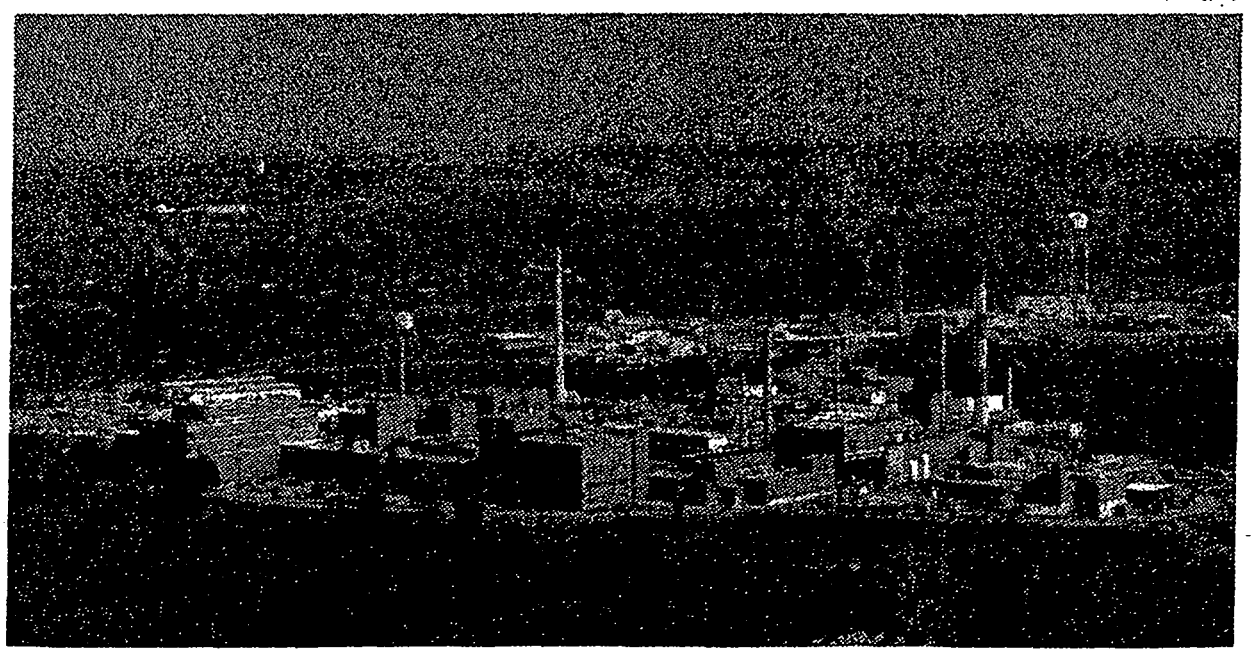
EG&G MOUND-30-03-04-02--9703050050

MOUND

Environmental
Restoration
Program

MOUND PLANT
Potential Release Site Package
PRS # 176/177/178/300



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Environmental Restoration Program

MOUND PLANT POTENTIAL RELEASE SITE PACKAGE

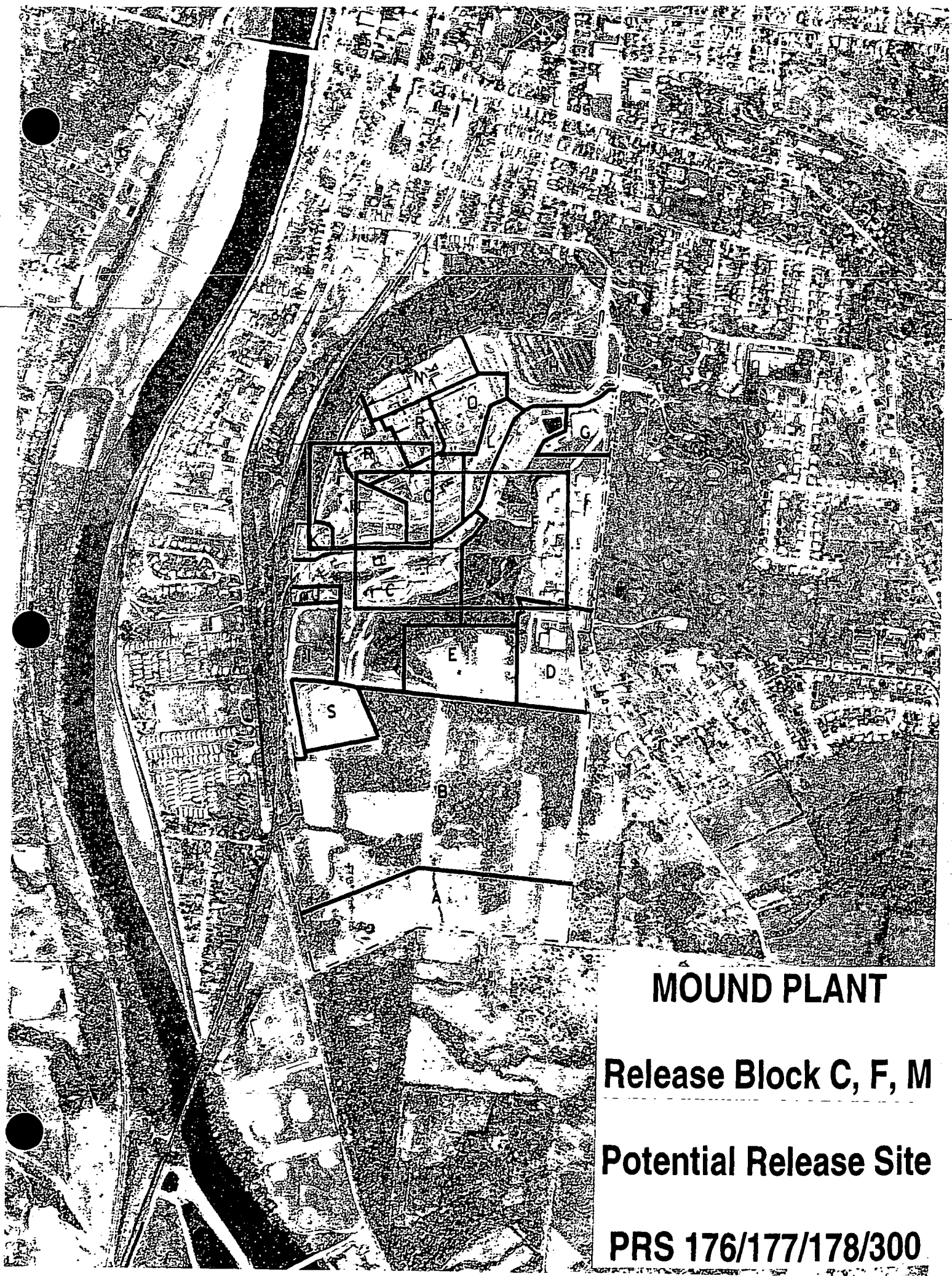
Notice of Public Review Period

The following potential release site (PRS) packages will be available for public review in the CERCLA Public Reading Room, 305 E. Central Ave., Miamisburg, Ohio beginning January 9, 1997. Public comment will be accepted on these packages from January 9, 1997, through February 13, 1997.

PRS 17: Oil Burn Structure
PRS 20: Aviation Fuel Storage Tank
PRS 42: T Building Construction Soil Staging Area
PRS 79: Former Waste Storage Site - Warehouse 15
PRS 82: Diesel Fuel Storage Tank - Building 56
PRS 153: Radioactive Wastewater Sewer Pipeline Break - Area 20
PRS 176/177/178/300: Waste Transfer System Line, Tanks and Soil

Questions can be referred to Mound's Community Relations at (937) 865-4140.

REV	DESCRIPTION	DATE
PUBLIC RELEASE 0	Available for comment.	Dec. 17, 1996
FINAL 1	Comment period expired. No comments. Recommendation page annotated.	Feb. 17, 1997

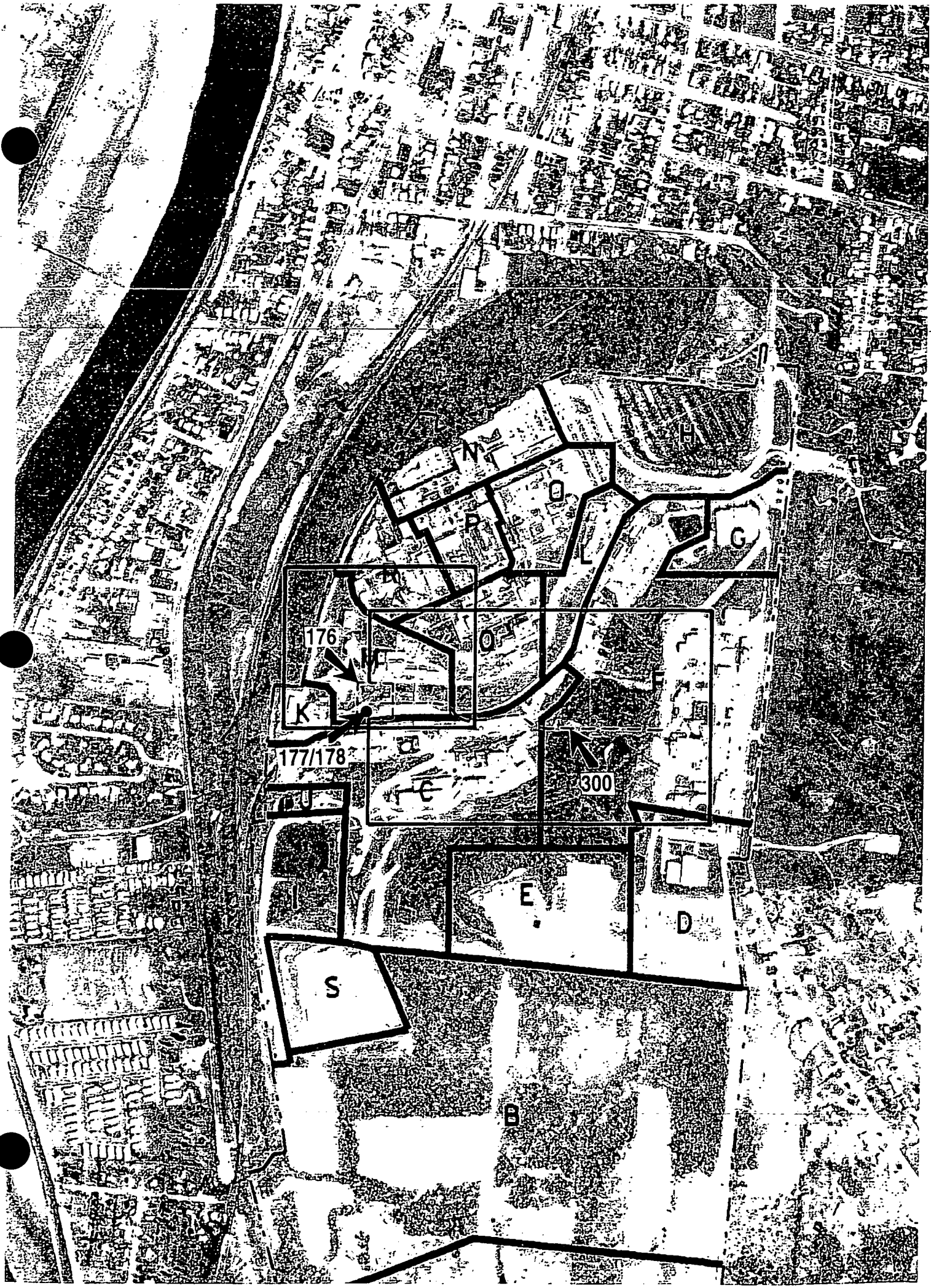


MOUND PLANT

Release Block C, F, M

Potential Release Site

PRS 176/177/178/300


N
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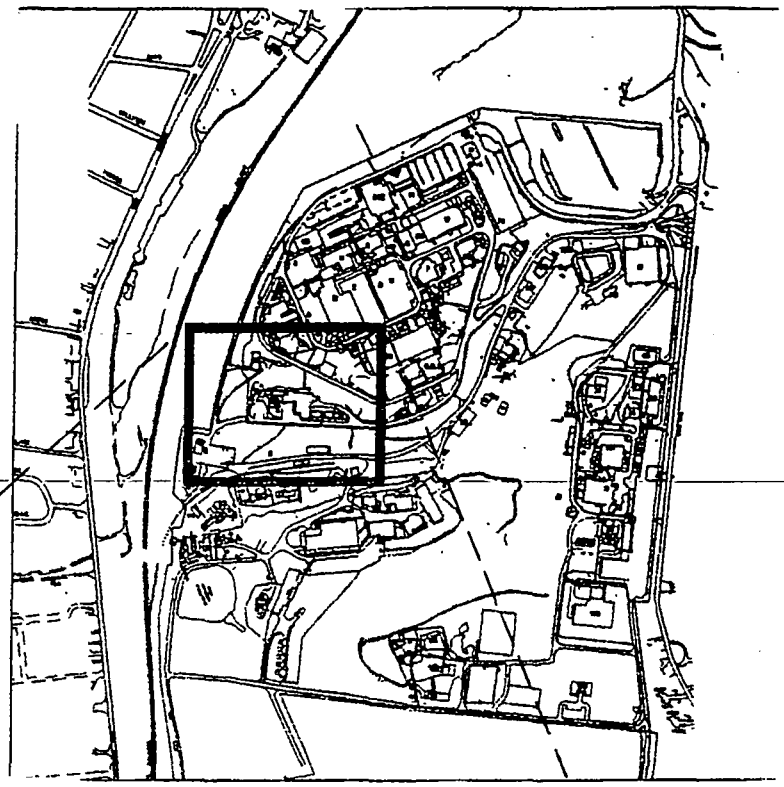
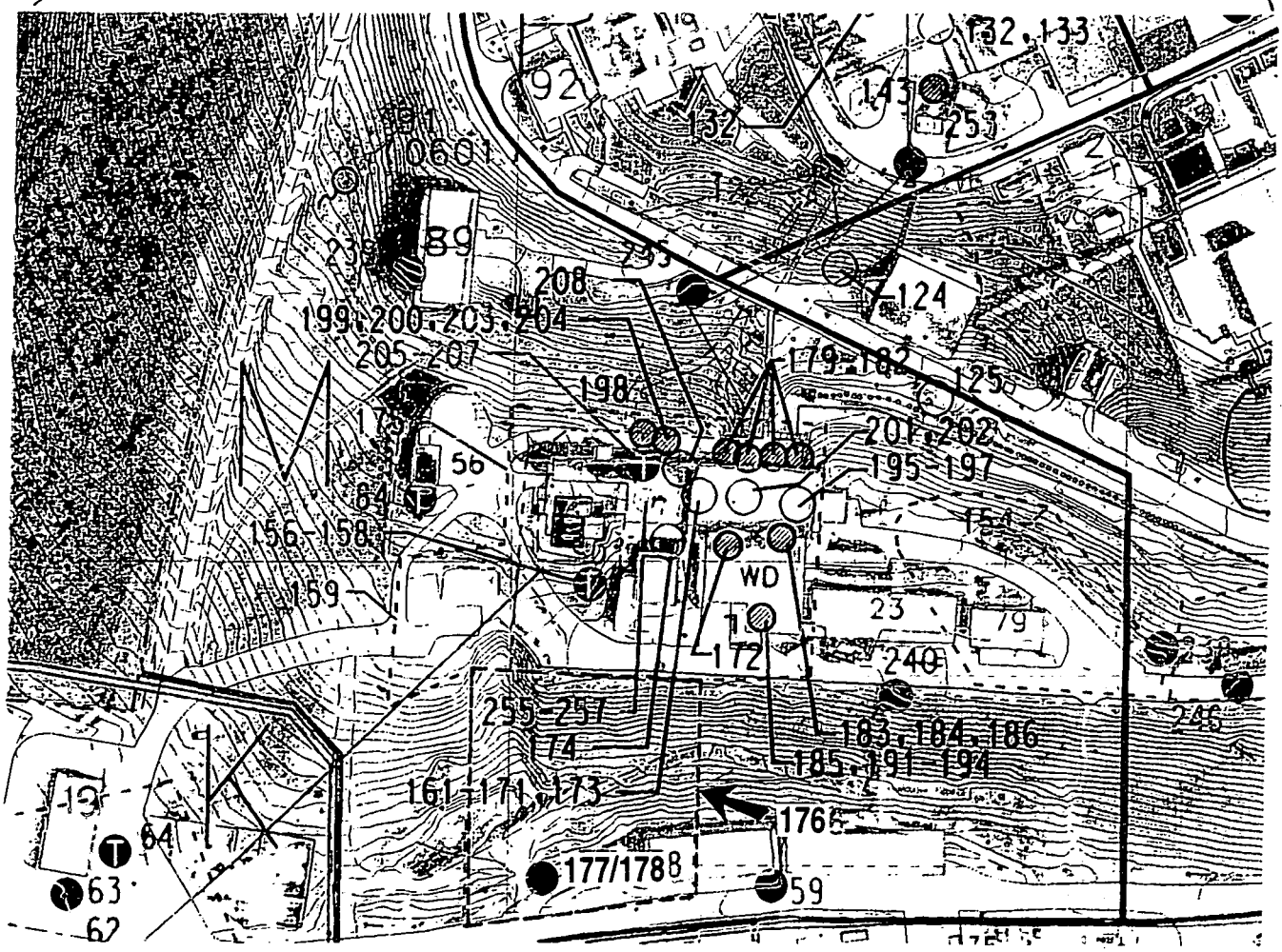
MOUND PLANT

Release Block M

Potential Release Site

PRS 176/177/178



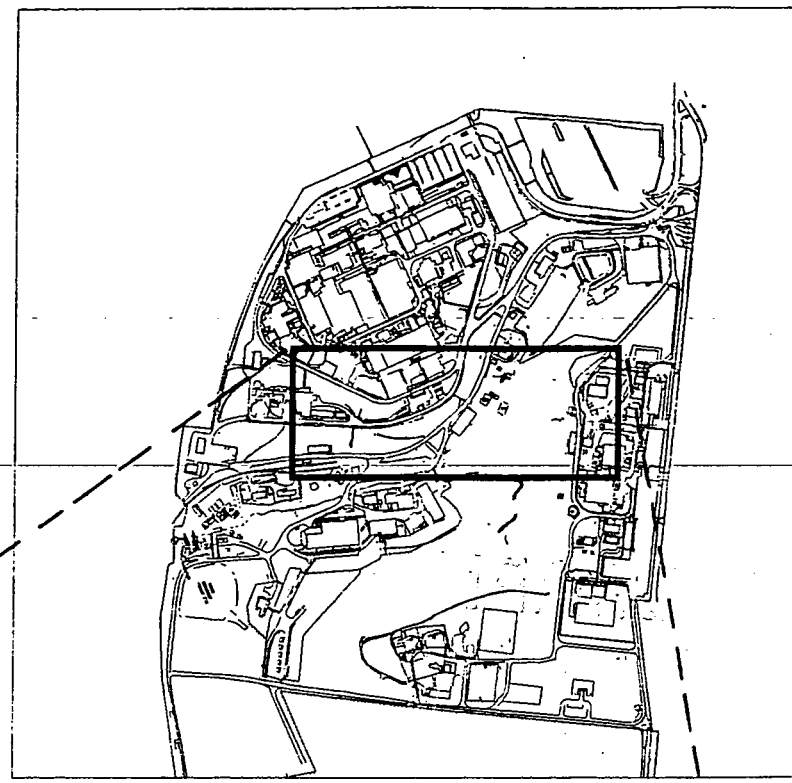


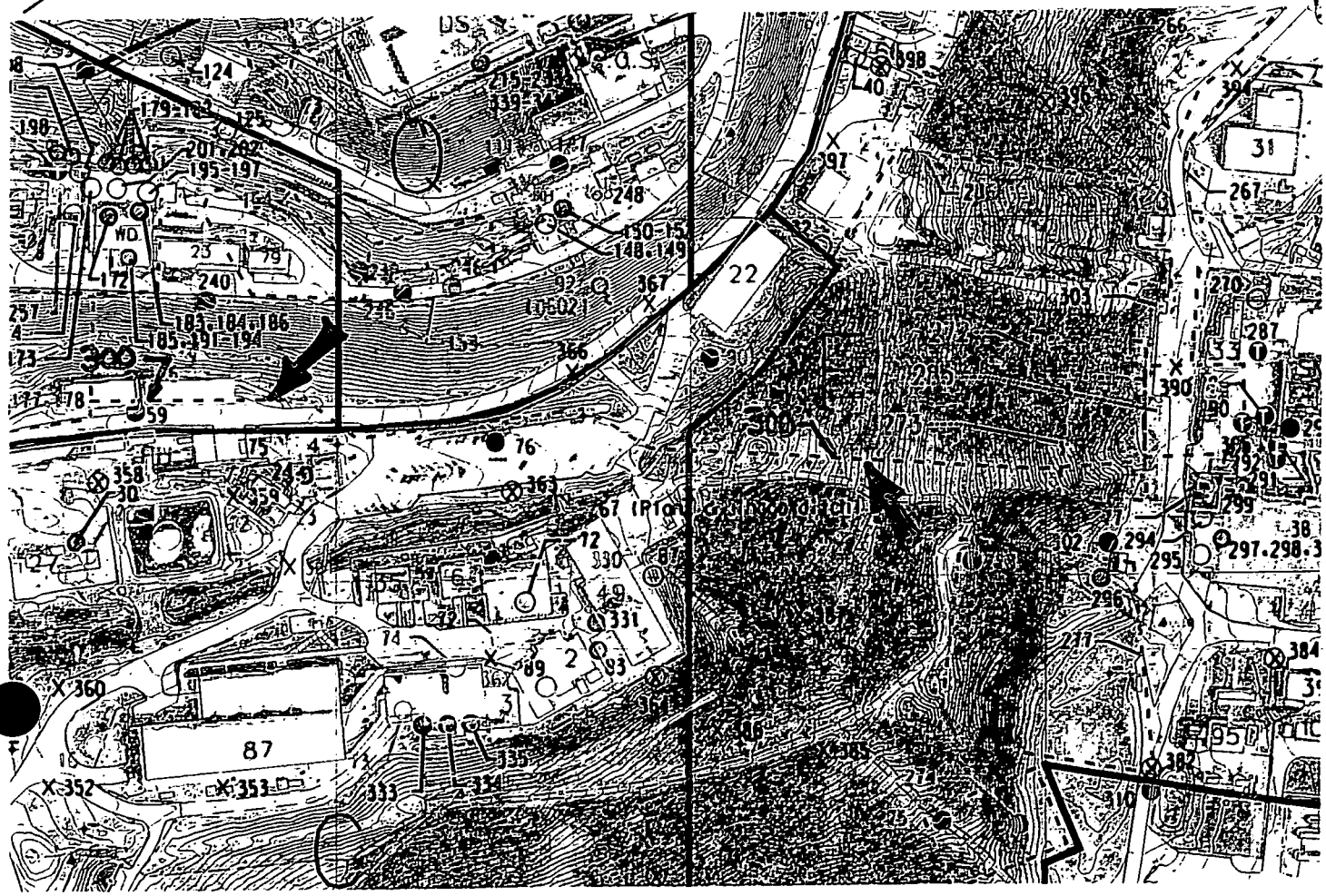
MOUND PLANT

Release Block C, F

Potential Release Site

PRS 300





176
177, 178

300

PRS 176/177/178/300

PRS HISTORY:

PRS 176 (Area 14) is an area located southwest of WD Building that was identified as a result of historical knowledge of a leak in the underground Waste Transfer System (WTS). PRS-177 and PRS-178 were underground tanks in Building 41 which were used to hold radioactive liquid waste prior to pumping to WD Building.[1, 2, 3, 4]

PRS 300 was identified as a Potential Release Site based on the fact that a pair of lines (waste transfer system) had been installed to transfer plutonium (Pu-238) contaminated waste solutions from SM Building to WD Building. The site consists of the WTS lines and the soil surrounding the lines from the SM area to the WD Building, a distance of approximately 2,600 feet.[1, 4, 5]

PROCESS DESCRIPTION:

The WTS was built in 1967 to transfer Pu-238 contaminated waste solutions from SM Building to WD Building. Building 38 Pu-238 contaminated waste solutions were also transferred to WD via the WTS. The WTS transferred liquid wastes by gravity from the SM/PP Hill to two underground holding tanks (PRS-177 and PRS-178) in Building 41. The solution was then pumped up the hill to the WD Building. In 1969, the high-risk line of the WTS sprung a leak between the Building 41 and WD Building. As a result, approximately 964 ft^3 of contaminated soil was removed and shipped off-site for disposal in 1969. Due to repeated leaks in the WTS transfer lines (PRS-300), the WTS was abandoned in 1974 and the two underground tanks in Building 41 were removed in 1986. The entire WTS, including Building 41 and the holding tanks (PRS-177, 178) plus the associated soils (PRS-176), underwent extensive D&D effort and have been removed.[4]

CONTAMINATION:

The contaminant of concern for the WTS is Pu-238. Cleanup standards were established with the decision rules:

1. "The upper 95 percent confidence interval is less than the cleanup standard of 100 pCi/gram for plutonium-238 for all soils.
2. The upper 95 percent confidence interval is less than the cleanup standard of 5 pCi/gram for thorium isotopes for all surface soils."[5 (pg. 55)]

Based upon the November 1993 Operable Unit 6 (OU6) Area 19 and Area 14 Verification Sampling Investigation, "the D&D remedial activities in Area 19 (PRS 300) and Area 14 (PRS 176/177/178) have achieved the established goals and based on these results no further action is required."[5 (pg. 61)]

The OU6, Area 19 and 14 verification included sampling for non-radiological parameters and statistical analysis of samples indicated no exceedances of the 10^{-6} Risk-Based Guideline Values. This included volatile organic compounds, semi-volatile organics, pesticides/PCBs, and inorganic analytes.[5]

READING ROOM REFERENCES:

1) OU9, Site Scoping Report: Volume 12 - Site Summary Report, December 1994. (pages 6-15)
2) Comprehensive Environmental Assessment and Response Program, Phase I: Installation Assessment, April 1986. (pages 16-17)
3) Mound Underground Storage Tank Program Plan and Regulatory Status Review, November 1992. (pages 18-20)
4) OU9, Site Scoping Report: Volume 3 - Radiological Site Survey, June 1993. (pages 21-38)
5) OU6, Area 19 and Area 14 Verification Report, October 1994. (pages 39-94)

PREPARED BY:

Gerald F. Maul, Member of EG&G Technical Staff

MOUND PLANT
PRS 176/177/178/300
WASTE TRANSFER SYSTEM LINE, TANKS AND SOIL

RECOMMENDATION:

These Potential Release Sites (PRSs) deal with the transfer of plutonium-238 contaminated waste solutions via the Waste Transfer System (PRS 300) to the Waste Disposal Building (WD) and to two underground storage tanks in Building 41 (PRSs 177 and 178). The PRSs were created as a result of historical knowledge of leaks in the underground Waste Transfer System (WTS).

The WTS was built in 1967 and remained in operation until 1974 when repeated leaks in the WTS lines forced the WTS to be abandoned. In 1974, the soils associated with the WTS leaks (PRS 176) were remediated. In the mid 1980s, the WTS line, the two holding tanks, and Building 43 were removed. Post removal sampling results obtained from the November 1993 *OU6, Area 19 and Area 14 Verification Report* indicated all concentrations of VOCs, SVOCs, pesticides/PCBs and inorganics, in the soil, were below their 10^{-6} Risk Based guideline values. Additionally, the *OU6, Area 19 and Area 14 Verification* sampling showed, within the 95% upper confidence level (UCL), plutonium-238 and thorium soil concentrations were below their respective guideline criteria of 25 pCi/g (Mound ALARA goal for plutonium) and 15 pCi/g (regulatory guideline criteria for subsurface thorium). No other contaminants were detected above guideline criteria.

Therefore, NO FURTHER ASSESSMENT is recommended for PRSs 176, 177, 178, and 300.

CONCURRENCE:

DOE/MB: Arthur W Kleinrath 11/26/96
Arthur W. Kleinrath, Remedial Project Manager (date)

USEPA: Timothy J. Fischer 12/3/96
Timothy J. Fischer, Remedial Project Manager (date)

OEPA: Brian Nickel 12/17/96
Brian K. Nickel, Project Manager (date)

SUMMARY OF COMMENTS AND RESPONSES:

Comment period from 1/9/97 to 2/13/97

☒ No comments were received during the comment period.

☐ Comment responses can be found on page _____ of this package.

REFERENCE MATERIAL
PRS 176/177/178/300

Document Control No. _____

Environmental Restoration Program

OPERABLE UNIT 9 SITE SCOPING REPORT: VOLUME 12 – SITE SUMMARY REPORT

MOUND PLANT
MIAMISBURG, OHIO

December 1994

Final

U.S. Department of Energy
Ohio Field Office

EG&G Mound Applied Technologies

Table A.1. Comprehensive Tabulation of Potential Release Sites

Description of History and Nature of Waste Handling						Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes[a]	Results	Ref
175	Area 4, WD Building Influent Tank Overflow	F-6	Surplus	Plutonium-238	1, 4, 5, 18	Low risk waste overflowed influent tank	S	10	1	SGS[b] Table B.4 Locations 1124 and 1127 Table B.5 Location B225	12
									4, 5, 6	Tables B.6, B.7, and B.8	8
									14, 16	Table B.1 (Table III.2 in Ref. 6)	6
176	Area 14, Radioactive Waste Line Break	G-5 G-6	Historical	Plutonium-238, nitric acid	1, 4, 5, 18	Plutonium-238	S, SW	6, 10	1	SGS[b] Table B.4 Locations 1125 and 1126 No Hits	12
									4, 5, 6	Tables B.6, B.7, and B.8	8
									14, 15	Table B.1 (Table IV.4 in Ref. 6)	6
177	Building 41 Alpha Wastewater Tank (Tank 208)	G-6	Historical	Alpha wastewater from SM Bldg. and Bldg. 38 Plutonium-238, nitric acid	3, 4	Suspected Plutonium-238, removed 1985	S	10	See data for Area 19		
178	Building 41 Alpha Wastewater Tank (Tank 209)										
179	WD Building Alpha Wastewater Influent Tank (Tank 3)	F-6	In service	Influent alpha wastewater from H Bldg., SW/R Complex, SM Bldg. and Bldg. 38. Possible contaminants include polonium-210, bismuth, plutonium-238, -239, radium-226, thorium-230,-232,-234, uranium-238, -234, -235, tritium, and actinium-227. Supernatant liquids from polonium processes in the HH Bldg. Possible contaminants include Protactinium-231, Cobalt-60, Radium-226 and aluminum chloride and bismuth chloride. Detergents, Organic solvents, waste chemicals, Lubricating oil	1, 3, 4, 5	Overflow of tanks recorded, see Area 4A			See Area 4A		

[a]Analyte List Codes
[b]SGS, Soil Gas Survey
[c]RSS, Radiological Site Survey

Description of History and Nature of Waste Handling						Hazardous Conditions and Incidents			Environmental Data		
No.	Site Name	Location	Status	Potential Hazardous Substances	Ref	Releases	Media	Ref	Analytes[a]	Results	Re
300	Area 19, Underground Waste Transfer Line	G-6 G-7 G-8 G-9	Historical	Plutonium-238, Nitric acid	1, 4, 5, 18	Plutonium-238	S	1, 6, 18	14	Tables B.1, B.6, B.7, and B.8	6,
301	Building 38 In-Line Incinerator	G-9	Historical	Plutonium-238	2, 4	None Suspected D&D 1986			No Data - pending verification		
302	Area D, Acid Leach Field	H-8 H-9 G-8 G-9	Historical	Plutonium-238, Thorium	1, 4, 5, 18	Plutonium-238	S	6	4, 6 14	Tables B.6, B.7, and B.8 Table B.1 (Table IV.10 in Ref. 6)	8 6
303	Warehouse 14 (AKA Pad 14)	G- 9	Grounds	Thorium sludge constituents Plutonium-238	4	None Suspected			14	Table B.9 RSS[c] Locations C0127 and C0128 (Appendix E in Ref. 6)	6
304	Excavated Materials Disposal Area (AKA Rader's Hill)	I-8	Grounds	Thorium	4	Thorium < 2 pci/gm	S	6	14	Table B.1	6
305	SM Stack	G-9	In service	Plutonium-238	4	None suspected beyond routine emissions	A	4, 18	No Data		
306	SM/PP Hill Seep 0609	L-9	NA	None suspected	5, 18	None suspected			No Data		
307	Site Survey Project Potential Hot Spot Location C0007	E-9	Grounds	Thorium	6	Isolated activity from unknown source			14	Table B.9 (Appendix E in Ref. 6)	6
308	Site Survey Project Potential Hot Spot Location C0028	F-10	Grounds	Thorium	6						
309	Site Survey Project Potential Hot Spot Location S0307	F-9	Grounds	Thorium	6						
310	Site Survey Project Potential Hot Spot Location S0647	H-9	Grounds	Cesium-137	6				15	Table B.9 (Appendix E in Ref. 6)	6

Table B.6 - Target Compound List - VOC (a,b)

References:
7) DOE 1993c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
22) DOE 1992i
24) DOE 1994

SITE NAME	Acetone	2-Butanone	Toluene	Benzene	Ethyl Benzene	Xylenes	1,2 Dichloroethane	Methylene Chloride	Perchloroethylene	2-Hexanone	4-Methyl-2-Pentanone	Trichloroethene	1,1,2 Trichloroethane	Carbon Disulfide	1,1,1-Trichloroethane	Chloroform	Freon 11	Freon 113	1,1-Dichloroethane	Bromo-dichloromethane	Bromoform	Reference
114-117. Powerhouse Area Fuel Tanks (Tanks 113, 114, 115, 116)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
125. Underground Sanitary Sewer Line G24																						7
159. Area 4A, WD Building Sewage Sludge Drying Pits	ND	ND	ND	ND															ND	ND	ND	8
172. WDA Building Basement Wash Sump (AKA Glass Melter Room Sump)	.065	ND	ND	ND															ND	ND	ND	7
174. WD Building Drum Staging Area	ND	ND	ND	ND															ND	ND	ND	7
175. Area 4, WD Building Influent Tank Overflow	ND	ND	ND	ND															ND	ND	ND	8
176. Area 14, Radioactive Waste Line Break			9.0												11							8
268. Area H Open Burn Pit (AKA Pyrotechnic Waste Disposal Area)	ND	ND	0.051	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	7
9. Pyrotechnic Waste Shed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
0. Thermal Treatment Unit			.04		0.011	0.03	0.2		0.04			0.074										7
1. Trash Burner	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
0. Underground Sewer Lines G6 and G7	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
9. Old Firing Range Drum Storage Area	0.23	0.03	0.016	ND	ND	0.02	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
1. Waste Oil Drum Field Area	0.15	0.03	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7

(a) - All units reported in mg/Kg unless noted otherwise.
(b) - No soil gas data results are presented.
(c) - Unit of measure is ug/Kg.
(d) - No volatile organic constituents were detected in the canal. See reference 16.
(e) - Note deleted in revision.
(f) - This site is the same as Site #19.
(g) - Unit of measure in g/kg
ND - Not detected.
Blank - Not analyzed for.

Table B.6 - Target Compound List - VOC (a,b)

SITE NAME	Acetone	2-Butanone	Toluene	Benzene	Ethyl Benzene	Xylenes	1,2 Dichloroethane	Methylene Chloride	Perchloroethylene	2-Hexanone	4-Methyl-2-Pentanone	Trichloroethene	1,1,2 Trichloroethane	Carbon Disulfide	1,1,1-Trichloroethane	Chloroform	Freon 11	Freon 113	1,1-Dichloroethane	Bromo-dichloromethane	Bromoform	Reference
283. Area 1, Bulk Transfer of Thorium Drums (AKA Plutonium Recoverable Waste Storage)	[illegible]		10													24						8
285. Area 11, Contamination from SM Building Operations	23	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	ND	41	ND	ND	ND	ND	ND		8
286. Area 16, SM Building Sanitary Sewage Septic Tank/Leach Basin								38							6	11						8
288. Area 17, SM Building Soils												21			19	10						8
300. Area 19, Underground Waste Transfer Line		13																				8
302. Area D, Acid Leach Field	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
314. Farm Trash Area	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7

(a) - All units reported in mg/Kg unless noted otherwise.
(b) - No soil gas data results are presented.
(c) - Unit of measure is ug/Kg.
(d) - No volatile organic constituents were detected in the canal. See reference 16.
(e) - Note deleted in revision.
(f) - This site is the same as Site #19.
(g) - Unit of measure in g/kg
ND - Not detected.
Blank - Not analyzed for.

References:
7) DOE 1993c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
22) DOE 1992i
24) DOE 1994

MOUND9\M9SSDF4.TBB 09/27/94

Table B.7. Target Compound List - SVOC, P/PCB, PAH, and EPH [a]

(a) - All units are reported in mg/Kg unless noted otherwise.
(b) - Additional data on ot her analytes are available in reference 16.
(c) - This site is the same as Site #19.
(d) - Groundwater data. Unit of measure is mg/L.
(e) - Unit of measure is g/Kg

References:
7) DOE 1933c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
24) DOE 1994

SITE NAME	SVOC	Polycyclic Aromatic Hydrocarbons (PAH)											Pesticides, Polychlorinated Biphenyls						EPH & TPH		
	Bis(2-ethylhexyl)phthalate	Acenapthene	Anthracene	Phenanthrene	Pyrene	Fluoranthene	Benzopyrene	Benzofluoranthene	Benzoanthracene	Indeno(1,2,3-CD)pyrene	Chrysene1	Benzo(g,h,i)perelene	PCBs	Chlordane	Endrin	Alpha,Beta,Delta,-BHC (Lindane)	Dieldrin	4,4'-DDT,4,4'-DDE	Extractable Petrol. Hydrocarbons	Total Petrol. Hydrocarbons	Reference
95. Main Hill Seep 0605 (d)																					18
97. Main Hill Seep 0607 (d)																					18
98. Main Hill Seep 0608 (d)																					18
112. Paint Shop Area	1.7	ND	ND	0.93	1.3	1.3	0.35	0.75	0.51	ND	0.73	ND	ND	ND	ND	ND	ND	ND			7
114-117. Powerhouse Area Fuel Tanks (Tanks 113, 114, 115, 116)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48000		7
125. Underground Sanitary Sewer Line G24																					7
159. Area 4A, Sewage Sludge Drying Pits																					8
172. WDA Building Basement Wash Sump (AKA Glass Melter Room Sump)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		7
174. WD Building Drum Staging Area	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7
175. Area 4, WD Building Influent Tank Overflow																					8
176. Area 14, Radioactive Waste Line Break	4,800				2,800											13.0		2754			8
256. Area H Open Burn Pit (AKA Pyrotechnic Waste Disposal Area)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7
259. Pyrotechnic Waste Shed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7
260. Thermal Treatment Unit	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7

Table B.7. Target Compound List - SVOC, P/PCB, PAH, and EPH [a]

SITE NAME	SVOC	Polycyclic Aromatic Hydrocarbons (PAH)											Pesticides, Polychlorinated Biphenyls						EPH & TPH		
	Bis(2-ethylhexyl)phthalate	Acenapthene	Anthracene	Phenanthrene	Pyrene	Fluoranthene	Benzopyrene	Benzofluoranthene	Benzoanthracene	Indeno(1,2,3-CD)pyrene	Chrysene1	Benzo(g,h,i)perylene	PCBs	Chlordane	Endrin	Alpha,Beta,Delta, BHC (Lindane)	Dieldrin	4,4'-DDT, 4,4'-DDE	Extractable Petrol. Hydrocarbons	Total Petrol. Hydrocarbons	Reference
261. Trash Burner	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7
270. Underground Sewer Lines G6 and G7	0.89	ND	ND	3.0	3.2	5.2	1.7	1.5	1.9	1.3	2.2	1.3	ND	ND	ND	ND	ND	ND			7
279. Old Firing Range Drum Storage Area	4.2	6.8	15	73	83	98	35	59	43	23	55	19	0.56	ND	ND	ND	ND	ND			7
280. Waste Oil Drum Field Area	6.5	ND	2.8	11	9.7	11	3.6	2.8	4.2	1.9	ND	2.1	1.15	0.098	0.023	ND	ND	ND		1500	7
283. Area 1, Bulk transfer of Thorium drums (AKA Plutonium recoverable waste storage)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
285. Area 11, Contamination from SM Building Operations	4700	ND	ND	ND	5000	ND	ND	ND	ND	ND	ND	ND	ND	ND	39	50	ND	ND	ND	ND	8
286. Area 16, SM Building sanitary sewage septic tank/leach field	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
288. Area 17, SM Building soils	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8
300. Area 19, underground waste transfer line			900	790	900	1,000															8
302. Area D, Acid Leach Field															20	12					8
314. Farm Trash Area	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			7

(a) - All units are reported in mg/Kg unless noted otherwise.
(b) - Additional data on ot her analytes are available in reference 16.
'19.
ıasure is mg/L.

References:
7) DOE 1933c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
24) DOE 1994

Table B.8. Target Analyte List (TAL) - Inorganics[a]

References:
7) DOE 1993c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
24) DOE 1994

(a) - All units are reported in mg/Kg unless otherwise noted.
(b) - Additional data on other analytes are avaiable in reference #19.
(c) - this site is the same as Site #19.
(d) - Groundwater data. Unit of measure is mg/L.

ND - Not detected.
NA - Not analyzed for.

SITE NAME	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chloride	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Nitrate	Nitrite	Silver	Thallium	Zinc	Cyanide	Lithium	Mercury	Vanadium	Reference
159. Area A4 WD building sewage sludge drying pits		18.6								105												8
172. WDA Building Basement Wash Sump (Tank 11) (AKA Glass Melter Room Sump) (4)	ND	ND	0.0062	ND	ND		ND	ND	0.0157	ND	0.0079	ND			ND	ND	0.0787	ND		ND	ND	7
174. WD Building Drum Staging Area	26.9	3.3	127	0.67	4.7		163	9.8	36.2	123	659	71.6			14.9	ND	126	ND		ND	19.5	7
175. Area 4, WD building influent tank overflow		7.6	465	1.2	7.5			13.6	13.3	27.2	565						303				20.2	8
176. Area 14, radioactive waste line break		6.2	623	1.3	7.2			19.9				46.7			4.0					0.91	22.3	8
258. Area H Open Burn Pit (AKA Pyrotechnic Waste Disposal Area)	44.5	9.1	13.9	1.8	11.7	ND	31.3	15.2	38.7	23.7	982	44.1	54.8	ND	20.4	ND	91.2	0.32		1.4	35.1	7
259. Pyrotechnic Waste Shed	25.1	8.6	89.1	1.7	4		37	11.6	27.5	15	538	27.8			20.8	ND	72.1	1.7		0.32	33.1	7
260. Thermal Treatment Unit	29.7	11.4	117	2.3	5.7		32.2	14	240	220	8,190	154			17.7	0.65	80.8	0.45		0.31	40	7
261. Trash Burner	5.7	19.5	82.7	2.2	1.1		15.3	11.4	1,100	15.4	290	14.8			5.7	ND	463	ND		ND	31.9	7
270. Underground Sewer Lines G6 and G7	32.3	7.1	58.8	1.4	7.9	121.3	25.1	9	63.2	39.1	562	22.7	129	5.02	16.7	ND	288	ND	ND	ND	20.9	7
279. Old Firing Range Drum Storage Area	39.2	7.5	90.4	0.98	10.2		28.9	14.2	25.2	31.3	698	25.6			18.6	ND	754	0.62		0.04	27	7
280. Waste Oil Drum Field Area	13.6	19.2	116	0.91	1.8		29.9	13.5	29.7	35.2	688	33.7			17	ND	73.4	8.9		1.0	35	7
283. Area 1, Bulk Transfer of Thorium Drums (AKA Plutonium Recoverable Waste Storage)		10.9	604	1.9	8.1		34.8	17.7	18.5	45.0		796			4.4		825			1.4	33.4	8
285. Area 11, Contamination from SM Building Operations		5.3	481	1.3	8.0		17.8	13.8	12.9	15.7		39.9									26.1	8
286. Area 16, SM Building Sanitary Sewage Septic Tank/Leach Field		6.5	491	1.6	5.0			16.6	14.5	41.7	440	39			2.8		327			0.24	22.2	8
288. Area 17, SM Building soils		9.6		1.1	9.6		19.0	16.6	18.1	27.6		31.7			3.2							8

Table B.8. Target Analyte List (TAL) - Inorganics[a]

SITE NAME	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chloride	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Nitrate	Nitrite	Silver	Thallium	Zinc	Cyanide	Lithium	Mercury	Vanadium	Reference
300. Area 19, Underground Waste Transfer Line		10.3	521	1.1	4.3		19.8	18.6	17.2	15.1	1,500	43.0			4.2		349				20.7	8
~~302. Area D, Acid Leach Field~~		~~11.7~~	~~594~~	~~1.0~~	~~5.6~~		~~84~~	~~20.1~~	~~20.4~~	~~20.7~~	~~640~~	~~41.1~~			~~3.5~~		~~342~~			~~0.75~~	~~20.5~~	~~8~~
~~314. Farm Trash Area~~	~~42.4~~	~~3.5~~	~~32.4~~	~~0.71~~	~~7.7~~		~~30.5~~	~~8.5~~	~~18~~	~~10.1~~	~~306~~	~~25.8~~			~~17~~	~~ND~~	~~40.4~~	~~0.38~~		~~ND~~	~~24.2~~	~~7~~

(a) - All units are reported in mg/Kg unless otherwise noted.
(b) - Additional data on other analytes are avaiable in reference #19.
(c) - this site is the same as Site #19.
(d) - Groundwater data. Unit of measure is mg/L.

ND - Not detected.
NA - Not analyzed for.

References:
7) DOE 1993c
8) DOE 1992d
15) Halford 1990
16) DOE 1993e
18) DOE 1992a
24) DOE 1994

1 - Soil Gas Survey - Freon 11, Freon 113, Trans-1,2-Dichloroethylene, Cis-1,2-Dichloroethylene, 1,1,1-Trichloroethane, Perchloroethylene, Trichloroethylene, Toluene
2 - Gamma Spectroscopy - Thorium-228, -230, Cobalt-60, Cesium-137, Radium-224, -226, -228, Americium-241, Actinium-227, Bismuth-207, Bismuth-210m, Potassium-40
3 - Target Analyte List
4 - Target Compound List (VOC)
5 - Target Compound List (SVOC)
6 - Target Compound List (Pesticides/Polychlorinated Biphenyl)
7 - Dioxins/Furans
8 - Extractable Petroleum Hydrocarbons (EPH)/Total Petroleum Hydrocarbons (TPH)
9 - Lithium
10 - Nitrate/Nitrite
11 - Chloride
12 - Explosives
13 - Plutonium-238
14 - Plutonium-238, Thorium-232
15 - Cobalt-60, Cesium-137, Radium-226, Americium-241
16 - Tritium

Reference List

1. DOE 1986 "Phase I: Installation Assessment Mound [DRAFT]."
2. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (Final)."
3. DOE 1992c "Mound Plant Underground Storage Tank Program Plan & Regulatory Status Review (Final)."
4. DOE 1993a "Site Scoping Report: Vol. 7 - Waste Management (FINAL)."
5. EPA 1988a "Preliminary Review/Visual Site Inspection for RCRA Facility Assessment of Mound Plant"
6. DOE 1993d "Operable Unit 9, Site Scping Report: Vol. 3 - Radiological Site Survey (FINAL)."
7. DOE 1993c "Operable Unit 3, Misc. Sites Limited Field Investigation Report."
8. DOE 1992d "Reconnaissance Sampling Report Decontamination & Decommissioning Areas, OU6, (FINAL)."
9. Fentiman 1990 "Characterization of Mound's Hazardous, Radioactive and Mixed Wastes."
10. DOE 1992f "Operable Unit 9, Site Scpoing Report: Vol. 9 - Spills and Response Actions (FINAL)."
11. Styron and Meyer 1981"Potable Water Standards Project: Final Report."
12. DOE 1993b "Reconnaissance Sampling Report - Soil Gas Survey & Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill (FINAL)."
13. DOE 1993d "Operable Unit 9, Site Scoping Report: Vol. 3 - Radiological Site Survey (FINAL)."
14. DOE 1991b "Main Hill Seeps, Operable Unit 2, On-Scene Coordinator Report for CERCLA Section 104 Remedial Action, West Powerhouse PCB Site."
15. Halford 1990 "Results of South Pond Sampling."
16. DOE 1993e "Operable Unit 4, Special Canal Sampling Report, Miami Erie Canal."
17. DOE 1990 "Preliminary Results of Reconnaissance Magnetic Survey of Mound Plant Areas 2, 6, 7, and C."
18. DOE 1992a "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Work Plan (FINAL)."
19. Rogers 1975 "Mound Laboratory Environmental Plutonium Study, 1974."
20. DOE 1992h "Ground Water and Seep Water Quality Data Report Through First Quarter, FY92."
21. Dames and Moore 1976a, b "Potable Water Standards Project Mound Laboratory" and "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory."
22. DOE 1992i "Closure Report, Building 34 - Aviation Fuel Storage Tank."
23. DOE 1992j "Closure Report, Building 51 - Waste Storage Tank."
24. DOE 1994 "Operable Unit 1, Remedial Investigation Report."
25. EG&G 1994 "Active Underground Storage Tank Plan."

A

ALBUQUERQUE OPERATIONS OFFICE
ENVIRONMENT, SAFETY AND HEALTH DIVISION
ENVIRONMENTAL PROGRAMS BRANCH

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT AND RESPONSE PROGRAM

PHASE I:
INSTALLATION ASSESSMENT
MOUND

NOT FOR PUBLIC DISSEMINATION

May contain unclassified controlled nuclear information subject to Section 148 of the AEA, as amended (42 USC 2168). Approval by the Department of Energy prior to release is required.

April 1986

DRAFT DRAFT DRAFT DRAFT DRAFT

Table V.3 (cont)

Area[a]	Isotopes	Planned Future Actions (PFA)
14	^{238}Pu	1969. Radioactive waste line from SM to WD Bldg. broke. Grossly contaminated soil (964 ft^3), removed and shipped to NECO for burial. Area backfilled with clean soil. In August 1974, action to remove all hillside surface soil containing significant levels of contamination was started. Approximately 2,700 ft of soil were removed containing an estimated 35 curies. The area was backfilled with clean dirt and sodded. The soil was shipped to Idaho for retrievable storage. PFA--Area 14 was submitted to and accepted by SFMP. SFMP-funded remedial action is underway.
15	^{226}Ra ^{227}Ac ^{228}Th	1958-1960. Steel crane, tracks, and shielding panels for SW Bldg. Old Room 219 cave are contained under new concrete floor. Area approximately 1,000 ft^2. PFA--Area 15 was submitted to and accepted by SFMP. Remedial action is planned but not yet scheduled.
16	^{238}Pu	1960-1965. Sanitary-sewage septic tank and leach basin for SM Bldg. Core samples will be obtained to determine whether any contamination exists. Area approximately 15,500 ft^2. PFA--Area 16 was submitted to and accepted by SFMP. SFMP-funded remedial action is underway.
17	^{238}Pu	1960-1970. Area under and immediately surrounding SM Building. The contamination is largely the result of activity located beneath the concrete floor of the "hot" side and the previous utilization of low risk tanks outside SM. Area approximately 40,000 ft^2. PFA--Area 17 was submitted to and accepted by SFMP. SFMP-funded remedial action is underway.

Circulates

Document Control No. _____

Environmental Restoration Program

MOUND PLANT UNDERGROUND STORAGE TANK PROGRAM PLAN AND REGULATORY STATUS REVIEW

MOUND PLANT
MIAMISBURG, OHIO

November 1992

FINAL

(Revision 0)

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

Program (FFA) site, Area 4a WD Building Influent Tank Overflow and Sewage Pit. Following removal, the tank sites will be investigated by the D&D Program. The tanks will be considered closed upon completion of D&D activities.

2.3.4. Building 41: Alpha Wastewater Tanks (Tanks 208 and 209)

Two 3,466-gallon, stainless-steel-lined steel tanks were formerly used to collect alpha wastewaters from the SM and PP Buildings. Collected wastewaters were pumped via the old waste transfer system underground line to the 30,000-gallon, alpha-wastewater influent tanks (Subsection 2.1.3.) at WD Building. The tanks are reported to have been removed in September 1986 (Andersen, 1991h). Radioactively contaminated soils with levels above Mound Plant guidelines were removed by the D&D Program pursuant to the AEA.

The tanks lie within a completed D&D Program project and are considered closed. Because of evidence of a release from the tanks systems, the tanks are subject to the FFA and are part of an ER Program site, Area 14 – Radioactive Waste Line Break.

2.3.5. SM Building: Alpha Wastewater Tanks (Tanks 210, 211, 212, and 213)

Four tanks of 5,000-, 3,000-, 1,000-, and 1,000-gallon capacity were located at the SM Building. The 5,000-gallon and 3,000-gallon tanks were constructed of unlined steel, while the two 1,000-gallon tanks were constructed of bituminous-lined steel. These tanks were formerly used to collect alpha wastewater and they drained to two 3,466-gallon, alpha-wastewater tanks (Subsection 2.3.4.) for transfer to the alpha-wastewater treatment system at WD Building. The 5,000-gallon and the 3,000-gallon tanks are reported to have been removed in June 1986 (NUS, 1989), while the two 1,000-gallon tanks are reported to have been similarly removed in January 1988 (Andersen, 1991h). All four tanks were reportedly last used in 1972 (Andersen, 1990c).

Because of their function in nuclear operations, the tanks are subject to the AEA. Radioactively contaminated soils remain at the tank locations above Mound Plant guidelines and must be remediated by the D&D Program pursuant to the AEA. The tanks lie within a D&D project and ER Program site, Area 17 – SM Building area. After the D&D activities are completed, the tank will be considered closed.

APPENDIX A (continued)
UST OWNERSHIP/SPONSORSHIP AND PRIMARY REGULATORY JURISDICTION

Tank #	NUS#*	Capacity (gallons)	Location	Purpose	Comments	Last date used*	Tentative Tank Sponsor	Spill Jurisdiction	Primary Regulatory Jurisdiction
203	1.3-3 #2	4,000	G Bldg.	Gasoline storage tank	Unlined steel tank used to supply gasoline.	Unknown (c/r summer 1986)	ER (2°)	FFA	FFA
204	1.3-3 #3	5,000	G Bldg.	Gasoline storage tank	Fiberglass-reinforced-plastic tank used to supply gasoline.	Unknown (c/r summer 1986)	ER (2°)	FFA	FFA
205	1.3-3 #4	7,500	Old SD Bldg.	Sanitary waste treatment tank	Unlined concrete tank used in sanitary waste treatment.	1975 (i/i)	D&D	AEA	AEA
206	1.3-3 #5	30,000	Old SD Bldg.	Sanitary waste treatment tank	Unlined concrete tank used in sanitary waste treatment.	1975 (i/i)	D&D	AEA	AEA
207	1.3-3 #6	7,500	Old SD Bldg.	Sanitary waste treatment tank	Unlined concrete tank used in sanitary waste treatment.	1975 (i/i)	D&D	AEA	AEA
208	1.3-3 #7	3,466	Bldg. 41	Alpha waste-water pumping station tank	Stainless-steel-lined steel tank used to collect alpha waste-waters and pump them to WD Building.	1974 (c/r Sept. 1986)	ER (6°)	FFA	FFA
209	1.3-3 #8	3,466	Bldg. 41	Alpha waste-water pumping station tank	Stainless-steel-lined steel tank used to collect alpha waste-waters and pump them to WD Building.	1976 (c/r Sept. 1986)	ER (6°)	FFA	FFA
210	1.3-3 #9	5,000	SM Bldg.	Alpha waste-water collection tank	Unlined steel tank used to collect alpha waste-waters.	1972 (c/r June 1986)	D&D	AEA	AEA
211	1.3-3 #10	3,000	SM Bldg.	Alpha waste-water collection tank	Unlined steel tank used to collect alpha waste-waters.	1972 (c/r June 1986)	D&D	AEA	AEA
				Alpha waste-water collection tank	Bituminous-lined steel tank used to collect alpha waste-waters.	1972 (c/r Jan. 1988)	D&D	AEA	AEA

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9, SITE SCOPING REPORT: VOLUME 3 - RADIOLOGICAL SITE SURVEY

MOUND PLANT
MIAMISBURG, OHIO

June 1993

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

FINAL

Production, analytical services and decontamination activities generated low and high risk solid and liquid wastes, and liquid and solid wastes containing plutonium above the economic discard limit. Treatment of high and low risk wastewater was conducted in SM, WDA and WS Buildings.

From 1961 to 1967, all low- and high-risk process wastewater and waste containing plutonium-238 in excess of the economic discard limit was treated in the SM waste disposal facility, processed for plutonium-238 recovery, or drummed and stored in the SM drum storage area for future plutonium recovery. The SM waste disposal facility discharged the treated effluent and influent tank overflow through the storm sewer system to the plant drainage ditch. Spills and upsets in the SM waste treatment facility resulted in the SM Building septic tank, and subsequently the associated leach field, known as Area 16, receiving wastewater contaminated with plutonium-238. In 1963 or 1964, the SM Building septic tank was taken out of service and sanitary wastes were sent to the sanitary waste treatment plant. An acid leach field associated with Building 38 is known as Area D.

In 1967, a WTS was installed between the SM Building and a newly constructed addition to the WD Building and became known as the WDA facility. Low- and high-risk waste was transferred to the WDA facility via dual underground, saran-lined steel pipes. The pipes were buried up to depths of 20 ft. The WTS transferred the wastes by gravity from the SM/PP Building complex to a lift station located in Building 41 in the plant valley. From Building 41, the wastes were pumped up to the WDA treatment facility. Low-risk wastewater was treated in WDA until 1970. Overflow of the influent tanks is documented (DOE 1992b). Treated wastewater was released to the plant drainage ditch. Since the polonium program was phased out in 1970, the WD facility was utilized for treatment of low-risk plutonium wastewater released to the Great Miami river through a closed pipeline. The outfall is regulated under the National Pollution Discharge Elimination System. The low-risk waste lines were taken out of service in 1976 and replaced with tanker trucks for material transfer.

High-risk waste was transferred to WDA from 1967 until 1974, when it was taken out of service when the WS facility was constructed at Building 38 for high-risk waste processing. In 1969, a leak of the high-risk, pressure-feed waste line between Building 41 and the WDA Building resulted in significant soil contamination. The gravity-feed part of the waste line down from the SM/PP complex to Building 41 was removed in the mid-1980s.

Areas involved with treatment of wastes from the plutonium-238 program were largely included in the work performed by the Site Survey Project. The WDA and WD Buildings are included in Areas 4 and 4a described in subsection 3.3. The hillslope below WD Building where the WTS pressure waste line ruptured is known as Area 14. The former gravity feed segment of the WTS wasteline from the SM/PP complex to Building 41 is known as Area 19. The SM wastewater

4.1.2. Area 11

Area 11 is located on the SM/PP Hill directly west of the SM Building (Plate 1). From the early 1960s to 1965, this area was used for the storage of plutonium-contaminated equipment and waste packages from the SM Building. Some of the drums of recoverable plutonium wastes were found to be leaking in 1964 and were moved to the open field south of SM Building for overpacking. The boundaries of Area 11 shown on Plate 1 are similar to the area depicted in the original Site Survey Project Report (Stought et al. 1988).

Five core locations were sampled in Area 11 during the Site Survey Project (Table IV.3). The samples were analyzed for plutonium-238 and thorium. The maximum thorium concentration measured was 5.65 pCi/g in a sample taken at a depth of 18 inches at core location 0141 (C0141 on Table IV.3). The maximum plutonium concentration measured was 870 pCi/g in the sample taken 18 inches deep at core location 0138 (C0138 on Table IV.3).

The concentrations of plutonium and thorium shown in Table IV.3 agree with the assessment of Area 11 given in the original report. However, the original Site Survey Project Report noted that more recent D&D data for Area 11 indicated plutonium-238 contamination in the 10 to 100 nanocuries per gram (nCi/g) (10,000 to 100,000 pCi/g) range. This was confirmed by the sampling performed in Area 11 in 1989 as part of the D&D Program, Operable Unit 6, reconnaissance sampling. This sampling f levels of plutonium as high as 64,000 pCi/g (64 nCi/g) and thorium as high as 69 pCi/g (DOE 19

The maximum depth of the core locations sampled in Area 11 during the Site Survey Project wa inches (Table IV.3). Mound Plant drawing #FSE16472, reproduced in the Site Scoping R Volume 2 Addendum (DOE 1992f) indicates the depth to bedrock in this area of Mound Plant 120 to 228 inches (10 to 19 ft), although it may be as shallow as 96 inches (8 ft) or less. Be the boring logs are not available, it is not known if the Area 11 core locations were sampl bedrock.

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4.1.3. Area 14

Area 14 is located on the southern slope of the Main Hill, below the WD Building (Plate 1). Area 14 is the original site of the 1969 waste-line break. In January 1969, the pressurized length of the WTS waste line broke at the upper portion of the slope, releasing about 400 Ci of plutonium-238 in a nitric acid solution to the surrounding soils. The events are described in "Reinvestigation of the January, 1969 Plutonium-238 Waste Transfer Line Break" (MRC 1974). Erosion of soils from Area 14 are interpreted to have contributed to contamination of areas downslope in Area 3 and the Miami-Erie Canal, described in a companion thorium section of this report (Rodgers 1975; Robinson et al. 1974).

Several remedial actions to remove plutonium-contaminated soils have been performed by the D&D Program in this area, including 964 ft^3 of highly contaminated soil was removed and shipped to Maxey Flats, Kentucky, for burial in 1969; and in 1974, 2,700 ft^3 of soil containing 35 Ci of plutonium-238 was removed and shipped to Idaho National Engineering Laboratory (Black 1974).

Limited sampling was performed in Area 14 during the Site Survey Project because remedial actions by the D&D Program were pending. The results of the sampling are given in Table IV.4 and the sampling locations are shown on Plate 1. The maximum plutonium-238 and thorium concentrations measured were 133.9 and 2.24 pCi/g, respectively, in a sample taken 18 inches deep at core location C0094 on Plate 1 (Table IV.4). However, the Site Survey Project original report notes that activity as high as 3,500 nCi/g was measured in Area 14 during the D&D Program activities.

Additional soil removal was completed in January 1991 by D&D in this area, using a cleanup level of 100 pCi/g of plutonium-238. A verification plan to confirm cleanup levels in Area 14 was prepared and implemented by Argonne National Laboratory (Mosho and Robinet 1990). The verification report on this area indicates that there is a 90 percent confidence that the mean plutonium-238 concentration for surface soils is now no greater than 13 pCi/g, and the mean for subsurface soils is now no greater than 29 pCi/g (Mosho and Robinet 1990).

4.1.4. Area 16

Area 16, also known as the SM Leach Field, is located on the western slope of the SM/PP Hill, near Building 30 (Plate 1). Area 16 reportedly contained a sanitary sewage septic tank and septic leach field formerly used for the SM Building. The area contains plutonium-238 contamination, possibly from the sanitary sewage system or from a storm sewer present in the area. The boundaries of Area 16 shown on Plate 1 are similar to the area depicted in the original Site Survey Project Report (Stought et al. 1988), except the area on Plate 1 has been extended westward to the plant drainage ditch to be consistent with current D&D Program plans. Concurrently with the writing of this report, the D&D Program is removing radioactively contaminated soils from Area 16. During this field activity, the septic tank was not present. No documentation of its removal was found. The lower part of the slope was found to possess plutonium-238 levels as high 8 nCi/g, but these levels are unsubstantiated at this writing. Elevated levels of plutonium-238 at the base of this slope and along the contiguous portions of the former upper reach of the plant drainage ditch were recognized during the investigations in 1974. These are shown on Figure 1.2.

Table IV.5 presents the results of the Site Survey Project sampling [illegible] plutonium-238 concentration measured was 144 pCi/g in the sampl [illegible]

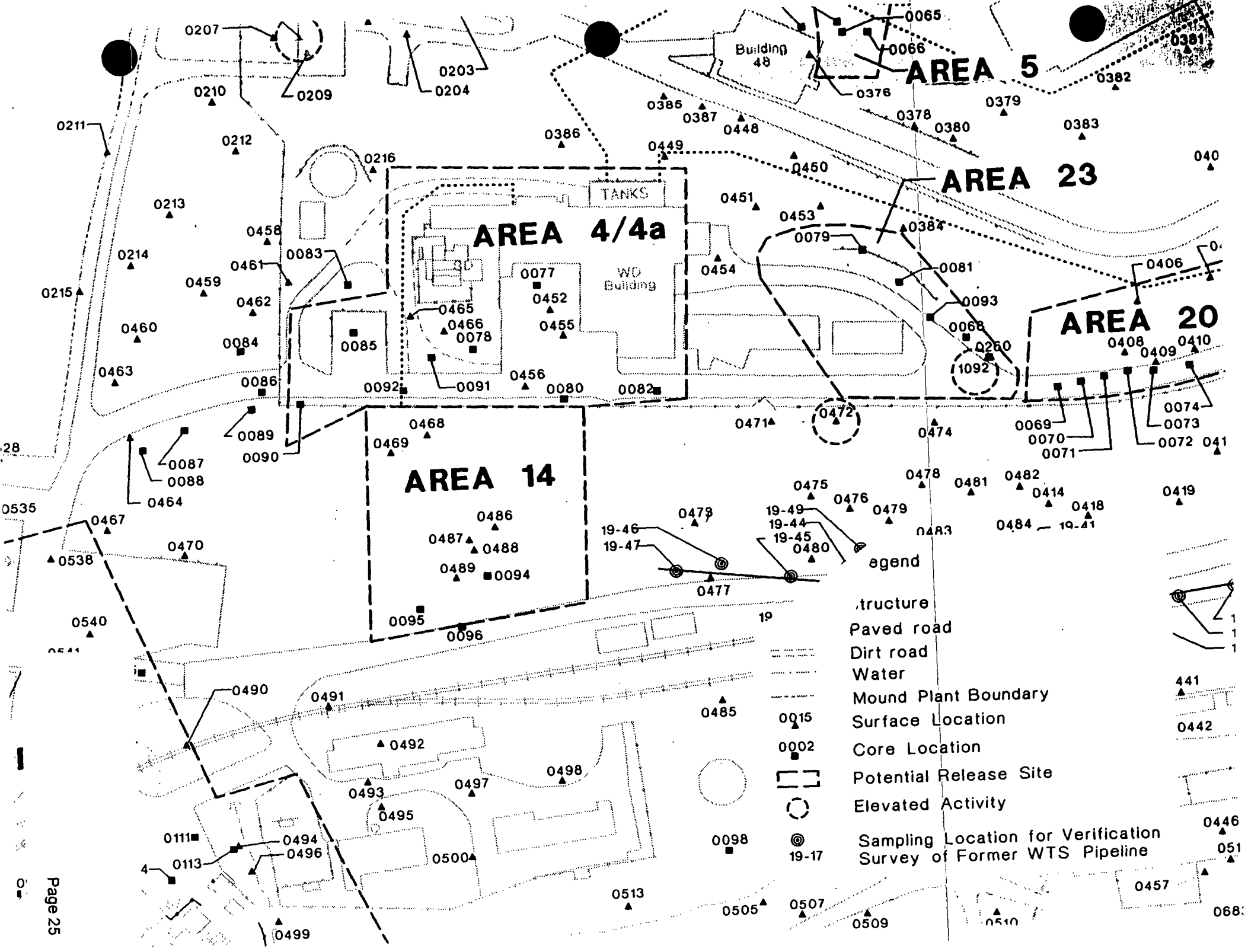
AREA 5
AREA 23
AREA 4/4a
AREA 20
AREA 14
Building 48
TANKS
WO Building
egend
structure
Paved road
Dirt road
Water
Mound Plant Boundary
Surface Location
Core Location
Potential Release Site
Elevated Activity
Sampling Location for Verification Survey of Former WTS Pipeline

Table IV.4. Mound Site Survey Project - Area 14

Plate 1 Location[a]	Coordinates South	Coordinates West	MRC ID No.	Mo-Yr	Depth (inch)	Plutonium-238 (pCi/g)	Thorium[b] (pCi/g)	Tritium (pCi/mL)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)
S0468	2025	3825	6292	08-84	0	0.17	b		LDL	LDL	1.2	LDL
S0469	2025	3860	6291	08-84	0	18.90	b					
S0486	2125	3810	6706	08-84	0	10.27	b					
S0487	2125	3835	6704	08-84	0	5.96	b					
S0488	2135	3835	6703	08-84	0	18.77	b					
S0489	2150	3860	6705	08-84	0	14.10	b					
C0094	2160	3835	1595	04-83	18	133.90	2.24					
			1596	04-83	36	59.90	b					
			1597	04-83	54	70.90	b					
			1598	04-83	72	6.81	b					
			1599	04-83	90	11.82	b					
			1600	04-83	108	1.24	b					
			1601	04-83	126	3.54	b					
C0095	2160	3900	1602	04-83	18	7.87	b					
			1603	04-83	54	3.97	b					
			1604	04-83	72	7.49	b					
			1605	04-83	90	5.00	b					
			1606	04-83	108	5.05	b					
			1607	04-83	126	6.63	b					
C0096	2190	3875	1608	04-83	18	0.27	b					
			1609	04-83	36	2.18	b					
			1610	04-83	54	0.26	b					
			1611	04-83	72	0.45	b					
			1612	04-83	90	1.46	b					
			1613	04-83	108	0.62	b					
			1614	04-83	126	0.09	b					
			1615	04-83	144	0.07	b					

[a]Map locations are given using a "C" to designate core locations and an "S" to designate surface locations.

[b]A "b" indicates that the total thorium concentration was less than the background level of 2.0 pCi/g, using FIDLER screening. Therefore, radiochemical analysis was not performed.

FIDLER - field instrument for the detection of low-energy radiation

LDL - The measured concentration was below the lower detection limit, estimated to be 0.5 pCi/g for cobalt-60, cesium-137, and americium-241; and 1 pCi/g for radium-226.

MRC ID - Monsanto Research Corporation identification

pCi/g - picocuries per gram

pCi/mL - picocuries per milliliter

Core samples of the landfill cover material were taken at three locations during the Site Survey Project. These were locations C0185, C0187, and C0188 (Plate 1; Table IV.7. A limited number of locations were sampled and later replugged, in order to maintain the integrity of the landfill cover. The maximum plutonium-238 concentration found in the core samples was 3.71 pCi/g in the sample taken at a depth of 126 inches at location C0187 (Table IV.7). Bedrock was not encountered during the drilling of these core locations because the depths were limited in order to avoid the buried materials located within the Site Sanitary Landfill.

Eleven surface samples were taken in Area 18 (0862, 0864, 0866, 0867, 0869, 0870, 0872, 0873, 0874, 0877, and 0878 on Plate 1). The maximum plutonium-238 concentration measured in the samples from these surface samples was 0.98 pCi/g at location S0878 (Table IV.7). No thorium concentrations above 2 pCi/g were detected in any of the Area 18 samples (core or surface).

4.1.7. Area 19

The gravity portion of the underground WTS, which consisted of two waste lines travelling from the SM Building to Building 41, was located in Area 19 (Figure 4.1 and Plate 1). Figure 4.1 shows the former location of the WTS. The location and extent of Area 19 shown on Plate 1 was identified based on the verification sampling locations, which are designated 19-1 through 19-62. The waste lines that comprised the WTS actually extended into Area 14. During the Site Survey Project, no sampling was performed at Area 19, because this area was being addressed by the D&D Program.

The major portions of these lines in Area 19 were removed from 1982 to 1984; work continued on the portion of the lines just south of the WD Building until about 1986. As the waste lines were removed, the adjacent soils in the trench were screened, and contaminated soil was removed. The verification survey performed to document the removal of contaminated soil near these lines is discussed in "Verification Survey of the WTS Excavation Area at the Mound Facility" (Stenhouse and Kirsch 1986). It is not known how much soil was removed.

Removal of the waste lines included the excavation and removal of soils contaminated by leaks in the waste lines. The target cleanup level for actinides, mostly plutonium-238 with thorium-232 at some locations, was 100 pCi/g, which is equal to 4.5×10^{-8} ppm. The waste line removal was performed under the Mound Plant D&D Program, which followed a cleanup level of 100 pCi/g for plutonium-238 and 25 pCi/g as the as low as reasonably achievable (ALARA) level.

A study to verify the cleanup of Area 19 was performed by Battelle in 1986 of 248 soil samples from a total of 62 locations. One surface sample and

were taken at each location. Table IV.8 gives the locations and the sampling patterns. These locations were plotted on Plate 1; Area 19 was identified based on these locations. The verification sampling was apparently performed after the trench was backfilled. With a few exceptions, the Battelle report indicates that the greatest depth at which contamination typically exceeded 25 pCi/g before removal was approximately 3 to 4 ft (Stenhouse and Kirsch 1986). Assuming that the depth of the backfilled soil was, at a minimum, 3 ft, it is probable that three samples were taken of the backfill material at 1, 2, and possibly 3 ft. It is not known how much backfill was placed in the trench.

Table IV.9 gives the analytical results for the verification survey of Area 19. The plutonium-238 analyses were performed using a Phoswich™ detector coupled to a multichannel analyzer. The system was calibrated to detect the low-energy gamma emissions from plutonium-238, correcting for the presence of thorium-232 as necessary. The LDL for this system was 20 pCi/g for a 400-second count. Twenty-five, or 10 percent, of the samples were also radiochemically analyzed for plutonium-238 by an independent laboratory to confirm the Phoswich™ results. In general, the plutonium-238 levels measured by both methods were comparable, with some inconsistencies for samples containing thorium-232 or having a low sample weight (Stenhouse and Kirsch 1986).

The verification study concluded that more than 90 percent of the samples analyzed contained levels of plutonium-238/thorium-232 within one standard deviation of the 100 pCi/g cleanup level. Samples taken at test hole numbers 7, 14, 22, and 23 contained plutonium-238 in excess of 100 pCi/g (Table IV.9). Contaminated soil was removed from test hole numbers 14 and 22 (Tables IV.8 and IV.9) in September 1990 and was boxed and disposed of by the D&D Program. Samples taken of the excavation walls in 1990 showed plutonium-238 levels to be less than 100 pCi/g after the excavation was completed. This soil removal was documented in an internal Mound Plant memorandum (Rader 1990).

4.1.8. Area D

Area D is located on the SM/PP Hill, adjacent to Area 12, and is the location of an acid-leach field for Building 38, also know as the PP Building (Plate 1). The acid leach field was designed so that a pipe extending from trays holding polypropylene tanks containing nitric acid for use in plutonium-238 processing would release nitric acid to the acid leach field in the event of leaks or spills. The leach field contained limestone gravel/rocks that had been placed there in order to neutralize the nitric acid. Both the pipe and the limestone were below ground surface, but the exact depths are unknown.

One core location was sampled in the apparent vicinity of the Area D ar
C0146 on Table IV.10 and location 0146 on Plate 1. No significant plu

OU9, SITE SCOPING REPORT, VOL. 3 - RAD. SITE SURVEY
DEC. 1992, PLATE 1

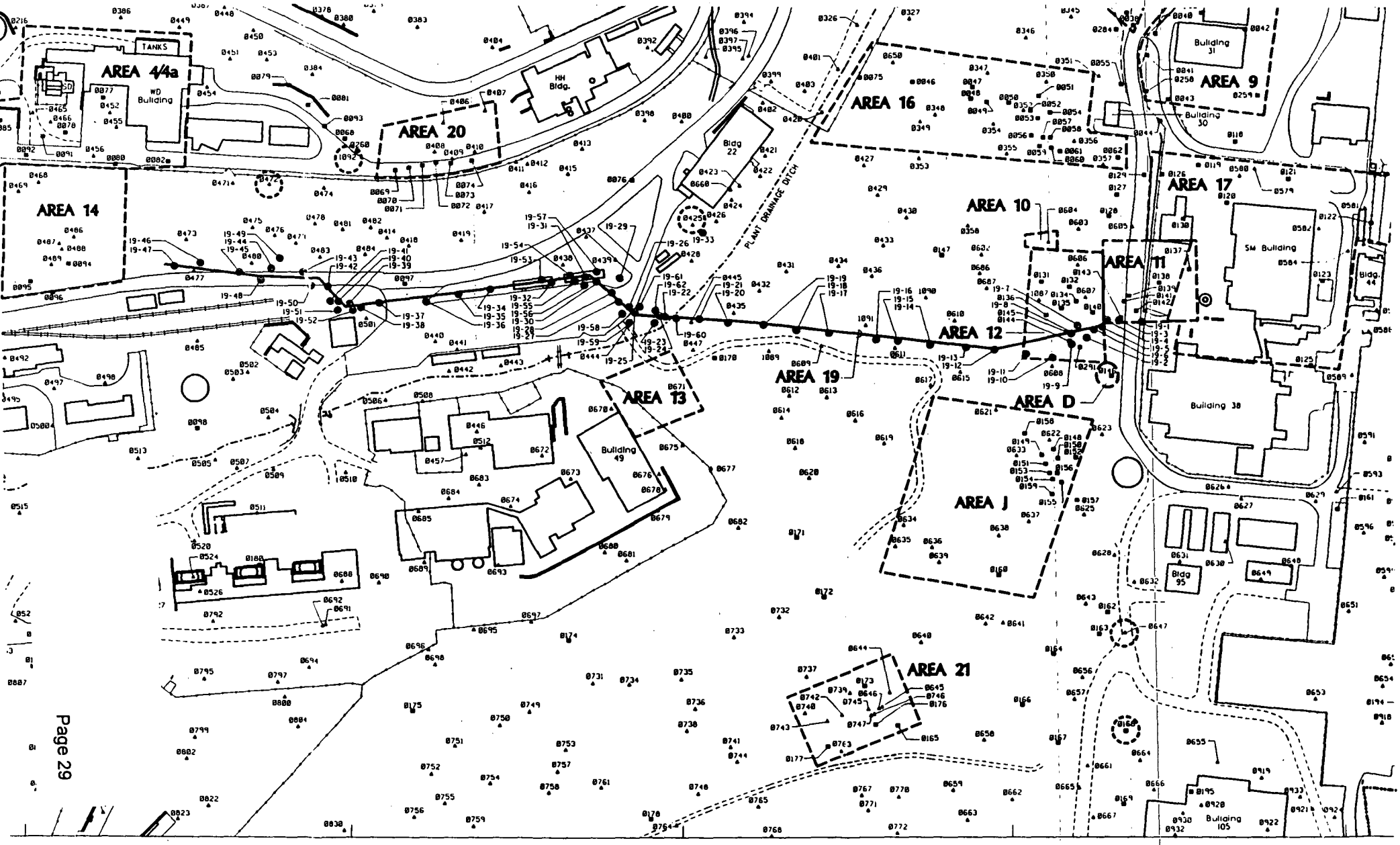

Table IV.9. Analytical Data

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
1	Surface	<LDL
	1 - 2	<LDL
	2 - 3	<LDL
	6 - 7	<LDL
2	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
3	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	8 - 9	<LDL
4	Surface	<LDL
	2 - 3	<LDL
	4 - 5	<LDL
	7 - 8	<LDL
5	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
6	Surface	26
	2 - 3	<LDL
	4 - 5	24
	7 - 8	<LDL

[a]Denotes those samples which were subsequently submitted for independent radiochemical analysis.

[b]Absolute errors are not provided for each plutonium-238 activity value. As a guideline, the following minimum errors (at the $\pm 1\sigma$ level) may be taken for various plutonium-238 activity levels. These errors depend on how much thorium is present; the first ± value is calculated for a thorium concentration of 1 pCi/g and the other ± value for 10 pCi/g thorium.

25 pCi/g plutonium-238: ±8 pCi/g; ±38 pCi/g
50 pCi/g plutonium-238: ±9 pCi/g; ±38 pCi/g
100 pCi/g plutonium-238: ±9 pCi/g; ±37 pCi/g

[c]The locations are designated 19-1 through 19-62 on Plate 1.

[d]Contaminated soil was removed from test holes 14 and 22 in September 1990. Post-removal plutonium-238 soil levels were less than 100 pCi/g (Rader 1990).

LDL - Lower detection limit. LDL is taken as equal to or less than 20 pCi/g for a 400 second count.

pCi/g - picocuries per gram

Table IV.9. (page 2 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
7	Surface	81
	4 - 5	181
	5 - 6	42
	7 - 8	33
8	Surface	35
	2 - 3	28
	7 - 8	21
	8 - 9	46
9	Surface	<LDL
	2 - 3	<LDL
	5 - 6	<LDL
	7 - 8	<LDL
10	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
11	Surface	<LDL
	3 - 4	<LDL
	5 - 6	<LDL
	7 - 8	<LDL
12	Surface	<LDL
	1 - 2	<LDL
	4 - 5	<LDL
	5 - 6	<LDL
13	Surface	23
	2 - 3	<LDL
	5 - 6	<LDL
	7 - 8	21
14[d]	Surface	<LDL
	2 - 3	23
	5 - 6	410
	7 - 8	34
15	Surface	<LDL
	2 - 3	<LDL
	5 - 6	<LDL
	8 - 9	<LDL
16	Surface	<LDL
	2 - 3	<LDL
	4 - 5	<LDL
	6 - 7	<LDL

Table IV.9. (page 3 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
17	Surface	<LDL
	1 - 2	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
18	Surface	26
	1 - 2	<LDL
	3 - 4	22
	4 - 5	26
19	Surface	22
	3 - 4	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
20	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	8 - 9	<LDL
21	Surface	24
	4 - 5	<LDL
	6 - 7	<LDL
	7 - 8	<LDL
22[d]	Surface	<LDL
	3 - 4	1057
	4 - 5	41
	5 - 6	<LDL
23	Surface	26
	2 - 3	114
	3 - 4	185
	8 - 9	<LDL
24	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	7 - 8	<LDL
25	Surface	<LDL
	1 - 2	<LDL
	2 - 3	<LDL
	3 - 4	26
26	Surface	<LDL
	1 - 2	<LDL
	5 - 6	<LDL
	6 - 7	<LDL

Table IV.9. (page 4 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
27	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	5 - 6	<LDL
28	Surface	<LDL
	1 - 2	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
29	Surface	<LDL
	3 - 4	<LDL
	5 - 6	<LDL
	7 - 8	<LDL
30	Surface	<LDL
	1 - 2	<LDL
	3 - 4	<LDL
	4 - 5	21
31	Surface	<LDL
	1 - 2	<LDL
	6 - 7	31
	7 - 8	22
32	'Surface	<LDL
	1 - 2	<LDL
	4 - 5	24
	5 - 6	<LDL
33	Surface	<LDL
	4 - 5	<LDL
	5 - 6	<LDL
	8 - 9	23
34	Surface	27
	3 - 4	<LDL
	4 - 5	<LDL
	7 - 8	21
35	Surface	26
	2 - 3	<LDL
	5 - 6	26
	6 - 7	<LDL
36	Surface	<LDL
	3 - 4	22
	4 - 5	<LDL
	7 - 8	<LDL

Table IV.9. (page 5 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
37	Surface	<LDL
	3 - 4	26
	5 - 6	28
	7 - 8	24
38	Surface	<LDL
	1 - 2	49
	2 - 3	50
	4 - 5	23
39	Surface	<LDL
	6 - 7	26
	7 - 8	24
	8 - 9	<LDL
40	Surface	<LDL
	2 - 3	35
	3 - 4	29
	5 - 6	38
41	Surface	<LDL
	2 - 3	21
	3 - 4	<LDL
	8 - 9	23
42	Surface	<LDL
	3 - 4	<LDL
	5 - 6	<LDL
	7 - 8	24
43	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	5 - 6	24
44	Surface	<LDL
	2 - 3	38
	4 - 5	<LDL
	5 - 6	<LDL
45	Surface	<LDL
	3 - 4	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
46	Surface	<LDL
	4 - 5	<LDL
	6 - 7	<LDL
	7 - 8	<LDL

Table IV.9. (page 6 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
47	Surface	36
	2 - 3	<LDL
	3 - 4	<LDL
	5 - 6	<LDL
48	Surface	<LDL
	1 - 2	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
49	Surface	<LDL
	5 - 6	<LDL
	6 - 7	<LDL
	8 - 9	<LDL
50	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	7 - 8	27
51	Surface	89
	1 - 2	<LDL
	2 - 3	26
	6 - 7	<LDL
52	Surface	<LDL
	2 - 3	41
	6 - 7	<LDL
	7 - 8	<LDL
53	Surface	22
	3 - 4	26
	4 - 5	<LDL
	5 - 6	22
54	Surface	25
	2 - 3	26
	3 - 4	23
	4 - 5	26
55	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	6 - 7	25
56	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	6 - 7	<LDL

Table IV.9. (page 7 of 7)

Test Hole/ Location No.[c]	Core Segment Depth (ft)	Plutonium-238 (pCi/g)
57	Surface	<LDL
	3 - 4	<LDL
	4 - 5	22
	8 - 9	<LDL
58	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	5 - 6	<LDL
59	Surface	<LDL
	2 - 3	<LDL
	3 - 4	<LDL
	6 - 7	<LDL
60	Surface	<LDL
	2 - 3	21
	3 - 4	27
	6 - 7	<LDL
61	Surface	<LDL
	1 - 2	29
	3 - 4	<LDL
	4 - 5	<LDL
62	Surface	21
	3 - 4	50
	4 - 5	<LDL
	5 - 6	<LDL

Table XI.1. Maximum Radioactivity Concentrations in Soil Samples from Major Areas

Site	Plutonium-238 (pCi/g)	Thorium (pCi/g)	Tritium (pCi/mL)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)	Actinium-227 (pCi/g)	Bismuth-207 (pCi/g)	Bismuth-210m (pCi/g)
Area 1	34,000	924.2	1.67	LDL	0.6	1.1	LDL	--	--	--
Area 2	17.10	3.31	--	--	--	--	--	--	--	--
Area 3	1,235	63	--	--	--	--	--	--	--	--
Area 4/4a	355.00	<2	--	LDL	LDL	1.2	1.0	--	--	--
Area 5	0.35[b]	<2[b]	--	250	1.6	0.6	LDL	--	--	--
Area 6	--	--	--	LDL	LDL	0.9	LDL	--	--	--
Area 7	7.40[j]	20.52	5.23	LDL	1.2	2.0	LDL	1,400	--	--
Area 8	24.40	254.30	1.12	LDL	LDL	3.3	LDL	--	--	--
Area 9	8.15	150	--	--	--	--	--	--	--	--
Area 10	99	<2	--	--	--	--	--	--	--	--
Area 11	100,000	69	--	--	--	--	--	--	--	--
Area 12	313.00	189.90	--	LDL	LDL	1.1	LDL	--	--	--
Area 13	5.74	<2	--	--	--	--	--	--	--	--
Area 14	29[j]	2.24	--	LDL	LDL	1.2	LDL	--	--	--
Area 15[e]	--	--	--	--	--	--	--	--	--	--
Area 16	8,000	3.46	0.35	LDL	LDL	1.2	LDL	--	--	--
Area 17	3,300	1,000	--	LDL	LDL	0.9	LDL	--	--	--
Area 18	3.71	<2	--	--	--	--	--	--	--	--
Area 19[d]	185[m]	1.2	--	--	--	--	--	--	--	--
Area 20	1.90[b]	4.02[b]		800	200	0.9	LDL	--	70	400
Area 21	1.12	<2	0.77	LDL	31	1.2	LDL	--	--	--
Area 22	1.67	<2	0.99	143	7.0	0.7	LDL	--	--	--
Area 23	--	6,000[k]	--	--	--	--	--	--	--	--
Area D	0.98	<2	--	--	--	--	--	--	--	--
	147	30.42	6.84	3.0	LDL	1.0	LDL	--	--	--
	8.30	<2	1.90	LDL	LDL	0.94	LDL	--	--	--

Table B.1.

Table XI.1. (page 2 of 2)

Site	Plutonium-238 (pCi/g)	Thorium (pCi/g)	Tritium (pCi/mL)	Cobalt-60 (pCi/g)	Cesium-137 (pCi/g)	Radium-226 (pCi/g)	Americium-241 (pCi/g)	Actinium-227 (pCi/g)	Bismuth-207 (pCi/g)	Bismuth-210m (pCi/g)
Possible Elevated Thorium	8.97	37.69	–	LDL	LDL	1.5	LDL	–	–	–
Drainage Ditch	535.00	–	–	–	–	–	–	–	–	–
Railroad Siding	573	107	–	–	–	–	–	–	–	–
Overflow Pond	–	268	–	–	–	–	–	–	–	–
SW Building[e] Soils	–	–	3.83×10^{6}	–	–	–	–	–	–	–
Building 48 Hillside	32,000	–	–	–	–	–	–	–	–	–
Building 66 Lot	7,000	–	–	–	–	–	–	–	–	–
Cobalt-60 Hot Spots	NR	NR		82	10	0.6	LDL	–	–	–
Plutonium-238 Hot Spots	61.0	<2	–	–	–	–	–	–	–	–
Remedial Action Guidelines[f]	100/25[g]	5 surface[h] 15 subsurface	5,200[j]	NE	80[j]	5 surface[h] 15 subsurface	20[j]	NE	NE	NE

[a]The total thorium concentration was less than the background level of 2 pCi/g, using FIDLER screening; therefore, radiochemical analysis was not performed.
[b]Most of the results for this radionuclide for this area are reported as NR. See the area-specific tabulated results.
[c]Area 15 emits 1 Ci per year of radon, indicating the presence of radium-226.
[d]Sampling of Area 19 was verification sampling conducted after remedial action.
[e]SW Building soils were sampled in 1977 (Dames and Moore 1977).
[f]Current remedial action guidelines are subject to change, pending additional pathways analysis and risk assessment.
[g]Current D&D cleanup level is 100 pCi/g (DOE 1983); 25 pCi/g, if feasible (as low as reasonably achievable [ALARA]).
[h]Remedial action guideline (CFR 1990)
[i]Remedial action guideline (DOE 1983)
[j]Value for Area 7 does not include value at Building 66
[k]Value indicated is thorium-230 isotope
[l]Value is mean during verification sampling after cleanup
[m]Highest residual level after verification cleanup
Dashes indicate that no data are available for the given area and given radionuclide.
FIDLER - field instrument for the detection of low-energy radiation
LDL - The measured concentration was below the lower detection limit, estimated to be 0.5 pCi/g for cobalt-60, cesium-137, and americium-241; and 1 pCi/g for radium-226 and actinium-227.
NE - Not established
NR - No result
pCi/g - picocuries per gram
pCi/mL - picocuries per milliliter
Ci - curie

Environmental Restoration Program

OPERABLE UNIT 6, AREA 19 AND AREA 14 VERIFICATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

October 1994

FINAL

(Revision 0)

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
EG&G Mound Applied Technologies

EXECUTIVE SUMMARY

A verification sampling investigation of the Operable Unit 6 (OU6), Area 19 and Area 14, was performed in November 1993. Prior to sampling efforts, proposed drilling locations were determined based upon the surveyed waste transfer line, and clearance was provided for all locations. A series of environmental soil borings and laboratory analysis of soil samples to characterize the nature and extent of radiological and non-radiological contamination was performed. In addition, based on the results of the investigation, the Mound Decontamination and Decommissioning (D&D) Program was assessed to determine if remediation activities at Areas 19 and 14 were successful.

Area 19 and 14 was divided into three separate areas (19-1, 19-2, and 19-3) so that the sampling activities could be performed. Area 14 is located within Area 19-2. A total of three (3) soil borings were drilled and sampled in the Area 19-1. Area 19-1 is located near the Waste Disposal (WD) Building. A total of ten (10) soil borings were drilled and sampled in area 19-2, which corresponds to the former building 41 location. The remaining soil borings were located in Area 19-3 along the former WTS between the SM/PP buildings to the WD Building. A total twenty-five (25) soil borings were performed for Area 19-3. The total amount of soil borings performed for the investigation is 38, plus one additional soil boring near the Test Fire parking lot.

Based on the analytical results and the statistical analysis of the results, the D&D Program has successfully remediated Areas 19-1, 19-2, and 19-3 for radiological compounds (assuming a subsurface cleanup standard for Thorium-228 of 15 pCi/gram). Of the non-radiological parameters, no compounds were identified as potential contaminants of concern.

1. INTRODUCTION

EG&G Mound Applied Technologies (EG&G) operates the Department of Energy (DOE) Mound Plant under contract with the DOE. Historical production and general material handling activities at Mound Plant have contributed to radiological and non-radiological chemical contamination of the environment on the plant property. As a result of past contaminant releases, Mound Plant was placed on the National Priorities List (NPL) in November 1989. In response to this listing, the DOE and the U.S. Environmental Protection Agency (USEPA) entered into a Federal Facility Agreement (FFA) which became effective October 12, 1990. Under the terms of the FFA, the DOE is required to develop and implement a Remedial Investigation/Feasibility Study (RI/FS) and conduct interim actions to protect public health and the environment. One of these interim actions includes the verification sampling and analysis investigation for D&D activities at Area 19 and Area 14 (ICF KE 1993).

Area 19 consists of soils that surrounded two underground waste transfer lines that were used to transfer low-activity and higher-activity plutonium-238 liquid waste. Area 14 consists of a former spill area upslope of the former lift station (Building 41) and downslope from the Waste Disposal Annex (WDA) Building. During the period from 1966 through 1967, Building 38 (PP Building), the WDA Building and the Waste Transfer System (WTS) were constructed to meet the increasing needs of the plutonium processing programs at Mound Plant. The WTS consisted of a series of holding tanks, a lift station (Building 41, subsequently demolished), and steel transfer pipes connecting the SM and PP Buildings to the WDA Building. The former lift station (Building 41) was located at the end of the gravity feed portion of the WTS, at the southeast corner of Area 14. The transfer pipes consisted of a 1.5-inch pipe to transfer the high-risk waste, and a 2-inch pipe to transfer the low-risk waste. The depth below ground surface (bgs) of these lines varied from approximately 4 feet to 17 feet. The low-risk line was in service from 1967 until September, 1974, and the high-risk line was used during the period from 1967 until April, 1976 (DOE 1992a). These two underground waste transfer lines and former Building 41 (Area 14) are the focus of the OU 6 verification sampling effort.

A series of environmental soil borings were drilled to determine if the remediation efforts performed by the Mound D&D Program were successful. Soil borings were performed and soil samples were collected for analysis of chemical and radiological parameters in accordance with the OU 6 Verification Plan. In addition, one additional boring was performed near a stream in the Test Fire parking lot to address EG&G Mound concerns. The subsurface borings were drilled with an All Terrain Vehicle (ATV) Mobile B-57 drilling using hollow-stem augers. Analytical services were performed by PACE Laboratories, located in Pittsburgh, Pennsylvania and Golden, Colorado and CompuChem located in Durham, North Carolina. A total of 39 soil borings were completed and 92 soil samples were collected for site characterization.

1.1. PURPOSE OF THE VERIFICATION ACTIVITY

The objective of the work activities for Area 19 and Area 14 was to determine the success of the Mound D&D Program remediation effort for soils along the former radioactive WTS. This was accomplished by advancing 13 soil borings (at areas 19-1 and 19-2) and 23 soil borings plus two hand auger locations (in Area 19-3) in areas of concern (Area 19 and Area 14). One additional soil boring was performed near the Test Fire parking lot to address concerns of possible radiological contamination. A total of 39 soil borings were performed with soil samples collected and analyzed for chemical and radiological parameters. Based on the results of the soil sampling, verification of the remedial effort is able to be provided to the regulatory agencies.

1.2. SCOPE OF THE VERIFICATION ACTIVITY

Based on an EG&G Mound and regulatory agency approved work plan, Area 19 and Area 14 was investigated. The scope of the verification activities addressed three individual areas of concern: the 19-1 area (the WTS within the secured WD building area); the 19-2 area (Area 14 and a portion of the WTS from WD to the former lift Station [Building 41]); and the 19-3 area (the WTS from the former lift station [Building 41] up to the SM/PP Building).

The investigation of the 19-1 area (Area 19) included the three soil boring locations within the WD area and the section of the WTS pipeline north of the WD Building where leaks in the pipeline and cleanouts occurred.

The 19-2 location (Area 14 and Area 19) is an area of a former spill that has been remediated under Mound's D&D Program. The area is upslope from the former lift station (Building 41) where the break occurred in the radioactive waste line in 1969. In Area 19-2, a total of 10 soil borings were drilled and sampled for site characterization.

The 19-3 area (Area 19) is the remaining section of the underground waste transfer line. The area investigated included the complete length of the trench excavated during the D&D program to remove the WTS piping. That piping extended from the SM/PP buildings through the former lift station (Building 41) to the WD and WDA buildings on the Main Hill. The first boring (19-3A) location was randomly determined along the former underground line. The 25 remaining soil boring locations were at predetermined distances relative to the randomly determined first boring (19-3A).

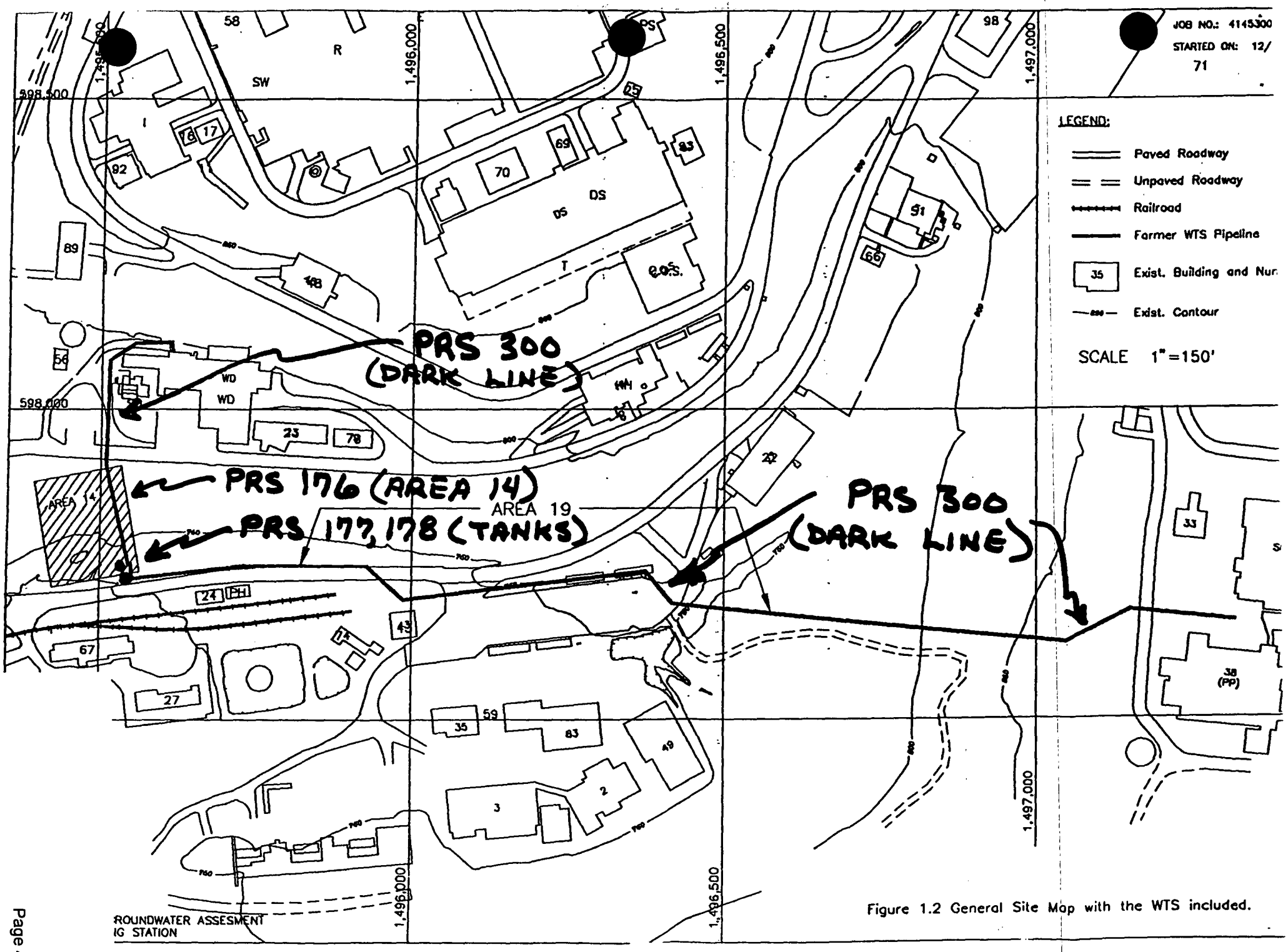

Figure 1.2 General Site Map with the WTS included.

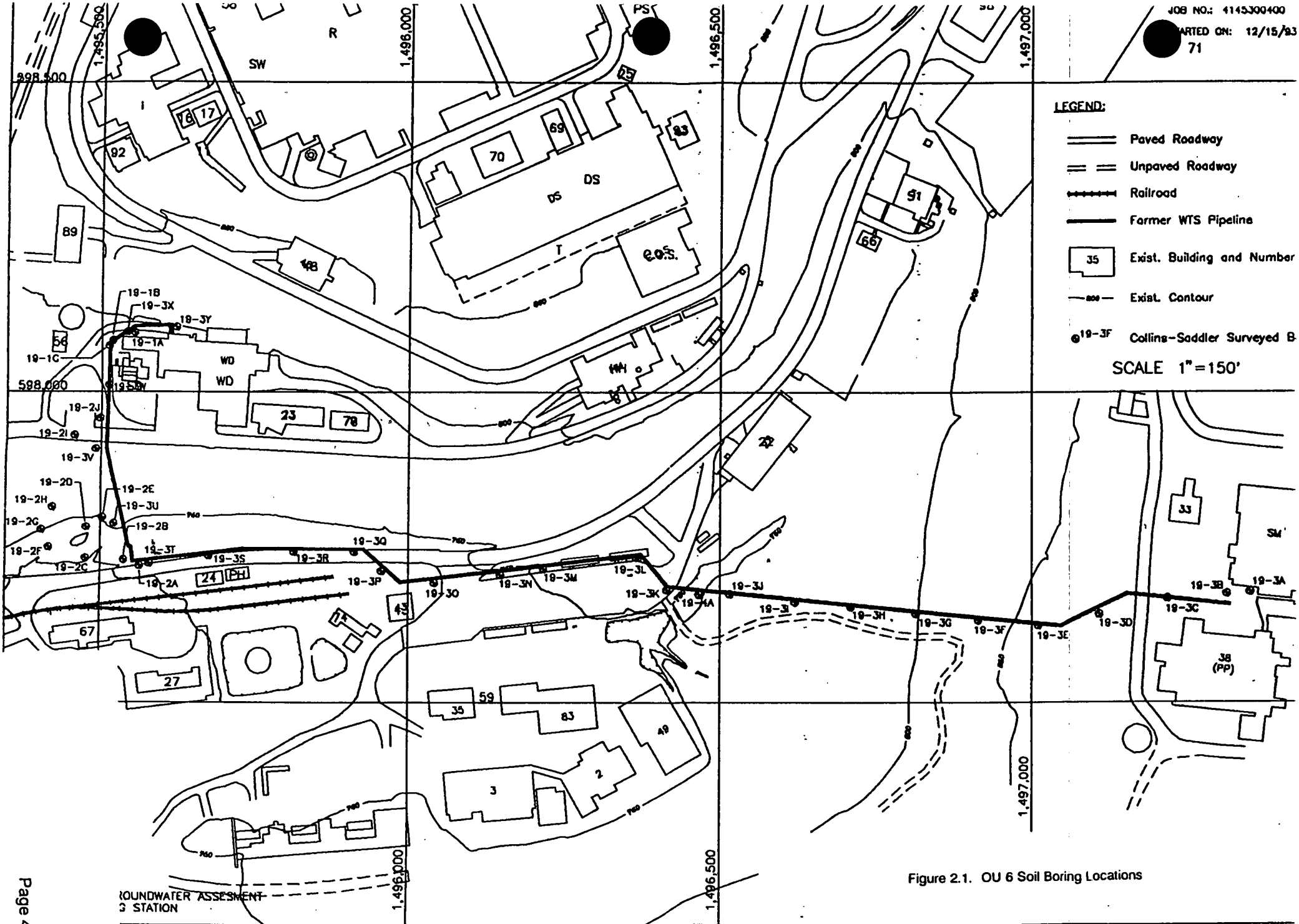

Figure 2.1. OU 6 Soil Boring Locations

Table IV.6 Radiological Analytical Data

Sample Number	Boring Location	Sample Depth	Units	Am-241	Q	Pu-238	Q	Pu 239/240	Q	Th-228	Q	Th-230	Q	Th-232	Q	Tritium	Q	U-234	Q	U-235	Q	U-238	Q
010002	19-3A	1-3'	pCi/g	0.30		5.04		0.20	U	0.84		0.59		0.50		14.00	U	0.54		0.07	UJ	0.48	
011002	19-3A	1-3'	pCi/g	0.26	U	132.05		1.92		0.84		0.88		0.71		14	U	0.68		0.07	U	0.52	
020003	19-3B	3-4'	pCi/g	0.31		100.92		0.54	J	1.10		0.99		0.98		14	U	0.52		0.06	J	0.71	
020006	19-3B	6-7'	pCi/g	0.30	U	16.55		0.30		3.66		0.95		0.16		14	U	0.53		0.10		0.53	
030004	19-3C	4-6'	pCi/g	0.31	U	3.25		0.11	U	3.52		0.61		0.23		14	U	0.39		0.07	U	0.37	
040007	19-3D	7-9'	pCi/g	0.31	U	0.23	U	0.11	U	1.16		1.40		0.72		14	U	0.75		0.07	U	0.74	
040012	19-3D	12-14'	pCi/g	0.33	U	0.23	U	0.11	U	0.98		0.84		0.68		14	U	0.55		0.10		0.61	
050004	19-3E	4-8'	pCi/g	0.27	U	0.45	U	0.21	U	0.47	U	0.44		0.38		14.00	U	0.49		0.07	UJ	0.42	
050010	19-3E	10-11.5'	pCi/g	0.40	U	0.45	U	0.21	U	0.48		0.43		0.24		14.00	U	0.61		0.10	J	0.70	
060000	19-3F	0-2'	pCi/g	0.39	U	7.54		0.11	U	1.78		1.25		0.97		14	U	0.67		0.07	U	0.68	
060005	19-3F	5-7'	pCi/g	0.37	U	1.48		0.11	U	1.23		1.25		0.80		14	U	0.58		0.08		0.55	
070001	19-3G	1-2'	pCi/g	0.40	U	6.10		0.12	J	1.53		0.97		1.10		14	U	0.52		0.07	U	0.72	
070012	19-3G	12-12.5'	pCi/g	0.36	U	0.23	U	0.11	UJ	1.44		1.21		1.31		14	U	0.67		0.07	U	0.87	
071001	19-3G	1-2'	pCi/g	0.34	U	10.86		0.11	UJ	1.18		1.06		0.96		14	U	0.52		0.07	U	0.71	
074000	19-3G	BLANK	pCi/L	98.64	U	0.93	U	0.44	U	2.78		1.50		0.36		700		0.33		0.29	U	0.24	U
080001	19-3H	1-3'	pCi/g	0.37	U	1.10		0.11	U	0.84		1.25		0.51		14	U	0.78	J	0.12	J	0.68	
080009	19-3H	9-11'	pCi/g	0.26	U	0.23	U	0.11	U	1.56		0.97		0.88		14	U	0.77	J	0.08	J	0.82	
090002	19-3I	2-4'	pCi/g	0.33	U	0.22	U	0.11	U	0.44		0.90		0.34		14	U	0.58		0.07	U	0.58	
090017	19-3I	17-19'	pCi/g	0.28	U	0.46	U	0.19	U	0.42	U	1.24		0.53		14.00	U	0.69		0.07	UJ	0.66	
100011	19-3J	11-13'	pCi/g	0.32	U	0.23	U	0.11	U	0.64		0.80		0.38		14	U	0.73		0.03	J	0.71	
100020	19-3J	20-22'	pCi/g	0.23	U	0.23	U	0.11	U	1.08		1.00		0.47		14	U	0.63	J	0.08	J	0.77	
101020	19-3J	20-22'	pCi/g	0.35	U	0.23	U	0.11	U	0.78		0.92		0.35		14	U	0.69		0.06	J	0.66	
104000	19-3J	BLANK	pCi/L	50.30	U	0.93	U	0.44	UJ	0.96	U	0.51		0.24	U	530	U	0.41		0.29	U	0.24	U
110006	19-3K	6-8'	pCi/g	0.36	U	0.45	U	0.21	U	0.89		0.95		1.27		14.00	U	1.18		0.11	JJ	1.21	
110017	19-3K	17-19'	pCi/g	0.31	U	0.45		0.11	U	0.74		0.83		0.50		14	U	0.71		0.08		0.67	
120001	19-3L	1-3'	pCi/g	0.38	U	3.01	J	0.21	U	2.58		1.32		1.90		17.40		0.85		0.10	J	0.85	
120020	19-3L	20-22'	pCi/g	0.29	U	0.22	U	0.11	U	4.17		0.88		0.44		14	U	0.68		0.07	U	0.77	
124000	19-3L	BLANK	pCi/L	81.85	U	0.93	U	0.44	U	0.96	U	0.34		0.24	U	530.00	U	0.36		0.29	UJ	0.28	
130003	19-3M	3-6'	pCi/g	0.37	U	6.82		0.11	U	0.69		0.84		0.58		14	U	0.72		0.07	U	0.74	
130008	19-3M	8-9'	pCi/g	0.39	U	0.33		0.11	U	1.35		1.48		1.48		14	U	0.83		0.12		1.12	
140006	19-3N	7-9'	pCi/g	0.32	U	2.50		0.11	U	0.87		1.00		0.56		14	U	0.65		0.08		0.72	
140001	19-3N	0.5-2.5'	pCi/g	0.35	U	20.18		0.20		4.23		0.82		0.57		14	U	1.12		0.18	J	1.09	
150001	19-3O	1-3'	pCi/g	0.43		31.96		0.23		1.06		1.09		0.70		14	U	0.91		0.19	J	0.73	
150020	19-3O	20-22'	pCi/g	0.33	U	0.23	U	0.11	U	0.73		0.70		0.44		14	U	0.83		0.16	J	0.87	
160018	19-3P	18-20'	pCi/g	0.40	U	0.46	U	0.22	U	0.46	U	0.49		0.37		14.00	U	0.71		0.08	J	0.80	
160010	19-3P	10-12'	pCi/g	0.36	U	0.23	U	0.11	U	1.51		1.31		1.18		14	U	0.71	J	0.07	J	0.80	
170007	19-3Q	7-9'	pCi/g	0.38	U	0.23	U	0.11	UJ	1.07		1.02		1.02		14	U	0.65		0.07	U	0.68	
170020	19-3Q	20-22'	pCi/g	0.34	U	0.23	U	0.11	UJ	1.40		1.28		1.18		14	U	0.70		0.13	J	0.74	
171020	19-3Q	20-22'	pCi/g	0.37	U	0.23	U	0.11	UJ	1.20		0.79		0.96		14	U	0.58		0.07	J	0.74	
180012	19-3R	10-12'	pCi/g	0.22	U	0.37	U	0.18	U	0.39		0.69		0.37		14.00	U	0.49		0.07	UJ	0.82	
180020	19-3R	20-22'	pCi/g	0.30	U	0.23	U	0.11	U	1.05		1.00		0.51		14	U	0.72	J	0.07	U	0.69	
190007	19-3S	7-9'	pCi/g	0.37	U	0.23	U	0.11	UJ	0.86		1.08		0.46		18.70		0.70		0.08	J	0.68	
190020	19-3S	20-22'	pCi/g	0.32	U	0.23	U	0.11	UJ	0.50		0.92		0.40		14	U	0.81		0.07	J	0.70	
191020	19-3S	20-22'	pCi/g	0.24	U	0.23	U	0.11	UJ	0.39		1.17		0.25		17.30		0.82		0.08	J	0.78	
200020	19-3T	20-22'	pCi/g	0.22	U	0.41	U	0.20	U	0.43	U	0.86		0.46		14.00	U	0.76		0.10	J	0.77	
200009	19-3T	9-11.5'	pCi/g	0.29	U	0.23	U	0.11	U	0.84		1.01		0.36		14	U	0.89	J	0.12	J	0.77	
210005	19-3U	5-7'	pCi/g	0.34		46.22		0.20		1.11		1.08		0.82		14	U	1.16	J	0.22	J	0.75	
210012	19-3U	12-14'	pCi/g	0.33	U	4.97		0.11	U	1.36		0.68		0.92		14	U	1.19	J	0.08	J	0.88	
220005	19-3V	5-7'	pCi/g	0.31	U	0.38	U	0.19	U	1.09		1.15		1.48		14.00	U	0.77		0.07	UJ	0.65	
220010	19-3V	10-11.5'	pCi/g	0.32	U	0.45	U	0.21	U	0.47	U	0.91		0.58		14.00	U	0.61		0.08	UJ	0.64	
230005	19-3W	5-7'	pCi/g	0.39	U	1.11		0.11	U	0.71		0.55		0.54		14	U	0.44		0.07	U	0.53	
230014	19-3W	15.15.5'	pCi/g	0.36	U	0.22	U	0.11	U	0.65		0.79		0.85		14	U	0.78		0.07		0.91	
240004	19-3X	4-6'	pCi/g	0.37	U	0.23	U	0.11	UJ	1.39		1.07		1.22		14	U	1.19		0.07	U	0.74	
240011	19-3X	11-12.5'	pCi/g	0.36	U	17.57		0.12	J	1.20		0.95		0.97		14	U	0.77		0.07	U	0.91	
250009	19-3Y	9-11.5'	pCi/g	0.28	U	0.74		0.11	U	1.24		1.10		1.09		14	U	0.82		0.08		0.85	
250016	19-3Y	16-17.5'	pCi/g	0.28	U	0.23	U	0.11	UJ	1.04		0.78		0.93		14	U	0.65		0.09	J	0.84	
260002	19-4A	1-3'	pCi/g	0.66		68.84		0.91		1.23		1.01		0.47		14	U	0.80	J	0.07	U	0.59	
260010	19-4A	9-11'	pCi/g	0.30	U	0.23	U	0.11	U	0.86		1.23		0.39		14	U	0.69	J	0.07	J	0.70	
260020	19-4A	20-22'	pCi/g	0.34	U	0.23	U	0.11	U	0.81		0.70		0.44		14	U	0.80	J	0.08	J	0.88	
270000	19-2A	0-2'	pCi/g	0.30	U	0.44	U	0.21	U	1.76		2.69		2.39		14.00	U	0.61		0.07	UJ	0.64	
270006	19-2A	6-8'	pCi/g	0.31	U	0.23	U	0.11	UJ	0.80		0.97		0.38		14	U	0.81		0.07	U	0.74	
270013	19-2A	13-15'	pCi/g	0.39	U	0.23	U	0.11	UJ	0.43		1.06		0.36		14	U	0.70		0.07	U	0.78	
270020	19-2A	20-22'	pCi/g	0.29	U	0.23	U	0.11	UJ	0.66		0.83		0.35		14	U	0.73		0.07	U	0.87	
274000	19-2A	BLANK	pCi/L	79.54	U	0.93	U	0.44	UJ	0.96	U	0.30		0.24	U	556.7		0.29	U	0.29	U	0.24	U
280006	19-2B	6-8'	pCi/g	0.27	U	0.44	U	0.21	U	0.51		0.73		0.21		15.30		0.58		0.07	UJ	0.70	
280013	19-2B	13-15'	pCi/g	0.30	U	0.45	U	0.22	U	0.45		0.61		0.39		14.00	U	0.78		0.15	J	0.82	
280020	19-2B	20-22'	pCi/g	0.28	U	1.68		0.22	U	0.52		0.88		0.42		14.00	U	0.87		0.07	UJ	0.81	
290000	19-2B	0-2'	pCi/g	0.19	U	0.88		0.11	U	0.40		0.07		0.07		14	U	0.26		0.07	U	0.11	
291000	19-2B	0-2'	pCi/g	0.22	U	0.23	U	0.11	U	0.24	U	0.56		0.36		14	U	0.23		0.07	U	0.25	
294000	19-2C	BLANK	pCi/L	48.74	U	0.93	U	0.93	U	0.96	U	0.29	U	0.24	U	530	U	0.29	U	0.29	U	0.24	U
290000	19-2C	0-2'	pCi/g	0.32	U	10.67		0.11	UJ	0.78		0.94		0.55		14	U	0.62	J	0.07	UJ	0.70	J
290006	19-2C	6-8'	pCi/g	0.31	U	0.23	U	0.11	U	0.80		1.06		0.48		14	U	0.79	J	0.21	J	0.97	
290013	19-2C	13-15'	pCi/g	0.35	U	1.35		0.11	U	1.10		0.97		0.89		14	U	0.83	J	0.07	U	0.72	
300000	19-2D	0-2'	pCi/g	0.23	U	2.67		0.11	U	0.50		0.68		0.28		14	U	0.44		0.07	U	0.42	
301000	19-2D	0-2'	pCi/g	0.41	U	16.86		0.11	U	1.27		1.12		0.82		21.3		1.35		0.07	U	0.78	
310000	19-2E	0-2'	pCi/g	0.32	U	21.51		0.45		2.64		1.29		0.46		34.0		7.45		0.15		0.62	
320000	19-2F	0-2'	pCi/g	0.22	U	0.23	U	0.11	U	0.72		0.78		0.43		14	U	0.81		0.24	J	0.82	
320006	19-2F	6-8'	pCi/g	0.33	U	0.23	U	0.11	U	1.10		0.88		0.42		14.9		0.80		0.13	J	0.95	
330006	19-2G	6-8'	pCi/g	0.43	U	1.53		0.22	U	0.76		0.65		0.90		22.00		0.69		0.08	J	0.69	
330000	19-2G	0-2'	pCi/g	0.29	U	3.83		0.11	U	1.06		1.37		0.72		16		0.79		0.07	U	0.65	
340000	19-2H	0-2'	pCi/g	0.36	U	1.22		0.11	U	1.32		0.77		1.07		14	U	0.88		0.07	U	0.92	
340006	19-2H	6-8'	pCi/g	0.38	U	0.35		0.11	U	1.49		0.98		1.05		14	U	1.02	J	0.07	U	0.97	
341000	19-2H	0-2'	pCi/g	0.37	U	0.51		0.11	U	2.19		1.10		1.20		14	U	1.22	J	0.09	J	0.92	
350013	19-2I	13-14.5'	pCi/g	0.39	U	0.40	U	0.19	U	0.81		0.74		0.85		14.00	U	0.65		0.07	UJ	0.71	
354000	19-2I	BLANK	pCi/L	47.02	U	0.93	U	0.44	U	0.96		0.29	U	0.24	U	530.00	U	0.29	U	0.29	UJ	0.24	U
350000	19-2I	0-2'	pCi/g	0.33	U	0.23	U	0.11	U	1.39		1.29		0.82		15	U	0.76		0.07		0.88	
350006	19-2I	6-8'	pCi/g	0.34	U	0.23	U	0.11	U	1.31		1.14		0.94		16.4		0.64		0.16		0.64	
350020	19-2I	20-22'	pCi/g	0.31	U	1.77		0.11	U	1.28		1.22		1.01		14	U	0.82	J	0.07	U	0.73	
360000	19-2J	0-2'	pCi/g	0.32	U	11.37		0.33		10.69		1.01		0.68		14	U	0.97		0.12	J	0.93	
360006	19-2J	6-8'	pCi/g	0.39	U	1.99		0.11	U	1.34		1.29		0.62		14	U	1.07		0.22	J	0.96	
360013	19-2J	13-15'	pCi/g	0.34	U	0.51		0.11	U	1.00		0.74		0.50		14	U	0.77		0.09	J	0.67	
360020	19-2J	20-22'	pCi/g	0.25	U	0.25		0.11	U	1.34		0.87		0.69		14	U	0.78		0.11	J	0.82	
370012	19-1A	12-14'	pCi/g	0.44	U	3.22		0.11	U	2.01		0.78		0.85		14	U	0.55		0.07	U	0.60	
370006	19-1A	6-8'	pCi/g	0.43	U	16.11		0.27		1.49		0.92		0.95		14	U	0.68	J	0.12	J	0.80	
380006	19-2B	6-8'	pCi/g	0.31	U	82.57		0.26	J	0.70		0.68		0.39		20.30		1.02		0.07	U	0.84	
380012	19-2B	12-14'	pCi/g	0.34	U	2.58		0.11	U	0.59		1.11		1.02		14	U	1.00		0.08		0.86	
384000	19-2B	BLANK	pCi/L	78.43	U	0.93	U	0.93	U	0.96	U	0.29	U	0.24	U	530	U	0.29	U	0.29	U	0.24	U
390011	19-2C	12-14'	pCi/g	0.45	U	0.84		0.11	U	1.07		1.07		1.03		14	U	0.61		0.07	U	0.69	
391006	19-2C	6-8'	pCi/g	0.36	U	0.23	U	0.11	U	1.29		0.93		1.20		14	U	0.76		0.07		0.89	
390006	19-2C	6-8'	pCi/g	0.44	U	5.38		0.11	UJ	1.12		0.82		1.25		14	U	1.04		0.07	J	0.88	
400000	NONE	SPIKE	pCi/g	0.86		103.93		1.54		13.35		2.77		1.21		14	U	0.94		0.08		0.92	
410010	NONE	SPIKE	pCi/g	0.37	U	17.09		0.37		2.64		1.59		0.88		14	U	0.77		0.07		0.78	
420020	NONE	SPIKE	pCi/g	0.35	U	0.23	U	0.11	U	1.15		1.55		0.68		14	U	0.54		0.08		0.78	

LIST OF ACRONYMS

ALARA	as low as reasonably achievable
ATV	all terrain vehicle
BVA	Buried Valley aquifer
CGI	Combustible Gas Indicator
CLP	Contract Laboratory Program
COC	Chain of Custody
COCs	Contaminants of Concern
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DQO	data quality objective
EG&G	EG&G Mound Applied Technologies
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
HAZWRAP	Hazardous Waste Remedial Action Program
ICF KE	ICF Kaiser Engineers, Inc.
ID	inner diameter
IDM	Investigative Derived Materials
MDA	method detected activity
MS/MSDS	matrix spike/matrix duplicate sample
NPL	National Priorities List
OEPA	Ohio Environmental Protection Agency
OU	operable unit
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
RAS	routine analytical service
RBGCV	Risk-Based Guidline Cleanup Value
RBTL	Risk-Based Threshold Level
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SAS	special analytical service
SDG	Sample Delivery Group
SOP	Standard Operating Procedure
SOW	Statement of Work
USEPA	United States Enviornmental Protection Agency
UST	underground storage tank

5. DATA ANALYSIS

The analysis of the soil data included a comparison of the soil data for both radiological and non-radiological compounds to existing risk-based soil standards developed for USEPA (EPA 1992) and to site-specific risk-based cleanup values (HAZWRAP 1994) where they exist for the contaminants of concern. Radiological threshold values were agreed upon for select radiological parameters.

A value of 100 pCi/gram (for Pu-238, which was the dominant radiological isotope detected) was used as the minimum cleanup standard and 25 pCi/gram as the ALARA (as low as reasonably achievable) value, respectively. For the statistical interpretation portion of the investigation, a clean up standard of 25 pCi/gram was used. The radiological remedial action guidelines for specific radiologic compounds are:

- Plutonium-238 — 100 pCi/gram with 25 pCi/gram if feasible (ALARA - as low as reasonably achievable);
- Thorium — 5 pCi/gram for surface and 15 pCi/gram for the subsurface;
- Tritium — 5,200 pCi/ml;
- Americium-241 — 20 pCi/gram; and
- Uranium — No remedial action level set.

(Source: OU 6 D&D Areas, Work Plan, page 3-14).

Mound has developed compound specific regulatory (clean up) levels for non-radiological compounds (HAZWRAP 1994). Where cleanup standards for a compound does not exist, a preliminary list of non site-specific risk-based, compound-specific regulatory threshold levels from an EPA document that provides a suitable basis for the statistical evaluation of the data was used (EPA 1992). The EPA document contains reference doses and carcinogenic potency slopes which have been combined with "standard" exposure scenarios to calculate chemical concentrations corresponding to fixed levels of risk in water, air, fish tissue, and soil. The soil concentrations are broken into two risk categories; commercial/industrial soil (lower exposure scenario) and residential soil (higher exposure scenario). The residential soil concentrations were selected for the regulatory threshold levels because they are the more conservative of the two options. Although these criteria are not final threshold levels, they should be adequate, to assess the effectiveness of the D&D effort.

The principal EPA source used to develop the regulatory threshold levels where used in this report is a risk-based concentration table from an EPA Region III document (EPA 1992). This table is used by the Region III toxicologists as a risk-based screen for Superfund sites and has been used to prepare preliminary remediation goals. The table is not intended as a substitute for setting site-specific cleanup

levels, and is intended as a predictor of generic single-contaminant health risk estimates. The table, containing nearly 600 chemicals, covers nearly every compound detected in Area 19. To avoid inconsistencies with other environmental restoration work at Mound Plant, regulatory threshold levels from another environmental investigation were used for compounds not covered by the Region III table or the site-specific risk-based guideline cleanup values (DOE 1993).

5.1. DATA INTERPRETATION

5.1.1. Volatile Organic

The soil samples were analyzed for volatile organic compounds and the validated data is presented in Table IV.1. Table V.1 displays the risk-based threshold levels (RBTL) or the risk-based guideline cleanup values (RBGCV) used to evaluate the volatile organic analytical data. A review of this table indicates that all of the soil sample results are under the risk-based threshold limits. The major contaminants detected were acetone and methylene chloride. Both compounds are common laboratory contaminants. In general, very few VOCs were detected.

5.1.2. Semi-Volatile Organic

The soil samples were analyzed for semi-volatile organic compounds and the validated data is presented in Table IV.2. Table V.2 displays the risk-based threshold levels or the risk-based guideline cleanup values used to evaluate the semi-volatile organic analytical data. A review of this table indicates that only eight semi-volatile compounds were detected at a concentration above the RBTL or RBGCV. The semi-volatile compounds Benzo(a)anthracene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Dibenzo(a,h)anthracene, Phenanthrene, Benzo(b)fluoranthene, Indeno(1,2,3-cd)pyrene, and Benzo(k)fluoranthene were detected in some samples at a concentration above the RBGCV. Note that in many cases the detection limits for these compounds were above the RBTL.

5.1.3. Inorganic

The soil samples were analyzed for inorganic analytes and the data is summarized in Tables IV.3 and IV.4. Table V.3 displays the RBTLs or RBGCVs used to evaluate the inorganic analytical data. A review of the inorganic analytical tables (Table IV.3 and IV.4) indicates that all of the results are under the inorganic RBTL or RBGCV.

Table V.1. VOC Risk-Based Threshold Levels

Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)	Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)
Chloromethane	2	.40 - 11	130,000	1,2-Dichloropropane	1	1	25,000[2]
Vinyl Chloride	0	NA	900	Bromodichloromethane	1	.60	10,000
Bromomethane	0	NA	110,000	cis-1,3-Dichloropropene	1	.80	9,500[1]
Chloroethane	0	NA	1,600,000	4-Methyl-2-Pentanone	19	.60 - 20	3,900,000
1,1-Dichloroethene	0	NA	2,800	Toluene	56	.30 - 6.00	16,000,000
Acetone	39	2 - 250	7,800,000	trans-1,3-Dichloropropene	1	.90	9,500[1]
Carbon Disulfide	19	.8 - 5	7,800,000	1,1,2-Trichloroethane	1	1.00	30,000
Methylene Chloride	90	.70 - 58	230,000	Tetrachloroethene	29	.2 - 8	33,000
1,2-Dichloroethene (total)	5	.09 - 6	700,000	2-Hexanone	12	2 - 34	NE
1,1-Dichloroethane	1	40	7,800,000[2]	Dibromochloromethane	2	.20 - .70	7,600[2]
2-Butanone	15	.60 - 72	3,900,000	Chlorobenzene	4	.50 - 11	1,600,000
Chloroform	49	0.1 - 1	280,000	Ethylbenzene	40	.50 - 8.00	7,800,000
1,1,1-Trichloroethane	0	NA	7,000,000	Xylenes (total)	58	.30 - 7.00	160,000,000
Carbon Tetrachloride	0	NA	4,900[2]	Styrene	49	0 - 3	57,000
Benzene	26	.5 - 3.0	22,000[2]	Bromoform	2	.80 - 2	220,000
1,2-Dichloroethane	0	NA	7.00 E + 13	1,1,2,2-Tetrachloroethane	4	.60 - 5.00	8,500
Trichloroethene	4	.60 - 34	150,000				

Notes:
1 - Based on 1,3-Dichloropropene.
2 - Risk-based Guideline Cleanup Values
NE - No regulatory threshold limit has been established.
NA - Not Applicable

Reference: USEPA 1992 and HAZWRAP 1994

Table V.2. Semi-Volatile Risk-Based Threshold Levels

Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)	Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)
Phenol	1	53	47,000,000	2,4-Dinitrophenol	0	NA	160,000
bis (2-Chloroethyl)ether	0	NA	46,000	4-Nitrophenol	0	NA	4,800,000
2-Chlorophenol	0	NA	390,000	Dibenzofuran	9	10 - 690	NE
1,3-Dichlorobenzene	0	NA	7,000,000	2,4-Dinitrotoluene	0	NA	160,000
1,4-Dichlorobenzene	0	NA	71,000	Diethylphthalate	22	1 - 100	63,000,000
1,2-Dichlorobenzene	0	NA	7,000,000	4-Chlorophenyl-phenylether	0	NA	NE
2-Methylphenol	0	NA	3,900,000	Fluorene	7	13 - 380	3,100,000
2,2'-oxybis (1-Chloropropane)	0	NA	24,000	4-Nitroaniline	1	920	230,000
4-Methylphenol	0	NA	390,000	4,6-Dinitro-2-methylphenol	0	NA	NE
N-Nitroso-di-n-propylamine	2	17 & 51	240	N-Nitrosodiphenylamine	5	78 - 400	130,000[3]
Hexachloroethane	1	740	78,000	4-Bromophenyl-phenylether	0	NA	4,500,000
Nitrobenzene	0	NA	39,000	Hexachlorobenzene	1	740	1100
Isophorone	2	11 & 13	67[3]	Pentachlorophenol	2	94 - 180	5300[3]
2-Nitrophenol	0	NA	4,800,000[1]	Phenanthrene	24	22 - 3,100	88[3]
2,4-Dimethyphenol	0	NA	1,600,000	Anthracene	15	11 - 760	23,000,000
bis (2-Chloroethoxy) methane	0	NA	NE	Carbazole	16	22 - 390	85,000
2,4-Dichlorophenol	0	NA	230,000	Di-n-butylphthalate	57	20 - 1,900	7,800,000
1,2,4-Trichlorobenzene	0	NA	780,000	Fluoranthene	37	15 - 3,300	3,100,000
Naphthalene	7	16 - 190	3,100,000	Pyrene	27	21 - 3,600	2,300,000
4-Chloroaniline	0	NA	310,000	Butylbenzylphthalate	18	14 - 800	16,000,000
Hexachlorobutadiene	1	740	22,000	3,3'-Dichlorobenzidine	0	NA	3,800
4-Chloro-3-methylphenol	0	NA	NE	Benzo (a) anthracene	20	21 - 1,500	880[3]
2-Methylnaphthalene	4	14 - 29	NE	Chrysene	20	30 - 1,500	NE
Hexachlorocyclopentadiene	1	740	550,000	bis (2-Ethylhexyl) phthalate	43	28 - 2,200	120,000[3]
2,4,6-Trichlorophenol	0	NA	150,000	Di-n-octylphthalate	16	43 - 1,500	1,600,000
2,4,5-Trichlorophenol	0	NA	7,800,000	Benzo (b) fluoranthene	20	21 - 1,400	880[3]

Table V.2. Semi-Volatile Risk-Based Threshold Levels (continued)

Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)	Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)
2-Chloronaphthalene	0	NA	6,300,000[2]	Benzo (k) fluoranthene	17	24 - 1,100	880[3]
2-Nitroaniline	0	NA	4,700	Benzo (a) pyrene	18	23 - 1,600	88[3]
Dimethylphthalate	2	100 & 390	780,000,000	Indeno (1,2,3-cd) pyrene	7	41 - 1,000	880[3]
Acenaphthylene	5	12 - 35	NE	Dibenz (a,h) anthracene	3	24 - 690	88[3]
2,6-Dinitrotoluene	7	82 - 500	2,500	Benzo (g,h,i) perylene	8	28 - 1,100	88[3]
3-Nitroaniline	0	NA	230,000				

Notes:
NE - No regulatory threshold limit has been established.
NA - Not Applicable
1 - Based on the regulatory threshold limit for 4-Nitrophenol.
2 - Based on the regulatory threshold limit for beta-Chloronaphthalene.
3 - Risk-based Guideline Cleanup Value

Reference: USEPA 1992 and HAZWRAP 1994

Table V.3. Inorganic Risk-Based Threshold Levels

Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)	Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)
Aluminum	98	48,000 - 21,200,000	230,000,000	Magnesium	98	42,000 - 44,000,000	NE
Antimony	0	NA	31,000	Manganese	89	3,000 - 5,820,000	7,800,000
Arsenic	98	2,000 - 32,200	23,000	Mercury	19	80 - 490	23,000
Barium	98	19,000 - 320,000	5,500,000	Nickel	89	3,000 - 30,000	1,600,000
Beryllium	87	170 - 1,100	150[5]	Potassium	98	23,000 - 7,460,000	NE
Cadmium	0	NA	39.	Selenium	13	500 - 1,100	390,000
Calcium	98	3,300 - 269,000	NE	Silver	5	640 - 1,800	390,000
Chromium	98	5,000 - 48,000	390,000[1]	Sodium	98	2,000 - 2,150,000	NE
Cobalt	86	2,000 - 15,000	39,000[2]	Thallium	8	460 - 5,500	5,500[3]
Copper	98	7,000 - 34,000	2,900,000	Vanadium	98	5,000 - 31,000	550,000
Iron	98	27,000 - 311,000	NE	Zinc	98	4,600 - 105,000	23,000,000
Lead	94	1,000 - 36,500	53,000[2]	Cyanide	35	240 - 53,000	390,000[4]

Notes:
NE - No regulatory threshold level has been established because these are naturally occurring compounds.
NA - Not Applicable
1 - Regulated threshold level is based on hexavalent chromium.
2 - Based upon 98% limit of background concentration for eastern United States soils.
3 - Based upon thallic oxide.
4 - Based upon copper cyanide.
5 - Risk-based Guideline Cleanup Value

Reference: USEPA 1992 and HAZWRAP 1994

5.1.4. Pesticide/PCBs

The samples were analyzed for Pesticide/PCB compounds and the validated data is presented in Table IV.5. Table V.4 displays the RBTLs or RBGCVs used to evaluate the pesticide and PCB data. A review of these tables indicate that the soil sample results are under the RBTLs or the RBGCVs. The results listed on Table IV.5 indicate there were no exceedances of any Pesticide/PCB compound RBTLs or RBGCVs, except in samples 410010 and 420020. As discussed in Section 5.2, these are EG&G supplied samples to monitor laboratory performance. These are not samples collected from OU-6 and are included in the tables only as a QA/QC sample.

5.1.5. Radiological

The samples were also analyzed for radiological isotopes and the validated data is summarized in Table IV.6. A review of the radiological data in Table IV.6 and a comparison to the radiological remedial action guidelines indicates that all soil samples except two were below the remedial action guideline of 100 pCi/gram. The radiological data indicates that the dominant radiological contaminant of concern is Plutonium-238 and to a lesser extent Th-228. The two samples that exceeded 100 pCi/gram were Plutonium-238 at boring 19-3A at 132.05 pCi/gram and at boring 19-3B at 100.92 pCi/gram. Both of these locations are near the SM/PP Buildings. Pu-238 was also detected at borings, 19-1A, 19-3F, 19-3G, 19-3M, 19-3N, 19-3O, 19-3U, 19-3X, 19-4A, 19-2E, 19-1B, 19-1C, 19-2C, 19-2D, and 19-2J (these levels range from 2.5 to 82.7 pCi/gram). Most of the elevated levels of Pu-238 were from borings at the SM/PP Building, the WD Building and north of Building 67. Except for the two samples at 19-3A and 19-3B, these radiological values are all under the remedial action guideline value of 100 pCi/gram for Pu-238 but some are over the ALARA value of 25 pCi/gram (excluding Mound spike samples). Thorium-228 was the other main radiological contaminant of concern. Nine readings above 2 pCi/gram were detected for Th-228 and ranged from 2 to 10.7 pCi/gram. In addition, most of the combined Thorium values are under or at 5 pCi/gram. Tritium contamination was detected in most of the rinsate blank samples at concentrations of 723 to 744 pCi/gram, but was not detected in most of the soil samples. For that reason, blank contamination was not considered a factor. Tritium was detected 14 times at levels ranging from 14.3 to 34 pCi/gram. Most of the elevated levels were from borings north of Building 67.

EG&G representatives provided spiked samples of soil. The purpose of these soil spike samples (samples numbers: MND14-3040-0000, MND14-3041-0010, and MND14-3042-0020 defined in Table IV.6 and Appendix B as 400000, 4100010, and 420020) was to compare the laboratory reported radiological results with EG&G screening results. The concentrations detected in all three of the soil samples were relatively close to the EG&G reported value. Sample number MND14-3042-0020 was within 1 pCi/gram of the EG&G value. Sample MND14-3040-0000 has a reported Pu-238 activity of 103.9 pCi/gram and the EG&G

Table V.4. Pesticide/PCB Risk-Based Threshold Levels

Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)	Parameter	Number of Detections	Range of Values (µg/kg)	Threshold or Cleanup Value Limit (µg/kg)
alpha-BHC	29	.20 - 3.20	270	4,4'-DDT	25	0.02 - 6.00	5,000
beta-BHC	0	NA	350[5]	Methoxychlor	11	.52 - 11.2	390,000
delta-BHC	2	0.01 - 1.50	950	Endrin ketone	1	0.22	23,000[2]
gamma-BHC (Lindane)	0	NA	1,300	Endrin aldehyde	0	NA	23,000[2]
Heptaclor	1	0.72	380	alpha-Chlordane	2	0.28 - 4.80	1,300[3]
Aldrin	2	.61 - 4.00	100	gamma-Chlordane	2	0.25	1,300[3]
Heptaclor epoxide	9	.33 - 11.00	190	Toxaphene	0	NA	1,500
Endosulfan I	1	1.40	3,900[1]	Aroclor-1016	0	NA	220[4]
Dieldrin	5	.55 - 6.40	40[5]	Aroclor-1221	0	NA	220[4]
4,4'-DDE	0	NA	1,900[5]	Aroclor-1232	0	NA	220[4]
Endrin	9	0.04 - 2.00	23,000	Aroclor-1242	0	NA	220[4]
Endosulfan II	2	.95 - 2.50	3,900[1]	Aroclor-1248	1	41	83[5]
4,4'-DDD	4	1 - 11	1,900	Aroclor-1254	1	67	83[5]
Endosulfan sulfate	0	NA	3,900[1]	Aroclor-1260	0	NA	83[5]

Notes:
NA - Not Applicable
1 - Based upon the regulatory threshold limit for Endosulfan.
2 - Based upon the regulatory threshold limit for Endrin.
3 - Based upon the regulatory threshold limit for Chlordaane.
4 - Based upon the regulatory threshold limit for total PCBs.
5 - Risk-based Guideline Cleanup Value

Reference: USEPA 1992 and HAZWRAP

reported value is 140 pCi/gram for a precision of 34.2% relative percent difference. The differences in the spike results for sample number 400000 is not considered significant due to the differences in analytical methods and the normal differences between laboratories. Sample number 410010 had a reported activity of 17 pCi/gram versus a EG&G reported value of 54 pCi/gram. This difference is large, but considering the results of the other two spike samples, the performance of laboratory appears acceptable. This is confirmed by the data validation results.

5.2. STATISTICAL ANALYSIS

Analytical data from the laboratory analyses of Area 19 and 14 soils were validated following procedures described in the EPA Functional Guidelines (EPA 1988b, 1990b) and the OU 6 and OU 9 QAPjPs (EG&G 1992a, 1992b). Once the data were validated, the results were evaluated to determine if the D&D activities have been successful in terms of meeting the D&D cleanup goals for plutonium and thorium.

To meet this objective, statistical procedures were used, following EPA's (1989) guidance, for determining whether the mean concentration in the samples collected in Areas 19-1, 19-2, and 19-3 have attained the designated cleanup standards.

After the radiological data have been collected, analyzed, and validated, summary statistics (the mean, the square root of the mean, standard deviation of the mean, and the log of the mean) were calculated for each of the three areas for both plutonium and thorium concentration values. Following EPA's (1989) guidance for concentrations measured below the detection limit, the detection limit was used to calculate the summary statistics for non-detect samples. Since the mean of the sampling data is only an estimate of the mean contamination of the entire sample area (the population), an upper one-sided confidence interval was calculated (using equation 6.8, page 6-11, in (EPA 1989) which provided a range of values within which the true population mean concentration is located. A one-sided confidence interval and the following 4-part decision rule were used to test whether each individual area (19-1, 19-2, and 19-3) has attained the cleanup standard.

Decision Rule Number 1

IF

1. The upper 95 percent confidence interval is less than the cleanup standard of 100 pCi/gram for plutonium-238 for all soils,

AND

2. The upper 95 percent confidence interval is less than the cleanup standard of 5 pCi/gram for thorium isotopes for all surface soils,

AND

3. The upper 95 percent confidence interval is less than the cleanup standard of 15 pCi/gram for thorium isotopes for all subsurface soils,

THEN

4. The area will be declared clean from a D&D perspective, otherwise the area will be declared not clean and additional D&D remediation activities will need to be performed.

If the upper 95 percent confidence intervals are greater than the cleanup standards stated in the decision rule, the data from the verification sampling and analysis program will be further evaluated to determine the location and frequency of additional samples to be collected to determine the magnitude and extent of remaining radiological contamination. This evaluation will include the nature of the contaminants, the frequency of detection, concentration values, lateral and vertical distribution, potential sources, and any other contributing factors that may become evident in the analysis of the sample results (SAIC 1993). The evaluation will not include the results of the samples (400000, 410010, 420020) provided by EG&G to monitor laboratory performance.

Decision Rule Number 2

Other potential contaminants of concern (COC) will be considered for further evaluation if:

1. The COC is positively detected (above the detection limit) in at least one soil sample,

OR

2. The COC is identified, but the exact concentration is unknown (i.e., J-qualified data),

OR

3. The COC is detected at the upper 95% confidence level at levels significantly higher than the same chemicals detected in the QA/QC blank samples, (without application of the 5X or 10X rule),

OR

4. The COC is detected at the upper 95% confidence level at levels significantly higher than naturally occurring levels of the same chemical (i.e., background).

Where "significantly" is not strictly defined by a number but is subjectively determined based on the COC and the site specific conditions.

The list of potential COCs resulting from the stated decision rule will be evaluated to characterize the nature and extent of residual chemical and other radiological contamination in area soils (SAIC 1993).

The evaluation will not include the results of the samples (400000, 410010, 420020) provided by EG&G to monitor laboratory performance.

5.2.1. Volatile Organic

Table V.1 displays the risk based volatile organic threshold levels or cleanup values. The statistical analysis of the data (Appendix B, Table B.1) indicated that the upper 95% confidence level values for the detected concentrations of volatile organic compounds were less than the RBTLs or the RBGCVs and additional sampling, risk assessment, or remediation are not warranted.

5.2.2. Semi-Volatile Organic

Table V.2 displays the risk-based semi-volatile organic threshold levels. The statistical analysis of the data (Appendix B, Table B.2) indicated that the upper 95% confidence level values for the semi-volatile organic compounds are less than the RBTLs and the RBGCVs. Therefore, additional sampling or remediation are not warranted.

5.2.3. Inorganic

Table V.3 displays the risk-based inorganic compound threshold levels. Based on the statistical analysis (Appendix B, Table B.3), the upper 95% confidence level for the detected concentrations of inorganic analytes were less than the RBTLs and the RBGCVs, and additional sampling, site-specific risk assessment work, or remediation are not warranted.

5.2.4. Pesticide/PCBs

Table V.4 displays the risk-based pesticide and PCB compound threshold levels. Since, the upper 95% confidence level (Appendix B) for the detected concentrations of pesticide and PCB compounds were less than the RBTLs or the RBGCVs, additional sampling, risk assessment, or remediation are not necessary.

5.2.5. Radiological

A statistical analysis of the radiological analytical data was performed. Summary statistics (the mean, the log of the mean, population size, and standard deviation of the mean) were calculated for the sample data from each of the three areas (Appendix B, Table B.5). Using EPA guidance (Methods for Evaluating the Attainment of Cleanup Standards, Equation 6.8, pg.6-11, EPA 1989), the upper, one-sided confidence interval was also calculated as a means of determining whether the soil samples from each area attained

the cleanup level. The soil samples in Area 19-1 had an upper 95 percent confidence level value for Plutonium-238 that was 21.036 pCi/gram, which is less than the ALARA value for Plutonium-238. Area 19-1, which had a sample population of seven subsurface samples, had an upper 95 percent confidence interval value for Thorium-228 (0.392 pCi/gram) that was less than the cleanup level (assuming 15 pCi/gram cleanup level for subsurface soils). In accordance with Section 7.1 of the SAP, the mean concentration of samples from the area attained the clean up standards for Plutonium-238 and the subsurface value for Thorium-228. There were no surface soils collected in Area 19-1. However, sample location 19-1B at a depth of 6 to 8 feet, did exceed the ALARA value of 25 pCi/gram, with a value of 82.57 pCi/gram. This value is below the action level of 100 pCi/gram, but is at the approximate bottom depth of the WTS pipeline near the SM/PP building. The results indicate that the cleanup was successful meeting the cleanup value of less than 100 pCi/gram.

Area 19-2 had a sample population of 30 samples. The soil samples in Area 19-2 had upper 95 percent confidence level values for Plutonium-238 and Thorium isotopes which were below 100 pCi/gram Plutonium and 15 pCi/gram Thorium isotopes, respectively. However, one sample in Area 19-2 had concentrations of Thorium isotopes above the surface soil cleanup standard (5 pCi/gram). The soil sample location was 19-2J at a depth of 0-2 feet, that exceeded the Th-228 surface cleanup standard. The mean concentration and upper 95% confidence level for Area 19-2 samples analyzed for Plutonium-238 and Thorium isotopes indicate that the cleanup standards were attained.

Area 19-3 had a sample population of 56 samples. The soil samples in Area 19-3 had upper 95 percent confidence level values for Plutonium isotopes and Thorium which were below 100 pCi/gram (Plutonium-238) and 15 pCi/gram (Thorium isotopes), respectively. However, some soil samples in Area 19-3 had concentrations of Plutonium above the soil cleanup standard (100 pCi/gram). Two soil samples exceeded the Pu-238 cleanup standards, at locations 19-3A and 19-3B. Concentrations of 100.92 for Pu-238 at 19-3B and 132.05 at 19-3A were detected. Additional locations were below the cleanup value (100 pCi/gram) for Pu-238 but were above the ALARA value of 25 pCi/gram at 19-4A (68.94 pCi/gram), 19-3U (46.22 pCi/gram) and 19.3O (31.98 pCi/gram). However, in Area 19-3, the mean concentration and upper 95% confidence level of samples analyzed for Plutonium-238 and Thorium isotopes indicate that the cleanup standards were attained.

5.3. DISCUSSION

5.3.1. Volatile Organic

Based on a comparison of the analytical data for volatile organic compounds to the RBTLs or the RBGCVs, no volatile organic compounds will be considered for further evaluation as potential COCs.

5.3.2. Semi-Volatile Organic

Based on a comparison of the analytical data for the semi-volatile organics, additional sampling or remediation are not warranted for these compounds.

5.3.3. Inorganic

The results listed on Table IV.3 and IV.4 indicate that the inorganic compounds in the soils are under the risk-based threshold levels. Table V.3 displays the risk based threshold levels for inorganic analytes. For convenience, the RBTL's are listed on the side of Table IV.3 so that the data can be easily reviewed. Some inorganic compounds were detected for which there are no RBTLs, however, generally these elements are essential human nutrients, and pose little health risk. Based on a comparison of the inorganic analytical data to the RBTLs or RBGCVs, no inorganic analytes will be considered for further evaluation as potential COCs.

5.3.4. Pesticide/PCBs

A review of the Pesticide/PCB analytical data is displayed in Table IV.5. A comparison of the data which passed the validation process indicates no exceedances of the RBTLs or RBGCVs.

Approximately 20% of the pesticide/PCB data is unusable (rejected during data validation) because of results which were not in compliance with the QAPP or the labs own quality assurance plans. Due to the low levels of PCBs and pesticides in the other samples, it does not appear that these compounds are a concern. No pesticides or PCBs will be considered for further evaluation as potential COCs.

5.3.5. Radiological

Based on the statistical analysis of the radiological soil samples using a clean up standard of 100 pCi/gram for Pu-238, and 15 pCi/gram (subsurface) or 5 pCi/gram (surface) for Thorium isotopes, the previous remediation in Areas 19-1, 19-2, and 19-3 was successful in meeting the goals of the D&D activity.

In Area 19-1, the 95 percent confidence interval value for Plutonium isotopes in subsurface soil samples was below the cleanup level. The upper 95 percent confidence value of 21.04 pCi/gram was primarily due to the concentration of Plutonium 238 (82.57 pCi/gram) in one sample at location 19-1B. Note that only subsurface soil samples were collected in Area 19-1. Based on the statistical results, the remediation in Area 19-1 met the goals of the D&D activity. In Area 19-2, the upper 95 percent confidence values for

Plutonium and Thorium were below the cleanup standard. No Plutonium or Thorium values exceeded the ALARA standard of 25 pCi/gram for Plutonium or the 15 pCi/gram standard for Thorium. Based on the statistical results, no additional sampling or remediation are necessary in Area 19-2.

In Area 19-3, the upper 95 percent confidence values for Plutonium and Thorium were below the cleanup standards. Although several locations had values that exceeded the 100 pCi/gram cleanup standard for Plutonium, based on the statistical results, the remediation of Area 19-3 successfully meet the goals of the D&D activity.

A review of previous radiological soil sampling information (in the OU 6 Verification Plan), indicates that the remediation effort was successful. A review of OU 6 Verification Plan Table II.1 indicates that the major hotspots of Pu-238 have been removed, and this was confirmed by this sampling effort. The highest level of the radiological contaminants (Pu-238) were observed near the SM/PP and WD Buildings, which is expected based on the history of the site.

6 CONCLUSIONS

A soil sampling verification investigation at Mound's OU 6 Area 19 and Area 14 was performed. Based on extensive testing, a review of all the analytical data for both radiological and non-radiological parameters and a statistical analysis of the analytical data, a conclusion was reached that the mean value of the analytical results for Pu-238 and Thorium isotopes have attained the cleanup criteria.

The results of the subsurface soil samples in Area 19-1 and Area 19-2 indicate that the cleanup criteria for Plutonium and Thorium isotopes was attained. However, one sample, 19-1B did exceed the ALARA value of 25 pCi/gram for Plutonium. The results of the subsurface investigation in Area 19-3 indicate that the cleanup criteria for Thorium isotopes was attained.

The results of the soil samples for Pu-238 indicate that some contamination still exists. Levels of Pu-238 of 132.05 and 100.92 pCi/gram were found at the Area 3 locations, 19-3A and 19-3B, respectively. In addition, a Pu-238 value of 82.57 pCi/gram was obtained from a sample collected at the Area 1 location, 19-1B. However, the mean and upper 95 percent confidence value for Pu-238 in Area 3 location indicates that the cleanup was successful.

The statistical analysis of the soil samples for the non-radiological parameters indicated no exceedances of the risk-based threshold levels for volatile organic compounds, semi-volatile organics, pesticides/PCBs, or inorganic analytes. Of the semi-volatile organic compounds analyzed, only a few compounds were detected at concentrations above the risk-based threshold level or cleanup value, but based on the statistical analysis the semi-volatile organic compounds are not a concern.

In conclusion, based on the mean and upper 95% confidence limit, D&D remedial activities in Area 19 and Area 14 have achieved the established goals. Based on these results, no further action is required.

APPENDIX B

SUMMARY DOCUMENTATION OF STATISTICAL ANALYSIS

Per the OU 6 Verification Plan, Section 7.1, the radiological and non-radiological analytical data was reduced using EPA guidance document "Methods for Evaluating the Attainment of Cleanup Standards Volume 1: Soils and Solid Media, pg. 6-11, February 1989." The equation used for an upper one-sided 100 (1-α) percent confidence limit around the population mean is presented below:

$$\mu U\alpha = \text{Log}(\bar{x}) + ti\text{-}\alpha,df \frac{s}{\sqrt{n}}$$

where

$\mu U\alpha$	=	is the upper one sided confidence limit
$\bar{x}$	=	mean of the sample population
s	=	standard deviation
n	=	population
ti-α,df	=	100 (1-α) value from "Table for Selected Alpha and Degrees of Freedom" (EPA, 1989).

The analytical data was reduced and the samples divided by Area 19-1, 19-2 and 19-3. Standard deviation as well as mean population calculations were performed on soil samples only. All sample blanks were removed from the tables to achieve precise values for mean and standard deviation. The analytical data is summarized on the following page. Values for tiα,df were obtained from Appendix A in the aforementioned EPA reference document.

Tables B.1 through B.5 provide the results of the summary statistics. The row labeled "Count" is the sample size or population. The row labeled "N Value" is the square root of the sample size or population (square root of the "Count" value). The row labeled "Degrees of Freedom" is the value for ti-α,df.

Concentration units are in μg/kg unless otherwise noted.

SUMMARY RADIOLOGICAL STATISTICAL ANALYSIS

Location	Compound	s	x	$\sqrt{n}$	$t_{i\alpha,df}$	μU_{α}
19-1	Pu-238	27.69	15.85	2.65	1.895	21.04
19-2	Pu-238	5.17	2.76	5.48	1.694	2.04
19-3	Pu-238	24.06	8.91	7.48	1.674	6.33
19-1	Th-228	0.44	1.18	2.65	1.895	0.392
19-2	Th-228	1.81	0.973	5.48	1.694	0.693
19-3	Th-228	0.86	1.17	7.48	1.674	0.263

STATISTICAL SUMMARY TABLES

Table B.1. Statistical Analysis of Volatile Organics

Sample Number	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloroethene (total)	1,2-Dichloropropane	2-Butanone	2-Hexanone
RBTC/RBGVC	7000000	6500	30000	7600000	2800	7.00E+13	700000	25000	3900000	NE
AREA 19-1										
391006	12	12	12	12	12	12	12	12	14	12
0011	11	11	11	11	11	11	11	11	11	2
0006	12	12	12	12	12	12	12	12	12	12
380012	12	12	12	12	12	12	12	12	12	12
380006	12	12	12	12	12	12	12	12	12	12
370012	11	11	11	11	11	11	11	11	11	11
370006	12	12	12	12	12	12	12	12	12	12
Count	7	7	7	7	7	7	7	7	7	7
Mean	1.069	1.069	1.069	1.069	1.069	1.069	1.069	1.069	1.079	1.016
Stan. Dev.	0.452	0.452	0.452	0.452	0.452	0.452	0.452	0.452	0.928	3.458
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedo	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	1.393	1.393	1.393	1.393	1.393	1.393	1.393	1.393	1.742	3.485
AREA 19-2										
360020	11	11	11	11	11	11	11	11	23	12
360013	12	12	12	12	12	12	12	12	12	12
360006	11	11	11	11	11	11	11	11	11	11
360000	11	11	11	11	11	11	11	11	11	11
350020	11	11	11	11	11	11	11	11	11	11
350013	12	12	12	12	12	12	12	12	12	12
350006	12	12	12	12	12	12	12	12	12	12
350000	11	11	11	11	11	11	11	11	11	11
341000	11	11	11	11	11	11	11	11	11	11
340006	13	13	13	13	13	13	13	13	13	13
340000	11	11	11	11	11	11	11	11	11	11
330006	11	11	11	11	11	11	11	11	11	11
330000	11	11	11	11	11	11	11	11	5	11
320006RA	11	11	11	11	11	11	11	11	11	11
320000RA	11	11	11	11	11	11	11	11	1	11
310000	11	11	11	11	11	11	11	11	11	11
301000	11	11	11	11	11	11	11	11	11	11
300000	12	12	12	12	12	12	12	12	12	12
290013	11	11	11	11	11	11	11	11	1	11
290006	11	11	11	11	11	11	11	11	11	11
290000	11	11	11	11	11	11	11	11	11	11
281000	10	10	10	10	10	10	10	10	10	6
280020	10	10	10	10	10	10	10	10	1	10
280013	12	12	12	12	12	12	12	12	12	12
280006	12	12	12	12	12	12	12	12	12	12
280000	10	10	10	10	10	10	10	10	10	10
270020	11	11	11	11	11	11	11	11	15	17
0013	11	11	11	11	11	11	11	11	11	11
0006	10	10	10	10	10	10	10	10	10	10
270000	11	11	11	11	11	11	11	11	11	11
Count	30	30	30	30	30	30	30	30	30	30
Mean	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.047	1.021	1.051
Stan. Dev.	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	4.12	1.564
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedo	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	1.254	1.254	1.254	1.254	1.254	1.254	1.254	1.254	2.295	1.535

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.1. Statistical Analysis of Volatile Organics

Sample Number	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dichloroethane (total)	1,2-Dichloropropane	2-Butanone	2-Hexanone
RBTC/RBGVC	7000000	8500	30000	7800000	2800	7.00E+13	700000	25000	3900000	NE
AREA 19-3										
260020	11	11	11	11	11	11	11	11	11	11
0010	11	11	11	11	11	11	11	11	11	11
0002	10	10	10	10	10	10	10	10	10	10
250016	10	10	10	10	10	10	10	10	9	10
250009	11	11	11	11	11	11	11	11	11	11
240011	12	12	12	12	12	12	12	12	12	12
240004	12	12	12	12	12	12	12	12	12	12
230014	11	11	11	11	11	11	11	11	25	8
230005	11	11	11	11	11	11	11	11	23	10
220010	11	11	11	11	11	11	11	11	11	11
220005	11	11	11	11	11	11	11	11	11	11
210012	11	11	11	11	11	11	11	11	11	11
210005	12	12	12	12	12	12	12	12	12	12
200020	11	11	11	11	11	11	11	11	1	11
200009	10	10	10	10	10	10	10	10	10	10
191020	11	11	11	11	11	11	11	11	11	11
190020	10	10	10	10	10	10	10	10	10	10
190007	11	11	11	11	11	11	11	11	11	11
180020	11	11	11	11	11	11	11	11	34	11
180012	10	10	10	10	10	10	10	10	10	10
171020	12	12	12	12	12	12	12	12	12	12
170020	11	11	11	11	11	11	11	11	11	11
170007	11	11	11	11	11	11	11	11	11	11
160018	12	12	12	12	12	12	12	12	12	12
160010	12	12	12	12	12	12	12	12	72	12
150020RA	11	11	11	11	11	11	11	11	11	11
150001	11	11	11	11	11	11	11	11	11	11
140008RA	11	11	11	11	11	11	1	11	10	11
140001RA	11	11	11	11	11	11	11	11	11	11
130008	11	11	11	0	11	11	8	11	11	11
130003	11	11	11	11	11	11	4	11	18	34
120020	11	11	11	11	11	11	11	11	11	11
120001	10	10	10	10	10	10	0	10	10	10
110017	11	11	11	11	11	11	11	11	11	11
110008	12	12	12	12	12	12	12	12	12	12
101020	11	11	11	11	11	11	0	11	9	3
100020	11	11	11	11	11	11	11	11	11	11
100011	11	11	11	11	11	11	11	11	11	11
090017	11	11	11	11	11	11	11	11	11	11
090002	11	11	11	11	11	11	11	11	11	11
080009	12	12	12	12	12	12	12	12	12	12
080001	11	11	11	11	11	11	11	11	11	11
1001	11	11	11	11	11	11	11	11	11	11
0012	12	12	12	12	12	12	12	12	1	12
/0001	11	11	11	11	11	11	11	11	11	11
060005	11	11	11	11	11	11	11	11	11	11
060000	11	11	11	11	11	11	11	11	11	11
050010	11	1	11	11	11	11	0	11	11	6
050004	11	1	1	11	11	11	11	1	11	11
040012	11	11	11	11	11	11	11	11	11	11
040007	11	11	11	11	11	11	11	11	11	11
030004	11	11	11	11	11	11	11	11	11	11
020006	11	11	11	11	11	11	11	11	11	11
020003	12	12	12	12	12	12	12	12	12	12
011002	11	11	11	11	11	11	11	11	11	11
010002	11	11	11	11	11	11	11	11	11	11
Count	56	56	56	56	56	56	56	56	56	56
Mean	1.044	1.03	1.037	1.037	1.044	1.044	1.005	1.037	1.103	1.047
Stan. Dev.	0.53	1.997	1.435	1.509	0.53	0.53	2.989	1.435	9.188	3.43
N Value	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483
Degrees of Freedo	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	1.163	1.477	1.358	1.375	1.163	1.163	1.674	1.358	3.154	1.814

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.1. Statistical Analysis of Volatile Organics (Continued)

Sample Number	4-Methyl-2-Pentanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	WC9	Chloroform	Chloromethane
RBTC/RBGVC	3900000	7800000	22000	10000	220000	110000	7800000	490	1600000	1600000	280000	130000
AREA 19-1												
391006	12	49	12	12	12	12	12	12	12	12	0	12
0011	3	11	3	11	11	11	11	11	11	11	0	11
0006	12	28	1	12	12	12	12	12	12	12	0	12
380012	12	12	12	12	12	12	12	12	12	12	12	12
380006	6	20	12	12	12	12	12	12	12	12	0	12
370012	11	11	11	11	11	11	11	11	11	11	0	11
370006	12	27	12	12	12	12	12	12	12	12	1	12
Count	7	7	7	7	7	7	7	7	7	7	7	7
Mean	0.987	1.354	0.951	1.069	1.069	1.069	1.069	1.069	1.069	1.069	0.316	1.069
Stan. Dev.	3.411	12.726	4.575	0.452	0.452	0.452	0.452	0.452	0.452	0.452	4.053	0.452
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedo	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	3.431	10.471	4.229	1.393	1.393	1.393	1.393	1.393	1.393	1.393	3.22	1.393
AREA 19-2												
360020	8	11	2	11	11	11	11	11	11	11	0	11
360013	12	12	1	12	12	12	12	12	12	12	12	12
360006	11	11	1	11	11	11	11	11	11	11	1	11
360000	11	11	11	11	11	11	11	11	11	11	0	11
350020	11	11	11	11	11	11	11	11	11	11	11	11
350013	12	12	12	12	12	12	12	12	12	12	12	12
350006	2	250	12	12	12	12	12	12	12	12	12	12
350000	11	11	11	11	11	11	11	11	11	11	11	11
341000	11	14	11	11	11	11	11	11	11	11	0	11
340006	13	96	13	13	13	13	13	13	13	13	13	13
340000	1	41	11	11	11	11	11	11	11	11	0	11
330006	11	11	11	11	11	11	2	11	11	11	1	11
330000	11	42	11	11	11	11	11	11	11	11	11	11
320006RA	11	11	11	11	11	11	11	11	11	11	11	11
320000RA	11	23	11	11	11	11	11	11	11	11	11	11
310000	11	11	11	11	11	11	11	11	11	11	11	11
301000	11	11	11	11	11	11	11	11	11	11	1	11
300000	12	12	12	12	12	12	12	12	12	12	0	12
290013	11	10	11	11	11	11	1	11	11	11	1	11
290006	11	34	11	11	11	11	1	11	11	11	11	11
290000	11	34	11	11	11	11	11	11	11	11	11	11
281000	3	13	10	10	10	10	10	10	10	10	0	10
280020	10	10	10	10	10	10	10	10	10	10	10	10
280013	12	12	12	12	12	12	12	12	12	12	12	12
280006	12	12	12	12	12	12	12	12	12	12	12	12
280000	10	10	10	10	10	10	10	10	10	10	10	10
270020	7	11	1	11	11	11	3	11	11	11	1	11
013	11	27	1	11	11	11	2	11	11	11	1	11
006	10	46	1	10	10	10	1	10	10	10	1	10
270000	11	41	11	11	11	11	11	11	11	11	0	11
Count	30	30	30	30	30	30	30	30	30	30	30	30
Mean	0.999	1.458	0.982	1.047	1.047	1.047	0.968	1.047	1.047	1.047	0.797	1.047
Stan. Dev.	2.94	44.875	4.064	0.67	0.67	0.67	3.897	0.67	0.67	0.67	5.425	0.67
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedo	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	1.908	15.338	2.219	1.254	1.254	1.254	2.173	1.254	1.254	1.254	2.475	1.254

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.1. Statistical Analysis of Volatile Organics (Continued)

Sample Number	4-Methyl-2-Pentanone	Acetone	Benzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	WC8	Chloroform	Chloromethane
RBTC/RBGVC	3900000	7800000	22000	10000	220000	110000	7800000	490	1600000	1600000	280000	130000
AREA 19-3												
260020	11	11	1	11	11	11	11	11	1	11	1	11
260010	11	11	1	11	11	11	1	11	11	11	11	11
260002	10	10	10	10	10	10	10	10	10	10	10	10
250016	10	10	10	10	10	10	10	10	10	10	10	10
250009	11	11	11	11	11	11	11	11	11	11	11	11
240011	12	37	12	12	12	12	12	12	12	12	0	12
240004	12	12	12	12	12	12	12	12	12	12	12	12
230014	4	200	1	11	11	11	5	11	11	11	1	11
230005	4	67	3	11	11	11	11	11	11	11	0	11
220010	11	20	11	11	11	11	11	11	11	11	11	11
220005	11	61	1	11	11	11	11	11	11	11	11	11
210012	11	43	11	11	11	11	11	11	11	11	11	11
210005	12	12	12	12	12	12	12	12	12	12	12	12
200020	11	28	1	11	11	11	3	11	11	11	1	11
200009	10	49	2	10	10	10	3	10	10	10	1	10
191020	11	2	11	11	11	11	2	11	11	11	1	11
190020	10	66	2	10	10	10	2	10	10	10	1	10
190007	11	37	11	11	11	11	11	11	11	11	0	11
180020	11	11	11	11	11	11	3	11	11	11	0	11
180012	10	10	1	10	10	10	10	10	10	10	10	10
171020	12	28	12	12	12	12	12	12	12	12	12	12
170020	11	42	11	11	11	11	11	11	11	11	11	11
170007	11	11	11	11	11	11	11	11	11	11	11	11
160016	12	35	12	12	12	12	12	12	12	12	12	12
160010	12	7	1	12	12	12	4	12	12	12	1	12
150020RA	11	11	1	11	11	11	11	11	11	11	1	11
150001	11	12	2	11	11	11	11	11	11	11	1	11
140006RA	10	12	1	11	11	11	11	11	11	11	0	11
140001RA	11	11	11	11	11	11	11	11	11	11	1	11
130008	11	11	11	11	11	11	11	11	11	11	0	11
130003	13	11	2	11	11	11	11	11	11	11	1	11
120020	11	11	11	11	11	11	2	11	11	11	11	11
120001	10	10	10	10	10	10	10	10	10	10	1	10
110017	11	11	11	11	11	11	11	11	11	11	0	11
110006	12	12	12	12	12	12	12	12	12	12	12	12
101020	8	17	1	11	11	11	4	11	11	11	1	11
100020	11	11	1	11	11	11	1	11	11	11	11	11
100011	11	11	1	11	11	11	11	11	11	11	1	11
090017	11	11	11	11	11	11	11	11	11	11	1	11
090002	11	11	11	11	11	11	11	11	11	11	11	11
080009	12	15	12	12	12	12	2	12	12	12	12	12
080001	11	11	11	11	11	11	11	11	11	11	11	11
071001	20	11	11	11	11	11	11	11	11	11	11	11
070012	1	12	12	12	12	12	12	12	12	12	0	12
070001	11	11	11	11	11	11	11	11	11	11	11	11
060005	11	11	11	11	11	11	11	11	11	11	11	11
060000	11	11	11	11	11	11	11	11	11	11	0	11
050010	4	10	1	11	11	11	11	11	1	11	1	11
050004	11	11	2	1	1	11	11	11	2	11	11	0
040012	11	14	11	11	11	11	11	11	11	11	1	11
040007	11	23	11	11	11	11	11	11	11	11	0	11
030004	5	12	11	11	11	11	11	11	11	11	1	11
020006	11	11	11	11	11	11	11	11	11	11	11	11
020003	1	14	12	12	12	12	12	12	12	12	1	12
011002	11	34	11	11	11	11	11	11	11	11	0	11
010002	11	12	11	11	11	11	11	11	11	11	1	11
Count	56	56	56	56	56	56	56	56	56	56	56	56
Mean	1.013	1.347	0.892	1.037	1.037	1.044	0.966	1.044	1.023	1.044	0.72	1.037
Stan. Dev.	2.909	28.897	4.721	1.485	1.48	0.53	3.529	0.53	2.298	0.53	5.294	1.509
N Value	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483	7.483
Degrees of Freedo	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	1.664	7.811	1.948	1.369	1.364	1.163	1.757	1.163	1.537	1.163	1.904	1.375

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.1. Statistical Analysis of Volatile Organics (Continued)

Sample Number	Dibromochloromethane	Ethylbenzene	Methylene Chloride	Styrene	Tetrachloroethene	Toluene	Trichloroethene	Vinyl Chloride	Xylene (total)	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene
RBTC/RBGVC	78000	7800000	230000	57000	33000	2E+07	150000	900	1.6E+08	9500	9500
AREA 19-1											
391006	12	1	5	12	12	1	12	12	0	12	12
390011	11	11	6	1	11	2	11	11	0	11	11
390006	12	2	5	1	12	12	12	12	12	12	12
380012	12	12	4	12	12	1	12	12	2	12	12
380006	12	1	5	0	0	1	12	12	12	12	12
370012	11	11	5	11	11	11	11	11	11	11	11
370006	12	2	6	1	12	1	12	12	1	12	12
Count	7	7	7	7	7	7	7	7	7	7	7
Mean	1.069	0.754	0.735	0.734	1.001	0.616	1.069	1.069	0.743	1.069	1.069
Stan. Dev.	0.452	4.933	1.178	5.427	4.036	4.683	0.452	0.452	5.348	0.452	0.452
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedo	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695	1.695
Cleanup Standard	1.393	4.268	1.579	4.622	3.693	3.971	1.393	1.393	4.575	1.393	1.393
AREA 19-2											
360020	11	2	6	1	11	11	11	11	1	11	11
360013	12	12	25	0	12	12	12	12	0	12	12
360006	11	11	17	1	11	4	11	11	2	11	11
360000	11	11	15	11	1	11	11	11	1	11	11
350020	11	11	11	11	1	1	11	11	1	11	11
350013	12	12	12	12	12	12	12	12	1	12	12
350006	12	2	11	1	12	2	12	12	4	12	12
350000	11	11	11	1	11	11	11	11	1	11	11
341000	11	1	18	11	11	1	11	11	11	11	11
340006	13	2	19	13	13	1	13	13	1	13	13
340000	11	1	10	11	11	1	11	11	0	11	11
330006	11	2	11	11	11	5	11	11	1	11	11
330000	11	7	43	2	11	6	11	11	1	11	11
320006RA	11	3	25	1	11	11	11	11	2	11	11
320000RA	11	11	24	11	11	11	11	11	11	11	11
310000	11	11	12	11	1	1	11	11	11	11	11
301000	11	11	11	11	11	11	11	11	11	11	11
300000	12	12	11	12	0	12	12	12	12	12	12
290013	11	3	16	1	11	3	11	11	11	11	11
290006	11	11	27	11	1	1	11	11	0	11	11
290000	11	11	16	11	11	11	11	11	11	11	11
281000	10	10	14	1	10	1	10	10	1	10	10
280020	10	10	10	10	10	10	10	10	10	10	10
280013	12	12	12	1	2	12	12	12	12	12	12
280006	12	12	12	1	12	12	12	12	12	12	12
280000	10	10	10	10	10	10	10	10	10	10	10
270020	11	11	23	1	11	2	11	11	0	11	11
270013	11	1	23	11	11	2	11	11	11	11	11
270006	10	2	39	1	1	3	10	10	1	10	10
270000	11	3	10	1	0	2	11	11	2	11	11
Count	30	30	30	30	30	30	30	30	30	30	30
Mean	1.047	0.682	1.225	0.798	0.925	0.807	1.047	1.047	0.705	1.047	1.047
Stan. Dev.	0.67	4.411	8.467	5.204	4.572	4.655	0.67	0.67	4.975	0.67	0.67
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedo	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	1.254	2.246	3.85	2.408	2.339	2.247	1.254	1.254	2.244	1.254	1.254

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.1. Statistical Analysis of Volatile Organics (Continued)

Sample Number	Dibromochloromethane	Ethylbenzene	Methylene Chloride	Styrene	Tetrachloroethane	Toluene	Trichloroethane	Vinyl Chloride	Xylene (total)	cis-1,3-Dichloroprop	trans-1,3-Dichloropropene
RBTC/RBGVC	76000	7800000	230000	57000	33000	2E+07	150000	900	1.6E+08	9500	9500
AREA 19-3											
260020	11	2	26	1	11	2	11	11	1	11	11
260010	11	1	7	1	11	1	11	11	1	11	11
260002	10	1	8	10	10	10	10	10	0	10	10
250016	10	10	8	10	1	1	10	10	0	10	10
250009	11	1	5	0	11	1	11	11	11	11	11
240011	12	1	10	12	12	1	12	12	0	12	12
240004	12	12	8	0	12	1	12	12	1	12	12
230014	11	8	6	3	1	5	11	11	2	11	11
230005	11	1	7	0	11	2	11	11	11	11	11
220010	11	11	10	11	11	1	11	11	0	11	11
220005	11	1	9	0	11	1	11	11	11	11	11
210012	11	11	21	11	11	11	11	11	11	11	11
210006	12	12	16	12	12	1	12	12	1	12	12
200020	11	2	45	11	11	2	11	11	1	11	11
200009	10	4	58	1	10	4	10	10	1	10	10
191020	11	11	12	11	11	1	11	11	1	11	11
190020	10	4	38	1	10	4	10	10	4	10	10
190007	11	1	7	0	11	1	11	11	0	11	11
180020	11	11	13	11	11	2	11	11	1	11	11
180012	10	3	21	1	2	3	10	10	1	10	10
171020	12	12	21	12	12	12	12	12	12	12	12
170020	11	11	21	11	11	11	11	11	11	11	11
170007	11	11	6	11	11	11	11	11	1	11	11
160018	12	12	23	12	3	2	12	12	2	12	12
160010	12	3	17	12	12	3	12	12	2	12	12
150020RA	11	11	42	1	4	11	11	11	2	11	11
150001	11	4	30	1	6	4	11	11	1	11	11
140006RA	11	1	11	11	1	11	6	11	1	11	11
140001RA	11	3	18	11	11	11	11	11	1	11	11
130006	11	11	19	1	8	2	34	11	1	11	11
130003	11	6	28	2	2	5	1	11	2	11	11
120020	11	11	7	11	11	11	11	11	1	11	11
120001	10	10	10	1	1	1	10	10	2	10	10
110017	11	11	10	11	11	11	11	11	11	11	11
110006	12	12	12	12	3	12	12	12	1	12	12
101020	11	11	44	1	1	3	11	11	3	11	11
100020	11	11	17	1	11	11	11	11	1	11	11
100011	11	2	30	1	11	2	11	11	1	11	11
090017	11	11	15	1	2	11	11	11	11	11	11
090002	11	11	10	11	11	11	11	11	11	11	11
080009	12	12	17	12	12	12	12	12	12	12	12
080001	11	11	7	11	11	11	11	11	11	11	11
071001	11	4	12	2	1	2	11	11	4	11	11
070012	12	12	7	0	12	12	12	12	12	12	12
070001	11	11	9	0	11	11	11	11	1	11	11
060005	11	3	12	1	2	2	11	11	2	11	11
060000	11	2	11	1	11	1	11	11	2	11	11
050010	11	11	17	2	1	1	11	11	5	11	11
050004	1	3	13	2	5	2	1	11	7	1	1
040012	11	11	6	0	11	11	11	11	11	11	11
040007	11	11	6	11	11	11	11	11	11	11	11
030004	11	2	7	1	1	2	11	11	1	11	11
020006	11	11	5	0	11	0	11	11	11	11	11
020003	12	12	8	12	12	1	12	12	12	12	12
011002	11	11	7	0	11	11	11	11	11	11	11
010002	11	1	8	0	11	1	11	11	11	11	11
Count	56	56	56	56	56	56	56	56	56	56	56
Mean	1.037	0.865	1.193	0.724	0.821	0.73	1.042	1.044	0.868	1.037	1.037
Stan. Dev.	1.472	4.482	11.429	5.199	4.232	4.583	3.737	0.53	4.683	1.46	1.448
N Value	7.483	7.483	7.483	7.483	7.483	7.48	7.483	7.483	7.483	7.483	7.483
Degrees of Freedo	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	1.366	1.868	3.75	1.887	1.868	1.758	1.878	1.163	1.714	1.364	1.361

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds

SAMPLE NO	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,2'-oxybis(1-Chloropropane)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol
RBTL / RBGCV	780000	7000000	7000000	71000	24000	7800000	150000	230000
EA 19-1								
1008	390	390	390	390	390	980	390	390
390011	380	380	380	380	380	980	380	380
390006	400	400	400	400	400	1000	400	400
380012	400	400	400	400	400	1000	400	400
380006	400	400	400	400	400	1000	400	400
370012	370	370	370	370	370	920	370	370
Count	6	6	6	6	6	6	6	6
Mean	2.591	2.591	2.591	2.591	2.591	2.990	2.591	2.591
Stan. Dev.	11.547	11.547	11.547	11.547	11.547	29.25	11.547	11.547
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	11.526	11.526	11.526	11.526	11.526	25.623	11.526	11.526
AREA 19-2								
360020	360	360	360	360	360	910	360	360
360013	390	390	390	390	390	970	390	390
360006	380	380	380	380	380	960	380	380
360000	380	380	380	380	380	950	380	380
350020	370	370	370	370	370	940	370	370
350013	390	390	390	390	390	980	390	390
350006	410	410	410	410	410	1000	410	410
350000	380	380	380	380	380	960	380	380
341000	380	380	380	380	380	950	380	380
340006	430	430	430	430	430	1100	430	430
340000	370	370	370	370	370	940	370	370
330006	360	360	360	360	360	910	360	360
330000	350	350	350	350	350	880	350	350
320006	370	370	370	370	370	920	370	370
320000	370	370	370	370	370	920	370	370
310000	400	400	400	400	400	990	400	400
301000	370	370	370	370	370	910	370	370
300000	400	400	400	400	400	990	400	400
290013	370	370	370	370	370	920	370	370
290006	360	360	360	360	360	900	360	360
290000	350	350	350	350	350	880	350	350
1000	350	350	350	350	350	870	350	350
020	360	360	360	360	360	910	360	360
280013	400	400	400	400	400	1000	400	400
280006	400	400	400	400	400	990	400	400
280000	350	350	350	350	350	870	350	350
270020	360	360	360	360	360	910	360	360
270013	360	360	360	360	360	910	360	360
270006	360	360	360	360	360	900	360	360
270000RA	380	380	380	380	380	920	380	380
Count	30	30	30	30	30	30	30	30
Mean	2.574	2.574	2.574	2.574	2.574	2.973	2.574	2.574
Stan. Dev.	19.619	19.619	19.619	19.619	19.619	48.63	19.619	19.619
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	8.642	8.642	8.642	8.642	8.642	18.014	8.642	8.642

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds

SAMPLE NO	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,2'-oxybis(1-Chloropropane)	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol
RBTL / RBGCV	780000	7000000	7000000	71000	24000	7800000	150000	230000
AREA 19-3								
260020RE	370	370	370	370	370	930	370	370
260010RE	380	380	380	380	380	940	380	380
260002RE	330	330	330	330	330	630	330	330
250016	370	370	370	370	370	930	370	370
250009	380	380	380	380	380	960	380	380
240011RA	390	390	390	390	390	950	390	390
240004	400	400	400	400	400	1000	400	400
230014	380	380	380	380	380	950	380	380
230005	390	390	390	390	390	970	390	390
220010	370	370	370	370	370	920	370	370
220005	370	370	370	370	370	940	370	370
210012	370	370	370	370	370	940	370	370
210005	400	400	400	400	400	990	400	400
200020	370	370	370	370	370	920	370	370
200009	360	360	360	360	360	900	360	360
191020	370	370	370	370	370	910	370	370
19007RA	370	370	370	370	370	890	370	370
190020RA	350	350	350	350	350	880	350	350
180020	370	370	370	370	370	920	370	370
180012	360	360	360	360	360	910	360	360
171020	780	780	780	780	780	1900	780	780
170020	380	380	380	380	380	950	380	380
170007	370	370	370	370	370	940	370	370
160018	410	410	410	410	410	1000	410	410
160010	410	410	410	410	410	1000	410	410
150020	360	360	360	360	360	910	360	360
150001	360	360	360	360	360	910	360	360
140006	370	370	370	370	370	930	370	370
140001	350	350	350	350	350	880	350	350
130008	360	360	360	360	360	910	360	360
130003	360	360	360	360	360	910	360	360
120020	740	740	740	740	740	1900	740	740
120001	690	690	690	690	690	1700	690	690
110017	370	370	370	370	370	920	370	370
110006	420	420	420	420	420	1000	420	420
101020	370	370	370	370	370	930	370	370
100020	360	360	360	360	360	910	360	360
090017	370	370	370	370	370	930	370	370
090002	370	370	370	370	370	920	370	370
080009	410	410	410	410	410	1000	410	410
080001	370	370	370	370	370	940	370	370
070012	390	390	390	390	390	970	390	390
070001	710	710	710	710	710	1800	710	710
060005	720	720	720	720	720	1800	720	720
060000	740	740	740	740	740	1900	740	740
050010	380	380	380	380	380	950	380	380
050004	370	370	370	370	370	920	370	370
040012	350	350	350	350	350	890	350	350
040007	370	370	370	370	370	940	370	370
030004	360	360	360	360	360	900	360	360
020006	370	370	370	370	370	920	370	370
020003	380	380	380	380	380	960	380	380
011002	380	380	380	380	380	950	380	380
010002	380	380	380	380	380	950	380	380
Count	54	54	54	54	54	54	54	54
Mean	2.616	2.616	2.616	2.616	2.616	3.014	2.616	2.616
Stan. Dev.	113.434	113.434	113.434	113.434	113.434	285.929	113.434	113.434
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	28.458	28.458	28.458	28.458	28.458	68.154	28.458	28.458

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine
RBTL / RBGCV	1600000	160000	160000	2500	6300000	390000	3900000	4700	4800000	3800
EA 19-1										
006	390	960	390	62	390	390	390	960	390	390
390011	380	960	380	240	380	380	380	960	380	380
390006	400	1000	400	250	400	400	400	1000	400	400
380012	400	1000	400	400	400	400	400	1000	400	400
380006	400	1000	400	400	400	400	400	1000	400	400
370012	370	920	370	370	370	370	370	920	370	370
Count	6	6	6	6	6	6	6	6	6	6
Mean	2.591	2.990	2.591	2.463	2.591	2.591	2.591	2.990	2.591	2.591
Stan. Dev.	11.547	29.25	11.547	113.991	11.547	11.547	11.547	29.25	11.547	11.547
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	11.526	25.623	11.526	90.668	11.526	11.526	11.526	25.623	11.526	11.526
AREA 19-2										
360020	360	910	360	360	360	360	360	910	360	360
360013	390	970	390	390	390	390	390	970	390	390
360006	380	960	380	380	380	380	380	960	380	380
360000	380	950	380	380	380	380	380	950	380	380
350020	370	940	370	370	370	370	370	940	370	370
350013	390	980	390	390	390	390	390	980	390	390
350006	410	1000	410	410	410	410	410	1000	410	410
350000	380	960	380	380	380	380	380	960	380	380
341000	380	950	380	380	380	380	380	950	380	380
340006	430	1100	430	430	430	430	430	1100	430	430
340000	370	940	370	370	370	370	370	940	370	370
330006	360	910	360	360	360	360	360	910	360	360
330000	350	880	350	350	350	350	350	880	350	350
320006	370	920	370	370	370	370	370	920	370	370
320000	370	920	370	370	370	370	370	920	370	370
310000	400	990	400	400	400	400	400	990	400	400
301000	370	910	370	370	370	370	370	910	370	370
300000	400	990	400	400	400	400	400	990	400	400
290013	370	920	370	370	370	370	370	920	370	370
290006	360	900	360	360	360	360	360	900	360	360
290000	350	880	350	350	350	350	350	880	350	350
000	350	870	350	350	350	350	350	870	350	350
020	360	910	360	360	360	360	360	910	360	360
280013	400	1000	400	400	400	400	400	1000	400	400
280006	400	990	400	400	400	400	400	990	400	400
280000	350	870	350	350	350	350	350	870	350	350
270020	360	910	360	360	360	360	360	910	360	360
270013	360	910	360	360	360	360	360	910	360	360
270006	360	900	360	360	360	360	360	900	360	360
270000RA	380	920	380	380	380	380	380	920	380	380
Count	30	30	30	30	30	30	30	30	30	30
Mean	2.574	2.973	2.574	2.574	2.574	2.574	2.574	2.973	2.574	2.574
Stan. Dev.	19.619	48.63	19.619	19.619	19.619	19.619	19.619	48.63	19.619	19.619
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	8.642	18.014	8.642	8.642	8.642	8.642	8.642	18.014	8.642	8.642

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Chlorophenol	2-Methylphenol	2-Nitroaniline	2-Nitrophenol	3,3'-Dichlorobenzidine
RBTL / RBGCV	1600000	160000	160000	2500	6300000	390000	3900000	4700	4600000	3800
EA 19-3										
0020RE	370	930	370	370	370	370	370	930	370	370
260010RE	380	940	380	380	380	380	380	940	380	380
260002RE	330	830	330	330	330	330	330	830	330	330
250016	370	930	370	370	370	370	370	930	370	370
250009	380	960	380	380	380	380	380	960	380	380
240011RA	390	950	390	390	390	390	390	950	390	390
240004	400	1000	400	400	400	400	400	1000	400	400
230014	380	950	380	85	380	380	380	950	380	380
230005	390	970	390	95	390	390	390	970	390	390
220010	370	920	370	370	370	370	370	920	370	370
220005	370	940	370	370	370	370	370	940	370	370
210012	370	940	370	370	370	370	370	940	370	370
210005	400	990	400	400	400	400	400	990	400	400
200020	370	920	370	370	370	370	370	920	370	370
200009	360	900	360	360	360	360	360	900	360	360
191020	370	910	370	370	370	370	370	910	370	370
19007RA	370	890	370	370	370	370	370	890	370	370
190020RA	350	880	350	350	350	350	350	880	350	350
180020	370	920	370	370	370	370	370	920	370	370
180012	360	910	360	360	360	360	360	910	360	360
171020	780	1900	780	780	780	780	780	1900	780	780
170020	380	950	380	380	380	380	380	950	380	380
170007	370	940	370	370	370	370	370	940	370	370
160018	410	1000	410	410	410	410	410	1000	410	410
160010	410	1000	410	290	410	410	410	1000	410	410
150020	360	910	360	360	360	360	360	910	360	360
150001	360	910	360	360	360	360	360	910	360	360
140006	370	930	370	370	370	370	370	930	370	370
140001	350	880	350	350	350	350	350	880	350	350
130008	360	910	360	360	360	360	360	910	360	360
130003	360	910	360	360	360	360	360	910	360	360
120020	740	1900	740	740	740	740	740	1900	740	740
120001	690	1700	690	690	690	690	690	1700	690	690
110017	370	920	370	370	370	370	370	920	370	370
110006	420	1000	420	420	420	420	420	1000	420	420
1020	370	930	370	370	370	370	370	930	370	370
0020	360	910	360	360	360	360	360	910	360	360
090017	370	930	370	370	370	370	370	930	370	370
090002	370	920	370	370	370	370	370	920	370	370
080009	410	1000	410	410	410	410	410	1000	410	410
080001	370	940	370	370	370	370	370	940	370	370
070012	390	970	390	390	390	390	390	970	390	390
070001	710	1800	710	710	710	710	710	1800	710	710
060005	720	1800	720	720	720	720	720	1800	720	720
060000	740	1900	740	500	740	740	740	1900	740	740
050010	380	950	380	380	380	380	380	950	380	380
050004	370	920	370	370	370	370	370	920	370	370
040012	350	890	350	350	350	350	350	890	350	350
040007	370	940	370	370	370	370	370	940	370	370
030004	360	900	360	360	360	360	360	900	360	360
020006	370	920	370	370	370	370	370	920	370	370
020003	380	960	380	380	380	380	380	960	380	380
011002	380	950	380	380	380	380	380	950	380	380
010002	380	950	380	380	380	380	380	950	380	380
Count	54	54	54	54	54	54	54	54	54	54
Mean	2.616	3.014	2.616	2.598	2.616	2.616	2.616	3.014	2.616	2.616
Stan. Dev.	113.434	285.929	113.434	121.865	113.434	113.434	113.434	285.929	113.434	113.434
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	28.458	68.154	28.458	30.361	28.458	28.458	28.458	68.154	28.458	28.458

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	3-Nitroaniline	4-Bromophenyl-phenylether	4-Chloroaniline	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
"BTL / RBGCV	230000	4500000	310000	390000	230000	4800000	23000000	880	88	880
EA 19-1										
41006	980	390	390	390	980	980	390	390	390	390
390011	960	380	380	380	960	960	380	380	380	380
390006	1000	400	400	400	1000	1000	400	400	400	400
380012	1000	400	400	400	1000	1000	400	400	400	400
380006	1000	400	400	400	1000	1000	400	400	400	400
370012	920	370	370	370	920	920	370	370	370	370
Count	6	6	6	6	6	6	6	6	6	6
Mean	2.990	2.591	2.591	2.591	2.990	2.990	2.591	2.591	2.591	2.591
Stan. Dev.	29.25	11.547	11.547	11.547	29.25	29.25	11.547	11.547	11.547	11.547
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	25.623	11.526	11.526	11.526	25.623	25.623	11.526	11.526	11.526	11.526
AREA 19-2										
360020	910	360	360	360	910	910	360	360	360	360
360013	970	390	390	390	970	970	390	390	390	390
360006	960	380	380	380	960	960	380	380	380	380
360000	950	380	380	380	950	950	380	380	380	380
350020	940	370	370	370	940	940	370	370	370	370
350013	980	390	390	390	980	980	390	390	390	390
350006	1000	410	410	410	1000	1000	410	410	410	410
350000	960	380	380	380	960	960	380	380	380	380
341000	950	380	380	380	950	950	380	380	380	380
340006	1100	430	430	430	1100	1100	430	430	430	430
340000	940	370	370	370	940	940	370	370	370	370
330006	910	360	360	360	910	910	360	360	360	360
330000	880	350	350	350	880	880	350	350	350	350
320006	920	370	370	370	920	920	370	370	370	370
320000	920	370	370	370	920	920	370	370	370	370
310000	990	400	400	400	990	990	400	400	100	100
301000	910	370	370	370	910	910	370	370	370	370
300000	990	400	400	400	990	990	27	660	760	730
290013	920	370	370	370	920	920	370	370	370	370
290006	900	360	360	360	900	900	360	360	360	360
290000	880	350	350	350	880	880	350	350	35	350
'1000	870	350	350	350	870	870	350	350	350	350
.0020	910	360	360	360	910	910	360	360	360	360
280013	1000	400	400	400	1000	1000	400	400	400	400
280006	990	400	400	400	990	990	400	400	400	400
280000	870	350	350	350	870	870	350	350	350	350
270020	910	360	360	360	910	910	360	360	360	360
270013	910	360	360	360	910	910	360	360	360	360
270006	900	360	360	360	900	900	360	360	360	360
270000RA	920	380	380	380	920	920	380	380	380	380
Count	30	30	30	30	30	30	30	30	30	30
Mean	2.973	2.574	2.574	2.574	2.973	2.973	2.560	2.564	2.564	2.576
Stan. Dev.	48.63	19.619	19.619	19.619	48.63	48.63	65.227	54.687	107.568	84.043
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	18.014	8.642	8.642	8.642	18.014	18.014	22.734	19.498	35.634	28.57

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	3-Nitroaniline	4-Bromophenyl-phenylether	4-Chloroaniline	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene
RBTL / RBGCV	230000	4500000	310000	390000	230000	4500000	23000000	880	88	880
A 19-3										
020RE	930	370	370	370	930	930	370	370	370	370
260010RE	940	380	380	380	940	940	380	380	380	380
260002RE	830	330	330	330	830	830	330	330	330	330
250016	930	370	370	370	930	930	370	370	370	370
250009	960	380	380	380	960	960	380	380	380	380
240011RA	950	390	390	390	950	950	390	390	390	390
240004	1000	400	400	400	1000	1000	400	400	400	400
230014	950	380	380	380	950	950	380	380	380	380
230005	970	390	390	390	970	970	390	390	390	390
220010	920	370	370	370	920	920	370	370	370	370
220005	940	370	370	370	940	940	370	370	370	370
210012	940	370	370	370	940	940	370	370	370	370
210005	990	400	400	400	990	990	400	400	400	400
200020	920	370	370	370	920	920	370	370	370	370
200009	900	360	360	360	900	900	360	360	360	360
191020	910	370	370	370	910	910	370	370	370	370
190007RA	690	370	370	370	690	690	370	370	370	370
190020RA	860	350	350	350	860	860	350	350	350	350
180020	920	370	370	370	920	920	370	370	370	370
180012	910	360	360	360	910	910	360	360	360	360
171020	1900	780	780	780	1900	1900	780	780	780	780
170020	950	380	380	380	950	950	380	380	380	380
170007	940	370	370	370	940	940	370	370	370	370
160018	1000	410	410	410	1000	1000	410	410	410	410
160010	1000	410	410	410	1000	1000	410	31	29	410
150020	910	360	360	360	910	910	360	360	360	360
150001	910	360	360	360	910	910	360	360	360	360
140008	930	370	370	370	930	930	12	370	110	110
140001	880	350	350	350	880	880	35	37	480	470
130008	910	360	360	360	910	910	360	360	88	360
130003	910	360	360	360	910	910	360	360	360	360
120020	1900	740	740	740	1900	1900	740	740	740	740
120001	1700	690	690	690	1700	1700	19	230	300	240
110017	920	370	370	370	920	920	370	370	370	370
110006	1000	420	420	420	1000	1000	420	420	420	420
020	930	370	370	370	930	930	370	370	370	370
020	910	360	360	360	910	910	360	360	360	360
090017	930	370	370	370	930	930	370	370	370	370
090002	920	370	370	370	920	920	370	370	370	370
080009	1000	410	410	410	1000	1000	470	1100	1100	950
080001	940	370	370	370	940	940	370	370	370	370
070012	970	390	390	390	970	970	32	390	390	390
070001	1800	710	710	710	1800	1800	350	1000	1100	980
060005	1800	720	720	720	1800	1800	760	1500	1600	1200
060000	1900	740	740	740	1900	1900	530	1300	1300	1100
050010	950	380	380	380	950	950	380	380	380	380
050004	920	370	370	370	920	920	41	81	72	66
040012	890	350	350	350	890	890	350	350	350	350
040007	940	370	370	370	940	940	370	370	370	370
030004	900	360	360	360	900	900	360	360	21	23
020006	920	370	370	370	920	920	370	370	24	24
020003	960	380	380	380	960	960	380	380	21	25
011002	950	380	380	380	950	950	380	11	380	67
010002	950	380	380	380	950	950	380	14	74	80
Count	54	54	54	54	54	54	54	54	54	54
Mean	3.014	2.616	2.616	2.616	3.014	3.014	2.565	2.619	2.611	2.599
Stan. Dev.	285.929	113.434	113.434	113.434	285.929	285.929	142.143	267.252	268.771	232.951
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	68.154	28.458	28.458	28.458	68.154	68.154	34.948	63.504	68.398	55.669

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table 8.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Butylbenzylphthalate	Carbazole	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Diethylphthalate	Dimethylphthalate	Fluoranthene
RBTL / RBGCV	88	880	16000000	85000	7800000	1600000	88	63000000	780000000	3100000
EA 19-1										
1006	390	390	390	22	390	43	390	390	390	29
390011	380	380	380	76	380	370	380	380	380	90
390006	400	400	400	32	400	1500	400	400	400	95
380012	400	400	400	390	400	680	400	400	400	400
380006	400	400	400	320	400	550	400	400	400	400
370012	370	370	370	370	310	370	370	370	370	240
Count	6	6	6	6	6	6	6	6	6	6
Mean	2.591	2.591	2.591	2.305	2.580	2.785	2.591	2.591	2.591	2.320
Stan. Dev.	11.547	11.547	11.547	160.555	32.146	452.814	11.547	11.547	11.547	149.153
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.695
Cleanup Standard	11.526	11.526	11.526	126.54	27.454	353.146	11.526	11.526	11.526	117.732
AREA 19-2										
360020	360	360	360	360	360	350	360	360	360	360
360013	390	390	390	390	390	250	390	390	390	390
360006	380	380	380	380	380	390	380	380	380	380
360000	380	380	380	380	380	400	380	380	380	380
350020	370	370	370	370	370	590	370	370	370	370
350013	390	390	390	40	390	510	390	390	390	390
350006	410	410	410	410	600	410	410	410	410	410
350000	380	380	380	380	380	100	380	380	380	380
341000	380	380	380	380	760	380	380	380	380	380
340006	430	430	430	430	1000	430	430	430	430	430
340000	370	370	370	370	810	370	370	370	370	370
330006	360	360	360	360	530	360	360	360	360	19
330000	350	350	350	350	350	350	350	350	350	350
320006	370	370	370	370	370	370	370	370	370	370
320000	370	370	370	370	370	370	370	370	370	370
310000	200	400	400	400	430	400	400	400	400	210
301000	370	370	370	370	510	370	370	370	370	53
300000	1000	310	400	81	310	400	400	400	400	2200
290013	370	370	370	370	750	370	370	370	370	370
290006	360	360	360	360	550	360	360	360	360	360
290000	42	350	350	340	43	700	350	350	350	350
1000	350	350	350	50	350	390	350	350	350	350
020	360	360	360	360	360	420	360	360	360	360
80013	400	400	400	53	400	630	400	400	400	400
280006	400	400	400	53	400	540	400	400	400	400
280000	350	350	350	32	350	250	350	350	350	350
270020	360	360	360	360	360	440	360	360	360	360
270013	360	360	360	360	360	320	360	360	360	360
270006	360	360	360	360	360	460	360	360	360	360
270000RA	360	360	360	360	360	320	360	360	360	360
Count	30	30	30	30	30	30	30	30	30	30
Mean	2.578	2.571	2.574	2.490	2.648	2.602	2.574	2.574	2.574	2.610
Stan. Dev.	134.346	22.313	19.619	130.037	179.548	112.309	19.619	19.619	19.619	344.842
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	44.13	9.472	6.642	42.71	58.161	37.338	6.642	6.642	6.642	109.267

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Butylbenzylphthalate	Carbazole	Di-n-butylphthalate	Di-n-octylphthalate	Dibenz(a,h)anthracene	Diethylphthalate	Dimethylphthalate	Fluoranthene
RBTL / RBGCV	88	880	16000000	65000	7800000	1600000	88	63000000	780000000	3100000
EA 19-3										
020RE	370	370	370	370	370	590	370	370	24	370
260010RE	380	380	380	380	380	530	380	380	380	380
260002RE	330	330	330	330	330	450	330	330	330	330
250016	370	370	370	69	370	960	370	370	370	370
250009	380	380	380	380	510	380	380	380	380	970
240011RA	390	390	390	390	390	300	390	390	390	390
240004	400	400	400	400	400	360	400	400	400	400
230014	380	380	380	260	380	720	380	380	380	37
230005	390	390	390	190	390	700	390	390	390	34
220010	370	370	370	370	780	370	370	370	370	370
220005	370	370	370	370	1500	370	370	370	370	370
210012	370	370	370	370	370	20	370	370	370	370
210005	400	400	400	400	400	260	400	400	400	400
200020	370	370	370	370	1200	370	370	370	370	370
200009	360	360	360	360	870	360	360	360	360	360
191020	370	370	370	370	370	260	370	370	370	370
190007RA	370	370	370	370	370	270	370	370	370	370
190020RA	350	350	350	350	350	280	350	350	350	350
180020	370	370	370	370	370	510	370	370	370	370
180012	360	360	360	360	360	210	360	360	360	360
171020	780	780	780	780	780	780	780	780	780	780
170020	380	380	380	380	380	380	380	63	380	380
170007	370	370	370	370	370	370	370	370	370	370
160018	410	410	410	410	410	220	410	410	410	410
160010	38	410	38	410	45	130	410	410	410	100
150020	360	360	360	610	360	400	360	360	32	360
150001	360	360	360	470	360	410	360	360	360	360
140006	220	370	190	490	140	640	370	370	370	370
140001	490	350	330	520	600	680	350	350	350	350
130008	360	360	120	320	130	770	360	360	360	360
130003	360	360	360	360	360	98	360	360	360	360
120020	740	740	740	740	740	740	740	740	740	740
120001	690	330	690	690	690	690	690	100	690	320
110017	370	370	370	370	370	370	370	370	70	370
110006	420	420	420	420	26	420	420	78	420	73
1020	370	370	370	230	370	650	370	370	370	370
320	360	360	360	180	360	740	360	360	360	360
017	370	370	190	370	63	370	370	78	370	370
090002	370	370	370	370	370	370	370	370	69	370
080009	760	610	410	240	410	410	410	78	410	2100
080001	370	370	370	370	370	370	370	68	370	370
070012	390	390	390	390	30	390	390	72	390	240
070001	750	700	710	220	710	710	710	78	710	2100
060005	940	1100	720	360	720	720	720	69	720	3300
060000	840	1100	740	270	740	740	740	72	740	2600
050010	380	380	800	380	60	380	380	68	380	34
050004	370	69	460	370	370	370	370	370	370	210
040012	350	350	350	350	1900	350	350	350	350	350
040007	370	370	370	370	24	370	370	370	370	370
030004	21	360	24	360	560	360	360	12	360	49
020006	34	370	25	370	400	370	370	370	370	56
020003	34	380	27	380	780	380	380	15	380	54
011002	79	380	76	380	630	380	380	28	380	150
010002	81	28	95	14	590	380	24	43	380	140
Count	54	54	54	54	54	54	54	54	54	54
Mean	2.591	2.619	2.573	2.572	2.677	2.651	2.61	2.476	2.591	2.693
Stan. Dev.	187.707	181.696	179.71	127.721	335.225	193.975	124.951	165.619	148.459	613.747
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	45.354	44.013	43.514	31.669	79.047	46.642	31.076	40.252	36.412	142.515

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	N-Nitroso-di-n-propylamine
RBTL / RBGCV	3100000	1100	22000	550000	78000	880	67	240
REA 19-1								
1008	390	390	390	390	390	390	390	390
90011	380	380	380	380	380	380	380	380
390006	400	400	400	400	400	400	400	17
380012	400	400	400	400	400	400	400	400
380006	400	400	400	400	400	400	400	400
370012	370	370	370	370	370	370	370	370
Count	6	6	6	6	6	6	6	6
Mean	2.591	2.591	2.591	2.591	2.591	2.591	2.591	2.513
Stan. Dev.	11.547	11.547	11.547	11.547	11.547	11.547	11.547	138.673
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	11.526	11.526	11.526	11.526	11.526	11.526	11.526	109.816
AREA 19-2								
360020	360	360	360	360	360	360	360	360
360013	390	390	390	390	390	390	390	390
360006	15	380	380	380	380	380	380	380
360000	25	380	380	380	380	380	380	380
350020	22	370	370	370	370	370	370	370
350013	390	390	390	390	390	390	390	390
350006	410	410	410	410	410	410	410	410
350000	380	380	380	380	380	380	380	380
341000	380	380	380	380	380	380	380	380
340006	430	430	430	430	430	430	430	430
340000	370	370	370	370	370	370	370	370
330006	360	360	360	360	360	360	360	360
330000	350	350	350	350	350	350	350	350
320006	370	370	370	370	370	370	370	370
320000	370	370	370	370	370	370	370	370
310000	400	400	400	400	400	400	400	400
301000	370	370	370	370	370	370	370	370
300000	81	400	400	400	400	310	400	400
290013	370	370	370	370	370	370	370	370
290006	360	360	360	360	360	360	360	360
290000	68	350	350	350	350	350	350	350
281000	350	350	350	350	350	350	350	350
020	360	360	360	360	360	360	360	360
0013	400	400	400	400	400	400	400	400
280006	400	400	400	400	400	400	400	400
280000	350	350	350	350	350	350	350	350
270020	360	360	360	360	360	360	360	360
270013	360	360	360	360	360	360	360	360
270006	360	360	360	360	360	360	360	360
270000RA	380	380	380	380	380	380	380	380
Count	30	30	30	30	30	30	30	30
Mean	2.506	2.574	2.574	2.574	2.574	2.571	2.574	2.574
Stan. Dev.	124.659	19.619	19.619	19.619	19.619	22.313	19.619	19.619
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	41.062	8.642	8.642	8.642	8.642	9.472	8.642	8.642

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	N-Nitroso-di-n-propylamine
RBTL / RBGCV	3100000	1100	22000	550000	78000	880	67	240
EA 19-3								
020RE	370	370	370	370	370	370	370	370
260010RE	380	380	380	380	380	380	380	380
260002RE	330	330	330	330	330	330	330	330
250016	370	370	370	370	370	370	370	370
250009	380	380	380	380	380	380	380	380
240011RA	390	390	390	390	390	390	390	390
240004	400	400	400	400	400	400	400	400
230014	380	380	380	380	380	380	380	380
230005	390	390	390	390	390	390	390	390
220010	370	370	370	370	370	370	370	370
220005	370	370	370	370	370	370	370	370
210012	370	370	370	370	370	370	370	370
210005	25	400	400	400	400	400	400	400
200020	370	370	370	370	370	370	370	370
200009	360	360	360	360	360	360	360	360
191020	370	370	370	370	370	370	370	370
19007RA	370	370	370	370	370	370	370	370
190020RA	350	350	350	350	350	350	350	350
180020	370	370	370	370	370	370	370	370
180012	360	360	360	360	360	360	360	360
171020	780	780	780	780	780	780	780	780
170020	380	380	380	380	380	380	380	380
170007	370	370	370	370	370	370	370	370
160016	410	410	410	410	410	410	410	410
160010	56	410	410	410	410	410	410	410
150020	360	360	360	360	360	360	360	360
150001	360	360	360	360	360	360	360	360
140006	150	370	370	370	370	370	370	370
140001	600	350	350	350	350	350	350	350
130006	220	360	360	360	360	360	360	360
130003	360	360	360	360	360	360	360	360
120020	740	740	740	740	740	740	740	740
120001	690	690	690	690	690	690	690	690
110017	370	370	370	370	370	370	370	370
110006	420	420	420	420	420	420	420	420
1020	370	370	370	370	370	370	370	370
020	360	360	360	360	360	360	360	360
0017	370	370	370	370	370	370	370	370
090002	370	370	370	370	370	370	370	370
080009	320	410	410	410	410	780	410	410
080001	370	370	370	370	370	370	370	370
070012	390	390	390	390	390	390	390	390
070001	140	710	710	710	710	740	710	710
060005	380	720	720	720	720	880	720	720
060000	260	740	740	740	740	820	740	740
050010	380	380	380	380	380	380	380	380
050004	370	370	370	370	370	370	370	370
040012	350	350	350	350	350	350	350	350
040007	370	370	370	370	370	370	370	370
030004	360	360	360	360	360	360	360	360
020006	370	370	370	370	370	370	370	370
020003	380	380	380	380	380	380	13	380
011002	380	380	380	380	380	380	380	380
010002	380	380	380	380	380	380	11	380
Count	54	54	54	54	54	54	54	54
Mean	2.569	2.616	2.616	2.616	2.616	2.628	2.602	2.616
Stan. Dev.	123.716	113.434	113.434	113.434	113.434	136.677	136.422	113.434
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	30.754	28.458	28.458	28.458	28.458	33.765	33.681	28.458

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	N-Nitrosodiphenylamine (1)	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	bis(2-Chloroethyl)ether	bis(2-Ethylhexyl)phthalate
RBTL / RBGCV	130000	3100000	39000	53000	68	5E+07	2300000	46000	120000
TEA 19-1									
1006	390	390	390	390	980	390	19	390	390
390011	78	380	380	380	960	380	380	380	380
390006	250	400	400	400	1000	400	400	400	400
380012	400	400	400	400	1000	400	400	400	400
380006	400	400	400	400	180	400	400	400	400
370012	370	370	370	920	370	370	370	370	370
Count	6	6	6	6	6	6	6	6	6
Mean	2.498	2.591	2.591	2.683	2.874	2.591	2.516	2.591	2.591
Stan. Dev.	117.964	11.547	11.547	198.165	339.432	11.547	138.745	11.547	11.547
N Value	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449	2.449
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	93.777	11.526	11.526	154.473	265.521	11.526	109.875	11.526	11.526
AREA 19-2									
360020	360	360	360	360	910	360	360	360	360
360013	390	390	390	390	970	390	390	390	390
360006	380	380	380	380	960	380	380	380	380
360000	380	380	380	380	950	380	380	380	380
350020	370	370	370	370	940	370	370	370	370
350013	390	390	390	390	960	390	390	390	390
350006	410	410	410	1000	410	410	410	410	180
350000	380	380	380	380	960	380	380	380	380
341000	380	380	380	950	380	380	380	380	380
340006	430	430	430	1100	430	430	430	430	430
340000	370	370	370	180	370	370	370	370	46
330006	360	360	360	910	360	360	21	360	180
330000	350	350	350	350	880	350	350	350	350
320006	370	370	370	370	920	370	370	370	370
320000	370	370	370	370	920	370	370	370	370
310000	400	400	400	990	400	400	200	400	1500
301000	370	370	370	910	370	370	46	370	1500
300000	400	400	400	990	1200	400	2000	400	400
290013	370	370	370	920	370	370	370	370	1300
290006	360	360	360	900	360	360	360	360	1600
290000	350	350	350	350	880	45	350	350	350
281000	350	350	350	350	870	350	350	350	350
0020	360	360	360	360	910	360	360	360	360
0013	400	400	400	400	1000	400	400	400	400
280006	400	400	400	400	990	400	400	400	400
280000	350	350	350	350	870	350	350	350	350
270020	360	360	360	360	910	360	360	360	360
270013	360	360	360	360	910	360	360	360	360
270006	360	360	360	360	900	360	360	360	360
270000RA	380	380	380	380	920	53	380	380	380
Count	30	30	30	30	30	30	30	30	30
Mean	2.574	2.574	2.574	2.734	2.888	2.549	2.602	2.574	2.697
Stan. Dev.	19.619	19.619	19.619	280.195	262.096	83.783	310.712	19.619	392.875
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	8.642	8.642	8.642	89.396	83.953	28.463	98.703	8.642	124.211

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.2. Statistical Analysis of Semivolatile Compounds (Continued)

SAMPLE NO	N-Nitrosodiphenylamine (1)	Naphthalene	Nitrobenzene	Pentachlorophenol	Phenanthrene	Phenol	Pyrene	bis(2-Chloroethyl)ether	bis(2-Ethylhexyl)phthalate
RBTL / RBGCV	130000	3100000	39000	53000	88	5E+07	2300000	46000	120000
AREA 19-3									
300020RE	370	370	370	370	930	370	370	370	370
280010RE	380	380	380	380	940	380	380	380	380
280002RE	330	330	330	330	830	330	330	330	330
250016	370	370	370	370	930	370	370	370	370
250009	380	380	380	960	670	380	380	380	65
240011RA	390	390	390	390	950	390	390	390	390
240004	400	400	400	400	1000	400	400	400	400
230014	190	380	380	380	950	380	380	380	380
230005	120	390	390	390	970	390	390	390	390
220010	370	370	370	920	370	370	370	370	61
220005	370	370	370	940	370	370	370	370	370
210012	370	370	370	370	940	370	370	370	370
210005	400	400	400	400	990	400	400	400	400
200020	370	370	370	920	370	370	370	370	46
200009	360	360	360	900	360	360	360	360	360
191020	370	370	370	370	910	370	370	370	370
190007RA	370	370	370	370	690	370	370	370	370
190020RA	350	350	350	350	860	350	350	350	350
180020	370	370	370	370	920	370	370	370	370
180012	360	360	360	360	910	360	360	360	360
171020	780	780	780	1900	780	780	780	780	780
170020	380	380	380	950	380	380	380	380	380
170007	370	370	370	940	370	370	370	370	370
160016	410	410	410	410	1000	410	410	410	410
160010	51	410	410	410	1000	27	410	410	410
150020	360	360	360	360	910	360	360	360	360
150001	360	360	360	360	910	360	360	360	360
140006	370	370	16	370	930	110	370	370	370
140001	350	350	350	350	880	270	350	350	350
130006	360	360	360	360	910	120	360	360	360
130003	360	360	360	360	910	360	360	360	360
120020	740	740	740	1900	740	740	740	740	740
120001	690	690	690	1700	130	690	500	690	690
110017	370	370	370	370	920	370	370	370	370
110006	420	420	420	1000	420	420	130	420	420
101020	370	370	370	370	930	370	370	370	370
0020	360	360	360	360	910	360	360	360	360
0017	370	370	370	930	370	370	370	370	200
090002	370	370	370	370	920	370	370	370	370
080009	410	89	410	1000	2400	410	2400	410	410
080001	370	370	370	940	370	370	370	370	370
070012	390	390	390	970	160	390	260	390	390
070001	710	48	710	1800	1700	710	2500	710	290
060005	720	190	720	1800	3100	720	3600	720	720
060000	740	65	740	1900	2200	740	3100	740	740
050010	380	380	380	950	38	380	380	380	380
050004	370	370	370	920	200	370	220	370	370
040012	350	350	350	890	350	350	350	350	42
040007	370	370	370	940	370	370	370	370	370
030004	360	360	360	900	25	360	42	360	29
020006	370	370	370	920	25	370	45	370	28
020003	380	380	380	94	22	380	47	380	40
011002	380	380	380	950	67	380	130	380	140
010002	380	380	380	950	58	380	120	380	58
Count	54	54	54	54	54	54	54	54	54
Mean	2.6	2.572	2.61	2.869	2.685	2.597	2.732	2.616	2.544
Stan. Dev.	132.515	115.161	125.362	473.268	573.706	137.243	692.065	113.434	171.492
N Value	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348	7.348
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	32.789	28.808	31.17	110.692	133.585	33.863	160.396	28.458	41.613

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data

Sample Number	Units	AG	AL	AS	BA	BE	BI	CA	CD	CN	CO	CR
RBTL / RBGCV	MG/KG	390	230000	23	5500	150	NE	NE	39	390	39	390
AREA 19-1												
391006	MG/KG	1	17700	6	32	1	1	26400	1	0	14	30
390011	MG/KG	1	15600	4	28	1	0	55600	1	0	15	24
390006	MG/KG	1	13900	3	26	1	0	49400	1	0	14	24
380012	MG/KG	1	21200	4	44	1	0	74500	1	0	12	29
380006	MG/KG	1	14700	4	52	1	0	95300	1	0	11	23
370012	MG/KG	1	9250	3	19	1	0	95600	1	0	10	14
370006	MG/KG	1	11300	4	22	1	0	74400	1	0	15	21
Count		7	7	7	7	7	7	7	7	7	7	7
Mean		0.636	14807.143	4.000	31.700	0.906	0.474	67314.286	0.636	0.000	12.929	23.629
Stan. Dev.		0.038	3662.204	0.938	11.334	0.198	0.053	23352.114	0.038	0.000	1.806	5.039
N Value		2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom		1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard		0.027	2627.942	1.274	9.621	0.142	0.038	16735.360	0.027	0.000	2.405	4.984
AREA 19-2												
360020	MG/KG	1	15400	4	36	1	1	115000	1	0	11	21
360013	MG/KG	1	11200	4	27	1	0	154000	1	0	11	16
360006	MG/KG	1	11900	6	81	1	0	76000	1	0	7	15
360000	MG/KG	1	18100	9	97	1	1	3300	1	0	10	22
350020	MG/KG	1	3770	4	32	0	0	138000	1	0	4	9
350013	MG/KG	1	12400	4	33	1	0	93300	1	0	11	18
350006	MG/KG	1	13900	4	39	1	1	54200	1	0	13	22
350000	MG/KG	1	14300	4	37	1	0	82400	1	0	12	20
341000	MG/KG	1	11000	3	16	1	0	32800	1	0	12	19
340006	MG/KG	1	17300	5	24	1	0	56000	1	0	15	28
340000	MG/KG	1	14600	2	19	1	0	39500	1	0	11	24
330006	MG/KG	1	9810	5	32	1	0	109000	1	0	9	15
330000	MG/KG	1	8100	4	36	1	0	92800	1	1	6	11
320006	MG/KG	1	7440	4	31	1	1	93500	1	1	6	13
320000	MG/KG	0	5470	6	253	0	0	116000	0	1	5	10
310000	MG/KG	1	9840	4	39	1	0	55000	1	0	8	16
301000	MG/KG	0	8250	2	30	1	0	62100	0	1	7	14
300000	MG/KG	1	4720	3	40	0	0	130000	1	0	4	10
290013	MG/KG	0	7750	3	31	0	0	172000	0	0	6	11
290006	MG/KG	1	3370	32	43	0	0	102000	1	0	6	8
290000	MG/KG	1	7280	6	35	0	0	104000	1	0	6	11
281000	MG/KG	1	1200	4	14	0	0	245000	1	1	2	5
280020	MG/KG	1	5350	3	28	0	0	170000	1	1	4	10
280013	MG/KG	1	11700	10	78	1	0	21300	1	0	8	17
280006	MG/KG	1	11800	9	79	1	0	20900	1	1	8	16
280000	MG/KG	2	1440	4	16	0	0	260000	1	1	2	6
270020	MG/KG	1	6560	5	46	0	0	102000	1	0	5	11
270013	MG/KG	1	6030	5	51	0	0	104000	1	0	5	11
270006	MG/KG	0	6580	5	46	0	0	114000	0	0	5	11
270000	MG/KG	1	13100	7	54	1	0	75200	1	0	7	20
Count		30	30	30	30	30	30	30	30	30	30	30
Mean		0.666	9322.000	5.640	47.367	0.592	0.434	99776.667	0.603	0.243	7.410	14.587
Stan. Dev.		0.265	4416.727	5.299	42.963	0.234	0.101	58274.584	0.101	0.295	3.333	5.523
N Value		5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom		1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697
Cleanup Standard		0.082	1372.453	2.393	14.987	0.073	0.031	18060.863	0.031	0.091	1.903	2.875

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data

Sample Number	Units	AG	AL	AS	BA	BE	BI	CA	CD	CN	CO	CR
RBTL / RBGCV	MG/KG	390	230000	23	5500	150	NE	NE	39	390	39	390
AREA 19–3												
260020	MG/KG	1	5190	4	31	0	0	106000	1	1	5	8
260010	MG/KG	1	7520	5	37	1	0	100000	1	1	6	12
260002	MG/KG	1	9760	7	49	1	0	65400	1	0	7	17
250016	MG/KG	1	18800	4	52	1	1	113000	1	0	12	25
250009	MG/KG	1	11800	3	26	1	0	34600	1	0	11	21
240011	MG/KG	1	19900	3	34	1	0	57900	1	0	14	29
240004	MG/KG	1	15500	3	28	1	0	58700	1	0	11	20
230014	MG/KG	1	18600	5	32	1	0	67700	1	0	12	26
230005	MG/KG	1	15600	4	50	1	0	95500	1	0	11	21
220010	MG/KG	1	8080	3	17	0	0	195000	1	0	8	12
220005	MG/KG	1	12000	3	20	1	0	51200	1	0	11	19
210012	MG/KG	1	14200	3	29	1	0	73400	1	1	10	19
210005	MG/KG	1	7890	4	37	1	1	132000	1	1	6	14
200020	MG/KG	1	4720	4	43	0	0	104000	1	0	5	10
200009	MG/KG	1	3570	4	33	0	0	119000	1	0	4	7
200003	MG/KG	1	7980	6	43	0	0	99100	1	0	6	13
191020	MG/KG	1	5610	5	43	0	0	98600	1	0	5	10
190020	MG/KG	1	4530	5	41	0	0	92200	1	0	4	9
190007	MG/KG	1	5850	5	34	0	0	125000	1	0	4	11
180020	MG/KG	1	6460	4	48	0	0	100000	1	1	5	11
180012	MG/KG	0	5240	4	41	0	0	123000	0	1	4	9
171020	MG/KG	1	14700	5	40	1	1	41600	1	0	14	23
170007	MG/KG	1	11700	3	320	1	0	128000	1	0	8	16
160018	MG/KG	1	16200	4	29	1	0	72000	1	1	14	26
160010	MG/KG	1	17300	5	25	1	0	62800	1	0	14	27
150020	MG/KG	1	6800	5	50	0	1	112000	1	0	5	10
150001	MG/KG	1	13300	4	27	1	1	49900	1	2	11	21
140020	MG/KG	0	12500	3	69	1	0	107000	0	0	10	17
140006	MG/KG	1	9410	4	23	1	1	103000	1	0	6	13
140001	MG/KG	1	12700	5	40	1	1	78800	1	0	9	18
130008	MG/KG	1	13900	4	30	1	1	105000	1	0	10	18
130003	MG/KG	1	11700	5	36	1	1	116000	1	0	8	17
120020	MG/KG	1	6530	4	57	0	1	107000	1	1	6	11
120001	MG/KG	1	5110	4	26	0	0	83800	1	2	6	9
110017	MG/KG	1	6380	4	41	0	0	170000	1	1	5	9
110006	MG/KG	1	13800	3	39	1	1	98700	1	0	10	18
101020	MG/KG	1	6900	5	55	0	0	115000	1	0	6	11
100020	MG/KG	1	4850	5	38	0	0	104000	1	1	5	9
100011	MG/KG	1	5820	5	33	0	1	112000	1	0	4	9
090017	MG/KG	1	5570	5	29	0	0	107000	1	0	5	9
090002	MG/KG	1	6730	5	29	0	0	146000	1	0	6	11
080009	MG/KG	0	75	3	0	0	0	1190	0	0	0	0
080001	MG/KG	1	7290	5	34	0	0	95000	1	0	6	13
071001	MG/KG	1	18900	7	82	1	1	63200	1	0	11	25
070012	MG/KG	1	9030	3	31	1	0	193000	1	0	7	12
070001	MG/KG	1	17600	4	77	1	1	53800	1	0	11	22
060005	MG/KG	1	12600	4	57	1	1	116000	1	1	8	17
060000	MG/KG	1	12300	5	50	1	1	97100	1	0	9	17
050010	MG/KG	1	10400	3	34	1	1	119000	1	0	9	16
050004	MG/KG	1	7680	3	32	1	1	187000	1	0	6	12
040012	MG/KG	1	6660	2	24	0	0	87400	1	0	6	10
040007	MG/KG	1	6680	5	50	0	0	67300	1	0	5	12
030004	MG/KG	1	10100	2	39	1	0	91400	1	0	6	14
020006	MG/KG	1	2500	4	23	0	0	24000	1	0	2	6
011002	MG/KG	0	8550	4	30	0	0	27700	0	0	5	13
010002	MG/KG	1	5310	3	24	0	0	23800	1	0	4	9
Count		56	56	56	56	56	56	56	56	56	56	56
Mean		0.599	9756.688	4.066	42.643	0.597	0.551	94246.250	0.584	0.212	7.448	14.696
Stan. Dev.		0.124	4679.216	1.059	39.924	0.269	0.227	39843.417	0.098	0.408	3.261	6.039
N Value		7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480
Degrees of Freedom		1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671
Cleanup Standard		0.028	1049.306	0.846	10.549	0.060	0.051	8905.823	0.022	0.091	1.601	2.516

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data (Continued)

Sample Number	Units	CU	FE	HG	K	LI	MG	MN	MO	NA	NI
RBTL / RBGCV	MG/KG	2900	NE	23	NE	NE	NE	7800	NE	NE	1600
AREA 19–1											
391006	MG/KG	22	30200	0	4830	34	8500	624	2	193	30
390011	MG/KG	22	27000	0	4580	30	7760	806	2	204	26
390006	MG/KG	22	26900	0	3400	30	7420	757	2	175	27
380012	MG/KG	21	23800	0	7460	32	8930	707	2	434	24
380006	MG/KG	17	21500	0	4400	20	7060	989	2	542	19
370012	MG/KG	14	17000	0	2340	19	11000	812	2	177	16
370006	MG/KG	19	22100	0	2710	25	6470	965	2	162	22
Count		7	7	7	7	7	7	7	7	7	7
Mean		19.614	24071.429	0.106	4245.714	27.300	8162.857	808.571	1.943	269.571	23.400
Stan. Dev.		2.842	4048.179	0.009	1581.770	5.461	1391.184	121.940	0.118	141.675	4.302
N Value		2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom		1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard		3.329	2904.684	0.006	1136.881	5.349	1000.620	90.271	0.373	103.933	4.451
AREA 19–2											
360020	MG/KG	15	22400	0	4770	29	15400	879	2	343	19
360013	MG/KG	12	19200	0	3100	21	12700	1000	2	325	18
360006	MG/KG	13	14300	0	1700	11	27800	655	2	187	13
360000	MG/KG	18	21300	0	1310	11	2840	582	2	87	15
350020	MG/KG	9	7910	0	1400	8	74600	360	4	201	7
350013	MG/KG	17	21700	0	3180	22	12600	742	2	233	18
350006	MG/KG	18	26000	0	2950	26	8860	648	2	214	24
350000	MG/KG	20	25700	0	3170	30	9480	831	2	215	23
341000	MG/KG	18	21600	0	2100	26	6320	515	2	144	23
340006	MG/KG	24	30800	0	4620	37	11100	597	2	262	2
340000	MG/KG	21	21400	0	3810	30	7170	471	2	174	1
330006	MG/KG	16	21400	0	2570	18	14400	619	2	234	17
330000	MG/KG	12	13500	0	1840	12	26200	365	2	236	11
320006	MG/KG	15	12900	0	2310	16	37000	320	2	277	14
320000	MG/KG	13	10000	0	1570	10	42100	260	1	229	11
310000	MG/KG	14	16100	0	1840	19	15200	375	2	167	17
301000	MG/KG	13	13900	0	1900	18	18800	352	2	207	14
300000	MG/KG	10	7890	0	918	8	38100	263	2	264	8
290013	MG/KG	12	15300	0	2400	18	12600	735	1	197	12
290006	MG/KG	9	13200	0	916	7	46300	207	2	158	13
290000	MG/KG	14	12900	0	1660	11	37000	355	2	151	12
281000	MG/KG	6	7930	0	549	1	40800	349	2	134	3
280020	MG/KG	10	11200	0	1790	11	16700	340	2	218	7
280013	MG/KG	17	18700	0	926	7	8930	464	2	66	16
280006	MG/KG	17	17600	0	921	7	11400	460	2	138	15
280000	MG/KG	6	9250	0	646	1	43700	413	2	154	3
270020	MG/KG	11	10400	0	2300	12	43000	250	2	177	11
270013	MG/KG	12	10600	0	1990	12	41900	247	2	326	11
270006	MG/KG	12	10700	0	2210	12	39800	231	1	286	12
270000	MG/KG	15	17100	0	2350	16	22400	369	2	375	18
Count		30	30	30	30	30	30	30	30	30	30
Mean		13.917	16096.000	0.106	2123.867	15.520	24840.000	475.133	1.893	212.643	12.933
Stan. Dev.		4.092	5933.074	0.023	1048.947	8.730	16604.742	206.480	0.440	71.872	5.975
N Value		5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom		1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697
Cleanup Standard		2.411	1842.517	0.007	328.334	3.896	5149.228	66.653	0.413	24.597	2.963

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data (Continued)

Sample Number	Units	CU	FE	HG	K	LI	MG	MN	MO	NA	NI
RBTL / RBGCV	MG/KG	2900	NE	23	NE	NE	NE	7800	NE	NE	1600
AREA 19--3											
260020	MG/KG	12	10000	0	1620	19	42100	223	2	163	11
260010	MG/KG	14	13200	0	2000	12	33600	249	2	195	13
260002	MG/KG	17	15900	0	1950	12	24600	722	2	173	16
250016	MG/KG	17	23100	0	7110	31	12300	874	2	319	21
250009	MG/KG	16	22800	0	2450	28	7720	787	2	184	25
240011	MG/KG	23	26600	0	6700	34	13200	676	2	235	27
240004	MG/KG	16	18200	0	5710	23	7280	529	2	169	17
230014	MG/KG	20	22500	0	6510	29	7680	623	2	214	24
230005	MG/KG	14	23000	0	3160	24	9910	798	2	169	22
220010	MG/KG	11	14700	0	2570	16	5820	1260	2	260	13
220005	MG/KG	19	21200	0	3560	22	5510	544	2	178	19
210012	MG/KG	17	23000	0	4370	33	16200	585	2	230	22
210005	MG/KG	16	12800	0	2200	13	35300	439	2	220	12
200020	MG/KG	11	9760	0	1440	11	43800	223	2	207	12
200009	MG/KG	10	8040	0	1090	8	44200	192	2	143	10
200003	MG/KG	14	13300	0	1240	9	27400	349	2	142	13
191020	MG/KG	12	11200	0	1930	11	40800	223	2	153	12
190020	MG/KG	12	9240	0	1440	10	37700	211	2	153	11
190007	MG/KG	13	10300	0	1820	9	48600	205	2	232	11
180020	MG/KG	14	11700	0	1990	14	42400	260	2	202	13
180012	MG/KG	14	9050	0	1410	9	46000	304	2	672	10
171020	MG/KG	21	31100	0	3970	36	12900	442	2	262	26
170007	MG/KG	15	19300	0	3200	23	16300	489	2	289	14
160018	MG/KG	25	30900	0	4560	38	10500	563	2	531	27
160010	MG/KG	22	32600	0	5040	37	11800	596	2	526	26
150020	MG/KG	13	12300	0	2280	15	33900	296	2	252	13
150001	MG/KG	21	23600	0	3170	28	13300	502	2	543	23
140020	MG/KG	15	20500	0	3630	29	13100	549	2	249	17
140006	MG/KG	16	15400	0	3040	19	33800	286	2	279	14
140001	MG/KG	18	22200	0	3570	22	20000	449	2	696	18
130008	MG/KG	18	24100	0	4370	27	14800	592	2	419	20
130003	MG/KG	17	18800	0	3560	20	27400	472	2	367	15
120020	MG/KG	13	12800	0	1950	16	36300	304	2	298	11
120001	MG/KG	12	12300	0	939	13	28000	288	2	247	11
110017	MG/KG	11	11400	0	2140	13	25400	332	2	231	11
110006	MG/KG	15	23000	0	3050	26	7950	434	2	578	21
101020	MG/KG	13	12500	0	2260	15	41900	272	2	226	14
100020	MG/KG	14	11400	0	1330	12	35600	278	2	154	12
100011	MG/KG	14	11700	0	1720	11	44900	208	2	197	12
090017	MG/KG	13	9820	0	1680	13	45500	190	2	249	12
090002	MG/KG	12	11400	0	2020	10	37500	362	2	178	10
080009	MG/KG	0	142	0	23	0	42	10	0	2	0
080001	MG/KG	13	13200	0	1660	12	36600	299	2	209	14
071001	MG/KG	15	24700	0	3810	27	12900	544	2	232	20
070012	MG/KG	13	15500	0	2270	17	8160	656	2	256	11
070001	MG/KG	14	23900	0	3370	26	7930	478	2	191	19
060005	MG/KG	15	18600	0	2810	21	13100	440	2	281	14
060000	MG/KG	17	19600	0	2420	22	19800	440	2	320	16
050010	MG/KG	14	20400	0	1990	24	7390	500	2	249	16
050004	MG/KG	34	14200	0	1830	14	10100	431	2	230	10
040012	MG/KG	7	11900	0	1730	14	9280	278	2	106	11
040007	MG/KG	11	10800	0	934	8	27800	330	2	166	11
030004	MG/KG	10	16000	0	3010	18	12200	249	2	659	14
020006	MG/KG	7	6050	0	655	4	35400	185	2	136	7
011002	MG/KG	11	13200	0	2340	15	27700	299	1	144	11
010002	MG/KG	9	10300	0	1250	11	33500	250	2	130	9
Count		56	56	56	56	56	56	56	56	56	56
Mean		14.548	16342.893	0.117	2675.904	18.419	23658.432	420.866	1.825	262.418	15.002
Stan. Dev.		4.787	6650.559	0.054	1487.127	8.676	13911.702	212.278	0.324	145.297	5.473
N Value		7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480
Degrees of Freedom		1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671
Cleanup Standard		2.232	1489.920	0.012	335.645	3.203	3112.189	50.046	0.334	34.878	2.399

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data (Continued)

Sample Number	Units	PB	SB	SE	SN	TA	TL	V	ZN
RBTL / RBGCV	MG/KG	53	31	390	NE	NE	5.5	550	23000
AREA 19–1									
391006	MG/KG	5	8	0	2	512	1	28	59
390011	MG/KG	4	8	0	2	375	2	22	49
390006	MG/KG	7	7	0	2	453	1	20	52
380012	MG/KG	6	7	0	2	403	1	31	49
380006	MG/KG	7	8	0	2	385	0	24	41
370012	MG/KG	6	7	1	2	164	0	13	33
370006	MG/KG	10	7	0	2	289	0	15	42
Count		7	7	7	7	7	7	7	7
Mean		6.514	7.414	0.441	2.114	368.714	0.919	21.757	46.214
Stan. Dev.		1.776	0.442	0.040	0.125	105.138	0.465	6.117	7.718
N Value		2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom		1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard		2.086	1.187	0.029	0.415	77.892	0.333	5.720	7.194
AREA 19–2									
360020	MG/KG	8	35	0	2	811	0	23	40
360013	MG/KG	7	34	0	2	788	0	16	50
360006	MG/KG	11	7	0	2	153	0	24	39
360000	MG/KG	14	7	0	2	241	1	37	53
350020	MG/KG	5	7	0	2	171	0	8	22
350013	MG/KG	9	7	0	2	172	0	18	52
350006	MG/KG	11	8	1	2	397	0	20	45
350000	MG/KG	7	7	0	2	157	0	19	49
341000	MG/KG	6	8	1	2	221	0	17	43
340006	MG/KG	10	7	1	2	466	0	25	55
340000	MG/KG	5	6	1	2	444	0	20	46
330006	MG/KG	10	7	0	2	218	0	16	33
330000	MG/KG	7	7	0	2	155	0	13	34
320006	MG/KG	5	7	0	2	173	0	14	32
320000	MG/KG	6	28	0	2	647	0	12	27
310000	MG/KG	7	6	1	2	252	0	17	41
301000	MG/KG	7	6	0	2	241	0	12	41
300000	MG/KG	8	8	1	2	216	0	10	27
290013	MG/KG	8	5	0	2	124	0	10	33
290006	MG/KG	6	8	1	2	176	0	7	31
290000	MG/KG	8	6	0	2	146	0	14	37
281000	MG/KG	2	7	0	2	168	0	2	5
280020	MG/KG	5	7	0	2	180	0	6	20
280013	MG/KG	13	8	0	2	216	0	27	51
280006	MG/KG	13	8	0	2	214	0	28	48
280000	MG/KG	2	7	0	2	167	0	4	5
270020	MG/KG	6	7	0	2	175	1	15	28
270013	MG/KG	6	7	0	2	215	1	13	28
270006	MG/KG	6	5	0	2	201	1	14	28
270000	MG/KG	10	6	0	2	328	1	28	44
Count		30	30	30	30	30	30	30	30
Mean		7.513	9.433	0.474	1.960	274.433	0.430	16.267	36.230
Stan. Dev.		2.922	7.568	0.224	0.227	179.514	0.141	7.757	12.680
N Value		5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom		1.697	1.697	1.697	1.697	1.697	1.697	1.697	1.697
Cleanup Standard		1.781	3.320	0.069	0.363	58.059	0.044	3.615	5.488

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.3 Statistical Analysis of Inorganic Data (Continued)

Sample Number	Units	PB	SB	SE	SN	TA	TL	V	ZN
RBTL / RBGCV	MG/KG	53	31	390	NE	NE	5.5	550	23000
AREA 19-3									
260020	MG/KG	5	7	0	2	152	0	10	27
260010	MG/KG	6	7	0	2	166	0	13	34
260002	MG/KG	8	7	0	2	163	0	20	49
250016	MG/KG	7	7	1	2	388	0	25	49
250009	MG/KG	6	7	0	2	477	0	15	48
240011	MG/KG	6	8	1	2	553	0	27	54
240004	MG/KG	4	8	1	2	310	0	23	34
230014	MG/KG	5	7	0	2	405	1	28	46
230005	MG/KG	7	8	0	2	233	1	21	46
220010	MG/KG	9	6	0	2	186	0	10	54
220005	MG/KG	11	7	1	2	262	0	17	35
210012	MG/KG	4	8	0	2	182	0	18	45
210005	MG/KG	7	8	0	2	187	0	13	36
200020	MG/KG	7	8	0	2	176	0	10	26
200009	MG/KG	5	6	0	2	141	0	7	23
200003	MG/KG	12	7	0	2	166	1	17	47
191020	MG/KG	7	8	1	2	213	0	12	26
190020	MG/KG	5	7	1	2	181	0	10	26
190007	MG/KG	6	7	0	2	173	0	12	33
180020	MG/KG	5	7	0	2	161	0	13	30
180012	MG/KG	4	6	0	2	134	0	11	21
171020	MG/KG	6	7	0	2	402	0	16	55
170007	MG/KG	7	8	0	2	190	0	14	40
160018	MG/KG	11	8	0	2	293	0	24	56
160010	MG/KG	8	8	0	2	336	0	26	51
150020	MG/KG	6	6	0	2	142	0	12	32
150001	MG/KG	5	7	0	2	200	0	21	49
140020	MG/KG	6	6	0	2	238	0	14	41
140006	MG/KG	7	6	0	2	147	0	16	39
140001	MG/KG	9	7	0	2	163	0	21	44
130008	MG/KG	11	7	0	2	168	0	21	52
130003	MG/KG	8	38	0	2	888	0	19	42
120020	MG/KG	6	8	0	2	237	0	11	32
120001	MG/KG	8	6	0	2	140	0	9	54
110017	MG/KG	5	37	0	2	175	0	9	28
110006	MG/KG	6	7	0	2	170	0	16	46
101020	MG/KG	6	38	0	2	889	0	14	33
100020	MG/KG	5	7	0	2	158	0	9	32
100011	MG/KG	6	7	0	2	158	0	11	33
090017	MG/KG	6	6	0	2	141	0	11	31
090002	MG/KG	6	7	0	2	157	0	12	28
080009	MG/KG	12	0	0	0	1	0	0	0
080001	MG/KG	6	7	0	2	156	0	14	34
071001	MG/KG	13	6	0	2	459	0	30	59
070012	MG/KG	6	8	0	2	186	0	10	31
070001	MG/KG	9	7	0	2	313	0	24	54
060005	MG/KG	9	6	0	2	284	0	17	43
060000	MG/KG	9	7	0	2	274	0	18	48
050010	MG/KG	6	6	0	2	256	0	11	48
050004	MG/KG	37	7	0	2	167	0	8	105
040012	MG/KG	4	7	0	2	221	1	7	26
040007	MG/KG	8	7	0	2	231	1	16	33
030004	MG/KG	6	7	0	2	201	1	12	29
020006	MG/KG	5	7	0	2	154	0	6	22
011002	MG/KG	12	6	0	2	226	1	12	32
010002	MG/KG	9	7	0	2	162	1	8	31
Count		56	56	56	56	56	56	56	56
Mean		7.530	8.445	0.430	1.950	244.500	0.437	14.836	39.273
Stan. Dev.		4.478	7.011	0.136	0.328	157.444	0.113	6.052	14.401
N Value		7.480	7.480	7.480	7.480	7.480	7.480	7.480	7.480
Degrees of Freedom		1.671	1.671	1.671	1.671	1.671	1.671	1.671	1.671
Cleanup Standard		1.877	2.493	0.030	0.363	37.561	0.025	2.523	4.811

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Sample Number	4,4'-DDD	4,4'-DDE	4,4'-DDT	Aldrin	Aroclor-1016	Aroclor-1221	Aroclor-1232	Aroclor-1242	Aroclor-1248
	1900	1900	5000.00	100.00	220.00	220.00	220.00	220.00	83
391006	3.90	3.90	3.20	2.00	31.00	39.00	24.00	11.00	47.00
390011	3.80	3.80	3.80	1.90	31.00	38.00	23.00	11.00	46.00
390006	4.00	4.00	4.00	2.00	32.00	40.00	24.00	11.00	48.00
380012	4.00	4.00	4.00	2.00	32.00	40.00	24.00	11.00	48.00
380006	4.00	4.00	4.00	2.00	32.00	40.00	24.00	11.00	48.00
370012	4.00	4.00	6.00	2.00	29.00	37.00	22.00	10.00	44.00
370006	4.00	4.00	5.00	2.00	31.00	39.00	23.00	11.00	47.00
Count	7	7	7	7	7	7	7	7	7
Mean	0.597	0.597	0.632	0.298	1.493	1.591	1.37	1.036	1.671
Stan. Dev	0.073	0.073	0.854	0.035	0.99	1.069	0.728	0.35	1.355
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	0.649	0.649	1.244	0.323	2.202	2.357	1.892	1.287	2.642
360020	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
360013	1.00	3.90	3.90	1.90	39.00	78.00	39.00	39.00	39.00
360006	3.80	3.80	3.80	1.90	38.00	77.00	38.00	38.00	38.00
360000	3.80	3.80	3.80	1.90	38.00	76.00	38.00	38.00	38.00
350020	3.80	3.80	3.80	1.90	38.00	76.00	38.00	38.00	38.00
350013	3.90	3.90	3.90	2.00	39.00	78.00	39.00	39.00	39.00
350006	2.00	4.00	4.00	2.00	33.00	41.00	24.00	11.00	49.00
350000	3.80	3.80	3.80	1.90	38.00	77.00	38.00	38.00	38.00
341000	4.00	4.00	4.00	2.00	30.00	38.00	23.00	11.00	45.00
340006	4.00	4.00	4.00	2.00	34.00	43.00	26.00	12.00	51.00
340000R	3.70	3.70	3.00	1.90	30.00	37.00	22.00	10.00	45.00
330006	4.00	4.00	3.00	4.00	29.00	36.00	22.00	10.00	43.00
330000	3.50	3.50	3.50	1.80	35.00	70.00	35.00	35.00	35.00
320006	11.00	3.70	3.70	1.90	37.00	74.00	37.00	37.00	37.00
320000	3.70	3.70	3.70	1.80	37.00	73.00	37.00	37.00	37.00
310000	4.00	4.00	3.00	2.00	32.00	40.00	24.00	11.00	48.00
301000	3.70	3.70	0.15	1.80	29.00	37.00	22.00	10.00	44.00
300000	4.00	4.00	2.30	2.00	32.00	40.00	24.00	11.00	48.00
290013	3.70	3.70	1.60	1.90	30.00	37.00	22.00	10.00	44.00
290006	3.60	3.60	2.20	1.80	29.00	36.00	22.00	10.00	43.00
290000	3.50	3.50	0.90	1.80	35.00	70.00	35.00	35.00	35.00
281000	3.50	3.50	3.50	1.70	35.00	69.00	35.00	35.00	35.00
280020	3.60	3.60	1.70	1.80	36.00	72.00	36.00	36.00	36.00
280013	4.00	4.00	4.00	2.00	40.00	80.00	40.00	40.00	40.00
280006	4.00	4.00	4.00	0.61	40.00	79.00	40.00	40.00	40.00
280000	3.50	3.50	3.50	1.70	35.00	69.00	35.00	35.00	35.00
270020	3.60	3.60	3.60	1.80	29.00	36.00	22.00	10.00	43.00
270013	3.60	3.60	3.60	1.80	29.00	36.00	22.00	10.00	43.00
270006	3.60	3.60	0.67	1.80	29.00	36.00	22.00	10.00	43.00
270000	3.80	3.80	3.80	1.90	31.00	38.00	23.00	11.00	46.00
Count	30	30	30	30	30	30	30	30	30
Mean	0.585	0.576	0.496	0.28	1.532	1.759	1.485	1.394	1.613
Stan. Dev	1.458	0.178	1.078	0.459	3.794	18.431	7.334	13.411	4.579
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	1.036	0.631	0.829	0.422	2.705	7.46	3.753	5.542	3.029
260020	3.70	3.70	3.70	1.90	37.00	75.00	37.00	37.00	37.00
260010	3.80	3.80	2.60	1.90	38.00	76.00	38.00	38.00	38.00
260002	3.60	3.60	2.30	1.80	36.00	72.00	36.00	36.00	36.00
250016	3.70	3.70	3.20	1.90	30.00	37.00	22.00	10.00	44.00
250006	4.00	4.00	4.00	2.00	31.00	38.00	23.00	11.00	46.00
240004	4.00	4.00	4.00	2.00	32.00	40.00	24.00	11.00	48.00
240011	3.90	3.90	3.90	2.00	31.00	39.00	24.00	11.00	47.00
230014	3.80	3.80	3.80	1.90	30.00	38.00	23.00	11.00	45.00
230006	3.90	3.90	3.20	1.90	31.00	39.00	23.00	11.00	47.00
220010	4.00	4.00	4.00	2.00	29.00	37.00	22.00	10.00	44.00
220006	4.00	4.00	4.00	2.00	30.00	37.00	22.00	10.00	45.00
210012	3.80	3.80	3.60	1.90	38.00	76.00	38.00	38.00	38.00
210006	4.00	4.00	4.00	2.00	40.00	80.00	40.00	40.00	40.00
200020	4.00	4.00	4.00	2.00	29.00	37.00	22.00	10.00	44.00
200006	3.60	3.60	3.00	1.80	29.00	36.00	22.00	10.00	43.00
191020	3.70	3.70	3.70	1.80	29.00	37.00	22.00	10.00	44.00
190020	3.50	3.50	3.50	1.80	28.00	35.00	21.00	9.90	43.00
190007	3.70	3.70	3.70	1.90	30.00	37.00	22.00	10.00	44.00
180020	3.70	3.70	3.70	1.80	37.00	73.00	37.00	37.00	37.00
180012	3.70	3.70	3.70	1.80	37.00	73.00	37.00	37.00	37.00
160018	4.10	4.10	3.10	2.00	41.00	81.00	41.00	41.00	41.00
160010	4.10	4.10	1.50	2.10	41.00	82.00	41.00	41.00	41.00
150020	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
150001	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
140006	3.70	3.70	3.70	1.90	37.00	74.00	37.00	37.00	37.00
140001	3.50	3.50	3.50	1.80	35.00	70.00	35.00	35.00	35.00
130006	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
130003	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
110017	7.30	7.30	7.30	3.70	73.00	150.00	73.00	73.00	73.00
101020	3.70	3.70	3.70	1.90	37.00	74.00	37.00	37.00	37.00
100020	3.70	3.70	3.70	1.80	37.00	73.00	37.00	37.00	37.00
100019	3.60	3.60	4.00	1.80	36.00	72.00	36.00	36.00	36.00
090002	3.60	3.60	3.60	1.80	36.00	72.00	36.00	36.00	36.00
040012	3.50	3.50	3.50	1.80	28.00	35.00	21.00	9.90	43.00
040007	3.70	3.70	3.70	1.90	30.00	37.00	22.00	10.00	45.00
030004	3.60	3.60	3.60	1.80	29.00	36.00	22.00	10.00	41.00
020006	3.70	3.70	3.80	1.80	29.00	37.00	22.00	10.00	44.00
020003	3.80	3.80	3.80	1.90	31.00	38.00	23.00	11.00	46.00
011002	3.80	3.80	3.80	1.90	30.00	38.00	23.00	11.00	45.00
010002	3.80	3.80	3.80	1.90	31.00	38.00	23.00	11.00	46.00
Count	40	40	40	40	40	40	40	40	40
Mean	0.565	0.585	0.563	0.285	1.537	1.761	1.467	1.393	1.622
Stan. Dev	0.576	0.576	0.761	0.296	7.257	23.606	10.048	15.379	6.417
N Value	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	0.733	0.733	0.757	0.361	[illegible]	7.767	4.052	5.319	3.26

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.4 Statistical Analysis of Pesticide/PCB (Continued)

Sample Number	Aroclor-1254	Aroclor-1260	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor epoxide	Methoxychlor
	83	83	40	3900.00	3900.00	3900.00	23000.00	23000.00	23000.00	190.00	380.00	390000.00
391006	11.00	11.00	1.50	2.00	3.90	3.90	2.80	3.90	3.90	2.00	2.00	20.00
390011	11.00	11.00	1.50	1.90	3.80	3.80	2.80	3.80	3.80	1.90	1.90	0.52
390006	11.00	11.00	1.50	2.00	4.00	4.00	2.90	4.00	4.00	2.00	2.00	6.60
380012	11.00	11.00	1.50	2.00	4.00	4.00	0.22	4.00	4.00	2.00	2.00	8.90
380006	11.00	11.00	1.00	2.00	4.00	4.00	1.20	4.00	4.00	0.72	2.00	20.00
370012	10.00	10.00	1.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	18.00
370006	11.00	11.00	2.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	19.00
Count	7	7	7	7	7	7	7	7	7	7	7	7
Mean	1.036	1.036	0.155	0.298	0.597	0.597	0.357	0.597	0.597	0.256	0.298	1.123
Stan. Dev	0.35	0.35	0.319	0.035	0.073	0.073	1.026	0.073	0.073	0.443	0.035	7.289
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	1.287	1.287	0.384	0.323	0.649	0.649	1.092	0.649	0.649	0.573	0.323	6.345
360020	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	16.00
360013	39.00	39.00	0.60	1.90	3.90	3.90	3.90	3.90	3.90	1.30	1.90	19.00
360006	38.00	38.00	0.55	1.90	3.80	3.80	3.80	3.80	3.80	0.92	1.90	19.00
360000	38.00	38.00	3.80	1.90	3.80	3.80	3.80	3.80	3.80	1.90	1.90	19.00
350020	38.00	38.00	3.80	1.90	3.80	3.80	3.80	3.80	3.80	1.90	1.90	19.00
350013	39.00	39.00	3.90	2.00	3.90	3.90	3.90	3.90	3.90	2.00	2.00	20.00
350006	11.00	11.00	2.00	2.00	4.00	4.00	0.00	4.00	4.00	2.00	2.00	20.00
350000	38.00	38.00	3.80	1.90	3.80	3.80	3.80	3.80	3.80	1.90	1.90	19.00
341000	11.00	11.00	1.00	2.00	4.00	4.00	2.00	4.00	4.00	2.00	2.00	19.00
340006	12.00	12.00	2.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	21.00
340000R	10.00	10.00	1.40	1.90	3.70	3.70	2.00	3.70	3.70	1.90	1.90	19.00
330006	10.00	10.00	1.00	2.00	4.00	4.00	1.00	4.00	4.00	2.00	1.00	18.00
330000	35.00	35.00	3.50	1.80	3.50	3.50	3.50	3.50	3.50	1.80	1.80	18.00
320006	37.00	37.00	3.70	1.90	3.70	3.70	3.70	3.70	3.70	1.90	1.90	19.00
320000	37.00	37.00	3.70	1.80	3.70	3.70	3.70	3.70	3.70	1.80	1.80	18.00
310000	11.00	11.00	1.50	2.00	4.00	4.00	2.90	4.00	4.00	2.00	2.00	20.00
301000	10.00	10.00	1.40	1.80	3.70	3.70	0.31	3.70	3.70	1.80	0.33	18.00
300000	11.00	11.00	0.95	2.00	4.00	4.00	2.90	4.00	4.00	2.00	1.20	20.00
290013	10.00	10.00	1.40	1.90	3.70	3.70	2.70	3.70	3.70	1.90	1.90	19.00
290006	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	1.80	18.00
290000	35.00	35.00	3.50	1.80	3.50	3.50	3.50	3.50	3.50	1.80	1.80	18.00
281000	35.00	35.00	3.50	1.70	3.50	3.50	3.50	3.50	3.50	1.70	1.70	17.00
280020	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
280013	40.00	40.00	5.20	2.00	4.00	4.00	0.25	4.00	4.00	2.00	2.00	20.00
280006	40.00	40.00	4.90	2.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	20.00
280000	35.00	35.00	3.50	1.70	3.50	3.50	3.50	3.50	3.50	1.70	0.48	17.00
270020	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	1.80	2.30
270013	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	1.80	18.00
270006	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	1.80	1.60
270000	11.00	11.00	6.40	1.90	3.80	3.80	2.80	3.80	3.80	1.90	1.90	19.00
Count	30	30	30	30	30	30	30	30	30	30	30	30
Mean	1.394	1.394	0.425	0.275	0.576	0.576	0.457	0.576	0.576	0.263	0.239	1.248
Stan. Dev	13.411	13.411	1.507	0.093	0.178	0.178	1.124	0.178	0.178	0.22	0.414	4.312
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	5.542	5.542	0.891	0.304	0.631	0.631	0.805	0.631	0.631	0.331	0.367	2.582
260020	37.00	37.00	3.70	1.90	3.70	3.70	3.70	3.70	3.70	1.90	1.90	19.00
260010	38.00	38.00	3.80	1.40	3.80	3.80	0.16	3.80	3.80	1.90	1.90	19.00
260002	36.00	36.00	3.60	1.80	3.60	3.60	0.78	3.60	3.60	1.80	6.00	18.00
250016	10.00	10.00	1.40	1.90	3.70	3.70	2.70	3.70	3.70	1.90	1.90	19.00
250009	11.00	11.00	2.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	19.00
240004	11.00	11.00	1.50	2.00	4.00	4.00	2.90	4.00	4.00	2.00	1.90	20.00
240011	11.00	11.00	1.50	2.00	3.90	3.90	2.80	3.90	3.90	2.00	2.00	20.00
230014	11.00	11.00	0.62	1.90	3.80	3.80	0.82	3.80	3.80	1.90	1.90	3.60
230005	11.00	11.00	1.50	1.90	3.90	3.90	2.80	3.90	3.90	1.90	1.90	19.00
220010	10.00	10.00	1.00	2.00	4.00	4.00	1.00	4.00	4.00	2.00	2.00	18.00
220005	10.00	10.00	1.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	19.00
210012	38.00	38.00	3.80	1.90	3.80	3.80	3.80	3.80	3.80	1.90	7.00	19.00
210005	40.00	40.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	20.00
200020	10.00	10.00	1.00	2.00	4.00	4.00	3.00	4.00	4.00	2.00	2.00	18.00
200009	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	5.00	18.00
191020	10.00	10.00	1.40	1.80	3.70	3.70	2.60	3.70	3.70	1.80	1.80	18.00
190020	9.90	9.90	1.30	1.80	3.50	3.50	2.60	3.50	3.50	1.80	1.80	18.00
190007	10.00	10.00	1.40	1.90	3.70	3.70	2.70	3.70	3.70	1.90	1.90	19.00
180020	37.00	37.00	3.70	1.80	3.70	3.70	3.70	3.70	3.70	1.80	1.80	18.00
180012	37.00	37.00	3.70	1.80	3.70	3.70	3.70	3.70	3.70	1.80	1.80	18.00
160018	41.00	41.00	4.10	2.00	4.10	4.10	0.29	4.10	4.10	2.00	11.00	20.00
160010	41.00	41.00	4.10	2.10	4.10	4.10	0.12	4.10	4.10	2.10	8.00	21.00
150020	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
150001	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
140006	37.00	37.00	3.70	1.90	3.70	3.70	3.70	3.70	3.70	1.90	1.90	19.00
140001	35.00	35.00	3.50	1.80	3.50	3.50	3.50	3.50	3.50	1.80	1.80	18.00
130006	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
130003	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
110017	73.00	73.00	7.30	3.70	7.30	7.30	7.30	7.30	7.30	3.70	3.70	37.00
101020	37.00	37.00	3.70	1.90	3.70	3.70	3.70	3.70	3.70	1.90	1.90	19.00
100020	37.00	37.00	3.70	1.80	3.70	3.70	3.70	3.70	3.70	1.80	1.80	18.00
100011	36.00	36.00	3.60	1.80	2.50	3.60	3.60	3.60	3.60	1.80	1.80	18.00
090002	36.00	36.00	3.60	1.80	3.60	3.60	3.60	3.60	3.60	1.80	1.80	18.00
040012	9.90	9.90	1.30	1.80	3.50	3.50	0.46	3.50	3.50	1.80	1.80	11.20
040007	10.00	10.00	1.40	1.90	0.95	3.70	2.70	3.70	3.70	1.90	1.90	4.20
030004	10.00	10.00	1.40	1.80	3.60	3.60	2.60	3.60	3.60	1.80	1.80	16.00
020006	10.00	10.00	1.40	1.80	3.70	3.70	2.60	3.70	3.70	1.80	1.80	10.00
020003	11.00	11.00	1.50	1.90	3.80	3.80	2.80	3.80	0.22	1.90	1.90	7.67
011002	11.00	11.00	1.40	1.90	3.80	3.80	2.70	3.80	3.80	1.90	1.90	[illegible]
010002	67.00	11.00	1.50	1.90	3.80	3.80	2.80	3.80	3.80	1.90	1.90	19.00
Count	40	40	40	40	40	40	40	40	40	40	40	40
Mean	1.417	1.303	0.419	0.282	0.574	0.585	0.459	0.585	0.574	0.285	0.417	[illegible]
Stan. Dev	16.571	15.379	1.409	0.307	0.76	0.578	1.317	0.578	0.809	0.266	1.973	[illegible]
N Value	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557	6.557	[illegible]
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674	[illegible]
Cleanup Standard	5.648	5.319	0.779	0.36	0.768	0.733	0.787	0.733	0.78	[illegible]	0.923	[illegible]

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Sample Number	Toxaphene	alpha-BHC	alpha-Chlordane	beta-BHC	delta-BHC	gamma-BHC(Lindane)	gamma-Chlordane
	1500.00	270.00	1300.00	350	950.00	1300.00	1300.00
391005	31.00	2.00	2.00	2.00	2.00	2.00	2.00
390011	31.00	1.90	1.90	1.90	1.90	1.90	1.90
390005	32.00	2.00	2.00	2.00	2.00	2.00	2.00
380012	32.00	2.00	2.00	2.00	2.00	2.00	2.00
380005	32.00	2.00	2.00	2.00	2.00	2.00	2.00
370012	29.00	2.00	2.00	2.00	2.00	2.00	2.00
370005	31.00	2.00	0.00	2.00	2.00	2.00	2.00
Count	7	7	7	7	7	7	7
Mean	1.493	0.298	0.23	0.298	0.298	0.298	0.298
Stan. Dev	0.99	0.035	0.695	0.035	0.035	0.035	0.035
N Value	2.645	2.645	2.645	2.645	2.645	2.645	2.645
Degrees of Freedom	1.895	1.895	1.895	1.895	1.895	1.895	1.895
Cleanup Standard	2.202	0.323	0.728	0.323	0.323	0.323	0.323
360020	180.00	1.80	1.80	1.80	1.90	1.80	1.80
360013	190.00	0.69	1.90	1.90	1.90	1.90	1.90
360005	190.00	0.49	1.90	1.90	1.90	1.90	1.90
360000	190.00	1.40	1.90	1.90	1.90	1.90	1.90
350020	190.00	2.30	1.90	1.90	1.90	1.90	1.90
350013	200.00	2.60	2.00	2.00	2.00	2.00	2.00
350005	33.00	1.00	2.00	2.00	2.00	2.00	2.00
350000	190.00	2.60	1.90	1.90	1.90	1.90	1.90
341000	30.00	1.00	2.00	2.00	2.00	2.00	2.00
340005	34.00	2.00	2.00	2.00	2.00	2.00	2.00
340000R	30.00	2.00	1.90	1.90	1.90	1.90	1.90
330005	29.00	2.00	2.00	2.00	2.00	2.00	2.00
330000	180.00	1.80	1.80	1.80	1.80	1.80	1.80
320005	190.00	2.40	1.90	1.90	1.90	1.90	1.90
320000	180.00	2.20	1.80	1.80	1.80	1.80	1.80
310000	32.00	2.00	2.00	2.00	2.00	2.00	2.00
301000	29.00	1.80	1.80	1.80	1.80	1.80	1.80
300000	32.00	0.67	2.00	2.00	2.00	2.00	2.00
290013	30.00	1.20	1.90	1.90	1.90	1.90	1.90
290005	29.00	0.76	1.80	1.80	1.80	1.80	1.80
290000	180.00	0.99	1.80	1.80	1.80	1.80	1.80
281000	170.00	1.70	1.70	1.70	1.70	1.70	1.70
280020	180.00	1.80	1.80	1.80	0.01	1.80	1.80
280013	200.00	3.20	2.00	2.00	2.00	2.00	2.00
280005	200.00	2.00	2.00	2.00	2.00	2.00	2.00
280000	170.00	1.70	1.70	1.70	1.70	1.70	1.70
270020	29.00	1.80	1.80	1.80	1.80	1.80	1.80
270013	29.00	1.80	1.80	1.80	1.80	1.80	1.80
270005	29.00	1.80	1.80	1.80	1.80	1.80	1.80
270000	31.00	0.41	4.80	1.90	1.90	1.90	1.90
Count	30	30	30	30	30	30	30
Mean	2.055	0.219	0.297	0.275	0.261	0.275	0.275
Stan. Dev	78.04	0.668	0.532	0.093	0.349	0.093	0.093
N Value	5.477	5.477	5.477	5.477	5.477	5.477	5.477
Degrees of Freedom	1.694	1.694	1.694	1.694	1.694	1.694	1.694
Cleanup Standard	26.192	0.426	0.462	0.304	0.369	0.304	0.304
260020	190.00	1.90	1.90	1.90	1.90	1.90	1.90
260010	190.00	0.68	1.90	1.90	1.90	1.90	1.90
260005	180.00	1.80	1.80	1.80	1.80	1.80	1.80
250016	30.00	1.90	1.90	1.90	1.90	1.90	1.90
250005	31.00	2.00	2.00	2.00	2.00	2.00	2.00
240005	32.00	2.00	2.00	2.00	2.00	2.00	2.00
240011	31.00	2.00	2.00	2.00	2.00	2.00	2.00
230014	30.00	1.90	1.90	1.90	1.90	1.90	1.90
230005	31.00	1.90	1.90	1.90	1.90	1.90	1.90
220010	29.00	2.00	2.00	2.00	2.00	2.00	2.00
220005	30.00	1.00	2.00	2.00	2.00	2.00	2.00
210012	190.00	1.90	1.90	1.90	1.90	1.90	1.90
210005	200.00	2.00	2.00	2.00	2.00	2.00	2.00
200020	29.00	2.00	2.00	2.00	2.00	2.00	2.00
200005	29.00	2.00	1.80	1.80	1.80	1.80	1.80
191020	29.00	1.80	1.80	1.80	1.80	1.80	1.80
190020	28.00	1.80	1.80	1.80	1.80	1.80	1.80
190007	30.00	1.90	1.90	1.90	1.90	1.90	1.90
180020	180.00	2.00	1.80	1.80	1.80	1.80	1.80
180012	180.00	2.20	1.80	1.80	1.80	1.80	1.80
160016	200.00	2.10	2.00	2.00	2.00	2.00	2.00
160010	210.00	1.60	2.10	2.10	2.10	2.10	2.10
150020	180.00	1.80	1.80	1.80	1.80	1.80	1.80
150005	180.00	1.80	1.80	1.80	1.80	1.80	1.80
140005	190.00	1.90	1.90	1.90	1.90	1.90	1.90
140001	180.00	1.80	1.80	1.80	1.80	1.80	1.80
130008	180.00	0.20	1.80	1.80	1.80	1.80	1.80
130003	180.00	1.80	1.80	1.80	1.80	1.80	1.80
110017	370.00	3.70	3.70	3.70	3.70	3.70	3.70
101020	190.00	1.90	1.90	1.90	1.90	1.90	1.90
100020	180.00	1.80	1.80	1.80	1.80	1.80	1.80
100011	180.00	0.29	1.60	1.50	1.80	1.60	1.80
090002	180.00	1.80	1.80	1.80	1.80	1.80	1.80
040012	28.00	1.80	1.80	1.80	1.80	1.80	1.80
040007	30.00	1.90	0.26	1.90	1.90	1.90	1.90
030004	29.00	1.80	1.80	1.80	1.80	1.80	1.80
020006	29.00	1.80	1.60	1.60	1.80	1.60	1.60
020003	31.00	1.90	1.90	1.90	1.90	1.90	1.90
011002	30.00	1.90	0.26	1.90	1.90	1.90	1.90
010002	31.00	1.90	1.90	1.90	1.90	1.90	1.90
Count	40	40	40	40	40	40	40
Mean	2.052	0.257	0.266	0.263	0.285	0.265	0.265
Stan. Dev	67.736	0.516	0.467	0.303	0.296	0.296	0.296
N Value	6.557	6.557	6.557	6.557	6.557	6.557	6.557
Degrees of Freedom	1.674	1.674	1.674	1.674	1.674	1.674	1.674
Cleanup Standard	24.454	0.389	0.365	0.36	0.361	0.361	0.361

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.5. Statistical Analysis of Radiological Data

Sample Number	Units	Am-241	Q	Pu-238	Q	Pu 239/240	Q	Th-228	Q	Th-230	Q	Th-232	Q	Tritium	Q	U-234	Q	U-235	Q	U-238	Q
AREA 19-1																					
390006	pCi/g	0.44	U	5.38		0.11	UJ	1.12		0.82		1.25		14	U	1.04		0.07	J	0.68	
0016	pCi/g	0.36	U	0.23	U	0.11	U	1.29		0.93		1.20		14	U	0.78		0.07		0.89	
0011	pCi/g	0.45	U	0.84		0.11	U	1.07		1.07		1.03		14	U	0.81		0.07	U	0.69	
380012	pCi/g	0.34	U	2.58		0.11	U	0.59		1.11		1.02		14	U	1.00		0.08		0.86	
380006	pCi/g	0.31	U	82.57		0.26	J	0.70		0.68		0.39		20.30		1.02		0.07	U	0.84	
370006	pCi/g	0.43	U	16.11		0.27		1.49		0.92		0.95		14	U	0.68	J	0.12	J	0.80	
370012	pCi/g	0.44	U	3.22		0.11	U	2.01		0.78		0.85		14	U	0.55		0.07	U	0.60	
Count		7		7		7		7		7		7		7		7		7		7	
Mean		0.398		15.847		0.154		1.181		0.901		0.958		14.9		0.837		0.079		0.823	
Stan. Dev.		0.053		27.687		0.07		0.448		0.143		0.264		2.205		0.175		0.017		0.096	
N Value		2.645		2.645		2.645		2.645		2.645		2.645		2.645		2.645		2.645		2.645	
Degrees of Freedom		1.895		1.895		1.895		1.895		1.895		1.895		1.895		1.895		1.895		1.895	
Cleanup Standard		0.038		21.036		0.05		0.392		0.102		0.189		2.753		0.125		0.012		0.089	
AREA 19-2																					
360020	pCi/g	0.25	U	0.25		0.11	U	1.34		0.87		0.89		14	U	0.78		0.11	J	0.62	
360013	pCi/g	0.34	U	0.51		0.11	U	1.00		0.74		0.50		14	U	0.77		0.09	J	0.67	
360006	pCi/g	0.39	U	1.99		0.11	U	1.34		1.29		0.62		14	U	1.07		0.22	J	0.96	
360000	pCi/g	0.32	U	11.37		0.33		10.69		1.01		0.86		14	U	0.97		0.12	J	0.93	
350020	pCi/g	0.31	U	1.77		0.11	U	1.28		1.22		1.01		14	U	0.82	J	0.07	U	0.73	
350006	pCi/g	0.34	U	0.23	U	0.11	U	1.31		1.14		0.94		16.4		0.64		0.16		0.64	
350000	pCi/g	0.33	U	0.23	U	0.11	U	1.39		1.29		0.62		15	U	0.76		0.07		0.88	
350013	pCi/g	0.39	U	0.40	U	0.19	U	0.81		0.74		0.85		14.00	U	0.65		0.07	UJ	0.71	
341000	pCi/g	0.37	U	0.51		0.11	U	2.19		1.10		1.20		14	U	1.22	J	0.09	J	0.92	
340006	pCi/g	0.38	U	0.35		0.11	U	1.49		0.98		1.05		14	U	1.02	J	0.07	U	0.97	
340000	pCi/g	0.36	U	1.22		0.11	U	1.32		0.77		1.07		14	U	0.68		0.07	U	0.92	
330000	pCi/g	0.29	U	3.83		0.11	U	1.08		1.37		0.72		18		0.79		0.07	U	0.65	
330006	pCi/g	0.43	U	1.53		0.22	U	0.76		0.65		0.90		22.00		0.69		0.06	J	0.69	
320006	pCi/g	0.33	U	0.23	U	0.11	U	1.10		0.68		0.42		14.9		0.80		0.13	J	0.95	
320000	pCi/g	0.22	U	0.23	U	0.11	U	0.72		0.78		0.43		14	U	0.81		0.24	J	0.82	
310000	pCi/g	0.32	U	21.51		0.45		2.64		1.29		0.46		34.0		7.45		0.15		0.62	
301000	pCi/g	0.41	U	16.86		0.11	U	1.27		1.12		0.82		21.3		1.35		0.07	U	0.78	
300000	pCi/g	0.23	U	2.67		0.11	U	0.50		0.68		0.28		14	U	0.44		0.07	U	0.42	
290013	pCi/g	0.35	U	1.35		0.11	U	1.10		0.97		0.89		14	U	0.83	J	0.07	U	0.72	
290006	pCi/g	0.31	U	0.23	U	0.11	U	0.80		1.06		0.46		14	U	0.79	J	0.21	J	0.97	
290000	pCi/g	0.32	U	10.67		0.11	UJ	0.78		0.94		0.55		14	U	0.62	J	0.07	UJ	0.70	J
281000	pCi/g	0.22	U	0.23	U	0.11	U	0.24	U	0.56		0.35		14	U	0.23		0.07	U	0.25	
280000	pCi/g	0.19	U	0.68		0.11	U	0.40		0.07		0.07		14	U	0.26		0.07	U	0.11	
280020	pCi/g	0.26	U	1.66		0.22	U	0.52		0.88		0.42		14.00	U	0.87		0.07	UJ	0.81	
280013	pCi/g	0.30	U	0.45	U	0.22	U	0.45		0.81		0.39		14.00	U	0.78		0.15	J	0.82	
280006	pCi/g	0.27	U	0.44	U	0.21	U	0.51		0.73		0.21		15.30		0.56		0.07	UJ	0.70	
0020	pCi/g	0.29	U	0.23	U	0.11	UJ	0.66		0.83		0.35		14	U	0.73		0.07	U	0.87	
013	pCi/g	0.39	U	0.23	U	0.11	UJ	0.43		1.08		0.36		14	U	0.70		0.07	U	0.78	
0006	pCi/g	0.31	U	0.23	U	0.11	UJ	0.80		0.97		0.36		14	U	0.81		0.07	U	0.74	
270000	pCi/g	0.30	U	0.44	U	0.21	U	1.78		2.59		2.39		14.00	U	0.61		0.07	UJ	0.64	
Count		30		30		30		30		30		30		30		30		30		30	
Mean		0.318		2.758		0.149		1.356		0.973		0.675		15.43		0.99		0.1		0.74	
Stan. Dev.		0.056		5.17		0.078		1.812		0.401		0.425		3.955		1.221		0.049		0.196	
N Value		5.477		5.477		5.477		5.477		5.477		5.477		5.477		5.477		5.477		5.477	
Degrees of Freedom		1.694		1.694		1.694		1.694		1.694		1.694		1.694		1.694		1.694		1.694	
Cleanup Standard		0.018		2.04		0.024		0.693		0.124		0.131		2.412		0.378		0.015		0.061	

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.

Table B.5. Statistical Analysis of Radiological Data

Sample Number	Units	Am-241	Q	Pu-238	Q	Pu 239/240	Q	Th-228	Q	Th-230	Q	Th-232	Q	Tritium	Q	U-234	Q	U-235	Q	U-238	Q
AREA 18-3																					
290020	pCi/g	0.34	U	0.23	U	0.11	U	0.81		0.70		0.44		14	U	0.80	J	0.08	J	0.68	
280010	pCi/g	0.30	U	0.23	U	0.11	U	0.86		1.23		0.39		14	U	0.69	J	0.07	J	0.70	
280002	pCi/g	0.66		68.84		0.91		1.23		1.01		0.47		14	U	0.60	J	0.07	U	0.59	
250016	pCi/g	0.28	U	0.23	U	0.11	UJ	1.04		0.78		0.93		14	U	0.65		0.09	J	0.84	
250009	pCi/g	0.28	U	0.74		0.11	U	1.24		1.10		1.09		14	U	0.82		0.06		0.85	
240011	pCi/g	0.36	U	17.57		0.12	J	1.20		0.95		0.97		14	U	0.77		0.07	U	0.91	
240004	pCi/g	0.37	U	0.23	U	0.11	UJ	1.39		1.07		1.22		14	U	1.19		0.07	U	0.74	
230014	pCi/g	0.35	U	0.22	U	0.11	U	0.65		0.79		0.85		14	U	0.78		0.07		0.91	
230005	pCi/g	0.39	U	1.11		0.11	U	0.71		0.55		0.54		14	U	0.44		0.07	U	0.53	
220010	pCi/g	0.32	U	0.45	U	0.21	U	0.47	U	0.91		0.58		14.00	U	0.61		0.08	UJ	0.64	
220005	pCi/g	0.31	U	0.39	U	0.19	U	1.09		1.15		1.46		14.00	U	0.77		0.07	UJ	0.65	
210012	pCi/g	0.33	U	4.97		0.11	U	1.36		0.68		0.92		14	U	1.19	J	0.06	J	0.68	
210005	pCi/g	0.34		48.22		0.20		1.11		1.08		0.92		14	U	1.16	J	0.22	J	0.75	
200009	pCi/g	0.29	U	0.23	U	0.11	U	0.64		1.01		0.36		14	U	0.89	J	0.12	J	0.77	
200020	pCi/g	0.22	U	0.41	U	0.20	U	0.43	U	0.86		0.46		14.00	U	0.76		0.10	J	0.77	
191020	pCi/g	0.24	U	0.23	U	0.11	UJ	0.39		1.17		0.25		17.30		0.82		0.08	J	0.76	
190020	pCi/g	0.32	U	0.23	U	0.11	UJ	0.50		0.92		0.40		14	U	0.81		0.07	J	0.70	
190007	pCi/g	0.37	U	0.23	U	0.11	UJ	0.66		1.06		0.46		18.70		0.70		0.08	J	0.68	
180020	pCi/g	0.30	U	0.23	U	0.11	U	1.05		1.00		0.51		14	U	0.72	J	0.07	U	0.69	
180012	pCi/g	0.22	U	0.37	U	0.18	U	0.39		0.69		0.37		14.00	U	0.49		0.07	UJ	0.62	
171020	pCi/g	0.37	U	0.23	U	0.11	UJ	1.20		0.79		0.98		14	U	0.59		0.07	J	0.74	
170020	pCi/g	0.34	U	0.23	U	0.11	UJ	1.40		1.26		1.18		14	U	0.70		0.13	J	0.74	
170007	pCi/g	0.38	U	0.23	U	0.11	UJ	1.07		1.02		1.02		14	U	0.65		0.07	U	0.68	
160010	pCi/g	0.36	U	0.23	U	0.11	U	1.51		1.31		1.18		14	U	0.71	J	0.07	J	0.80	
160016	pCi/g	0.40	U	0.46	U	0.22	U	0.46	U	0.49		0.37		14.00	U	0.71		0.08	J	0.80	
150020	pCi/g	0.33	U	0.23	U	0.11	U	0.73		0.70		0.44		14	U	0.83		0.16	J	0.67	
150001	pCi/g	0.43		31.98		0.23		1.05		1.09		0.70		14	U	0.91		0.19	J	0.73	
140001	pCi/g	0.35	U	20.18		0.20		4.23		0.82		0.57		14	U	1.12		0.18	J	1.09	
140006	pCi/g	0.32	U	2.50		0.11	U	0.87		1.00		0.58		14	U	0.65		0.08		0.72	
130006	pCi/g	0.39	U	0.33		0.11	U	1.35		1.46		1.46		14	U	0.93		0.12		1.12	
130003	pCi/g	0.37	U	6.82		0.11	U	0.69		0.84		0.58		14	U	0.72		0.07	U	0.74	
120020	pCi/g	0.29	U	0.22	U	0.11	U	4.17		0.88		0.44		14	U	0.68		0.07	U	0.77	
120001	pCi/g	0.38	U	3.01	J	0.21	U	2.58		1.32		1.90		17.40		0.85		0.10	J	0.85	
110017	pCi/g	0.31	U	0.45		0.11	U	0.74		0.83		0.50		14	U	0.71		0.08		0.67	
110006	pCi/g	0.38	U	0.45	U	0.21	U	0.89		0.95		1.27		14.00	U	1.18		0.11	JJ	1.21	
101020	pCi/g	0.35	U	0.23	U	0.11	U	0.78		0.92		0.35		14	U	0.69		0.08	J	0.66	
100020	pCi/g	0.23	U	0.23	U	0.11	U	1.08		1.00		0.47		14	U	0.63	J	0.09	J	0.77	
100011	pCi/g	0.32	U	0.23	U	0.11	U	0.84		0.80		0.38		14	U	0.73		0.03	J	0.71	
090017	pCi/g	0.28	U	0.40	U	0.19	U	0.42	U	1.24		0.53		14.00	U	0.69		0.07	UJ	0.66	
090002	pCi/g	0.33	U	0.22	U	0.11	U	0.44		0.90		0.34		14	U	0.58		0.07	U	0.58	
[illegible]1009	pCi/g	0.26	U	0.23	U	0.11	U	1.55		0.97		0.98		14	U	0.77	J	0.09	J	0.82	
[illegible]001	pCi/g	0.37	U	1.10		0.11	U	0.84		1.25		0.51		14	U	0.78	J	0.12	J	0.65	
[illegible]/1001	pCi/g	0.34	U	10.95		0.11	UJ	1.18		1.05		0.95		14	U	0.52		0.07	U	0.71	
070012	pCi/g	0.36	U	0.23	U	0.11	UJ	1.44		1.21		1.31		14	U	0.67		0.07	U	0.87	
070001	pCi/g	0.40	U	6.10		0.12	J	1.53		0.97		1.10		14	U	0.52		0.07	U	0.72	
060005	pCi/g	0.37	U	1.48		0.11	U	1.23		1.25		0.80		14	U	0.58		0.08		0.55	
060000	pCi/g	0.39	U	7.54		0.11	U	1.76		1.25		0.97		14	U	0.67		0.07	U	0.59	
050010	pCi/g	0.40	U	0.45	U	0.21	U	0.48		0.43		0.24		14.00	U	0.61		0.10	J	0.70	
050004	pCi/g	0.27	U	0.45	U	0.21	U	0.47	U	0.44		0.38		14.00	U	0.49		0.07	UJ	0.42	
040012	pCi/g	0.33	U	0.23	U	0.11	U	0.98		0.84		0.68		14	U	0.55		0.10		0.61	
040007	pCi/g	0.31	U	0.23	U	0.11	U	1.18		1.40		0.72		14	U	0.75		0.07	U	0.74	
030004	pCi/g	0.31	U	3.25		0.11	U	3.52		0.61		0.23		14	U	0.39		0.07	U	0.37	
020006	pCi/g	0.30	U	18.55		0.30		3.66		0.95		0.15		14	U	0.53		0.10		0.53	
020003	pCi/g	0.31		100.92		0.54	J	1.10		0.99		0.96		14	U	0.52		0.05	J	0.71	
011002	pCi/g	0.28	U	132.05		1.92		0.84		0.88		0.71		14	U	0.68		0.07	U	0.52	
010002	pCi/g	0.30		5.04		0.20	U	0.66		0.59		0.50		14.00	U	0.54		0.07	UJ	0.48	
Count		56		56		56		56		56		56		56		56		56		56	
Mean		0.335		6.911		0.192		1.177		0.954		0.714		14.204		0.723		0.087		0.733	
Stan. Dev.		0.065		24.056		0.284		0.86		0.237		0.37		0.868		0.181		0.033		0.154	
N Value		7.483		7.483		7.483		7.483		7.483		7.483		7.483		7.483		7.483		7.483	
Degrees of Freedom		1.674		1.674		1.674		1.674		1.674		1.674		1.674		1.674		1.674		1.674	
Cleanup Standard		0.015		6.331		0.059		0.263		0.053		0.083		1.347		0.04		0.007		0.034	

The row listed as "Cleanup Standard" is the "Upper One Sided Confidence Limit" of the sample data set. This number should be compared to the "Cleanup Standard". See explanation Appendix B, Page B-1.