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Mound, Inc.
1 Mound Road
P.O. Box 3030
Miamisburg, OH
45343-3030

CH2MHILL

ER-050/03
March 6, 2003

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

ATTENTION: Robert S. Rothman

SUBJECT: Contract No. DE-AC24-03OH20152
PRS 277/278 OSC REPORT, FINAL

REFERENCE: Statement of Work Requirement 039 – PRS Documentation

Dear Mr. Provencher:

Rob Rothman from your office has approved the release of the following document for public review:

- PRS 277/278 OSC Report, Final

Regulator comments have been incorporated into the document. If you or members of your staff have any questions regarding the document, or if additional support is needed, please contact Dave Rakel at extension 4203.

Sincerely,

Monte A. Williams
Deputy Project Manager, Environmental Restoration

MAW/KMA:jdg

Enclosures

cc: David Seely, USEPA, (1) w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandegrift, ODH, (1) w/attachments
Paul Lucas, DOE/MCP, (1) w/attachments
Terry Tracy, DOE/HQ, (1) w/attachments
Randy Tormey, DOE/OH, (1) w/attachments
J. D..Bonfiglio, MESH, (1) w/attachments
Monte Williams, CH2M HILL, (2) w/attachments
John Fulton, CH2M HILL, (1) w/o attachments
Gene Valett, CH2M HILL, (1) w/o attachments
Dave Rakel, CH2M HILL, (1) w/o attachments
Public Reading Room, (4) w/attachments
Admin Records, (2) w/attachments
DCC, (1) w/attachments

PRS 277/278 REMOVAL ACTION

OSC REPORT

March 2003

Final

Department of Energy
Miamisburg Closure Project

CH2MHILL

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Acronyms

COC	Contaminant of Concern
DOE	Department of Energy
FA	Further Assessment
MCP	Miamisburg Closure Project
OEPA	Ohio Environmental Protection Agency
OSC	On-Scene Coordinator
PRS	Potential Release Site
RA	Removal Action
RGBV	Risk-Based Guideline Value
SM/PP	Special Metallurgical/Plutonium Processing
SVOC	semivolatile organic compound
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

RECOMMENDATION

The Potential Release Site (PRS) 277/278 Removal Action (RA) was successfully completed at a soil location on the west slope of the Special Metallurgical/Plutonium Processing (SM/PP) Hill, northwest of Building 105 on the southeast end of the Mound Plant in the city of Miamisburg, Ohio. This removal action resulted in the excavation and disposal of approximately 46,683 cubic feet (1,729 cubic yards) of material. All material was shipped via railcar to Envirocare disposal facility. The cleanup objectives (10^{-5} Risk-Based Guideline Value (RGBV) plus background) for the RA Contaminants of Concern (COCs), thorium-230, thorium-232, plutonium-238, cobalt-60, and actinium-227, are 2.8 pCi/g, 2.1 pCi/g, 55 pCi/g, 0.7 pCi/g, and 4.6 pCi/g respectively. All verification sample results (except one) were below the cleanup objectives. The Hot Spot criteria for thorium-232 is 3.5 pCi/g (3 X the 10^{-5} RGBV plus background). The Hot Spot criteria was applied at one location (V057) for a thorium-232 result of 2.49 pCi/g.

2/25/03

Rob Rothman, OSC
U.S. Department of Energy
Miamisburg, Ohio

2/25/03

Tim Fischer, RPM
USEPA
Chicago, Illinois

2/27/03

Brian Nickel
OEPA
Dayton, Ohio

1.0 SUMMARY OF EVENTS

This section describes the site background and events leading up to the RA, parties involved in responding to the RA, cleanup objective determination, chronological narrative of the RA, and resources committed to complete the project.

1.1 Site Conditions and Background

PRSs 277/278, also known as the hillside disposal area and catch basin, are located on the west slope of the Mound Plant SM/PP Hill. Process history of the PRSs indicated the potential for the presence of construction/building debris, paints, thinners, chemical contaminants, asbestos, thorium, and plutonium-238.

Further Assessment (FA) sampling was performed per the Core Team-approved Sampling and Analysis Plan. COCs included lead-210, radium-226, actinium-227, thorium-228, thorium-230, thorium-232, and plutonium-238. Volatile and semivolatile organic compounds (VOCs and SVOCs) were anticipated due to potential disposition of demolition debris. During the FA sampling, a plutonium-238 hot spot was identified and removed. The excavated area was verified to be below screening levels.

Based on FA results, a RA was recommended by the Core Team for thorium-230, thorium-232 (plus daughter isotopes), plutonium-238, cobalt-60, and actinium-227.

1.2 Organization of the Removal Action

Table 1 lists the parties responding to the removal action, and their responsibilities.

1.3 Objectives

Documentation Objective. The objective of this On-Scene Coordinator (OSC) Report is to describe the RA fieldwork, items identified for continual improvement, and document successful completion of the project. Material quantities and disposition locations are presented in Table 2. The cost breakdown of the removal action is presented in Table 3.

Cleanup Objective. The cleanup objectives for the COCs, thorium-230, thorium-232 (plus daughter isotopes), plutonium-238, cobalt-60, and actinium-227, are 2.8 pCi/g, 2.1 pCi/g, 55 pCi/g, 0.7 pCi/g, and 4.6 pCi/g respectively. The cleanup objective is the sum of the 10^{-5} RGBV and background. All verification sample results were below the cleanup objectives (except for one result of thorium-232) and are presented in Tables 4 and 5.

Hot Spot Criteria. The Hot Spot criteria for thorium-232 is 3.5 pCi/g (3X the 10^{-5} RGBV plus background). Per Core Team agreement, one thorium-232 result of 2.49 pCi/g (V057) was not removed because of inaccessibility issues.

1.4 Chronological Narrative of the Removal Action

The following is a chronological narrative of events surrounding the PRS 277/278 RA.

PRS 277/278 Chronology

1950s-1980s	Area used for disposal of construction debris and staging of contaminated soil.
1995	PRS 277 binned FA by the Core Team.
1996	The Core Team combined FA of PRS 277 with that of PRS 278.
2000-2001	FA sampling implemented. Details included in the Public Fact Sheet (Appendix D) and Further Assessment Data Report, Final, September 2001.
Feb 2002	Core Team binned PRS 277/278 as a RA.
Oct. 24, 2002	Excavation begins.
Aug-Sep 2002	Public Fact Sheet available for comment and review by the public.
Nov 2002	Removal Action Work Plan and Verification Sampling and Analysis Plan approved by the Core Team.
Nov. 11, 2002	Excavation completed. All elevated FIDLER reading and sample result locations were removed and verified by Mound gamma spec lab.
Oct-Nov 2002	PRS 277/278 verification sampling performed.
Jan 2003	Site restoration completed (graded, seeded, and straw applied).
Jan 2003	OSC Report generated.

2.0 EFFECTIVENESS OF THE REMOVAL ACTION

Verification sample results are presented in Tables 4 and 5. All results except one are below the cleanup objective. The Hot Spot criteria was applied once with Core Team concurrence. Required validation was performed on sample results from offsite laboratories.

2.1 Actions Taken by Mound Personnel

Mound Soils Project and onsite personnel planned, performed oversight, and performed the excavation, monitoring, sampling and analyses, and transportation of contaminated soil and debris to the designated onsite soil staging area. A Public Fact Sheet was made available to the general public and is included in Appendix D of this OSC Report. Photographic documentation is presented in Appendix E to this OSC Report.

2.2 Actions Taken by Local, State, and Federal Agencies

The Department of Energy/Miamisburg Closure Project (DOE/MCP), the United States Environmental Protection Agency (USEPA), and the Ohio Environmental Protection Agency (OEPA) had oversight responsibility for the removal action.

2.3 Actions Taken by Subcontractors

Subcontractors involved in the project included the following:

- ❑ Weston Solutions, Inc. performed sample technician, laboratory liaison, and data validation support.
- ❑ Envirocare (disposal facility) received waste via rail transport.

3.0 DIFFICULTIES ENCOUNTERED

3.1 Items that Affect the Removal Action

No difficulties were encountered during the removal.

3.2 Issues of Intergovernmental Coordination

All DOE/OEPA/USEPA interactions were good. The agencies were updated at Core Team meetings and the Mound 2000 Process worked well. Splitting of samples with OEPA went well.

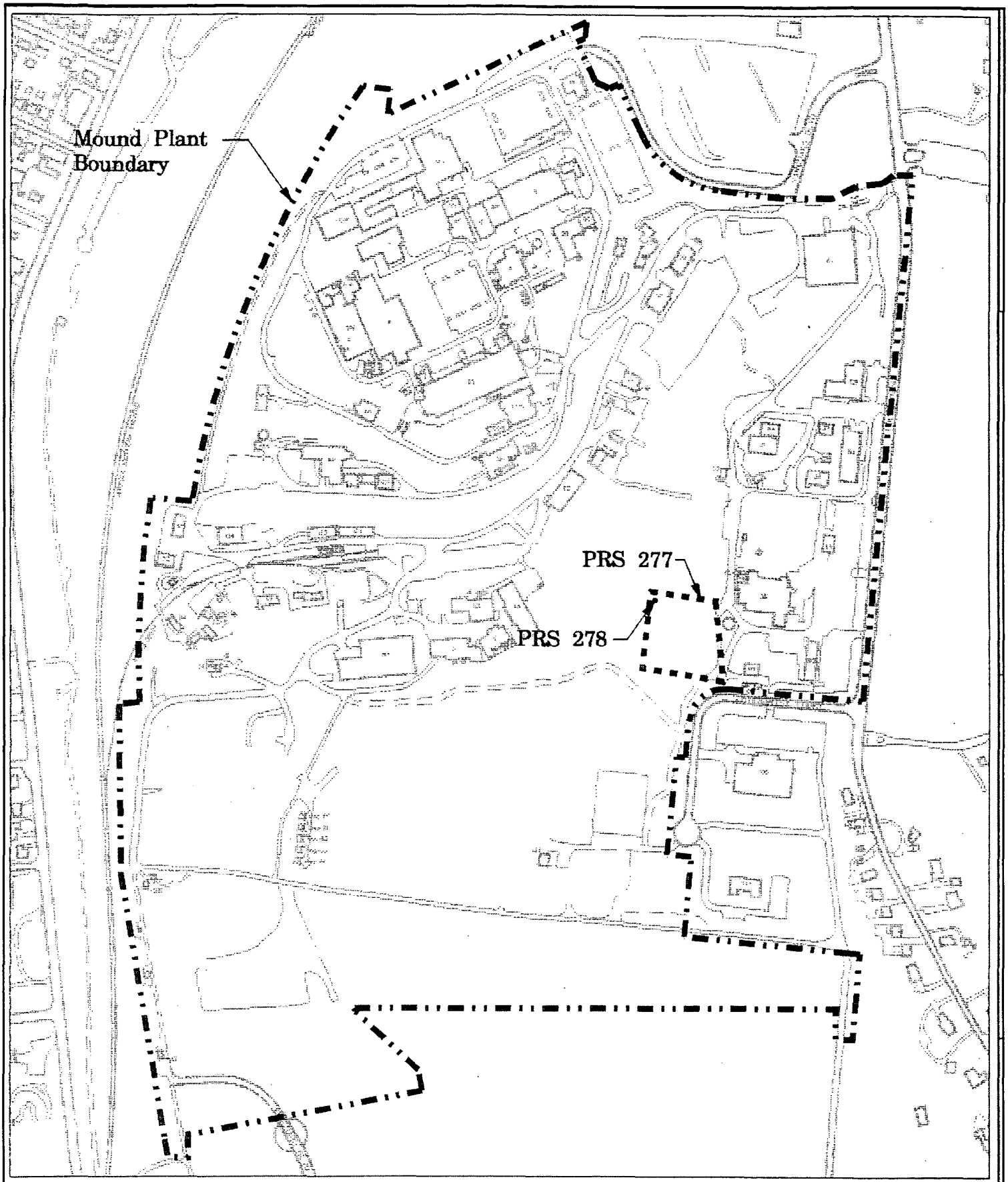
4.0 RECOMMENDATIONS

4.1 Means to Prevent a Recurrence

The waste was removed and therefore recurrence of a spill or leak, or spread of contamination is prevented. Recurrence will be prevented as it is no longer an accepted practice of the industry to dispose of potentially contaminated material in the same way. This area will be transferred from federal to private ownership. All State and Federal disposal rules will apply.

APPENDIX A

FIGURES



Legend

Structures
Paved roadway
Unpaved roadway
Mound Plant boundary
Railroad

0 100 200 400 600 800 1000
Scale in Feet

ISS	DATE	REVISION	BY	CHKR	ENG	LPMGR	APVD	#
	04/25/02	*	SSF					

MOUND

Environmental Restoration Geographic Information System

SHEET	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ISSUE																					

SHEET	1	2	3	4	5	6
ISSUE						

PART CLASSIFICATION

Figure 1
Location of PRS 277/278

DRAWING CLASSIFICATION: UNCLASSIFIED
SIZE
DRAWING NUMBER: gen_site_plan.dgn
JOB NUMBER
DWG TYPE: STE
PRNG: ER-GIS
CADEC
SCALE
SHEET 1 OF
STATUS: MD-REL-**/**/**
ORIGIN: MSTATION / J

APPENDIX B

TABLES

Table 1: Organization of the Removal Action

US Environmental Protection Agency SFR-5J 77 W. Jackson Street Chicago, IL 60604 312-353-2000	Tim Fischer	Federal agency responsible for oversight
Ohio Environmental Protection Agency 401 E. Fifth Street Dayton, OH 45402-2911 937-285-6357	Brian Nickel	State agency responsible for oversight
Dept. of Energy, Miamisburg Closure Project P.O. Box 66 1 Mound Road Miamisburg, OH 45343-0066 937-865-3597	Rob Rothman	On-scene Coordinator (OSC) responsible for oversight and success
BWXT of Ohio Environmental Restoration Project 1 Mound Road Miamisburg, OH 45343-3030 937-865-4543	Monte Williams	Provide OSC with technical assistance, administrative support, field oversight, sample management, site safety, photo, site documentation, and preparation of the OSC Report

Table 2: Materials and Disposition

Type of Material	Quantity	Disposal Method	Disposal Location
contaminated soil	46,683 cubic feet	Rail transport	Envirocare

Table 3: Removal Cost

Extramural Costs	Cost
Fieldwork	$85,000
Transportation of Contaminated Soil	$198,482
Disposal of Contaminated Soil	$254,000
Sample Plan, Verification Sampling & Analyses, and Data Validation	$50,000
Restoration/grading/seeding	$5,000
Estimated Total Project Cost	**$592,482**

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000165	V001	Actinium-227	SSF	11/15/2002	0.2800	0.2800	U	
000109	V027	Actinium-227	SSF	10/25/2002	0.2300	0.2300	U	
000165	V001	Americium-241	SSF	11/15/2002	0.0800	0.0800	U	
000109	V027	Americium-241	SSF	10/25/2002	0.0700	0.0700	U	
000165	V001	Cesium-137	SSF	11/15/2002	0.0800	0.0800	U	
000109	V027	Cesium-137	SSF	10/25/2002	0.0500	0.0500	U	
000165	V001	Cobalt-60	SSF	11/15/2002	0.0900	0.0900	U	
000109	V027	Cobalt-60	SSF	10/25/2002	0.0600	0.0600	U	
000109	V027	Lead-210	SSF	10/25/2002	0.8300	0.7100		
000165	V001	Lead-210	SSF	11/15/2002	0.7200	0.7200	U	
000165	V001	Plutonium-238	SSF	11/15/2002	18.0500	18.0500	U	
000162	V003	Plutonium-238	STLRL	11/15/2002	14.0000	0.0065		J
000109	V027	Plutonium-238	SSF	10/25/2002	13.2400	13.2400	U	
000162	V003	Plutonium-239/240	STLRL	11/15/2002	0.0515	0.0144		J
000165	V001	Radium-226	SSF	11/15/2002	1.9800	0.7300		
000109	V027	Radium-226	SSF	10/25/2002	1.2100	0.7100		
000129	V057	Thorium-228	STLRL	10/28/2002	2.2500	0.0105		
000103	V031	Thorium-228	STLRL	10/25/2002	1.5100	0.0164		
000104	V031	Thorium-228	STLRL	10/25/2002	1.4200	0.0112		
000112	V038	Thorium-228	STLRL	10/25/2002	1.3300	0.0222		
000153	V016	Thorium-228	STLRL	11/15/2002	1.2900	0.0168		
000118	V043	Thorium-228	STLRL	10/25/2002	1.2100	0.0145		
000113	V038	Thorium-228	STLRL	10/25/2002	1.1000	0.0234		
000140	V026	Thorium-228	STLRL	11/13/2002	1.0100	0.0097		
000156	V017	Thorium-228	STLRL	11/15/2002	0.9490	0.0119		
000121	V059	Thorium-228	STLRL	10/28/2002	0.9110	0.0202		
000154	V018	Thorium-228	STLRL	11/15/2002	0.8840	0.0099		
000161	V002	Thorium-228	STLRL	11/15/2002	0.8710	0.0160		
000125	V053	Thorium-228	STLRL	10/28/2002	0.8590	0.0226		
000126	V054	Thorium-228	STLRL	10/28/2002	0.8160	0.0113		
000150	V015	Thorium-228	STLRL	11/15/2002	0.8130	0.0261		
000120	V058	Thorium-228	STLRL	10/28/2002	0.8020	0.0101		
000127	V055	Thorium-228	STLRL	10/28/2002	0.7980	0.0168		
000162	V003	Thorium-228	STLRL	11/15/2002	0.7950	0.0107		
000155	V019	Thorium-228	STLRL	11/15/2002	0.7860	0.0043		
000145	V006	Thorium-228	STLRL	11/15/2002	0.7740	0.0120		
000165	V001	Thorium-228	STLRL	11/15/2002	0.7460	0.0169		

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000142	V024	Thorium-228	STLRL	11/13/2002	0.7190	0.0129		
000110	V028	Thorium-228	STLRL	10/25/2002	0.7160	0.0046		
000144	V007	Thorium-228	STLRL	11/15/2002	0.7070	0.0043		
000163	V012	Thorium-228	STLRL	11/15/2002	0.7040	0.0193		
000101	V029	Thorium-228	STLRL	10/25/2002	0.6850	0.0130		
000111	V037	Thorium-228	STLRL	10/25/2002	0.6820	0.0136		
000117	V042	Thorium-228	STLRL	10/25/2002	0.6650	0.0173		
000133	V047	Thorium-228	STLRL	10/28/2002	0.6580	0.0153		
000137	V050	Thorium-228	STLRL	10/28/2002	0.6510	0.0125		
000149	V004	Thorium-228	STLRL	11/15/2002	0.6500	0.0098		
000151	V014	Thorium-228	STLRL	11/15/2002	0.6490	0.0166		
000128	V056	Thorium-228	STLRL	10/28/2002	0.6460	0.0177		
000146	V006	Thorium-228	STLRL	11/15/2002	0.6370	0.0180		
000158	V021	Thorium-228	STLRL	11/15/2002	0.6280	0.0185		
000152	V013	Thorium-228	STLRL	11/15/2002	0.6220	0.0104		
000114	V039	Thorium-228	STLRL	10/25/2002	0.6210	0.0123		
000164	V011	Thorium-228	STLRL	11/15/2002	0.6060	0.0269		
000123	V053	Thorium-228	STLRL	10/28/2002	0.5930	0.0219		
000168	V009	Thorium-228	STLRL	11/15/2002	0.5910	0.0099		
000148	V005	Thorium-228	STLRL	11/15/2002	0.5840	0.0169		
000160	V022	Thorium-228	STLRL	11/15/2002	0.5830	0.0249		
000108	V035	Thorium-228	STLRL	10/25/2002	0.5470	0.0166		
000159	V021	Thorium-228	STLRL	11/15/2002	0.5400	0.0098		
000141	V025	Thorium-228	STLRL	11/13/2002	0.5400	0.0044		
000124	V052	Thorium-228	STLRL	10/28/2002	0.5380	0.0106		
000116	V041	Thorium-228	STLRL	10/25/2002	0.5330	0.0177		
000106	V033	Thorium-228	STLRL	10/25/2002	0.5320	0.0223		
000107	V034	Thorium-228	STLRL	10/25/2002	0.5320	0.0115		
000115	V040	Thorium-228	STLRL	10/25/2002	0.5220	0.0169		
000143	V023	Thorium-228	STLRL	11/13/2002	0.5170	0.0170		
000166	V010	Thorium-228	STLRL	11/15/2002	0.5120	0.0143		
000157	V020	Thorium-228	STLRL	11/15/2002	0.4990	0.0180		
000102	V030	Thorium-228	STLRL	10/25/2002	0.4940	0.0174		
000139	V008	Thorium-228	STLRL	11/13/2002	0.4940	0.0163		
000122	V051	Thorium-228	STLRL	10/28/2002	0.4910	0.0139		
000105	V032	Thorium-228	STLRL	10/25/2002	0.4760	0.0242		
000100	V036	Thorium-228	STLRL	10/25/2002	0.4690	0.0045		
000132	V046	Thorium-228	STLRL	10/28/2002	0.4180	0.0198		
000136	V049	Thorium-228	STLRL	10/28/2002	0.3890	0.0212		
000130	V044	Thorium-228	STLRL	10/28/2002	0.3340	0.0048		
000134	V048	Thorium-228	STLRL	10/28/2002	0.3190	0.0126		

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000135	V048	Thorium-228	STLRL	10/28/2002	0.3010	0.0248		
000131	V045	Thorium-228	STLRL	10/28/2002	0.1080	0.0134		
000109	V027	Thorium-230	SSF	10/25/2002	6.0300	6.03*	U	
000159	V021	Thorium-230	STLRL	11/15/2002	2.4800	0.0107		
000158	V021	Thorium-230	STLRL	11/15/2002	1.9600	0.0098		
000137	V050	Thorium-230	STLRL	10/28/2002	1.6700	0.0092		
000136	V049	Thorium-230	STLRL	10/28/2002	1.2300	0.0110		
000113	V038	Thorium-230	STLRL	10/25/2002	0.8670	0.0069		
000118	V043	Thorium-230	STLRL	10/25/2002	0.8230	0.0045		
000133	V047	Thorium-230	STLRL	10/28/2002	0.8210	0.0102		
000112	V038	Thorium-230	STLRL	10/25/2002	0.8120	0.0104		
000111	V037	Thorium-230	STLRL	10/25/2002	0.7150	0.0081		
000142	V024	Thorium-230	STLRL	11/13/2002	0.7040	0.0103		
000129	V057	Thorium-230	STLRL	10/28/2002	0.6890	0.0046		
000114	V039	Thorium-230	STLRL	10/25/2002	0.6780	0.0091		
000117	V042	Thorium-230	STLRL	10/25/2002	0.6700	0.0045		
000151	V014	Thorium-230	STLRL	11/15/2002	0.6230	0.0064		
000152	V013	Thorium-230	STLRL	11/15/2002	0.5980	0.0087		
000149	V004	Thorium-230	STLRL	11/15/2002	0.5870	0.0096		
000105	V032	Thorium-230	STLRL	10/25/2002	0.5830	0.0113		
000103	V031	Thorium-230	STLRL	10/25/2002	0.5830	0.0097		
000168	V009	Thorium-230	STLRL	11/15/2002	0.5830	0.0044		
000110	V028	Thorium-230	STLRL	10/25/2002	0.5710	0.0099		
000130	V044	Thorium-230	STLRL	10/28/2002	0.5660	0.0104		
000157	V020	Thorium-230	STLRL	11/15/2002	0.5620	0.0098		
000141	V025	Thorium-230	STLRL	11/13/2002	0.5580	0.0095		
000164	V011	Thorium-230	STLRL	11/15/2002	0.5540	0.0107		
000163	V012	Thorium-230	STLRL	11/15/2002	0.5530	0.0115		
000161	V002	Thorium-230	STLRL	11/15/2002	0.5450	0.0058		
000155	V019	Thorium-230	STLRL	11/15/2002	0.5430	0.0092		
000104	V031	Thorium-230	STLRL	10/25/2002	0.5420	0.0043		
000101	V029	Thorium-230	STLRL	10/25/2002	0.5410	0.0103		
000116	V041	Thorium-230	STLRL	10/25/2002	0.5400	0.0063		
000121	V059	Thorium-230	STLRL	10/28/2002	0.5380	0.0110		
000108	V035	Thorium-230	STLRL	10/25/2002	0.5350	0.0059		
000126	V054	Thorium-230	STLRL	10/28/2002	0.5320	0.0083		
000115	V040	Thorium-230	STLRL	10/25/2002	0.5270	0.0060		
000148	V005	Thorium-230	STLRL	11/15/2002	0.5240	0.0094		
000153	V016	Thorium-230	STLRL	11/15/2002	0.5190	0.0044		
000128	V056	Thorium-230	STLRL	10/28/2002	0.5180	0.0064		

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000165	V001	Thorium-230	STLRL	11/15/2002	0.5170	0.0045		
000154	V018	Thorium-230	STLRL	11/15/2002	0.5170	0.0044		
000120	V058	Thorium-230	STLRL	10/28/2002	0.5120	0.0044		
000145	V006	Thorium-230	STLRL	11/15/2002	0.5110	0.0096		
000132	V046	Thorium-230	STLRL	10/28/2002	0.5090	0.0107		
000107	V034	Thorium-230	STLRL	10/25/2002	0.5070	0.0085		
000166	V010	Thorium-230	STLRL	11/15/2002	0.5040	0.0100		
000162	V003	Thorium-230	STLRL	11/15/2002	0.5040	0.0079		
000146	V006	Thorium-230	STLRL	11/15/2002	0.4990	0.0099		
000144	V007	Thorium-230	STLRL	11/15/2002	0.4920	0.0094		
000156	V017	Thorium-230	STLRL	11/15/2002	0.4880	0.0095		
000127	V055	Thorium-230	STLRL	10/28/2002	0.4750	0.0057		
000100	V036	Thorium-230	STLRL	10/25/2002	0.4690	0.0098		
000106	V033	Thorium-230	STLRL	10/25/2002	0.4620	0.0116		
000140	V026	Thorium-230	STLRL	11/13/2002	0.4620	0.0043		
000150	V015	Thorium-230	STLRL	11/15/2002	0.4600	0.0059		
000143	V023	Thorium-230	STLRL	11/13/2002	0.4490	0.0100		
000125	V053	Thorium-230	STLRL	10/28/2002	0.4490	0.0067		
000139	V008	Thorium-230	STLRL	11/13/2002	0.4480	0.0043		
000134	V048	Thorium-230	STLRL	10/28/2002	0.4270	0.0045		
000123	V053	Thorium-230	STLRL	10/28/2002	0.4160	0.0103		
000102	V030	Thorium-230	STLRL	10/25/2002	0.4090	0.0100		
000160	V022	Thorium-230	STLRL	11/15/2002	0.3950	0.0055		
000135	V048	Thorium-230	STLRL	10/28/2002	0.3880	0.0116		
000122	V051	Thorium-230	STLRL	10/28/2002	0.3420	0.0093		
000131	V045	Thorium-230	STLRL	10/28/2002	0.3190	0.0107		
000124	V052	Thorium-230	STLRL	10/28/2002	0.3110	0.0044		
000129	V057	Thorium-232	STLRL	10/28/2002	2.4900	0.0102		
000104	V031	Thorium-232	STLRL	10/25/2002	1.5100	0.0076		
000103	V031	Thorium-232	STLRL	10/25/2002	1.4500	0.0159		
000153	V016	Thorium-232	STLRL	11/15/2002	1.4000	0.0098		
000118	V043	Thorium-232	STLRL	10/25/2002	1.2600	0.0045		
000112	V038	Thorium-232	STLRL	10/25/2002	1.1300	0.0059		
000140	V026	Thorium-232	STLRL	11/13/2002	0.9840	0.0095		
000113	V038	Thorium-232	STLRL	10/25/2002	0.9650	0.0121		
000121	V059	Thorium-232	STLRL	10/28/2002	0.8710	0.0134		
000156	V017	Thorium-232	STLRL	11/15/2002	0.8270	0.0043		
000154	V018	Thorium-232	STLRL	11/15/2002	0.7650	0.0098		
000125	V053	Thorium-232	STLRL	10/28/2002	0.7310	0.0118		
000150	V015	Thorium-232	STLRL	11/15/2002	0.7120	0.0123		

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000161	V002	Thorium-232	STLRL	11/15/2002	0.7100	0.0058		
000155	V019	Thorium-232	STLRL	11/15/2002	0.7070	0.0042		
000128	V056	Thorium-232	STLRL	10/28/2002	0.6740	0.0112		
000120	V058	Thorium-232	STLRL	10/28/2002	0.6500	0.0098		
000162	V003	Thorium-232	STLRL	11/15/2002	0.6470	0.0105		
000117	V042	Thorium-232	STLRL	10/25/2002	0.6420	0.0100		
000163	V012	Thorium-232	STLRL	11/15/2002	0.6420	0.0055		
000126	V054	Thorium-232	STLRL	10/28/2002	0.6400	0.0083		
000101	V029	Thorium-232	STLRL	10/25/2002	0.6220	0.0046		
000111	V037	Thorium-232	STLRL	10/25/2002	0.6190	0.0139		
000145	V006	Thorium-232	STLRL	11/15/2002	0.6150	0.0043		
000137	V050	Thorium-232	STLRL	10/28/2002	0.6140	0.0092		
000146	V006	Thorium-232	STLRL	11/15/2002	0.6110	0.0121		
000151	V014	Thorium-232	STLRL	11/15/2002	0.5970	0.0064		
000127	V055	Thorium-232	STLRL	10/28/2002	0.5880	0.0057		
000144	V007	Thorium-232	STLRL	11/15/2002	0.5840	0.0043		
000149	V004	Thorium-232	STLRL	11/15/2002	0.5780	0.0096		
000164	V011	Thorium-232	STLRL	11/15/2002	0.5700	0.0061		
000110	V028	Thorium-232	STLRL	10/25/2002	0.5640	0.0045		
000142	V024	Thorium-232	STLRL	11/13/2002	0.5610	0.0047		
000114	V039	Thorium-232	STLRL	10/25/2002	0.5600	0.0091		
000158	V021	Thorium-232	STLRL	11/15/2002	0.5580	0.0161		
000165	V001	Thorium-232	STLRL	11/15/2002	0.5560	0.0099		
000152	V013	Thorium-232	STLRL	11/15/2002	0.5300	0.0114		
000123	V053	Thorium-232	STLRL	10/28/2002	0.5280	0.0058		
000133	V047	Thorium-232	STLRL	10/28/2002	0.5250	0.0174		
000148	V005	Thorium-232	STLRL	11/15/2002	0.5150	0.0149		
000159	V021	Thorium-232	STLRL	11/15/2002	0.5090	0.0096		
000168	V009	Thorium-232	STLRL	11/15/2002	0.4910	0.0097		
000143	V023	Thorium-232	STLRL	11/13/2002	0.4860	0.0123		
000141	V025	Thorium-232	STLRL	11/13/2002	0.4820	0.0043		
000116	V041	Thorium-232	STLRL	10/25/2002	0.4810	0.0112		
000109	V027	Thorium-232	SSF	10/25/2002	0.4800	0.2100		
000108	V035	Thorium-232	STLRL	10/25/2002	0.4720	0.0059		
000115	V040	Thorium-232	STLRL	10/25/2002	0.4670	0.0060		
000166	V010	Thorium-232	STLRL	11/15/2002	0.4620	0.0045		
000105	V032	Thorium-232	STLRL	10/25/2002	0.4610	0.0064		
000106	V033	Thorium-232	STLRL	10/25/2002	0.4500	0.0116		
000107	V034	Thorium-232	STLRL	10/25/2002	0.4480	0.0085		
000102	V030	Thorium-232	STLRL	10/25/2002	0.4420	0.0123		
000160	V022	Thorium-232	STLRL	11/15/2002	0.4340	0.0098		
000157	V020	Thorium-232	STLRL	11/15/2002	0.4330	0.0121		

Table 4: Onsite and Offsite Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000132	V046	Thorium-232	STLRL	10/28/2002	0.4060	0.0132		
000136	V049	Thorium-232	STLRL	10/28/2002	0.4030	0.0110		
000124	V052	Thorium-232	STLRL	10/28/2002	0.3820	0.0078		
000139	V008	Thorium-232	STLRL	11/13/2002	0.3810	0.0095		
000100	V036	Thorium-232	STLRL	10/25/2002	0.3640	0.0044		
000122	V051	Thorium-232	STLRL	10/28/2002	0.3270	0.0142		
000134	V048	Thorium-232	STLRL	10/28/2002	0.2630	0.0080		
000130	V044	Thorium-232	STLRL	10/28/2002	0.2560	0.0047		
000135	V048	Thorium-232	STLRL	10/28/2002	0.1970	0.0066		
000131	V045	Thorium-232	STLRL	10/28/2002	0.0657	0.0048	J	

NOTES:

MEIMS: Mound Envioronmental Management System
DL: detection limit
LQ: lab qualifier
DQ: data qualifier
STLRL: St. Louis/Richland Lab
SSF: Soil Screening Facility (Onsite Gamma Spec)
U: not detected at the specified DL
R: rejected
J: estimated
*: Per Core Team agreement, the only COC for V027 was cobalt-60, and this is the reason why the DL of 6.03 pCi/g for thorium-230 is acceptable.

Table 5: Superseded Radiological Results (pCi/g)

MEIMS ID	Sample ID	Analyte	Lab	Date	Result	DL	LQ	DQ
000165	V001	Thorium-230	SSF	11/15/2002	6.9100	6.9100	U	
000165	V001	Thorium-232	SSF	11/15/2002	0.6600	0.1900		

NOTES:
MEIMS: Mound Envioronmental Management System
DL: detection limit
LQ: lab qualifier
DQ: data qualifier
SSF: Soil Screening Facility (Onsite Gamma Spec)
U: not detected at the specified DL

Hierarchy of superseding data (most accurate to least per Residual Risk Evaluation):
offsite alpha spec
onsite alpha spec
offsite gamma spec
onsite gamma spec
other methods

APPENDIX C

WALKOVER SURVEY

RADIOLOGICAL SURVEY DATA SHEET

LOCATION: (BLDG./AREA/ROOM) PRS 277/278 @ SM watertower	SURVEY NO. 02-ER-706
PURPOSE: 100 % FIDLER WALKOVER ON HISTORIC SCR605	RWP NO. N/A
	DATE: 10/23/02
	TIME: 1215 hrs

The FIDLER is used as an indicator only

N/A = not applicable N/D = Non detectable

MAP/DRAWING

100 % FIDLER Survey of 25' x 25' area near SM water tower resulted in no positive readings above back ground on out channel.

Contaminate of concern was thorium 232 [redacted] 1-14-03
Scan confirmed that elevated Thorium 232 was not present [redacted] 1-15-03

COPY

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

INSTRUMENTS USED

Instrument	Serial Number	Cal. Due Date
FIDLER	3829 / 3430	7-15-03
FIDLER	3638 / 3848	9-17-03
	N/A	

Completed by: (Signature) [redacted]	HP# 2839 5520	Date: 10-24-02
Completed by: (Print) [redacted]		
Counted by: (Signature) N/A	HP#	Date:
Counted by: (Print) N/A		
Review [redacted]	HP# 6144	Date: 10/24/03
Reviewed/Approved by: (Print) [redacted] 6144		11/14/03

ML-9620 (2/98)

RADIOLOGICAL SURVEY DATA SHEET (cont.)

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
1				NA
2				NA
3				NA
4				NA
5				NA
6				NA
7				NA
8				NA
9				NA
10				NA
11				NA
12				NA
13				NA
14				NA
15				NA
16				NA
17				NA
18				NA
19				NA
20				NA
21				NA
22				NA
23				NA
24				NA
25				NA
26				NA
27				NA
28				NA
29				NA
30				NA
31				NA
32				NA
33				NA
34				NA
35				NA

N/A

Removable Contamination				
Swipes (dpm/100cm2)				
Sample#	β/γ	Alpha	Tritium	Comments
36				NA
37				NA
38				NA
39				NA
40				NA
41				NA
42				NA
43				NA
44				NA
45				NA
46				NA
47				NA
48				NA
49				NA
50				NA
51				NA
52				NA
53				NA
54				NA
55				NA
56				NA
57				NA
58				NA
59				NA
60				NA
61				NA
62				NA
63				NA
64				NA
65				NA
66				NA
67				NA
68				NA
69				NA
70				NA

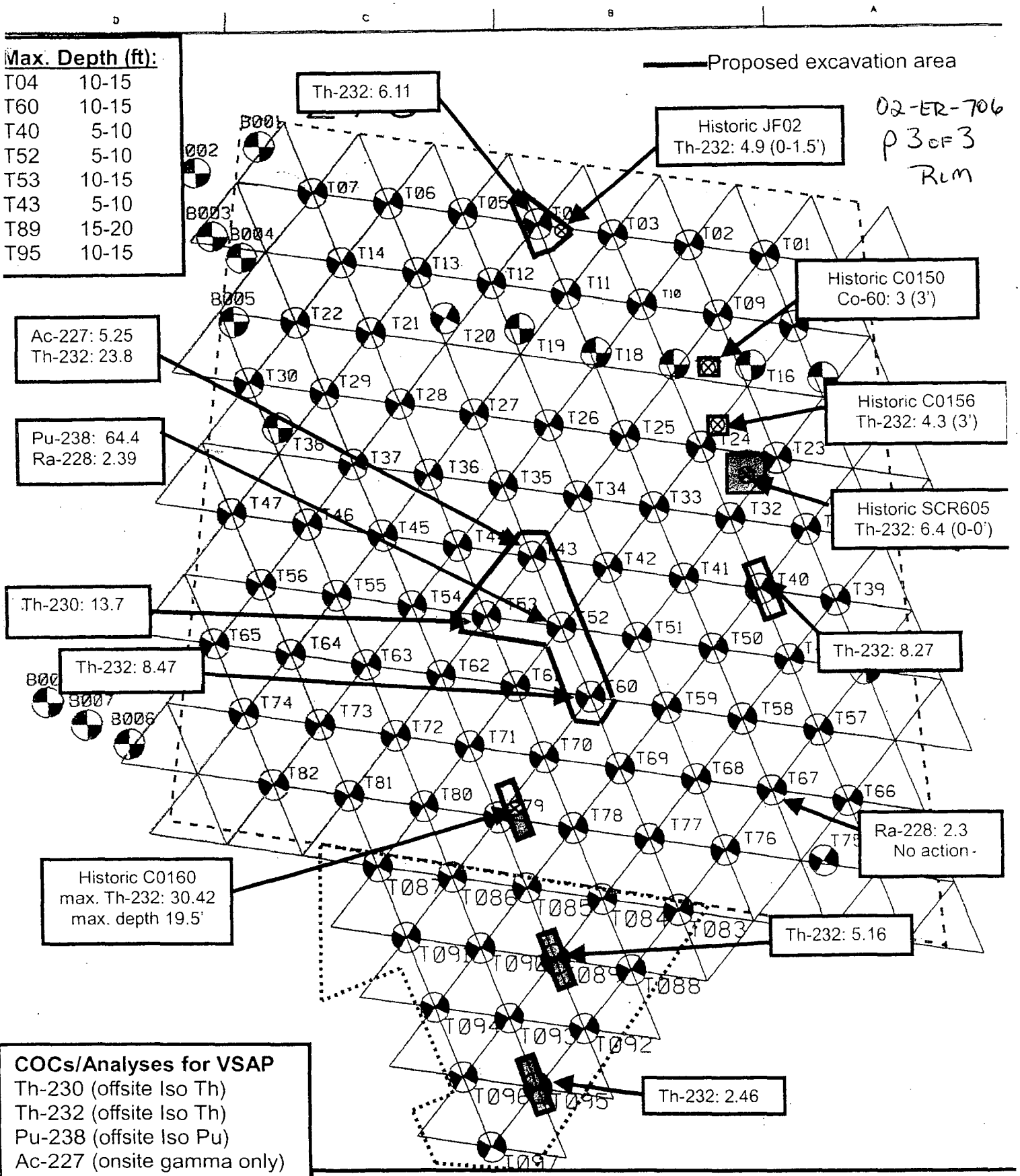
N/A

COMMENTS:

N/A

NOTES:

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



COCs/Analyses for VSAP
Th-230 (offsite Iso Th)
Th-232 (offsite Iso Th)
Pu-238 (offsite Iso Pu)
Ac-227 (onsite gamma only)
Co-60 (onsite gamma only)

results in pCi/g

0 40
Scale in Ft.

A	08/21/01	ISSUE FOR REPORT
ISS	DATE	REVISION

Figure 2:
Locations Exceeding Cleanup Objectives* & Proposed Dig Areas

*All locations with Th-232 exceedances also had elevated Th-228 & Ra-228 due to decay chain daughters of Th-232 but were not identified and addressed separately because they are accounted for in the risk calculation of the parent nuclide.

APPENDIX D

GENERAL MEDIA INFORMATION

PUBLIC FACT SHEET

PRS 277/278: Hillside Disposal Area and Catch Basin

This Fact Sheet satisfies the Public Notification requirement set forth in the Contingent Action Memorandum[1].

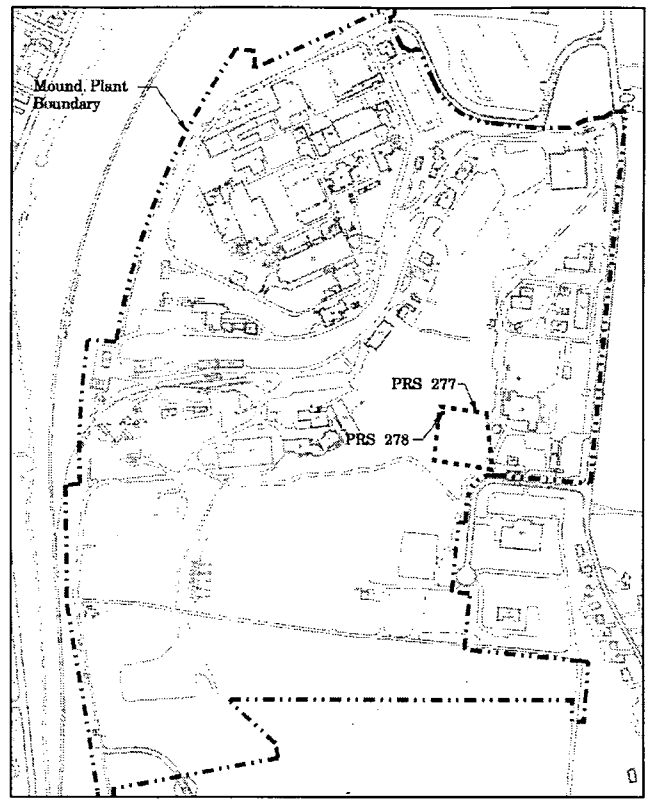
Background. Potential Release Sites (PRSs) 277/278, also known as the hillside disposal area & catch basin, are located on the west slope of the Mound Plant SM/PP Hill. Process history of the PRSs indicated the potential for the presence of construction/building debris, paints, thinners, chemical contaminants, asbestos, thorium, & plutonium-238.

Further Assessment (FA) sampling was performed during the later months of 2000 & during 2001 per the Core Team-approved Sampling & Analysis Plan (SAP). Contaminants of concern (COCs) included lead-210, radium-226, actinium-227, thorium-228, thorium-230, thorium-232, and plutonium-238. Volatile & semivolatile organic compounds (VOCs & SVOCs) were anticipated due to potential disposition of demolition debris. During the FA sampling, a plutonium-238 hot spot was identified & removed. The excavated area was verified to be below screening levels.

Of the eight targeted samples analyzed for SVOCs, one contained a result above cleanup objective (benzo(a)pyrene at 5,100 ug/kg, with a cleanup objective of 4,100 ug/kg). This compound is commonly found in asphalt and other petroleum products & may represent asphalt type debris that was found at various locations within the PRS. No evidence of staining or release of a source material (e.g. creosote) was found during the FA effort. Detected VOC (trichloroethylene (TCE), acetone, and 2-butanone) results were below soil screening levels but evaluated & found not to have the potential for leaching into the groundwater at levels of concern.

Of the 242 samples, eight test pits contained rad (Pu-238, Th-230, Th-232, & Ac-227) results above cleanup objective.

Based on the above results, the Core Team recommended a **Removal Action** (RA) per the Contingent Action Memo[1]. RA COCs are Pu-238, Th-230, Th-232+daughter isotopes, & Ac-227.



The **Work Plan** for Contingent Removal Actions[2], supplemented by the Unique Work Package, includes procedures, instructions, and applicable permits and notifications required to safely conduct the work. Erosion and runon/runoff controls will be managed per the SWP3[3].

The RA will consist of excavation up to 20 feet deep at 8 locations. Post-excavation sampling will be performed within the excavations per the Core Team-approved **Verification Sampling** & Analysis Plan.

Schedule. This Fact Sheet will be in public review for 30 days, ending 26 September 2002. The RA may be ongoing during the review time. A summary of the RA & the verification data will be included in the On-Scene Coordinator (OSC) Report. The OSC Report will be placed in the reading room in early 2003.

Excavation & verification are expected to cost $200,000.

Additional information can be found in the public reading room, or by contacting Jane Greenwalt at 865-3116.

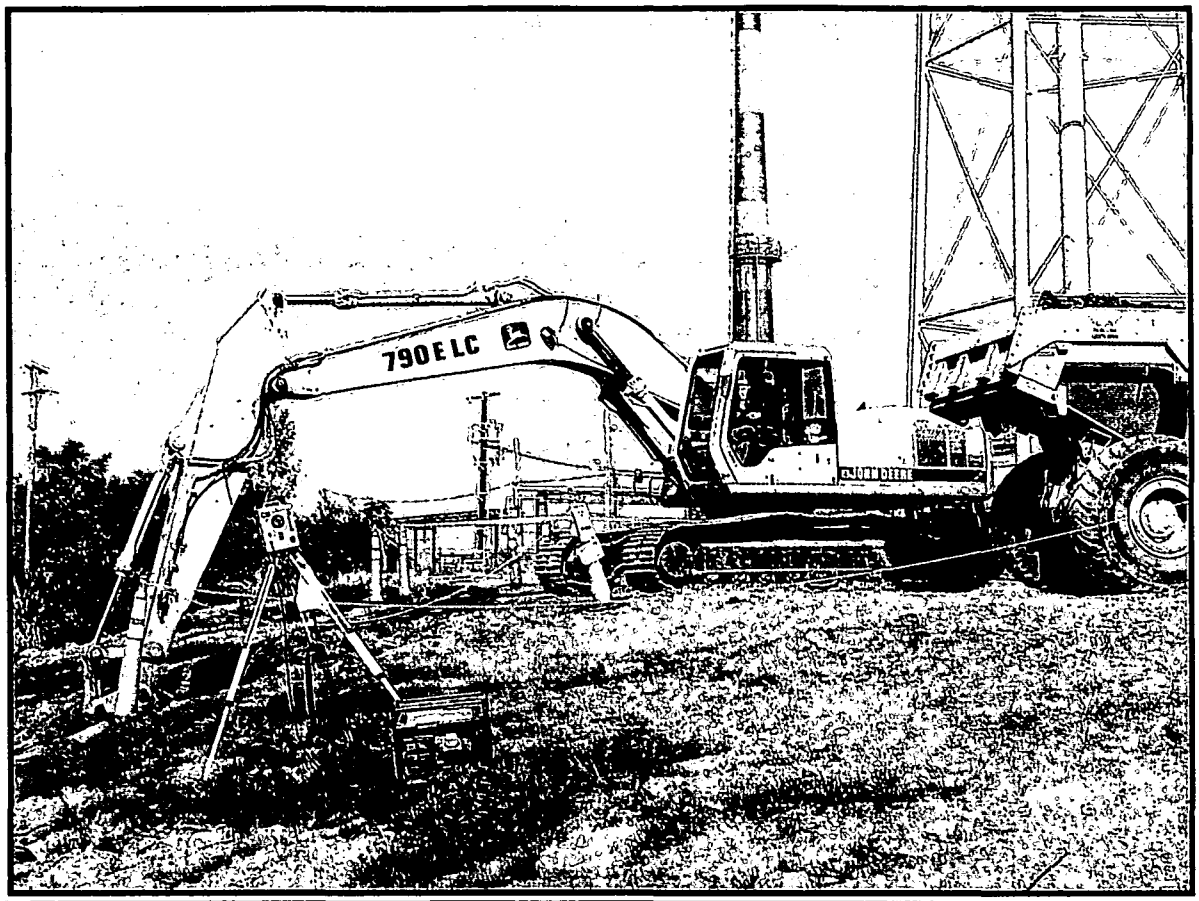
1: Action Memorandum/Engineering Evaluation/Cost Analysis, Contingent Removal Action for Contaminated Soil, June 2002, Final
2: Standard Work Package for Contingent Removal Actions, November 2001, Final
3: Storm Water Pollution Prevention Plan

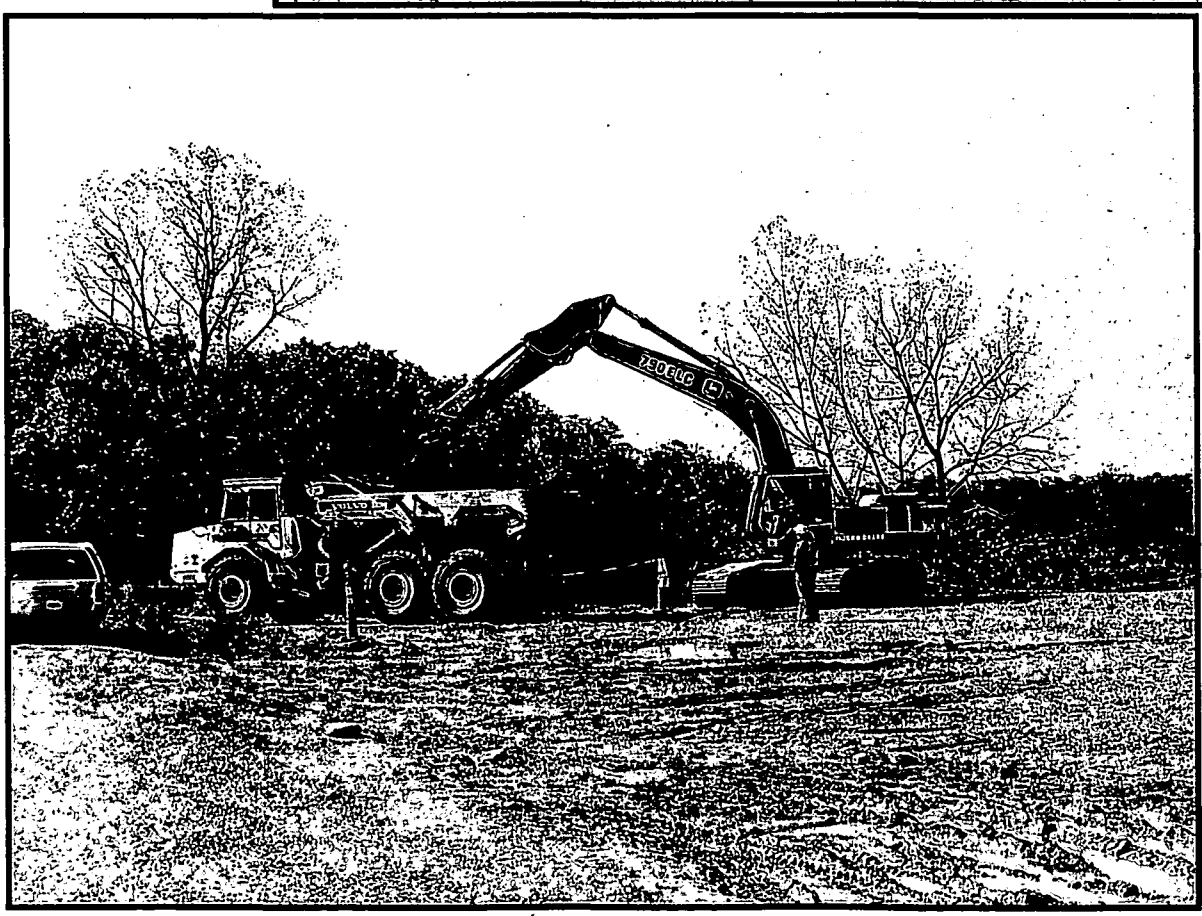
APPENDIX E

PHOTOGRAPH DOCUMENTATION

PHOTO DOCUMENTATION

Largest excavation area in center of PRS 277/278.

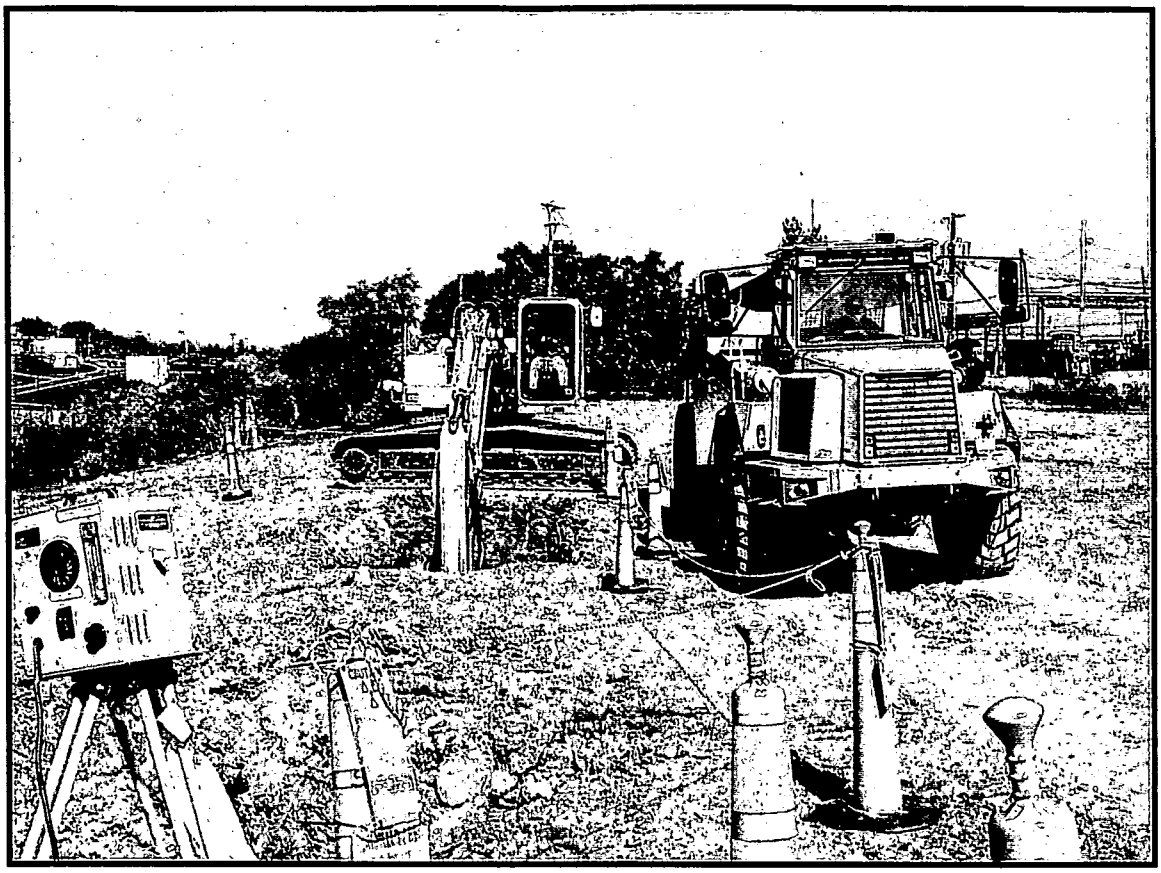




Excavation on south end of PRS 277/278.

PHOTO DOCUMENTATION

Trench excavation near the center of PRS 277/278.



Restoration will be performed in Spring 2003.
Photo not available.

Backfill and restoration process.

T04 Area

C0150 Area

870

C0156 Area

T40 Area

T43, T52, T53, T60 Area

T79 Area

T89 Area

T95 Area

830

840

NOTE: SEE FIGURE 2 OF THE VSAP

Excavated Area Boundary

SCALE

25 0 50 100 FEET

ISS	DATE	REVISION	BY	CHKR	ENG	LP&EC	APVD	M
B	01/14/03	ADDED PRS AND AREA NOTES	SSP					
A	12/03/02	ISSUE FOR REPORT	KRW					

MOUND

Environmental Restoration Geographic Information System

SHEET	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
ISSUE																					

SHEET	1	2	3	4	5	6
ISSUE	B					

PART CLASSIFICATION

FIGURE 2
PRS 277 /278
SAMPLE LOCATIONS

DRAWING CLASSIFICATION: UNCLASSIFIED

SIZE

DRAWING NUMBER: ver_sample_loc.dgn

JOB NUMBER

DWG TYPE: STE | PRMG: ER-GIS | CAGEC | SCALE GRAPHIC | SHEET 1 OF 1

STATUS: MD-REL-12/03/02 | ORIGIN: MSTATION / J

0306XXXXXX-04061 50015 #1 BOX 28144