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REMOVAL SITE EVALUATION CONTAMINATION AT THE FIRE TRAINING FACILITY JUNE 1992

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REMOVAL SITE EVALUATION

Contamination at the Fire Training Facility

Fernald Environmental Management Project
U. S. Department of Energy

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1.0 INTRODUCTION

The Fire Training Facility is located north of the FEMP Production Area (just outside the fenced perimeter) on the North Access Road (See Figure 1 and 1A). This area has historically been used to simulate fire and emergency response conditions for training purposes. The Fire Training Facility presently consists of the following components (See Figure 2):

1. An abandoned two story concrete block structure (bunker)surrounded by an asphalt pad.
2. An eight foot diameter stainless steel pressure vessel with elliptical ends. One end of the vessel has been removed and forms a "bowl" on the east end of the vessel.
3. An unbermed 500 gallon skid mounted steel tank (above ground).
4. An open top partially submerged rectangular tank constructed of salt bath tank from Plant 6.
5. An underground sump with valve to gravity drain water and oil from the pond around the above ground skid tank.

The windows and door of the concrete block structure (bunker) are boarded up to prevent entry into the structure. There are visible cracks in the asphalt pad around the block structure. The pad and the pressure vessel are located on the west side of the North Access Road and access is uncontrolled. The 500 gallon skid tank contains visible holes and is severely corroded. The tank is located in the center of a very shallow circular pond containing brownish liquid. Black stains are evident around the perimeter of the pond. The open top rectangular tank contains approximately 8 inches of brownish liquid. The skid tank and the rectangular tank are enclosed by a 4 foot livestock fence on the east side of the North Access Road to control access to this area and the area is marked off with plastic chain and signs restricting access.

From the best available information it was determined that the following list of materials were burned or stored in the Fire Training Facility:

Material	Source of Material	Comments
Waste Oil	FEMP	Primarily from Garage (Bldg. 31)
Kerosene	FEMP	
Gasoline	FEMP	
Waste Wood Pallets	FEMP	Possibly contaminated
Straw	Non-FEMP	Primarily from Ross, Ohio
Vehicle	FEMP	
Office Furniture	FEMP	
Household Furniture	Unknown	
Rubber Tires	FEMP	
Metallic Sodium	FEMP	
Magnesium	FEMP	
Waste Solvents	Non-FEMP	Usually floor sweeping or broken bags (possibly contaminated) Brought in by other fire departments for training (possibly containing paint thinners)

The Fire Training Facility equipment, tanks, buildings and structures are in Operable Unit 3, residual soils and groundwater are in Operable unit 5. The Fire Training Facility has been determined to be a Hazardous Waste Management Unit (HWMU) under the requirements of the Resource Conservation Recovery Act (RCRA). Boundaries for HWMU are the North Access Road, North Construction Gravel Road, and the North Boundary fence (see Figures 1, 1A, and 2).

This Removal Site Evaluation (RSE) has been completed by the DOE under authorities delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). This RES addresses disposition of the structures and contaminated soils in the Fire Training Facility and has been completed to support the decision as to whether the present conditions warrant a removal action.

2.0 SOURCE TERM

2.1 Hazardous Substance List Sample Data

Eight piezometers were installed in the Fire Training Facility as part of the Remedial Investigation/Feasibility Study (RI/FS) Facility Testing Program (See Figure 2 for locations). These borings were sampled for full hazardous substance list (HSL) parameters in the soil and groundwater. Appendix A contains the results of these soil and groundwater sampling activities. Appendix A only includes analytes that were detected. Undetected analytes are not included in Appendix A.

2.2 Radiological Sample Data

Based upon historical data, it is believed that radionuclide contaminated oils and wastes were burned in the Fire Training Facility. Also, the open top tank which may have been reclaimed from the Plant 6 process area is suspected of being contaminated with radionuclides. A radiological contamination survey was performed at the Fire Training Facility by the Industrial Radiation Safety and Training (IRS&T) Department in May 1989 using a Beta/Gamma Frisker. The results of this survey are presented in Figure 3. In May 1990, groundwater sampled from the eight wells mentioned previously was submitted to the International Technology Corporation Radiological Sciences Laboratory for full radiological analysis. The results of this testing is included in Appendix B. Soil samples were submitted for radiological analysis when the eight wells were originally installed in February 1990. The results of this soil sampling is also included in Appendix B.

3.0 EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

3.1 CHEMICAL PATHWAY ASSESSMENT

3.1.1 Hazardous Substance List Parameters

The HSL sampling results included in Appendix A identify the hazardous substances that were detected in the Fire Training Facility. The results indicate that boring #1509 located to the southwest of the 500 gallon skid tank is the only location where appreciable concentrations of organics were detected in the groundwater. Methylene chloride was also detected in the groundwater from borings 1508, 1511, 1513, and 1514, but at concentrations which were inconclusive when considering that methylene chloride was found in the associated blank for these samples. The HSL substances which were detected in the groundwater at levels above MCL standards for drinking water are listed in Table 2.

Elevated levels of calcium, magnesium, and potassium were also reported in the groundwater from these borings but below harmful concentrations when compared to the recommended daily allowances for these minerals. The groundwater in the Fire Training Facility is not presently utilized as a drinking water supply but the analytical results from this groundwater are compared to proposed or existing drinking water standards for the purposes of this RSE.

3.1.2 Evaluation of the Magnitude of the Potential Chemical Threat

The HSL soil sampling results are listed in Appendix A. It is important to note, however, that a larger number of HSL organic parameters were observed in the soil than the groundwater from these borings. It is probable that these organic compounds are held in retention in the soils and have not migrated to the groundwater. Sample results were not received for boring numbers 1510 and 1511 (excluding arsenic, lead, and potassium results for boring 1511). The soil sampling results also show elevated levels of HSL metals including aluminum, calcium, iron, magnesium, manganese, sodium, and potassium. One HSL parameter (Aroclor-1260) from the pesticides/PCB analysis was detected in the soil sampling results from boring numbers 1508 (240 ug/kg) and 1512 (2700 ug/kg).

Surface contamination including stains are present in addition to soil contamination. Thus a threat exists from migration of the contamination to the perched ground water in the area of the Fire Training Facility.

3.2 Radionuclides

Eight groundwater samples were characterized for a variety of radionuclides, including total uranium and thorium (see Table 3). Four of the samples (50%) for total uranium had concentration levels below 30 picocuries per liter. The groundwater sampling results are compared to the proposed MCL concentrations for uranium in drinking water (assuming natural isotopic proportions) of 20 pCi/L and corresponding to a mass concentration of 30 ug/L of total uranium (assuming a natural distribution of major uranium isotopes). This proposed level is used pending promulgation of an MCL for uranium which is expected in the near future. Other specific radionuclides, including thorium, were identified in only a few of the groundwater samples which further emphasizes the conservative nature of the assessment.

The sampling results for radiological parameters in the groundwater demonstrate that the higher activity levels were detected in the piezometers near the above ground skid tank even though the rectangular open topped tank has much higher activity levels on the surface. This could be attributed to the presumption that radionuclide contaminated oils collected in the circular pond around the skid tank and were able to migrate more easily to the groundwater than the surface contamination on the rectangular tank. Two values for total uranium are listed for each well. The wells were resampled for total uranium approximately one month after the initial sampling.

Boring 1509 has the highest radionuclide concentrations. The complete sampling results for radionuclide parameters (total uranium and total thorium) are included in Appendix B.

3.2.1 Radiological Pathway Assessment and Parameters

In order to support the decision as to whether the present conditions warrant a removal action, a risk analysis was conducted (Appendix C) to characterize the risks to a potential Reasonable Maximum Exposed (RME) individual. The RME individual is identified under the exposure scenario. The exposure scenario evaluated the dose and risk associated with a worker installing a security fence and excavating contaminated soil around the salt bath tank and the pond. The exposure to this individual occurs from two exposure pathways: 1) external radiation pathway from working in the contaminated region and 2) inhalation radiation pathway resulting from breathing resuspended dust containing radionuclides.

Total uranium and thorium, assumed to be represented by a natural isotopic activity distribution, are the only radionuclides of concern. In order to simplify the calculation, as well as provide conservative dose and risk estimates, the maximum total uranium and thorium values were used.

67.8 parts per million = Concentration for Uranium.

138 parts per million = Concentration for Thorium.

Assuming a natural activity distribution would correspond to the following activities:

Total Uranium = 45.2 pCi/g

U-238 = 22.1 pCi/g

U-235 = 1.0 pCi/g

U-234 = 22.1 pCi/g

Although a natural isotopic distribution is assumed for the uranium isotopes, the uranium contamination is assumed to be NORMAL in content, meaning that the uranium has been processed and the only daughters which are included in the dose and risk calculation are the immediate, short-lived daughters, which are thorium-234 and protactinium-234.
Total thorium represents all thorium-232:

Th-232 = 14.96 pCi/g

Th-228 = 14.96 pCi/g (Secular Equilibrium with Thorium-232)

3.2.2 Evaluation of the Magnitude of the Potential Radiological Threat:

Dose and risk estimates were determined for the exposure scenario using the maximum identified source locations. The exposure scenario was specified as the worker who performs the excavation activities along with the installation of the security fencing.

The total risk for the exposure scenario is shown below:

Total Risk = 9.70×10^{-7} (See appendix C)

This risk is based on several assumptions, outlined below, which provide a very conservative risk estimate.

1) A constant homogeneous source distribution.

2) Conservative, hypothetical exposure scenario.

3) A uniform source distribution.

4) A conservative dust resuspension factor.

Table 5 lists the average, maximum, and minimum dose equivalents (mrem/yr.) as derived from the Dose conversion factor for each specific radioisotope. Also, the total dose equivalent, found by summing the individual dose equivalents, is shown at the bottom of Table 5.

Table 1: Source Characterization of Radionuclides in Soil Samples

Radionuclide	Average (ug/g)	Maximum (ug/g)	Minimum (ug/g)
Total Thorium	35.75	136	7
Total Uranium	32.05	67.8	16.4

Table 2: Source Characterization for HSLs in Groundwater Samples.

HSL Parameter	Boring #	Results (ug/L)	MCL Standard (ug/L)
2,4-Dimethylphenol	1509	40	5
Bis (2-Ethylhexel)-phthalate	1509	4	3
Methylene chloride	1509	26	5
1,1 Dichloroethene	1509	490	7
1,2 Dichloroethane	1509	19	5
1,1,1 Trichloroethane	1509	2900	200
Trichloroethene	1509	98	5
Tetrachloroethene	1509	280	0.7

Table 3: Source Characterization for Uranium in Groundwater at each Boring.

Boring #	Isotope	Concentration (Pci/L)	Collection Date (MM/DD/YY)
1508	U-Total	53.9	5/2/90
	U-Total	48.7	6/4/90
1509	U-234	47.1	5/2/90
	U-238	45.3	5/2/90
	U-Total	183	5/2/90
	U-Total	41.3	6/4/90
1510	U-234	44.2	5/3/90
	U-238	38.5	5/3/90
	U-Total	97.2	5/3/90
	U-Total	138	6/4/90
1511	U-234	23.6	5/3/90
	U-238	20.2	5/3/90
	U-Total	31.4	5/3/90
	U-Total	57.4	6/4/90
1513	U-Total	11.5	5/2/90
	U-Total	103	6/16/90

Table 4: Source Characterization of Borings by Depth.

Boring #	Isotope	Reading (ug/g)	Depth (ft)
1509	U-Total	67.8	0 - 0.5
1511	Th-Total	82	0 - 0.5
	Th-Total	48	2.5 - 3.0
	Th-Total	78	6.0 - 6.5
1512	U-Total	38.4	0 - 0.5
	U-Total	136	2.5 - 3.0
1515	U-Total	42.3	0 - 0.5

Table 5: Potential Drinking Water Dose Equivalents

Radionuclide	Average Dose (mrem/yr)	Maximum Dose (mrem/yr)	Minimum Dose (mrem/yr)
Radium-226	3.7	4.7	2.7
Thorium-228	1.3	1.9	0.7
Thorium-230	0.8	1.3	0.5
Thorium-232	4.2	5.7	2.7
Uranium-234	3.5	8.9	0.6
Uranium-235/236	0.3	0.7	0.2
Uranium-238	3.1	8.3	0.5
Total Dose	17	32	8

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4.0 ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the National Contingency Plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415 (b)(2). The following apply specifically to the above background concentrations of contaminants occurring at the Fire Training Facility.

40 CFR 300.415 (b)(2)(iv)

High levels of hazardous substances or pollutants or contaminant in soils largely at or near the surface, that may migrate.

> This factor is considered appropriate as a result of the concentrations of contamination in the surface soils posing a threat of migration to the perched ground water and potential airborne contamination.

5.0 APPROPRIATENESS OF A RESPONSE

If it is determined that a response action is appropriate due to both the level of contamination found in the soils in the Fire Training Facility and the potential of contaminant migration, a removal action is required to address the existing situation. If a planning period of less than six months exists prior to initiation of a response action, DOE will issue an Action Memorandum. The Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, DOE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat of public health and the environment. It will also serve as a decision document to be included in the Administrative Record.

APPENDIX A

HAZARDOUS SUBSTANCE LIST SAMPLING RESULTS

TABLE A.1

Hazardous Substance List Soil Sampling Results

Organics - Current EPA CLP Protocol - MV702 (ug/kg)

Parameter		Boring Number 1508	1509	1510	1511	1512	1513	1514	1515
Methylene Chloride	V	4JB	5JB	D	5JB	5JB			4JB
2-Butanone	V	76B	54B	D	59B	86B			50B
Acetone	V		10JB	D	16B				13B
1,2-Dichloroethane	V		6	D					
1,1,1-Trichloroethane	V		1J	D					
Tetrachloroethene	V		2J	D					
Toluene	V		2J	D					
Hexanedioic Acid, Dioctyl ES	SV			D					
1,2-Dichloroethylene	V		2J	D			240J		
unknown (hydroxypentanone?)	SV			D		1100ABJ	1100ABJ	1300ABJ	1700ABJ
2-Pentanone, 4-Hydroxy 4-Met	SV			D		34000ABJ	17000ABJ	19000ABJ	18000ABJ
Unknown (sat'd HC)	SV			D		840J			
Pentachlorophenol	SV			D			98J		530J
Unknown	SV			D		970	250J	340J	
Benzoic Acid	SV			D			49JB		
2-Hexanal	SV			D			180JB	200BJ	250JB
2-Hexanone, 6-(Acetyloxy)	SV			D			670ABJ	720ABJ	1000ABJ
4-Heptanol, 2-methyl	SV			D			180JB	230JB	
Hexadecanoic acid	SV			D			350JB	200J	
N-Nitrosodi-phenylamine(1)	SV			D					
9-Octadecenamide, (2)	SV			D				46	
Chloroform	V			D					620J
									2J

TABLE A.1 (Continued)

TAL ICP Metals - EPA CLP Protocol - AP703 (mg/kg)

Parameter		Boring Number 1508	1509	1510	1511	1512	1513	1514	1515
Aluminum		10600	8470	D	14300	13300	14400	16800	12400
Barium		95	69.2	D	119	135	128	156	134
Cadmium		2.6	4.2	D	3.9	3.3	3.4	3.4	2.9
Calcium		44900I	97700I	D	28600I	20600I	10100I	4910I	4850I
Chromium		20.7	24.3	D	23.6	20.8	19.5	19.8	14.3
Iron		19900	16200	D	26500	24200	29900	30200	26900
Magnesium		6190	24600	D	12100	7660	4900	3890	2830
Manganese		436	495	D	833	678	285	1080	765
Silver		2.8		D	2.9	5.6			
Sodium		102	154I	D	87.6I	139I	363I	85.3I	91.2I
Vanadium		24.6	25.8E	D	24.9E	22.9E	20.4D	21.9E	25.7E
Zinc		52.2	47.3E	D	64.8E	75.3E	74.8E	74.7E	54.8E
Beryllium		1.4	1.6	D	1.5	1.8	1.8	1.9	1.7
Cobalt		12.3	10.2I	D	18.6	14.7	13.4	20.3	16.9
Copper		15.3	11.4	D	18.1	19.2	19.8	21.5	13.8
Nickel		34.1	67.1	D	43.2	36.8	50.5	50	28.7
Arsenic	W	4.8	5.1	D	7.6	5.1		10	5.7
Lead	W	14.8	21.1	D	2.1	25.4	20.9	15.4	18.5
Selenium	W			D					
Thallium	W			D					
Potassium	X	1020	935I	D	827I	977I	783I	775	590I
Mercury	Y		0.18	D	0.11				
Cyanide	Z		0.5I	D					

TABLE A.1 (Continued)

EPA CLP TCL Pesticides & PCBs - Current EPA Protocol - (ug/kg)

Parameter	Boring Number 1508	1509	1510	1511	1512	1513	1514	1515
Aroclor-1260	240		D		2700[J]			

TABLE A.2

Hazardous Substance List Groundwater Sampling Results

TAL ICP Metals - EPA CLP Protocol - (ug/l)

Parameter	Boring Number 1508	1509	1510	1511	1512	1513	1514	1515
Aluminum	91.7I	121I	93I	842	89.3I	110I	137I	162I
Barium	77.1I	94.6I	64.9I	78.4I	116I	62.4I	83.4I	115I
Cadmium	3.3I	6.2	5.4	3.7I	6.5	4.6I	4.6I	5.5I
Calcium	105000	155000	126000	116000	136000	106000	98800	111000
Chromium	25.2	35.9	32.2	28	31.1	26.8	24.6	29.6
Iron	59.2I	296	38.5I	555	41.7I	62.2I	108	152
Magnesium	30500	45300	30700	32000	52200	33400	33100	41800
Manganese	1470	2540	344	1220	794	67.3	74.3	206
Silver	17.9	24.3	21.6	19.3	21.5	18.5	17.9	19
Sodium	19500	33600	18500	12200	20000	21300	11800	26000
Vanadium	14.3I	19.3I	16.1I	14I	16.1I	14I	12.9I	14.4I
Zinc	17.9I	11.4I	10.3I	9.2I	17.7I	12I	10.5I	
Arsenic	2.2I	2.8I				7.1E		
Lead	5.3NI	2.6INI				5INI		3.5INI
Potassium	1030I	695I	1060I	2380I	2330I	597I	1340I	514I
Copper		11.7I	12.1I					
Nickel		25.6I		20I	20.8I	20.2I		21.6I
Mercury				.73N				

TABLE A.2 (Continued)

Organics - Current EPA CLP Protocol - (ug/l)

Parameter	Boring Number 1508	1509	1510	1511	1512	1513	1514	1515
Benzyl alcohol		5J						
4-Methylphenol		15						
2,4-Dimenthylphenol		40						
Benzoid Acid		25J						
bis (2-Ethylhexl) phthalate		4J						
Methylene Chloride V	1BJ	26B						
1,1-Dichloroethane V	3J	2500E		1BJ		1BJ	1BJ	
Chloroethane V		110						
1,1-Dichloroethene V		490E						
1,2-Dichloroethane V		19						
1,1,1-Trichloroethane V		2900E						
Trichloroethene V		98						
Tetrachloroethene V		280E						
Toluene V		260E						
Ethylbenzene V		13						
Total Xylenes V		55						
Acetone V		59						

TABLE A.3

Qualifiers and Symbols

B	Analyte found in associated blank
J	Estimated value (1:1 response assumed or less than quantitations limit but greater than zero)
A	A TIC is a suspected aldol-condensation product
I	Reported value is less than Contract-Required Detection Limit (CRDL), but greater than the Instrument Detection Limit (IDL)
E	Estimated value due to interference
N	Spiked sample recovery not within control limits
T	Duplicate analysis not within control limits
W	TAL Metal Analysis by Furnace - Current EPA CLP Protocol
X	Potassium by Flame - Current EPA CLP Protocol
Y	Mercury by Cold Vapor - Current EPA CLP Protocol
Z	Total Cyanide - Current EPA CLP Protocol
D	Sample results have not been returned from laboratory to date.
L	Compound analyzed at a secondary dilution factor
V	Volatile Organic by GCMS - Current EPA CLP Protocol - (ug/L)
SV	Semi-volatile organic
F	Post digestion spike for furnace AA analysis is out of control limits

Blank fields indicate that analyte was not detected.

APPENDIX B

RADIOLOGICAL SAMPLING RESULTS

8.1 cl.

TABLE B.1

Radiological Groundwater Sampling Results from Boring 1508

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/2/90
PU-238	< 1.0		pCi/L	5/2/90
PU-239/240	< 1.0		pCi/L	5/2/90
RA-226	3.37	0.57	pCi/L	5/2/90
RA-228	< 3.0		pCi/L	5/2/90
SR-90	< 5.0		pCi/L	5/2/90
TC-99	< 30		pCi/L	5/2/90
TH-228	3.40	0.95	pCi/L	5/2/90
TH-230	3.44	0.96	pCi/L	5/2/90
TH-232	2.84	0.85	pCi/L	5/2/90
TH-Total	25.6	7.7	ug/L	5/2/90
U-234	15.7	2.2	pCi/L	5/2/90
U-235/236	1.20	0.39	pCi/L	5/2/90
U-238	15.2	2.2	pCi/L	5/2/90
U-Total	53.9	8.4	ug/L	5/2/90
CS-137	< 20		pCi/L	5/2/90
RU-106	< 150		pCi/L	5/2/90
U-Total	48.7	6.8	ug/L	6/4/90

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1509

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/2/90
PU-238	< 1.0		pCi/L	5/2/90
PU-239/240	< 1.0		pCi/L	5/2/90
RA-226	< 1.0		pCi/L	5/2/90
RA-228	< 3.0		pCi/L	5/2/90
SR-90	< 5.0		pCi/L	5/2/90
TC-99	< 30		pCi/L	5/2/90
TH-228	< 1.0		pCi/L	5/2/90
TH-230	2.67	0.89	pCi/L	5/2/90
TH-232	< 1.0		pCi/L	5/2/90
TH-Total	5.91	4.25	ug/L	5/2/90
U-234	47.1	17.9	pCi/L	5/2/90
U-235/236	2.4	0.6	pCi/L	5/2/90
U-238	45.3	5.9	pCi/L	5/2/90
U-Total	183	30	ug/L	5/2/90
CS-137	< 20		pCi/L	5/2/90
RU-106	< 150		pCi/L	5/2/90
U-Total	41.3	9.9	ug/L	6/4/90

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1510

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/3/90
PU-238	< 1.0		pCi/L	5/3/90
PU-239/240	< 1.0		pCi/L	5/3/90
RA-226	5.93	0.91	pCi/L	5/3/90
RA-228	< 3.0		pCi/L	5/3/90
SR-90	< 5.0		pCi/L	5/3/90
TC-99	*		pCi/L	5/3/90
TH-228	< 1.0		pCi/L	5/3/90
TH-230	1.21	0.64	pCi/L	5/3/90
TH-232	1.31	0.66	pCi/L	5/3/90
TH-Total	11.8	6.0	ug/L	5/3/90
U-234	44.2	5.7	pCi/L	5/3/90
U-235/236	3.74	0.77	pCi/L	5/3/90
U-238	38.5	5.0	pCi/L	5/3/90
U-Total	96.2	12.9	ug/L	5/3/90
CS-137	< 20		pCi/L	5/3/90
RU-106	< 150		pCi/L	5/3/90
U-Total	138	18	ug/L	6/4/90

* Data will be reported by the laboratory at a later date.

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1511

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/3/90
PU-238	< 1.0		pCi/L	5/3/90
PU-239/240	< 1.0		pCi/L	5/3/90
RA-226	< 1.0		pCi/L	5/3/90
RA-228	< 3.0		pCi/L	5/3/90
SR-90	< 5.0		pCi/L	5/3/90
TC-99	•		pCi/L	5/3/90
TH-228	< 1.0		pCi/L	5/3/90
TH-230	< 1.0		pCi/L	5/3/90
TH-232	< 1.0		pCi/L	5/3/90
TH-Total	< 3.7		ug/L	5/3/90
U-234	23.6	3.0	pCi/L	5/3/90
U-235/236	2.48	0.52	pCi/L	5/3/90
U-238	20.2	2.6	pCi/L	5/3/90
U-Total	31.4	5.1	ug/L	5/3/90
CS-137	< 20		pCi/L	5/3/90
RU-106	< 150		pCi/L	5/3/90
U-Total	57.4	11.8	ug/L	6/4/90

• Data will be reported by the laboratory at a later date.

TABLE 3.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1512

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/3/90
PU-238	< 1.0		pCi/L	5/3/90
PU-239/240	< 1.0		pCi/L	5/3/90
RA-226	< 1.0		pCi/L	5/3/90
RA-228	< 3.0		pCi/L	5/3/90
SR-90	*		pCi/L	5/3/90
TC-99	*		pCi/L	5/3/90
TH-228	< 1.0		pCi/L	5/3/90
TH-230	< 1.0		pCi/L	5/3/90
TH-232	< 1.0		pCi/L	5/3/90
TH-Total	< 7.0		pCi/L	5/3/90
U-234	4.44	0.83	ug/L	5/3/90
U-235/236	< 1.0		pCi/L	5/3/90
U-238	3.20	0.66	pCi/L	5/3/90
U-Total	12.9	1.4	pCi/L	5/3/90
CS-137	< 20		ug/L	5/3/90
RU-106	< 150		pCi/L	5/3/90
U-Total	23.4	3.6	pCi/L	5/3/90
			ug/L	6/16/90

- Data will be reported by the laboratory at a later date.

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1513

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/2/90
PU-238	< 1.0		pCi/L	5/2/90
PU-239/240	< 1.0		pCi/L	5/2/90
RA-226	< 1.0		pCi/L	5/2/90
RA-228	< 3.0		pCi/L	5/2/90
SR-90	< 5.0		pCi/L	5/2/90
TC-99	< 30.		pCi/L	5/2/90
TH-228	1.29	0.55	pCi/L	5/2/90
TH-230	< 1.0		pCi/L	5/2/90
TH-232	< 1.0		pCi/L	5/2/90
TH-Total	7.78	4.19	ug/L	5/2/90
U-234	2.94	0.60	pCi/L	5/2/90
U-235/236	< 1.0		pCi/L	5/2/90
U-238	2.71	0.57	pCi/L	5/2/90
U-Total	11.5	1.2	ug/L	5/2/90
CS-137	< 20		pCi/L	5/2/90
RU-106	< 150		pCi/L	5/2/90
U-Total	103	14	ug/L	6/16/90

- Data will be reported by the laboratory at a later date.

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1514

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/3/90
PU-238	< 1.0		pCi/L	5/3/90
PU-239/240	< 1.0		pCi/L	5/3/90
RA-226	< 1.0		pCi/L	5/3/90
RA-228	< 3.0		pCi/L	5/3/90
SR-90	< 5.0		pCi/L	5/3/90
TC-99	*		pCi/L	5/3/90
TH-228	< 1.0		pCi/L	5/3/90
TH-230	1.28	0.55	pCi/L	5/3/90
TH-232	< 1.0		pCi/L	5/3/90
TH-Total	< 4.7		ug/L	5/3/90
U-234	6.22	0.99	pCi/L	5/3/90
U-235/236	< 1.0		pCi/L	5/3/90
U-238	5.31	0.88	pCi/L	5/3/90
U-Total	18.1	2.7	ug/L	5/3/90
CS-137	< 20		pCi/L	5/3/90
RU-106	< 150		pCi/L	5/3/90
U-Total	10.6	1.1	ug/L	6/16/90

* Data will be reported by the laboratory at a later date.

TABLE B.1 (Continued)

Radiological Groundwater Sampling Results From Boring 1515

Parameter	Result	2-Sigma Error	Units	Date Collected
NP-237	< 1.0		pCi/L	5/2/90
PU-238	< 1.0		pCi/L	5/2/90
PU-239/240	< 1.0		pCi/L	5/2/90
RA-226	< 1.0		pCi/L	5/2/90
RA-228	< 3.0		pCi/L	5/2/90
SR-90	< 5.0		pCi/L	5/2/90
TC-99	< 30.		pCi/L	5/2/90
TH-228	< 1.0		pCi/L	5/2/90
TH-230	< 1.0		pCi/L	5/2/90
TH-232	< 1.0		pCi/L	5/2/90
TH-Total	2.75	2.49	ug/L	5/2/90
U-234	4.79	0.80	pCi/L	5/2/90
U-235/236	< 1.0		pCi/L	5/2/90
U-238	4.20	0.72	pCi/L	5/2/90
U-Total	11.0	1.9	ug/L	5/2/90
CS-137	< 20		pCi/L	5/2/90
RU-106	< 150		pCi/L	5/2/90
U-Total	15.8	2.6	ug/L	6/16/90

- Data will be reported by the laboratory at a later date.

TABLE B.2

Radiological Soil Sampling Results from Boring 1508

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	16.4	2.6	ug/g
U - Total	3.0 - 3.5	8.26	2.54	ug/g
U - Total	6.0 - 6.5	10.6	3.0	ug/g
U - Total	10.0 - 10.5	<3.45		ug/g
Th - Total	0.0 - 0.5	5	2	ug/g
Th - Total	3.0 - 3.5	14	4	ug/g
Th - Total	6.0 - 6.5	10	3	ug/g
Th - Total	10.0 - 10.5	6	2	ug/g

Radiological Soil Sampling Results from Boring 1509

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	67.8	8.1	ug/g
U - Total	3.0 - 3.5	14.3	3.8	ug/g
U - Total	5.0 - 5.5	13.6	3.8	ug/g
U - Total	10.0 - 10.5	<4.62		ug/g
U - Total	15.0 - 15.5	8.25	2.82	ug/g
Th - Total	0.0 - 0.5	4	2	ug/g
Th - Total	3.0 - 3.5	10	3	ug/g
Th - Total	5.0 - 5.5	10	3	ug/g
Th - Total	10.0 - 10.5	16	4	ug/g
Th - Total	15.0 - 15.5	10	4	ug/g

TABLE B.2 (Continued)

Radiological Soil Sampling Results from Boring 1510

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	17.2	4.8	ug/g
U - Total	2.5 - 3.0	6.44	3.84	ug/g
U - Total	5.0 - 5.5	8.52	3.21	ug/g
Th - Total	0.0 - 0.5	6	2	ug/g
Th - Total	2.5 - 3.0	10	4	ug/g
Th - Total	5.0 - 5.5	7	2	ug/g

Radiological Soil Sampling Results from Boring 1511

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	23.2	4.7	ug/g
U - Total	2.5 - 3.0	10.1	3.3	ug/g
U - Total	6.0 - 6.5	6.53	3.33	ug/g
U - Total	10.0 - 10.5	6.41	3.17	ug/g
Th - Total	0.0 - 0.5	82	17	ug/g
Th - Total	2.5 - 3.0	48	10	ug/g
Th - Total	6.0 - 6.5	78	17	ug/g
Th - Total	10.0 - 10.5	17	4	ug/g

TABLE B.2 (Continued)

Radiological Soil Sampling Results from Boring 1512

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	38.4	5.3	ug/g
U - Total	2.5 - 3.0	8.47	3.3	ug/g
U - Total	5.0 - 5.5	<5.07		ug/g
U - Total	10.0 - 10.5	3.4	2.94	ug/g
Th - Total	0.0 - 0.5	3	1	ug/g
Th - Total	2.5 - 3.0	136	26	ug/g
Th - Total	5.0 - 5.5	7	2	ug/g
Th - Total	10.0 - 10.5	<4		ug/g

Radiological Soil Sampling Results from Boring 1513

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	22.8	4.6	ug/g
U - Total	2.5 - 3.0	7.07	2.25	ug/g
U - Total	5.0 - 5.5	<4.48		ug/g
U - Total	10.0 - 10.5	20.7	4.5	ug/g
U - Total	15.0 - 15.5	13.8	4.0	ug/g
Th - Total	0.0 - 0.5	6	2	ug/g
Th - Total	3.0 - 3.5	8	3	ug/g
Th - Total	5.0 - 5.5	5	3	ug/g
Th - Total	10.0 - 10.5	3	2	ug/g
Th - Total	15.0 - 15.5	11	3	ug/g

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TABLE B.2 (Continued)

Radiological Soil Sampling Results from Boring 1514

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	28.3	5.5	ug/g
U - Total	2.0 - 2.5	10.2	3.5	ug/g
U - Total	5.0 - 5.5	2.93	2.31	ug/g
U - Total	10.0 - 10.5	3.55	2.40	ug/g
Th - Total	0.0 - 0.5	6	2	ug/g
Th - Total	2.0 - 2.5	7	2	ug/g
Th - Total	5.0 - 5.5	7	2	ug/g
Th - Total	10.0 - 10.5	7	3	ug/g

Radiological Soil Sampling Results from Boring 1515

Parameter	Depth (ft.)	Result	2-Sigma Error	Units
U - Total	0.0 - 0.5	42.3	6.0	ug/g
U - Total	2.5 - 3.0	3.56	3.36	ug/g
U - Total	5.0 - 5.5	6.68	3.24	ug/g
U - Total	10.0 - 10.5	<5.58		ug/g
Th - Total	0.0 - 0.5	5	2	ug/g
Th - Total	2.5 - 3.0	10	2	ug/g
Th - Total	5.0 - 5.5	6	2	ug/g
Th - Total	10.0 - 10.5	9	2	ug/g

APPENDIX C

ESTIMATION OF POTENTIAL DOSE AND RISK ASSOCIATED WITH THE INSTALLATION OF A SECURITY FENCE AND THE EXCAVATION OF CONTAMINATED SOIL IN THE FIRE TRAINING AREA

INTRODUCTION

This assessment will characterize the doses and risks to a Reasonable Maximum Exposed (RME) individual as identified under Exposure Scenario below:

A exposed worker who both installs a security fence and excavates the material around the salt tank as well as the pond. This person is assumed to work in the eastern portion of the fire training area on a daily basis, five days per week for a total of one month. The fence will enclose an area of 2090.3 m^2 and will be constructed with fence post that are driven into the ground without removing any soil. The soil excavation would consist of removing soil from two areas. The area of the pond, which is approximately 116.75 m^2 and the area of the salt bath tank, which is approximately 23.24 m^2.The total excavation area is about 140 m^2. The format for this investigation will consist of the following components: 1) source characterization, 2) exposure scenario and their associated parameters, 3) exposure pathways and their methodology, and 4) dose and risk results for the exposure scenario.

SOURCE CHARACTERIZATION

The radioactivity sources for this investigation are assumed to be uniformly and homogeneously distributed throughout the contaminated zone, as represented by the maximum observed concentrations of total uranium and thorium in Attachment B. In addition, a uniform distribution of radionuclides are assumed. The fire training facility can be considered an infinite or semi-infinite region. The volume of contamination is assumed to be uniformly distributed to an infinite depth as well. As a result of these assumptions, the resulting dose distribution can be assumed to be uniform within the body (USDOE, 1989). Finally by utilizing these idealized assumptions, dose conversion factors (DCFs) relating an effective dose equivalent rate to a radionuclide concentration can be established.

The external radiation pathway is primarily controlled by gamma-ray radiation. Gamma radiation is the primary radiation of concern for the external radiation pathway because it penetrates the body to represent a dose at considerable distances. The DCFs for ground contamination were developed based on exposure at a distance of one meter above the ground. These DCFs represent the annual effective dose equivalent from exposure to external radiation.

The radiation dose from inhalation has been extensively evaluated by the International Commission on Radiation Protection in its Publication 30 (ICRP, 1979-1982). Dose equivalents in organs and tissues of the body are calculated with models that describe first the entrance of materials into the body and then the deposition and later retention of the radionuclides in the bodily organs. Dose equivalents estimate the energy deposition of the radionuclides in the tissues of the body (ICRP, 1979-1982). Dose conversion factors for inhalation represent committed effective dose equivalents per unit intake of a radionuclide. Figures 1 & 2 identify the proposed security fence and soil excavation activities in the fire training area. The tables of Attachment B identify both soil and groundwater results for total uranium and thorium for the fire training area.

Total uranium and thorium, assumed to be represented by a natural isotopic activity distribution, are the only radionuclides of concern. In order to simplify the calculations, as well as provide conservative dose and risk estimates, the maximum total uranium and thorium values were used.

67.8 parts per million = Average Concentration for Uranium.

136 parts per million = Average Concentration for Thorium.

Assuming a natural activity distribution would correspond to the following activities:

Total Uranium = 45.2 pCi/g

U-238 = 22.1 pCi/g

U-235 = 1.0 pCi/g

U-234 = 22.1 pCi/g

Although a natural isotopic distribution is assumed for the uranium isotopes, the uranium contamination is assumed to be NORMAL in content, meaning that the uranium has been processed and the only daughters which are included in the dose and risk calculations are the immediate, short-lived daughters, which are thorium-234 and Protactinium-234.

Mass of Total Thorium Represents All Thorium-232

Th-232 = 14.96 pCi/g

Th-228 = 14.96 pCi/g (Secular Equilibrium with Thorium-232)

EXPOSURE SCENARIO AND PARAMETERS

The exposure scenario evaluates the exposure to a worker who installs the fence and excavates soil. In addition to an external radiation dose, the installation of the fence and soil excavation is assumed to result in the resuspension of dust during excavation activities which can also result in a potential dose to the RME individual.

The exposure scenario, characterizing the RME individual who will be performing the installation of the fence and excavating the soil, is composed of two pathways: external radiation and inhalation of resuspended dust. The inhalation of resuspended dust becomes potentially significant where excavation of contaminated soil occurs.

The exposure and source term parameters for the external radiation and inhalation pathways are as follows:

EF = 0.0197 Exposure Factor for both external radiation and inhalation (See Reference 5, based on a limited exposure duration of 8 hours, five days each week for a total of 4.3 weeks.)

Bulk Density = Soil default value of 1.8 g/cm^3.

FA_1 = 11 External radiation area factor.
$FA_2 = A^{1/2}/(A^{1/2}+DL)$. Inhalation area factor, see calculations in the Exposure Pathways and Methodology Section.

A = Area of Contamination. DL = Dilution length, default value of 3 meters is typically used. The subscript (2) represents the inhalation pathway.

FCD_{11} = 1, External radiation depth factor.(USDOE 1989)

FCD_{12} = 1, Inhalation depth factor, For Cd(t) = 0, T(t) $\geq$ dm.

Where Cd(t) = Uncontaminated cover depth at time t is equal to zero, due to start of excavation.

T(t) = Contaminated zone thickness at time t is approximately 1 meter, dm = Mixing depth default of 0.15 meters, based on the air resuspension model. (US DOE 1989)

FI = Inhalation Rate, 8400 m^3/yr.

EXPOSURE PATHWAYS AND METHODOLOGY

The direct radiation pathway is shown in Equation (1) below:

DOSE (mrem/yr) = DCF_{11} x Bulk Density x Source Conc. x EF x FA_1 x FS (1)

DCF_{11} = (mrem/yr)/(pCi/cm^3) representing the annual effective dose equivalent from exposure to external radiation. See Table 3-1 of this appendix for the specific values.

Bulk Density of soil with a default value of 1.8 g/cm^3.

Source Term = Picocuries/Gram of Soil for the ith radionuclide. Use the radionuclide specific values on page 3.

FS = Shape Factor, 1. The shape factor corrects for a noncircular shape area factor.

FA_1 = Area Factor, 1. The area factor represents a circular-area equivalent contaminated zone. A more detailed analysis can be found in DOE. 1989.

EF = Exposure Factor, see previous description.
= 0.0197

The inhalation of resuspended dust pathway is shown in Equation (2) below:

DOSE (mrem/yr) . ASR x FA_2 x FCD_{12}(t) x EF x FI_2 x Source rerm x DCF_{12} (2)

ASR = Air-to-Soil resuspension factor, 2 $x10^{-4}$ g/m^3 typically used value (USDOE, 1989).

FA_2 = Area Factor for the inhalation pathway which is identified by the subscript number 2.

$*FA_2 = A^{1/2}/(A^{1/2} + DL) = 140^{1/2}/(140^{1/2}+3)=0.789$
Where DL = Dilution length, default value of 3 meters. (USDOE, 1989)

Contaminated zone area based on excavation of 140 m^2.

$FCD_{12}(t)$ = Cover and Depth factor, 1. The cover and depth factor represents the fraction of resuspended soil particles at the ground surface that are contaminated. It is calculated by assuming that the mixing of the soil will occur within a layer of thickness d_m at the surface (USDOE, 1989). The subscript (2) represents the inhalation pathway.

The term $C_d(t)$ represents the uncontaminated cover depth (meters) at time "t". The T(t) term represents the contaminated thickness depth (meters) at time "t".

EF = Exposure Factor, (0.0197 for the exposure Scenario).

FI = Average adult breathing rate, 8400 m^3/yr.

Source Term = Picocuries per Gram of soil for the ith radionuclide. See page 3 for radionuclide specific concentrations.

DCF_{12} = Annual committed Effective Dose Equivalent from a one time exposure one intake of the i_{th} radionuclide (USDOE, 1989). See Table 3-2 for specific DCFs.

DOSE AND RISK RESULTS

The purpose of this section is to integrate the source term characterization, the exposure scenario description, and the pathway analysis methodology in order to estimate the resulting dose and risk. Using this exposure scenario, dose and risk will be estimated for the fence instillation and soil excavation. Table 3.1 provides estimated doses and risks for the external radiation pathway.

Table 3-1: Doses and Risks for the External Radiation Pathway

Dose = DCF_{i1} x Bulk Density x Source Term x EF x FA_1, x FS

Radionuclide	DCF_{i1} (mren/yr)/(pCi/cm^3)	Dose (mrem/yr)	Risk/yr
U-238+D	7×10^{-2}	5×10^{-2}	1×10^{-8}
U-235+D	5×10^{-1}	2×10^{-2}	3×10^{-9}
U-234+D	7×10^{-4}	5×10^{-4}	1×10^{-10}
Total U		7×10^{-2}	1×10^{-8}
Th-232+D	6×10^{-4}	3×10^{-4}	6×10^{-11}
Th-228+D	7	4	8×10^{-7}
Total Th	-	4	8×10^{-7}

Sum of External Risk = $1 \times 10^{-8} + 8 \times 10^{-7} = 8 \times 10^{-7}$

* Based on BEIR III Risk Coefficient of 2×10^{-7} risk/mrem

+D = Aggregated Dose Conversion Factors for Intake of Principal Radionuclide Plus Radionuclides of Associated decay chain in secular equilibrium.

General Equation for the Inhalation of Resuspended Dust Pathway

Dose = DCF^{12} x ASR x FA^2 x Source Term x FCD^{12} x EF x FI^2

Table 3-2:Doses and Risks from the Inhalation of Resuspended Dust Pathway

Radionuclide	DCF_{12} (mren/yr)/(pCi/cm^3)	Dose (mrem/yr)	Risk/yr
U-238+D	1.2×10^{-1}	9×10^{-2}	2×10^{-8}
U-235+D	1.2×10^{-1}	4×10^{-3}	8×10^{-10}
U-234+D	1×10^{-1}	1×10^{-1}	2×10^{-8}
Total U		2×10^{-1}	4×10^{-8}
Th-232+D	1	5×10^{-1}	1×10^{-7}
Th-228+D	3×10^{-1}	2×10^{-1}	3×10^{-8}
Total Th	-	7×10^{-1}	1×10^{-7}

Sum of Inhalation Risk = $4 \times 10^{-8} + 1 \times 10^{-7} = 2 \times 10^{-7}$

TOTAL RISK (External and Inhalation) = $8 \times 10^{-7} + 2 \times 10^{-7} = 1 \times 10^{-6}$

* Based on using BEIR III Risk Coefficient of 2×10^{-7} risk/mrem.

+D = Aggregated Dose Conversion Factors for Intake of Principal Radionuclide Plus Radionuclides of Associated decay chain in secular equilibrium.

SUMMARY/DISCUSSION OF RESULTS

Dose and risk were estimated for the exposure scenario for the maximum identified source locations. This scenario was identified by the worker who performs the excavation activities along with the installation of the securit~ fence.

The total risk for This exposure scenario is shown below. This value represents the potential risk to the individual in the above workinq situation.

Total Risk = 1×10^{-6}

This risk is based on several assumptions, outlined below, which greatly exaggerate the doses and associated risks.

1) A constant homogeneous source distribution.

2) Conservative, hypothetical exposure scenario.

3) A uniform source distribution.

4) A conservative dust resuspension factor.

APPENDIX C REFERENCES

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4. U. S. Department of Energy, 1989. A manual for Implementing Residual Radioactive Material Guidelines, Argonne National Laboratory, ANL/ES-160, DOE/CH/8901

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1. U.S. Department of Energy, 1988. Internal Dose Conversion Factors for Calculation of Dose to the Public, National Technical Information Service, Contract Number: DE88-014297.

2. U.S. Nuclear Regulatory Commission, 1981. "Disposal or Onsite Storage of Thorium and Uranium Wastes from Past Operations," Federal Register, Volume 46, Number 205, page 52061 f.

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4. U.S. Environmental Protection Agency, 1989. Risk Assessment Guidance for Superfund: Human Health Evaluation Manual Part A, Interim Final, Office of Emergency and Remedial Response, Washington, D.C. OSWER Directive 9285.7-01a.

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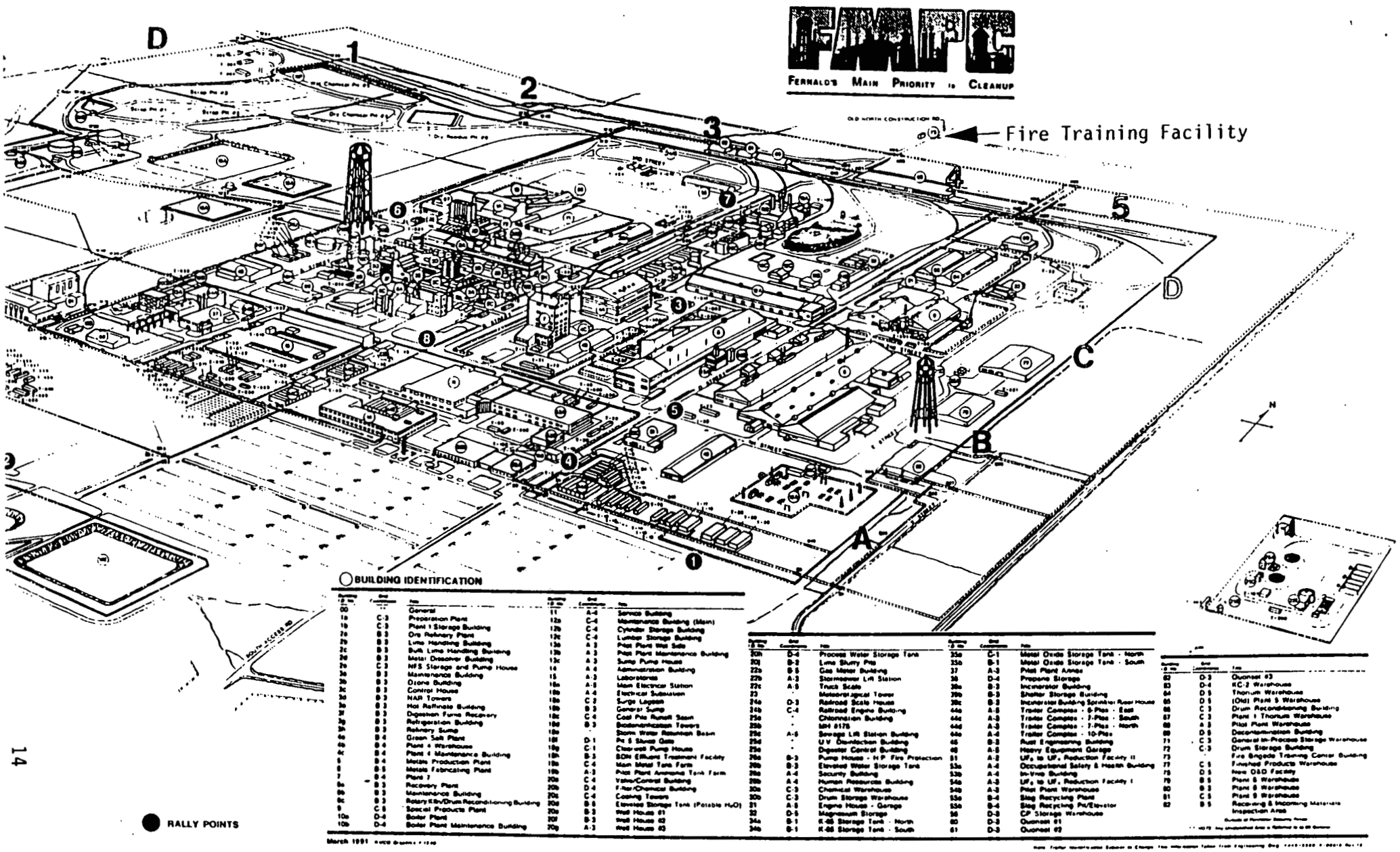


FIGURE 1
Location of Fire
Training Facility

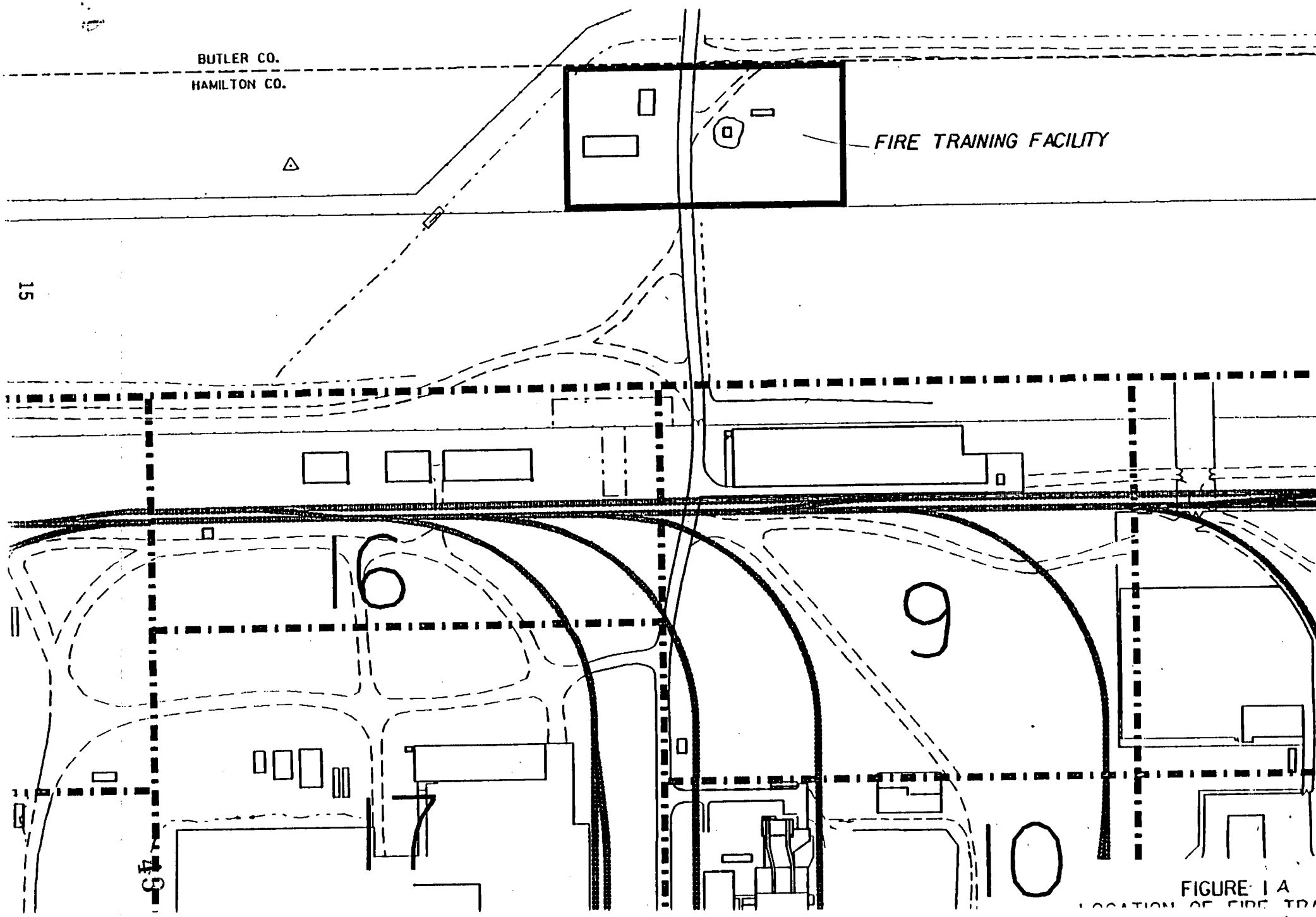


FIGURE 1 A
LOCATION OF FIRE TRA

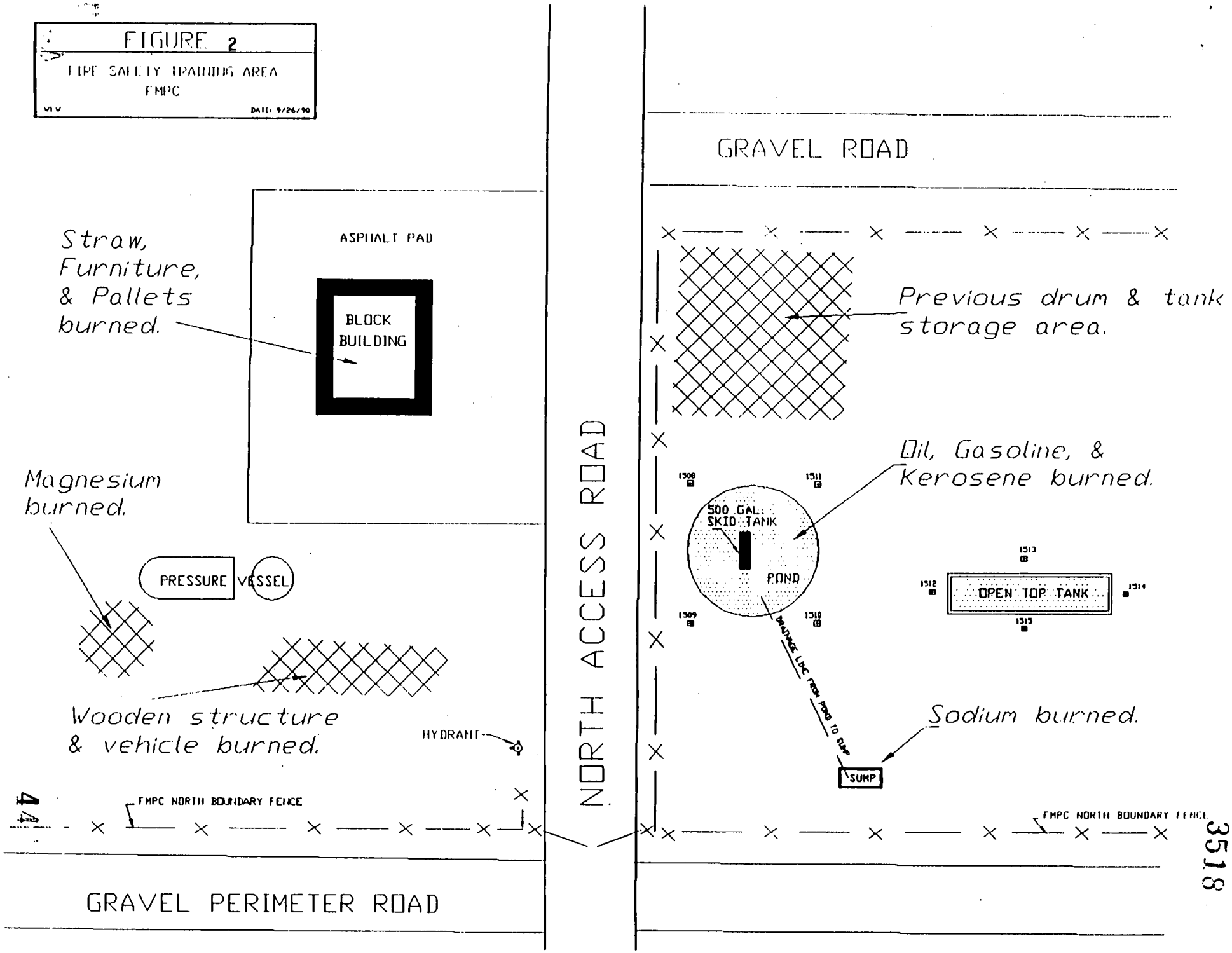


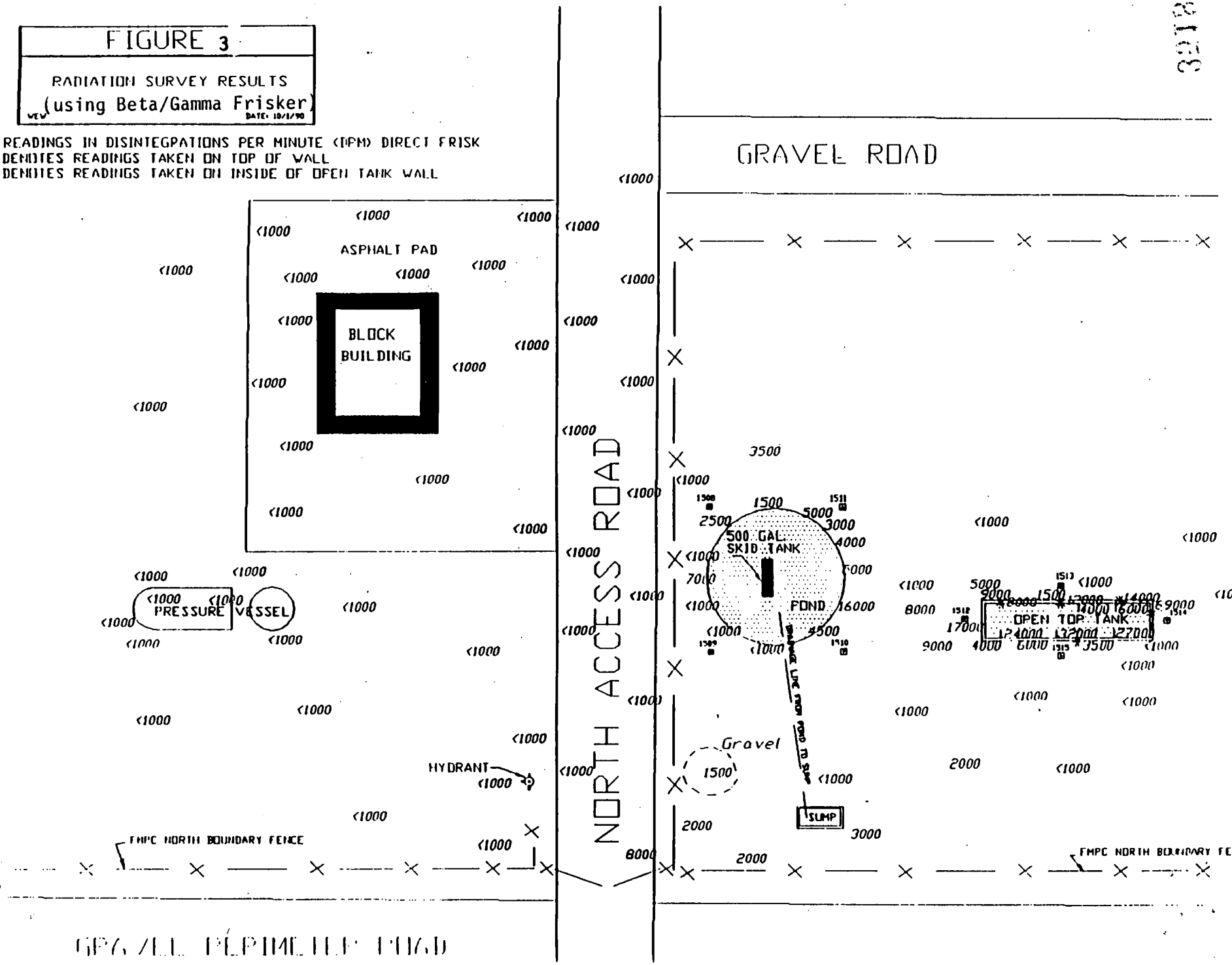
FIGURE 2
FIRE SAFETY TRAINING AREA
FMPC
DATE: 9/26/90
GRAVEL ROAD
ASPHALT PAD
BLOCK BUILDING
Straw, Furniture, & Pallets burned.
Previous drum & tank storage area.
Oil, Gasoline, & Kerosene burned.
Magnesium burned.
500 GAL. SKID TANK
POND
1508
1511
1509
1510
1513
1512
1514
1515
OPEN TOP TANK
PRESSURE VESSEL
DRAINAGE LINE FROM POND TO SUMP
Sodium burned.
Wooden structure & vehicle burned.
HYDRANT
SUMP
FMPC NORTH BOUNDARY FENCE
FMPC NORTH BOUNDARY FENCE
NORTH ACCESS ROAD
GRAVEL PERIMETER ROAD

FIGURE 3

RADIATION SURVEY RESULTS
(using Beta/Gamma Frisker)

REV DATE: 10/1/90

NOTE: READINGS IN DISINTEGRATIONS PER MINUTE (DPM) DIRECT FRISK
* DENOTES READINGS TAKEN ON TOP OF WALL
1 DENOTES READINGS TAKEN ON INSIDE OF OPEN TANK WALL



3519

TYPIST: MA
CONCURREN

RTG. SYMBOL FN: RJ
INITIALS/SIG.
DATE 7/10/

RTG. SYMBOL FN: JRC
INITIALS/SIG.
DATE 7/10/9

RTG. SYMBOL FN: WG
INITIALS/SIG
DATE 7/10/9

RTG. SYMBOL FN: GWO
INITIALS/SIG
DATE 10

RTG. SYMBOL FN: RET
INITIALS/SI
DATE

RTG. SYMBOL FN:
INITIALS/SI
DATE

RTG. SYMBOL FN:
INITIALS/SI
DATE

JUL 14 1992

DOE-2057-92

Mr. H. F. Daugherty, President
Westinghouse Environmental
Management Company of Ohio
P.O. Box 398704
Cincinnati, Ohio 45239-8704

Dear Mr. Daugherty:

ACTION MEMORANDUM: CONTAMINATION AT THE FIRE TRAINING FACILITY

The enclosed Removal Site Evaluation for Contamination at the Fire Training Facility has been reviewed by my office. Based on this review, the Department of Energy (DOE) has determined that this project constitutes a removal action. The Fire Training Facility has also been determined to be a Hazardous Waste Management Unit. Therefore, the requirements of the Ohio Administration Code for hazardous waste management and other regulations must be integrated into this removal action. The Administrative Record file for the removal action should include this document.

Westinghouse Environmental Management Company of Ohio (WEMCO) should proceed to complete the necessary actions to prepare a Removal Action Work Plan (RAWP) containing the necessary Closure Plan Information for the Fire Training Facility. The RAWP should address removal, decontamination and disposal, treatment or storage of all structures, tanks, equipment, the underground sump and oil/water separator, in addition to addressing "hot spots," soil staining, and any other surface soils from which a threat of migration of contamination exists. Soil and debris should be managed to the maximum extent possible under the proposed Improved Storage of Soil and Debris Removal Action Number 17. The Work Plan should be transmitted to my office within ninety (90) days from the receipt of this Removal Action Memorandum.

If you or your staff have any questions, please contact R. J. Janke at extension 6883.

Sincerely,

R. E. Tiller
Manager

FN:Janke

Enclosure: As Stated

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