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**REMOVAL SITE EVALUATION
WASTE PIT 6 EXPOSED MATERIAL
SEPTEMBER 25, 1990**

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**WASTE PIT 6
EXPOSED MATERIAL**

Feed Materials Production Center

U. S. Department of Energy

September 25, 1990

Removal Site Evaluation
Waste Pit 6 Exposed Material

INTRODUCTION

Waste Pit 6 was constructed in 1979 and waste materials were added to the pit until 1985. The pit remains open with the majority of the surface area covered by water that collects from rainfall. The water levels remain relatively constant with the occasional need to pump excess to the surge lagoon after in place precipitation of solids. Since the completion of the cap on Waste Pit 4 (which diverted runoff water away from Pit 6) in 1989 water removal has been performed once.

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 RSE addresses the exposed material in Waste Pit 6 and has been completed to support the decision as to whether the present conditions warrant a removal action.

SOURCE AND NATURE OF THE THREAT OF A RELEASE

Waste Pit 6 has a 32,400 square foot surface area and has a 24 foot depth. The pit contains an estimated 9,000 cubic yards of green salt (uranium tetrafluoride), filter cake, slag, process residues, and asbestos. The pit contains an estimated 1.9 million pounds of uranium. Approximately 4,800 square feet of the contents are exposed to weather making them available for wind erosion and are a major contributor to the airborne dose received by the maximum exposed off-site individual from all sources of radiation at the FMPC. The estimated dose to the individual with maximum exposure for the air pathway from all FMPC sources in 1989 was reported as 5.2 millirem (52% of the Environmental Protection Agency [EPA] ten millirem guide) in the 1989 "Environmental Monitoring Report" (EMR). The Waste Pit Area contribution to that dose is estimated to be 4.8 millirem with Waste Pit 6 contributing 4.6 millirem to that exposure. The dose estimates are qualitative in nature and derived using numerical models and not supported by quantified monitoring.

EVALUATION OF THE MAGNITUDE OF THE THREAT

The potential threat posed by the exposed material in Pit 6 is the resuspension of exposed waste material and the: (1) potential migration to previously uncontaminated areas, (2) exposure via inhalation to on-site personnel, and (3) exposure via inhalation of the off-site population. The mechanism for the contaminants to become airborne is wind erosion, with dispersion, of the exposed material.

Progressive investigations under the RI/FS have identified the possible existence of a jurisdiction wetland in the drainage area directly north of Waste Pit 6. Resuspended waste material could be deposited in this sensitive environmental ecosystem possibly necessitating future cleanup action.

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The following table summarizes the estimated fugitive dust emissions from Waste Pit 6 as reported in the 1989 EMR.

TABLE 1

EMISSIONS SUMMARY OF WASTE PIT 6

YEAR	PIT	WEIGHT % URANIUM	URANIUM Kg/YR
1988	6	9.1	12.4
1989	6	9.1	18.8

Attachment A contains the estimated radionuclide emissions due to resuspension of stored waste inventories as reported in the 1989 EMR.

Attachment B contains the chemical and radionuclide characterization data from Waste Pit 6 as reported in the "Characterization Investigation Study, Volume II, Chemical and Radiological Analysis of the Waste Storage Pits," November 1987, FMPC/Sub 008 Vol. 2, UC-70.

ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with Section 40 CFR 300.410 of the NCP, the Department of Energy shall determine the appropriateness of a removal action. The following factors listed in 40 CFR 300.415 (6)(2) specifically apply to the exposed material in Waste Pit 6.

40 CFR 300.415 (6)(2)(i)

Actual or potential exposure to hazardous substances or pollutants or contaminants to nearby populations, animals or food chains.

40 CFR 300.415 (6)(2)(v)

Weather conditions that may cause hazardous substance or pollutants or contaminants to migrate or be released.

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APPROPRIATENESS OF A RESPONSE

If it is determined that a response action is appropriate as a result of the potential off-site exposure received as a result of wind erosion and dispersal of the exposed material in Waste Pit 6 a removal action may be required to address the existing situation. The removal action, if required, shall be consistent with and, to the extent practicable, contribute to the efficient performance of long term remedial actions for Waste Pit 6.

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 alternative response actions. It will also serve as a decision document to be included in the Administrative Record.

ATTACHMENT A

Waste Pits Radionuclide Emissions

Pit 6 12.4 kg U 1988			Waste Pit 6 1989		
Isotope	uCi/kg U	Ci Released	kg U = 18.8 Isotope	uCi/kg U	Ci Released
U234	67	8.31E-04	U234	67	1.26E-03
U235	20.4	2.53E-04	U235	20.4	3.84E-04
U236	12.9	1.60E-04	U236	12.9	2.43E-04
U238	332.9	4.13E-03	U238	332.9	6.26E-03
SR90	0.037	4.59E-07	SR90	0.037	6.96E-07
TC99	2.49	3.09E-05	TC99	2.49	4.68E-05
RU106	ND	0.00E+00	RU106	ND	0.00E+00
CS137	0.34	4.22E-06	CS137	0.34	6.39E-06
BA137M	0.34	4.22E-06	BA137M	0.34	6.39E-06
RA226	ND	0.00E+00	RA226	ND	0.00E+00
RA228	0.01	1.24E-07	RA228	0.01	1.88E-07
TH228	0.0186	2.31E-07	TH228	0.0186	3.50E-07
TH230	0.52	6.45E-06	TH230	0.52	9.78E-06
TH232	0.01	1.24E-07	TH232	0.01	1.88E-07
TH234	332.9	4.13E-03	TH234	332.9	6.26E-03
PA234M	332.9	4.13E-03	PA234M	332.9	6.26E-03
NP237	0.049	6.08E-07	NP237	0.049	9.21E-07
PU238	0.015	1.86E-07	PU238	0.015	2.82E-07
PU239	0.085	1.05E-06	PU239	0.085	1.60E-06
PU240	0.085	1.05E-06	PU240	0.085	1.60E-06
PU241	0.58	7.19E-06	PU241	0.58	1.09E-05

Radionuclide Emission Factors for 1988 were developed as described below for the waste pits. The same values were used for 1989.

1. U-234, U235, U238, SR90, TC99, RU106, CS137, RA226, TH228, TH230, TH232, NP237, PU238, PU239 values are averages of core sample analyses performed on each waste pit. The specific analyses are listed in the following document; Solow, A. J. and Phoenix, D. R., "Characterization Investigation Study, Vol. 2: Chemical and Radiological Analyses of the Waste Storage Pits", November 1987, FMPC/SUB 008, Vol. 2 UC-70, Appendix D.
2. U236 values are assumed equal to the site average for FMPC processes as analyzed for composite dust collector filter samples for 1988.
3. BA137M is assumed to be in equilibrium with CS137, i.e. BA137M activity equals that of CS137.
4. RA228 is assumed to be in equilibrium with TH232, i.e. RA228 activity equals that of TH232.
5. PU239/240 - half of the analyzed values discussed in 1 above are proportioned to each.
6. TH234 and PA234M are assumed to be in equilibrium with U238, i.e. the TH234 and PA234M activities are equal to that of U238.
7. PU241 is assumed to be in the same ratio to Pu239/240 as is seen for FMPC processes as analyzed for composite dust collector filter samples for 1988.

ATTACHMENT B

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Table B-12
Pit Six Organic Data Summary

hole ber	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure	Qualifier
-01	FMP-PS-06-030	5531-1-16	ACETONE	1800.00	UG/KG	J*
			TOTAL XYLENES	750.00	UG/KG	J
-02	FMP-PS-06-029	5531-1-13	2-BUTANONE	1200.00	UG/KG	J*
			TOTAL XYLENES	460.00	UG/KG	J*
			ACETONE	760.00	UG/KG	J*
-03	FMP-PS-06-011	5531-1-10	ACETONE	1400.00	UG/KG	J*
			2-BUTANONE	1400.00	UG/KG	J*
			METHYLENE CHLORIDE	700.00	UG/KG	J*
			TOLUENE	440.00	UG/KG	J*
			BIS(2-ETHYLHEXYL)PHTHALATE	910.00	UG/KG	J*
			TOTAL XYLENES	670.00	UG/KG	J
-04	FMP-PS-06-001	8704-108-0020	AROCLOR-1254	81.00	UG/KG	J
			BIS(2-ETHYLHEXYL)PHTHALATE	410.00	UG/KG	J*
			TRICHLOROETHENE	170.00	UG/KG	J
			METHYLENE CHLORIDE	280.00	UG/KG	*
			2-BUTANONE	530.00	UG/KG	*
			1,1,1,2,2-TETRACHLOROETHANE	29000.00	UG/KG	*
			ACETONE	3200.00	UG/KG	J*
			8704-108-0020DIL			

J = Concentration is below quantification level; * = Common laboratory contaminant

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Table B-11
Pit Six Inorganic Data Summary

hole ber	Sample Id	Batch Number	Parameter	Concentration	Unit Of Measure
4	FMP-PS-06-001	8704-108-0020	SODIUM, TOTAL	600.07	MG/KG
			VANADIUM, TOTAL	100.18	MG/KG
			ZINC, TOTAL	47.74	MG/KG
		8704-108-0050	BARIUM, EP LEACHATE	1092.00	UG/L
			CADMIUM, EP LEACHATE	251.00	UG/L
			LEAD, EP LEACHATE	1894.00	UG/L
			SILVER, EP LEACHATE	2068.00	UG/L

TABLE 3-6 RADIONUCLIDE CONCENTRATIONS IN COMPOSITE SAMPLES FROM PIT 6

Borehole Number (a)	Radionuclide (b)	VA	Activity Concentration (pCi/g, dry)	Uncertainty (pCi/g, dry)	Borehole Number (a)	Radionuclide (b)	VA	Activity Concentration (pCi/g, dry)	Uncertainty (pCi/g, dry)
06-01	CS-137	=	15.00	4.00	06-03	TC-99	=	164.00	7.00
	NP-237	=	2.60	.60		TH-228	=	.20	.10
	PU-238	=	1.40	.20		TH-230	=	25.00	1.00
	PU-239/240	=	15.00	1.00		TH-232	=	.20	.10
	RA-226	<	30.00			U-234	=	2960.00	120.00
	RU-106	<	35.00			U-235	=	350.00	40.00
	SR-90	=	4.00	.40		U-238	=	18000.00	300.00
	TC-99	=	84.00	2.00					
	TH-228	=	1.20	.20					
	TH-230	=	41.00	1.00					
	TH-232	=	1.20	.20					
	U-234	=	3380.00	80.00					
	U-235	=	1490.00	50.00					
U-238	=	18700.00	200.00						
06-02	CS-137	=	31.00	4.00	06-04	CS-137	<	4.00	.40
	NP-237	=	4.50	.80		NP-237	=	1.90	.20
	PU-238	=	.60	.20		PU-238	=	.70	.10
	PU-239/240	=	9.50	.50		PU-239/240	=	6.30	.50
	RA-226	<	20.00			RA-226	<	23.00	
	RU-106	<	35.00			RU-106	<	35.00	
	SR-90	=	1.80	.40		SR-90	=	1.90	.40
	TC-99	=	120.00	5.00		TC-99	=	140.00	9.00
	TH-228	=	2.00	.20		TH-228	=	.40	.10
	TH-230	=	26.00	1.00		TH-230	=	14.00	1.00
	TH-232	=	.30	.10		TH-232	=	.40	.10
	U-234	=	5330.00	100.00		U-234	=	2000.00	70.00
	U-235	=	1750.00	60.00		U-235	=	580.00	40.00
U-238	=	18700.00	200.00	U-238	=	12500.00	200.00		
06-03	CS-137	=	20.00	4.00					
	NP-237	=	.90	.40					
	PU-238	=	.40	.10					
	PU-239/240	=	4.00	.30					
	RA-226	<	16.00						
	RU-106	<	35.00						

(a) Refer to Table 2-1 in Subsection 2.1.2 for boring numbers and grid locations
 (b) RA-226 and RA-228, when reported, were measured by gamma spectrometry and reported on a dry weight basis

DRAFT TRANSMITTAL

Mr. W. H. Britton, President
 Westinghouse Materials Company of Ohio
 P. O. Box 398704
 Cincinnati, Ohio 45239-8704

Dear Mr. Britton:

REMOVAL ACTION MEMORANDUM: WASTE PIT 6 EXPOSED MATERIAL

Reference: DOE-930-90, R. J. Hansen to M. B. Boswell, "CERCLA
 Removal Actions," dated April 23, 1990.

The attached Removal Site Evaluation for the Waste Pit 6 exposed material has been reviewed by my office. Based on this review, DOE has determined that this project constitutes a time critical removal action as defined in the reference letter. The Administrative Record for the Remedial Investigation/Feasibility Study (RI/FS) should include this document.

WMCO and the DOE site office should cooperatively work to complete the following tasks to implement this action.

1. Evaluate alternatives to eliminate the inhalation hazard from Waste Pit 6.
2. Establish a preferred method for the removal action and develop a work plan and schedule.
3. Implement control measures to prevent release and spread of contamination.

WMCO should submit an evaluation of alternatives and recommend a method of removal within 30 days of receipt of this letter.

If you have any questions, please contact O. Vincent, of my staff, at extension x6937.

Sincerely,

Gerald W. Westerbeck
 FMPC Site Manager

Enclosure: as stated

c: A. P. Avel	D. J. Carr, WMCO
S. W. Coyle, WMCO	B. J. Davis
I. W. Diggs, WMCO	J. T. Grumski, WMCO
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