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AGENDA, OVERHEADS AND HANDOUTS FROM THE PUBLIC MEETING FOR OPERABLE UNIT 4 FEASIBILITY STUDY/PROPOSED PLAN-DRAFT ENVIRONMENTAL IMPACT STATEMENT HELD MARCH 21, 1994

03/21/94

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U.S. DEPARTMENT OF ENERGY
PUBLIC MEETING FOR OPERABLE UNIT 4
FEASIBILITY STUDY/PROPOSED PLAN -
DRAFT ENVIRONMENTAL IMPACT STATEMENT
MARCH 21, 1994

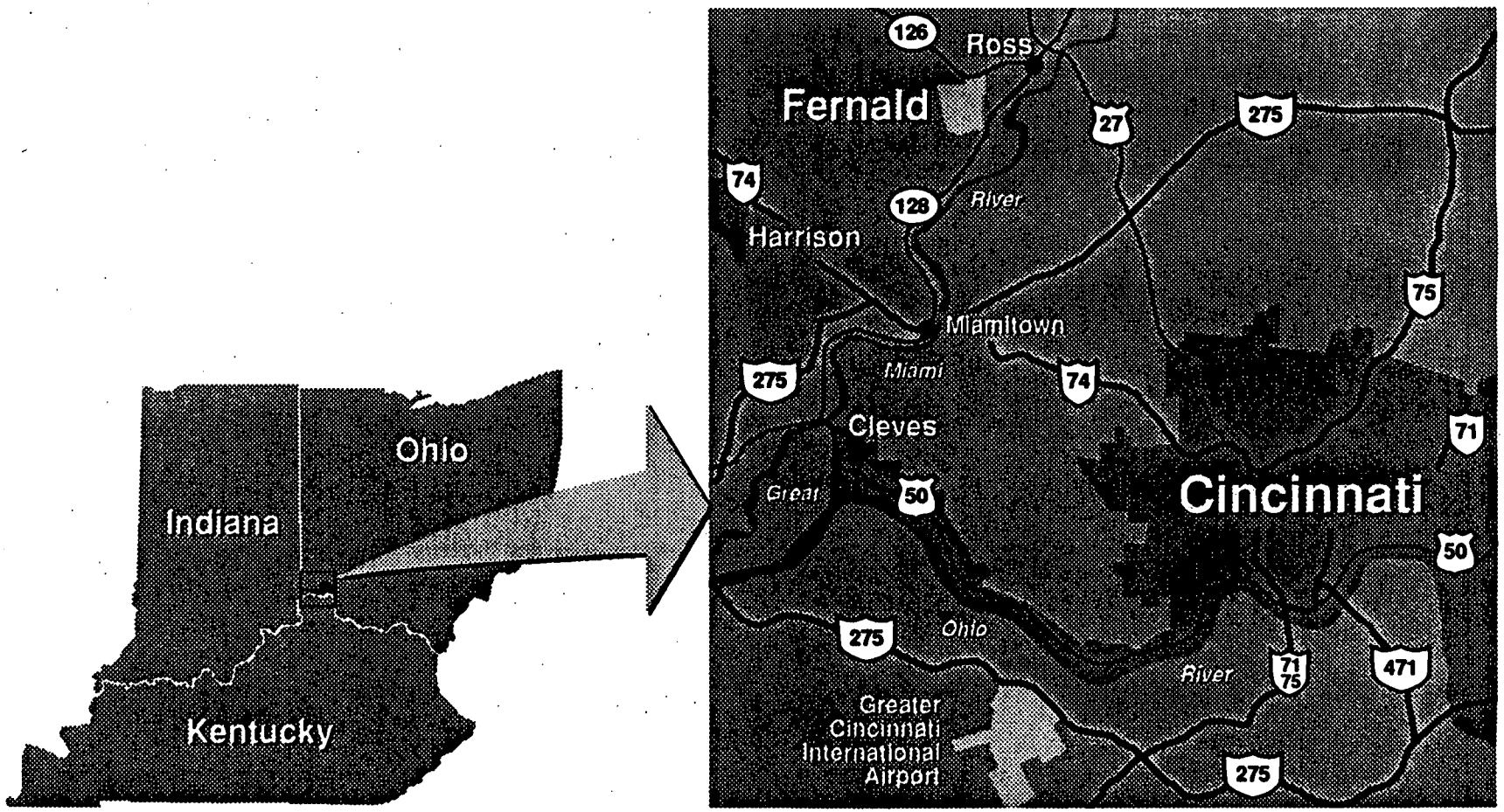
6:30 - 7:00 p.m.	Operable Unit 4 Exhibits
7:00 - 7:45 p.m.	Presentations
Welcome/Introductory Remarks	Gary Stegner
FEMP RI/FS Program Overview	Randi Allen
OU4 History and Background	Dennis Nixon
OU4 RI/FS Program	Dennis Nixon
CERCLA/NEPA Integration	Eric Woods
Public Participation Overview	Randi Allen
Remarks From U.S. EPA and Ohio EPA	
7:45 - 8:15	Informal Question and Answer Session
8:15 - 8:30 p.m.	Break
8:30 - 10:00 p.m.	Formal Comment Session
Closing Remarks	Gary Stegner

Operable Unit 4 (Silos 1-4)

Feasibility Study/
Proposed Plan-
Draft Environmental Impact Statement
Formal Public Hearing

March 21, 1994

FERNALD AND VICINITY



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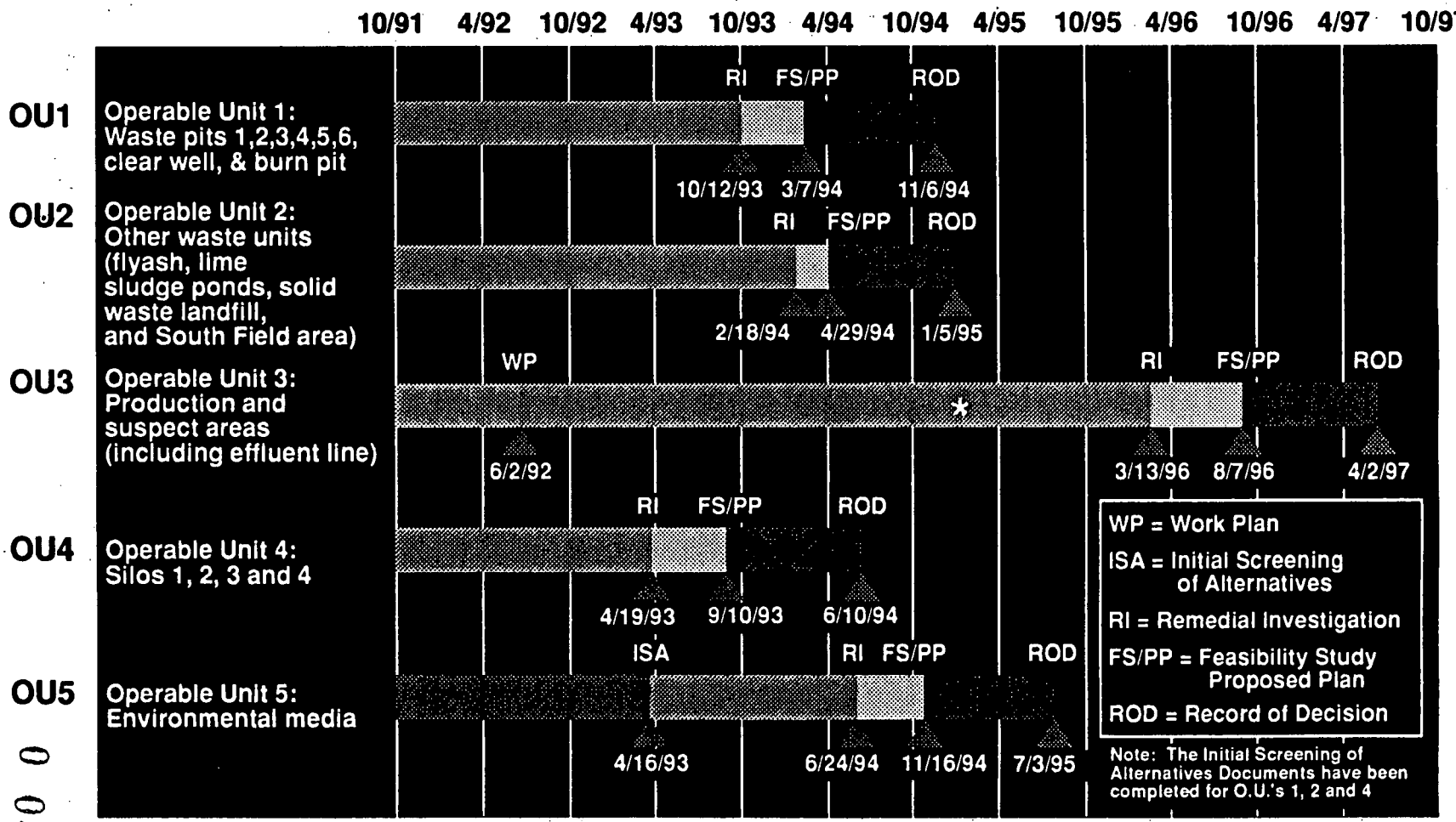
Randi

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SCHEDULE OF RI/FS ACTIVITIES



* The OU3 ISA will be incorporated into the OU3 FS

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Randi Allen

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OPERABLE UNIT 4

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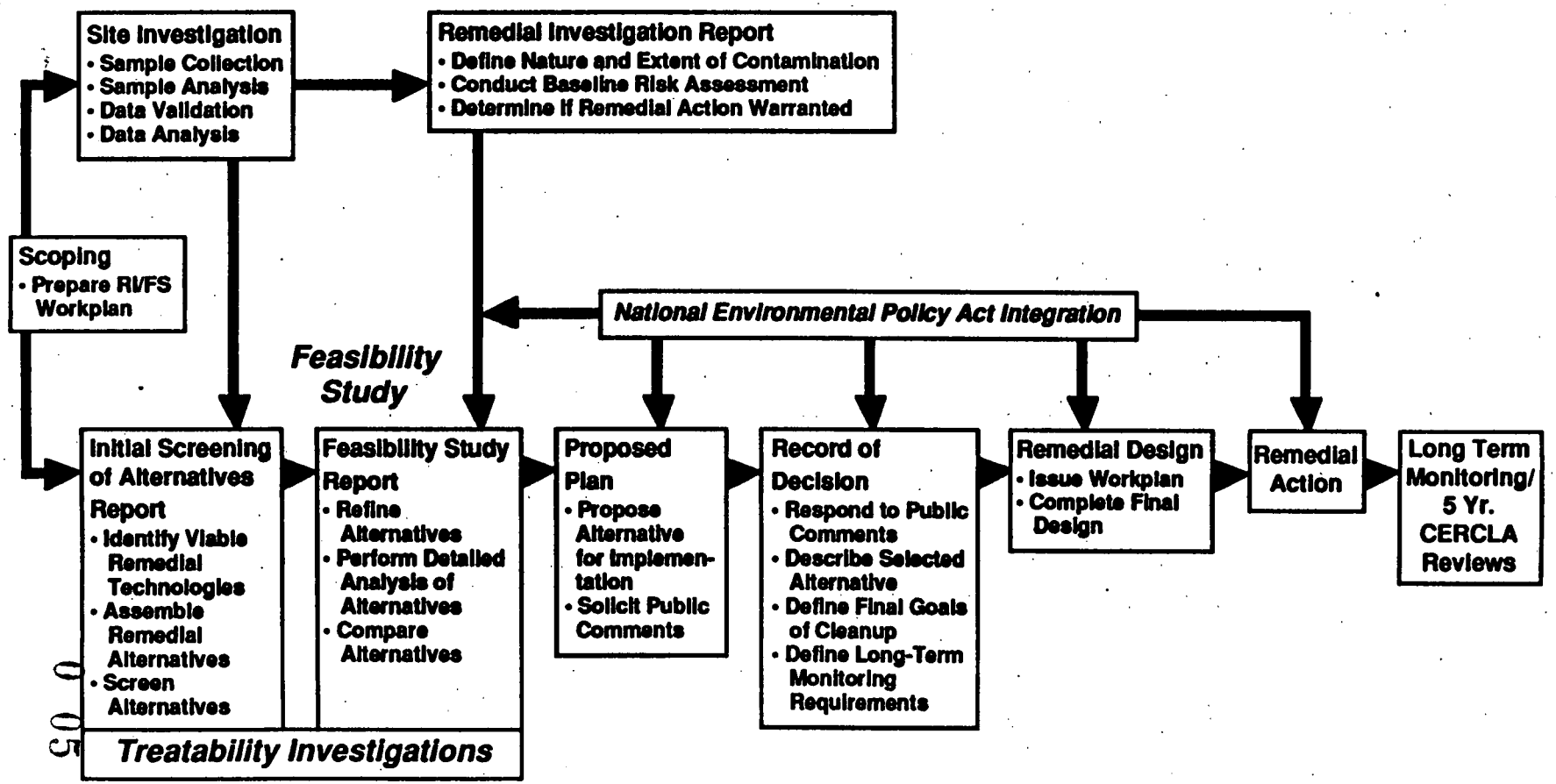
Operable Unit 4 Environmental Restoration Process



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Dennis Nixon

OPERABLE UNIT 4

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Introduction

- OU4 is one of five operable units at the FEMP
- OU4 consists of:
  - Four concrete storage silos and their contents
  - Decant sump tank
  - Radon treatment system
  - Earthen berm surrounding Silos 1 and 2
  - Soils within OU4 boundary
  - Perched water encountered during remediation
- Silos 1 and 2 contain K-65 residues
- Silo 3 contains "cold" metal oxides
- Silo 4 is empty
- Decant Sump Tank contains water and sludge from the K-65 residues

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Brief History of K-65 Silos

- Constructed during fall of 1951 and winter of 1952
  - At time of construction, Safety Analysis, as known today, was not performed
- Filled during the period 1952 through 1958
- Asphaltic coating and earthen embankment added in 1964
- Berm addition to current size in 1983
- Dome covers and foam added in 1987
- Bentonite clay placed over the K-65 residues in 1991

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Receipt and Generation

K-65 Residues

- Received in drums from Mallinckrodt Chemical Works
- Residues transferred to silos via the Drum Handling Building
  - Drums dumped into tank
  - Slurried with water
  - Pumped into Silos 1 and 2
  - Solids settled
  - Liquids decanted into Decant Sump Tank
- FEMP generated K-65 residues pumped into silos as slurry from Production Area

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Receipt and Generation (Cont.)

Cold Metal Oxides

- Generated only at the FEMP
- Dried at high temperatures
- Pneumatically transferred to Silo 3 from Production Area

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Residue Characteristics

K-65 Residues

mg/l ≈ ppm

- Wet gray-silty solid
- Defined as 11(e) 2 by-product material
- Contain elevated concentrations of radium, thorium, and lead-210
- Radon emanation rate is approximately 4500 pCi/m^2 /s
  - Greater than 200 times EPA limit (20 pCi/m^2 /s)
- Elevated concentrations of inorganics
  - Barium
  - Lead

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Residue Characteristics (Cont.)

K-65 Residues (Cont.)

mg/kg = ppm

- Very low concentrations of organics
  - PCBs (10-15 mg/kg)
  - Tributyl phosphate (20-50 mg/kg)
- Total volume of K-65 residues - 8012 yd^3
  - 4239 yd^3 in Silo 1
  - 3719 yd^3 in Silo 2
- Total volume of Bentonite Clay - 878 yd^3
  - 467 yd^3 in Silo 1
  - 411 yd^3 in Silo 2
- Total volume of waste in Silos 1 and 2 - 8890 yd^3

OPERABLE UNIT 4

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Summary of Radionuclide Analyses for Silo 1 and 2 Residues

Analyte	Frequency of Detection	Rejected	Arithmetic Mean (pCi/g)	Upper 95% CI on A-Mean (pCi/g)	Range of Detects (pCi/g)
SILO 1					
Actinium-227	13/20	0	5960	7670	4320-17390
Lead-210	20/20	0	165000	202000	48980-381400
Polonium-210	13/13	0	242000	281000	144000-434000
Radium-226	20/20	0	391000	477000	89280-890700
Thorium-228	2/20	0	422	2280	835-2280
Thorium-230	24/24	0	60000	68900	10569-105372
Thorium-232	8/20	0	424	1110	661-1106
Uranium-234	21/21	0	800	932	326-1548
Uranium-235/236	14/20	0	38	54	19.1-105
Uranium-238	20/20	0	642	693	387-920
SILO 2					
Actinium-227	11/14	0	5100	6640	2905-10450
Protactinium-231	1/14	0	2350	4040	4041-4041
Lead-210	14/14	0	145000	190000	58160-399200
Polonium-210	8/8	0	139000	231000	55300-241000
Radium-226	14/14	0	195000	263000	657-481000
Thorium-228	5/14	0	645	7360	411-7360
Thorium-230	15/15	0	48400	76200	8365-132800
Thorium-232	3/14	0	402	985	851-985
Uranium-234	13/13	0	961	1160	121-1465
Uranium-235/236	11/13	0	73	94	35.6-172
Uranium-238	14/14	0	912	1120	46-1925

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OPERABLE UNIT 4

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Summary of TCLP Metals Analyses for Silo 1 Residues - 1990/1991

Analyte	Frequency of Detection	Rejected	Mean (mg/l)	Standard Deviation (mg/l)	Range (mg/l)	Maximum Allowable Concentration
Aluminum	12/12	0	0.314	0.067	0.228-0.441	NA
Antimony	12/12	0	0.093	0.019	0.067-0.129	NA
Arsenic	1/11	1	0.002	–	–	5.0
Barium	12/12	0	0.868	0.402	0.348-1.83	100.0
Beryllium	6/12	0	0.002	0.0004	0.002-0.003	NA
Boron	11/12	0	0.255	0.070	0.168-0.384	NA
Cadmium	12/12	0	0.003	0.001	0.002-0.005	1.0
Calcium	12/12	0	55.4	33.6	17.6-108	NA
Chromium	12/12	0	0.059	0.012	0.045-0.081	5.0
Cobalt	12/12	0	1.82	0.89	0.72-3.06	NA
Copper	12/12	0	0.208	0.097	0.068-0.404	NA
Iron	10/12	0	0.046	0.022	0.018-0.1	NA
Lead	8/9	3	614	221	229-841	5.0
Magnesium	12/12	0	8.96	2.00	6.12-13.8	NA
Manganese	12/12	0	0.163	0.070	0.067-0.308	NA
Mercury	1/12	0	0.0002	–	–	0.2
Molybdenum	12/12	0	0.072	0.026	0.036-0.108	NA
Nickel	12/12	0	3.18	1.39	1.32-5.57	NA
Potassium	12/12	0	10.3	5.32	2.95-18.3	NA
Selenium	11/11	1	0.135	0.088	0.015-0.306	1.0
Silicon	12/12	0	31.9	8.2	13.5-42.1	NA
Silver	12/12	0	0.034	0.008	0.023-0.048	5.0
Thallium	9/12	0	0.005	0.003	0.002-0.009	NA
Vanadium	12/12	0	0.023	0.005	0.017-0.032	NA
Zinc	12/12	0	0.128	0.079	0.02-0.323	NA

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mg/l ≈ ppm

NA- Not Available

OPERABLE UNIT 4

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Summary of TCLP Metals Analyses for Silo 2 Residues - 1990/1991

Analyte	Frequency of Detection	Rejected	Mean (mg/l)	Standard Deviation (mg/l)	Range (mg/l)	Maximum Allowable Concentration
Aluminum	7/7	0	1.29	0.763	0.462-2.75	NA
Antimony	6/6	1	0.096	0.018	0.079-0.123	NA
Arsenic	8/8	0	0.064	0.110	0.003-0.32	5.0
Barium	8/8	0	2.96	3.30	0.157-8.47	100.0
Beryllium	7/7	0	0.005	0.0007	0.003-0.006	NA
Boron	4/4	0	0.69	0.58	0.24-1.5	NA
Cadmium	7/7	1	0.047	0.028	0.010-0.077	1.0
Calcium	7/7	0	483	276	163-975	NA
Chromium	8/8	0	0.129	0.036	0.086-0.207	5.0
Cobalt	7/7	0	3.02	2.11	1.18-6.16	NA
Copper	7/7	0	1.41	1.41	0.274-3.86	NA
Iron	7/7	0	0.076	0.012	0.053-0.090	NA
Lead	7/7	1	516	348	117-1072	5.0
Magnesium	7/7	0	15.4	8.84	7.39-29.6	NA
Manganese	7/7	0	0.776	0.466	0.409-1.62	NA
Molybdenum	7/7	0	0.058	0.027	0.034-0.099	NA
Nickel	7/7	0	3.48	1.45	2.04-5.77	NA
Potassium	5/7	0	4.032	1.18236	2.64-5.31	NA
Selenium	8/8	0	0.114	0.184	0.026-0.568	1.0
Silicon	5/5	1	16.3	5.2	12.1-24.3	NA
Silver	8/8	0	0.093	0.032	0.053-0.164	5.0
Thallium	6/7	0	0.009	0.011	0.0022-0.0288	NA
Vanadium	5/5	1	0.053	0.006	0.046-0.060	NA
Zinc	6/6	1	0.339	0.184	0.141-0.563	NA

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mg/l ≈ ppm

NA- Not Available

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Residue Characteristics (Cont.)

Cold Metal Oxides

- Dry powdery solid
- Defined as 11(e) 2 by-product material
- Mixture of metal oxides
- Much lower concentrations of radionuclides
- Predominant radionuclides
  - Thorium
  - Uranium
  - Lead-210
- Leaches arsenic, chromium, cadmium, and selenium at rates exceeding RCRA limits

OPERABLE UNIT 4

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Residue Characteristics (Cont.)

Cold Metal Oxides (Cont.)

- Little to no organics
- Total volume of cold metal oxides - 5088 yd^3
- Total volume of waste in silos for disposal 13,178 yd^3

OPERABLE UNIT 4

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Radionuclide Concentrations in Silo 3 Residues

Analyte	Frequency of Detection	Rejected	Arithmetic Mean (pCi/g)	Upper 95% CI on A Mean (pCi/g)	Range of Detection (pCi/g)
SILO 3					
Actinium-227	9/9	2	618	925	234-1363
Lead-210	11/11	0	2620	3480	454-6427
Protactinium-231	9/11	0	487	627	266-931
Radium-224	11/11	0	290	367	64-453
Radium-226	11/11	0	2970	3870	467-6435
Radium-228	9/11	0	297	406	82-559
Thorium-228	7/11	0	590	747	459-996
Thorium-230	11/11	0	51200	60200	21010-71650
Thorium-232	8/11	0	656	842	411-1451
Uranium-234	11/11	0	1480	1730	348-1935
Uranium-235/236	10/11	0	93.6	117	42-158
Uranium-238	11/11	0	1500	1780	320-2043

OPERABLE UNIT 4

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EP Toxicity Results for Silo 3 Residues - 1989

	Frequency of Detection	Mean (mg/l)	Standard Deviation (mg/l)	Minimum (mg/l)	Maximum (mg/l)	Maximum Allowable Concentration (mg/l)
SILO 3						
Arsenic	9/11	9.481	12.393	ND	41.5	5.0
Barium	11/11	0.080	0.046	0.02	0.156	100.0
Cadmium	11/11	0.847	1.740	0.108	6.32	1.0
Chromium	11/11	5.05	3.22	0.336	11.9	5.0
Lead	7/11	0.239	0.327	ND	1.01	5.0
Mercury	2/11	0.0005	0.0009	ND	0.003	0.2
Selenium	11/11	2.65	3.00	0.92	11.7	1.0
Silver	1/11	0.007	0.008	ND	0.032	5.0

mg/l ≈ ppm

ND- None Detected

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Contaminated Media

- **Surface Soils**
  - Activity concentrations for U-238 from 2.4 to 20.8 pCi/g
  - Activity concentrations for Th-230 from 1.4 to 4.8 pCi/g
  - Concentrations generally limited to the upper six inches of soil
- **Berm Soils**
  - Uranium was the predominant contaminant with activity concentration less than 4 pCi/g
  - Activity concentrations of Po-210 and Pb-210 that were 10 and 6 times background respectively

OPERABLE UNIT 4

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- **Subsurface Soils**
  - Contamination at the interface of the berm base and the original surface
  - Uranium was found present as high as 53 pCi/g
- **Perched Groundwater**
  - Constituents consistent with Silo Leachate present directly beneath and to the West of Silos 1 and 2 (U-238 [1.1 - 1313 pCi/l])

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OPERABLE UNIT 4

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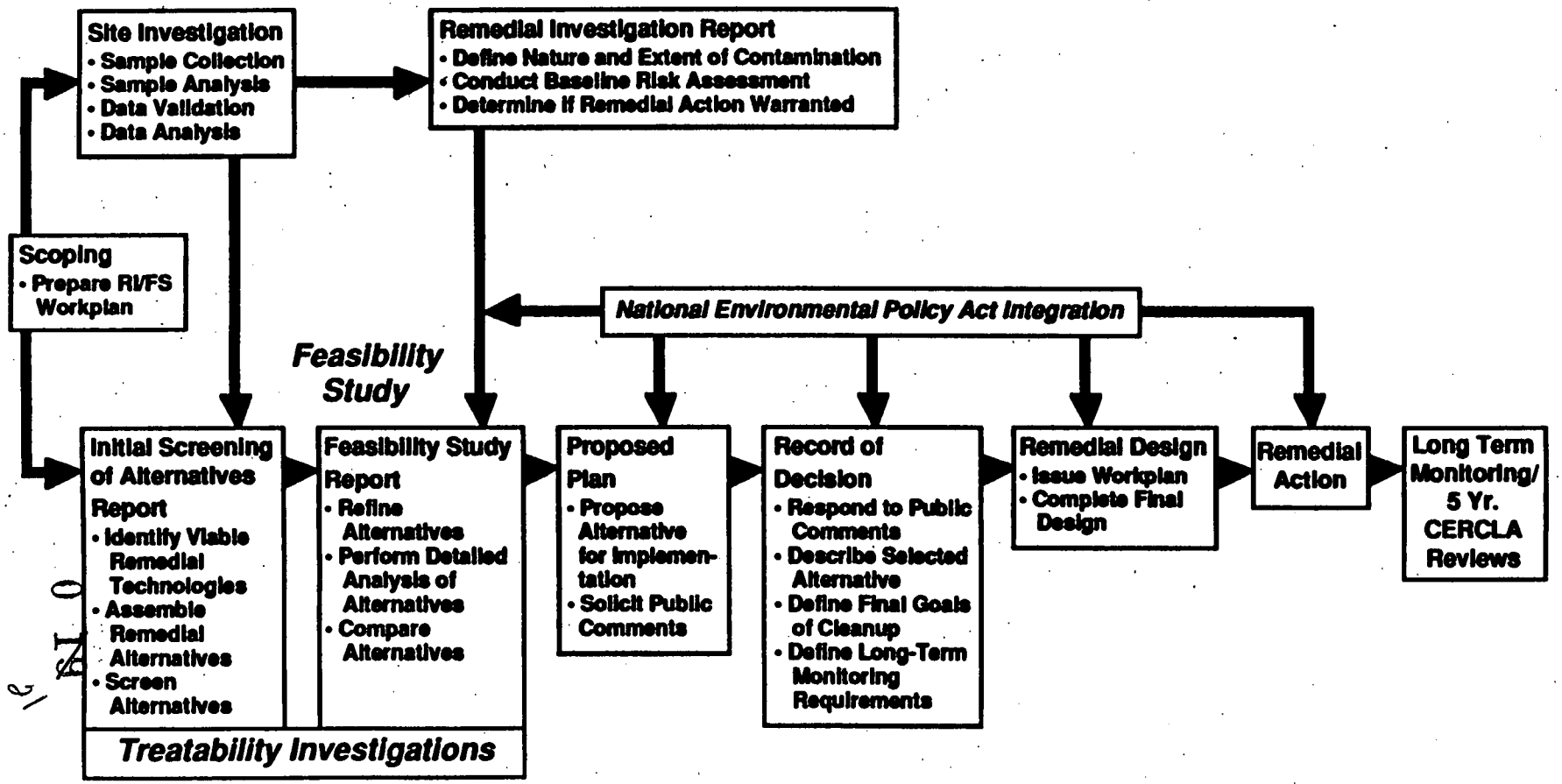
Operable Unit 4 Environmental Restoration Process



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OPERABLE UNIT 4

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Alternatives Evaluated in Detailed Analysis
Feasibility Study/Proposed Plan - Environmental Impact Statement

Operable Unit 4 Subunit	Alternative	Description
Subunit A Silos 1 and 2 contents & decant tank sludge	0A 2A/Vit 2A/Cem *3A.1/Vit* 3A.1/Cem	No Action Removal, vitrification, on-property disposal Removal, cement stabilization, on-property disposal *Removal, vitrification, off-site disposal at NTS (Pref. Alt.)* Removal, cement stabilization, off-site disposal at NTS
Subunit B Silo 3 contents (cold metal oxides)	0B 2B/Vit 2B/Cem *3B.1/Vit* 3B.1/Cem 4B	No Action Removal, vitrification, on-property disposal Removal, cement stabilization, on-property disposal *Removal, vitrification, off-site disposal at NTS (Pref. Alt.)* Removal, cement stabilization, off-site disposal at NTS Removal, on-property disposal
Subunit C Silos 1, 2, 3 & 4 structures, soils, debris	0C *2C* 3C.1 3C.2	No Action *Demolition, removal, on-property disposal (Pref. Alt.)* Demolition, removal, off-site disposal at NTS Demolition, removal, off-site disposal at Permitted Commercial Facility

Yellow, italic text = Preferred Alternative

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Detailed Analysis of Alternatives

Alternatives are Evaluated Against the Following Criteria:

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements

Balancing Criteria

- Long-term Effectiveness and Permanence
- Reduction of Toxicity, Mobility or Volume through Treatment
- Short-term Effectiveness
- Implementability
- Cost

Modifying Criteria

- State Acceptance
- Community Acceptance

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OPERABLE UNIT 4

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Major Components of the Preferred Alternative

- Removal of the contents of Silos 1, 2, and 3 and the decant sump tank
- Vitrification to stabilize the wastes from the silos and decant sump tank
- Off-site disposal at the Nevada Test Site of the treated waste

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Major Components of the Preferred Alternative (Cont.)

- Demolition and decontamination of Silos 1-4 and Remedial Facilities
- Excavation of contaminated soils to achieve proposed remediation levels
- Remediation of any perched groundwater encountered during remedial activities
- Treatment/disposal of Operable Unit 4 contaminated soils and debris consistent with the selected remedies for Operable Units 5 and 3, respectively

OPERABLE UNIT 4

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Why Remove the Waste from the Silos?

- Questionable long term structural integrity of the silos
- Potential for future leakage of silo contents
- Longterm unacceptable risks to off-site receptors
- Indefinite maintenance of decant sump tank
- Loss of institutional and access controls would pose unacceptable risks to a trespasser

OPERABLE UNIT 4

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Why Vitrify the Waste?

- Reduces radon emanation to that of building materials
- Reduces leachability of metals and radiological constituents from waste
- Reduces volume of waste for disposal
- Proven technology commercially
- Characteristics of silo material favorable to vitrification
- Cost effective

OPERABLE UNIT 4

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Waste Characteristics

Constituent of Concern	Leachability Untreated Waste	Leachability Treated Waste	Leachability RCRA Limits
Arsenic (Silo #3)	1 - 45 mg/l	< 1.0 mg/l	5.0 mg/l
Cadmium (Silo #3)	1 - 6 mg/l	< 0.1 mg/l	1.0 mg/l
Chromium (Silo #3)	1 - 12 mg/l	< 0.1 mg/l	5.0 mg/l
Lead (Silo #1 & 2)	500 - 600 mg/l	< 1.0 mg/l	5.0 mg/l
Selenium (Silo #3)	1 - 12 mg/l	< 0.1 mg/l	1.0 mg/l

	Untreated Waste	Treated Waste	NESHAP Limit
Radon Emanation	1985 - 7314 ($pCi/m^2/sec$)	.009 - .059 ($pCi/m^2/sec$)	20 ($pCi/m^2/sec$)

- mg/l - milligram per liter (≈ ppm)
- $pCi/m^2/sec$ - pico Curies per meter squared per second
- RCRA - Resource Conservation and Recovery Act
- NESHAP - National Emissions Standards for Hazardous Air Pollutants

OPERABLE UNIT 4

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Why Dispose of Treated Waste at NTS?

- Long term effectiveness
- Complies with all pertinent Applicable or Relevant and Appropriate Requirements
- Land use surrounding FEMP site
- Low population density
- Arid Climate
- Favorable hydrogeological conditions
- Administratively favorable - existence of current waste shipping program
- Cost effective

OPERABLE UNIT 4

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Why Remediate Contaminated Media?

- Contaminated soil a source of unacceptable risk to on-property and off-property receptors
- Inhalation risk due to resuspension of contaminated soil
- Surface soil source of contamination to surface water
- Leaching of contamination from soil to groundwater
- Contaminated perched water within OU4 boundary requires treatment prior to final disposition

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Proposed Remediation Levels in Soils

Constituents	Background Concentration	Proposed Remediation Level
Radionuclide		
Lead-210[1]	1.33 pCi/g	78 pCi/g
Radium-226[2]	1.45 pCi/g	2 pCi/g
Radium-228[3]	1.19 pCi/g	2 pCi/g
Thorium-228	1.43 pCi/g	2 pCi/g
Uranium-238[1]	1.22 pCi/g	60 pCi/g
Chemical		
Antimony	7.7 mg/kg	NR
Arsenic	8.45 mg/kg	NR
Barium	91.3 mg/kg	NR
Cadmium	0.82 mg/kg	NR
Chromium (III)	15.5 mg/kg	NR
Molybdenum	2.6 mg/kg	NR
Nickel	20.9 mg/kg	NR
Silver	2.6 mg/kg	NR
Thallium	0.58 mg/kg	NR
Vanadium	30.4 mg/kg	NR
Zinc	62.2 mg/kg	NR

mg/kg = ppm

[1]Includes two daughter products
[2]Includes five daughter products
[3]Includes one daughter product
NR - No Remediation Required

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OPERABLE UNIT 4

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Why Integrate Remedy for Debris and Soil with OU3 and OU5?

- **OU4 contaminated soil and debris volume less than 1 percent of volume of site-wide contaminated soil and debris**
- **Promotes integration of site-wide and debris cleanup strategy**
- **Cost effective to utilize programs developed by OU3 and OU5**
- **Takes advantage of applicable waste minimization initiatives under development by OU3 and OU5**

OPERABLE UNIT 4

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Summary of Costs
Operable Unit 4 Preferred Alternative (Million $)

Capital Cost	86.6
Operations & Maintenance Costs	
During Remediation	16.6
Post-Remediation	3.6
Total Present Worth Cost	91.7

Note: The accuracy of the cost estimates are between +50% and -30%

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NEPA/CERCLA INTEGRATION

Presenter: Eric Woods

OU4 NEPA COMPLIANCE

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NEPA

- National Environmental Policy Act
- Signed into Law in 1970
- Established a National Policy on Protecting the Natural and Human Environments
- Established EIS Process that Requires Federal Agencies to Factor Environmental Consequences into their Decisions

OU4 NEPA COMPLIANCE

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Renovation EIS

- Notice of Intent issued in August of 1986
- Scoping Meetings Held June in September of 1986
- Purpose: To Examine the Impacts of Modernizing the FEMP for Continued Operation
- Status: Cancelled Because DOE Decided to Permanently Close the FEMP

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OU4 NEPA COMPLIANCE

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NEPA/CERCLA Compliance

- Notice of Intent for RI/FS-EIS Issued in May of 1990
- Scoping Meetings for Overall Cleanup at the Site were Held June of 1990
- Operable Unit 4 FS/PP-EIS is the Lead EIS
  - Address Operable Unit 4 Alternatives and Impacts
  - Address Cumulative Impacts of Site Remedial Actions for All Operable Units
- Operable Units 1,2,3, and 5
  - FS/PP-EAs will be Prepared for Each Operable Unit and Tier from OU4 FS/PP-EIS

OU4 NEPA COMPLIANCE

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Key Points

- CERCLA Process Address Most NEPA Requirements- the Remainder are Infused into the FS and PP
- NEPA and CERCLA are Integrated
  - Avoids duplication and potential inconsistencies
  - Minimizes NEPA procedural liabilities
  - Complies with DOE Order 5400.4

OU4 NEPA COMPLIANCE

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Integration Process

- The Introduction of the FS is Expanded to Address NEPA/CERCLA Integration
- NEPA Impacts for each Alternative During Remediation are Included in the CERCLA Short-Term Effectiveness Section of the FS (Chapter 4.0)
- NEPA Impacts After Remediation are Included in the CERCLA Long-Term Effectiveness Section of the FS (Chapter 4.0)

OU4 NEPA COMPLIANCE

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Criteria Evaluated in Impact Analysis

- Soil & Geology
- Water Quality and Hydrology
- Air Quality
- Biotic Resources
- Floodplains & Wetlands
- Socioeconomics & Land Use
- Cultural Resources

OU4 NEPA COMPLIANCE

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Integration Process (Continued)

- Several Short Sections are added to the FS to Address NEPA Guidelines (Chapter 4.0)
  - Commitment of resources
  - Short-term versus long-term productivity
  - Unavoidable Adverse Impacts

OU4 NEPA COMPLIANCE

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Cumulative Impacts

- Cumulative Environmental Impacts Assessed in Appendix I
  - Assesses Overall Impacts of Implementing the Leading Remedial Alternatives
  - Cumulative Impacts Updated as Leading Remedial Alternatives Change

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OU4 NEPA COMPLIANCE

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Substantive OU4 Impacts

- Eliminates Source of Contamination
- Less Than 15 Acres of Site Disturbance
- Potential for Disturbance of Small Area of Wetlands
- Minor Traffic Increases (Average of 10 Trips Per Day)

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OU4 NEPA COMPLIANCE

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Substantive Cumulative Impact

- Reduces/Eliminates Source of Contaminants
- Up to 250 Acres of Surface Disturbance
- Loss of up to 220 Acres of Habitat
- Disruption of 36 Acres of Wetlands
- Site Worker Levels Remain Fairly Constant During Remedial Action

Graphics #2619.12 3/94

OPERABLE UNIT 4

FERNALD

Public Participation in the Operable Unit 4 Feasibility Study/Proposed Plan - Draft Environmental Impact Statement

• Provided special Operable Unit 4 update handout and copies of the draft Proposed Plan to FRESH members	September 23, 1993
• Public Roundtable held to present and discuss draft FS/PP-DEIS documents	October 14, 1993
• Presentation on the Operable Unit 4 Risk Assessment at STEP-session	October 19, 1993
• Groundwater workshop conducted with FRESH members	November 23, 1993
• Public Roundtable to discuss CERCLA-NEPA integration approach at the FEMP Site	January 24, 1994
• Mailed invitation to Stakeholders to attend the public meeting on March 21, 1994 (Proposed Plan Fact Sheet was attached)	February 21, 1994
• Mailed Proposed Plan to Stakeholders with insert card to obtain a copy of FS/PP-DEIS	February 24, 1994

OPERABLE UNIT 4

FERNALD

Public Participation (Cont.)

• Mailed copies of the FS/PP-DEIS, Proposed Plans, Fact Sheets to Nevada Operations Office - Public Affairs Office and Nevada Environmental Protection Organizations	February 24, 1994
• Provided Operable Unit 4 update and held a question-and-answer session with FRESH members	February 24, 1994
• Operable Unit 4 FS/PP-DEIS made available at the Public Environmental Information Center	March 1, 1994
• Local Notice of Availability for Operable Unit 4's FS/PP-DEIS published in three community newspapers	March 2, 1994
• OEPA FS/PP-DEIS discussion meeting with Fernald Citizens Task Force and FRESH members	March 2 , 1994
• Federal Notice of Availability for Operable Unit 4's FS/PP-DEIS published March 4, 1994	March 4, 1994
• Operable Unit 4 FS/PP-DEIS public review period began	March 7, 1994

OPERABLE UNIT 4

FERNALD

Public Participation (Cont.)

• Formal meeting with DOE - Nevada Operations Office and Nevada Environmental Protection Agencies	March 8, 1994
• Mailed postcards reminding Stakeholders to attend formal public hearing on March 21, 1994	March 15, 1994
• Formal public hearing on the Operable Unit 4 FS/PP-DEIS	March 21, 1994
• Formal public review period for the Operable Unit 4 FS/PP-DEIS concluded	April 20, 1994
• Complete draft Responsiveness Summary to public comment and finalize Proposed Draft Record of Decision	May 18, 1994
• Submit Proposed Draft Record of Decision to USEPA	June 10, 1994
• Community Assessment for input on Public Participation during Remedial Design and Remedial Action activities	(to be initiated within the next three months)

PUBLIC HEARING SIGN-IN SHEET
OPERABLE UNIT 4 FEASIBILITY STUDY/
PROPOSED PLAN-DRAFT ENVIRONMENTAL IMPACT STATEMENT
MARCH 21, 1994

Name:_____

Affiliation:_____

Address:_____

City/State/Zip:_____

Phone:_____

DO YOU PLAN TO MAKE A VERBAL COMMENT DURING THE FORMAL QUESTION AND ANSWER SESSION TONIGHT? **YES** ____ **NO** ____

Name:_____

Affiliation:_____

Address:_____

City/State/Zip:_____

Phone:_____

DO YOU PLAN TO MAKE A VERBAL COMMENT DURING THE FORMAL QUESTION AND ANSWER SESSION TONIGHT? **YES** ____ **NO** ____

Name:_____

Affiliation:_____

Address:_____

City/State/Zip:_____

Phone:_____

OPERABLE UNIT 4 (SILOS 1-4) FEASIBILITY STUDY/ PROPOSED PLAN- DRAFT ENVIRONMENTAL IMPACT STATEMENT

5418

MARCH 21, 1994

Public Hearing Evaluation Form

We would like your opinion on the U. S. Department of Energy's (DOE) proposed cleanup plan for Operable Unit 4 (Silos 1-4). Please complete this evaluation form before leaving.

---

1. How well do you understand DOE's proposed cleanup plan for Operable Unit 4?
   _____ Very well
   _____ Well
   _____ Not very well
   _____ Not at all

2. DOE's proposed cleanup plan for Operable Unit 4 entails using a process called vitrification to turn the silos' contents into glass and then disposing of the wastes at the Nevada Test Site. Do you agree with this proposed solution?
   _____ Yes
   _____ No
   _____ Undecided

   If no, why?

3. How well do you understand the issues that were discussed tonight?
   _____ Very well
   _____ Well
   _____ Not very well
   _____ Not at all

4. Did you review the spiral-bound *Proposed Plan for Remedial Actions at Operable Unit 4*, available at the Public Environmental Information Center?
   _____ Yes
   _____ No Why? _____

   If yes, what was your opinion of the document, in terms of readability, content, etc.?

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5. Did you read the 16-page summary *Fact Sheet for the Proposed Plan for Remedial Actions at Operable Unit 4*?

- 5418 _____ Yes
_____ No Why? _____

If yes, what was your opinion of the document, in terms of readability, content, etc.?

6. How satisfied were you with responses to questions that were asked this evening?

_____ Very satisfied
_____ Somewhat satisfied
_____ Satisfied
_____ Not satisfied
_____ Very dissatisfied

Why?

7. Did you find the exhibits and/or handouts informative?

_____ Yes
_____ No

If no, why?

8. How did you learn about tonight's meeting?

_____ Newspaper story
_____ Television story
_____ Newspaper ad
_____ Flyer
_____ Other: _____
_____ Friend or neighbor
_____ Letter from DOE
_____ Fernald employee
_____ Fernald envoy

9. Please check *all* of the following that apply. I am a(n):

_____ Area resident
_____ DOE employee
_____ Member of Fernald Citizens Task Force
_____ Other _____
_____ Fernald employee
_____ Member of FRESH

10. If you would like to be added to Fernald's mailing list, please complete the following:

Name_____
Address_____
City_____State_____Zip_____
Phone Number_____Fax Number_____

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Formal Comment Card 5418

Please write your formal comment(s) below for submittal during this meeting:

0 49

51

PUBLIC PARTICIPATION

FERNALD
Environmental Management Project

INTRODUCTION

Several federal regulations guide the cleanup of Fernald:

- ☐ The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
- ☐ The Superfund Amendments and Reauthorization Act (SARA)
- ☐ The Resource Conservation and Recovery Act (RCRA)
- ☐ The National Environmental Policy Act (NEPA)

All of these laws require public involvement under a well-defined set of activities and schedules. Moreover, the U.S. Department of Energy (DOE) wants to ensure public participation in the decisions about Fernald. So DOE has decided that it will not limit its public involvement program to those mechanisms required by law.

How Do I Become Involved?

There are several ways to become a part of cleanup decisions at Fernald. Some of the major activities include:

Answers to Questions

Fernald officials want to answer your questions. If they don't have answers immediately, they will get them. Call:

Kenneth L. Morgan
Director of Public Information
(513) 648-3131
Or write:

Public Information
U.S. Department of Energy
Fernald Field Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705

Public Meetings and Workshops

These forums are opportunities for members of the public to meet and discuss cleanup and waste management activities with those responsible for doing the work. Public meetings and workshops are advertised in three area newspapers: *The Harrison Press*, *The Journal News* in Hamilton, and *The Cincinnati Enquirer*.

Sometimes public hearings are held, either as a separate meeting or during regular meetings or workshops. The primary purpose of public hearings is to record public comments on a specific proposed action.

Community Roundtables

These are small meetings that usually focus on specific technical or regulatory issues related to Fernald cleanup. Participants attend by invitation only because of the specialized nature of the topics. If you are interested in being invited to roundtables, contact Ken Morgan at (513) 648-3131.

Site Tours, Speakers

Fernald offers group tours of the site. You can get tour information by calling Rachel Clark at (513) 738-6321. Tours are not provided to school-age groups.

Speakers for group meetings or schools are available through the speakers bureau. To get more information or to request a speaker, call Rachel Clark at (513) 738-6321.

Public Comment Periods

The public has many opportunities to comment on cleanup and waste management documents. At various stages in the Remedial Investigation and Feasibility Study process, public input is sought on proposed cleanup activities. After the public has commented, the DOE issues a summary of the comments and how they were addressed.

The public may comment on any part of a document, from the proposed action to the amount of jargon it contains. If you feel you need more information in order to comment on a document, DOE encourages you to call Ken Morgan at (513) 648-3131.

All public comments will be considered by DOE and the draft document may be revised based on the comments received. The comment period is an important part of public participation at Fernald.

When there is a public comment period, an advertisement is put in the legal notice section of the *Cincinnati Enquirer*, the Hamilton *Journal News*, and *The Harrison Press*.

Among the documents that have public comment periods are:

- Remedial Investigation reports
- Feasibility Study reports
- Proposed Plans
- Draft Records of Decision
- Removal Action work plans
- Community Relations Plan

For major reports required by the Amended Consent Agreement between DOE and the U.S. Environmental Protection Agency (EPA), the public comment periods start on the date the reports are submitted to EPA. The upcoming reports are:

September 10, 1993 - Operable Unit 4 Feasibility Study/Proposed Plan

October 12, 1993 - Operable Unit 1 Remedial Investigation/Baseline Risk Assessment

February 18, 1994 - Operable Unit 2 Remedial Investigation/Baseline Risk Assessment

March 7, 1994 - Operable Unit 1 Feasibility Study/Proposed Plan

April 29, 1994 - Operable Unit 2 Feasibility Study/Proposed Plan

June 10, 1994 - Operable Unit 4 Record of Decision

June 24, 1994 - Operable Unit 5 Remedial Investigation/Baseline Risk Assessment

November 6, 1994 - Operable Unit 1 Record of Decision

November 16, 1994 - Operable Unit 5 Feasibility Study/Proposed Plan

January 5, 1995 - Operable Unit 2 Record of Decision

March 28, 1995 - Operable Unit 3 Initial Screening of Alternatives

July 3, 1995 - Operable Unit 5 Record of Decision

March 13, 1996 - Operable Unit 3 Remedial Investigation/Baseline Risk Assessment

August 7, 1996 - Operable Unit 3 Feasibility Study/Proposed Plan

April 2, 1997 - Operable Unit 3 Record of Decision

Fernald Citizens Task Force

The Fernald Citizens Task Force is another opportunity for public participation. Members of this advisory group represent the major groups affected by activities at Fernald. Members report to their groups and to the public, either through meetings or publications.

The Citizens Task Force makes recommendations to DOE about cleanup standards, waste disposal and future land use. These recommendations will help guide cleanup at Fernald.

Information Repository

Information on the site and cleanup activities is available for review at the Public Environmental Information Center (PEIC), located in the JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030.

The public may get copies of documents at the PEIC.

Written Materials

There are a variety of written materials prepared about Fernald to keep people informed about the cleanup and related activities. The newsletter about the cleanup is mailed to people who have asked to be on the site mailing list. Other materials, such as fact sheets, are available at meetings, at the PEIC, or by request.

News releases also are prepared for the area media.

Briefing Public Officials

Public officials and agencies often are asked for information about Fernald. Therefore these officials are kept informed through regular briefings and notifications.

Employee Communication

More than 2,500 people work at Fernald. They often share information about the site with their families, friends and neighbors. As part of the employee communication program, updates, a monthly newsletter and a weekly publication are distributed to employees.

Why Do I Need to Become Involved?

The more public involvement in the decision-making process at Fernald, the better decisions will be. Participating in decisions at Fernald will help DOE respond to your concerns and clean up the site in a safe, effective and economical manner.

AN INTRODUCTION TO RISK

5418

FERNALD
Environmental Management Project

PURPOSE

Regulatory actions, such as cleaning up Fernald, are based on two distinct elements: risk assessment and risk management.

Risk assessment is the science of defining the health effects of exposure to hazardous materials and situations. At Fernald, risk assessment information helps determine what action should be taken to clean the site. Risk assessments are one type of information considered in risk management.

Risk management is the process of weighing policy alternatives and selecting the most appropriate regulatory action. Risk management combines information about risk with economic, political, legal, ethical and **value judgments** to reach decisions.

What Is Risk?

Risk is the chance that some harmful event will occur.

Because it is a probability, risk is expressed as a fraction, without units. It takes values from 0 to 1.0. Zero is the absolute certainty that there is no risk (which can never be shown). One is the absolute certainty that a risk will occur. Values between 0 and 1 represent the chance that a risk will occur.

For example, we say that a lifetime cancer risk from carcinogen A at an average daily dose of B is 1 in 100,000 (0.00001 or 10^{-5}). If this number is accurate, it means that one in every 100,000 people exposed to carcinogen A at a lifetime average daily dose of B will develop cancer over a lifetime. The probability also describes the extra risk incurred by each individual in that exposed population.

People are more familiar with expressions of risk associated with various activities than they are with risks associated with chemical exposures. We speak, for example, of the annual risks of dying as a result of certain activities.

The annual chance of dying in automobile accidents for people who drive the average number of miles is about 1 in 4,000. The lifetime risk of developing cancer in the United States is about 1 in 5.

These types of expressions of risk are more familiar, but they mean roughly the same thing as those risks of toxicity from chemical exposures. However, information on death rates from automobile accidents, for example, is more reliable than that pertaining to most chemical risks.

Most of the risks associated with environmental chemical exposures are not so well known. So although chemical risk information often is expressed in the same form as directly-measured risks, chemical risk information is calculated using a different methods. Chemical risk information almost always include estimates where measured risk data are not available.

What Is Risk Assessment?

A risk assessment should be able to answer the question: "What is the problem, and how bad is it?"

Risk assessment consists of four major steps:

- ☐ Hazard identification
- ☐ Dose-response assessment
- ☐ Exposure assessment
- ☐ Risk characterization

Hazard identification. This step determines whether exposure to an agent can cause an increase in the incidence of a health condition, such as illness or birth defects. Hazard identification involves characterizing the nature and strength of the relationship between exposure to an agent and the adverse health effect.

The research for this stage includes laboratory and field observation of adverse health effects and exposures to particular agents.

Dose-response assessment. What is the relationship between does and incidence in humans? This step considers the intensity of the exposure and other variables that might affect response, such as gender or lifestyle.

Researchers at this stage decide how to apply information from animal studies for humans.

Exposure assessment. What exposures are currently experienced or anticipated under different conditions?

Research in this step focuses on field measurements, estimated exposures and population studies.

Risk characterization. This is the process of estimating the incidence of a health effect under the various conditions of human exposure described in exposure assessment. It is performed by combining the exposure and dose-response assessments. The summary effects of the uncertainties in the preceding steps are described in this stage.

Types of Risk Assessments

There are several types of risk assessments being used at Fernald:

■ **Baseline Risk Assessment (BRA)** - The study and estimation of risk from taking no action. Involves estimates of chance and results.

■ **Risk Assessment (RA)** - The study and estimation of risk from a current or proposed activity. Involves estimates of the probability and consequence of an action.

■ **Comprehensive Response Action Risk Evaluation (CRARE)** - The assessment of the impacts of all cleanup activities at the site.

■ **Ecological Risk Assessment** - The study of the impact of cleanup activities on vegetation and wildlife.

Interpreting Risk Numbers

Risk is expressed in *scientific notation*, which is the use of numbers raised to a power, such as 10^4 or 10^{-6}. Writing numbers in scientific notation is much more concise on a page, but that economy of space often sacrifices comprehension for the non-technical audience.

If a number has an exponent, it is multiplied by itself the number of times indicated. (The exponent is the small number to the upper right.) For example, 10^2 (^{2} is the exponent) is 100, or 10 x 10.

Negative exponents are different; a negative exponent indicates a fraction. So 10^{-4} is the same as 1/(10 x 10 x 10 x 10) or 1 divided by (10 x 10 x 10 x 10). This is 1/(10,000), which equals 0.0001. Another way to think about 10^{-4} is to think that it is 10,000 times smaller than 1.

The Fernald risk assessment documents are packed with numbers in scientific notation. Here are the most common numbers "translated" from scientific notation:

10^6= 1 million
10^5= 1 hundred thousand
10^4= 10 thousand
10^3= 1 thousand
10^2= 1 hundred
10^1= 10
10^0= 1
10^{-1}= 1/10 (0.1)
10^{-2}= 1/100 (0.01)
10^{-3}= 1/1,000 (0.001)
10^{-4}= 1/10,000 (0.0001)
10^{-5}= 1/100,000 (0.00001)
10^{-6}= 1/1,000,000 (0.000001)

Other examples of scientific notation:

$1.5 \times 10^1 = 15$
$7.3 \times 10^{-4} = 0.00073$
$4.18 \times 10^2 = 418$

How Do I Get More Information?

Additional information about risk assessment is available in *Risk Assessment in the Federal Government: Managing the Process*, by the Committee on the Institutional Means for Assessment of Risks to Public Health, the Commission on Life Sciences and the National Research Council. This book is the basis for regulatory guidance on risk assessment.

Or contact:
Kenneth L. Morgan
Director of Public Information
U.S. Department of Energy
Fernald Field Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 648-3131

PRINCIPAL LAWS AND REGULATIONS AFFECTING THE CLEANUP PROGRAM

FERNALD
Environmental Management Project

5418

INTRODUCTION

Several federal laws guide environmental restoration in the United States. Each has a different emphasis, but together they target the most pressing hazardous waste sites in the nation. The **Comprehensive Environmental Response, Compensation and Liability Act** (CERCLA) of 1980 -- also known as Superfund -- provides for the funding, study and implementation of cleanup efforts. In 1986, Congress reauthorized CERCLA as the **Superfund Amendments and Reauthorization Act** (SARA). The **Resource Conservation and Recovery Act** (RCRA) of 1986 sets the standards for managing hazardous waste facilities and also provides mechanisms for dealing with hazardous waste releases at the sites. The **National Environmental Policy Act** (NEPA) of 1969 requires federal agencies to consider possible environmental effects when making decisions. All three laws require public involvement under a well-defined set of activities and schedules.

The cleanup process is dynamic and flexible, tailored to the specific circumstances of each site. A phased approach is used to help efforts. Researchers first collect available data to learn about the general conditions at a site. As a basic understanding is reached, they begin to identify possible cleanup alternatives. To fill in gaps of information and to test potential cleanup methods, they collect additional data, used to refine alternatives. This interactive process of study goes back and forth between data collection and testing, and the development and refinement of alternatives, until enough information is available to identify sound alternatives. The goal of gathering this information is not to remove all uncertainty -- an impossibility -- but to collect enough information to make and support an informed decision on which remedy appears to be the most appropriate for a given site. The goal of all these principal federal laws is to protect the safety of human health and the environment.

CERCLA

CERCLA is a federal law passed in 1980 that was amended in 1986. The act created a special tax that goes into a trust fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. These tax dollars are not being used at Fernald. CERCLA addresses sites not covered under RCRA provisions; RCRA's scope is limited to permitted waste management facilities, already monitored by the U.S. Environmental Protection Agency (EPA).

CERCLA consists of three phases:
1) a preliminary assessment,
2) a thorough study of the site, exploration of alternatives and selection of a remedial action plan, and
3) design and implementation of the chosen plan.

■ The CERCLA Preliminary Assessment and Site Inspection (PA/SI) is used to determine which sites should be placed on the National Priorities List (NPL) that identifies the most serious uncontrolled or abandoned hazardous waste sites.

The assessment focuses on the potential for contamination. If the assessment determines that further action is needed, a site inspection is performed to determine the threat to the public and the environment. The site is scored using a brief, on-site investigation. Sites that exceed a certain score are added to the NPL.

The NPL also may list hazardous waste sites named by states as their top priority and sites determined to pose a significant threat to public health, welfare or the environment.

■ A Remedial Investigation and Feasibility Study (RI/FS) is conducted for sites placed on the NPL. The RI/FS has several components.

The first stage involves planning. All work performed during the RI/FS follows general principles developed during a scoping, or planning, phase. Existing data on a hazardous waste site is evaluated to develop a cleanup strategy, identify objectives and prepare a work plan. A sampling analysis plan is prepared so that any decisions made are developed using the most accurate and best documented data possible. At Fernald, U.S. EPA approves the sampling analysis and work plans.

The next step is the remedial investigation portion of the cleanup, during which extensive sampling and analysis activities are conducted. The feasibility study, which is performed simultaneously, takes the data and develops a range of alternatives for remediation.

The development and screening of alternatives requires identifying objectives, screening cleanup techniques and evaluating the alternatives. The alternatives must include a broad range of options, and all must be evaluated until they are rejected because of effectiveness, implementability, cost, or community acceptance. This elimination of the less promising alternatives is known as the screening process.

Once all potential alternatives have been developed and screened, the remaining options are evaluated in detail according to nine evaluation criteria developed by U.S. EPA. The alternatives are analyzed individually against each criterion and then compared against one another to determine their respective strengths and weaknesses and to identify the key tradeoffs that must be balanced for that site. One of these nine criterion is community acceptance, which reflects the community's apparent preferences or concerns with the alternatives.

When one alternative is selected, it is entered into a Record of Decision, which states the preferred method and manner of remediation. The record also considers public comments and community concerns. Community acceptance, however, is assessed throughout the RI/FS.

■ A Remedial Design/Remedial Action (RD/RA) is conducted to implement the decision and to monitor the performance of the selected remedy.

RCRA

RCRA created a management system for hazardous waste, requiring that safe and secure procedures be used in treating, transporting, storing and disposing of hazardous wastes. Facilities must have permits to handle these wastes and are required to operate within specific guidelines. In 1984, RCRA was strengthened by the Hazardous and Solid Waste Amendments. Now RCRA allows EPA to require corrective action for continuing releases and releases beyond a waste management facility's boundary.

RCRA focuses on whether releases of hazardous waste have occurred on licensed operating facilities, and requires corrective action if releases are found. A progression of measures, similar to those for CERCLA, is taken to determine if a site requires environmental restoration.

1) The first step is a RCRA Facility Assessment (RFA) to determine if further investigations are necessary. Like the CERCLA PA/SI, the RFA is designed to give an initial characterization of a potentially hazardous site. However, the RFA focuses only on identified releases from individual sites -- the PA/SI looks instead for potential off-site releases. In addition, the RFA does not require sampling.

2) If a problem exists, U.S. EPA requires the owner/operator of the site to conduct a RCRA Facility Investigation (RFI) and corrective measures study (CMS). The nature, extent and rate of contamination are measured, all with U.S. EPA oversight. If the RFI indicates corrective action is needed, the CMS will be performed to identify possible solutions to problems at the site.

The CMS under RCRA is similar to the CERCLA feasibility study. Both identify, develop, evaluate and select remedial action alternatives. However, a CMS may develop just one alternative, while a CERCLA feasibility study requires a full range of alternatives.

3) The last step is to implement one of the solutions through a process called Corrective Measures Implementation (CMI). After U.S. EPA selects the remedy, the owner/operator performs the corrective action, taking appropriate measures to operate and maintain the remedy, and to monitor the results. This stage is similar to the CERCLA RD/RA.

NEPA

NEPA is the federal law that sets basic policy on protecting the environment. The principal purpose of NEPA is to determine if a major federal action has significant environmental effects. NEPA requires federal agencies to evaluate all environmental impacts prior to taking actions.

If an action clearly has no significant impact, a Categorical Exclusion fulfills the obligation. If an action may have environmental consequences, an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) may be necessary. In preparing an EA, data are collected and analyzed to determine whether impacts are sufficient to justify the preparation of the more complete EIS study, or whether a "Finding of No Significant Impact" (FONSI) is appropriate.

If an Environmental Impact Statement is required, NEPA requires public participation early in the process of identifying conditions at the site and in the assessment of alternatives. Public involvement, or "scoping," ensures that real problems are identified early, concentrates energies and effort on those areas requiring resolution and provides for a balanced and thorough Environmental Impact Statement. The NEPA scoping process is different from that of CERCLA.

Other Laws and Regulations

A variety of other laws or regulations also may apply to Fernald. They include:

- ☐ The Toxic Substances Control Act, which regulates certain classes of chemicals, including polychlorinated biphenyls (PCBs).
- ☐ The Clean Air Act, which controls emissions of waste into the air.
- ☐ The National Emission Standards for Hazardous Pollutants, which limits air emissions for pollutants.
- ☐ The Clean Water Act, which controls the amount of waste that can be released into surface water bodies or publicly owned treatment systems.
- ☐ The Safe Drinking Water Act, which is designed to protect drinking water resources. This law is incorporated into RCRA and CERCLA provisions dealing with groundwater protection.

Cleanup activities at Fernald also are regulated by the Amended Consent Agreement between DOE and U.S. EPA, and the Consent Decree between DOE and the Ohio Environmental Protection Agency.

For more information about this topic or about other Fernald activities and issues, contact the Office of Public Information, DOE Fernald Field Office, at (513) 648-3131.

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FERNALD AND THE NATIONAL ENVIRONMENTAL POLICY ACT

FERNALD
Environmental Management Project

5418

INTRODUCTION

The National Environmental Policy Act (NEPA) is the federal law that sets basic policy on protecting the environment. The principal purpose of NEPA is to require that federal agencies consider the environmental impacts of their actions. NEPA requires federal agencies to evaluate all environmental impacts prior to taking actions.

Why Do a NEPA Analysis?

There are several regulatory requirements for the analysis of potential impacts at Fernald. In addition, the U.S. Department of Energy has ordered compliance with NEPA at its sites.

Integration at Fernald

Fernald has a plan that integrates NEPA activities with those being conducted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund. Under this plan, impacts will be evaluated at two levels:

- ☐ The general intensity and extent of impacts from actions on a site-wide basis
- ☐ The magnitude of the potential impacts associated with actions within each operable unit, or study area

The NEPA evaluation is being conducted in conjunction with the Remedial Investigation and Feasibility Study activities proceeding under CERCLA. The NEPA information analyzing impacts is being prepared as an Environmental Impact Statement (EIS) or Environmental Assessment (EA).

At Fernald, a "lead" EIS/EA will be incorporated into the first operable unit feasibility study to be completed. The first is Operable Unit 4, and it is scheduled to be issued September 10, 1993. The lead EIS/EA will present operable unit-specific, site-wide, and cumulative impacts. These impact analyses can be updated, as necessary, in each subsequent operable unit NEPA analysis.

Potential Impacts

Under NEPA, a wide range of activities are evaluated to determine potential impacts. They include:

- Air quality
- Noise
- Groundwater
- Soils/geological
- Aquatic
- Terrestrial
- Flood plains, wetlands
- Threatened/endangered species
- Public health
- Worker health
- Transportation
- Historic/archaeological
- Socioeconomic
- Land Use
- Commitment of raw materials
- Commitment of lands
- Use of resources
- Off-site disposal issues
- Cumulative impacts
- Long-term nature of impacts

Site-Wide Characterization Report

The Site-Wide Characterization Report (SWCR) contains some information from the NEPA analysis at Fernald. The SWCR is the primary source for detailed, site-specific and regional factors such as air quality, geology, soils, etc.

It also contains the NEPA analysis of the "no action" alternative.

Public Involvement Under NEPA

The public will have 45 days to comment on the NEPA information contained in the feasibility study reports. The U.S. Department of Energy will address those comments when it prepares the draft Record of Decision documents.

Other public involvement, or "scoping," is required under NEPA. The scoping ensures that real problems are identified early, concentrates energies and effort on those areas requiring resolution and provides for a balanced and thorough EIS/EA.

There were two scoping meetings for the OU4 EIS. The first was held June 12, 1990 at Ross High School and the second was held June 13, 1990 at Forest Park High School. Transcripts of those meetings, as well as related reports, are available in the Public Environmental Information Center, located in the JAMTEK Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio 45030.

Comments were received from seven organizations, two government agencies and four individuals during the two scoping meetings. From these comments, about 200 issues were categorized and summarized.

For more information about this topic or about other Fernald activities and issues, contact the Office of Public Information, DOE Fernald Field Office, at (513) 648-3131.

SELECTING THE CLEANUP STRATEGY UNDER SUPERFUND

FERNALD
Environmental Management Project

5418

INTRODUCTION

Several federal laws guide environmental restoration at the U.S. Department of Energy's Fernald site, but the primary one is the **Comprehensive Environmental Response, Compensation and Liability Act** (CERCLA) of 1980, or Superfund. In 1986, Congress reauthorized CERCLA as the **Superfund Amendments and Reauthorization Act** (SARA). Superfund requires extensive public involvement in decision-making under a well-defined set of activities and schedules.

The cleanup process is dynamic and flexible, tailored to the specific circumstances of each site. As information about the nature and extent of the contamination at a site is gathered, possible cleanup alternatives are identified. The goal is to make and support an informed decision on the best cleanup option. The goal is to protect the safety of human health and the environment.

The Superfund Process

CERCLA consists of three phases:

1) a preliminary assessment,

2) a thorough study of the site, evaluation of alternatives and selection of a remedial action plan, and

3) design and implementation of the plan.

The second phase is known as the Remedial Investigation and Feasibility Study (RI/FS). The RI/FS has several phases.

The first stage involves planning. The next step is the remedial investigation portion of the cleanup, during which extensive sampling and analysis activities are conducted. The feasibility study, performed simultaneously, develops a range of cleanup alternatives based on the sampling and other data.

Developing and Screening Alternatives

Cleanup alternatives are developed by examining how existing technologies might be applied to a specific condition at a site. This process consists of six general steps:

- ☐ Establish remedial action objectives
- ☐ Develop general response actions -- such as excavation, containment, etc. -- for each type of contamination, treatment, excavation, pumping or other actions
- ☐ Identify volumes or similar areas of contamination in which general response actions might be applied
- ☐ Identify and screen the technologies applicable to each general response action to eliminate those that cannot be done
- ☐ Identify and evaluate options based on effectiveness, relative cost, and whether they are practical or possible
- ☐ Proceed with a detailed analysis of alternatives

As part of the screening process, alternatives are analyzed to determine how well they will combine to protect the entire site.

This approach is designed to provide decision makers with sufficient information to adequately compare the alternatives, select an appropriate remedy and justify that decision.

Once all potential alternatives have been developed and screened, the remaining options are evaluated in detail according to nine evaluation criteria developed by EPA. The alternatives are analyzed individually against each criterion and then compared to one another to determine their respective strengths and weaknesses and to identify the key tradeoffs that must be balanced for that site.

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Under the nine criteria, alternatives must:

- ☐ Protect human health and the environment
- ☐ Meet all applicable or relevant and appropriate requirements
- ☐ Have long-term effectiveness
- ☐ Reduce toxicity, mobility or volume of the contaminants
- ☐ Have short-term effectiveness
- ☐ Be implementable
- ☐ Be cost-effective
- ☐ Have state acceptance
- ☐ Have community acceptance

When the evaluation process is complete, the recommendation -- or *preferred alternative* -- is published in a document known as a Proposed Plan. After the public and regulators have commented on the proposed plan, a Record of Decision is prepared. A Record of Decision is the document that explains which cleanup alternative will be used.

Major Superfund Documents

The public has many opportunities to comment on cleanup and waste management decisions throughout the Superfund process. DOE welcomes public comment on all its documents. But at various stages in the Remedial Investigation and Feasibility Study process, public input is sought on proposed cleanup activities.

When documents are available, an advertisement is put in the legal notice section of the *Cincinnati Enquirer*, the Hamilton *Journal News*, and *The Harrison Press*.

The major reports coming up are:

September 10, 1993 -- Operable Unit 4 Feasibility Study/Proposed Plan

October 12, 1993 -- Operable Unit 1 Remedial Investigation/ Baseline Risk Assessment

February 18, 1994 -- Operable Unit 2 Remedial Investigation/ Baseline Risk Assessment

March 7, 1994 -- Operable Unit 1 Feasibility Study/Proposed Plan

April 29, 1994 -- Operable Unit 2 Feasibility Study/Proposed Plan

June 10, 1994 -- Operable Unit 4 Record of Decision

June 24, 1994 -- Operable Unit 5 Remedial Investigation/Baseline Risk Assessment

November 6, 1994 -- Operable Unit 1 Record of Decision

November 16, 1994 -- Operable Unit 5 Feasibility Study/Proposed Plan

January 5, 1995 -- Operable Unit 2 Record of Decision

March 28, 1995 -- Operable Unit 3 Initial Screening of Alternatives

July 3, 1995 -- Operable Unit 5 Record of Decision

March 13, 1996 -- Operable Unit 3 Remedial Investigation/Baseline Risk Assessment

August 7, 1996 -- Operable Unit Feasibility Study/Proposed Plan

April 2, 1997 -- Operable Unit 3 Record of Decision

The public may comment on any part of a document, from the proposed action to the amount of jargon it contains. If you feel you need more information in order to comment on a document, call:

Kenneth L. Morgan
Director, Public Information
U.S. Department of Energy
Fernald Field Office

(513) 648-3131

FERNALD SITE CONDITIONS

5418

FERNALD
Environmental Management Project

Studies now in progress will determine the most effective cleanup actions to address identified environmental concerns at the Fernald site and surrounding area.

Several types of waste materials are stored at Fernald. These include low-level radioactive waste, hazardous chemical waste, mixed waste (hazardous wastes which also contain radiological constituents), as well as construction rubble and other waste materials generated as a result of performing cleanup activities at the site.

These wastes are stored in six in-ground waste pits, three aboveground silos, and thousands of steel drums, metal boxes, and other containers. The drums, boxes, and other containers are stored in warehouses, former production buildings, tent-like support structures, and on outdoor concrete pads.

Cleanup Strategy

The facility and environmental issues associated with the site are divided into five parts (known as "operable units"), which are areas logically grouped according to their similarities in terms of environmental concern or likely cleanup alternatives. This strategy promotes a more structured and expeditious cleanup of Fernald under a Consent Agreement between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA).

Environmental studies at Fernald focus on the examination of surface soils and below-surface soils, surface water and sediment, groundwater, and atmospheric conditions to determine the nature and extent of radiological and chemical contamination present in each of the five cleanup units. This allows personnel to develop a detailed understanding of the associated risks posed to human health and the surrounding environment. Once that information is known, alternatives for removing or immobilizing the contamination can be analyzed.

During the course of environmental studies, certain conditions are occasionally identified which call for more immediate actions. Cleanup activities are accelerated as needed to address releases or potential releases of hazardous substances.

Operable Unit 1

The six waste pits being addressed under Operable Unit 1 contain approximately 475,000 tons of waste, including uranium, thorium, and other radioactive and chemical elements. Environmental concerns associated with the waste pits include the potential leaching of contaminants into below-surface soils and groundwater, rainwater runoff from the waste pit area into Paddy's Run and other drainage swales, and wind or water erosion from exposed surfaces and roadways.

Operable Unit 2

Operable Unit 2 consists of areas used to dispose of flyash generated as a result of burning coal in the boiler plant, spent lime from water treatment processes, sanitary waste, construction rubble and other materials from past operations at Fernald.

While uranium is the primary contaminant, studies are in progress to confirm that elevated concentrations of other hazardous materials are not present in Operable Unit 2. Environmental concerns associated with this cleanup unit include the potential leaching of contaminants into below-surface soils and groundwater, and wind and water erosion that could result in contaminants becoming airborne or migrating to surface waterways.

Operable Unit 3

Operable Unit 3 focuses on cleanup of contamination in the former production area resulting from the 37-year production mission at Fernald. This is one of

the largest and most complex of the cleanup units, due to the wide variety of former processing facilities and large quantities of radioactive materials and hazardous chemicals located in this 136-acre study area. The primary contaminant is uranium, and the main focal points of cleanup are buildings, equipment, and support facilities. Environmental concerns being addressed in this cleanup unit include contaminated soils, uncontrolled rainwater runoff, and asbestos abatement.

Operable Unit 4

Operable Unit 4 includes four above-ground storage silos, two of which contain approximately 9,700 tons of radium-bearing radioactive waste. A third silo contains dried uranium-bearing wastes; the fourth silo is empty. Environmental concerns associated with the silos include radon gas emissions and below-surface soil contamination due to leaching of contaminants from the silos.

Operable Unit 5

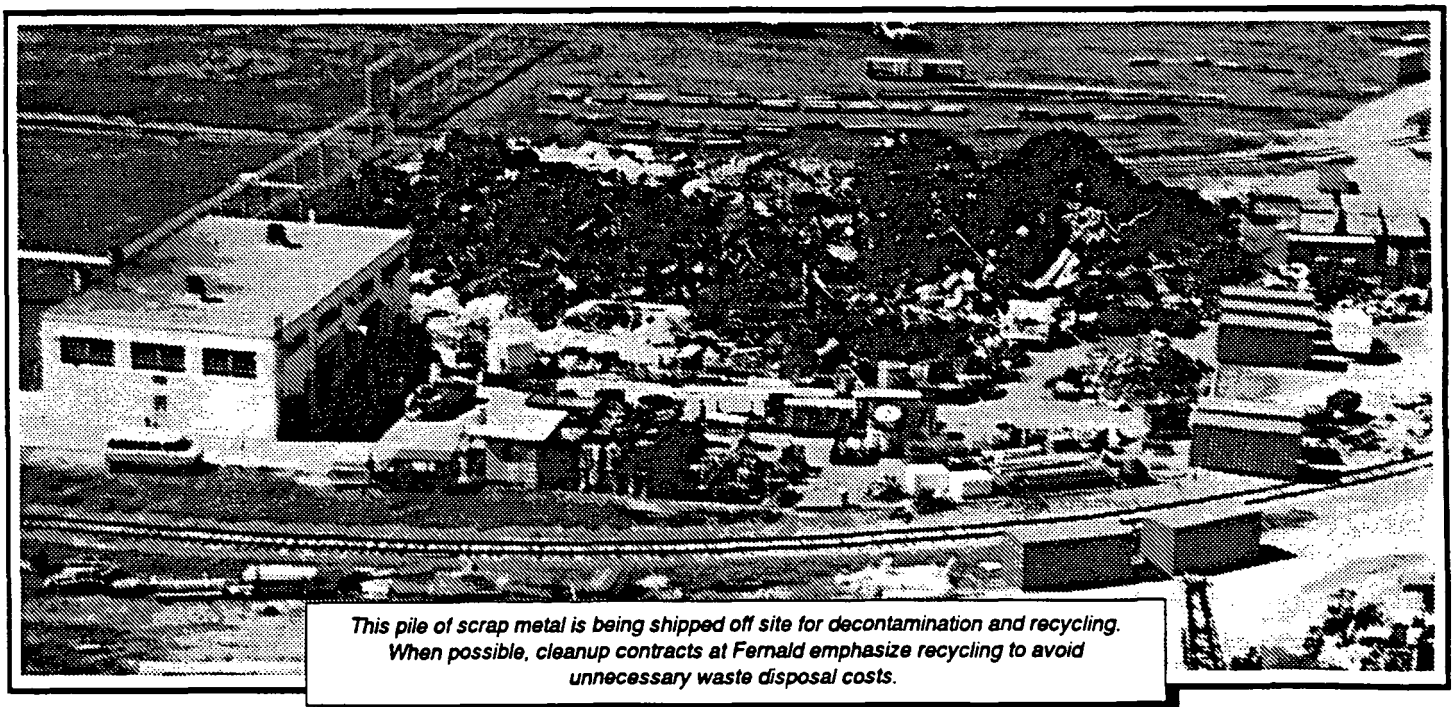
Operable Unit 5 encompasses the environmental media at Fernald and surrounding areas that could be impacted by the facility. While other cleanup units focus on specific waste facilities or defined areas, Operable Unit 5 is concerned with those areas that could be affected by the Fernald site. "Environmental media" includes the groundwater, surface water, soils, sediments, air, vegetation, and wildlife throughout the Fernald site and surrounding areas. The groundwater includes the Great Miami Buried Valley Aquifer, a source of water in the vicinity of Fernald, and pockets of "perched" water trapped in clay layers above the aquifer at several locations on the Fernald site.

Surface waters include the Great Miami River, Paddys Run, and the Fernald site's storm sewer outfall ditch. Sediments in Operable Unit 5 include solid materials carried in stormwater runoff or plant discharges of treated wastewaters to surface waterways or drainage ditches. Soils on and off the Fernald site boundaries also are being investigated for possible contamination due to past discharges or air emissions.

Selecting Cleanup Alternatives

Upon completion of environmental studies at Fernald, a Record of Decision (ROD) will be issued by the U.S. EPA to specify the final remedial alternative for each of the five cleanup units. As directed by the U.S. EPA in the Records of Decision, the DOE will implement selected final cleanup actions which are the most protective of human health and the environment.

For more information about this topic or about other Fernald activities and issues, contact the Office of Public Information, DOE Fernald Field Office, at (513) 648-3131.



This pile of scrap metal is being shipped off site for decontamination and recycling. When possible, cleanup contracts at Fernald emphasize recycling to avoid unnecessary waste disposal costs.

THE PUBLIC ENVIRONMENTAL INFORMATION CENTER

5418

FERNALD
Environmental Management Project

INTRODUCTION

The Public Environmental Information Center (PEIC) was created to provide easy public access to documents about the cleanup activities at the Fernald Environmental Management Project.

The PEIC houses the Administrative Record and the public reading room.

Administrative Record

The Administrative Record is required by the Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund). The Administrative Record is a body of documents that forms the basis for selection of a particular response action at a site. Documents in the Administrative Record include those that contain cleanup alternatives or options that were considered, but were ultimately rejected.

Not only does the Administrative Record document the decision for the selection of a response action, it serves as a vehicle for public participation in the selection of the response action. Moreover, judicial review of any issue concerning the adequacy of a response selection is limited to the Administrative Record. For purposes of administrative and judicial review, the record contains documents that reflect the participation of the public and the U.S. Department of Energy's (DOE) consideration of the public's concerns.

Many different types of documents are generated when a remedial response action is selected. They may include:

- ☐ **Factual information/data**, such as sampling data, inspection reports, risk assessments, work plans, technical studies performed for the site
- ☐ **Policy and guidance**, such as memoranda on off-site disposal availability, alternative treatment technologies, guidance documents, technical literature
- ☐ **Public Participation**, such as the community relations plan, public notices, transcripts of formal meetings, responses to significant comments received from the public, the proposed plan
- ☐ **Enforcement documents**, such as administrative orders and consent decrees or agreements
- ☐ **Decision documents**, such as the Record of Decision
- ☐ **Other information**, such as the Administrative Record index, health assessments, documentation of state involvement

Key Documents

Methods for cleaning up Fernald are determined primarily through the Remedial Investigation and Feasibility Study process, which is required under Superfund. At various steps in this process, a report is issued. These key reports include:

- ☐ **Remedial Investigation**, which presents information on the nature and extent of hazardous substance contamination. This report emphasizes data collection and site characterization.
- ☐ **Feasibility Study**, which fully evaluates alternatives to prevent or reduce the migration or release of hazardous substances from the site.
- ☐ **Baseline Risk Assessment**, which examines current and potential threats to human health and the environment that may be posed by contaminants on the site.
- ☐ **Comprehensive Response Action Risk Evaluation**, which evaluates the risk associated with the proposed alternatives.
- ☐ **Proposed Plan**, which summarizes what cleanup remedy has been selected, and why. The proposed plan, which the public comments on, is issued with the feasibility study.

☐ **Record of Decision**, which spells out the cleanup plan. It also includes a section addressing public comments received on the proposed plan.

Public Reading Room

The reading room contains additional background information on Fernald and other DOE sites, environmental restoration, fact sheets on cleanup activities and audio or video tapes. Some of the materials available include:

- Reference books on hazardous waste and related topics
- News clippings
- Technical law collection
- Technical Information Exchange (TIE) reports
- Technical information collection
- Risk assessment information
- Cassette tapes or videotapes on selected meetings and conferences, site activities, etc.

Copies

Documents may not be taken out of the PEIC, but the public may make copies of the documents and other information. Copies are free.

Location

The PEIC is located about one mile south of the site on Hamilton-Cleves Highway, which is also State Route 128.

Hours

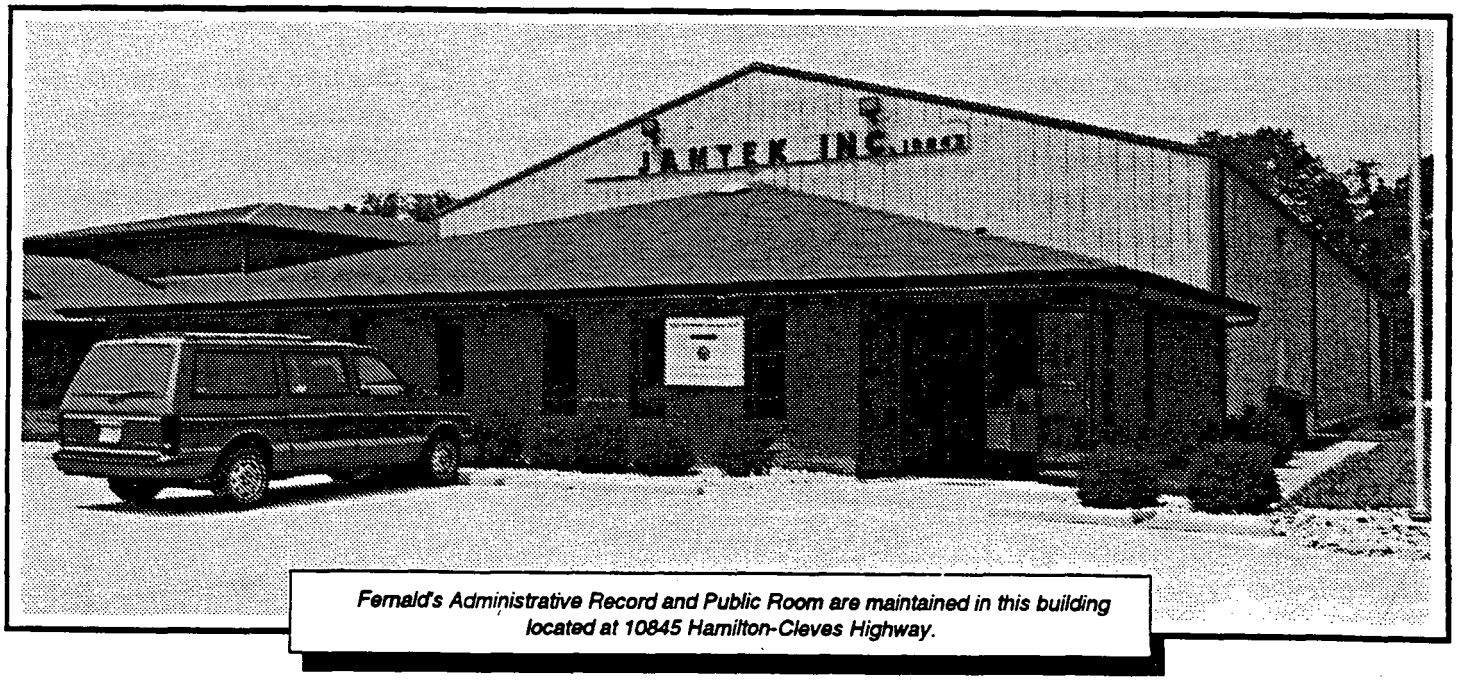
The PEIC is open six days a week:

9 a.m. - 8 p.m.	Monday and Thursday
9 a.m. - 4:30 p.m.	Tuesday, Wednesday and Friday
9 a.m. - 1 p.m.	Saturday

For More Information

You can call the PEIC at

(513) 738-0164
or
(513) 738-0165.



Fernald's Administrative Record and Public Room are maintained in this building located at 10845 Hamilton-Cleves Highway.