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SM-135/02
October 23, 2002

Mr. Richard B. Provencher, Director
Miamisburg Closure Project
U. S. Department of Energy
P. O. Box 66
Miamisburg, OH 45343-0066

ATTENTION: Robert S. Rothman

SUBJECT: Contract No. DE-AC24-97OH20044
E Building On-Scene Coordinator Report, Final

REFERENCE: Statement of Work Requirement C.7.1e - Regulator Reports

Dear Mr. Provencher:

Rob Rothman from your office has approved the release of the following final document to the regulators and the public:

- E Building On-Scene Coordinator Report, Final

If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact Bob Ransbottom at extension 4220.

Sincerely,

C. D. Thompson
SMPP/TFV Project Manager

CDT/VKD:jdg

Enclosures

cc: Tim Fischer, USEPA, (1) w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Frank Schmaltz, DOE/MCP, (1) w/attachments
Randy Tormey, DOE/OH, (1) w/attachments
Terry Tracy, DOE/HQ, (1) w/attachments
J. D. Bonfiglio, MESH, (1) w/attachments
Bob Ransbottom, BWXT of Ohio, (1) w/attachments
Val Darnell, BWXT of Ohio, (1) w/attachments
Budd Thompson, BWXT of Ohio, (1) w/attachments
Public Reading Room, (4) w/attachments
Admin Record, (2) w/attachments
DCC

ON-SCENE COORDINATOR (OSC) REPORT

E BUILDING

REMOVAL ACTION

October 2002

Final

(Revision 0)

Department of Energy
Miamisburg Closure Project

BWXT of Ohio, Inc.

On-Scene Coordinator (OSC) Report

For

E Building Removal Action (RA)

Miamisburg, Ohio 45343-3020

Prepared for:

United States Department of Energy

Miamisburg Closure Project

P.O. Box 3020

Miamisburg, Ohio 45343-3020

Prepared by:

BWXT of Ohio

Contract # DE-AC24-97OH20044

October 2002

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EXECUTIVE SUMMARY

This On-Scene Coordinator (OSC) Report serves to document the activities and conclusion of the E Building Removal Action (RA). This RA addressed Buildings E, 68, PRS 104, and associated soils near to and on which E Building resided.

E Building was one of the original buildings constructed in 1948. Initially, E Building was designated as the Electronics Laboratory Building. The facility eventually was expanded with five separate additions to encompass 45,755 square feet. As the building changed shape, so did its purpose. The E Building expansions included detonator support work, laboratories for analytical chemistry, environmental analysis, and metallurgical labs. The process history of E Building indicates some cutting and polishing of uranium occurred within the building. For approximately five years, until September 30, 1999, portions of the building were leased to the Miamisburg Mound Community Improvement Corporation (MMCIC) to further economic development.

In November 1997, E Building was presented as a RA to address soil near and underneath E Building possibly contaminated by radionuclides and organic solvent chemicals. Although the RA was warranted for these concerns, the primary purpose of the RA was to facilitate the removal of R Building with which it shared a common wall. The objective of the RA was dismantlement and demolition of E Building and removal of contaminated soil as needed. Demolition of the building structure was completed in August 2000 while the slab removal was completed in March 2001.

Associated soils included Potential Release Sites (PRSs) 103, 104, and 105. PRS 103 represented E Building soils, PRS 104 the liquid scintillation vial storage room, and PRS 105 the E Building solvent storage shed. PRSs 103 and 105 have been previously determined by the Core Team (on August 20, 1996) to require No Further Assessment (NFA). PRS 104 was considered removed as part of the demolition of E Building. When final, this OSC Report will be the basis for a status change to NFA for PRS 104.

Other removal highlights consisted of a cesium source storage well which was removed and the void backfilled with grout. The sealed cesium source was removed from E Building in 1995-96. Additional sampling was conducted in the sanitary pipe trench when a portion of the sanitary line was discovered to have lost integrity. The section of

failed pipe was approximately 60 feet in length. In addition to E Building, Building 68 structure was removed including fourteen fixed contamination spots on the slab.

Cleanup Objectives are based on the most restrictive of Hazard Index (HI) = 1 or 10^{-5} Risk-Based Guideline Values (RBGVs) of construction worker or office worker plus background. Results from soil sampling near and underneath E Building were compared with the Cleanup Objectives, and all verification results were below the Cleanup Objectives.

10/16/02

Robert Rothman, On-Scene Coordinator
U.S. Department of Energy (DOE)
Miamisburg, Ohio

10/16/02

Timothy Fischer, Remedial Project Manager
U.S. Environmental Protection Agency (USEPA)
Chicago, Illinois

10/16/02

Brian Nickel, Project Manager
Ohio Environmental Protection Agency (OEPA)
Dayton, Ohio

1 SUMMARY OF EVENTS

1.1 SITE CONDITIONS AND BACKGROUND

E Building was one of the original buildings constructed at Mound in 1948 and was located on the Main Hill. Originally used as an electronics laboratory, the building was later expanded to include five different additions to the north, east, and south of the original building. The facility encompassed 45,755 square feet including a one-story structure and a two-story office annex. E Building and E Annex were serviced by five separate penthouses. The building was constructed of reinforced concrete block walls, with brick face veneer and a metal roof covered with a built-up coal tar membrane. The facility was served by the central steam system for heat, chilled water for cooling, and electrical service of 480 volts. The location of Buildings E and 68 are shown in Figure 1.

The building footprint was bordered by a sidewalk and roadway on the south side, a roadway on the north, and gravel alley on the east side. It shared a corridor with R Annex on its west side and a rear wall with Building 68 on its south side. Other adjacent buildings are H Building to the north, DS Building to the south, to the east was M Building (removed in 1999) and R Building to the west.

Operations in E Building included detonator support work, laboratories for analytical chemistry, environmental analysis, and metallurgical labs. The process history of E Building indicates some cutting and polishing of uranium occurred within the building. For approximately five years, until September 30, 1999, portions of the building were leased to the MMCIC. Eighty percent of the building was used for laboratories, while the remaining area was office space.

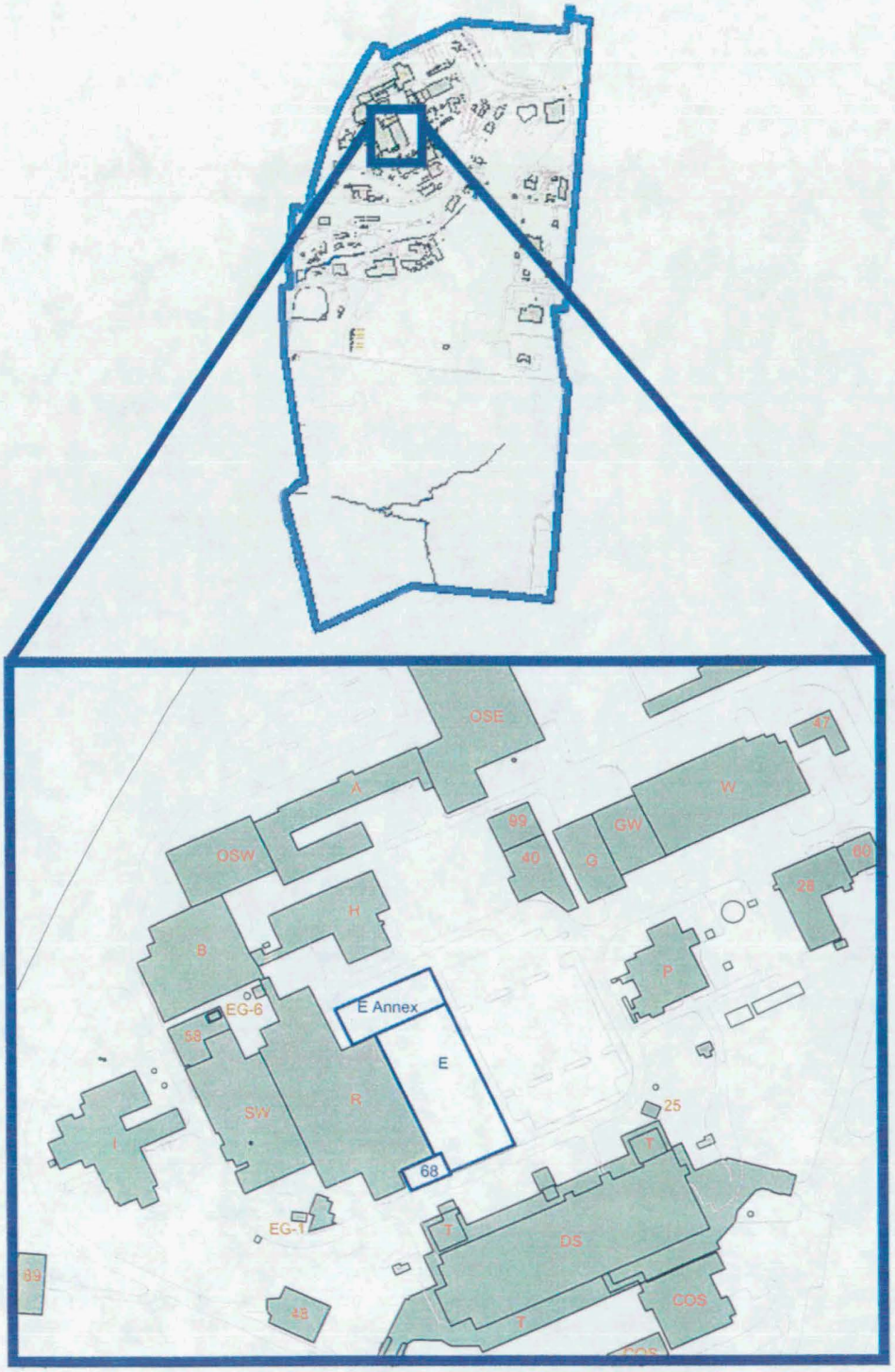


Figure 1. Location of Buildings E and 68

Building 68 was a metal garage-like structure attached to the south walls of Buildings E and R. It was constructed of non-insulated metal panels over steel beams with a metal built-up membrane roof. Building 68 was built in 1979 to serve as a staging area for wastes associated with the decontamination and decommissioning of R Building Corridor 5. Containers of radioactive waste, primarily of low-specific activity (LSA), from Buildings R and SW were staged for shipping. At the time of demolition, Building 68 was used as a storage area for maintenance equipment and supplies.

In order to facilitate the removal of E Building, a decision was made to remove the Building 68 structure while demolishing E Building. The remaining Building 68 slab and associated soils have been incorporated into the SW/R Building Action Memorandum. Radiological surveys identified fourteen spots of fixed contamination on the five-inch thick concrete slab. Information related to these spots can be found in Appendix F. These spots were saw-cut out, removed, and back filled with gravel prior to the structural demolition. The Building 68 structure was demolished on May 20, 2000.

The possibility of minor chemical and radiological contamination warranted a RA under CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) and subsequent demolition of E Building. The hazardous materials found in E Building are asbestos containing material (ACM), lead, and polychlorinated biphenyls (PCBs). The asbestos surveys completed indicated ACM, as pipe insulation, fumehood linings, some floor tile, and the roof flashing. A complete asbestos abatement was performed prior to demolition. There are lead seals inside the cast iron drain piping joints. Piping and joints were removed if radiological contamination was present. The fluorescent lighting ballasts were suspected of containing PCBs, especially in lights from the original structure. This potential source of contamination was removed prior to demolition. Equipment remaining on or inside the building was drained of refrigerants and hydraulic fluids prior to demolition. There were no hazardous process chemicals being used or stored in E Building at the time of demolition nor was the building contaminated with energetic materials.

Radiological surveys identified several areas of contamination. Contaminated equipment was removed as LSA waste. Floor and wall contamination was removed prior to the building demolition. Radiological contamination was also

found in three floor drains. These drains were grouted in place prior to the building demolition and were later extracted during the slab removal phase of the project.

Associated Potential Release Sites and Previous Investigations

There were three PRSs associated with E Building. These were PRS 103, 104, and 105. PRS 103 represented E Building soils, PRS 104 the liquid scintillation vial storage room, and PRS 105 the E Building solvent storage shed. PRSs 103 and 105 have been previously determined by the Core Team (DOE, USEPA, and OEPA) to require No Further Assessment (NFA). Previous sampling and analysis data collected from each PRS was summarized, and additional sampling from the first floor area via core samples was proposed in the *Sampling and Analysis Plan for the Characterization of E Building and Surrounding Soils, January 26, 1999*. These PRS investigations are summarized below:

PRS 103, E Building Soils: Potential hazardous substances were 111-trichloroethane (TCA), trichloroethene (TCE), and toluene. Calculations were performed converting the 10^{-6} RBGV, in mg/kg of soil, to corresponding 10^{-6} RBGV in soil gas concentrations (parts of contaminant / parts of soil gas). The soil gas measurement results for PRS 103 showed that the contaminants of concern were well below guideline values. Additionally, plutonium-238 and thorium-232 were found at concentrations below their respective guideline values of 55 pCi/g (10^{-5}) and 1.49 pCi/g. Therefore on August 20, 1996, PRS 103 was binned as NFA.

PRS 104, E-133 Liquid Scintillation Storage Room: This room was designated as a PRS due to the storage of scintillation vials from tritium analysis prior to disposal as LSA waste. During the decontamination and decommissioning (D&D) of E Building, the vials were removed and Room E-133 underwent Generic Disposition and RMMA Rollback surveys. Based on radiological surveys, no surface contamination existed in Room E-133 prior to demolition. This PRS was removed as part of the D&D of E Building. When final, this OSC Report will be the basis for a status change to NFA for PRS 104.

PRS 105, E Building Solvent Storage Shed: PRS 105 is a remediated soils location that was a former site of the E Building Solvent Storage Shed. This area was identified as a PRS due to the shed's use as a short-term storage area for both fresh and spent solvents. The contaminants of concern were identified as TCE, ethanol, and methanol. In 1988, the shed's structure, concrete floor, and underlying soil were removed. The soil was excavated to approximately a four-foot depth. Subsequent verification sampling found no evidence of any organics in the soil in excess of the Cleanup Objectives. In addition, no evidence of contamination was found in excess of the guideline criteria during a 1984 radiological study and a 1994 quantitative soil gas study near PRS 105.

Therefore, since the removal verification results found no evidence of contamination from operations at the E Building Storage Shed and no additional history or lab evidence of contamination exists at this general locale, PRS 105 was binned NFA on August 20, 1996, by the Core Team.

E Building Soil Characterization: Soils underneath and near E Building were evaluated under three investigations. The first evaluation included those areas previously sampled in the vicinity of E Building and E Annex. These samples included surface and core sites collected between 1983 and 1999 for radiological parameters. No radiological contamination was indicated by these samples. The sample sites and data are presented in Appendix B.

In 1999, a sampling and analysis plan was prepared to characterize the soil beneath E Building prior to demolition. As shown in Figure 2, a 25-ft grid pattern was overlaid on the E Building floor plan. Twelve of these locations were statistically chosen for core boring based on process knowledge and the most recent radiological surveys. Since isotopic radiological sampling results as part of this characterization were lower than Cleanup Objectives, the results were used as verification data as shown in Table 2, February 1999 Soil Verification Sampling Results. All radiological results were below Cleanup Objectives.

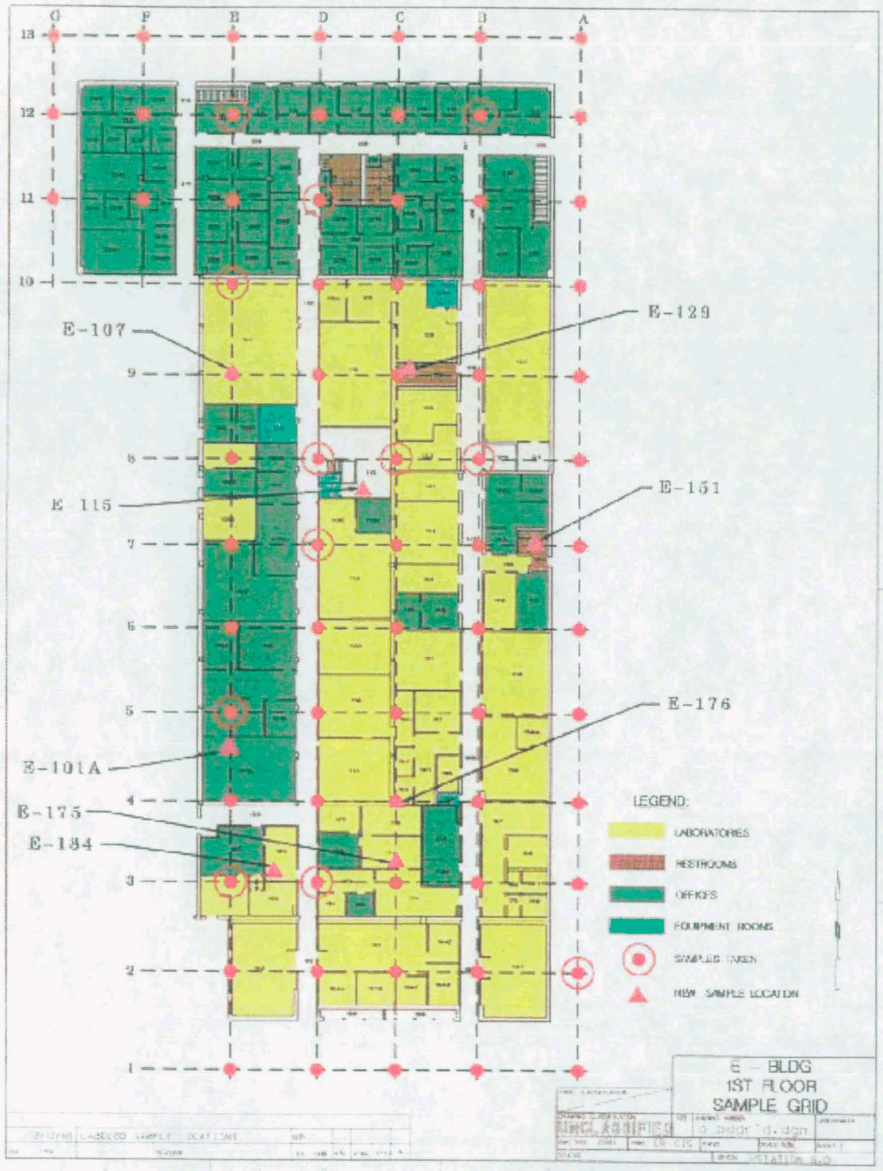


Figure 2. E Building 1999 Sampling Grid

In addition to radiological characterization, TCLP (toxicity characteristic leaching procedures) analyses for organics and metals were performed on the soil samples. Sample data are presented in Appendix C. Details of the 1999 sampling plan can be reviewed in the *"Sampling and Analysis Plan for the Characterization of E Building and Surrounding Soils."*

Last, a sampling and analysis plan was prepared to verify that the data quality objectives (DQO) were met for the E Building RA. The *"Verification Sampling and Analysis Plan, E Building Soil," January 9, 2001,* identified eight additional sites to be sampled for volatile and semivolatile organics, metals, and radiological parameters. In addition, four additional soil samples and a groundwater sample were collected from the sanitary trench when a portion of the sanitary line was discovered to have lost its integrity. Tables 3 and 4, the March 2001 Soil Verification Sampling Results and Sanitary Trench Soil Verification Sampling Results, respectively, summarize the results. The associated sample data are presented in Appendices D and E, respectively.

A formal recommendation for a Removal Action for E Building was made by the Core Team on December 15, 1999, when they signed the E Building Action Memorandum. This document was made available for public review and comment from December 22, 1999 to January 20, 2000. Since the DOE is the sole responsible party for cleanup of contamination in E Building, no other Potentially Responsible Parties (PRPs) were sought to cleanup the site. Monsanto Research Corporation and EG&G Mound Applied Technologies were the operating contractors at the site from 1948 to September 30, 1988, and from October 1, 1988 until September 30, 1997, respectively. BWXT of Ohio (BWXTO) became the contractor for the Miamisburg Closure Project (MCP) on October 1, 1997.

1.2 ORGANIZATION OF THE RESPONSE

Table 1 lists the groups responding to this RA, and their responsibilities.

Table 1. Organization of the Response

Agencies or Parties Involved	Contact	Description of Participation
US EPA SFR-5J 77 W. Jackson Chicago, IL 60604	Tim Fischer (312) 886-5787	Federal agency responsible for response oversight.
Ohio EPA 401 E. Fifth St. Dayton, OH 45402-2911	Brian Nickel (937) 285-6468	State agency responsible for response oversight.
DOE-MCP P.O. Box 66 1 Mound Road Miamisburg, OH 45343-0066	Robert Rothman (937) 865-3823	Lead agency for the response.
DOE-MCP P.O. Box 66 1 Mound Road Miamisburg, OH 45343-0066	Frank Schmaltz (937) 865-3620	DOE Project Manager responsible for project oversight and success.
BWXTO 1 Mound Road Miamisburg, OH 45343-3030	Budd Thompson (937) 865-4071	Project Manager responsible for staff management and committing resources to successfully complete the project.
BWXTO 1 Mound Road Miamisburg, OH 45343-3030	John Nichols (937) 865-3706	Project engineer responsible for planning and field work for response. Prepared work package and Verification Sampling and Analysis Plan. Provide site documentation.

1.3 OBJECTIVES

The *Action Memorandum/Engineering Evaluation/Cost Analysis, E Building* (AA/EE/CA) identified the objective of this RA as the safe shutdown and demolition of E Building and removal of any associated contaminated sub-soil. The contaminants of concern for soil near E Building were organic and inorganic chemicals, and radionuclides. E Building was demolished, and the debris and slab were removed between April 2000 and March 2001. Results of verification sampling are summarized in Tables 2, 3, 4, and 5. Table 2 and Appendix C include results from samples collected in February 1999, prior to building dismantlement, from core borings taken through first floor rooms. Table 3 and Appendix D summarize results from soil verification samples collected in March 2001. Tables 4, 5, and Appendix E provide results from samples collected in the sanitary trench following Room E-176 floor drain removal. Table 6 and Appendix G provide a soil sample and survey results collected during the removal of the Cesium Storage Well which was located in Room E-156B (see figure in Appendix G).

The contaminants of concern for soil near E Building were possible chemical and radiological contaminants. None of the contaminants of concern are above the Cleanup Objectives from sampling the soil near and underneath E Building. The AM/EE/CA also indicated "A Verification Plan will be developed to identify what, if any, contaminants are present." Because of the uncertainty of which radionuclides were present, the elements of concern could not all be identified beforehand. The *Verification Sampling and Analysis Plan, E Building Soil* also identified the steps to determine the concentration of those contaminants to compare to appropriate RBGVs and applicable or relevant and appropriate requirements (ARARs). The verification sampling results are reported in Appendices D and E. The Background, 10^{-5} RBGV, HI=1, Cleanup Objective, and Maximum Result for the verification sampling is summarized in Tables 3 and 4. In addition, volatile organic results were compared to soil screening levels for leaching to groundwater. Leaching equations are provided in Appendix E. All results are less than the Cleanup Objectives.

Table 2. February 1999 Soil Verification Sampling Results

Radionuclides	Background [a] (pCi/g)	10^{-5} RBGV [b] (pCi/g)	Cleanup Objective [c] (pCi/g)	Maximum Result (pCi/g)	Location
Cesium-137 + D	0.42	3.4	3.82	ND	NA
Lead-212	1.4 [d]	0.7 [d]	2.1 [d]	0.27	E-10
Lead-214	1.2 [e]	1.0 [e]	2.2 [e]	0.43	B-8 / E-12
Plutonium-238	0.13	61	55 [f]	0.068	A-2
Plutonium-239/240	0.18	60	60.2	0.20	E-5
Potassium-40	37	14.2	51.2	11.9	D-7
Thorium-228 + D	1.5	1.1	2.6	0.49	A-2
Thorium-230 + D	1.9	0.9	2.8	1.38	D-11
Thorium-232 + D	1.4	0.7	2.1	0.47	E-10
Uranium-234	1.1	105	106.1	0.55	A-2 / E-10
Uranium-235	0.11	16	16.11	0.059	E-10
Uranium-238 + D	1.2	1.0	2.2	0.56	D-7 / E-10
Tritium	1.6	235,000	235,000	1.26	D-3

[a] *Mound 2000 Residual Risk Evaluation Methodology, Final Revision 0, January 6, 1997.*
[b] RBGV most stringent of construction or office worker scenarios per *Risk-Based Guideline Value, Final, March 1997,* as performed using April 2001 HEAST slope factors.
[c] Cleanup Objective equals 10^{-5} RBGV plus background.
[d] Lead-212 is assumed to be in secular equilibrium with Thorium-232 and evaluated at the Thorium-232 RBGV and background level.
[e] Lead-214 is assumed to be in secular equilibrium with Uranium-238 and evaluated at the Uranium-238 RBGV and background level.
[f] 10^{-5} RBGV is 61 pCi/g but 55 pCi/g was retained due to its familiarity to the public.
+ D Value indicates inclusion of pertinent daughters within risk calculations.
NA Value not applicable / available.
ND Not detected.

Table 3. March 2001 Soil Verification Sampling Results

Parameter	Background [a]	10^{-5} RBGV [b]	HI = 1 [c]	Cleanup Objective [d]	Maximum Result	Location
Volatile Organics	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Values below method's reporting limits	NA	NA	NA	NA	NA	NA
Semivolatile Organics	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Anthracene	NA	NC	64,000	64,000	0.4	E-176
Benzo (a) anthracene	NA	41	NC	41	1.1	E-176
Benzo (a) pyrene	NA	4.1	NC	4.1	1.1	E-176
Benzo (b) fluoranthene	NA	41	NC	41	1.0	E-176
Benzo (ghi) perylene	NA	NC	NC	NA	0.77	E-176
Benzo (k) fluoranthene	NA	410	NC	410	0.86	E-176
Butyl benzyl phthalate	NA	NC	43,000	43,000	0.49	E-101
Chrysene	NA	4,100	NC	4,100	1.2	E-176
bis (2-Ethylhexyl) phthalate	NA	2,150	4,300	2,150	0.52	E-101
Fluoranthene	NA	NC	8,500	8,500	2.6	E-176
Indeno (1,2,3-cd) pyrene	NA	41	NC	41	0.67	E-176
Phenanthrene	NA	NC	NC	NA	1.9	E-176
Pyrene	NA	NC	6,400	6,400	2.0	E-176

Table 3. March 2001 Soil Verification Sampling Results (continued)

Parameter	Background [a]	10^{-5} RBGV [b]	HI = 1 [c]	Cleanup Objective [d]	Maximum Result	Location
Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Aluminum	19,000	NC	210,000	229,000	8,730	E-129
Arsenic	8.6	12,000	64	72.6	7.3	E-101
Barium	180	NC	15,000	15,180	57.3	E-151
Beryllium	1.3	7.0	1,100	8.3	0.50	E-129
Calcium	310,000	NC	NC	NA	210,000	E-107
Chromium	20	15,000	1,100	1,120	11.1	E-151
Copper	26	NC	7,900	7,926	15	E-101
Iron	35,000	NC	NC	NA	17,700	E-129
Lead	48	NC	NC	NA	9.7	E-176
Magnesium	40,000	NC	NC	NA	69,200	E-175
Manganese	1,400	NC	27,000	28,400	469	E-151
Nickel	32	NC	4,300	4,332	12.8	E-129
Potassium	1,900	NC	NC	NA	3,930	E-129
Vanadium	25	NC	1,500	1,525	17.3	E-151
Zinc	140	NC	64,000	64,140	43.8	E-176

Table 3. March 2001 Soil Verification Sampling Results (continued)

Parameter	Background [a]	10^{-5} RBGV [b]	HI = 1 [c]	Cleanup Objective [d]	Maximum Result	Location
Radionuclides	**pCi/g**	**pCi/g**		**pCi/g**	**pCi/g**	
Plutonium-238	0.13	61	NC	55 [e]	< LDL	
Plutonium-239/240	0.18	60	NC	60.2	0.02	E-151
Thorium-228 + D	1.5	1.1	NC	2.6	0.70	E-151
Thorium-230 + D	1.9	0.9	NC	2.8	1.13	E-151
Thorium-232 + D	1.4	0.7	NC	2.1	0.76	E-151
Uranium-234	1.1	105	NC	106.1	0.73	E-176
Uranium-235	0.11	16	NC	16.11	0.044	E-176
Uranium-238 + D	1.2	1.0	NC	2.2	0.69	E-184
Tritium	1.6	235,000	NC	235,000	2.56	E-151

[a] *Mound 2000 Residual Risk Evaluation Methodology, Final Revision 0, January 6, 1997.*
[b] RBGV most stringent of construction or office worker scenarios per *Risk-Based Guideline Value, Final, March 1997,* as performed using April 2001 HEAST slope factors.
[c] Hazard Index (HI) most stringent of construction or office worker scenarios per *Risk Based Guideline Value, Final, March 1997.*
[d] Cleanup Objective equals the most restrictive of HI=1 or 10^{-5} RBGV.
[e] 10^{-5} RBGV is 61 pCi/g but 55 pCi/g was retained due to its familiarity to the public.
+ D Value indicates inclusion of pertinent daughters within risk calculations.
NC Value not calculated.
NA Value not applicable / available.
LDL Less than the lower detection limit.

Note: Only qualified detected values above the method's reporting limit presented. Refer to Appendix D for data qualifications.

Table 4. Sanitary Trench Soil Verification Sampling Results

Parameter	Background [a]	Leaching Criteria [b]	HI = 1 [c]	Cleanup Objective [d]	Maximum Result	Location
Volatile Organics	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Tetrachloroethene	NA	0.05	2,100	0.05	0.0073	E-ST-2
1,1,1-Trichloroethane	NA	1.50	3,240	1.50	0.0085	E-ST-2

Parameter	Background [a]	10^{-5} RBGV [e]	HI = 1 [c]	Cleanup Objective [f]	Maximum Result	Location
Semivolatile Organics	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Anthracene	NA	NC	64,000	64,000	0.37	E-ST-1
Benzo (a) anthracene	NA	41	NC	41	0.66	E-ST-1
Benzo (a) pyrene	NA	4.1	NC	4.1	0.48	E-ST-1
Benzo (b) fluoranthene	NA	41	NC	41	0.47	E-ST-1
Benzo (k) fluoranthene	NA	410	NC	410	0.43	E-ST-1
Chrysene	NA	4,100	NC	4,100	0.65	E-ST-1
bis (2-Ethylhexyl) phthalate	NA	2,150	4,300	2,150	0.61	E-ST-FD
Fluoranthene	NA	NC	8,500	8,500	1.30	E-ST-1
Phenanthrene	NA	NC	NC	NA	1.60	E-ST-1
Pyrene	NA	NC	6,400	6,400	2.00	E-ST-1

Table 4. Sanitary Trench Soil Verification Sampling Results (continued)

Parameter	Background [a]	10^{-5} RBGV [e]	HI = 1 [c]	Cleanup Objective [f]	Maximum Result	Location
Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	
Aluminum	19,000	NC	210,000	229,000	4,720	E-ST-4
Arsenic	8.6	12,000	64	72.6	5.6	E-ST-1
Barium	180	NC	15,000	15,180	102	E-ST-FD
Beryllium	1.3	7.0	1,100	8.3	0.28	E-ST-4
Calcium	310,000	NC	NC	NA	199,000	E-ST-2
Chromium	20	15,000	1,100	1,120	16.5	E-ST-FD
Copper	26	NC	7,900	7,926	25.5	E-ST-4
Iron	35,000	NC	NC	NA	16,900	E-ST-4
Lead	48	NC	NC	NA	33.8	E-ST-4
Magnesium	40,000	NC	NC	NA	70,100	E-ST-2
Manganese	1,400	NC	27,000	28,400	250	E-ST-4
Mercury	NA	NC	64	64	0.85	E-ST-4
Nickel	32	NC	4,300	4,332	12.5	E-ST-4
Vanadium	25	NC	1,500	1,525	14	E-ST-4
Zinc	140	NC	64,000	64,140	40.3	E-ST-4

Table 4. Sanitary Trench Soil Verification Sampling Results (continued)

Parameter	Background [a]	10^{-5} RBGV [e]	HI = 1 [c]	Cleanup Objective [f]	Maximum Result	Location
Radionuclides	**pCi/g**	**pCi/g**	**mg/kg**	**pCi/g**	**pCi/g**	
Plutonium-238	0.13	61	NC	55 [g]	1.85	E-ST-4
Plutonium-239/240	0.18	60	NC	60.2	0.12	E-ST-2
Thorium-227	0.11 [h]	4.5 [h]	NC	4.61 [h]	0.13	E-ST-4
Thorium-228 + D	1.5	1.1	NC	2.6	0.51	E-ST-4
Thorium-230 + D	1.9	0.9	NC	2.8	1.60	E-ST-1
Thorium-232 + D	1.4	0.7	NC	2.1	0.45	E-ST-4
Uranium-234	1.1	105	NC	106.1	0.71	E-ST-4
Uranium-235	0.11	16	NC	16.11	0.032	E-ST-2
Uranium-238 + D	1.2	1.0	NC	2.2	0.68	E-ST-4
Tritium	1.6	235,000	NC	235,000	< LDL	

[a] *Mound 2000 Residual Risk Evaluation Methodology, Final Revision 0, January 6, 1997.*
[b] Leaching criteria is that concentration left in the soil when leached would yield a concentration less than the maximum contaminant level for drinking water as documented in *Potential Release Site Packages Reading and Understanding, Volume II, Appendix D, Attachment D-4, August 1996.*
[c] Hazard Index (HI) most stringent of construction or office worker scenarios per *Risk Based Guideline Value, Final, March 1997.*
[d] Cleanup Objective equals the most restrictive of HI=1 or the leaching criteria.
[e] RBGV most stringent of construction or office worker scenarios per *Risk-Based Guideline Value, Final, March 1997,* as performed using April 2001 HEAST slope factors.
[f] Cleanup Objective equals the most restrictive of HI=1 or 10^{-5} RBGV.
[g] 10^{-5} RBGV is 61 pCi/g but 55 pCi/g was retained due to its familiarity to the public.
[h] Thorium-227 is assumed to be in secular equilibrium with Actinium-227 and evaluated at Actinium-227 RBGV and background level.
+ D Value indicates inclusion of pertinent daughters within risk calculations.
NC Value not calculated.
NA Value not applicable / available.
LDL Less than the lower detection limit.

Note: Only qualified detected values above the method's reporting limit presented. Refer to Appendix E for data qualifications.

Table 5. Sanitary Trench Groundwater Sampling Results

Parameter	Background [a]	HI = 1 [b]	Cleanup Objective [c]	Maximum Result
Metals	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Calcium	114.02	NC	NA	840
Magnesium	40.45	NC	NA	188
Manganese	0.22	0.51	0.73	0.506
Nickel	0.04	2.00	2.04	0.0602
Potassium	4.48	NC	NA	77.8
Sodium	61.65	NC	NA	301

[a] *Mound 2000 Residual Risk Evaluation Methodology, Final Revision 0, January 6, 1997.*
[b] Hazard Index (HI) most stringent of construction or office worker scenarios per *Risk-Based Guideline Value, Final, March 1997.*
[c] Cleanup Objective equals HI plus background.
NC Value not calculated.
NA Value not applicable / available.

Note: Only qualified detected values above the method's reporting limit presented. Refer to Appendix E for data qualifications.

Table 6. Cesium Well Soil Verification Sampling Results

Radionuclide	Background [a]	10^{-5} RBGV [b]	Cleanup Objective [c] (pCi/g)	Results (pCi/g)	MDA [d] (pCi/g)
Plutonium-238	0.13	61	55 [e]	ND	5.96
Cobalt-60	NA	0.7	0.7	0.01	0.02
Cesium-137 + D	0.42	3.4	3.82	ND	0.02
Lead-210 + D	1.2	6.2	7.4	0.38	0.22
Radium-226 + D	2.0	0.9	2.9	0.77	0.33
Actinium-227 + D	0.11	4.5	4.61	0.05	0.10
Thorium-230 + D	1.9	0.9	2.8	0.57	2.49 [f]
Thorium-232 + D	1.4	0.7	2.1	0.36	0.06
Americium-241	NA	63	63	0.02	0.02

a *Mound 2000 Residual Risk Evaluation Methodology, Final Revision 0, January 6, 1997.*
b RBGV most stringent of construction or office worker scenarios per *Risk Based Guideline Value, Final, March 1997,* as performed using April 2001 HEAST slope factors.
c Cleanup Objective equals 10^{-5} RBGV plus background.
d Corresponding MDA for Gamma Spectroscopy.
e 10^{-5} RBGV is 61 pCi/g but 55 pCi/g was retained due to its familiarity to the public.
f Thorium 230 Gamma Spectroscopy MDA less than 10 pCi/g.
ND Not detected at the corresponding MDA.

1.4 CHRONOLOGICAL NARRATIVE OF RESPONSE ACTIONS

The following is a chronological narrative of events, as they occurred for the E Building RA.

1948: E Building is constructed.

1962: Northeast addition - Detonator Support Facility is constructed.

1966: East addition - Isolated Health Physics Facility is constructed.

1969: Southeast addition - Analytical Facility is constructed.

1979	Building 68 is constructed.
1982:	E Annex is constructed.
1987:	South addition - Material Science Facility is constructed.
November 1989:	Mound Plant is placed on the National Priorities List (NPL).
1995-1996	The sealed cesium source was removed from E Building.
August 1996:	PRS 103 (E Building Soils) and PRS 105 (Solvent Storage Shed) NFA recommendations signed by Core Team on August 20, 1996.
November 1997:	E Building presented as a removal action to the Core Team.
January 1999:	*Sampling and Analysis Plan for the Characterization of E Building and Surrounding Soils* was issued summarizing previous sampling and proposing core samples for first floor area.
February 1999:	Pre-demolition supplemental characterization surveys, property disposition, and environmental lab relocation to Building 48 begin. E Building soil characterization conducted; first floor core samples collected.
September 1999:	Property disposition completed. Decontamination activities and safe shutdown, including utilities isolation, begin.
November 1999:	Asbestos abatement begins.

December 1999:	Core Team signs E Building AM/EE/CA recommendation; document starts formal public review period.
Dec. 1999-Jan. 2000:	E Building AM/EE/CA released for formal public review and comment.
March 2000:	Asbestos abatement completed. Building RMMA and supplemental surveys completed. PCB ballasts were removed. Steam and condensate lines for E Building were blocked off. Electric power to E Building was disconnected. Domestic water, fire protection water, and sanitary sewer lines to E Building were cut/blocked off. Fourteen areas of fixed contamination were identified on the floor (slab) of adjacent Building 68.
April 2000:	E Building AM/EE/CA final was issued. Work Plan for E Building demolition was finalized. Demolition of E Building was initiated mid-month (4/13/00). OEPA reviews initial sampling and analysis plan (submittal as a VSAP for E Building soils).
May 2000:	Fourteen fixed contamination areas were saw-cut and removed from the Building 68 slab. Building 68 structure was demolished during E Building dismantlement. Building 68 Slab is turned over to Tritium Project. OEPA requested a formal VSAP be submitted that include organic and inorganic constituents.
August 2000:	E Building structure demolition was completed.
October 2000:	The slab and foundation removal for E Building started. The removal of a tube (storage well) in which a sealed cesium source was historically stored.

November 2000:	Revision 2 of the VSAP was submitted to the regulators for review and comment. Underground utility isolation begins. Radiological surveys, isotopic analyses, and soil sample results in/around the removed cesium well indicated no contamination above release limits.
January 2001:	The E Building cesium well opening was back-filled with high pressure grout. The final VSAP was approved by OEPA. Contaminated drains (101A, 184, and 176) removal begins.
March 2001:	The slab removal for E Building was completed. Eight additional soil samples from beneath the former location of E Building were taken to determine the presence of contamination from organic and inorganic chemicals and radionuclides. Corroded piping was found and removed during the removal of contaminated drain from Room E-176. A groundwater sample and four soil samples were collected on March 26.
April 2001:	Chemical and radiological contamination results received for the eight E Building soil locations. Foundation removal, grading, and site restoration is completed.
May 2001:	Chemical contamination results received for the four E Building sanitary trench locations.
June 2001:	E Building Draft OSC Report is issued.

1.5 RESOURCES COMMITTED

Table 7 summarizes the disposition of materials from the demolition of Buildings E and 68. The cost summary for the RA is in Table 8.

Table 7. Materials and Disposition

Waste Type	Volume (cu. ft.)	Disposal Costs ($)	Destination
Asbestos	1,901	2,100	Stony Hollow
Light ballasts	0.3	975	Laidlaw Environmental
Glycol	44.1	636	Laidlaw Environmental
Transformer oil	2.0	174	Laidlaw Environmental
Mercury	0.8	565	Laidlaw Environmental
Laboratory chemicals	30	1,072	Laidlaw Environmental
Gas cylinders	1.5	1,848	Laidlaw Environmental
Construction debris	301,050	74,333	Stony Hollow
Scrap metal for recycle	63,450	0	Franklin Metal
Rad debris (concrete & soil)	2,916	30,300	Nevada Test Site
Concrete debris (non-rad)	68,300	0	Recycled as fill
Totals	437,695.7	$112,003	

Table 8. Removal Project Cost Summary

Total Cleanup Costs	$2,958,003

2 EFFECTIVENESS OF THE REMOVAL ACTION

2.1 ACTIONS TAKEN BY MOUND PERSONNEL

BWXTO personnel planned and performed the building dismantlement and demolition, provided on-site transportation and staging of soil and debris, slab and foundation removal, and site restoration. BWXTO personnel reviewed the verification sample results. As Tables 2 through 6 indicate, the project met the Cleanup Objectives. BWXTO personnel prepared the OSC Report which shows that the objectives of the RA were achieved.

2.2 ACTIONS TAKEN BY LOCAL, STATE, AND FEDERAL AGENCIES

DOE/MCP was the lead agency for the RA. DOE/MCP provided the funding and oversight of the RA. The USEPA and OEPA had oversight responsibility for the RA. USEPA and OEPA reviewed the verification sampling plan to ensure that the sampling data objectives were met.

2.3 ACTIONS TAKEN BY CONTRACTORS

Quanterra Environmental Services in Earth City, Missouri performed the analysis of the verification samples.

3. DIFFICULTIES ENCOUNTERED

3.1 ITEMS THAT AFFECTED THE RESPONSE

Sampling and analysis in areas associated with PRSs 103 and 105 and other historical sampling data indicated that chemical and radiological contamination was minimal and within acceptable limits. The initial characterization / verification sampling of the E Building site in February 1999 consisted of 12 core borings summarized in Table 2. The data indicated that radiological contamination was less than the 10^{-6} RBGV. The 1999 sampling plan was resubmitted to the regulators in April 2000 summarizing the data collected to date as verification the site was clean. Due to insufficient organic and inorganic data, the OEPA required in May 2000, that a formal VSAP be submitted to further characterize the E Building site and verify Cleanup Objectives were achieved. This plan included the analysis for volatile and semivolatile organics, metals, and radionuclides. Eight sample locations were identified based on radiological surveys and process knowledge. The final VSAP was approved in January 2001.

In order to facilitate the removal of E Building, the RA also included the demolition of the Building 68 structure. The remaining Building 68 slab and its associated soils have been incorporated into the R/SW/58 Buildings Action Memorandum. Radiological surveys identified fourteen spots of fixed contamination on the five-inch thick concrete slab. These spots were saw-cut out and backfilled with gravel prior to the structure demolition. Building 68 was demolished on May 20, 2000.

Although no radiological contamination was observed, the storage well in which a sealed cesium source was historically kept was removed in October 2000. The storage well was a 12-inch diameter, 24-foot long pipe with the upper four feet encased in concrete, which was embedded in the ground in Room E-156B. Radiological surveys on the pipe and a soil sample from the bottom of the removed cesium storage well indicated no contamination above release limits. In January 2001, the E Building cesium storage well opening was backfilled with high pressure grout.

Three floor drains were identified by radiological surveys to be contaminated and warranted removal. They were in rooms E-101A, E-176, and E-184. Prior to the building demolition, the drains were grouted shut. Removal of these drains began in January 2001, approximately three months after the slab and foundation removal action began.

In order for the drain piping to be abandoned in place, twenty feet of uncontaminated surveyed piping had to be identified. Although there was no indication of contamination by field surveys, gamma spectroscopy of scrapings from inside the piping indicated some level of contamination greater than the 10^{-6} RBGV in piping associated with floor drains in E-176 and E-184. Soil samples collected in conjunction with the pipe samples showed no evidence of radiological contamination above 10^{-6} RBGV. The E-184 floor drain discharged to a storm water line. This line was removed all the way back to the main storm trunk line running along the east boundary of the building footprint. Twenty feet of clean pipe could not be ascertained before reaching the main storm trunk line.

The E-176 floor drain discharged into a sanitary line. At the point where there was no observable contamination above the guideline criteria inside the pipe, the integrity of the pipe became suspect. The piping previously removed was acid resistant, where it became suspect, it was cast iron. Approximately 60 feet of cast iron pipe, running primarily under the first two additions, was removed. Samples collected inside the failed pipe and its surrounding soils showed no observable radiological contamination above 10^{-6} RBGV. Four soil samples were collected from the trench to verify that there was no organic, inorganic, or radiological contamination above the Cleanup Objectives. A groundwater sample was also collected from one of the borings when it backfilled with water.

3.2 ISSUES OF INTERGOVERNMENTAL COORDINATION

There were no issues of intergovernmental coordination.

4 RECOMMENDATIONS

4.1 MEANS TO PREVENT A RECURRENCE OF THE DISCHARGE OR RELEASE

This RA was part of the remediation and closure of the MCP, formally know as the Mound Plant. E Building and surrounding contaminated soils were removed and disposed of, therefore, recurrence of a spill or leak or spread of contamination is prevented. This area will be transferred from federal to private ownership. All state and federal disposal rules will apply.

5 REFERENCE LIST OF SUPPLEMENTAL DOCUMENTS

The following reports and documents are pertinent to the RA and can be found in the CERCLA public reading room at the Miamisburg Senior Adult Center, 305 Central Avenue, Miamisburg or by contacting Rob Rothman, On-Scene Coordinator for E Building Removal Action, at 937-865-3823.

- Potential Release Site Package PRS 103, DOE, Final, August 20, 1996.
- Potential Release Site Package PRS 105, DOE, Final, August 20, 1996.
- Operable Unit 9, Site Scoping Report Volume 3 - Radiological Site Survey, EG&G, June 1993.
- Soil Vapor Reconnaissance Operable Unit 2, Main Hill Operable Unit 2 Phase I Technical Memorandum, EG&G, February 1995.
- Sampling and Analysis Plan for the Characterization of E Building and Surrounding Soils, BWXTO, Final, January 26, 1999.
- Verification Sampling and Analysis Plan, E Building Soil, BWXTO, Final, January 9, 2001.
- Action Memorandum/Engineering Evaluation/Cost Analysis, Buildings R/SW/58/68 Slab, DOE, Public Review Draft, November 2000.
- Action Memorandum/Engineering Evaluation/Cost Analysis, E Building, DOE, Final, April 2000.
- E Building, Removal Action Work Plan, BWXTO, Final, April 2000.

APPENDIX A

PHOTOGRAPH DOCUMENTATION

1. North View of E Building
2. South View of Buildings E and 68
3. 1999 Core Boring in E Building
4. 1999 Soil Sampling in E Building
5. E Building Demolition Begins
6. E Building Demolition Site
7. E Building Demolition
8. E Building Demolition
9. E Building Demolition Prior to Building 68
10. Building 68 Removed
11. E Building Demolition Completed
12. E Building Slab Removal
13. E Building Slab Removal
14. E Building Sanitary Trench Excavation
15. E Building Site Final Restoration

Photo 1. North View of E Building

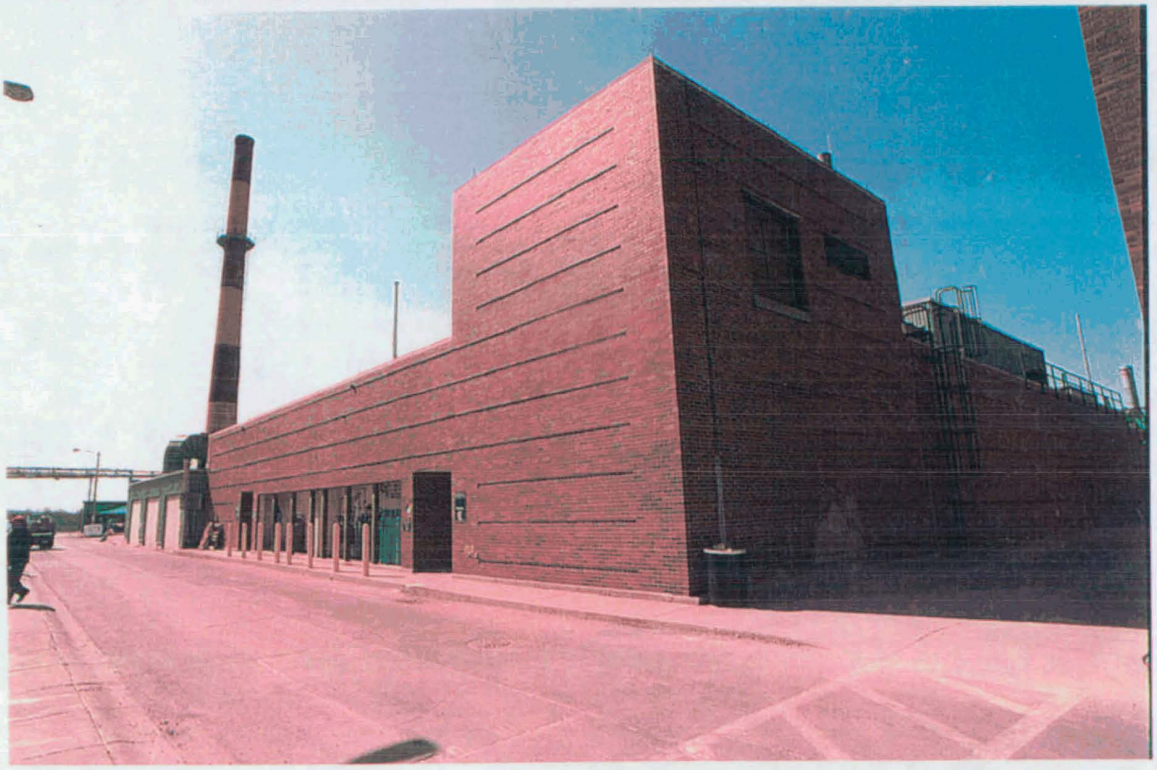


Photo 2. South View of E Building and 68

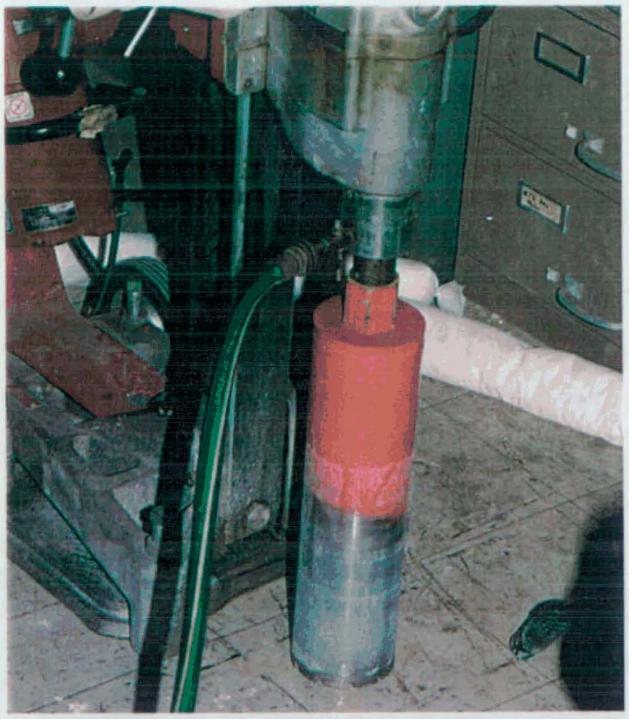


Photo 3. 1999 Core Boring in E Building

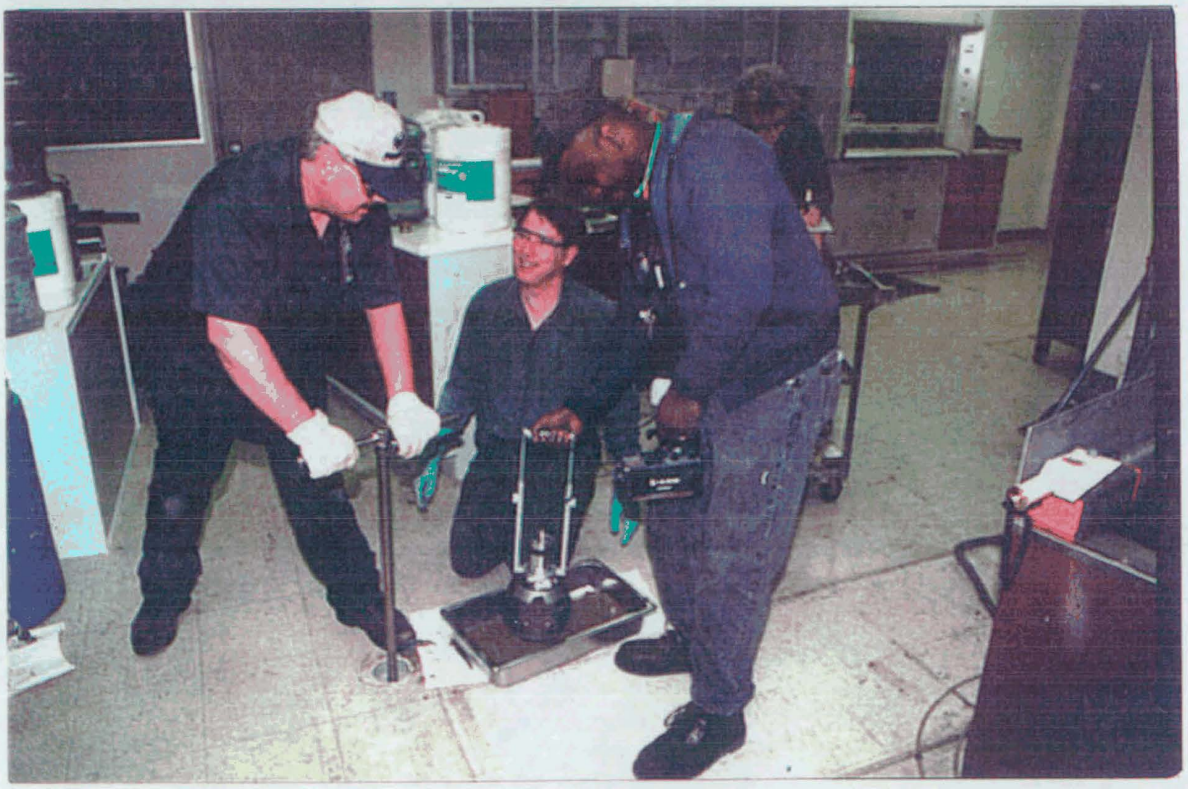


Photo 4. 1999 Soil Sampling in E Building

Photo 5. E Building Demolition Begins

Photo 6. E Building Demolition Site

Photo 7. E Building Demolition

Photo 8. E Building Demolition

Photo 9. E Building Demolition Prior to Building 68

Photo 10. Building 68 Removed

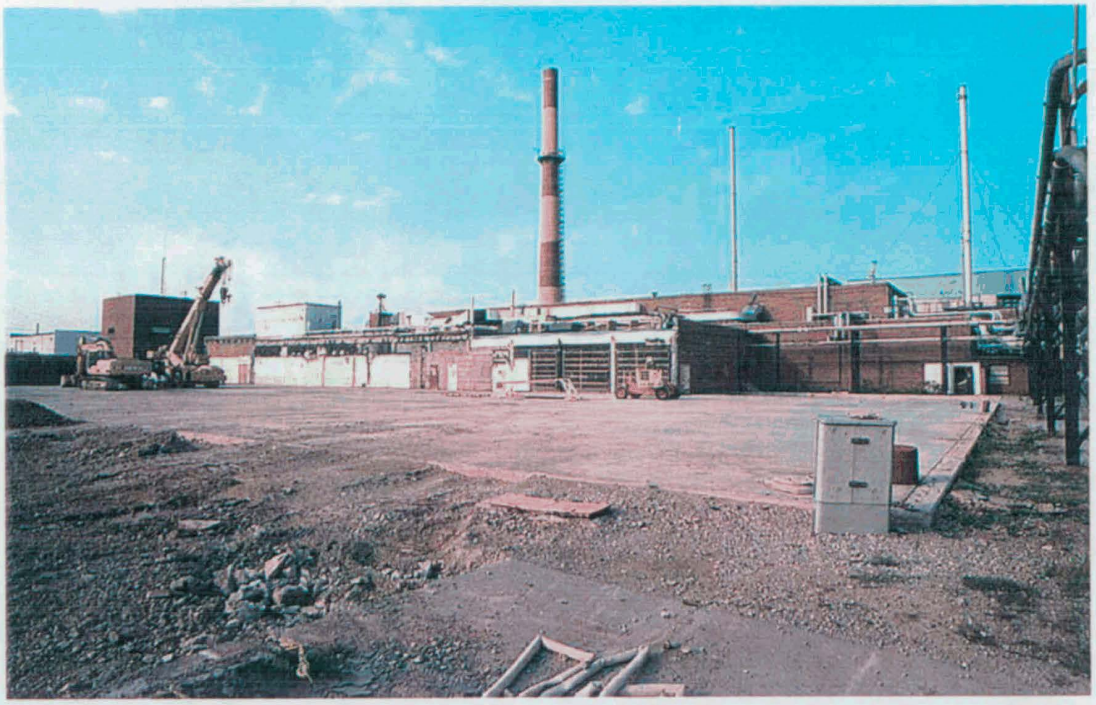


Photo 11. E Building Demolition Completed

Photo 12. E Building Slab Removal

Photo 13. E Building Slab Removal

Photo 14. E Building Sanitary Trench Excavation

Photo 15. E Building Site Final Restoration

B

APPENDIX B

E BUILDING HISTORICAL SOIL SAMPLING DATA

Table Key

DL	The detection limit for the parameter of interest.
U	The parameter was not detected.
FT	Feet.
pCi/g	picoCuries per gram.

Appendix B

E Building Historical Soil Sampling Data

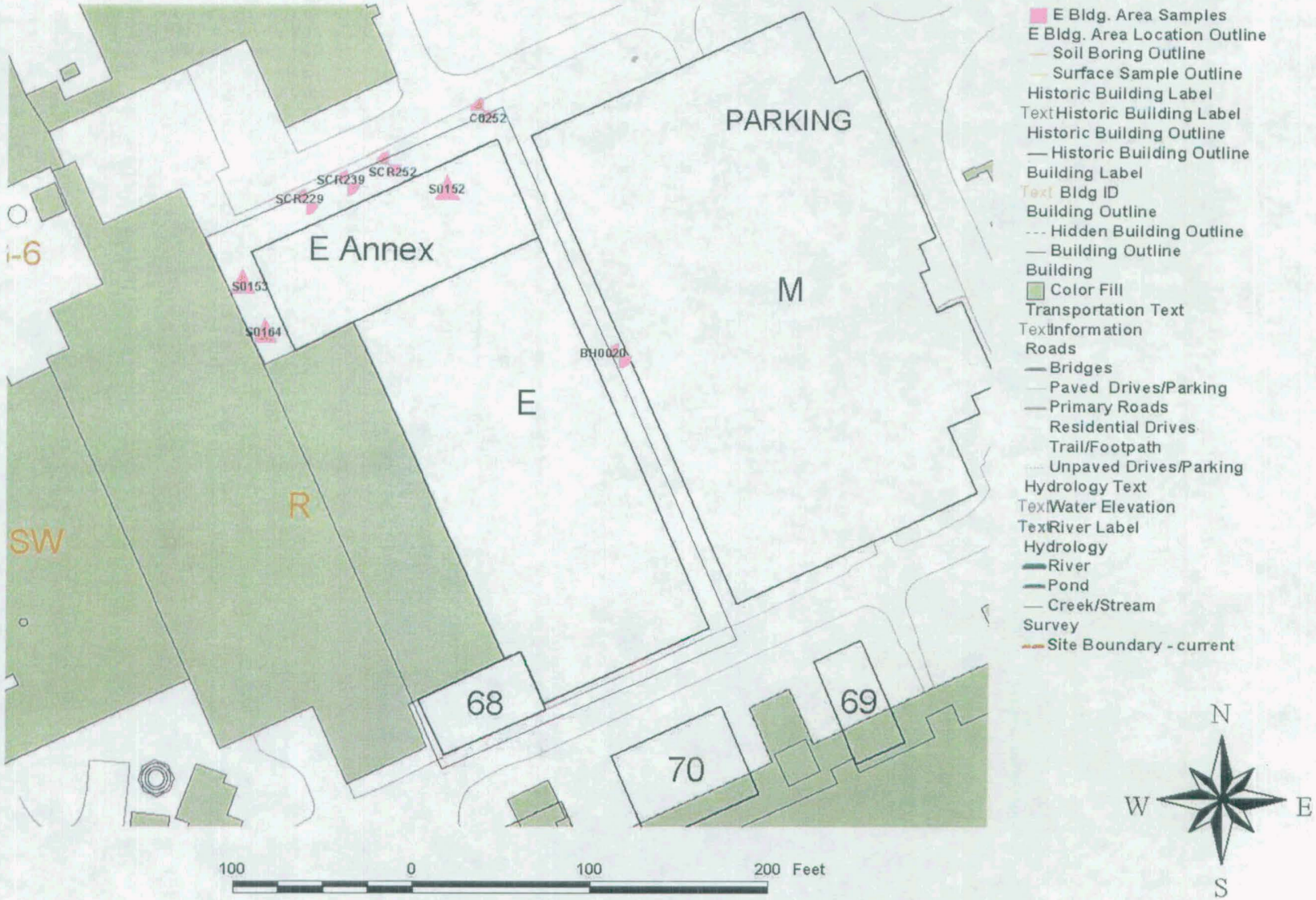
Location	Date	Parameter	Result	Units	DL	Lab Qualifier	Location Type	Start Depth	End Depth	Units	Sample ID
BH0020	19880107	Plutonium-238	8	pCi/g		U	Borehole	1.0	1.0	FT	8801071
BH0020	19880107	Thorium-232	1	pCi/g		U	Borehole	1.0	1.0	FT	8801071
BH0020	19880107	Plutonium-238	11	pCi/g		U	Borehole	2.0	2.0	FT	8801074
BH0020	19880107	Thorium-232	1	pCi/g		U	Borehole	2.0	2.0	FT	8801074
C0252	19841201	Plutonium-238	0	pCi/g	0.01		Borehole	3.0	3.0	FT	8400
C0252	19841201	Thorium-232	2	pCi/g	2.0	U	Borehole	3.0	3.0	FT	8400
S0152	19840801	Plutonium-238	0	pCi/g	0.01		Surface location	0.0	0.0	FT	6184
S0152	19840801	Thorium-232	2	pCi/g	2.0	U	Surface location	0.0	0.0	FT	6184
S0153	19840801	Plutonium-238	0	pCi/g	0.01		Surface location	0.0	0.0	FT	6185
S0153	19840801	Thorium-232	2	pCi/g	2.0	U	Surface location	0.0	0.0	FT	6185
S0164	19831001	Plutonium-238	0	pCi/g	0.01		Surface location	0.0	0.0	FT	3096
S0164	19831001	Thorium-232	2	pCi/g	2.0	U	Surface location	0.0	0.0	FT	3096
SCR229	19901011	Plutonium-238	0	pCi/g		U	Borehole	0.0	1.0	FT	9010124
SCR229	19901011	Thorium-232	0	pCi/g		U	Borehole	0.0	1.0	FT	9010124
SCR229	19901011	Plutonium-238	0	pCi/g		U	Borehole	2.0	4.0	FT	9010125
SCR229	19901011	Thorium-232	1	pCi/g		U	Borehole	2.0	4.0	FT	9010125
SCR239	19920701	Plutonium-238	11	pCi/g		U	Borehole	0.0	0.0	FT	92070110
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	92070110
SCR239	19920701	Plutonium-238	0	pCi/g		U	Borehole	0.0	0.0	FT	9207014
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207014
SCR239	19920701	Plutonium-238	19	pCi/g		U	Borehole	0.0	0.0	FT	9207015
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207015
SCR239	19920701	Plutonium-238	5	pCi/g		U	Borehole	0.0	0.0	FT	9207016
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207016
SCR239	19920701	Plutonium-238	19	pCi/g		U	Borehole	0.0	0.0	FT	9207017
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207017
SCR239	19920701	Plutonium-238	8	pCi/g		U	Borehole	0.0	0.0	FT	9207018
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207018
SCR239	19920701	Plutonium-238	5	pCi/g		U	Borehole	0.0	0.0	FT	9207019
SCR239	19920701	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207019
SCR239	19920706	Plutonium-238	12	pCi/g		U	Borehole	0.0	0.0	FT	9207064

Appendix B

E Building Historical Soil Sampling Data

Location	Date	Parameter	Result	Units	DL	Lab Qualifier	Location Type	Start Depth	End Depth	Units	Sample ID
SCR239	19920706	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207064
SCR239	19920706	Plutonium-238	22	pCi/g		U	Borehole	0.0	0.0	FT	9207065
SCR239	19920706	Thorium-232	1	pCi/g		U	Borehole	0.0	0.0	FT	9207065
SCR252	19901011	Plutonium-238	0	pCi/g		U	Borehole	0.0	1.0	FT	9010123
SCR252	19901011	Thorium-232	0	pCi/g		U	Borehole	0.0	1.0	FT	9010123

E Bldg. Area



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APPENDIX C

1999 E BUILDING PRE-REMOVAL SAMPLING DATA

APPENDIX C

1999 E BUILDING PRE-REMOVAL SAMPLING DATA

Table Key

B	Organic parameter identified in the blank.
B	The inorganic analysis indicates the presence of an analyte below the established reporting limit but above the instrument's detection limit.
FD	Field duplicate.
J	The associated numerical value is the approximate concentration of the analyte.
ND	Not detected.
U	The parameter was not detected.
ug/L	Micrograms per liter.
mg/L	Milligrams per liter.
mg/kg	Milligrams per kilograms.
pCi/g	picoCuries per gram.
TCLP	Toxicity characteristic leaching procedures.
50	Numbers in bold indicate a result above the analytical method's reporting limit.
Note:	Radiological isotopic analyses supersede gamma spectroscopy results.

Appendix C

1999 E BUILDING PRE-REMOVAL SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations													
		A-2	B-8	B-12	C-8	C-8 FD	D-3	D-7	D-8	D-8 FD	D-11	E-3	E-5	E-10	E-12
Volatile Organics - TCLP	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Benzene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Butanone	200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	88 J,B	< 200	< 200
Carbon tetrachloride	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Chlorobenzene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Chloroform	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2-Dichloroethane	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,1-Dichloroethene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Tetrachloroethene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Trichloroethene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Vinyl chloride	100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
4-Bromofluorobenzene	%	100	85	112	86	97	99	97	111	103	104	95	109	95	105
Dibromofluoromethane	%	129	93	145	102	110	138	109	118	137	134	117	117	109	135
Toluene-d8	%	107	98	118	99	115	105	113	106	111	113	104	108	111	113
Semivolatile Organics - TCLP	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Cresol, M&P	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,4-Dichlorobenzene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4-Dinitrotoluene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Hexachlorobenzene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Hexachlorobutadiene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Hexachloroethane	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Methylphenol	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Nitrobenzene	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Pentachlorophenol	250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250	< 250
Pyridine	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4,5-Trichlorophenol	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2,4,6-Trichlorophenol	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
2-Fluorophenol	%	21	1	29	1	1	19	10	35	28	21	24	25	20	22
Phenol-d5	%	14	0	20	0	0	12	7	24	19	13	18	15	13	14
Nitrobenzene-d5	%	67	78	73	71	67	67	76	74	65	68	72	66	64	64

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Appendix C

1999 E BUILDING PRE-REMOVAL SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations													
		A-2	B-8	B-12	C-8	C-8 FD	D-3	D-7	D-8	D-8 FD	D-11	E-3	E-5	E-10	E-12
2-Fluorobiphenyl	%	64	71	65	68	63	60	72	65	58	64	66	62	61	58
2,4,6-Tribromophenol	%	74	27	71	40	34	66	64	78	68	72	61	69	58	59
Terphenyl-dl4	%	54	83	72	68	61	64	68	70	65	59	64	56	54	71
Metals - TCLP	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
Arsenic	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Barium	2.8	224 B	440 B	365 B	436 B	354 B	232 B	339 B	418 B	430 B	236 B	240 B	251 B	231 B	292 B
Cadmium	2.0	< 2.0	< 0.4	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chromium	7.2	< 7.2	< 10.0	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2
Copper	14.4	< 14.4	< 0.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	< 14.4	30.6 B
Lead	6.4	< 6.4	< 10.0	< 6.4	13.7 B	12.5 B	< 6.4	**2430**	13.3 B	< 6.4	6.5 B	9.6 B	18.8 B	< 6.4	< 6.4
Mercury	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Selenium	11.6	< 11.6	< 0.4	12.0 B	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	< 11.6	11.8 B
Silver	10.0	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Zinc	2.8	< 2.8	26.9 B	4.9 B	11.5 B	34.9 B	< 2.8	38.9 B	3.0 B	< 2.8	49.3 B	25.6 B	9.9 B	< 2.8	< 2.8
Chemistry															
pH		**8.36**	**8.56**	**8.41**	**8.63**	**8.82**	**8.19**	**8.83**	**7.99**	**8.13**	**8.52**	**8.78**	**9.24**	**8.07**	**8.47**
Cyanide (mg/kg)	0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49	< 0.49
Reactive Sulfide (mg/kg)	22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2	< 22.2
Radionuclides	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**
Tritium	0.020 - 0.036	**0.04**	**0.22**	**0.21**	**0.43**	**0.50**	**1.26**	**0.72**	**0.47**	**0.35**	**0.19**	**1.23**	**0.67**	**0.12**	**0.43**
Gross Alpha	4.08 - 8.63	**5.60**	**8.64**	**5.96**	**5.30**	**8.29**	**3.91**	**7.90**	**4.17**	**4.37**	**8.81**	**3.45**	**7.44**	**9.59**	**3.81**
Gross Beta	3.54 - 4.41	**9.66**	**12.9**	**10.50**	**8.05**	**12.4**	**11.3**	**15.2**	**12.4**	**12.1**	**13.20**	**8.81**	**11.80**	**16.7**	**10.50**
Cesium 137	0.11 - 0.19	< 0.11	< 0.16	< 0.17	< 0.17	< 0.17	< 0.13	< 0.14	< 0.14	< 0.14	< 0.19	< 0.18	< 0.13	< 0.15	< 0.17
Lead 212	0.15 - 0.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.24**	ND	**0.24**	**0.27**	**0.21**
Lead 214	0.18 -0.21	ND	**0.43**	ND	ND	**0.33**	ND	ND	**0.24**	ND	ND	ND	ND	ND	**0.43**
Plutonium 238	0.077 - 0.200	**0.068**	**0.028**	**0.060**	-0.009	**0.013**	**0.025**	**0.018**	**0.004**	**0.007**	-0.020	-0.011	**0.009**	**0.030**	**0.013**
Plutonium 239/240	0.040 - 0.140	**0.015**	**0.006**	**0.053**	-0.030	**0.023**	-0.008	0.000	**0.012**	**0.027**	**0.008**	-0.021	**0.200**	**0.024**	**0.018**
Potassium 40	1.02 - 2.38	**6.08**	**3.64**	**5.14**	**5.10**	**7.45**	**6.63**	**11.9**	**5.87**	**7.79**	**9.10**	**5.35**	**8.43**	**10.6**	**5.92**
Thorium 228	0.07 - 0.20	**0.49**	**0.30**	**0.30**	**0.37**	**0.28**	**0.21**	**0.42**	**0.28**	**0.17**	**0.33**	**0.36**	**0.38**	**0.42**	**0.28**
Thorium 230	0.09 - 0.42	**1.14**	**1.12**	**0.84**	**1.20**	**1.14**	**0.82**	**0.64**	**1.06**	**0.88**	**1.38**	**1.13**	**1.00**	**1.11**	**1.00**

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Appendix C

1999 E BUILDING PRE-REMOVAL SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations													
		A-2	B-8	B-12	C-8	C-8 FD	D-3	D-7	D-8	D-8 FD	D-11	E-3	E-5	E-10	E-12
Thorium 232	0.04 - 0.20	**0.36**	**0.20**	**0.38**	**0.34**	**0.41**	**0.25**	**0.43**	**0.24**	**0.29**	**0.44**	**0.40**	**0.36**	**0.47**	**0.27**
Uranium 234	0.030 - 0.190	**0.55**	**0.25**	**0.37**	**0.45**	**0.47**	**0.27**	**0.44**	**0.37**	**0.48**	**0.32**	**0.30**	**0.34**	**0.55**	**0.39**
Uranium 235	0.017 - 0.110	-0.016	**0.030**	**0.020**	**0.045**	**0.003**	**0.003**	**0.029**	**0.037**	**0.011**	**0.02**	**0.015**	**0.022**	**0.059**	**0.035**
Uranium 238	0.030 - 0.093	**0.45**	**0.29**	**0.041**	**0.43**	**0.53**	**0.40**	**0.56**	**0.43**	**0.42**	**0.52**	**0.43**	**0.41**	**0.56**	**0.46**

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D

APPENDIX D

2001 E BUILDING VERIFICATION SAMPLING DATA

Table Key

B	Organic parameter identified in the blank.
B	The inorganic analysis indicates the presence of an analyte below the established reporting limit but above the instrument's detection limit.
FD	Field duplicate.
J	The associated numerical value is the approximate concentration of the analyte.
ND	Not detected.
U	The parameter was not detected.
ug/kg	Micrograms per kilograms.
mg/kg	Milligrams per kilograms.
pCi/g	PicoCuries per gram.
50	Numbers in bold indicate a result above the analytical method's reporting limit.
Note:	Radiological isotopic analyses supersede gamma spectroscopy results.

Appendix D

2001 E BUILDING VERIFICATION SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations								
		E101	E107	E115	E115 FD	E129	E151	E175	E176	E184
Volatile Organics	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
Acetone	11 - 12	< 12	< 11	3.1 J,B	< 11	< 11	< 11	4.1 J,B	5.2 J	3.8 J,B
Benzene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Bromodichloromethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Bromoform	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Bromomethane	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
2-Butanone	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	2.7 J
Carbon disulfide	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Carbon tetrachloride	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Chlorobenzene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Chloroethane	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
Chloroform	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Chloromethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Dibromochloromethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,1-Dichloroethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,2-Dichloroethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,1-Dichloroethene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,2-Dichloroethene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,2-Dichloropropane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
cis-1,3-Dichloropropene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
trans-1,3-Dichloropropene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Ethylbenzene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
2-Hexanone	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
Methylene chloride	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	1.4 J	< 5.3
4-Methyl-2-pentanone	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
Styrene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,1,2,2-Tetrachloroethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Tetrachloroethene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Toluene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,1,1-Trichloroethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3

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Appendix D

2001 E BUILDING VERIFICATION SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations								
		E101	E107	E115	E115 FD	E129	E151	E175	E176	E184
1,1,2--Trichloroethane	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
Trichloroethene	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
1,1,2-Trichloro-1,2,2-trifluoroethane	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
Vinyl chloride	11 - 12	< 12	< 11	< 11	< 11	< 11	< 11	< 11	< 11	< 11
Xylenes (total)	5.3 - 5.8	< 5.8	< 5.3	< 5.4	< 5.4	< 5.5	< 5.6	< 5.3	< 5.6	< 5.3
4-Bromofluorobenzene	59 -113	101	92	99	105	103	104	98	101	98
Toluene-d8	84 - 138	101	95	99	102	105	107	107	105	105
1,2-Dichloroethane-d4	70 - 121	950	86	94	95	95	95	96	96	98
Semivolatile Organics	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
Acenaphthene	350 - 380	< 380	< 350	< 350	< 360	< 360	92 J	< 350	190 J	< 350
Acenaphthylene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Anthracene	350 - 380	< 380	< 350	< 350	< 360	< 360	130 J	< 350	**400**	< 350
Benzo (a) anthracene	350 - 380	120 J	< 350	< 350	< 360	< 360	**420**	83 J	**1100**	< 350
Benzo (a) pyrene	350 - 380	110 J	< 350	< 350	< 360	< 360	**400**	72 J	**1100**	< 350
Benzo (b) fluoranthene	350 - 380	100 J	< 350	< 350	< 360	< 360	**390**	< 350	**1000**	< 350
Benzo (ghi) perylene	350 - 380	100 J	< 350	< 350	< 360	< 360	330 J	< 350	**770**	< 350
Benzo (k) fluoranthene	350 - 380	93 J	< 350	< 350	< 360	< 360	290 J	< 350	**860**	< 350
4-Bromophenyl phenyl ether	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Butyl benzyl phthalate	350 - 380	**490**	< 350	< 350	< 360	< 360	< 370	260 J	< 370	< 350
Carbazole	350 - 380	< 380	< 350	< 350	< 360	< 360	79 J	< 350	200 J	< 350
4-Chloroaniline	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
bis (2-Chloroethoxy) methane	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
bis (2-Chloroethyl)-ether	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
4-Chloro-3-methylphenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Chloronaphthalene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Chlorophenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
4-Chlorophenyl phenyl ether	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,2'-oxybis (1-Chloropropane)	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Chrysene	350 - 380	130 J	< 350	< 350	< 360	< 360	**440**	88 J	**1200**	< 350
Dibenzofuran	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	87 J	< 350

Appendix D

2001 E BUILDING VERIFICATION SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations								
		E101	E107	E115	E115 FD	E129	E151	E175	E176	E184
1,2-Dichlorobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
1,3-Dichlorobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
1,4-Dichlorobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
3,3'-Dichlorobenzidine	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,4-Dichlorophenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Diethyl phthalate	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Dimethyl phthalate	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,4-Dimethylphenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Di-n-butyl phthalate	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
4,6-Dinitro-2-methylphenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,4-Dinitrophenol	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
2,4-Dinitrotoluene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,6-Dinitrotoluene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Di-n-octyl phthalate	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
bis (2-Ethylhexyl) phthalate	350 - 380	**520**	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Fluoranthene	350 - 380	280 J	95 J	< 350	< 360	< 360	**930**	170 J	**2600**	78 J
Fluorene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	130 J	< 350
Hexachlorobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Hexachlorobutadiene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Hexachlorocyclopentadiene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Hexachloroethane	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Indeno (1,2,3-cd) pyrene	350 - 380	84 J	< 350	< 350	< 360	< 360	270 J	< 350	**670**	< 350
Isophorone	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Methylnaphthalene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Methylphenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
4-Methylphenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Naphthalene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	86 J	< 350
2-Nitroaniline	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
3-Nitroaniline	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
4-Nitroaniline	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850

Appendix D

2001 E BUILDING VERIFICATION SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations								
		E101	E107	E115	E115 FD	E129	E151	E175	E176	E184
Nitrobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Nitrophenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
4-Nitrophenol	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
N-Nitrosodi-n-propylamine	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
N-Nitrosodiphenylamine	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Pentachlorophenol	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
Phenanthrene	350 - 380	260 J	74 J	< 350	< 360	< 360	**600**	130 J	**1900**	< 350
Phenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
Pyrene	350 - 380	210J	88 J	< 350	< 360	< 360	**790**	150 J	**2000**	71 J
1,2,4-Trichlorobenzene	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2,4,5-Trichlorophenol	850 - 930	< 930	< 850	< 860	< 860	< 870	< 900	< 850	< 900	< 850
2,4,6-Trichlorophenol	350 - 380	< 380	< 350	< 350	< 360	< 360	< 370	< 350	< 370	< 350
2-Fluorophenol	25 - 121	64	68	88	72	64	64	72	60	76
Phenol-d5	24 - 113	64	60	92	68	64	64	72	60	76
Nitrobenzene-d5	23 - 120	53	66	78	66	59	58	60	50	66
2-Fluorobiphenyl	30 - 115	58	72	78	72	66	66	72	59	72
2,4,6-Tribromophenol	19 - 122	44	76	80	64	68	64	48	48	48
Terphenyl-dl4	10 - 157	47	78	72	66	60	60	72	55	66
2-Chlorophenol-d4	20 - 130	68	56	80	72	64	68	72	60	76
1,2-Dichlorobenzene-d4	20 - 130	46	52	54	54	50	47	49	37	59
Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Aluminum	26.5 - 29.0	**6860**	**7330**	**3070**	**3280**	**8730**	**8470**	**2650**	**6370**	**3580**
Antimony	2.1 - 2.3	< 2.3	< 2.1	< 2.1	< 2.2	< 2.2	0.91 B	< 2.1	1.2 B	< 2.1
Arsenic	2.1 - 2.3	**7.3**	1.7 B	**5.2**	**5.0**	**2.2**	**5.0**	**2.8**	**6.0**	**4.3**
Barium	42.4 - 46.4	**48.0**	21.5 B	22.3 B	23.0 B	21.2 B	**57.3**	18.7 B	33.3 B	18.3 B
Beryllium	0.21 - 0.23	**0.35**	**0.43**	0.13 B	0.15 B	**0.50**	**0.45**	< 0.21	**0.32**	0.15 B
Cadmium	1.1 - 1.6	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Calcium	10600-11600	**116000**	**210000**	**117000**	**115000**	**195000**	**150000**	**179000**	**129000**	**149000**
Chromium	2.1 - 2.3	**9.3**	**8.8**	**4.9**	**6.0**	**10.4**	**11.1**	**9.0**	**8.6**	**6.8**
Cobalt	10.6 - 11.6	4.5 B	4.7 B	2.9 B	3.1 B	5.7 B	5.9 B	2.7 B	4.9 B	3.4 B

Appendix D

2001 E BUILDING VERIFICATION SAMPLING RESULTS

Parameter	Reporting Limit	E Building Sampling Locations								
		E101	E107	E115	E115 FD	E129	E151	E175	E176	E184
Copper	5.3 - 5.8	**15.0**	**9.7**	**8.2**	**8.0**	**9.2**	**11.3**	**6.9**	**11.4**	**8.1**
Iron	21.2 - 23.2	**14700**	**15400**	**8210**	**8670**	**17700**	**15700**	**6120**	**14100**	**8070**
Lead	0.64 - 0.70	**8.4**	**8.6**	**4.3**	**4.5**	**6.5**	**9.4**	**3.0**	**9.7**	**4.9**
Magnesium	10600-11600	**37800**	**26600**	**39300**	**42800**	**20900**	**29300**	**69200**	**36800**	**61100**
Manganese	3.2 - 3.5	**361**	**330**	**223**	**204**	**339**	**469**	**253**	**339**	**306**
Mercury	0.11 - 0.12	< 0.12	< 0.11	< 0.11	< 0.11	0.083 B	< 0.11	< 0.11	< 0.11	0.085 B
Nickel	8.5 - 9.3	**12.2**	**10.5**	< 8.6	< 8.6	**12.8**	**12.5**	< 8.5	**10.7**	**10.8**
Potassium	1060 - 1160	**1870**	**3450**	977 B	956 B	**3930**	**2440**	872 B	**2310**	**1150**
Selenium	1.1 - 1.2	< 1.2	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1
Silver	2.1 - 2.3	< 2.3	< 2.1	< 2.1	< 2.2	< 2.2	< 2.2	< 2.1	< 2.2	< 2.1
Sodium	1060 - 1160	547 B	504 B	448 B	476 B	484 B	561 B	472 B	500 B	516 B
Thallium	2.1 - 2.3	1.3 B	1.0 B	< 2.1	< 2.2	1.3 B	1.1 B	< 2.1	1.1 B	< 2.1
Vanadium	2.6 - 2.9	**17.0**	**10.3**	**10.3**	**11.4**	**11.7**	**17.3**	**9.5**	**13.0**	**11.3**
Zinc	4.2 - 4.6	**41.1**	**24.5**	**25.9**	**27.3**	**28.2**	**38.1**	**15.2**	**43.8**	**19.0**
Radionuclides	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**
Tritium	0.93 - 0.97	< 0.93	< 0.96	< 0.96		**1.30 J**	**2.56 J**	< 0.96	**1.04 J**	1.88 J
Plutonium 238	0.027 - 0.150	< 0.070	< 0.055	< 0.063		< 0.150	< 0.027	< 0.091	< 0.042	< 0.085
Plutonium 239/240	0.007 - 0.082	<0.057	< 0.044	< 0.036		< 0.082	0.020 J	< 0.053	< 0.0069	< 0.081
Thorium 228	0.08 - 0.24	**0.40 J**	**0.36 J**	**0.31 J**		**0.45 J**	**0.70 J**	**0.22 J**	**0.39 J**	**0.28 J**
Thorium 230	0.04 - 0.25	**1.02**	**0.86 J**	**0.90 J**		**0.58 J**	**1.13**	**0.57 J**	**0.79 J**	**0.78 J**
Thorium 232	0.05 - 0.16	**0.54 J**	**0.53 J**	**0.35 J**		**0.62 J**	**0.76 J**	**0.17 J**	**0.42 J**	**0.38 J**
Uranium 234	0.03 - 0.11	**0.56 J**	**0.49 J**	**0.53 J**		**0.63 J**	**0.67 J**	**0.61 J**	**0.73 J**	**0.51 J**
Uranium 235	0.040 - 0.120	< 0.100	< 0.089	< 0.044		< 0.060	< 0.120	< 0.13	**0.044 J**	< 0.081
Uranium 238	0.04 - 0.09	**0.52 J**	**0.51 J**	**0.56 J**		**0.54 J**	**0.64 J**	**0.58 J**	**0.54 J**	**0.69 J**

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000685
FILE ID: F0000329.S0
PRIORITY:

Description\Location: E101A

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.02	45,000
Cs-137	*	0.01	0.03	45,000
Pb-210	*	0.64	0.73	45,000
Ra-226	*	0.54	0.99	800
Ac-227 (D)	*	0.00	0.26	40
Th-230	*	3.45	7.76	800
Th-232 (D)		0.29	0.08	130
Pu-238	*	4.64	24.64	500
Am-241	*	0.00	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.03 nCi/g

Σ Respirator 0.07

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS GVM

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000684
FILE ID: A0000362.S0
PRIORITY:

Description\Location:
E107

Collector: 4488

Date Received: 3/7/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.04	45,000
Cs-137	*	0.00	0.04	45,000
Pb-210	*	0.26	0.78	45,000
Ra-226	*	0.61	0.78	800
Ac-227 (D)	*	0.00	0.27	40
Th-230	*	3.99	7.09	800
Th-232 (D)		0.28	0.13	130
Pu-238	*	0.00	63.45	500
Am-241	*	0.03	0.08	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.07 nCi/g

Σ Respirator 0.15

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS [illegible]

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000680
FILE ID: F0000327.S0
PRIORITY:

Description\Location: E115

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.01	0.03	45,000
Pb-210		0.85	0.75	45,000
Ra-226	*	0.79	0.80	800
Ac-227 (D)	*	0.15	0.34	40
Th-230	*	0.00	8.09	800
Th-232 (D)		0.22	0.11	130
Pu-238	*	2.31	12.82	500
Am-241	*	0.10	0.10	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.05

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS gdm

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000681
FILE ID: A0000360.S0
PRIORITY:

Description\Location: E129

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.06	45,000
Cs-137	*	0.00	0.04	45,000
Pb-210	*	0.37	0.92	45,000
Ra-226	*	0.44	1.02	800
Ac-227 (D)	*	0.00	0.28	40
Th-230	*	4.25	7.70	800
Th-232 (D)		0.35	0.14	130
Pu-238	*	24.50	70.31	500
Am-241		0.12	0.07	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.08 nCi/g

Σ Respirator 0.16

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6 d w

D 1256 16

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H00000686
FILE ID: A0000363.S0
PRIORITY:

Description\Location:
E15.

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.05	45,000
Cs-137	*	0.03	0.04	45,000
Pb-210	*	0.87	0.99	45,000
Ra-226	*	0.34	1.01	800
Ac-227 (D)	*	0.10	0.26	40
Th-230	*	5.76	8.98	800
Th-232 (D)		0.46	0.13	130
Pu-238	*	0.00	83.58	500
Am-241	*	0.00	0.11	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.10 nCi/g

Σ Respirator 0.19

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6d 01

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000682
FILE ID: A0000361.S0
PRIORITY:

Description\Location: E17

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.03	45,000
Cs-137	*	0.00	0.03	45,000
Pb-210	*	0.01	0.74	45,000
Ra-226		0.68	0.64	800
Ac-227 (D)	*	0.07	0.17	40
Th-230	*	0.00	0.74	800
Th-232 (D)		0.25	0.06	130
Pu-238	*	1.28	58.05	500
Am-241	*	0.06	0.06	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.07 nCi/g

Σ Respirator 0.13

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ LOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6 O m

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000683
FILE ID: F0000328.S0
PRIORITY:

Description\Location: E176

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.04	45,000
Cs-137	*	0.02	0.03	45,000
Pb-210	*	0.06	0.92	45,000
Ra-226	*	0.33	1.00	800
Ac-227 (D)	*	0.00	0.30	40
Th-230	*	5.86	8.46	800
Th-232 (D)		0.34	0.12	130
Pu-238	*	0.45	28.98	500
Am-241	*	0.00	0.09	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.04 nCi/g

Σ Respirator 0.08

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6 U m

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000679
FILE ID: A0000359.S0
PRIORITY:

Description\Location:
E184

Collector: 4488

Date Received: 3/7/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.00	0.03	45,000
Pb-210	*	0.45	0.46	45,000
Ra-226	*	0.66	0.69	800
Ac-227 (D)	*	0.04	0.18	40
Th-230	*	0.37	6.18	800
Th-232 (D)		0.20	0.07	130
Pu-238	*	0.00	49.71	500
Am-241	*	0.04	0.06	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.06 nCi/g

Σ Respirator 0.11

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/8/01 Counted By: 5890 Analyzed By: 5613 INITIALS [illegible]

E

APPENDIX E

E BUILDING SANITARY TRENCH SAMPLING DATA

Table Key

B	Organic parameter identified in the blank.
B	The inorganic analysis indicates the presence of an analyte below the established reporting limit but above the instrument's detection limit.
FD	Field duplicate.
J	The associated numerical value is the approximate concentration of the analyte.
ND	Not detected.
U	The parameter was not detected.
ug/L	Micrograms per liter.
ug/kg	Micrograms per kilograms.
mg/kg	Milligrams per kilograms.
pCi/g	PicoCuries per gram.
50	Numbers in bold indicate a result above the analytical method's reporting limit.
Note:	Radiological isotopic analyses supersede gamma spectroscopy results.

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Appendix E

E BUILDING TRENCH SAMPLING RESULTS

Parameter	Reporting Limit	E Sanitary Trench Sampling Locations					
		E-ST-1	E-ST-2	E-ST-FD	E-ST-3	E-ST-4	E-ST-2 Grd Water
Volatile Organics	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
Acetone	11	10 JB	11 J,B	12 B	10 J,B	11 J,B	
Benzene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Bromodichloromethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Bromoform	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Bromomethane	5.3-5.7	< 5.5	1.2 J,B	< 5.7	1.1 J,B	< 5.3	
2-Butanone	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Carbon disulfide	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Carbon tetrachloride	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Chlorobenzene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Chloroethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Chloroform	11	< 11	< 11	< 11	< 11	< 11	
Chloromethane	11	< 11	< 11	< 11	< 11	< 11	
Dibromochloromethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,1-Dichloroethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,2-Dichloroethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,1-Dichloroethene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,2-Dichloroethene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,2-Dichloropropane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
cis-1,3-Dichloropropene	11	< 11	< 11	< 11	< 11	< 11	
trans-1,3-Dichloropropene	11	< 11	< 11	< 11	< 11	< 11	
Ethylbenzene	11	< 11	< 11	< 11	< 11	< 11	
2-Hexanone	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Methylene chloride	11	3.8 J,B	2.8 J,B	3.4 J,B	3.6 J,B	3.1 J,B	
4-Methyl-2-pentanone	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Styrene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,1,2,2-Tetrachloroethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Tetrachloroethene	5.3-5.7	1.9 J	**7.3**	1.8 J	< 5.3	< 5.3	
Toluene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,1,1-Trichloroethane	5.3-5.7	< 5.5	1.3 J	**8.5**	1.6 J	< 5.3	
1,1,2--Trichloroethane	11	< 11	< 11	< 11	< 11	< 11	
Trichloroethene	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
1,1,2-Trichloro-1,2,2-trifluoroethane	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Vinyl chloride	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
Xylenes (total)	5.3-5.7	< 5.5	< 5.6	< 5.7	< 5.3	< 5.3	
4-Bromofluorobenzene	59 -113	83	86	93	84	83	
Toluene-d8	84 - 138	94	98	105	104	105	
1,2-Dichloroethane-d4	70 - 121	86	93	97	93	95	
Semivolatile Organics	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/L**
Acenaphthene	350 - 380	330 J	< 380	100 J	< 380	< 360	
Acenaphthylene	350 - 380	< 350	< 380	< 370	< 380	< 360	
Anthracene	350 - 380	**370**	< 380	170 J	190 J	< 360	
Benzo (a) anthracene	350 - 380	**660**	< 380	350 J	< 380	160 J	

Appendix E

E BUILDING TRENCH SAMPLING RESULTS

Parameter	Reporting Limit	E Sanitary Trench Sampling Locations					
		E-ST-1	E-ST-2	E-ST-FD	E-ST-3	E-ST-4	E-ST-2 Grd Water
Benzo (a) pyrene	350 - 380	**480**	< 380	310 J	120 J	130 J	
Benzo (b) fluoranthene	350 - 380	**470**	< 380	310 J	140 J	150 J	
Benzo (ghi) perylene	350 - 380	260 J	< 380	160 J	< 380	160 J	
Benzo (k) fluoranthene	350 - 380	**430**	< 380	280 J	120 J	110 J	
4-Bromophenyl phenyl ether	350 - 380	< 350	< 380	< 370	< 380	< 360	
Butyl benzyl phthalate	350 - 380	< 350	< 380	< 370	< 380	< 360	
Carbazole	350 - 380	110 J	< 380	110 J	< 380	< 360	
4-Chloroaniline	350 - 380	< 350	< 380	< 370	< 380	< 360	
bis (2-Chloroethoxy) methane	350 - 380	< 350	< 380	< 370	< 380	< 360	
bis (2-Chloroethyl)-ether	350 - 380	< 350	< 380	< 370	< 380	< 360	
4-Chloro-3-methylphenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Chloronaphthalene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Chlorophenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
4-Chlorophenyl phenyl ether	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,2'-oxybis (1-Chloropropane)	350 - 380	< 350	< 380	< 370	< 380	< 360	
Chrysene	350 - 380	**650**	< 380	**370**	< 380	170 J	
Dibenzofuran	350 - 380	100 J	< 380	< 370	< 380	< 360	
1,2-Dichlorobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
1,3-Dichlorobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
1,4-Dichlorobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
3,3'-Dichlorobenzidine	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,4-Dichlorophenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
Diethyl phthalate	350 - 380	< 350	< 380	< 370	< 380	< 360	
Dimethyl phthalate	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,4-Dimethylphenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
Di-n-butyl phthalate	350 - 380	< 350	< 380	< 370	< 380	< 360	
4,6-Dinitro-2-methylphenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,4-Dinitrophenol	850 - 930	< 850	< 920	< 900	< 930	< 860	
2,4-Dinitrotoluene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,6-Dinitrotoluene	350 - 380	< 350	< 380	< 370	< 380	< 360	
Di-n-octyl phthalate	350 - 380	< 350	< 380	< 370	< 380	< 360	
bis (2-Ethylhexyl) phthalate	350 - 380	< 350	97 J	**610**	120 J	**360**	
Fluoranthene	350 - 380	**1300**	110 J	**890**	320 J	250 J	
Fluorene	350 - 380	190 J	< 920	120 J	< 930	< 860	
Hexachlorobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
Hexachlorobutadiene	350 - 380	< 350	< 380	< 370	< 380	< 360	
Hexachlorocyclopentadiene	350 - 380	< 350	< 380	< 370	< 380	< 360	
Hexachloroethane	350 - 380	< 350	< 380	< 370	< 380	< 360	
Indeno (1,2,3-cd) pyrene	350 - 380	220 J	< 380	140 J	< 380	120 J	
Isophorone	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Methylnaphthalene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Methylphenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
4-Methylphenol	350 - 380	< 350	< 380	< 370	< 380	< 360	

Appendix E

E BUILDING TRENCH SAMPLING RESULTS

Parameter	Reporting Limit	E Sanitary Trench Sampling Locations					
		E-ST-1	E-ST-2	E-ST-FD	E-ST-3	E-ST-4	E-ST-2 Grd Water
Naphthalene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Nitroaniline	850 - 930	< 850	< 920	< 900	< 930	< 860	
3-Nitroaniline	850 - 930	< 850	< 920	< 900	< 930	< 860	
4-Nitroaniline	850 - 930	< 850	< 920	< 900	< 930	< 860	
Nitrobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Nitrophenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
4-Nitrophenol	850 - 930	< 850	< 920	< 900	< 930	< 860	
N-Nitrosodi-n-propylamine	350 - 380	< 350	< 380	< 370	< 380	< 360	
N-Nitrosodiphenylamine	350 - 380	< 350	< 380	< 370	< 380	< 360	
Pentachlorophenol	850 - 930	< 850	< 920	< 900	< 930	< 860	
Phenanthrene	350 - 380	**1600**	< 380	**600**	180 J	150 J	
Phenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
Pyrene	350 - 380	**2000**	86 J	**670**	280 J	180 J	
1,2,4-Trichlorobenzene	350 - 380	< 350	< 380	< 370	< 380	< 360	
2,4,5-Trichlorophenol	850 - 930	< 850	< 920	< 900	< 930	< 860	
2,4,6-Trichlorophenol	350 - 380	< 350	< 380	< 370	< 380	< 360	
2-Fluorophenol	25 - 121	63	53	49	44	63	
Phenol-d5	24 - 113	64	50	50	44	62	
Nitrobenzene-d5	23 - 120	53	47	40	37	56	
2-Fluorobiphenyl	30 - 115	56	52	44	40	58	
2,4,6-Tribromophenol	19 - 122	55	49	61	34	50	
Terphenyl-dl4	10 - 157	82	59	55	52	50	
2-Chlorophenol-d4	20 - 130	65	51	50	45	65	
1,2-Dichlorobenzene-d4	20 - 130	42	37	36	33	49	
Metals	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**ug/L**
Aluminum	26.6 - 29	**2100**	**2010**	**2310**	**2220**	**4720**	< 200
Antimony	2.1-2.3	< 2.1	< 2.3	< 2.3	< 2.3	< 2.2	< 60
Arsenic	2.1 - 2.3	**5.6**	**2.8**	**3.6**	**2.7**	**4.3**	< 10
Barium	42.5 - 46.5	23.4 B	29.7 B	**102**	41.9 B	**49.3**	77.3 B
Beryllium	0.21 - 0.23	< 0.21	0.18 B	0.19 B	0.15 B	**0.28**	< 5
Cadmium	1.1-1.2	< 1.1	< 1.2	< 1.1	< 1.2	< 1.1	0.7 B
Calcium	26600-29000	**147000**	**199000**	**153000**	**142000**	**129000**	**840000**
Chromium	2.1 - 2.3	**7.5**	**4.5**	**16.5**	**5.4**	**15.4**	< 10
Cobalt	10.6 - 11.6	3.3 B	1.7 B	2.2 B	3.1 B	3.9 B	2.4 B
Copper	5.3 - 5.8	**11.6**	**14.8**	5.0 B	4.1 B	**25.5**	5.6 B
Iron	21.3 - 23.2	**7550**	**4900**	**6020**	**8140**	**16900**	< 100
Lead	0.64 - 0.70	**10.4**	**9.3**	**6.8**	**6.6**	**33.8**	< 3
Magnesium	26600-29000	**51600**	**70100**	**68000**	**68900**	**65100**	**188000**
Manganese	3.2 - 3.5	**199**	**215**	**204**	**192**	**250**	**506**
Mercury	0.11 - 0.12	0.094 B	**0.51**	0.09 B	0.032 B	**0.85**	< 0.2
Nickel	8.5 - 9.3	**11.2**	6.1 B	**11.4**	**9.8**	**12.5**	**60.2**
Potassium	1065 - 1160	603 B	557 B	554 B	401 B	1080 B	**77800**
Selenium	1.1-1.2	< 1.1	< 1.2	< 1.1	< 1.2	< 1.1	2.1 B

Appendix E

E BUILDING TRENCH SAMPLING RESULTS

Parameter	Reporting Limit	E Sanitary Trench Sampling Locations					
		E-ST-1	E-ST-2	E-ST-FD	E-ST-3	E-ST-4	E-ST-2 Grd Water
Silver	2.1-2.3	< 2.1	< 2.3	< 2.3	< 2.3	1.0 B	< 10
Sodium	1060 - 1160	284 B	352 B	397 B	362 B	312 B	**301000**
Thallium	2.1 - 2.3	0.63 B	0.79 B	0.47 B	0.48 B	0.90 B	3.8 B
Vanadium	2.7 - 2.9	**7.2**	**6.7**	**7.6**	**9.1**	**14.0**	< 50
Zinc	4.3 - 4.7	**28.5**	**15.1**	**12.7**	**12.6**	**40.3**	< 20
Total Cyanide	0.27 - 0.29	< 0.27	< 0.29	< 0.28	< 0.29	< 0.27	
Radionuclides	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	**pCi/g**	
Tritium	< 600	< 600	< 600		< 600	< 600	
Plutonium 238	0.006 - 0.009	**0.613**	**0.279**		**0.029**	**1.849**	
Plutonium 239/240	0.008 - 0.026	< 0.026	**0.124**		**0.009**	< 0.021	
Thorium 227	0.012 - 0.028	**0.126**	**0.118**		**0.068**	**0.128**	
Thorium 228	0.006 - 0.042	**0.352**	**0.338**		**0.347**	**0.513**	
Thorium 230	0.006 -0.033	**1.602**	**0.647**		**0.687**	**0.853**	
Thorium 232	0.006 - 0.042	**0.397**	**0.309**		**0.305**	**0.452**	
Uranium 233/234	0.005 - 0.016	**0.544**	**0.474**		**0.494**	**0.711**	
Uranium 235	0.005 - 0.015	**0.019**	**0.032**		**0.022**	**0.029**	
Uranium 238	0.005 - 0.006	**0.567**	**0.506**		**0.524**	**0.681**	

E-BUILDING SOIL SCREENING LEVEL (SSL) CALCULATIONS

Parameters for soil leaching calculation:			
Definition	**Parameter**	**Main Hilltop soil**	**Units**
source length parallel to ground water flow	**L**	**20**	**m**
aquifer thickness (DOE 1994)	da	15	m
hydraulic conductivity (DOE 1994)	K	52	m/y
hydraulic gradient at the source	**i**	**0.008**	**m/m**
horizontal distance to receptor	**xr**	**150**	**m**
infiltration rate (Schairbaum & Frost 1988)	in	0.15	m/y
soil-water partition coefficient (Koc * foc for organic chemicals)	Kd	chemical specific	L/kg
saturated porosity	Ow	0.15	
air filled porosity	Oa	0.28	
Henry's Law constant * 41 (0 for metals and radionuclides)	H	chemical specific	
dry soil bulk density	B	1.6	kg/L
soil organic carbon/water partition coefficient	Koc	chemical specific	L/kg
fraction organic carbon in soil (DOE Mound Plant Data Base)	foc	0.02	
mixing zone depth	d	15	m
dilution factor (used to multiply the target concentration)	df=	3.08	

Results for Detected Volatile Organic Compounds

CHEMICAL NAME	H	Koc	foc	Kd	MCL	Acceptable	Cw	SSL
		L/kg		L/kg	mg/L	Concentration (mg/L)	mg/L	mg/kg
Tetrachloroethylene	7.09E-01	139	0.02	2.78	0.005	0.005	0.02	**0.05**
1,1,1-Trichloroethane	7.63E-01	110	0.02	2.2	0.2	0.2	0.62	**1.50**

BWXT of Ohio, Inc.

ANALYTICAL SERVICES REQUEST FOR ANALYSIS

DATE SUBMITTED	SAMPLE TYPE	COLLECTED BY	NUMBER OF SAMPLES
4-4-01	SOIL	HARVEY	4

PROJECT/FUNCTION:	PRIMARY CONTACT/PHONE NO.:	MAIL STOP
E-SLAB ~~D00130~~	HARVEY 3163	OSW417D

CHARGE NUMBER:	DATE(S) COLLECTED	RSDS# (if applicable)	ATTACHMENTS (list)
D00130	3-28-01	01-E-045.	

ANALYSES REQUESTED (check):

- [x] ^3H
- [ ] Characterize/Approve for Sanitary or Storm Discharge. Estimate of Total Volume for Release_____ Approved_____
- [ ] Gross Alpha
- [ ] Air Filter – Isotopic Analysis
- [ ] Characterization per MD-80036, Operation #10015
- [x] Isotopic Analysis: Pu X U X Th X Am____ Other____
- [ ] Other _____

ADDITIONAL INFORMATION:

NOTE: Attach additional information (e.g. RSDS, screening results, collection data, and gamma spec. results) if applicable

LAB IDENTIFICATION	SAMPLE LOCATION	SAMPLE NUMBER	RESULTS
0103537	E-TRENCH	1	
538	↓	2	
539	↓	3	
540	↓	4	

COMMENTS:

DJH

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ANALYZED BY: Bradley P Jones

DATE: 4-18-01

ML-5222 (1-01)

E96 32

ONSITE α

Laboratory ID:	0103537-0103540	
Project/function:	E-Slab	
Submitted:	April 4, 2001	
Submitted by:	Dan Harvey	
Point of contact:	Dan Harvey	x3163
RSDS#:	01-E-045	
Date:	April 17, 2001	

Tritium	Sample Location	nCi/L	LDL nCi/L
0103537	E-Trench #1	<LDL	0.6
0103538	E-Trench #2	<LDL	0.6
0103539	E-Trench #3	<LDL	0.6
0103540	E-Trench #4	<LDL	0.6

0103537

Isotope	Sample Location	pCi/gram	Uncertainty	LDL pCi/gram
Plutonium 238	E-Trench #1	0.613	0.057	0.006
Plutonium 239	E-Trench #1	<LDL		0.026
Thorium 232	E-Trench #1	0.397	0.052	0.042
Thorium 230	E-Trench #1	1.602	0.147	0.033
Thorium 228	E-Trench #1	0.352	0.049	0.042
Thorium 227	E-Trench #1	0.126	0.026	0.012
Uranium 238	E-Trench #1	0.567	0.051	0.006
Uranium 235	E-Trench #1	0.019	0.006	0.006
Uranium 233/234	E-Trench #1	0.544	0.050	0.016

0103538

Isotope	Sample Location	pCi/gram	Uncertainty	LDL pCi/gram
Plutonium 238	E-Trench #2	0.279	0.036	0.009
Plutonium 239	E-Trench #2	0.124	0.022	0.009
Thorium 232	E-Trench #2	0.309	0.032	0.006
Thorium 230	E-Trench #2	0.647	0.056	0.006
Thorium 228	E-Trench #2	0.338	0.035	0.006
Thorium 227	E-Trench #2	0.118	0.018	0.015
Uranium 238	E-Trench #2	0.506	0.046	0.005
Uranium 235	E-Trench #2	0.032	0.008	0.005
Uranium 233/234	E-Trench #2	0.474	0.044	0.005

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0103539

Isotope	Sample Location	pCi/gram	Uncertainty	LDL pCi/gram
Plutonium 238	E-Trench #3	0.029	0.010	0.008
Plutonium 239	E-Trench #3	0.009	0.005	0.008
Thorium 232	E-Trench #3	0.305	0.035	0.019
Thorium 230	E-Trench #3	0.687	0.064	0.019
Thorium 228	E-Trench #3	0.347	0.039	0.032
Thorium 227	E-Trench #3	0.068	0.016	0.028
Uranium 238	E-Trench #3	0.524	0.047	0.005
Uranium 235	E-Trench #3	0.022	0.007	0.015
Uranium 233/234	E-Trench #3	0.494	0.045	0.005

0103540

Isotope	Sample Location	pCi/gram	Uncertainty	LDL pCi/gram
Plutonium 238	E-Trench #4	1.849	0.147	0.008
Plutonium 239	E-Trench #4	<LDL		0.021
Thorium 232	E-Trench #4	0.452	0.049	0.008
Thorium 230	E-Trench #4	0.853	0.078	0.008
Thorium 228	E-Trench #4	0.513	0.053	0.008
Thorium 227	E-Trench #4	0.128	0.022	0.022
Uranium 238	E-Trench #4	0.681	0.058	0.005
Uranium 235	E-Trench #4	0.029	0.008	0.005
Uranium 233/234	E-Trench #4	0.711	0.060	0.005

Bradley D Justice [redacted] 4-18-01

Analyst HP# Date

[redacted] 4/18/01

Data Verification HP# Date

DJH

01-E-045 10 of 12

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000721
FILE ID: A0000389.S0
PRIORITY:

Description\Location:
176 FINAL VERIFICATION # 1
LONG COUNT

Collector: 6178

Date Received: 3/28/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.33	0.13	45,000
Ra-226		0.93	0.14	800
Ac-227 (D)	*	0.04	0.04	40
Th-230	*	0.00	1.40	800
Th-232 (D)		0.21	0.02	130
Pu-238	*	0.00	11.37	500
Am-241	*	0.01	0.01	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.01 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: DJH

01-E-045 4 of 12

Date: 4/2/01 Counted By: 5890 Analyzed By: 5613 INITIALS

E 12 of 32

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000722
FILE ID: F0000348.S0
PRIORITY:

Description\Location:
176 FINAL VERIFICATION # 2
LONG COUNT

Collector: 6178

Date Received: 3/28/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210	*	0.00	0.35	45,000
Ra-226		1.03	0.33	800
Ac-227 (D)	*	0.09	0.10	40
Th-230	*	0.46	2.98	800
Th-232 (D)		0.14	0.05	130
Pu-238	*	6.51	10.59	500
Am-241	*	0.01	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments: AJH

01-E-045 5 of 12

Date: 4/2/01 Counted By: 5890 Analyzed By: 5613 INITIALS

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000723
FILE ID: A0000390.S0
PRIORITY:

Description\Location:
176 FINAL VERIFICATION # 3
LONG COUNT

Collector: 6178

Date Received: 3/28/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210		0.42	0.27	45,000
Ra-226		0.89	0.29	800
Ac-227 (D)	*	0.00	0.10	40
Th-230	*	0.11	4.82	800
Th-232 (D)		0.17	0.04	130
Pu-238	*	3.93	24.53	500
Am-241	*	0.01	0.03	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

DGH

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Date: 4/2/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6 of

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000724
FILE ID: A0000388.S0
PRIORITY:

Description\Location:
176 FINAL VERIFICATION # 4
LONG COUNT

Collector: 6178

Date Received: 3/28/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	•	0.01	0.01	45,000
Cs-137		0.02	0.01	45,000
Pb-210		0.41	0.15	45,000
Ra-226		1.23	0.15	800
Ac-227 (D)	•	0.02	0.04	40
Th-230	*	0.00	1.53	800
Th-232 (D)		0.26	0.02	130
Pu-238	*	0.00	12.14	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

DJH

01-E-045 7 of 12

Date: 4/2/01 Counted By: 5890 Analyzed By: 5613 INITIALS GDM

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RADIOLOGICAL SURVEY DATA SHEET

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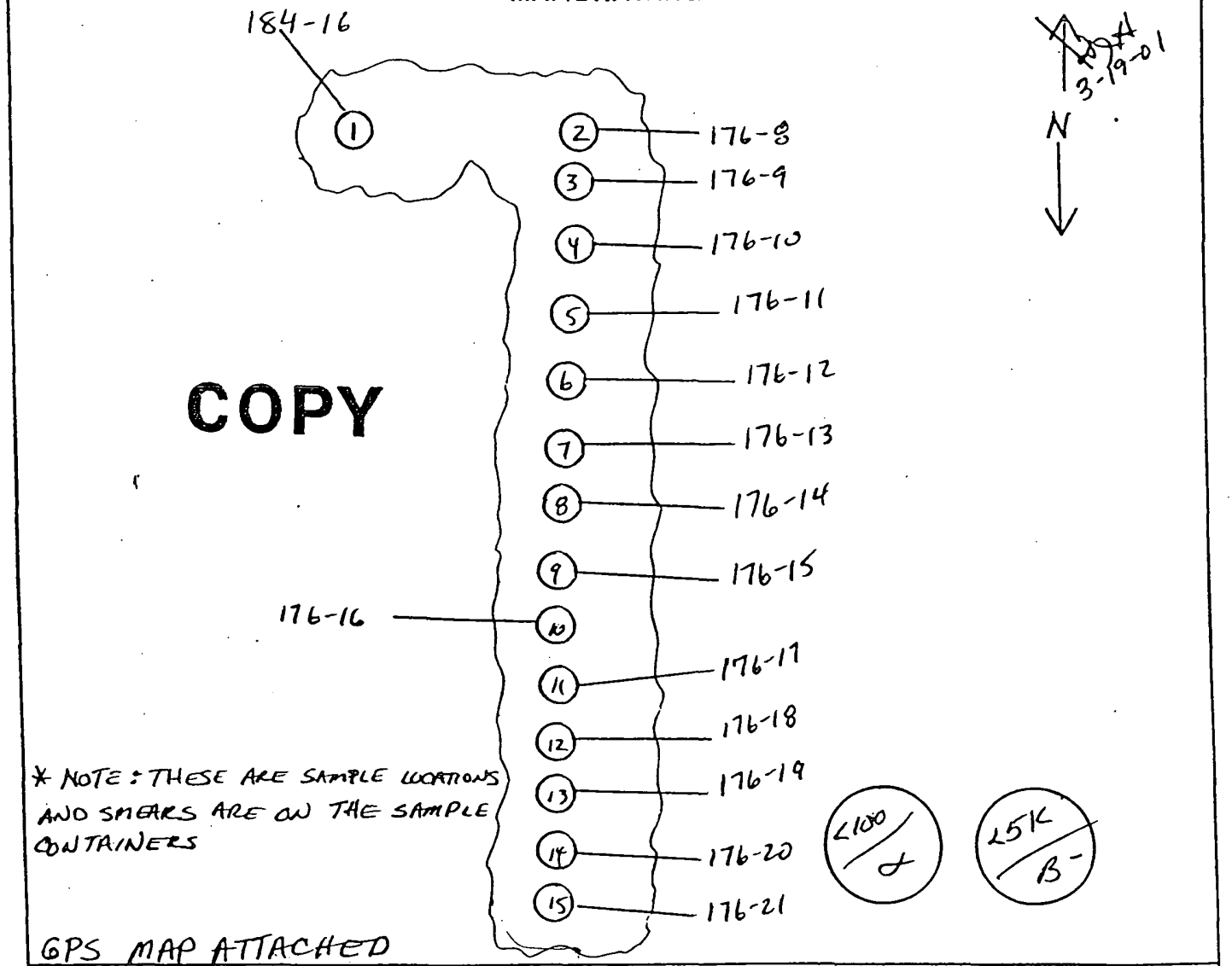
15 (3024)

LOCATION: (BLDG/AREA/ROOM) E-SLAB 176 DRAIN LINE	SURVEY NO. 01-E-041
PURPOSE: SOIL SAMPLES FOR RELEASING THE CA	RWP NO. E-001-01
	DATE: 3-15-01
	TIME: 1630

MAP/DRAWING



LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
ELECTRA	5595/5596	4-30-01
	N	
	A	

Completed by: (Signature) Daniel J. Harney	HP# [redacted]	Date: 3-15-01
Completed by: (Print Name) DANIEL J. HARNEY Tom C. Davis		
Counted by: (Signature) D. Smith Brown	H [redacted]	Date: 3/19/01
Counted by: (Print Name) D. Smith Brown		
Reviewed/Approved by: (Signature)	HP#	Date:
Reviewed/Approved by: (Print Name)		

ML-9620 (2-98)

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000710
FILE ID: F0000341.S0
PRIORITY:

Description\Location: E SLAB 176-8

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.90	0.52	45,000
Ra-226		1.33	0.45	800
Ac-227 (D)	*	0.06	0.18	40
Th-230	*	0.00	5.38	800
Th-232 (D)		0.39	0.10	130
Pu-238	*	1.66	7.25	500
Am-241	*	0.02	0.06	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000711
FILE ID: A0000377.S0
PRIORITY:

Description\Location:
E SLAB 176-9

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.37	0.28	45,000
Ra-226		1.04	0.33	800
Ac-227 (D)	*	0.06	0.11	40
Th-230	*	0.00	3.09	800
Th-232 (D)		0.23	0.04	130
Pu-238	*	15.42	22.70	500
Am-241	*	0.00	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.03 nCi/g

Σ Respirator 0.06

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000712
FILE ID: F0000342.S0
PRIORITY:

Description\Location:
E SLAB 176-10

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210	•	0.36	0.49	45,000
Ra-226		1.23	0.44	800
Ac-227 (D)	*	0.10	0.14	40
Th-230	*	0.00	4.93	800
Th-232 (D)		0.31	0.06	130
Pu-238	*	0.60	13.12	500
Am-241	•	0.02	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS _____

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000713
FILE ID: A0000378.S0
PRIORITY:

Description\Location:
E SLAB 176-11

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.43	0.20	45,000
Ra-226		0.79	0.25	800
Ac-227 (D)	*	0.02	0.08	40
Th-230	*	0.28	2.14	800
Th-232 (D)		0.14	0.05	130
Pu-238	*	0.00	18.02	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS _____

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000714
FILE ID: F0000343.S0
PRIORITY:

Description\Location:
E SLAB 176-12

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.00	0.01	45,000
Pb-210		0.80	0.19	45,000
Ra-226		1.88	0.17	800
Ac-227 (D)	*	0.05	0.07	40
Th-230	*	1.37	1.68	800
Th-232 (D)		0.30	0.02	130
Pu-238	*	1.17	4.78	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000715
FILE ID: A0000380.S0
PRIORITY:

Description\Location:
E SLAB 176-13

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210	*	0.24	0.31	45,000
Ra-226		0.82	0.35	800
Ac-227 (D)	*	0.01	0.10	40
Th-230	*	0.92	3.07	800
Th-232 (D)		0.17	0.05	130
Pu-238	*	0.00	27.78	500
Am-241	*	0.00	0.04	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT **0.03** **nCi/g**

Σ Respirator **0.06**

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS _____

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000716
FILE ID: F0000344.S0
PRIORITY:

Description\Location:
E SLAB 176-14

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.01	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.87	0.42	45,000
Ra-226		0.45	0.24	800
Ac-227 (D)	*	0.00	0.14	40
Th-230	*	0.00	5.00	800
Th-232 (D)		0.08	0.02	130
Pu-238	•	0.00	13.73	500
Am-241	*	0.03	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT **0.02** nCi/g

Σ Respirator **0.04**

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/22/01 Counted By: 5890 Analyzed By: 5613 INITIALS _____

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000703
FILE ID: A0000373.S0
PRIORITY:

Description\Location:
E SLAB 176-15

Collector: 6178

Date Received: 3/19/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.02	0.02	45,000
Cs-137	*	0.01	0.03	45,000
Pb-210		0.71	0.47	45,000
Ra-226		1.17	0.42	800
Ac-227 (D)	*	0.07	0.15	40
Th-230	*	0.51	4.92	800
Th-232 (D)		0.30	0.05	130
Pu-238	*	0.00	43.75	500
Am-241	*	0.03	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.05 nCi/g

Σ Respirator 0.10

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS GJM

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000704
FILE ID: F0000338.S0
PRIORITY:

Description\Location:
E SLAB 176-16

Collector: 6178

Date Received: 3/19/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.03	45,000
Cs-137	*	0.01	0.02	45,000
Pb-210		1.25	0.51	45,000
Ra-226		1.40	0.52	800
Ac-227 (D)	*	0.00	0.19	40
Th-230	*	4.00	4.80	800
Th-232 (D)		0.25	0.04	130
Pu-238	*	0.00	14.36	500
Am-241	*	0.00	0.06	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
U238D	1.07	0.49	
U235	0.42	0.30	

Σ DOT 0.02 nCi/g

Σ Respirator 0.04

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6/ al

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000705
FILE ID: F0000339.S0
PRIORITY:

Description\Location:
E SLAB 176-17

Collector: 6178

Date Received: 3/19/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.02	45,000
Cs-137	*	0.01	0.02	45,000
Pb-210		0.45	0.41	45,000
Ra-226		1.13	0.35	800
Ac-227 (D)	*	0.05	0.13	40
Th-230	*	3.97	4.19	800
Th-232 (D)		0.14	0.03	130
Pu-238	*	0.00	11.48	500
Am-241	*	0.00	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.02 nCi/g

Σ Respirator 0.03

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6dal

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000706
FILE ID: A0000374.S0
PRIORITY:

Description\Location:
E SLAB 176-18

Collector: 6178

Date Received: 3/19/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137		0.03	0.02	45,000
Pb-210		0.51	0.46	45,000
Ra-226		0.94	0.44	800
Ac-227 (D)	*	0.04	0.15	40
Th-230	*	1.66	4.55	800
Th-232 (D)		0.24	0.07	130
Pu-238	*	0.00	62.87	500
Am-241	*	0.03	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.07 nCi/g

Σ Respirator 0.14

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6JM

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000707
FILE ID: A0000375.S0
PRIORITY:

Description\Location:
E SLAB 176-19

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	•	0.01	0.01	45,000
Pb-210	•	0.15	0.16	45,000
Ra-226		0.69	0.16	800
Ac-227 (D)	•	0.03	0.05	40
Th-230	•	0.00	1.67	800
Th-232 (D)		0.14	0.02	130
Pu-238	•	0.00	13.14	500
Am-241	*	0.01	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT **0.02** **nCi/g**

Σ Respirator **0.03**

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6/m

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000708
FILE ID: F0000340.S0
PRIORITY:

Description\Location:
E SLAB 176-20

Collector: 6178

Date Received: 3/19/01 Date Collected:

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.00	0.01	45,000
Cs-137	*	0.01	0.01	45,000
Pb-210	*	0.12	0.18	45,000
Ra-226		0.90	0.21	800
Ac-227 (D)	*	0.00	0.08	40
Th-230	*	1.19	1.68	800
Th-232 (D)		0.16	0.02	130
Pu-238	*	1.00	5.60	500
Am-241	*	0.00	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS 6/ul

SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000709
FILE ID: A0000376.S0
PRIORITY:

Description\Location:
E SLAB 176-21

Collector: 6178

Date Received: 3/19/01 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.03	45,000
Cs-137	*	0.01	0.02	45,000
Pb-210	*	0.45	0.50	45,000
Ra-226		0.75	0.46	800
Ac-227 (D)	*	0.01	0.16	40
Th-230	*	0.00	4.97	800
Th-232 (D)		0.19	0.09	130
Pu-238	*	0.00	41.10	500
Am-241	*	0.00	0.05	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.05 nCi/g

Σ Respirator 0.09

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

Comments:

Date: 3/21/01 Counted By: 5890 Analyzed By: 5613 INITIALS

APPENDIX F

BUILDING 68 FIXED CONTAMINATION AREAS DATA

The Building 68 Generic Disposition and RMMA Rollback radiological surveys revealed fourteen Fixed Contamination Areas (FCAs) on the slab floor. These areas were documented and marked for removal. A composite sample of the contaminated spots was taken and analyzed by Alpha Spectrometry. The isotopes and their respective concentrations are presented in Table F-1. The FCA locations and survey results are presented in Table F-2.

Table F-1. Isotopic Concentrations

Isotope	Concentration pCi / sample	MDA pCi / sample
Plutonium 238	32.294 ± 7.174	0.233
Plutonium 239	0.109	0.0109
Thorium 227	7.840 ± 2.601	0.312
Thorium 228	3.445 ± 1.237	0.447
Thorium 230	7.150 ± 2.386	0.312
Thorium 232	3.228 ± 1.169	0.312
Uranium 234	0.59 ± 0.14	0.077
Uranium 238	0.62 ± 0.14	0.077

F2 of 3

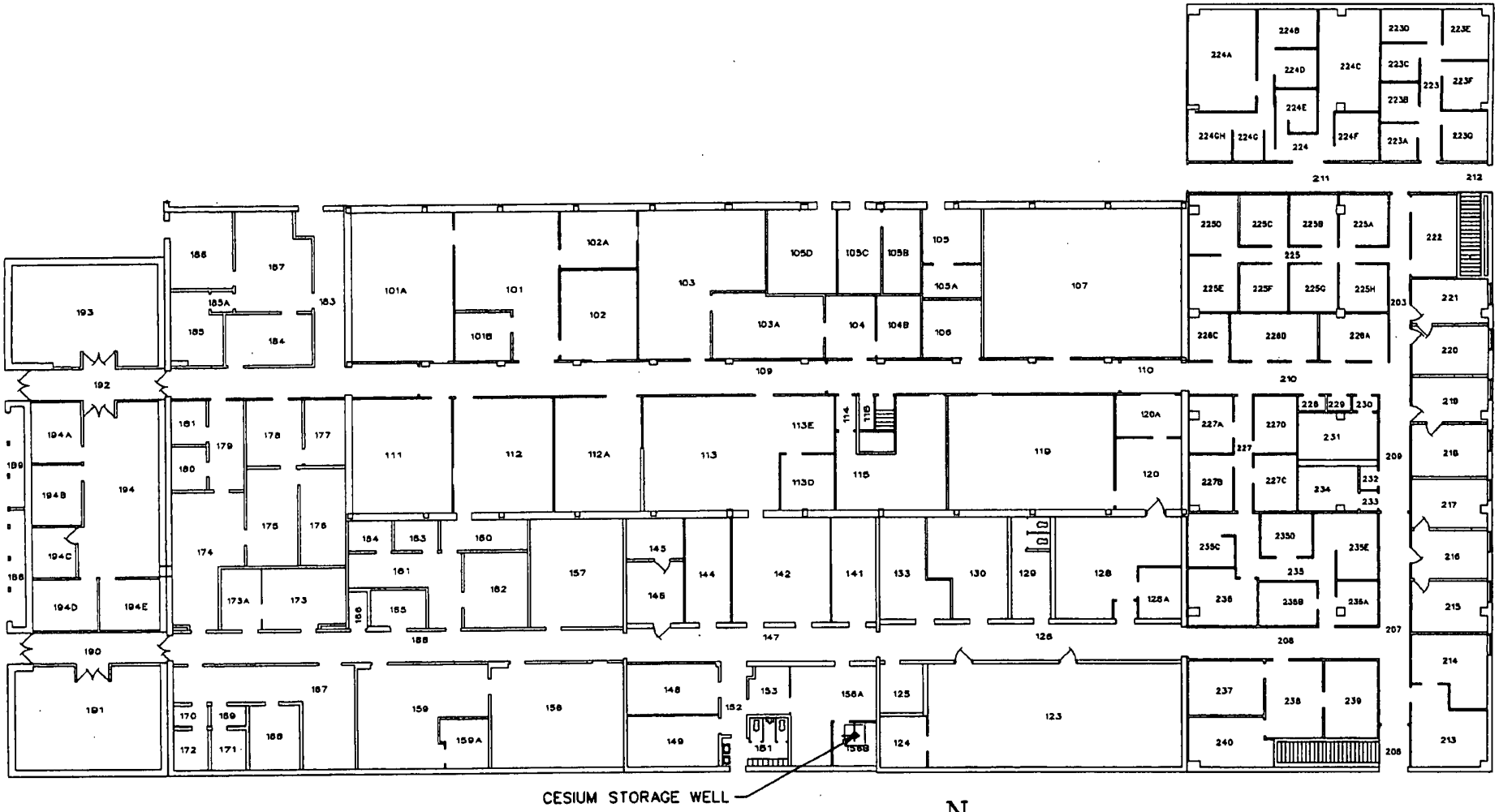
Table F-2. Building 68 FCA Locations

Grid Location	Sample Number	Survey Reading
1. A-5 Wall	FCA 68-04	7,200 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
2. B-1	11 FCA 68-04	1,500 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
3. B-1	12 FCA 68-04	300 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
4. B-1	13 FCA 68-04	3,000 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
5. C-1 Wall	23 FCA 68-04	500 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
6. C-1 Wall	24 FCA 68-04	2,200 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
7. C-1 Wall	25 FCA 68-04	500 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
8. C-1	11 FCA 68-04	10,000 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
9. C-2	11 FCA 68-04	700 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
10. C-2	12 FCA 68-04	1,200 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
11. C-2	13 FCA 68-04	700 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
12. C-3	FCA 68-04	4,300 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
13. C-5	FCA 68-04	420 dpm/cm^2 alpha < 5000 dpm/cm^2 beta
14.	FCA 68-01	29,300 dpm/cm^2 alpha < 5000 dpm/cm^2 beta

G

APPENDIX G

CESIUM WELL DATA



E-BUILDING 1ST FLOOR

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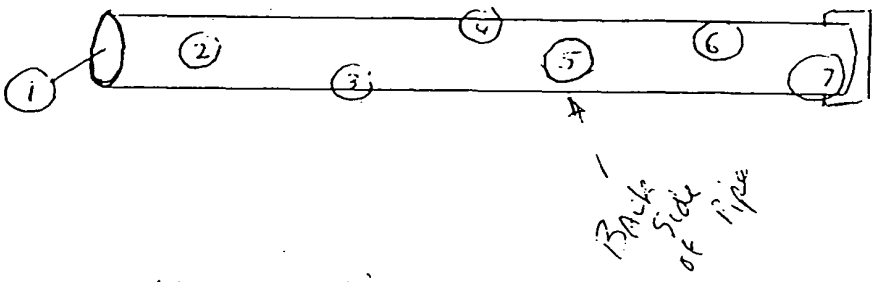
RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG/AREA/ROOM) E-Slab / Cesium Well	SURVEY NO. 00-E-704
PURPOSE: Survey of Cesium well after removal from ground	RWP NO. N/A
	DATE: 11-1-00
	TIME: 1430

MAP/DRAWING

Cesium Well @ E-Slab



All direct Readings were:

* <100 dpm/100cm² α
* <5000 dpm/100cm² βγ

8

Sample of material scraped from well

(See attached printout)

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
NE ELECTRA	5364/5285	3/26/01
	N/A	

Completed by: (Signature) Robert Coblentz	HP# [redacted]	Date: 11-1-00
Completed by: (Print Name) Robert Coblentz		
Counted by: (Signature) B Smith-Brown	[redacted]	Date: 11/2/00
Counted by: (Print Name) B Smith-Brown		
Reviewed/Approved by: (Signature) [signature]	HP# [redacted]	Date: 11/6/00
Reviewed/Approved by: (Print Name) V. FILEPPI		

ML-9620 (2-98)

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See attached Sheets			Cesium well
2				
3				
4				
5				
6				
7				Cesium well
8	See attached Sheets			Sample Container

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments

COMMENTS: N/A

NOTES:

1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If not needed, mark N/A.

ML-9620 (4-98)

Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Blue
Data file name: SMEAR085
Batch Ended: 11/2/2000 9:07
Cal. Due Date: 5/22/2001
Serial Number: 26966-3

Alpha activity action level (DPM): 20
Beta activity action level (DPM): 200

Batch ID: 00-E-704 COBLENTZ

Detector ID	Sample ID	Alpha Activity DPM	Alpha Activity σ	Alpha Activity flags	Beta Activity DPM	Beta Activity σ	Beta Activity flags
C1	1	0.00	1.75	<MDA	4.34	2.77	<AL
C2	2	0.00	1.78	<MDA	0.00	1.25	<MDA
C3	3	0.00	1.99	<MDA	0.24	1.87	<MDA
C4	4	0.00	1.77	<MDA	0.00	1.25	<MDA
D1	5	3.36	2.81	<AL	0.00	1.48	<MDA
D2	6	1.45	2.07	<MDA	0.00	1.28	<MDA
D3	7	0.00	2.14	<MDA	1.42	2.51	<MDA
D4	8	3.37	2.80	<AL	0.00	1.31	<MDA

6556 12

RWL 11-2-00

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Protocol #: 2 Pw H3 20cc #405828 User : 5268

Time: 2.00
Data Mode: DPM Nuclide: SMVIAL3 Quench Set: SMVIAL3
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5 -	18.6	0	0.0	7.11
Region B:	2.0 -	18.6	0	0.0	6.62
Region C:	40.0 -	2000	0	0.0	10.50

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
90-E-704 COBLENTZ(30-22) 5
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: c:\data\PROT.DAT
Count Data Filename: c:\data\SDATA2.DAT
Spectrum Data Drive & Path: c:\data

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2Sigma	CPMC
-1	10.00	7.11	6.62	0	B	582.15		0.00	10.50
0	2.00	997.42	932.35	0		554.22	2383.57	210.49	1.00
1	2.00	0.00	0.00	0		394.61	0.00	0.00	0.00
2	2.00	0.84	1.32	6		486.51	2.13	11.01	0.00
3	2.00	0.00	0.00	36		313.86	0.00	0.00	1.00
4	2.00	0.00	0.00	8		341.92	0.00	0.00	0.00
5	2.00	0.00	0.00	10		291.37	0.00	0.00	0.00
6	2.00	0.00	0.00	13		359.67	0.00	0.00	0.00
7	2.00	0.00	0.00	13		219.95	0.00	0.00	2.00
8	2.00	0.39	0.70	0		546.40	0.94	10.16	0.00

Rmc

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SOIL ANALYSIS REPORT

FIELD SAMPLE ID:
LAB SAMPLE ID: H0000448
FILE ID: A0000220.S0
PRIORITY: Y

Description\Location:
CESIUM WELL E SLAB

Collector: 6178

Date Received: 10/24/200 **Date Collected:**

Radionuclide		Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)
Co-60	*	0.01	0.02	45,000
Cs-137	*	0.00	0.02	45,000
Pb-210		0.38	0.22	45,000
Ra-226		0.77	0.33	800
Ac-227 (D)	*	0.05	0.10	40
Th-230	*	0.57	2.49	800
Th-232 (D)		0.36	0.06	130
Pu-238	*	0.00	5.96	500
Am-241	*	0.02	0.02	500

Other Nuclides:

Radionuclide	Activity (pCi/g)	MDA	MD-10438 Limit (pCi/g)

Σ DOT 0.01 nCi/g

Σ Respirator 0.02

Σ Respirator <1 indicates soil levels below limit.
Values > or = 1 indicate soil levels exceed limit. Limits based on MD-10438 table 4.

Σ DOT 2 nCi/g limit, total activity.

(D) Denotes identification by daughter emissions.
Sample is assumed to be in secular equilibrium.

* Indicates activity < MDA. MDA used in limits calculation.

Instrument type: High Purity Germanium

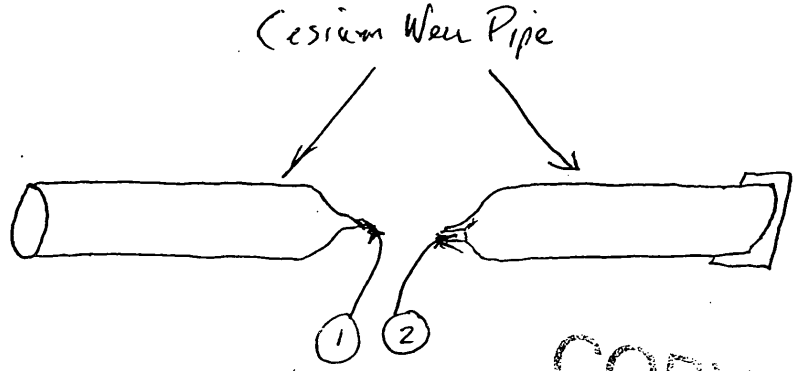
Comments:

Date: 11/02/2000 Counted By: 5801 Analyzed By: 5613 INITIALS Gd M

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) E- SLAB	SURVEY NO. 00-E-706
PURPOSE: Job Coverage for cutting (crimp-cut) of Cesium Well Pipe	RWP NO. N/A
	DATE: 11-16-00
	TIME: 0900

MAP/DRAWING



COPY

Direct survey inside cut ends <100 dpm/100cm² α
<5000 dpm/100cm² β-

LEGEND: # = mrem/hr (γ) whole body
E = mrem/hr (β+η+γ) extremity on contact
△# = mrem/hr neutron
[#] = air sample number
(#) = swipe number
(#/α) or /β = direct cont. measurement in dpm/100cm²

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
NE ELECTRA	5364/5285	3/26/01
	N/A	

Completed by: (Signature) Robert M. Coblentz	[redacted]	Date: 11/16/00
Completed by: (Print Name) Robert M. Coblentz		
Counted by: (Signature) D. Smith-Brown	[redacted]	Date: 11/16/00
Counted by: (Print Name) D. Smith-Brown		
Reviewed/Approved by: (Signature) V. Filleppi	[redacted]	Date: 11/16/00
Reviewed/Approved by: (Print Name) V. FILEPPI		

ML-9620 (2-98)

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Survey No. 00-E-706

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments
1	See attached printouts			I/s cut end
2	See attached printouts			I/s cut end

Removable Contamination				
Swipes (dpm/100cm²)				
Sample #	β/γ	Alpha	Tritium	Comments

COMMENTS: N/A

NOTES:
1. See MD-80036 10002 for calculations of WB, extremity and skin dose rates.
2. To request RO Count Room analysis for β/γ, alpha or tritium, leave column blank. Mark column N/A if not needed. If count room printout of results are attached, write "see attached" in column.
3. Annotate special sample type (e.g., soil, water), special identifiers or otherwise in Comments. If needed, mark N/A.

ML-9620A (4-98)

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Smear Analysis

Unit Type: LB4100/W
Counting Unit ID: Blue
Data file name: SMEAR169
Batch Ended: 11/16/2000 10:33
Cal. Due Date: 5/22/2001
Serial Number: 26966-3

Alpha activity action level (DPM): 20
Beta activity action level (DPM): 200

Batch ID: 00-E-706 COBLENTZ

Detector ID	Sample ID	Alpha Activity			Beta Activity		
		DPM	σ	flags	DPM	σ	flags
C1	1	0.00	1.70	<MDA	0.00	1.68	<MDA
C2	2	1.27	1.78	<MDA	0.00	1.25	<MDA

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15 Nov 2000 10:47 TRI-CARB - 1.09 Page #1
Protocol #: 4 Pw H3 20cc #407906 User : 526E

Time: 2.00
Data Mode: DPM Nuclide: SMVIAL3 Quench Set: SMVIAL3
Background Subtract: 1st Vial

	LL	UL	LCR	2S%	BKG
Region A:	0.5	- 18.6	0	0.0	7.60
Region B:	2.0	- 18.6	0	0.0	7.13
Region C:	40.0	- 2000	0	0.0	9.10

Quench Indicator: tSIE/AEC
Ext Std Terminator: Count
00-E-706 COBLENTZN(30-23) 2
Luminescence Correction On
Coincidence Time(ns): 18
Delay Before Burst(ns): Normal
Protocol Data Filename: C:\DATA\PROT1.DAT
Count Data Filename: C:\DATA\SDATA4.DAT
Spectrum Data Drive & Path: C:\DATA

S#	TIME	CPMA	CPMB	LUM	FLAG	tSIE	DPM1	2SIGMA	CPMC
-1	10.00	7.60	7.13	0	B	639.53		0.000	9.10
0	2.00	687.24	637.03	0		511.91	2530.72	190.272	4.40
1	2.00	0.00	0.00	0		414.93	0.00	0.000	0.00
2	2.00	0.00	0.00	0		352.91	0.00	0.000	0.00

RMC