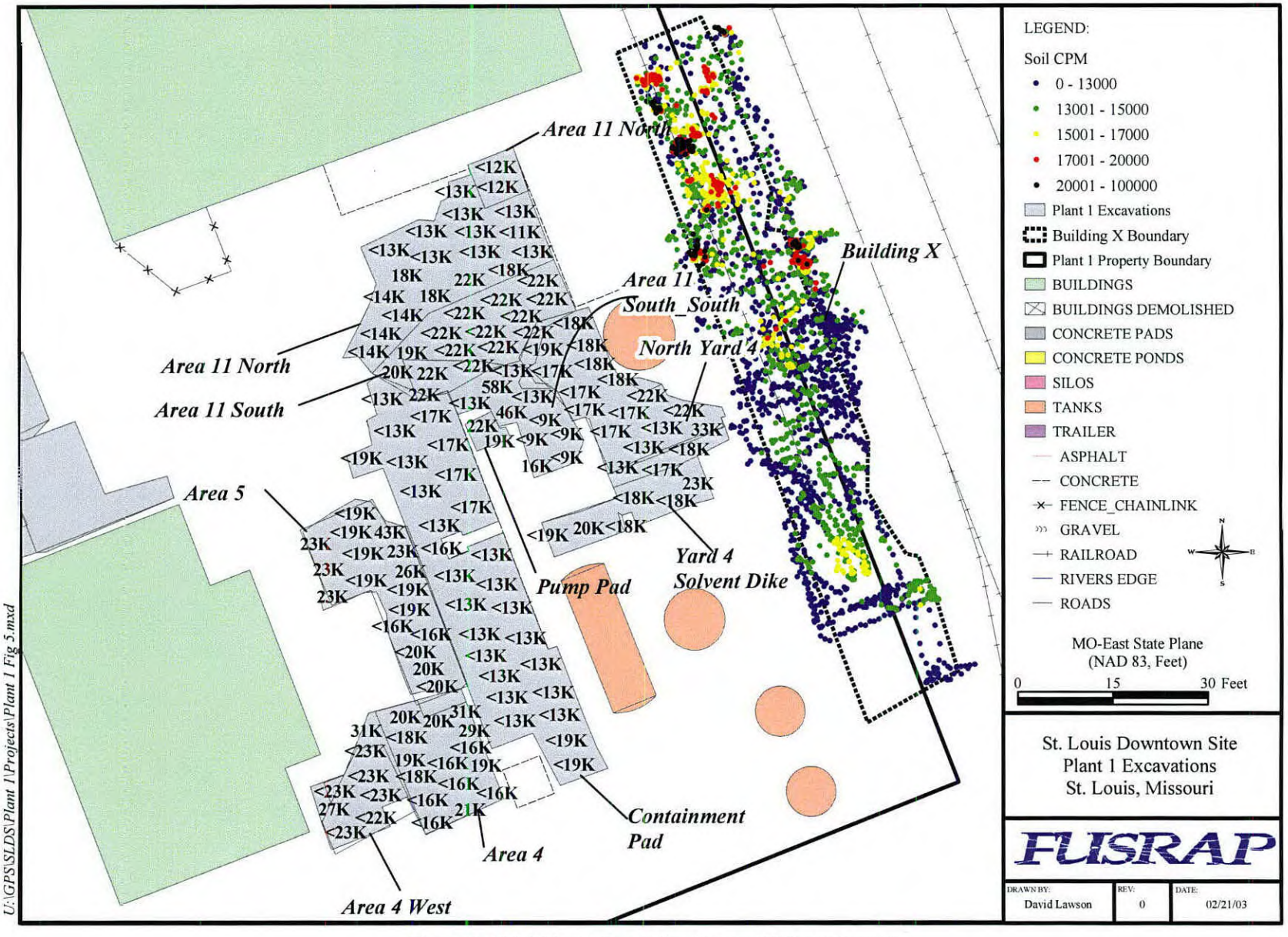


Figure 5. SLDS Plant 1 Excavation Gamma Walkover Survey

ATTACHMENT C-8

PLANT 1 FINAL STATUS SURVEY FIXED POINT MEASUREMENT DATA ON CONSOLIDATED MATERIAL SURFACES

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.178	0.25	0.0445		0.278	0.25	0.0695	
Area 11 South/South		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 11 South/South	1	4	0.3	3.7	67	400	185	215	2,475
Area 11 South/South	2	2	0.3	1.7	31	400	185	215	2,475
Area 11 South/South	3	3	0.3	2.7	49	400	185	215	2,475
Area 11 South/South	4	2	0.3	1.7	31	400	185	215	2,475
Area 11 South/South	5	4	0.3	3.7	67	400	185	215	2,475

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.178	0.25	0.0445		0.278	0.25	0.0695	
Area 1 East		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 1 East	1	0	1	-1	-18	500	234	266	3,062
Area 1 East	2	3	1	2	36	500	234	266	3,062
Area 1 East	3	2	1	1	18	500	234	266	3,062
Area 1 East	4	2	1	1	18	500	234	266	3,062
Area 1 East	5	1	1	0	0	500	234	266	3,062
Area 1 East	6	3	1	2	36	500	234	266	3,062
Area 1 East	7	0	1	-1	-18	500	234	266	3,062
Area 1 East	8	1	1	0	0	500	234	266	3,062
Area 1 East	9	3	1	2	36	500	234	266	3,062
Area 1 East	10	2	1	1	18	500	234	266	3,062
Area 1 East	11	1	1	0	0	500	234	266	3,062
Area 1 East	12	2	1	1	18	500	234	266	3,062
Area 1 East	13	2	1	1	18	500	234	266	3,062
Area 1 East	14	2	1	1	18	500	234	266	3,062
Area 1 East	15	3	1	2	36	500	234	266	3,062

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
Area 6 North		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 6 North	1	0	1.3	-1.3	-24	400	257	143	1,899
Area 6 North	2	4	1.3	2.7	50	400	257	143	1,899
Area 6 North	3	2	1.3	0.7	13	400	257	143	1,899
Area 6 North	4	2	1.3	0.7	13	400	257	143	1,899
Area 6 North	5	6	1.3	4.7	87	400	257	143	1,899

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.161	0.25	0.04025		0.252	0.25	0.063	
Area 6 South/South (wall)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 6 South/South (wall)	1	2	0.2	1.8	36	220	152	68	863
Area 6 South/South (wall)	2	1	0.2	0.8	16	211	152	59	749
Area 6 South/South (wall)	3	2	0.2	1.8	36	186	152	34	432
Area 6 South/South (wall)	4	4	0.2	3.8	76	200	152	48	610
Area 6 South/South (wall)	5	2	0.2	1.8	36	223	152	71	902

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
Area 6 South/South		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 6 South/South	1	5	0	5	93	191	132	59	783
Area 6 South/South	2	2	0	2	37	205	132	73	969
Area 6 South/South	3	1	0	1	19	203	132	71	943
Area 6 South/South	4	2	0	2	37	198	132	66	876
Area 6 South/South	5	2	0	2	37	195	132	63	837
Area 6 South/South	6	3	0	3	56	207	132	75	996
Area 6 South/South	7	3	0	3	56	260	132	128	1,700

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.176	0.25	0.044		0.259	0.25	0.06475	
Area 5 Cont. Pad		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 5 Cont. Pad	2	24	0.6	23.4	425	500	210	290	3,583
Area 5 Cont. Pad	3	2	0.6	1.4	25	500	210	290	3,583
Area 5 Cont. Pad	4	4	0.6	3.4	62	500	210	290	3,583
Area 5 Cont. Pad	5	3	0.6	2.4	44	500	210	290	3,583
Area 5 Cont. Pad	6	4	0.6	3.4	62	500	210	290	3,583
Area 5 Cont. Pad	7	4	0.6	3.4	62	500	210	290	3,583
Area 5 Cont. Pad	8	4	0.6	3.4	62	500	210	290	3,583
Area 5 Cont. Pad	9	2	0.6	1.4	25	500	210	290	3,583
Area 5 Cont. Pad	10	4	0.6	3.4	62	500	210	290	3,583
Area 5 Cont. Pad	11	7	0.6	6.4	116	500	210	290	3,583
Area 5 Cont. Pad	12	3	0.6	2.4	44	500	210	290	3,583
Area 5 Cont. Pad	13	5	0.6	4.4	80	500	210	290	3,583
Area 5 Cont. Pad	14	12	0.6	11.4	207	500	210	290	3,583
Area 5 Cont. Pad	15	3	0.6	2.4	44	500	210	290	3,583

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
UE-3		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
UE-3	1	0	0.3	-0.3	-6	200	132	68	903
UE-3	2	0	0.3	-0.3	-6	200	132	68	903
UE-3	3	0	0.3	-0.3	-6	230	132	98	1,301
UE-3	4	0	0.3	-0.3	-6	216	132	84	1,115
UE-3	5	0	0.3	-0.3	-6	272	132	140	1,859
UE-3	6	2	0.3	1.7	32	198	132	66	876
UE-3	7	2	0.3	1.7	32	292	132	160	2,124
UE-3	8	4	0.3	3.7	69	270	132	138	1,832
UE-3	9	0	0.3	-0.3	-6	254	132	122	1,620

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.181	0.25	0.04525		0.294	0.25	0.0735	
Area 4 East (Plant 1)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 4 East (Plant 1)	1	0	0.2	-0.2	-4	320	205	115	1,252
Area 4 East (Plant 1)	2	2	0.2	1.8	32	368	205	163	1,774
Area 4 East (Plant 1)	3	0	0.2	-0.2	-4	374	205	169	1,839
Area 4 East (Plant 1)	4	0	0.2	-0.2	-4	322	205	117	1,273
Area 4 East (Plant 1)	5	4	0.2	3.8	67	332	205	127	1,382
Area 4 East (Plant 1)	6	0	0.2	-0.2	-4	334	205	129	1,404
Area 4 East (Plant 1)	7	4	0.2	3.8	67	282	205	77	838
Area 4 East (Plant 1)	8	6	0.2	5.8	103	352	205	147	1,600
Area 4 East (Plant 1)	9	6	0.2	5.8	103	264	205	59	642
Area 4 East (Plant 1)	10	26	0.2	25.8	456	400	205	195	2,122
Area 4 East (Plant 1)	11	10	0.2	9.8	173	430	205	225	2,449
Area 4 East (Plant 1)	12	10	0.2	9.8	173	504	205	299	3,254
Area 4 East (Plant 1)	13	2	0.2	1.8	32	450	205	245	2,667
Area 4 East (Plant 1)	14	6	0.2	5.8	103	452	205	247	2,688
Area 4 East (Plant 1)	15	8	0.2	7.8	138	368	205	163	1,774
Area 4 East (Plant 1)	16	2	0.2	1.8	32	212	205	7	76
Area 4 East (Plant 1)	17	4	0.2	3.8	67	334	205	129	1,404
Area 4 East (Plant 1)	18	0	0.2	-0.2	-4	368	205	163	1,774

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
Y4SD North/South		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Y4SD North/South	1	2	2.6	-0.6	-11	294	754	-460	-6,108
Y4SD North/South	2	0	2.6	-2.6	-48	308	754	-446	-5,922
Y4SD North/South	3	4	2.6	1.4	26	378	754	-376	-4,993
Y4SD North/South	4	6	2.6	3.4	63	298	754	-456	-6,055
Y4SD North/South	5	0	2.6	-2.6	-48	302	754	-452	-6,002
Y4SD North/South	6	2	2.6	-0.6	-11	306	754	-448	-5,949
Y4SD North/South	7	6	2.6	3.4	63	306	754	-448	-5,949
Y4SD North/South	8	12	2.6	9.4	175	388	754	-366	-4,860
Y4SD North/South	9	10	2.6	7.4	138	440	754	-314	-4,169
Y4SD North/South	10	12	2.6	9.4	175	532	754	-222	-2,948
Y4SD North/South	11	12	2.6	9.4	175	368	754	-386	-5,125
Y4SD North/South	12	60	2.6	57.4	1,068	382	754	-372	-4,939
Y4SD North/South	13	14	2.6	11.4	212	356	754	-398	-5,285
Y4SD North/South	14	18	2.6	15.4	287	350	754	-404	-5,364
Y4SD North/South	15	18	2.6	15.4	287	502	754	-252	-3,346
Y4SD North/South	16	2	2.6	-0.6	-11	336	754	-418	-5,550
Y4SD North/South	17	12	2.6	9.4	175	424	754	-330	-4,382
Y4SD North/South	18	4	2.6	1.4	26	288	754	-466	-6,188
Y4SD North/South	19	4	2.6	1.4	26	320	754	-434	-5,763
Y4SD North/South	20	6	2.6	3.4	63	296	754	-458	-6,081
Y4SD North/South	21	2	2.6	-0.6	-11	454	754	-300	-3,983
Y4SD North/South	22	4	2.6	1.4	26	480	754	-274	-3,638
Y4SD North/South	23	4	2.6	1.4	26	674	754	-80	-1,062
Y4SD North/South	24	10	2.6	7.4	138	1224	754	470	6,241
Y4SD North/South	25	14	2.6	11.4	212	570	754	-184	-2,443
Y4SD North/South	26	4	2.6	1.4	26	540	754	-214	-2,841
Y4SD North/South	27	16	2.6	13.4	249	412	754	-342	-4,541
Y4SD North/South	28	0	2.6	-2.6	-48	326	754	-428	-5,683
Y4SD North/South	29	4	2.6	1.4	26	376	754	-378	-5,019
Y4SD North/South	30	0	2.6	-2.6	-48	368	754	-386	-5,125
Y4SD North/South	31	6	2.6	3.4	63	358	754	-396	-5,258
Y4SD North/South	32	2	2.6	-0.6	-11	496	754	-258	-3,426
Y4SD North/South	33	4	2.6	1.4	26	264	754	-490	-6,506
Y4SD North/South	34	4	2.6	1.4	26	132	754	-622	-8,259
Y4SD North/South	35	8	2.6	5.4	100	390	754	-364	-4,833
Y4SD North/South	36	2	2.6	-0.6	-11	288	754	-466	-6,188
Y4SD North/South	37	6	2.6	3.4	63	338	754	-416	-5,524
Y4SD North/South	38	8	2.6	5.4	100	290	754	-464	-6,161
Y4SD North/South	39	2	2.6	-0.6	-11	284	754	-470	-6,241
Y4SD North/South	40	6	2.6	3.4	63	356	754	-398	-5,285
Y4SD North/South	41	2	2.6	-0.6	-11	264	754	-490	-6,506
Y4SD North/South	42	2	2.6	-0.6	-11	328	754	-426	-5,656
Y4SD North/South	43	0	2.6	-2.6	-48	342	754	-412	-5,471
Y4SD North/South	44	2	2.6	-0.6	-11	322	754	-432	-5,736
Y4SD North/South	45	10	2.6	7.4	138	364	754	-390	-5,178

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.182	0.25	0.0455		0.302	0.25	0.0755	
Area 11 South		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 11 South	1	1	0.3	0.7	12	247	169	78	826
Area 11 South	2	4	0.3	3.7	65	233	169	64	678
Area 11 South	3	3	0.3	2.7	47	249	169	80	848
Area 11 South	4	5	0.3	4.7	83	295	169	126	1,335

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
Area 11 North/North		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 11 North/North	1	2	0.3	1.7	32	306	132	174	2,310
Area 11 North/North	2	10	0.3	9.7	180	254	132	122	1,620
Area 11 North/North	3	6	0.3	5.7	106	259	132	127	1,686
Area 11 North/North	4	4	0.3	3.7	69	240	132	108	1,434
Area 11 North/North	5	2	0.3	1.7	32	288	132	156	2,071
Area 11 North/North	6	4	0.3	3.7	69	266	132	134	1,779
Area 11 North/North	7	4	0.3	3.7	69	262	132	130	1,726
Area 11 North/North	8	0	0.3	-0.3	-6	288	132	156	2,071
Area 11 North/North	9	6	0.3	5.7	106	290	132	158	2,098
Area 11 North/North	10	2	0.3	1.7	32	262	132	130	1,726
Area 11 North/North	11	2	0.3	1.7	32	316	132	184	2,443
Area 11 North/North	12	0	0.3	-0.3	-6	296	132	164	2,178
Area 11 North/North	13	2	0.3	1.7	32	334	132	202	2,682
Area 11 North/North	14	2	0.3	1.7	32	292	132	160	2,124

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.181	0.25	0.04525		0.307	0.25	0.07675	
Area 11 North(concrete)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 11 North	1	3	0.3	2.7	48	218	166	111	1,157
Area 11 North	2	2	0.3	1.7	30	212	166	100	1,042
Area 11 North	3	4	0.3	3.7	65	184	166	72	750
Area 11 North	4	4	0.3	3.7	65	222	166	110	1,147

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.18	0.25	0.045		0.292	0.25	0.073	
Area 11 North (pipe)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 11 North (pipe)	1	0	0.6	-0.6	-11	288	177	111	1,216
Area 11 North (pipe)	2	2	0.6	1.4	25	250	177	73	800
Area 11 North (pipe)	3	0	0.6	-0.6	-11	290	177	113	1,238
Area 11 North (pipe)	4	8	0.6	7.4	132	308	177	131	1,436
Area 11 North (pipe)	5	22	0.6	21.4	380	330	177	153	1,677
Area 11 North (pipe)	6	19	0.6	18.4	327	326	177	149	1,633
Area 11 North (pipe)	7	16	0.6	15.4	274	322	177	145	1,589
Area 11 North (pipe)	8	6	0.6	5.4	96	336	177	159	1,742
Area 11 North (pipe)	9	6	0.6	5.4	96	370	177	193	2,115
Area 11 North (pipe)	10	10	0.6	9.4	167	290	177	113	1,238
Area 11 North (pipe)	11	10	0.6	9.4	167	282	177	105	1,151
Area 11 North (pipe)	12	2	0.6	1.4	25	262	177	85	932
Area 11 North (pipe)	13	0	0.6	-0.6	-11	222	177	45	493
Area 11 North (pipe)	14	2	0.6	1.4	25	272	177	95	1,041
Area 11 North (pipe)	15	4	0.6	3.4	60	294	177	117	1,282
Area 11 North (pipe)	16	2	0.6	1.4	25	318	177	141	1,545

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.16	0.25	0.04		0.302	0.25	0.0755	
Area 6 South		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 6 South	1	4	0.2	3.8	76	256	227	29	307
Area 6 South	2	16	0.2	15.8	316	377	227	150	1,589
Area 6 South	3	8	0.2	7.8	156	316	227	89	943
Area 6 South	4	4	0.2	3.8	76	341	227	114	1,208
Area 6 South	5	6	0.2	5.8	116	300	227	73	774
Area 6 South	6	14	0.2	13.8	276	293	227	66	699
Area 6 South	7	5	0.2	4.8	96	400	227	173	1,833
Area 6 South	8	6	0.2	5.8	116	340	227	113	1,197
Area 6 South	9	3	0.2	2.8	56	220	227	-7	-74
Area 6 South	10	2	0.2	1.8	36	150	227	-77	-816
Area 6 South	11	4	0.2	3.8	76	178	227	-49	-519
Area 6 South	12	3	0.2	2.8	56	208	227	-19	-201
Area 6 South	13	1	0.2	0.8	16	207	227	-20	-212
Area 6 South	14	5	0.2	4.8	96	270	227	43	456
Area 6 South	15	3	0.2	2.8	56	220	227	-7	-74
Area 6 South	16	24	0.2	23.8	476	564	227	337	3,571

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.184	0.25	0.046		0.27	0.25	0.0675	
Area 6 West (pipe)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 6 West	1	16	0	16	278	500	300	200	2,370
Area 6 West	2	2	0	2	35	410	300	110	1,304
Area 6 West	3	12	0	12	209	477	300	177	2,098
Area 6 West	4	4	0	4	70	395	300	95	1,126

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
Area 5		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 5	1	3	2.3	0.7	13	450	132	318	4,222
Area 5	2	2	2.3	-0.3	-6	400	132	268	3,559
Area 5	3	3	2.3	0.7	13	425	132	293	3,890
Area 5	4	2	2.3	-0.3	-6	430	132	298	3,957
Area 5	5	wet	2.3	---	---	467	132	335	4,448
Area 5	6	wet	2.3	---	---	427	132	295	3,917
Area 5	7	wet	2.3	---	---	460	132	328	4,355

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.182	0.25	0.0455		0.302	0.25	0.0755	
Area 4 West (1)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 4 West (1)	1	40	0.3	39.7	698	828	169	659	6,983
Area 4 West (1)	2	20	0.3	19.7	346	582	169	413	4,376
Area 4 West (1)	3	12	0.3	11.7	206	650	169	481	5,097
Area 4 West (1)	4	6	0.3	5.7	100	302	169	133	1,409
Area 4 West (1)	5	16	0.3	15.7	276	382	169	213	2,257
Area 4 West (1)	6	4	0.3	3.7	65	236	169	67	710
Area 4 West (1)	7	26	0.3	25.7	452	398	169	229	2,426
Area 4 West (1)	8	16	0.3	15.7	276	302	169	133	1,409
Area 4 West (1)	9	8	0.3	7.7	135	169	169	0	0
Area 4 West (1)	10	4	0.3	3.7	65	169	169	0	0
Area 4 West (1)	11	6	0.3	5.7	100	172	169	3	32
Area 4 West (1)	12	0	0.3	-0.3	-5	169	169	0	0
Area 4 West (1)	13	0	0.3	-0.3	-5	169	169	0	0
Area 4 West (1)	14	0	0.3	-0.3	-5	169	169	0	0
Area 4 West (1)	15	0	0.3	-0.3	-5	169	169	0	0
Area 4 West (1)	16	18	0.3	17.7	311	196	169	27	286
Area 4 West (1)	17	18	0.3	17.7	311	169	169	0	0
Area 4 West (1)	18	32	0.3	31.7	557	188	169	19	201
Area 4 West (1)	19	28	0.3	27.7	487	314	169	145	1,536
Area 4 West (1)	20	32	0.3	31.7	557	322	169	153	1,621
Area 4 West (1)	21	24	0.3	23.7	417	564	169	395	4,185
Area 4 West (1)	22	2	0.3	1.7	30	500	169	331	3,507
Area 4 West (1)	23	6	0.3	5.7	100	208	169	39	413
Area 4 West (1)	24	2	0.3	1.7	30	500	169	331	3,507
Area 4 West (1)	25	8	0.3	7.7	135	174	169	5	53
Area 4 West (1)	26	0	0.3	-0.3	-5	500	169	331	3,507
Area 4 West (1)	27	8	0.3	7.7	135	500	169	331	3,507
Area 4 West (1)	28	8	0.3	7.7	135	232	169	63	668
Area 4 West (1)	29	12	0.3	11.7	206	216	169	47	498
Area 4 West (1)	30	18	0.3	17.7	311	348	169	179	1,897
Area 4 West (1)	31	28	0.3	27.7	487	750	169	581	6,156
Area 4 West (1)	32	16	0.3	15.7	276	590	169	421	4,461
Area 4 West (1)	33	8	0.3	7.7	135	840	169	671	7,110
Area 4 West (1)	34	24	0.3	23.7	417	1074	169	905	9,589
Area 4 West (1)	35	2	0.3	1.7	30	226	169	57	604
Area 4 West (1)	36	6	0.3	5.7	100	274	169	105	1,113
Area 4 West (1)	37	8	0.3	7.7	135	272	169	103	1,091
Area 4 West (1)	38	16	0.3	15.7	276	1462	169	1293	13,701
Area 4 West (1)	39	10	0.3	9.7	171	440	169	271	2,872
Area 4 West (1)	40	14	0.3	13.7	241	424	169	255	2,702
Area 4 West (1)	41	10	0.3	9.7	171	506	169	337	3,571
Area 4 West (1)	42	2	0.3	1.7	30	228	169	59	625
Area 4 West (1)	43	38	0.3	37.7	663	350	169	181	1,918
Area 4 West (1)	44	12	0.3	11.7	206	394	169	225	2,384
Area 4 West (1)	45	6	0.3	5.7	100	376	169	207	2,193
Area 4 West (1)	46	12	0.3	11.7	206	350	169	181	1,918
Area 4 West (1)	47	12	0.3	11.7	206	252	169	83	879
Area 4 West (1)	48	8	0.3	7.7	135	346	169	177	1,875
Area 4 West (1)	49	58	0.3	57.7	1,015	1556	169	1387	14,697
Area 4 West (1)	50	2	0.3	1.7	30	174	169	5	53
Area 4 West (1)	51	84	0.3	83.7	1,472	3074	169	2905	30,781
Area 4 West (1)	52	24	0.3	23.7	417	398	169	229	2,426
Area 4 West (1)	53	22	0.3	21.7	382	282	169	113	1,197
Area 4 West (1)	54	38	0.3	37.7	663	388	169	219	2,321
Area 4 West (1)	55	12	0.3	11.7	206	282	169	113	1,197
Area 4 West (1)	56	12	0.3	11.7	206	169	169	0	0
Area 4 West (1)	57	2	0.3	1.7	30	174	169	5	53
Area 4 West (1)	58	6	0.3	5.7	100	442	169	273	2,893
Area 4 West (1)	59	20	0.3	19.7	346	322	169	153	1,621
Area 4 West (1)	60	18	0.3	17.7	311	702	169	533	5,648
Area 4 West (1)	61	22	0.3	21.7	382	512	169	343	3,634

Area 4 West (1)	62	14	0.3	13.7	241	364	169	195	2,066
Area 4 West (1)	63	16	0.3	15.7	276	378	169	209	2,215
Area 4 West (1)	64	4	0.3	3.7	65	178	169	9	95
Area 4 West (1)	65	18	0.3	17.7	311	169	169	0	0
Area 4 West (1)	66	10	0.3	9.7	171	169	169	0	0
Area 4 West (1)	67	2	0.3	1.7	30	169	169	0	0
Area 4 West (1)	68	2	0.3	1.7	30	169	169	0	0
Area 4 West (1)	69	4	0.3	3.7	65	180	169	11	117

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.182	0.25	0.0455		0.302	0.25	0.0755	
Area 4 West (2)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 4 West (2)	1	0	0.3	-0.3	-5	296	169	127	1,346
Area 4 West (2)	2	12	0.3	11.7	206	436	169	267	2,829
Area 4 West (2)	3	16	0.3	15.7	276	496	169	327	3,465
Area 4 West (2)	4	20	0.3	19.7	346	549	169	380	4,026
Area 4 West (2)	5	20	0.3	19.7	346	698	169	529	5,605
Area 4 West (2)	6	14	0.3	13.7	241	404	169	235	2,490
Area 4 West (2)	7	14	0.3	13.7	241	394	169	225	2,384
Area 4 West (2)	8	2	0.3	1.7	30	422	169	253	2,681
Area 4 West (2)	9	6	0.3	5.7	100	398	169	229	2,426
Area 4 West (2)	10	8	0.3	7.7	135	392	169	223	2,363

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.183	0.25	0.04575		0.28	0.25	0.07	
Area 4 West (3)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
Area 4 West (3)	1	2	0.2	1.8	31	348	202	146	1,669
Area 4 West (3)	2	4	0.2	3.8	66	390	202	188	2,149
Area 4 West (3)	3	19	0.2	18.8	329	508	202	306	3,497

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.178	0.25	0.0445		0.278	0.25	0.0695	
SU-1 Area 1 West(1)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm²**
SU-1 Area 1 West	1	26	1.6	24.4	439	1460	319	1141	13,134
SU-1 Area 1 West	2	18	1.6	16.4	295	444	319	125	1,439
SU-1 Area 1 West	3	8	1.6	6.4	115	1230	319	911	10,486
SU-1 Area 1 West	4	6	1.6	4.4	79	1006	319	687	7,908
SU-1 Area 1 West	5a	82	1.6	80.4	1,445	3222	319	2903	33,416
SU-1 Area 1 West	5b	30	1.6	28.4	511	1570	319	1251	14,400
SU-1 Area 1 West	6	8	1.6	6.4	115	1180	319	861	9,911
SU-1 Area 1 West	7	16	1.6	14.4	259	810	319	491	5,652
SU-1 Area 1 West	8	14	1.6	12.4	223	932	319	613	7,056
SU-1 Area 1 West	9	6	1.6	4.4	79	500	319	181	2,083
SU-1 Area 1 West	10	8	1.6	6.4	115	500	319	181	2,083
SU-1 Area 1 West	11	14	1.6	12.4	223	500	319	181	2,083
SU-1 Area 1 West	12	0	1.6	-1.6	-29	500	319	181	2,083
SU-1 Area 1 West	13	0	1.6	-1.6	-29	500	319	181	2,083
SU-1 Area 1 West	15	5	1.6	3.4	61	500	319	181	2,083
SU-1 Area 1 West	16	4	1.6	2.4	43	696	319	377	4,340
SU-1 Area 1 West	17	0	1.6	-1.6	-29	500	319	181	2,083
SU-1 Area 1 West	21	18	1.6	16.4	295	1240	319	921	10,601
SU-1 Area 1 West	22	2	1.6	0.4	7	1112	319	793	9,128
SU-1 Area 1 West	23	10	1.6	8.4	151	1052	319	733	8,437
SU-1 Area 1 West	24	2	1.6	0.4	7	844	319	525	6,043
SU-1 Area 1 West	29	2	1.6	0.4	7	500	319	181	2,083
SU-1 Area 1 West	30	16	1.6	14.4	259	2696	319	2377	27,361

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.172	0.25	0.043		0.241	0.25	0.06025	
SU-1 Area 1 West(2)		**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm^2**	**Gross (cpm)**	**BKGD (cpm)**	**Net (cpm)**	**dpm/100cm^2**
SU-1 Area 1 West	18	0	0	0	0	500	254	246	3,266
SU-1 Area 1 West	19	8	0	8	149	796	254	542	7,197
SU-1 Area 1 West	20	3	0	3	56	521	254	267	3,545
SU-1 Area 1 West	25	6	0	6	112	650	254	396	5,258
SU-1 Area 1 West	26	12	0	12	223	1491	254	1237	16,425
SU-1 Area 1 West	27	21	0	21	391	4806	254	4552	60,441
SU-1 Area 1 West	28	4	0	4	74	500	254	246	3,266
SU-1 Area 1 West	31	5	0	5	93	587	254	333	4,422
SU-1 Area 1 West	32	1	0	1	19	1567	254	1313	17,434

Fixed Point Measurement Results

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.15	0.25	0.0375		0.31	0.25	0.0775	
Building X Wall(1)		Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2	Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2
Bldg X Wall	1	3	3	0	0	362	350	12	124
Bldg X Wall	2	2	3	-1	-21	370	350	20	206
Bldg X Wall	3	4	3	1	21	388	350	38	392
Bldg X Wall	4	1	3	-2	-43	401	350	51	526
Bldg X Wall	5	6	3	3	64	375	350	25	258
Bldg X Wall	6	2	3	-1	-21	388	350	38	392
Bldg X Wall	7	4	3	1	21	413	350	63	650
Bldg X Wall	8	5	3	2	43	394	350	44	454
Bldg X Wall	9	7	3	4	85	356	350	6	62
Bldg X Wall	10	6	3	3	64	392	350	42	434
Bldg X Wall	11	6	3	3	64	382	350	32	330
Bldg X Wall	12	6	3	3	64	397	350	47	485
Bldg X Wall	13	3	3	0	0	325	350	-25	-258
Bldg X Wall	14	7	3	4	85	363	350	13	134
Bldg X Wall	15	4	3	1	21	337	350	-13	-134
Bldg X Wall	16	3	3	0	0	359	350	9	93
Bldg X Wall	17	5	3	2	43	381	350	31	320
Bldg X Wall	18	2	3	-1	-21	366	350	16	165
Bldg X Wall	19	8	3	5	107	388	350	38	392
Bldg X Wall	20	4	3	1	21	361	350	11	114
Bldg X Wall	21	3	3	0	0	372	350	22	227
Bldg X Wall	22	6	3	3	64	396	350	46	475
Bldg X Wall	23	8	3	5	107	392	350	42	434
Bldg X Wall	24	4	3	1	21	317	350	-33	-341
Bldg X Wall	25	5	3	2	43	349	350	-1	-10
Bldg X Wall	26	7	3	4	85	374	350	24	248
Bldg X Wall	27	3	3	0	0	372	350	22	227
Bldg X Wall	28	3	3	0	0	382	350	32	330
Bldg X Wall	29	4	3	1	21	387	350	37	382
Bldg X Wall	30	2	3	-1	-21	373	350	23	237
Bldg X Wall	31	5	3	2	43	379	350	29	299
Bldg X Wall	32	5	3	2	43	386	350	36	372
Bldg X Wall	33	4	3	1	21	383	350	33	341
Bldg X Wall	34	6	3	3	64	391	350	41	423
Bldg X Wall	35	4	3	1	21	361	350	11	114
Bldg X Wall	36	7	3	4	85	376	350	26	268
Bldg X Wall	37	5	3	2	43	381	350	31	320
Bldg X Wall	38	6	3	3	64	370	350	20	206
Bldg X Wall	39	4	3	1	21	366	350	16	165
Bldg X Wall	40	6	3	3	64	373	350	23	237
Bldg X Wall	41	4	3	1	21	380	350	30	310
Bldg X Wall	42	3	3	0	0	363	350	13	134
Bldg X Wall	43	6	3	3	64	377	350	27	279
Bldg X Wall	44	4	3	1	21	348	350	-2	-21
Bldg X Wall	45	2	3	-1	-21	361	350	11	114
Bldg X Wall	46	15	3	12	256	741	350	391	4,036
Bldg X Wall	47	8	3	5	107	659	350	309	3,190
Bldg X Wall	48	10	3	7	149	443	350	93	960
Bldg X Wall	49	7	3	4	85	477	350	127	1,311
Bldg X Wall	50	9	3	6	128	564	350	214	2,209
Bldg X Wall	51	6	3	3	64	667	350	317	3,272
Bldg X Wall	52	7	3	4	85	595	350	245	2,529
Bldg X Wall	53	9	3	6	128	569	350	219	2,261
Bldg X Wall	54	10	3	7	149	536	350	186	1,920
Bldg X Wall	55	7	3	4	85	561	350	211	2,178
Bldg X Wall	56	6	3	3	64	590	350	240	2,477
Bldg X Wall	57	3	3	0	0	482	350	132	1,363
Bldg X Wall	58	3	3	0	0	456	350	106	1,094
Bldg X Wall	59	1	3	-2	-43	432	350	82	846
Bldg X Wall	60	6	3	3	64	432	350	82	846
Bldg X Wall	61	5	3	2	43	430	350	80	826

Bldg X Wall	62	0	3	-3	-64	474	350	124	1,280
Bldg X Wall	63	1	3	-2	-43	403	350	53	547
Bldg X Wall	64	1	3	-2	-43	426	350	76	785
Bldg X Wall	65	2	3	-1	-21	433	350	83	857
Bldg X Wall	66	4	3	1	21	358	350	8	83

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.136	0.25	0.034		0.296	0.25	0.074	
Building X Wall(2)		Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2	Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2
Bldg X Wall	67	5	1	4	94	316	199	117	1,265
Bldg X Wall	68	9	1	8	188	273	199	74	800
Bldg X Wall	69	6	1	5	118	373	199	174	1,881
Bldg X Wall	70	5	1	4	94	369	199	170	1,838
Bldg X Wall	71	2	1	1	24	353	199	154	1,665
Bldg X Wall	72	11	1	10	235	449	199	250	2,703
Bldg X Wall	73	30	1	29	682	1,031	199	832	8,995
Bldg X Wall	73-1	10	1	9	212	605	199	406	4,389
Bldg X Wall	73-2	21	1	20	471	677	199	478	5,168
Bldg X Wall	73-3	9	1	8	188	561	199	362	3,914
Bldg X Wall	73-4	12	1	11	259	502	199	303	3,276
Bldg X Wall	73-5	7	1	6	141	344	199	145	1,568
Bldg X Wall	73-6	4	1	3	71	309	199	110	1,189
Bldg X Wall	74	8	1	7	165	404	199	205	2,216
Bldg X Wall	75	7	1	6	141	427	199	228	2,465
Bldg X Wall	76	19	1	18	424	475	199	276	2,984
Bldg X Wall	76-1	12	1	11	259	440	199	241	2,605
Bldg X Wall	76-2	15	1	14	329	478	199	279	3,016
Bldg X Wall	76-3	13	1	12	282	489	199	290	3,135
Bldg X Wall	77	3	1	2	47	377	199	178	1,924
Bldg X Wall	78	8	1	7	165	378	199	179	1,935
Bldg X Wall	79	5	1	4	94	410	199	211	2,281
Bldg X Wall	80	2	1	1	24	269	199	70	757
Bldg X Wall	81	6	1	5	118	303	199	104	1,124

		Alpha				Beta			
		ε_i[1]	ε_s[2]	ε_{total}[3]		ε_i[1]	ε_s[2]	ε_{total}[3]	
		0.16	0.25	0.04		0.255	0.25	0.06375	
TVW Pipe Support (TVW-02)		Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2	Gross (cpm)	BKGD (cpm)	Net (cpm)	dpm/100cm^2
TVW Pipe Support	1	6	0.67	5.33	107	443	255	188	2,359
TVW Pipe Support	2	10	0.67	9.33	187	420	255	165	2,071
TVW Pipe Support	3	12	0.67	11.33	227	474	255	219	2,748
TVW Pipe Support	4	12	0.67	11.33	227	432	255	177	2,221
TVW Pipe Support	5	12	0.67	11.33	227	473	255	218	2,736
TVW Pipe Support	6	11	0.67	10.33	207	459	255	204	2,560
TVW Pipe Support	7	24	0.67	23.33	467	494	255	239	2,999
TVW Pipe Support	8	20	0.67	19.33	387	527	255	272	3,413
TVW Pipe Support	9	17	0.67	16.33	327	515	255	260	3,263
TVW Pipe Support	10	11	0.67	10.33	207	599	255	344	4,317
TVW Pipe Support	11	9	0.67	8.33	167	551	255	296	3,715
TVW Pipe Support	12	21	0.67	20.33	407	583	255	328	4,116
TVW Pipe Support	13	30	0.67	29.33	587	904	255	649	8,144
TVW Pipe Support	14	11	0.67	10.33	207	834	255	579	7,266
TVW Pipe Support	15	15	0.67	14.33	287	912	255	657	8,245
TVW Pipe Support	16	10	0.67	9.33	187	505	255	250	3,137
TVW Pipe Support	17	8	0.67	7.33	147	519	255	264	3,313
TVW Pipe Support	18	8	0.67	7.33	147	464	255	209	2,623

Fixed Point Measurement Results

Table 8-2

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Area 11 South/South	1	67	533	2,475	3,525
Area 11 South/South	2	31	569	2,475	3,525
Area 11 South/South	3	49	551	2,475	3,525
Area 11 South/South	4	31	569	2,475	3,525
Area 11 South/South	5	67	533	2,475	3,525
Area 1 East	1	-18	618	3,062	2,938
Area 1 East	2	36	564	3,062	2,938
Area 1 East	3	18	582	3,062	2,938
Area 1 East	4	18	582	3,062	2,938
Area 1 East	5	0	600	3,062	2,938
Area 1 East	6	36	564	3,062	2,938
Area 1 East	7	-18	618	3,062	2,938
Area 1 East	8	0	600	3,062	2,938
Area 1 East	9	36	564	3,062	2,938
Area 1 East	10	18	582	3,062	2,938
Area 1 East	11	0	600	3,062	2,938
Area 1 East	12	18	582	3,062	2,938
Area 1 East	13	18	582	3,062	2,938
Area 1 East	14	18	582	3,062	2,938
Area 1 East	15	36	564	3,062	2,938
Area 6 North	1	-24	624	1,899	4,101
Area 6 North	2	50	550	1,899	4,101
Area 6 North	3	13	587	1,899	4,101
Area 6 North	4	13	587	1,899	4,101
Area 6 North	5	87	513	1,899	4,101
Area 6 South/South (wall)	1	36	564	863	5,137
Area 6 South/South (wall)	2	16	584	749	5,251
Area 6 South/South (wall)	3	36	564	432	5,568
Area 6 South/South (wall)	4	76	524	610	5,390
Area 6 South/South (wall)	5	36	564	902	5,098
Area 6 South/South	1	93	507	783	5,217
Area 6 South/South	2	37	563	969	5,031
Area 6 South/South	3	19	581	943	5,057
Area 6 South/South	4	37	563	876	5,124
Area 6 South/South	5	37	563	837	5,163
Area 6 South/South	6	56	544	996	5,004
Area 5 Cont. Pad	2	425	175	3,583	2,417
Area 5 Cont. Pad	3	25	575	3,583	2,417
Area 5 Cont. Pad	4	62	538	3,583	2,417
Area 5 Cont. Pad	5	44	556	3,583	2,417
Area 5 Cont. Pad	6	62	538	3,583	2,417
Area 5 Cont. Pad	7	62	538	3,583	2,417
Area 5 Cont. Pad	8	62	538	3,583	2,417
Area 5 Cont. Pad	9	25	575	3,583	2,417
Area 5 Cont. Pad	10	62	538	3,583	2,417
Area 5 Cont. Pad	11	116	484	3,583	2,417
Area 5 Cont. Pad	12	44	556	3,583	2,417
Area 5 Cont. Pad	13	80	520	3,583	2,417

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Area 5 Cont. Pad	14	207	393	3,583	2,417
Area 5 Cont. Pad	15	44	556	3,583	2,417
UE-3	1	-6	606	903	5,097
UE-3	2	-6	606	903	5,097
UE-3	3	-6	606	1,301	4,699
UE-3	4	-6	606	1,115	4,885
UE-3	5	-6	606	1,859	4,141
UE-3	6	32	568	876	5,124
UE-3	7	32	568	2,124	3,876
UE-3	8	69	531	1,832	4,168
UE-3	9	-6	606	1,620	4,380
Area 4 East (Plant 1)	1	-4	604	1,252	4,748
Area 4 East (Plant 1)	2	32	568	1,774	4,226
Area 4 East (Plant 1)	3	-4	604	1,839	4,161
Area 4 East (Plant 1)	4	-4	604	1,273	4,727
Area 4 East (Plant 1)	5	67	533	1,382	4,618
Area 4 East (Plant 1)	6	-4	604	1,404	4,596
Area 4 East (Plant 1)	7	67	533	838	5,162
Area 4 East (Plant 1)	8	103	497	1,600	4,400
Area 4 East (Plant 1)	9	103	497	642	5,358
Area 4 East (Plant 1)	10	456	144	2,122	3,878
Area 4 East (Plant 1)	11	173	427	2,449	3,551
Area 4 East (Plant 1)	12	173	427	3,254	2,746
Area 4 East (Plant 1)	13	32	568	2,667	3,333
Area 4 East (Plant 1)	14	103	497	2,688	3,312
Area 4 East (Plant 1)	15	138	462	1,774	4,226
Area 4 East (Plant 1)	16	32	568	76	5,924
Area 4 East (Plant 1)	17	67	533	1,404	4,596
Area 4 East (Plant 1)	18	-4	604	1,774	4,226
Y4SD North/South	1	-11	611	-6,108	12,108
Y4SD North/South	2	-48	648	-5,922	11,922
Y4SD North/South	3	26	574	-4,993	10,993
Y4SD North/South	4	63	537	-6,055	12,055
Y4SD North/South	5	-48	648	-6,002	12,002
Y4SD North/South	6	-11	611	-5,949	11,949
Y4SD North/South	7	63	537	-5,949	11,949
Y4SD North/South	8	175	425	-4,860	10,860
Y4SD North/South	9	138	462	-4,169	10,169
Y4SD North/South	10	175	425	-2,948	8,948
Y4SD North/South	11	175	425	-5,125	11,125
Y4SD North/South	12	1,068	-468	-4,939	10,939
Y4SD North/South	13	212	388	-5,285	11,285
Y4SD North/South	14	287	313	-5,364	11,364
Y4SD North/South	15	287	313	-3,346	9,346
Y4SD North/South	16	11	611	-5,550	11,550
Y4SD North/South	17	175	425	-4,382	10,382
Y4SD North/South	18	26	574	-6,188	12,188
Y4SD North/South	19	26	574	-5,763	11,763
Y4SD North/South	20	63	537	-6,081	12,081

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Y4SD North/South	21	-11	611	-3,983	9,983
Y4SD North/South	22	26	574	-3,638	9,638
Y4SD North/South	23	26	574	-1,062	7,062
Y4SD North/South	24	138	462	6,241	-241
Y4SD North/South	25	212	388	-2,443	8,443
Y4SD North/South	26	26	574	-2,841	8,841
Y4SD North/South	27	249	351	-4,541	10,541
Y4SD North/South	28	-48	648	-5,683	11,683
Y4SD North/South	29	26	574	-5,019	11,019
Y4SD North/South	30	-48	648	-5,125	11,125
Y4SD North/South	31	63	537	-5,258	11,258
Y4SD North/South	32	-11	611	-3,426	9,426
Y4SD North/South	33	26	574	-6,506	12,506
Y4SD North/South	34	26	574	-8,259	14,259
Y4SD North/South	35	100	500	-4,833	10,833
Y4SD North/South	36	-11	611	-6,188	12,188
Y4SD North/South	37	63	537	-5,524	11,524
Y4SD North/South	38	100	500	-6,161	12,161
Y4SD North/South	39	-11	611	-6,241	12,241
Y4SD North/South	40	63	537	-5,285	11,285
Y4SD North/South	41	-11	611	-6,506	12,506
Y4SD North/South	42	-11	611	-5,656	11,656
Y4SD North/South	43	-48	648	-5,471	11,471
Y4SD North/South	44	-11	611	-5,736	11,736
Y4SD North/South	45	138	462	-5,178	11,178
Area 11 South	1	12	588	826	5,174
Area 11 South	2	65	535	678	5,322
Area 11 South	3	47	553	848	5,152
Area 11 South	4	83	517	1,335	4,665
Area 11 North/North	1	32	568	2,310	3,690
Area 11 North/North	2	180	420	1,620	4,380
Area 11 North/North	3	106	494	1,686	4,314
Area 11 North/North	4	69	531	1,434	4,566
Area 11 North/North	5	32	568	2,071	3,929
Area 11 North/North	6	69	531	1,779	4,221
Area 11 North/North	7	69	531	1,726	4,274
Area 11 North/North	8	-6	606	2,071	3,929
Area 11 North/North	9	106	494	2,098	3,902
Area 11 North/North	10	32	568	1,726	4,274
Area 11 North/North	11	32	568	2,443	3,557
Area 11 North/North	12	-6	606	2,178	3,822
Area 11 North/North	13	32	568	2,682	3,318
Area 11 North/North	14	32	568	2,124	3,876
Area 11 North	1	48	552	1,157	4,843
Area 11 North	2	30	570	1,042	4,958
Area 11 North	3	65	535	750	5,250
Area 11 North	4	65	535	1,147	4,853
Area 11 North (pipe)	1	-11	611	1,216	4,784
Area 11 North (pipe)	2	25	575	800	5,200

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Area 11 North (pipe)	3	-11	611	1,238	4,762
Area 11 North (pipe)	4	132	468	1,436	4,564
Area 11 North (pipe)	5	380	220	1,677	4,323
Area 11 North (pipe)	6	327	273	1,633	4,367
Area 11 North (pipe)	7	274	326	1,589	4,411
Area 11 North (pipe)	8	96	504	1,742	4,258
Area 11 North (pipe)	9	96	504	2,115	3,885
Area 11 North (pipe)	10	167	433	1,238	4,762
Area 11 North (pipe)	11	167	433	1,151	4,849
Area 11 North (pipe)	12	25	575	932	5,068
Area 11 North (pipe)	13	-11	611	493	5,507
Area 11 North (pipe)	14	25	575	1,041	4,959
Area 11 North (pipe)	15	60	540	1,282	4,718
Area 11 North (pipe)	16	25	575	1,545	4,455
Area 6 South	1	76	524	307	5,693
Area 6 South	2	316	284	1,589	4,411
Area 6 South	3	156	444	943	5,057
Area 6 South	4	76	524	1,208	4,792
Area 6 South	5	116	484	774	5,226
Area 6 South	6	276	324	699	5,301
Area 6 South	7	96	504	1,833	4,167
Area 6 South	8	116	484	1,197	4,803
Area 6 South	9	56	544	-74	6,074
Area 6 South	10	36	564	-816	6,816
Area 6 South	11	76	524	-519	6,519
Area 6 South	12	56	544	-201	6,201
Area 6 South	13	16	584	-212	6,212
Area 6 South	14	96	504	456	5,544
Area 6 South	15	56	544	-74	6,074
Area 6 South	16	476	124	3,571	2,429
Area 6 West	1	278	322	2,370	3,630
Area 6 West	2	35	565	1,304	4,696
Area 6 West	3	209	391	2,098	3,902
Area 6 West	4	70	530	1,126	4,874
Area 5	1	13	587	4,222	1,778
Area 5	2	-6	606	3,559	2,441
Area 5	3	13	587	3,890	2,110
Area 5	4	-6	606	3,957	2,043
Area 5	5	---	---	4,448	1,552
Area 5	6	---	---	3,917	2,083
Area 5	7	---	---	4,355	1,645
Area 4 West (1)	1	698	-98	6,983	-983
Area 4 West (1)	2	346	254	4,376	1,624
Area 4 West (1)	3	206	394	5,097	903
Area 4 West (1)	4	100	500	1,409	4,591
Area 4 West (1)	5	276	324	2,257	3,743
Area 4 West (1)	6	65	535	710	5,290
Area 4 West (1)	7	452	148	2,426	3,574
Area 4 West (1)	8	276	324	1,409	4,591

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Area 4 West (1)	9	135	465	0	6,000
Area 4 West (1)	10	65	535	0	6,000
Area 4 West (1)	11	100	500	32	5,968
Area 4 West (1)	12	-5	605	0	6,000
Area 4 West (1)	13	-5	605	0	6,000
Area 4 West (1)	14	-5	605	0	6,000
Area 4 West (1)	15	-5	605	0	6,000
Area 4 West (1)	16	311	289	286	5,714
Area 4 West (1)	17	311	289	0	6,000
Area 4 West (1)	18	557	43	201	5,799
Area 4 West (1)	19	487	113	1,536	4,464
Area 4 West (1)	20	557	43	1,621	4,379
Area 4 West (1)	21	417	183	4,185	1,815
Area 4 West (1)	22	30	570	3,507	2,493
Area 4 West (1)	23	100	500	413	5,587
Area 4 West (1)	24	30	570	3,507	2,493
Area 4 West (1)	25	135	465	53	5,947
Area 4 West (1)	26	-5	605	3,507	2,493
Area 4 West (1)	27	135	465	3,507	2,493
Area 4 West (1)	28	135	465	668	5,332
Area 4 West (1)	29	206	394	498	5,502
Area 4 West (1)	30	311	289	1,897	4,103
Area 4 West (1)	31	487	113	6,156	-156
Area 4 West (1)	32	276	324	4,461	1,539
Area 4 West (1)	33	135	465	7,110	-1,110
Area 4 West (1)	34	417	183	9,589	-3,589
Area 4 West (1)	35	30	570	604	5,396
Area 4 West (1)	36	100	500	1,113	4,887
Area 4 West (1)	37	135	465	1,091	4,909
Area 4 West (1)	38	276	324	13,701	-7,701
Area 4 West (1)	39	171	429	2,872	3,128
Area 4 West (1)	40	241	359	2,702	3,298
Area 4 West (1)	41	171	429	3,571	2,429
Area 4 West (1)	42	30	570	625	5,375
Area 4 West (1)	43	663	-63	1,918	4,082
Area 4 West (1)	44	206	394	2,384	3,616
Area 4 West (1)	45	100	500	2,193	3,807
Area 4 West (1)	46	206	394	1,918	4,082
Area 4 West (1)	47	206	394	879	5,121
Area 4 West (1)	48	135	465	1,875	4,125
Area 4 West (1)	49	1,015	-415	14,697	-8,697
Area 4 West (1)	50	30	570	53	5,947
Area 4 West (1)	51	1,472	-872	30,781	-24,781
Area 4 West (1)	52	417	183	2,426	3,574
Area 4 West (1)	53	382	218	1,197	4,803
Area 4 West (1)	54	663	-63	2,321	3,679
Area 4 West (1)	55	206	394	1,197	4,803
Area 4 West (1)	56	206	394	0	6,000
Area 4 West (1)	57	30	570	53	5,947

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Area 4 West (1)	58	100	500	2,893	3,107
Area 4 West (1)	59	346	254	1,621	4,379
Area 4 West (1)	60	311	289	5,648	352
Area 4 West (1)	61	382	218	3,634	2,366
Area 4 West (1)	62	241	359	2,066	3,934
Area 4 West (1)	63	276	324	2,215	3,785
Area 4 West (1)	64	65	535	95	5,905
Area 4 West (1)	65	311	289	0	6,000
Area 4 West (1)	66	171	429	0	6,000
Area 4 West (1)	67	30	570	0	6,000
Area 4 West (1)	68	30	570	0	6,000
Area 4 West (1)	69	65	535	117	5,883
Area 4 West (2)	1	-5	605	1,346	4,654
Area 4 West (2)	2	206	394	2,829	3,171
Area 4 West (2)	3	276	324	3,465	2,535
Area 4 West (2)	4	346	254	4,026	1,974
Area 4 West (2)	5	346	254	5,605	395
Area 4 West (2)	6	241	359	2,490	3,510
Area 4 West (2)	7	241	359	2,384	3,616
Area 4 West (2)	8	30	570	2,681	3,319
Area 4 West (2)	9	100	500	2,426	3,574
Area 4 West (2)	10	135	465	2,363	3,637
Area 4 West (3)	1	31	569	1,669	4,331
Area 4 West (3)	2	66	534	2,149	3,851
Area 4 West (3)	3	329	271	3,497	2,503
SU-1 Area 1 West	1	439	161	13,134	-7,134
SU-1 Area 1 West	2	295	305	1,439	4,561
SU-1 Area 1 West	3	115	485	10,486	-4,486
SU-1 Area 1 West	4	79	521	7,908	-1,908
SU-1 Area 1 West	5a	1,445	-845	33,416	-27,416
SU-1 Area 1 West	5b	511	89	14,400	-8,400
SU-1 Area 1 West	6	115	485	9,911	-3,911
SU-1 Area 1 West	7	259	341	5,652	348
SU-1 Area 1 West	8	223	377	7,056	-1,056
SU-1 Area 1 West	9	79	521	2,083	3,917
SU-1 Area 1 West	10	115	485	2,083	3,917
SU-1 Area 1 West	11	223	377	2,083	3,917
SU-1 Area 1 West	12	-29	629	2,083	3,917
SU-1 Area 1 West	13	-29	629	2,083	3,917
SU-1 Area 1 West	15	61	539	2,083	3,917
SU-1 Area 1 West	16	43	557	4,340	1,660
SU-1 Area 1 West	17	-29	629	2,083	3,917
SU-1 Area 1 West	21	295	305	10,601	-4,601
SU-1 Area 1 West	22	7	593	9,128	-3,128
SU-1 Area 1 West	23	151	449	8,437	-2,437
SU-1 Area 1 West	24	7	593	6,043	-43
SU-1 Area 1 West	29	7	593	2,083	3,917
SU-1 Area 1 West	30	259	341	27,361	-21,361
SU-1 Area 1 West	18	0	600	3,266	2,734

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
SU-1 Area 1 West	19	149	451	7,197	-1,197
SU-1 Area 1 West	20	56	544	3,545	2,455
SU-1 Area 1 West	25	112	488	5,258	742
SU-1 Area 1 West	26	223	377	16,425	-10,425
SU-1 Area 1 West	27	391	209	60,441	-54,441
SU-1 Area 1 West	28	74	526	3,266	2,734
SU-1 Area 1 West	31	93	507	4,422	1,578
SU-1 Area 1 West	32	19	581	17,434	-11,434
Bldg X Wall	1	0	600	124	5,876
Bldg X Wall	2	-21	621	206	5,794
Bldg X Wall	3	21	579	392	5,608
Bldg X Wall	4	-43	643	526	5,474
Bldg X Wall	5	64	536	258	5,742
Bldg X Wall	6	-21	621	392	5,608
Bldg X Wall	7	21	579	650	5,350
Bldg X Wall	8	43	557	454	5,546
Bldg X Wall	9	85	515	62	5,938
Bldg X Wall	10	64	536	434	5,566
Bldg X Wall	11	64	536	330	5,670
Bldg X Wall	12	64	536	485	5,515
Bldg X Wall	13	0	600	-258	6,258
Bldg X Wall	14	85	515	134	5,866
Bldg X Wall	15	21	579	-134	6,134
Bldg X Wall	16	0	600	93	5,907
Bldg X Wall	17	43	557	320	5,680
Bldg X Wall	18	-21	621	165	5,835
Bldg X Wall	19	107	493	392	5,608
Bldg X Wall	20	21	579	114	5,886
Bldg X Wall	21	0	600	227	5,773
Bldg X Wall	22	64	536	475	5,525
Bldg X Wall	23	107	493	434	5,566
Bldg X Wall	24	21	579	-341	6,341
Bldg X Wall	25	43	557	-10	6,010
Bldg X Wall	26	85	515	248	5,752
Bldg X Wall	27	0	600	227	5,773
Bldg X Wall	28	0	600	330	5,670
Bldg X Wall	29	21	579	382	5,618
Bldg X Wall	30	-21	621	237	5,763
Bldg X Wall	31	43	557	299	5,701
Bldg X Wall	32	43	557	372	5,628
Bldg X Wall	33	21	579	341	5,659
Bldg X Wall	34	64	536	423	5,577
Bldg X Wall	35	21	579	114	5,886
Bldg X Wall	36	85	515	268	5,732
Bldg X Wall	37	43	557	320	5,680
Bldg X Wall	38	64	536	206	5,794
Bldg X Wall	39	21	579	165	5,835
Bldg X Wall	40	64	536	237	5,763
Bldg X Wall	41	21	579	310	5,690

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
Bldg X Wall	42	0	600	134	5,866
Bldg X Wall	43	64	536	279	5,721
Bldg X Wall	44	21	579	-21	6,021
Bldg X Wall	45	-21	621	114	5,886
Bldg X Wall	46	256	344	4,036	1,964
Bldg X Wall	47	107	493	3,190	2,810
Bldg X Wall	48	149	451	960	5,040
Bldg X Wall	49	85	515	1,311	4,689
Bldg X Wall	50	128	472	2,209	3,791
Bldg X Wall	51	64	536	3,272	2,728
Bldg X Wall	52	85	515	2,529	3,471
Bldg X Wall	53	128	472	2,261	3,739
Bldg X Wall	54	149	451	1,920	4,080
Bldg X Wall	55	85	515	2,178	3,822
Bldg X Wall	56	64	536	2,477	3,523
Bldg X Wall	57	0	600	1,363	4,637
Bldg X Wall	58	0	600	1,094	4,906
Bldg X Wall	59	-43	643	846	5,154
Bldg X Wall	60	64	536	846	5,154
Bldg X Wall	61	43	557	826	5,174
Bldg X Wall	62	-64	664	1,280	4,720
Bldg X Wall	63	-43	643	547	5,453
Bldg X Wall	64	-43	643	785	5,215
Bldg X Wall	65	-21	621	857	5,143
Bldg X Wall	66	21	579	83	5,917
Bldg X Wall	67	94	506	1,265	4,735
Bldg X Wall	68	188	412	800	5,200
Bldg X Wall	69	118	482	1,881	4,119
Bldg X Wall	70	94	506	1,838	4,162
Bldg X Wall	71	24	576	1,665	4,335
Bldg X Wall	72	235	365	2,703	3,297
Bldg X Wall	73	682	-82	8,995	-2,995
Bldg X Wall	73-1	212	388	4,389	1,611
Bldg X Wall	73-2	471	129	5,168	832
Bldg X Wall	73-3	188	412	3,914	2,086
Bldg X Wall	73-4	259	341	3,276	2,724
Bldg X Wall	73-5	141	459	1,568	4,432
Bldg X Wall	73-6	71	529	1,189	4,811
Bldg X Wall	74	165	435	2,216	3,784
Bldg X Wall	75	141	459	2,465	3,535
Bldg X Wall	76	424	176	2,984	3,016
Bldg X Wall	76-1	259	341	2,605	3,395
Bldg X Wall	76-2	329	271	3,016	2,984
Bldg X Wall	76-3	282	318	3,135	2,865
Bldg X Wall	77	47	553	1,924	4,076
Bldg X Wall	78	165	435	1,935	4,065
Bldg X Wall	79	94	506	2,281	3,719
Bldg X Wall	80	24	576	757	5,243
Bldg X Wall	81	118	482	1,124	4,876

Fixed Point Measurement Results

Survey Area	Measurement No.	ALPHA dpm/100cm^2	Alpha Difference[1]	BETA dpm/100cm^2	Beta Difference[2]
TVW Pipe Support	1	107	493	2,359	3,641
TVW Pipe Support	2	187	413	2,071	3,929
TVW Pipe Support	3	227	373	2,748	3,252
TVW Pipe Support	4	227	373	2,221	3,779
TVW Pipe Support	5	227	373	2,736	3,264
TVW Pipe Support	6	207	393	2,560	3,440
TVW Pipe Support	7	467	133	2,999	3,001
TVW Pipe Support	8	387	213	3,413	2,587
TVW Pipe Support	9	327	273	3,263	2,737
TVW Pipe Support	10	207	393	4,317	1,683
TVW Pipe Support	11	167	433	3,715	2,285
TVW Pipe Support	12	407	193	4,116	1,884
TVW Pipe Support	13	587	13	8,144	-2,144
TVW Pipe Support	14	207	393	7,266	-1,266
TVW Pipe Support	15	287	313	8,245	-2,245
TVW Pipe Support	16	187	413	3,137	2,863
TVW Pipe Support	17	147	453	3,313	2,687
TVW Pipe Support	18	147	453	2,623	3,377
Test Statistics	[redacted]	**Alpha**		**Beta**	
s+		[redacted]	*401*	[redacted]	*381*
n			*409*		*409*
$k_{critical}$			*221*		*231*
Result			***Pass***		***Pass***

Fixed Point Measurement Results

Y4SD North/South		
Sample No.	dpm/100cm^2	Alpha
9	138	
10	175	
11	175	
12	1,068	
13	212	
14	287	
25	212	
26	26	
29	26	
30	-48	
Average	227	1m^2

Y4SD North/South		
Sample No.	dpm/100cm^2	Beta
5	-6,002	
6	-5,949	
7	-5,949	
8	-4,860	
23	-1,062	
24	6,241	
Average	-2,930	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Alpha
1	698	
2	346	
3	206	
4	100	
5	276	
8	276	
9	135	
10	65	
11	100	
Average	245	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Beta
1	6,983	
2	4,376	
3	5,097	
4	1,409	
5	2,257	
8	1,409	
9	0	
10	0	
11	32	
Average	2,396	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Beta
30	1,897	
31	6,156	
32	4,461	
33	7,110	
34	9,589	
35	604	
36	1,113	
37	1,091	
38	13,701	
39	2,872	
40	2,702	
Average	4,663	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Alpha
21	417	
22	30	
23	100	
24	30	
25	135	
28	135	
43	663	
44	206	
45	100	
Average	202	1m^2

Fixed Point Measurement Results

Area 4 West		
Sample No.	dpm/100cm^2	Alpha
49	1,015	
50	30	
51	1,472	
52	417	
53	382	
57	30	
58	100	
59	346	
60	311	
61	382	
Average	449	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Alpha
52	417	
53	382	
54	663	
55	206	
56	206	
60	311	
61	382	
62	241	
63	276	
64	65	
Average	315	1m^2

Area 4 West		
Sample No.	dpm/100cm^2	Beta
49	14,697	
50	53	
51	30,781	
52	2,426	
53	1,197	
57	53	
58	2,893	
59	1,621	
60	5,648	
61	3,634	
Average	6,300	1m^2

TVW Pipe Support (TVW-02)		
Sample No.	dpm/100cm^2	Alpha
10	4,317	
11	3,715	
12	4,116	
13	8,144	
14	7,266	
15	8,245	
16	3,137	
17	3,313	
18	2,623	
Average	4,986	1m^2

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