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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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MAR 31 1998

REPLY TO THE ATTENTION OF: SRF-5J

Mr. Johnny W. Reising
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

Subject: Final Explanation of Significant Differences for Operable Unit 4 Silo 3 Remedial Action

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the above-referenced document (ESD) as part of its oversight activities for the United States Department of Energy (U.S. DOE) Fernald Environmental Management Project. The ESD, dated January 1998, was provided to U.S. EPA on February 17, 1998. Consistent with the July 22, 1997 Dispute Settlement Agreement, this ESD was prepared to document the change in remedy for treatment and disposal of Silo 3 material.

A Record of Decision for Operable Unit 4 (OU4) was signed on December 7, 1994 identifying on-site vitrification and off-site disposal at the U.S. DOE Nevada Test Site (NTS) as the selected remedy for remediation of the silo materials. Difficulties with vitrification lead to the decision that treatment of Silo 3 material should be implemented separately from treatment of Silo 1 and 2 material, and further that an alternate remedy should be considered for treatment and disposal of Silo 3 material. In summary, the alternate remedy for remediation of Silo 3 material is defined as: 1) treatment using either chemical stabilization/solidification or a polymer-based encapsulation process to stabilize characteristic metals to meet RCRA TCLP limits and attain disposal facility waste acceptance criteria; and 2) off-site disposal at either the NTS or an appropriately-permitted commercial disposal facility.

U.S. EPA concurs with this change in remedy and signed the ESD on March 27, 1998. In accordance with the July 22, 1997 Dispute Settlement Agreement, a revised Remedial Design Work Plan for Silo 3 Remedial Action is to be submitted to U.S. EPA within 60 days of signature of this ESD. Please contact me at (312) 886-4591 if you have any questions.

Sincerely,

G. Jablonowski

Gene Jablonowski
Remedial Project Manager
Federal Facilities Section
SFD Remedial Response Branch #2

Enclosure

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FEMP-OU4-ESD-0 FINAL
January 26, 1998

FINAL

EXPLANATION OF SIGNIFICANT DIFFERENCES for OPERABLE UNIT 4 SILO 3 REMEDIAL ACTION at the FERNALD ENVIRONMENTAL MANAGEMENT PROJECT FERNALD, OHIO

40400-RP-0004

REVISION 0

JANUARY 1998

FINAL

EXPLANATION OF SIGNIFICANT DIFFERENCES for OPERABLE UNIT 4 SILO 3 REMEDIAL ACTION at the FERNALD ENVIRONMENTAL MANAGEMENT PROJECT FERNALD, OHIO

JANUARY 1998

2/5/98

Leah Dever, Manager — Date
United States Department of Energy - Ohio Field Office

3/27/98

William E. Muno, Director — Date
Superfund Division
United States Environmental Protection Agency - Region V

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1. INTRODUCTION

1.1 Background

The Fernald Environmental Management Project (FEMP) is a former uranium processing facility located northwest of Cincinnati, Ohio and owned by the United States Department of Energy (DOE). In November 1989, the FEMP site (referred to at that time as the Feed Materials Production Center) was included on the National Priorities List (NPL) of the U.S. Environmental Protection Agency (U.S. EPA). DOE is the lead agency for remediation of the FEMP pursuant to the 'Consent Agreement as Amended Under CERCLA Sections 120 and 106(a)' (ACA), which was signed by DOE and U.S. EPA in September 1991 (Reference 1).

Operable Unit (OU) 4 is one of five operable units identified in the ACA and consists primarily of four concrete storage silos, three of which contain materials placed there primarily in the 1950s. A Record of Decision (ROD) for OU4 was signed on December 7, 1994 (Reference 2), identifying on-site vitrification and off-site disposal at the DOE Nevada Test Site (NTS) as the selected remedy for remediation of the silo materials.

1.2 Circumstances Giving Rise to Preparation of an Explanation of Significant Differences (ESD) for Remediation of Silo 3 Material

As part of the OU4 remedial design process, a Vitrification Pilot Plant (VITPP) treatability study program was initiated to collect quantitative performance data to support full-scale application of the vitrification technology to the silo materials. The high sulfate content of the surrogate Silo 3 material resulted in significant technical and operational difficulties during Phase I operation of the VITPP (Reference 3). Through vitrification of surrogate materials simulating Silo 1, 2, and 3 materials, it was observed that, although blending surrogate Silo 3 material with surrogate Silo 1 and 2 material did reduce the overall sulfate concentration of the feedstream, high melter operating temperatures (>1,150°C) and the use of reductants were still necessary to attempt control of sulfate layering and foaming events within the melt pool. The high operating temperatures resulted in accelerated component wear and, coupled with the addition of reductants, created a melt pool environment conducive to the formation of molten lead. Thus, although addition of reductants did help to control sulfate foaming, their use exacerbated operational problems associated with the high lead content of the surrogate Silo 1 and 2 material. The relatively high and varying lead content in the Silos 1 and 2 material, without proper controls, could precipitate in the melter and compromise the integrity of the melter's materials of construction. The competing glass chemistry, specifically high lead content of Silos 1 and 2 material and high sulfate concentration in Silo 3 material, creates a high degree of uncertainty in the ability to reliably produce a vitrified material on a full-scale continuous basis. These difficulties culminated on December 26, 1996 with failure of melter hardware caused by incompatible materials of construction and glass composition, in combination with high operating temperatures. Phase I operations were suspended following this incident.

Attempts to resolve technical and operational issues during Phase I operation resulted in documented schedule and cost increases. During early stages of Phase I operation, the DOE identified the need to reassess the technical path forward for remediation of OU4 in order to identify opportunities to address the technical and operational issues experienced with vitrification. In November 1996, the DOE convened the Silos Project Independent Review Team (IT) as a technical resource to assist the DOE in reevaluating the path forward for remediation of the silo material. The IT was comprised of technical representatives from throughout the DOE complex and private industry with expertise in various aspects of waste treatment, vitrification, and other treatment technologies. The recommendations of the IT (Reference 4), the evaluation of the December 26, 1996 melter hardware failure (Reference 5), and other evaluations on the part of the DOE and FEMP stakeholders (Section 7), supported a decision that although a vitrification process could potentially be developed to effectively vitrify Silo 3 material, the cost and the significant extension in cleanup time would not be practical. In addition, the evaluations concluded that separating the materials would significantly reduce the technical uncertainties and programmatic risks of developing an effective treatment process for Silos 1 and 2 material. The DOE made the decision that treatment of Silo 3 material should be implemented separately from treatment of the Silo 1 and 2 material, and further that an alternate remedy should be considered for treatment and disposal of Silo 3 material. Consistent with the July 22, 1997 dispute settlement discussed in Section 2.3, this ESD has been prepared to document the change in remedy for treatment and disposal of Silo 3 material.

1.3 Regulatory Basis

Pursuant to Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act as amended (CERCLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at Title 40 Code of Federal Regulations (CFR) §300.435(c)(2)(I), an ESD document should be published when "differences in the remedial or enforcement action, settlement, or consent decree significantly change but do not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost." The U.S. EPA's position (Reference 8) is that implementation of an alternate remedy for treatment and disposal of Silo 3 material is not a fundamental change as long as the alternate treatment process is a stabilization/solidification process that continues to meet all remedial objectives and performance standards of the approved OU4 ROD (see Section 2.2) for a cost roughly equivalent to the original remedy, and the remedy includes disposal at a protective, appropriately permitted offsite disposal facility. As long as the alternate remedy for treatment of Silo 3 material satisfies these conditions, an ESD is a sufficient means of documenting the change.

1.4 Public Availability of ESD

This ESD will become part of the Administrative Record pursuant to 40 CFR §300.825(a)(2) and will be available at the Public Environmental Information Center (PEIC), 10995 Hamilton-Cleves Highway, Harrison, Ohio, (513) 648-7480. A draft ESD was submitted to Ohio EPA and U.S. EPA for review (Reference 21) and was approved by both agencies after incorporation of their comments (References 23 through 25). As described in Sections 4 and 6, a draft Final ESD (Reference 26) was made available for public review. All comments received during public review of the draft Final ESD, and the response to each comment, are documented in the responsiveness summary in Section 4.

A list of the documents which form the basis for this ESD is provided in Section 7. These documents are available at the PEIC.

2. SUMMARY OF SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

2.1 Site History

The FEMP site is a 425 hectare (1,050 acre) facility north of Fernald, Ohio, a small farming community 18 miles northwest of Cincinnati, Ohio, that lies on the boundary between Hamilton and Butler Counties. Between 1951 and 1989, the primary mission of the FEMP was to process uranium ore concentrates and residues into metallic uranium materials for use at other DOE facilities in the nation's defense program. Production operations at the facility were limited to a fenced 55 hectare (136 acre) tract of land, now known as the former Production Area, located near the center of the site.

OU4 is situated in the southwestern portion of the Waste Storage Area, west of the former Production Area, and consists of two earthen-bermed, concrete silos containing K-65 materials (described below), a decant sump tank, one silo containing Silo 3 material, one unused silo, and various quantities of contaminated soils, perched water, and debris.

The OU4 silos were constructed in the early 1950's for storage of byproduct materials. The materials in Silos 1, 2, and 3 are classified as byproduct materials, as defined in Section 11(e)(2) of the Atomic Energy Act (AEA) of 1954. Silos 1 and 2 contain residues, known as K-65 material, which were generated from the processing of high-grade uranium ores. K-65 material is a silty, clay-like material containing significant activity concentrations of radionuclides including Radium-226, Thorium-230, Lead-210, and Polonium-210. The material also contains levels of lead above the RCRA TCLP limits. Due to the radium content of the K-65 material, Silos 1 and 2 represent a significant source of Radon-222 emanations. As required by the 1991 Federal Facility Agreement for Control and Abatement of Radon-222 Emissions, and the Amended Consent Agreement, a Removal Action was implemented to place a bentonite clay layer over the materials inside Silos 1 and 2 to reduce chronic radon emanation from both silos.

Silo 3 contains material, known as cold metal oxides, that was generated at the FEMP site during uranium extraction operations in the 1950s. These oxides were formed by calcining residues from the solvent extraction process used to extract uranium from ore concentrates and residues. The material in Silo 3 is substantially different from that in Silos 1 and 2. The K-65 material is silty and clay-like, whereas Silo 3 material is dry and powdery. Second, while the radiological constituents in Silo 3 material are similar to those found in the Silo 1 and 2 material, certain radionuclides, such as radium, are present in much lower concentrations in the Silo 3 material. On an activity basis, the predominant radiological constituent of the Silo 3 material is Thorium-230. Due to the lower radium content, Silo 3 exhibits a much lower direct radiation field and has substantially lower Radon-222 emanations than Silos 1 and 2. Therefore, where the original remedy identifies radon attenuation and destruction of organics as factors in selecting vitrification, those are factors almost exclusively associated with the Silos 1 and 2 material and not with the Silo 3 material. Data from the OU4 Remedial Investigation (RI) report indicates that Silo 3 material contains the metals arsenic, cadmium, chromium, and selenium at levels above RCRA TCLP limits.

2.2 Description of Current Selected Remedy

In accordance with the ACA, the DOE performed a Remedial Investigation/Feasibility Study (RI/FS) for OU4 which was approved by the U.S. EPA in August 1994. The OU4 FS (Reference 9) evaluated a number of alternatives for stabilization/solidification of the K-65 and Silo 3 material. The initial phase of this evaluation involved the development of Remedial Action Objectives (RAOs) for each portion of the remedial action. The RAOs identified in the FS for the Silo 3 material are:

- Prevent direct contact with or ingestion of waste material;
- Prevent release or migration of waste materials to soil, groundwater, surface water or sediment; and
- Prevent exposures to waste material that may cause an individual to exceed applicable dose limits.

In addition, the OU4 ROD specifies that the Silo 1, 2, and 3 materials will be treated to "significantly reduce the leachability of metal contaminants of concern to levels that are below RCRA regulatory thresholds."

The initial evaluation of potential alternatives for stabilization/solidification of Silo 3 material considered several stabilization/solidification-type technologies including vitrification, chemical treatment, and also removal and disposal with no additional treatment. Two treatment options, vitrification and cement stabilization, each with either on-site or off-site disposal, were carried forward along with removal and onsite disposal with no further treatment for detailed analysis. The evaluation summarized in the ROD indicated that vitrification provided greater radon attenuation than cement stabilization. The primary factors influencing the selection of vitrification over cement stabilization for treatment of Silo 3 material were its anticipated reduction in waste volume and resulting lower estimated implementation cost.

The draft Final ROD for Remedial Actions at OU4 was submitted to the U.S. EPA in November 1994. The U.S. EPA approved and signed the ROD for Remedial Actions at OU4 on December 7, 1994. The selected remedy consisted of the following components:

- Removal of contents from the Silos 1, 2, and 3 structures, on-site vitrification of the silo materials, and transportation and disposal at the DOE's Nevada Test Site (NTS);
- Decontamination and demolition of all silo structures and the vitrification facility in accordance with the approved OU3 ROD;
- Excavation and treatment of contaminated soils, and treatment of perched water encountered during remedial action, in accordance with the approved OU5 ROD.

This ESD addresses only a change in the treatment portion of the selected remedy for Silo 3 material. No change to any other portion of the selected remedy for OU4 is addressed in this document.

2.3 Current Status

Consistent with the strategy outlined in the OU4 Remedial Design Work Plan approved by the U.S. EPA on June 15, 1995 (Reference 10), the DOE initiated several advanced pilot-scale treatability studies both on-site and in partnership with the academic community. The VITPP Phases I and II Treatability Study Programs were integrated directly into the OU4 Remedial Design/Remedial Action (RD/RA) program in order to collect quantitative performance data to support application of the vitrification technology to remediation of the silo materials. Phase I VITPP testing activities began June 19, 1996 with initiation of the first of four campaigns. On December 26, 1996, VITPP operations were suspended during the final campaign of Phase I due to failure of melter hardware.

In response to the previously discussed schedule delays and need to reassess the technical path forward for remediation of OU4, the DOE requested an extension of certain RD/RA milestones (Reference 11). The U.S. EPA denied the request for extension and agreed to a period of informal dispute resolution to allow the DOE, in consultation with the U.S. EPA, OEPA, and stakeholders, to reassess the path forward (Reference 12). During this period of informal dispute resolution, the DOE, with input from the IRT, U.S. EPA, Ohio EPA, and the public, evaluated the results of the VITPP program, the results of the melter incident, and the technical and schedule impacts of alternatives for OU4 remediation.

These evaluations culminated in a decision not to restart the VITPP for additional Phase I or Phase II testing. These same evaluations supported DOE's decision, originally proposed in August 1996, to recommend that remediation of Silo 3 material be implemented separately from Silo 1 and 2 material and that an alternate remedy should be considered for treatment and disposal of Silo 3 material.

The July 22, 1997 "Agreement Resolving Dispute Concerning Denial of Request for Extension of Time for Certain Operable Unit 4 Milestones," (Reference 13) specified that the change in remedy for Silo 3 material should be documented in an ESD, and further concentrations are extremely difficult to control during vitrification. Vitrification of these materials can result in foaming events which cause potentially serious safety and operational concerns. In addition, use of reductants to control foaming can reduce waste loading in the glass matrix to an undesirable level.

Although a vitrification process could potentially be developed to accommodate these conditions in order to effectively vitrify Silo 3 material, the cost and the significant extension in cleanup time required to develop two independent melter designs would not be practical. Separating the materials, however, will significantly reduce the technical uncertainties and programmatic risks of developing an effective treatment process for Silos 1 and 2 material. For example, vitrification of Silo 1 and 2 material separate from Silo 3 material could be accomplished using a lower-temperature, commercially-available melter design, thus reducing the uncertainties associated with melt pool chemistry, melter life, and materials of construction. Therefore, DOE recommends that treatment of Silo 3 material be evaluated and implemented separately from treatment of Silos 1 and 2 material.

3.2 Decision to Identify an Alternative to Vitrification for Stabilization/Solidification of Silo 3 Material

Based upon the results of the VITPP program, reductants alone would not be an effective means of managing the high sulfate levels present in Silo 3 material. The use of reductants reduces waste loadings and increases the cost of treating the material, and, even if reductants were to be used, foaming could still occur due to irregularities in the sulfate concentrations of the Silo 3 stream. The most certain means of managing the sulfate levels in the Silo 3 material, in order to successfully vitrify the material, would be to dilute the Silo 3 material to reduce the sulfate levels from the 15 to 17 weight-percent levels present in Silo 3 material to as low as 1.5 weight-percent prior to vitrification. Dilution of the Silo 3 material to reduce the sulfate content to these levels would result in a large increase in the volume of material requiring vitrification and a resultant increase in treated waste volume. Associated with this increase in treated waste volume would be an increase in operation and maintenance costs, packaging, transportation, and disposal that the Feasibility Study, Proposed Plan, and ROD for Silos 1 and 2 Remedial Action should be revised and resubmitted.

As discussed in Section 6, a significant level of public involvement was maintained throughout reevaluation of the OU4 path forward, meetings of the Silos Project IRT, and the dispute resolution process.

3. DESCRIPTION OF THE SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES

3.1 Separation of Silo 3 Material Treatment From Treatment of Silo 1 and 2 Material

Phase I operation of the Vitrification Pilot Plant evaluated the vitrification technology by testing a variety of silo surrogate formulations. Silo 3 material contains relatively high concentrations of sulfates (approximately 15 wt%). It was observed that although a "blend" of the Silo 1, 2, and 3 surrogate streams reduced the overall sulfate concentrations of the feedstream, higher melter operating temperatures (> 1,150°C) and the use of reductants were still necessary to control sulfate layering and foaming events within the melt pool. Although addition of reductants did help to control sulfate foaming, their use exacerbated operational problems associated with the high lead content of the surrogate Silo 1 and 2 waste. As was discussed in Section 1.2, the competing glass chemistry creates a high degree of uncertainty in the ability to reliably produce a vitrified waste from Silo 3 material on a full-scale continuous basis. These phenomena were documented as significant causal factors in the February 1997 "Vitrification Pilot Plant Melter Incident Final Report." Tests conducted on a "Silo 3 only" surrogate stream at the Catholic University of America - Vitreous State Laboratory (VSL), in support of the VITPP program, observed the same inherent difficulties associated with vitrification of a material, such as Silo 3 material, with a high sulfate content.

It is theoretically possible that process flow sheets and melter designs could be developed to successfully vitrify Silo 3 material alone or in combination with Silo 1 and 2 material. However, as demonstrated during the VITPP program, materials containing high sulfate costs, and transportation risk. Thus, dilution of the Silo 3 material effectively eliminates the advantages that resulted in the original selection of vitrification. Evaluations indicate that the cost to vitrify Silo 3 material could be as much as several times higher than the cost to treat the material using an alternate process.

The FEMP has demonstrated through several successful mixed waste stabilization projects that stabilization/solidification technologies other than vitrification can be effectively implemented for treatment of waste materials, such as thorium-bearing waste, that are relatively similar to the Silo 3 material. Chemical stabilization technologies have been implemented successfully at the FEMP for treatment of waste streams including:

- Thorium Nitrate
- Grit Blast Residues
- Solidified Furnace Salts
- Sump Cakes
- Construction Rubble
- Miscellaneous Trash

A total of more than 850 yd^3 of waste has been successfully treated at the FEMP through these projects.

In addition to waste stabilized at the FEMP, chemical stabilization processes have been implemented at numerous projects of varying scales throughout the United States. A search of professional journals, electronic databases, and other sources revealed a substantial number of commercial and Superfund remediation projects that have utilized chemical stabilization processes to treat hazardous and mixed waste. A partial list of the journals that were consulted include the *Journal of Hazardous Materials Remediation, Environmental Protection,* and the *Journal of Environmental Science and Health.* The electronic databases that were accessed include the Superfund Innovative Technology Evaluation (SITE) Program, the Alternative Treatment Technology Information Center (ATTIC) and both the U.S. EPA and Ohio EPA Internet Home Pages. Information was also obtained from a variety of published literature, and Internet Home Pages for specific Agencies, Universities and Corporations.

This search revealed several successful chemical stabilization processes within the DOE, Superfund, and commercial sectors. Successful chemical stabilization processes within the DOE complex have stabilized/solidified over 70,000 yd^3 of liquids, sludges, and soils containing radioactive and mixed waste characteristics. The projects included the Savannah River Site, M-Area, where 63,000 yd^3 of soil were stabilized in the 1988 - 1989 period. The Savannah River Saltstone Facility has also stabilized approximately 2,000 yd^3 of sodium nitrate mixed waste. The West Valley Facility stabilized approximately 5,100 yd^3 of sodium nitrate solution. Smaller scale projects have been completed on the Oak Ridge Melton Valley Storage Tanks, and at FERMI Laboratory, the Portsmouth Gaseous Diffusion Plant, and the Pantex Plant.

Of the information that could be quantified, this search revealed that over 1,000,000 yd^3 of soils, sludges, residues, and liquids have been successfully treated using cement (chemical) stabilization processes at Superfund sites and commercial facilities. Examples of these stabilization projects are listed below:

- Carolina Stadium Site, Charlotte NC - 19,000 yd^3 of soil contaminated with lead, PCBs, and semi-volatiles;
- Sacramento Army Depot - 40,000 yd^3 of contaminated soil burn pits and oxidation lagoons;
- Pennington Army Co. - 50,000 yd^3 of hazardous sludge stabilized in situ;
- Eglin Air Force Base - 900 yd^3 of contaminated sand;
- Vickery Surface Impoundment - 400,000 yd^3 of hazardous waste sludge also containing PCBs and dioxins;
- American Airlines, Oklahoma - 1,100 yd^3 of hazardous spent blast media;
- Pioneer Sand Site (Superfund) - 6,000 yd^3 of hazardous waste sludge containing metals and organics;
- Davie Landfill (Superfund) - 82,000 yd^3 of sludge containing cyanide, lead;
- Sapp Battery and Salvage (Superfund) - 200,000 yd^3 of soils containing lead and mercury; and
- Peppers Steel and Alloy (Superfund) - 89,000 yd^3 of soil containing lead, arsenic, and PCBs.

Treatability studies conducted on Silo 3 material during the OU4 FS found alternatives such as cement (chemical) stabilization to be viable remediation alternatives. The characteristics of the Silo 3 materials, and the level of commercial development of stabilization/solidification technologies, indicate that an alternative to vitrification will provide greater certainty of producing a treated Silo 3 material form which satisfies all DOE and environmental regulations and requirements for disposal, in a timely and cost effective manner. Thus, the DOE concluded that the Silo 3 materials should not be vitrified either individually or in combination with the Silo 1 and 2 material.

The DOE has concluded that the method for achieving the objectives of the OU4 ROD for Silo 3 material should be changed from vitrification followed by disposal at the NTS to a revised alternative consisting of:

- Treatment at the FEMP or an appropriately-permitted offsite facility, using a process other than vitrification, to stabilize characteristic metals to levels below RCRA TCLP limits and disposal facility Waste Acceptance Criteria (WAC); and
- Offsite disposal at either the NTS or an appropriately-permitted Commercial Disposal Facility (PCDF) that complies with the CERCLA 'offsite rule' (40 CFR 300.440).

The remainder of this section will describe the process used to identify the acceptable stabilization/solidification technology, or technologies, to be used to implement the revised alternative described above for treatment and disposal of Silo 3 material.

3.3 Screening of Potential Stabilization/Solidification Alternatives

As discussed in Section 1.3, in order to be acceptable for implementation through an ESD, the revised alternative must meet the RAOs and performance standards of the approved OU4 ROD for a cost roughly equivalent to that of the original selected remedy. Any treatment alternative not meeting these criteria would have to be evaluated through a ROD amendment. In Section 3.4, the stabilization alternatives selected for detailed evaluation will be compared against vitrification relative to the Silo 3 RAOs to demonstrate their acceptability for implementation through an ESD.

The first step in identifying the acceptable stabilization/solidification technology, or technologies, to be used to implement the revised alternative was to research literature and other information sources to identify potentially applicable technologies (References 14 through 19).

Several categories of potential treatment technologies were judged not applicable to treatment of the Silo 3 material and were eliminated from the screening process. Silo 3 material is the result of oxidation of the residue from a solvent extraction process by calcination. Subjecting the material to further oxidation or solvent extraction would provide no further reduction in mobility of toxic constituents, and would fail to accomplish the remedial action objectives identified in Section 2.2. Solvent extraction and thermal desorption technologies were judged not to warrant further evaluation.

Retrieval and off-site disposal without treatment was also eliminated from the screening process. The requirements of RCRA, which are identified as Applicable or Relevant and Appropriate Requirements (ARARs) in the approved OU4 ROD, require that the material be treated to remove the toxicity characteristic before being disposed. These regulations also preclude blending as a substitute for treatment. The option of retrieval and off-site disposal with no further treatment, therefore, fails to comply with all ARARs and does not warrant further evaluation.

The following alternatives were identified for consideration in the screening process:

- Asphalt (Bitumen) Stabilization
- Chemical Stabilization/Solidification
- Polymer (Micro) Encapsulation
- Ceramics
- Ceramic Silicon Foam
- Macro Encapsulation
- Metal Matrix (Ceramet)
- Molten Metal Technology
- Thermal Setting (Epoxy) Resins
- Sulfur/Polymer Encapsulation
- Phoenix Ash Stabilization

Information regarding the potential technologies was drawn from the previously identified research sources as well as from input of technical experts in waste treatment. The eleven alternatives were then evaluated, with participation of the public, against the 3 criteria specified in U.S. EPA regulations for the RI/FS Preliminary Screening of Alternatives process (40 CFR 300.430(e)(7)). Public involvement in the screening and detailed evaluation of stabilization/solidification alternatives is discussed in greater detail in Section 6. As illustrated below, more detailed sub-criteria were developed within each of the three National Contingency Plan (NCP) screening criteria to provide a more detailed screening.

The following screening criteria were used to screen the alternatives and identify those to be carried forward for detailed evaluation:

Effectiveness

- Reduction in Mobility of Constituents of Concern (COCs)
- Volume Increase/Decrease
- Attainment of WAC for Characteristic Metals, based upon WAC at NTS and a representative PCDF
- Long-term Effectiveness/Permanence
- Attainment of ARARs and To Be Considered (TBC) requirements

Implementability

- Commercial Availability
- Generation of Secondary Waste Streams
- Pretreatment Requirements
- Processing Throughput
- System Reliability/Maintainability

Cost

- Overall Cost
- Capital or Operation, Maintenance, and Disposal Cost- Intensive

The comparison of potential stabilization/solidification alternatives against the screening criteria is summarized in Tables 1 through 3. As a result of the screening process, it was determined that eight of the alternatives did not warrant further consideration in the detailed analysis of alternatives. These eight alternatives, and the basis for their exclusion, are identified in Table 4.

TABLE 1
SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - EFFECTIVENESS

STABILIZATION ALTERNATIVE	MOBILITY OF CONSTITUENTS OF CONCERN	VOLUME INCREASE / DECREASE	WAC[1] FOR CHARACTERISTIC METALS [1] Based upon evaluation of WAC from NTS and a representative PCDF	LONG-TERM EFFECTIVENESS / PERMANENCE
Asphalt (Bitumen) Stabilization	Mobility reduced through physical binding	Volume increase	May not meet WAC for characteristic metals	Acceptable long-term effectiveness
Chemical Stabilization/Solidification	Demonstrated ability to reduce mobility of Silo 3 COCs	20% volume increase shown in Silo 3 treatability tests	Demonstrated ability to attain WAC with same metals present in Silo 3 material	Acceptable long-term effectiveness
Polymer (Micro) Encapsulation	Mobility reduced through physical binding	Volume increase should be similar to cement stabilization/solidification	Pilot-scale testing on similar material shows ability to immobilize metals	Acceptable long-term effectiveness
Ceramics	Mobility reduced through physical binding	Volume increase / decrease unknown	Requires development work to confirm ability to meet WAC for characteristic metals	Acceptable long-term effectiveness
Ceramic Silicon Foam	Mobility reduced through physical binding	Volume increase less than that from cementation	Likely would not meet WAC for characteristic metals	Acceptable long-term effectiveness
Macro Encapsulation	Mobility reduced through physical binding	Volume increase	Would not meet WAC for characteristic metals	Would fail to produce acceptable material form for long-term disposal from Silo 3 material

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TABLE 1
SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - EFFECTIVENESS

STABILIZATION ALTERNATIVE	MOBILITY OF CONSTITUENTS OF CONCERN	VOLUME INCREASE / DECREASE	WAC[1] FOR CHARACTERISTIC METALS [1] Based upon evaluation of WAC from NTS and a representative PCDF	LONG-TERM EFFECTIVENESS / PERMANENCE
Metal Matrix (Ceramet)	Mobility reduced through physical binding	Volume increase / decrease unknown	Requires development work to confirm ability to meet WAC for characteristic metals	Acceptable long-term effectiveness
Molten Metal Technology	Reduces mobility of constituents of concern	Volume increase	Requires development work to confirm ability to meet WAC for characteristic metals	Acceptable long-term effectiveness
Thermal Setting (Epoxy) Resins	Reduces mobility of constituents of concern through physical binding	Volume increase or decrease unknown	Requires development work to confirm ability to meet WAC for characteristic metals	Acceptable long-term effectiveness
Sulfur/Polymer Encapsulation	Reduces mobility of constituents of concern through physical binding	Volume increase	May require additives to chemically bind characteristic metals	Acceptable long-term effectiveness
Phoenix Ash Stabilization	Reduces mobility of constituents of concern	Potential volume decrease	Requires development work to confirm ability to meet WAC for characteristic metals	Acceptable long-term effectiveness

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TABLE 2

SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - IMPLEMENTABILITY

STABILIZATION ALTERNATIVE	COMMERCIAL AVAILABILITY	SECONDARY WASTE	PRETREATMENT REQUIREMENTS	PROCESSING THROUGHPUT	RELIABILITY / MAINTAINABILITY
Asphalt (Bitumen) Stabilization	Mature technology; not widely used	Volatiles in offgas require treatment;	None required	Large processing throughput achievable	Flammability issue; complex facility and equipment requirements; operator-friendly and easily maintained
Chemical Stabilization/Solidification	Mature technology; used on a commercial scale by numerous vendors	Secondary waste is limited to HEPA filters	None required	Large processing throughput achievable	Facility and equipment requirements are not complex; ambient temperature operation; easily maintained
Polymer (Micro) Encapsulation	Commercially available	Volatiles in offgas may require offgas treatment	May require drying prior to encapsulation	Large processing throughput achievable	Facility and equipment requirements are not complex
Ceramics	Not commercially available	Volatiles in offgas may require offgas treatment	Pretreatment may be required; mechanical compression or drying	Processing throughput unknown	Complex facility and equipment requirements; Unknown reliability / maintainability

TABLE 2

SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - IMPLEMENTABILITY

STABILIZATION ALTERNATIVE	COMMERCIAL AVAILABILITY	SECONDARY WASTE	PRETREATMENT REQUIREMENTS	PROCESSING THROUGHPUT	RELIABILITY / MAINTAINABILITY
Ceramic Silicon Foam	Not commercially available	Volatiles in offgas may require offgas treatment	Pretreatment required: may require drying	Processing throughput unknown	Complex facility and equipment requirements; reliability and maintainability similar to polymer encapsulation
Macro Encapsulation	Mature technology for large discrete objects (equipment, debris, etc), but not applicable to Silo 3 material	No secondary waste	No pretreatment required	Large processing throughput achievable	Facility and equipment requirements are not complex; operator-friendly and easily maintained
Metal Matrix (Ceramet)	Developmental technology; commercial availability unknown	Produces volatile gases	Pretreatment required; proprietary process	Processing throughput limited	Complex facility and equipment requirements; high temperature operation(above metal melting point); system reliability and maintainability unknown

TABLE 2

SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - IMPLEMENTABILITY

STABILIZATION ALTERNATIVE	COMMERCIAL AVAILABILITY	SECONDARY WASTE	PRETREATMENT REQUIREMENTS	PROCESSING THROUGHPUT	RELIABILITY / MAINTAINABILITY
Molten Metal Technology	Has been used for volume reduction of nuclear reactor spent resins; not commercially available	Produces SO_2, CO_x, PO_x in offgas; also produces slag waste	Pretreatment required; waste sizing requirement	Processing throughput limited	Facility and equipment requirements, and system reliability / maintainability similar to vitrification
Thermal Setting (Epoxy) Resins	Not commercially available	Volatiles in offgas may require offgas treatment	Pretreatment (drying) may be required	Processing throughput unknown	Complex facility and equipment requirements; Higher-than-ambient operating temperatures. Reliability / maintainability similar to polymer encapsulation
Sulfur/Polymer Encapsulation	Commercially available	SO_2 and H_2S in offgas may require treatment	Pretreatment required; moisture sensitive	Large processing throughput possible	Thermal process; involves handling of molten sulfur; computerized process control required; flammability issues (flash point 177°C). More complex and difficult to maintain than cement stabilization

TABLE 2

SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - IMPLEMENTABILITY

STABILIZATION ALTERNATIVE	COMMERCIAL AVAILABILITY	SECONDARY WASTE	PRETREATMENT REQUIREMENTS	PROCESSING THROUGHPUT	RELIABILITY / MAINTAINABILITY
Phoenix Ash Stabilization	Developmental technology; commercially available; one equipment vendor	Secondary waste limited to HEPA filters	Pretreatment required - mechanical compression; particle size-reduction and pretreatment for chromium and cadmium	Limited processing throughput	Facility and equipment requirements and reliability similar to cement stabilization. High pressure operation results in higher maintenance requirements

TABLE 3

SCREENING OF POTENTIAL STABILIZATION/SOLIDIFICATION ALTERNATIVES - COST

STABILIZATION ALTERNATIVE	OVERALL COST	CAPITAL OR OPERATION AND MAINTENANCE (O&M) COST INTENSIVE
Asphalt (Bitumen) Stabilization	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Chemical Stabilization/Solidification	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Polymer (Micro) Encapsulation	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Ceramics	Medium	Capital cost is predominant factor
Ceramic Silicon Foam	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Macro Encapsulation	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Metal Matrix (Ceramet)	Medium	Capital cost is predominant factor
Molten Metal Technology	High	Capital cost is predominant factor
Thermal Setting (Epoxy) Resins	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Sulfur/Polymer Encapsulation	Medium	Majority of cost associated with processing, packaging, shipping, and disposal
Phoenix Ash Stabilization	Medium	Similar to cement stabilization

TABLE 4

STABILIZATION/SOLIDIFICATION ALTERNATIVES NOT CARRIED FORWARD FOR DETAILED EVALUATION

STABILIZATION ALTERNATIVE	BASIS FOR EXCLUSION FROM DETAILED EVALUATION
Asphalt (Bitumen) Stabilization	May not meet WAC for characteristic metals; complex facility and equipment requirements; safety (flammability) concerns
Ceramics	Not commercially available; complex facility and equipment requirements
Ceramic Silicon Foam	Not commercially available; may not meet WAC for characteristic metals
Macro Encapsulation	Would fail to meet WAC for characteristic metals; would fail to produce an acceptable material form for long-term disposal from Silo 3 material
Metal Matrix (Ceramet)	Commercial availability unknown; complex facility and equipment requirements
Molten Metal Technology	Not commercially available; complex facility and equipment requirements (analogous to vitrification); high cost
Thermal Setting (Epoxy) Resins	**Not commercially available; complex facility and equipment** requirements
Phoenix Ash Stabilization	Limited commercial availability; falls within Chemical Stabilization/Solidification alternative

The following three alternatives were identified for detailed evaluation:

Chemical Stabilization/Solidification

This type of stabilization process is the most widely commercially-used method for stabilization of low-level and mixed waste. The process involves mixing the waste with a variety of inorganic chemical additive formulations such as cement, lime, pozzolans, gypsum, or silicates, to accomplish chemical and physical binding of the constituents of concern. These processes provide reduction in contaminant mobility by chemically stabilizing contaminants into a non-leachable form, as well as physically binding the chemically stabilized contaminants in a solid matrix. It is a non-thermal process with relatively simple facility and equipment requirements. Cement stabilization/solidification was evaluated in detail in the original OU4 Feasibility Study.

Polymer (micro) Encapsulation

Polymer (micro) encapsulation is a thermal process which physically binds the COCs in a thermoplastic polymer. Polyethylene is melted and mixed with the dry waste using a typical commercial extruder. The molten mixture is poured into the disposal container where solidification occurs as the mixture cools.

Sulfur/Polymer Encapsulation

Similar to polymer (micro) encapsulation, sulfur/polymer encapsulation (SPC) is a thermal process that produces a solid waste form that physically binds the COCs. SPC encapsulates the COCs in a cement, sulfur, and polymer matrix. The sulfur provides a highly corrosion-resistant cement, while the polymer ensures proper curing to prevent crystallization of the sulfur.

3.4 Detailed Evaluation of Silo 3 Stabilization/Solidification Alternatives

The OU4 FS evaluated several alternatives for stabilization/solidification of Silo 3 material, including vitrification, and cement stabilization, which is representative of a wide range of chemical stabilization/solidification-type technologies. The FS found that both vitrification and cement stabilization successfully met all RAOs and treatment objectives for Silo 3 material. Table 5 provides a comparison of Chemical Stabilization/Solidification, Polymer-based Encapsulation (which includes both Sulfur/Polymer encapsulation and Polymer (micro) Encapsulation), and vitrification, relative to the RAOs and treatment objectives for Silo 3 material.

As illustrated in Table 5, the three alternatives carried forward from the initial screening are successful in attaining the RAOs and treatment objectives specified for vitrification of Silo 3 material. The primary basis for selecting vitrification in the OU4 ROD was lower estimated implementation cost and lower treated waste volume. The superior radon attenuation provided by vitrification was also a factor influencing selection of vitrification for treatment of Silo 1 and 2 material. Due to the significantly lower radium content of Silo 3 material, radon attenuation was not a predominant factor in selecting the treatment remedy for Silo 3 material; all three alternatives can provide adequate radon attenuation. As discussed in Section 3.2, measures to control the sulfate levels present in Silo 3 material would likely minimize the advantage in treated waste volume offered by vitrification. The rough-order of-magnitude costs estimated for the three stabilization alternatives are roughly equivalent to the cost originally estimated for vitrification. Based upon the comparison summarized in Table 5, all three alternatives carried forward from the initial screening are judged acceptable for detailed evaluation through an ESD.

TABLE 5
ATTAINMENT OF SILO 3 REMEDIAL ACTION OBJECTIVES

REMEDIAL ACTION OBJECTIVE	VITRIFICATION	CHEMICAL STABILIZATION/SOLIDIFICATION	POLYMER-BASED ENCAPSULATION
Prevent Direct Contact with / Ingestion of Waste Material	Radiological and toxic constituents are solidified in a solid matrix. The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders.	Radiological and toxic constituents are solidified in a solid matrix. The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders.	Radiological and toxic constituents are physically bound in a polymer matrix. The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders.

TABLE 5
ATTAINMENT OF SILO 3 REMEDIAL ACTION OBJECTIVES

REMEDIAL ACTION OBJECTIVE	VITRIFICATION	CHEMICAL STABILIZATION/SOLIDIFICATION	POLYMER-BASED ENCAPSULATION
Prevent Release or Migration of Waste Material to Soil, Groundwater, or Surface Water	COCs are chemically bound in a glass matrix.	COCs are chemically stabilized into a non-leachable form.	Migration of COCs is prevented through physical binding in a polymer matrix.
	Demonstrated ability to immobilize contaminants present in Silo 3 material through OU4 FS and subsequent testing.	Demonstrated ability to immobilize contaminants present in Silo 3 material through OU4 FS and subsequent testing, and both FEMP and commercial treatment of mixed wastes.	Pilot-scale testing on mixed wastes similar to Silo 3 material shows ability to successfully immobilize hazardous constituents.
	Met TCLP limits for all hazardous constituents in OU4 FS and VITPP testing.	Met TCLP limits for all hazardous constituents in OU4 FS testing.	
	Met NESHAP Subpart Q radon flux limit in OU4 FS testing.	Met NESHAP Subpart Q radon flux limit in OU4 FS testing.	
	Disposal facility design and location minimizes exposure of treated waste to potential degradation mechanisms	Disposal facility design and location minimizes exposure of treated waste to potential degradation mechanisms	Disposal facility design and location minimizes exposure of treated waste to potential degradation mechanisms

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TABLE 5
ATTAINMENT OF SILO 3 REMEDIAL ACTION OBJECTIVES

REMEDIAL ACTION OBJECTIVE	VITRIFICATION	CHEMICAL STABILIZATION/SOLIDIFICATION	POLYMER-BASED ENCAPSULATION
Prevent Exposures to Waste Material Causing an Individual to Exceed Annual Dose Limits of: 25mrem/year whole body 75 mrem/year to the thyroid 25 mrem/year to any other organ 100 mrem/year effective dose equivalent above background, from all exposure routes	The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders. Cumulative dose equivalent to transportation worker during transportation of vitrified Silo 3 material - 0.86 mrem Dose equivalent to maximally exposed member of the public during routine transportation of all shipments of vitrified Silo 3 material - 0.002 mrem.	The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders. Cumulative dose equivalent to transportation worker during transportation of chemically stabilized Silo 3 material - 0.95 mrem Dose equivalent to maximally exposed member of the public during routine transportation of all shipments of chemically stabilized Silo 3 material - 0.006 mrem.	The disposal configuration will be permitted, designed and located to prevent contact with the treated waste by members of the public or inadvertent intruders. Dose to worker and member of the public during transportation of encapsulated Silo 3 material can be assumed roughly equivalent to that from chemically-stabilized material.

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TABLE 5
ATTAINMENT OF SILO 3 REMEDIAL ACTION OBJECTIVES

REMEDIAL ACTION OBJECTIVE	VITRIFICATION	CHEMICAL STABILIZATION/SOLIDIFICATION	POLYMER-BASED ENCAPSULATION
Achieve Residual Risk < $1x10^{-6}$			
Transportation	Estimated Lifetime Cancer Risk (LCR) of $3x10^{-10}$ to maximally exposed member of the public during routine transport from all shipments (assuming onsite treatment)	Estimated Lifetime Cancer Risk (LCR) of $8x10^{-10}$ to maximally exposed member of the public during routine transport from all shipments (assuming onsite treatment) Transportation risk for offsite treatment will be maintained less than $1x10^{-6}$ through onsite pretreatment of Silo 3 material and packaging in accordance with DOT regulations	Estimated Lifetime Cancer Risk (LCR) to maximally exposed member of the public during routine transport from all shipments of $8x10^{-10}$ (assuming onsite treatment) Transportation risk for offsite treatment will be maintained less than$1x10^{-6}$ through onsite pretreatment of Silo 3 material and packaging in accordance with DOT regulations
Onsite (FEMP)	Residual risk less than $1x10^{-6}$ will be attained through removal of the source term	Residual risk less than $1x10^{-6}$ will be attained through removal of the source term	Residual risk less than $1x10^{-6}$ will be attained through removal of the source term
Offsite (Disposal Facility)	Residual risk less than $1x10^{-6}$ will be attained through design and location of the disposal facility to minimize the potential for human or ecological receptors	Residual risk less than $1x10^{-6}$ will be attained through design and location of the disposal facility to minimize the potential for human or ecological receptors	Residual risk less than $1x10^{-6}$ will be attained through design and location of the disposal facility to minimize the potential for human or ecological receptors

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TABLE 5
ATTAINMENT OF SILO 3 REMEDIAL ACTION OBJECTIVES

REMEDIAL ACTION OBJECTIVE	VITRIFICATION	CHEMICAL STABILIZATION/SOLIDIFICATION	POLYMER-BASED ENCAPSULATION
Cost	$28 million - 1994 dollars (ROM cost from OU4 FS, alternative 3B/1/Vit)	Rough-order-of-magnitude cost estimate - $25 million	Assumed roughly equivalent to cement stabilization due to expected similar waste volume and capital costs (based upon U.S. EPA literature review)

The three technologies were then evaluated using the criteria defined by CERCLA for the RI/FS Detailed Analysis of Alternatives process [40 CFR 300.430(e)(9)]. These criteria are:

Threshold Criteria

- Overall Protection of Human Health and the Environment
- Compliance with ARARs

Balancing Criteria

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

As was the practice with the original OU4 FS, formal consideration of the modifying criteria of State and Community Acceptance was accomplished through review of the draft Final ESD by the state and the public, as formally documented in the responsiveness summary included as Section 4 of this Final ESD. No changes to the draft Final ESD were required based upon consideration of state and community acceptance.

A comparison of the three stabilization/solidification alternatives against the criteria is summarized in Tables 6 through 11. As illustrated by Table 6, all three alternatives successfully meet the two threshold criteria. Although the evaluation identified potential advantages offered by each of the three alternatives in individual balancing criteria, none of the advantages were judged sufficient to preclude further consideration of all three alternatives.

3.5 Description of Alternate Remedy for Silo 3 Material

Based upon the detailed evaluation against the criteria prescribed by the NCP, both Chemical Stabilization / Solidification, and Polymer-based Encapsulation processes (such

TABLE 6
COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES

THRESHOLD CRITERIA

EVALUATION CRITERION	CHEMICAL STABILIZATION	POLYMER (micro) ENCAPSULATION	SULFUR/POLYMER ENCAPSULATION
PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT	< = = = = = = = = = = = = = = = =	All alternatives are very protective: Effectively immobilizes all hazardous and radiological constituents to meet disposal facility WAC Potential disposal facilities will be permitted, designed, and located to minimize the potential for human or ecological exposure Engineered disposal design minimizes potential for access by inadvertent intruders Short-term (transportation) risks to the public are maintained well within CERCLA criteria (see short-term effectiveness evaluation)	= = = = = = = = = = = = = = = = = = = >
COMPLIANCE WITH ARARS	< = = = = = = = = = = = = = = = =	All three alternatives can comply with current ARARs No modifications to current ARARs will be required or requested	= = = = = = = = = = = = = = = = = = >

TABLE 7
COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES

BALANCING CRITERIA

LONG-TERM EFFECTIVENESS AND PERMANENCE

CHEMICAL STABILIZATION	POLYMER (micro) ENCAPSULATION	SULFUR/POLYMER ENCAPSULATION
<= = = = = = = = = = = = = = = = = = =	All three alternatives provide adequate long-term effectiveness Disposal facility design and location minimizes exposure of treated material to potential degradation mechanisms (freeze thaw, groundwater infiltration, etc), thus maintaining the protectiveness discussed above	= =>

TABLE 8
COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES

BALANCING CRITERIA

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

	CHEMICAL STABILIZATION	POLYMER (micro) ENCAPSULATION	SULFUR/POLYMER ENCAPSULATION
TOXICITY	<= = = = = = = = = = = = = = = = = = =	None of the three alternatives provide destruction of toxic constituents (no significant reduction of toxicity is accomplished). All three alternatives provide effectiveness by immobilizing toxic constituents	= = = = = = = = = = = = = = = = = =>
MOBILITY	Demonstrated ability to immobilize contaminants present in Silo 3 material through OU4 FS and subsequent testing, and both FEMP and commercial treatment of similar materials. Reduces mobility through chemical stabilization of COCs, as well as physical binding.	Pilot-scale testing on materials similar to Silo 3 material shows ability to successfully immobilize hazardous constituents. Reduces mobility by physically encapsulating COCs; no chemical stabilization	Pilot-scale testing on materials similar to Silo 3 material shows ability to successfully immobilize hazardous constituents. Reduces mobility by physically encapsulating COCs; no chemical stabilization
VOLUME	Estimated 20% volume increase, based upon treatability tests with Silo 3 material Minimal secondary waste	Assumed equivalent to Cement Stabilization, based upon U.S. EPA literature review. Could potentially provide lower treated waste volume than cement stabilization	Assumed equivalent to Cement Stabilization, based upon U.S. EPA literature review. Could potentially provide lower treated waste volume than cement stabilization

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TABLE 9

COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES

BALANCING CRITERIA

IMPLEMENTABILITY

	CHEMICAL STABILIZATION	POLYMER (micro) ENCAPSULATION	SULFUR/POLYMER ENCAPSULATION
ADMINISTRATIVE IMPLEMENTABILITY	< = = = = = = = = = = = = = = = =	NTS provides preliminary confirmation of acceptability of treated waste under existing PA	= = = = = = = = = = = = = = = = = >
TECHNICAL IMPLEMENTABILITY	More widely implemented on a commercial scale for mixed waste treatment than other two alternatives Has been successfully implemented on a commercial scale to treat mixed waste at numerous DOE and non-DOE superfund sites Has been successful at FEMP on other mixed wastes, including thorium waste	Limited commercial implementation Successful on a bench scale with mixed waste and on a pilot-scale with surrogate Development required to confirm treated waste volume and achievable throughput	More uncertain than Cement(chemical) Stabilization due to limited commercial implementation More complex facility and equipment requirements than cement(chemical) stabilization or polymer (micro) encapsulation Successful on a pilot scale; small-scale commercial facility exists Development required to confirm treated waste volume and achievable throughput

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TABLE 10
COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES

BALANCING CRITERIA

SHORT-TERM EFFECTIVENESS

	CHEMICAL STABILIZATION	POLYMER (MICRO) ENCAPSULATION	SULFUR / POLYMER ENCAPSULATION
Worker Risks	Lower than other three alternatives due to lower operating temperature and shorter period of operation	Operating temperatures, and therefore worker risk, are slightly higher than Cement Stabilization, but lower than Sulfur/Polymer Encapsulation.	Higher than Cement Stabilization or Polymer Encapsulation due to higher operating temperatures and handling of molten sulfur
Transportation Risk	Occupational, public, and accident-scenario (including accident with fire) transportation risks are well within CERCLA guidelines	Equivalent to Cement Stabilization, assuming equal treated waste volume; lower treated waste volume would result in risk lower than that for cement stabilization	Equivalent to Cement Stabilization, assuming equal treated waste volume; lower treated waste volume would result in risk lower than that for cement stabilization
Offgas Issues	Minimal; process maintains moisture in untreated waste, resulting in minimal particulate emissions	Minimal; process requires very low moisture content in feed stream, resulting in waste particulate generation during material handling	Greater than cement stabilization or Polymer (micro) encapsulation. Process requires very low moisture content in feed stream , resulting in waste particulate generation during material handling. Potential generation of SO_2 and H_2S during process upsets can be treated through typical offgas controls
Clean-up Time	Clean-up time is most certain of the three alternatives based upon OU4 treatability testing and commercial experience with similar wastes. Potential clean-up time of less than 9 months - actual cleanup time will be determined by selected subcontractor	Achievable throughput and resulting clean-up time must be determined through development work. U.S. EPA literature indicates clean-up time should be roughly similar to that achievable by chemical stabilization	Achievable throughput and resulting clean-up time must be determined through development work. U.S. EPA literature indicates clean-up time should be roughly similar to that achievable by chemical stabilization

TABLE 11
COMPARATIVE EVALUATION OF SILO 3 STABILIZATION/SOLIDIFICATION ALTERNATIVES
BALANCING CRITERIA

COST

CHEMICAL STABILIZATION	POLYMER (micro) ENCAPSULATION	SULFUR/POLYMER ENCAPSULATION
Due to wide-spread commercial implementation and more certain implementability, cost is most certain of the three alternatives	Assumed roughly equivalent to cement stabilization due to expected similar waste volume and capital costs (based upon U.S. EPA literature review)	Assumed roughly equivalent to cement stabilization due to expected similar waste volume and capital costs (based upon U.S. EPA literature review)
Rough- order-of-magnitude cost estimate: $25 million	Cost is more uncertain than that for cement stabilization due to limited commercial-scale basis for estimate	Cost is more uncertain than that for cement stabilization due to limited commercial-scale basis for estimate

as Polymer (micro) Encapsulation and Sulfur/Polymer Encapsulation) were judged acceptable, and demonstrated to meet RAOs and treatment objectives for stabilization/solidification of the Silo 3 material. Therefore, the alternate remedy for remediation of Silo 3 material will be defined as:

- Treatment, using either Chemical Stabilization/Solidification or a Polymer-Based Encapsulation process, to stabilize characteristic metals to meet RCRA TCLP limits and attain disposal facility WAC; and
- Offsite disposal at either the NTS or an appropriately-permitted commercial disposal facility.

The treatment portion of the alternate remedy may be accomplished through either onsite treatment at the FEMP to meet disposal facility WAC, or pretreatment onsite as required to reduce dispersability of thorium-bearing particulates and render the material acceptable for transportation, followed by transportation to an appropriately permitted offsite facility for treatment using Chemical Stabilization/Solidification or a polymer-based encapsulation process to meet disposal facility WAC. For offsite treatment to attain the Silo 3 RAOs, onsite pretreatment, in combination with packaging in accordance with Department of Transportation (DOT) regulations, must reduce the dispersability of thorium-bearing particulates and result in transportation risk less than $1x10^{-6}$. The specific process to be used will be selected through evaluation of proposals submitted by potential subcontractors. A request for proposal (RFP) will be issued requesting potential contractors to submit proposals for implementation of the alternate remedy described above. The specific process to accomplish the treatment and disposal of Silo 3 material will then be designed, tested, and implemented by the selected contractor.

4. SUPPORT AGENCY AND PUBLIC COMMENTS AND RESPONSIVENESS SUMMARY

A formal public comment period, and preparation of a responsiveness summary addressing all comments, are typically included in the process of issuing a ROD in accordance with the NCP and U.S. EPA guidance. Although a formal comment period is not specifically as part of issuing an ESD, U.S. EPA guidance on the preparation of an ESD recommends that public comments be accepted, and formally responded to, in cases where there is considerable public interest in the changes being addressed in an ESD.

Public involvement in the development and issuance of this ESD is addressed in detail in Section 6. A draft Final ESD (Reference 26) was made available for public review and comment beginning November 17, 1997. Notices announcing the availability of the draft Final ESD at the PEIC, the period for public comment, and the schedule of formal public hearings were mailed to stakeholders.

A hearing for stakeholders in the vicinity of the FEMP was held on November 25, 1997. A transcript of this hearing is contained in Appendix A. After a brief review of the background and contents of the draft Final ESD, stakeholders were invited to comment, either orally at the hearing, or in writing at any time prior to December 16, 1997. No oral comments were presented at the hearing.

A second hearing, for stakeholders in the vicinity of the NTS, was held on December 2, 1997. Following a briefing on the contents of the draft Final ESD, three members of the public presented oral comments. A transcript of the hearing, including the complete text of oral comments, is contained in Appendix B.

The public comment period for the draft Final ESD was closed on December 16, 1997. Written comments were received from only one commentor. These comments are contained in Appendix C.

No changes to the draft Final ESD were required as a result of addressing comments received during public review of the document.

4.1 Responses to Public Comments on the Draft Final ESD

Commentor A

Earl McGhee, Amargosa Valley, NV

Summary of Comment:

Oral Comment A.1: '...I see by all of the things that are happening, you want to destroy people. You want to destroy a perfect habitat for humanity and wildlife, and you are putting it all at risk...'

Response: The remedy for treatment and disposal of Silo 3 material has been selected, and will be implemented, fully in accordance with CERCLA, NEPA and other applicable regulations promulgated to assure protection of the public and the environment. As evidenced by the evaluation documented in this ESD, CERCLA requires risk to the public and the environment to be evaluated as primary factors in the remedy selection process. By statute, the selected remedy is required to be protective of human health and the environment. CERCLA also requires input from the public as an integral part of selecting and implementing remedial actions. As described in Section 5 of the ESD, the remedy for treatment and disposal of Silo 3 material has also been fully evaluated under the NEPA process to assure that potential impacts to the environment, wildlife, and other ecological resources have been appropriately addressed.

Commentor B

Dennis A. Bechtel, Henderson, NV

Summary of Comments:

Oral Comment B.1: '... The performance assessment should include more than just the operation of material...There is a lot of ways you can test the performance, one of which is the transportation of the waste itself...there should be a performance assessment of things like the packaging, training of the drivers...'

Response: See responses to Written Comments B.4 and B.5.

Oral Comment B.2: '...One concern we have had, we discussed this, is about our big issue out here regarding transportation and the fact that Fernald is looking at a number of operable units in their clean-up.... There should be somebody looking at overall shipments of waste, and whether it's at an individual site, Fernald should be considering shipments from all of the operable units....'

Response: See response to Written Comment B.7.

Oral Comment B.3: 'I had a couple of comments with regards to the RFP.'

Response: These comments on the draft Request for Proposal (RFP) for treatment of Silo 3 material will be addressed, along with other stakeholder comments, during preparation of the final RFP.

Written Comment B.4: 'With the change in the recommendation from the original ROD, it is important that a performance assessment be conducted of the stabilization processes selected. Given the problems experienced with the Pondcrete at Rocky Flats and the K-25 waste stabilization the performance of the material must meet a number of demands.'

Response: The stabilization process implemented for treatment of the Silo 3 material will be required to meet TCLP limits for metals and attain WAC of the waste disposal facility. The RFP issued for the Silo 3 Project will specify treatability testing, using actual Silo 3 material, to demonstrate the ability of potential treatment processes to effectively stabilize the constituents of concern. As is the case with current low-level waste shipments, analyses of treated waste will be performed in accordance with the disposal facility WAC prior to shipment for disposal to confirm that the treated waste has attained the established WAC.

Written Comment B.5: '*Performance Assessment* should include a range of considerations from the stabilization of the waste at Fernald to the final disposal at either the NTS or a commercial facility. *Performance standards* should be specified for quality control, waste handling, the "packaging" of the waste. And the multitude of issues associated with the transportation of the waste (e.g., driver training) need to be addressed as important elements of a performance assessment.'

Response: Standards for quality control (inspection, sampling to confirm WAC attainment), handling (marking, labeling, record keeping), packaging and transportation of the treated waste are specified by ARARs in the approved ROD, as well as disposal facility WAC, U.S. DOT regulations, and site-specific FEMP procedures. Independent of which specific stabilization process is selected for treatment of Silo 3 material, the treated material will be managed, transported, and disposed in full compliance with these standards.

Written Comment B.6: 'While the draft recommends Stabilization or Encapsulation for Silo-3 waste, it appears that, given the problems being experienced with the Vitrification Pilot Project at Fernald, Silos 1 and 2, may also become candidates for Stabilization, and, perhaps off-site disposal at the NTS. The future potential use of Stabilization for Silos 1 and 2 needs to be addressed.'

Response: The current selected remedy for Silo 1 and 2 material, identified in the approved ROD, is on-site stabilization by vitrification, followed by off-site disposal at the NTS. The treatment remedy for Silo 1 and 2 material is currently being reevaluated, primarily due to cost issues, to identify the most effective means of attaining the RAOs for treatment of the Silo 1 and 2 material. This evaluation of potential treatment alternatives, which will culminate in preparation of a revised FS and issuance of an amendment to the OU4 ROD, will consider both vitrification and other commercially available stabilization technologies.

Written Comment B.7: 'The fact that the cleanup of the Operable Units is organized independently, apparently has precluded the comprehensive evaluation of issues such as cumulative effects from the transportation of the waste. Individually each of the units have a moderate number of shipments and what is described basically as minimal impacts, but collectively the total number of shipments will be greater , and, potentially, the potential risk to the public greater as well. Because other sites are also in the queue to ship waste to the NTS, DOE needs to tackle the issue of cumulative shipments to the NTS.

Since the Nevada Test Site is being considered as either a regional or centralized site for the storage, treatment, or disposal many shipments through urbanized, and rapidly growing Las Vegas, it is important that cumulative impacts must be addressed.'

Response: The integrated CERCLA/National Environmental Policy Act (NEPA) evaluations, which were included in the FS for each operable unit, provided evaluation and public review of the cumulative risks of transportation and disposal of the waste generated from remediation of the FEMP. These evaluations, which resulted in the 'balanced approach' developed for on-site and off-site disposal of the waste from FEMP remedial actions, demonstrated that the risks associated with shipment and disposal of waste from FEMP operable units, including treated OU4 material, are well within CERCLA guidelines.

In addition, review of the *Final EIS for NTS and Off-Site Locations in the State of Nevada* dated August 1996, indicates that the document provided a comprehensive evaluation of transportation and socioeconomic impacts from all material anticipated to be transported to and from the NTS. For example, Section 5.1.1.2 provides an analysis of transportation impacts for an alternative dealing with continuing current operations of the NTS.

Written Comments B.8 and B.9: This commentor also provided two specific comments on text from the draft RFP for treatment of Silo 3 material. These comments will be addressed, along with other stakeholder comments on the RFP, during preparation of the final RFP.

Commentor C

Dale Schutte, Pahrump, NV

Summary of Comments:

Oral Comment C.1: '...I would like you to give serious consideration to shipping all this material by rail, as it appears to be safer than by truck.'

Response: DOE is currently evaluating intermodal transportation of waste from DOE facilities, including FEMP, to the NTS utilizing a transfer point that does not require truck transport through the Las Vegas valley. Based on the results of this evaluation, which will include evaluation of safety, cost effectiveness, and availability of rail transport, consideration will be given to intermodal transportation of waste to the NTS. Input from stakeholders will continue to be part of this decision process.

Oral Comment C.2: 'You pay only a portion of what it costs the Nevada Test Site here to handle this material. There is nothing that will help us pay for closure of the sites, service thereto, monitoring of the sites, the long-term stewardship of these sites....you are only paying a portion of the lifecycle cost of this material, and we need pressure on Congress to help us with the full lifecycle cost...you have to have something set up, a long-term funding; and Nevada does not have that.'

Response: DOE-FEMP includes funding for the cost of disposing of waste from FEMP at the NTS in its budget requests. Funding for operation and monitoring of the NTS are be included in budget requests submitted by DOE-NV. There is currently no mechanism within the federal budget process for establishing a monitoring and surveillance/post-closure fund in advance of the five-year budget planning period. DOE-NV. Funding for closure of the NTS, will have to be requested from congress at the appropriate time . DOE-FEMP will, if requested, assist DOE-NV in justifying and obtaining necessary funding.

5. AFFIRMATION OF STATUTORY DETERMINATION

Changing the stabilization/solidification process for Silo 3 materials from vitrification to Chemical Stabilization/Solidification, or a Polymer-based Encapsulation process, followed by off-site disposal, does not fundamentally alter the remedy selected in the approved OU4 ROD. The alternate remedy will effectively immobilize the heavy metals present in the material to reduce the leachability and associated toxicity of the material and in order to meet RCRA TCLP limits and the disposal facility WAC. In addition, the alternative provides for disposal of treated waste at a protective off-site disposal facility after stabilization/ solidification. As discussed in Section 3.4, either type of treatment process can attain the RAOs specified by the OU4 FS and ROD for Silo 3 material. Treatment, using either of the identified treatment technologies, at an off-site location can also attain all of the Silo 3 RAOs, provided that the risk during transportation to the treatment facility is maintained less than 1×10^{-6} through on-site pretreatment to reduce dispersability and packaging in accordance with DOT regulations.

The NTS and representative PCDFs are located in remote, arid regions of the western United States so that human health and environmental impacts are similar for both facilities. Changing the selected remedy for Silo 3 materials from vitrification to either of the potential alternatives will not result in any changes to the ARARs identified in the approved OU4 ROD. Treatment of Silo 3 materials using either Chemical Stabilization/Solidification or a Polymer-based Encapsulation process will comply with all ARARs identified in the approved OU4 ROD. Off-site treatment of Silo 3 material, using either type of technology, can also attain all ARARs, provided that transportation risk is minimized as discussed above.

In order to meet the substantive and procedural requirements of the DOE's NEPA Implementing Regulations (10 CFR 1021), the OU4 FS and Proposed Plan (PP) were prepared as an integrated NEPA Environmental Impact Statement (EIS). The DOE's NEPA regulations mandate that proposed changes to a federal action which has been the subject of an EIS evaluation, must be evaluated in a Supplemental Analysis to determine if formal revision to the original EIS is required through issuance of a Supplemental EIS. A Supplemental Analysis (Reference 20) was prepared to evaluate the NEPA impacts of the proposed changes in the Silo 3 stabilization technology and potential changes in the final disposal location. The Supplemental Analysis concluded the proposed change in treatment technology and the potential change in the disposal location were sufficiently evaluated in the original OU4 FS/PP-EIS and did not require the preparation of a Supplemental EIS. The Silo 3 Supplemental Analysis was made available for stakeholder review and approved by the DOE-Ohio Field Office NEPA Compliance Officer and placed in the PEIC in December of 1996 pursuant to the requirements of the DOE's NEPA regulations regarding public availability.

6. PUBLIC PARTICIPATION

Public participation played an integral role in reevaluating the remedy for remediation of Silo 3 material. Formal public involvement opportunities during identification of the alternate remedy for Silo 3 material and development of this draft Final ESD are summarized in Table 12.

A draft ESD was reviewed and approved by both U.S. EPA and Ohio EPA (References 21-25). A draft Final ESD (Reference 26) was made available for public review from November 17, 1997 through December 16, 1997. Formal public hearings were held at the FEMP on November 25, 1997, and at the NTS on December 2, 1997 to receive stakeholder comments and concerns. A responsiveness summary document, which formally addresses stakeholder comments received on the draft Final ESD, is contained in Section 4.

TABLE 12

FORMAL PUBLIC INVOLVEMENT OPPORTUNITIES
DEVELOPMENT OF ALTERNATE REMEDY FOR SILO 3 MATERIAL

DATE	PARTICIPANTS	TOPIC
August 20, 1996	DOE, FDF, U. S. EPA, Ohio EPA, local stakeholders	OU4 path forward; Evaluation of Silo 3 Alternatives
September 4, 1996	DOE, FDF, Nevada Test Site Citizens Advisory Board, NTS Stakeholders	OU4 path forward; Evaluation of Silo 3 Alternatives
September 11, 1996	DOE, FDF, Fernald Citizens Advisory Board (FCAB), Waste Management Subcommittee	Reevaluation of OU4 path forward
November 6, 1996	DOE, FDF, Nevada Test Site Citizens Advisory Board, NTS Stakeholders	Resolution of NTS stakeholder comments on Silo 3 Alternatives Evaluation
November 9, 1996	DOE, FDF, FCAB	VITPP status; Silo 3 path forward
November 14-15, 1996	DOE, FDF, IRT, U.S. EPA, Ohio EPA, local stakeholders	OU4 Path forward, IRT kickoff
December 12-13, 1996	DOE, FDF, IRT, U.S. EPA, Ohio EPA, local stakeholders	IRT meeting
January 21-23, 1997	DOE, FDF, IRT, U.S. EPA, Ohio EPA, local stakeholders	IRT meeting
February 11-13. 1997	DOE, FDF, IRT, U.S. EPA, Ohio EPA, local stakeholders	IRT meeting; included a public availability session concerning the IRT on February 12, 1997
February 25-28, 1997	DOE, FDF, IRT, U.S. EPA, Ohio EPA, local stakeholders	IRT meeting; included a public briefing on draft recommendations of the IRT on February 26, 1997
May 14, 1997	DOE, FDF, U.S. EPA, Ohio EPA, local stakeholders	Screening of potential stabilization/solidification alternatives

TABLE 12

**FORMAL PUBLIC INVOLVEMENT OPPORTUNITIES
DEVELOPMENT OF ALTERNATE REMEDY FOR SILO 3 MATERIAL**

DATE	PARTICIPANTS	TOPIC
June 3, 1997	DOE, FDF, Nevada Test Site Citizens Advisory Board, NTS Stakeholders	Presentation of May 14, 1997 public workshop to NTS stakeholders
June 16, 1997	DOE, FDF, U.S. EPA, Ohio EPA, local stakeholders	Review of screening of potential stabilization / solidification alternatives; technical briefing on stabilization, solidification and encapsulation technologies; initial detailed evaluation of alternatives
July 1, 1997	DOE, FDF, Nevada Test Site Citizens Advisory Board, NTS Stakeholders	Presentation of June 16, 1997 public workshop to NTS stakeholders
July 16, 1997	DOE, FDF, Fernald Citizens Advisory Board(FCAB)	Technical briefing and tour at Brookhaven National Laboratory concerning polymer-based encapsulation technologies
July 29, 1997	DOE, FDF, U.S. EPA, Ohio EPA, local stakeholders	Detailed evaluation of stabilization/solidification alternatives
November 25, 1997	DOE, FDF, U.S. EPA, Ohio EPA, local stakeholders	Formal public hearing on draft Final ESD
December 2, 1997	DOE, FDF, Nevada Test Site Citizens Advisory Board, NTS Stakeholders	Formal public hearing on draft Final ESD

After approval of this Final ESD, public participation will continue to be an integral part of implementing stabilization/solidification of Silo 3 material. The DOE will keep stakeholders, locally and at potential disposal locations, involved throughout implementation of Silo 3 material stabilization/solidification through periodic written and verbal updates. The Administrative Record, which provides greater detail on the decision-making process for changing the selected treatment technology for Silo 3 materials is available at the PEIC, 10995 Hamilton-Cleves Highway, Harrison, Ohio. The PEIC may also be contacted by calling (513) 648-7480 or (513) 648-7481.

7. REFERENCES

1. U.S. EPA 1991, "Consent Agreement as Amended Under CERCLA Sections 120 and 106(a)," United States Environmental Protection Agency Region V, Administrative Docket Number V-W-90-C-057, September 20, 1991
2. DOE 1994, "Final Record of Decision for Remedial Actions at Operable Unit 4," December 1994
3. FDF 1997, "Operable Unit 4 Vitrification Pilot Plant Phase I Interim Treatability Study Report Campaign 4," March 12, 1997
4. IRT 1997, "Silos Project Independent Review Team Final Majority Report," April 1997
5. FDF 1997, "Vitrification Pilot Plant Melter Incident Final Report," February 26, 1997
6. DOE 1996, DOE-0309-97, "Draft Final Evaluation of Silo 3 Residues Alternatives," December 16, 1996
7. DOE 1996, "Value Engineering Presentation Report, Project: Remedial Actions at Operable Unit 4, Fernald/FEMP, Record of Decision Plan," January 12, 1996
8. U.S. EPA 1997, letter, James A. Saric, U.S. EPA to Johnny Reising, DOE, "OU 4 Post-ROD Changes," May 21, 1997
9. DOE 1994, "Feasibility Study for Operable Unit 4," February 1994
10. DOE 1995, "Workplan for the Operable Unit 4 Remedial Design," May 1995
11. DOE 1996, letter, DOE-1349-96, Johnny Reising, DOE to James A. Saric, U. S. EPA and Tom Schneider, OEPA, "Request for Extension - Operable Unit 4," September 26, 1996
12. DOE 1996, letter, DOE-0036-97, Johnny Reising, DOE to James A. Saric, U.S.

EPA, "U. S. Environmental Protection Agency October 2, 1996 Nonconcurrence with Extension Request and Notice of Intent to Assess Stipulated Penalties," October 9, 1996

13. U.S. EPA 1997, "Agreement Resolving Dispute Concerning Denial of Request for Extension of Time for Certain Operable Unit 4 Milestones," United States Environmental Protection Agency Region V, Administrative Docket Number V-W-90-C-057, July 22, 1997
14. "Encyclopedia of Technologies," 1992
15. U.S. EPA 1996, "Stabilization/Solidification Processes for Mixed Waste"
16. Literature Survey of "Innovative Technologies for Hazardous Waste Site Remediation," 1987-1991
17. U.S. EPA 1994, "Fifth Forum on Innovative Hazardous Waste Treatment Technologies: Domestic and International"
18. U.S. EPA 1993, "Remediation Technologies Screening Matrix and Reference Guide"
19. U. S. NRC 1989, "Workshop on Cement Stabilization of Low-Level Radioactive Waste"
20. DOE 1996, "Draft Final Evaluation of Silo 3 Alternatives Volume 2 of 2 Revision B, Appendix F 'NEPA Supplemental Analysis'," December 16, 1996
21. DOE 1997, letter DOE-1330-97, Johnny Reising, DOE to James A. Saric, U. S. EPA and Tom Schneider, Ohio EPA, "Draft Explanation of Significant Differences (ESD) for Operable Unit 4 Silo 3 Remedial Action," dated September 12, 1997
22. OEPA 1997, letter, Tom Schneider, Ohio EPA to Johnny Reising, DOE, "Conditional Approval - OU4 Silo 3 ESD Draft Final Comments," dated September 22, 1997
23. U.S. EPA 1997, letter, Gene Jablonowski, U.S. EPA to Johnny Reising, DOE,"Silo 3 ESD Disapproval," dated October 16, 1997
24. DOE 1997, letter DOE-0099-98, Johnny Reising, DOE to Gene Jablonowski, U. S. EPA and Tom Schneider, Ohio EPA, "Response to Ohio Environmental Protection Agency and United States Environmental Protection Agency Comments on Draft Explanation of Significant Differences (ESD) for Operable Unit 4 Silo 3 Remedial Action," dated October 28, 1997
25. U.S. EPA 1997, letter, Gene Jablonowski, U.S. EPA to Johnny Reising, DOE, "Silo 3 ESD Approval," dated November 5, 1997
26. DOE 1997, "Draft Final Explanation of Significant Differences (ESD) for Operable Unit 4 Silo 3 Remedial Action," dated November 6, 1997

APPENDIX A

TRANSCRIPT OF NOVEMBER 25, 1997 PUBLIC HEARING ON DRAFT FINAL ESD AT FERNALD, OHIO

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FERNALD CLEANUP PROGRESS BRIEFING/

SILO PROJECT PUBLIC HEARING

Tuesday, November 25, 1997

6:00 P.M.

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minutes. That will give you access to each presenter. So questions you don't get answered during the open session here, you can seek out the presenters or the staff people and they can answer your questions then. And as the usual drill, we will be here following both sessions tonight to answer any questions that may arise.

Again, I've asked the presenters to sort of expedite things tonight to sort of compress their presentations. And as I mentioned, we'll try to hold it down to two questions per presenter so we can keep things on track and hope to get this first session through in an hour to an hour and 15 minutes so we can move into the hearing on the explanation of significant differences for Silo 3. As I indicated, we will take a rather, for us, a lengthy break between sessions.

So with that, make sure I'm not forgetting anything, I think we can move into the first presentation, which is Dave Lojek.

MR. LOJEK: Good evening. Welcome. I'm going to go over basically a brief status of Operable Unit 1 and where we are. We have the project schedule slide, and basically you can see

MR. STEGNER: I want to welcome you all here and thank you for coming. My name is Gary Stegner. I work in Public Affairs for the Department of Energy at the site.

You can see by the agenda that's coming up here shortly on the screen that it is a very full agenda, probably a little bit ambitious.

On your seats you'll have the latest additions to the Fernald Tool Box. It has evaluation forms on there also. We would ask that you fill out the evaluation forms at the conclusion of this evening's session and please indicate your preference for the topic of the month for January.

We're going to sort of move things rather quickly tonight. We're going to ask your indulgence on some things. At the September session you indicated a preference for having questions immediately following the presentations, so we're going to do that tonight, but the indulgence we're going to ask of you is that we will only field two questions per so we can move through this and get into the public hearing in good time. To make up for that, what we'll do is have a break between the sessions, about 15 our three activities, our ARASA contract was awarded, complete rail upgrades is coming up, ARASA construction start. We're on target for all those items. First waste processing and shipping, that's still -- our Record of Decision, of course, will date to March 1st, 1999. That's our long-term target, and a little longer term target, our complete operations in the year 05, May 05.

Basically the message from this slide here is that on-site activities necessary to support the rail infrastructure upgrades, and during the month of October, were continuing in the month of October. These basically involve the rail enclave, which you can see over there on Paddy's Run Road. In fact, that was completed during the month -- at this point in time it's completed. The north railyard is coming to completion. The loadout area is complete. Rail maintenance building. So those are some of the subitems that are under that category.

Under the category of off-site activities, we have some off-site trestles, primarily the Okeana trestle, the Camp Run trestle, and the Wynn Road trestle. We've completed those upgrades to all those, the largest of that being the Okeana trestle, the 600, almost 700 foot trestle out there in Okeana. Camp Run and Wynn Road were two smaller trestles there.

And I guess most importantly, during the month of October we awarded the ARASA contract to International Technologies Corporation. The ARASA subcontractor is basically the contractor that will be engaged in the remediation of the waste pits. So that was awarded on October 20.

One other item here on this one is that the Shandon yard improvements is an upcoming activity. That will see some action, you will be able to see some action out in the community.

A lot of these activities I pretty much touched on. Like I said, the Shandon yard upgrade. With the completion of the Okeana trestle, the Camp Run, and the Wynn Road, that pretty much gets us out of the community, so to speak, out of that far reach of the community. The Shandon yard access, when we upgrade that access point there, you'll see some activities right there along Paddy's Run Road, but that's pretty much it.

Our on-site rail infrastructure

construction, completed about a month from today, December 23rd is our date for that.

The 90-day look ahead, the key item here -- two key items I want to touch on here, first is the amendment to our RA work plan. Basically with the award of the ARASA subcontract on October 20th, we have an RA work plan deliverable that said within 60 days of contract award we have to submit basically the RD and RA package document submittal dates to the EPA. So we're on target for that, that's due December 20th. I think December 20th is a Saturday, so I think we're targeting for December 19th to the EPA. We have a submittal there. And the bottom item here in our 90-day look ahead is award of the contract for railcar procurement, which we did have an RFP that was put out on the street for railcars. That RFP was put out on the street Friday of last week. And we're looking at a potential award of that contract in February of '98.

Here we've got some photographs of our work. This is the Okeana trestle, this is as it stood in October of '97, so this is the completed work on the Okeana trestle. You can see each of these sections here are now steel sections to support the rail line that crosses. This is about a hundred feet high, almost 700 feet long from end to end. The wooden trestle -- go ahead to the next slide, that should show -- here's the shot. This is the July '94, so this is sort of a file record that shows the Okeana trestle as we had it with all the wooden members in it, so we had that all upgraded.

Another item I mentioned was the Paddy's Run trestle. This is located on-site, but it's right there at the edge of the property line there. We had an upgrade that we had to do to the Paddy's Run trestle. We also put a walkway along the side here and barrier here because when we load our unit trains along this area here, we'll have a need to do a walk down of the train at that area.

And this item here, this is a shot taken from our rail maintenance facility. We're looking out through the west and a little bit to the south this way. The rail yard is all in through here, so this is just a shot showing the progress made in the rail yard area.

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Okay, that's my presentation here. Up next we have Operable Unit 2, that's Jay Jalovec.

MR. STEGNER: Are there any quick questions for Dave before he sits down on this? If not, Jay.

MR. JALOVEC: Thank you, Dave. My name again is Jay Jalovec, and I'm going to talk about OU-2. This overall general chart includes the subprojects, one of which is the new North Access Road that was completed October 20th. That was part of this project because the old North Access Road was in the footprint of the disposal facility. The Haul Road is scheduled to be completed the end of this month. That is on schedule. And that's the road that takes the excavated waste from the southern waste units to the on-site disposal facility. This milestone here, OSDF seasonal cover, that will mark the end of the construction season in December. Then we will essentially be shut down for the wintertime until next spring, 3/98, when we have RA work plan milestone of first waste placement on March 27th, 1998, and then an arrow showing just ongoing construction currently scheduled for the year 2006.

Major work activities for October, we completed the Cell 1 clay liner installation, and that was 3 feet of compacted clay that's on the prepared subgrade. We also initiated installation of the secondary composite liner, and that is what we commonly call the GCL and the GML, or the geosynthetic clay liner and geomembrane liner.

On the leachate conveyance system, completed installation of the southern and eastern portions and the permanent lift station. The leachate conveyance system, as a reminder, is the system that transports the leachate from the disposal facility to AWWT for eventual treatment. We also began final testing of the leachate lines in October.

Major work activities continuing for the roads. As I said, we finished up the North Entrance Road, opened it up to the public on 10/20. We completed gravel base and geotextile installation on the Haul Road, and started paving process of that. We have no enforceable milestones due in October.

The 90-day look ahead as far as the on-site disposal facility, install the primary liner system, that was initiated this past Sunday. We had a real nice weather day and worked some long hours and got that process initiated. The leak detection system is currently underway. Following that we have the leachate collection system and beginning placement of the protective cover. Those activities actually are slated right now for the first part of December, not November as indicated here. The protective cover, that will consist of a minimum of 1 foot of impacted material. In December we will complete that protective cover and close for the winter. And then January months will begin preparation for next season, which includes setting up of a debris transfer area.

The 90-day look ahead for the leachate system, complete final testing and performance systems, operability testing, we'll do the standard start-up review. That is just independent verification that that system is indeed ready to begin operations. The initiate leachate collection and treatment upon placement of material, that's the protective cover I just mentioned, so that actually will be December rather than November as indicated there. Then in December it will be up and operational, and we'll be performing routine maintenance. The road, that's specific to the Haul Road, we've actually continued paving at this point. Right now we have small minor details that we're working on, like painting and some shoulder work.

As far as milestones for the look ahead, we have to place a seasonal cover by 12/31/97, and this is different than the protective cover that I was just mentioning. This will be a crusting agent, a pine sap material that will be applied to the impacted material for erosion control purposes during the winter.

A few pictures here. This is Cell 1, the black material is the GML, geomembrane liner, and this is just showing PetroEnvironmental, the contractor, went out and got some lights so we could extend the hours of operation. With the rain and a few problems that we encountered, we needed some extra time, and this was a real effective way to extend the workday.

This is the shot before we had all

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the liner material put down. This is the liner on the east part of the first cell. We had a guy come in to dry out this uncovered clay due to those rains, and the motions of the helicopter was really effective in helping to dry that material out.

This is an example of the seaming operation. He is seaming the GML together, and this piece of equipment is called a mouse.

The last slide, this just shows the exposed clay, the 3 feet compacted clay. The white material here is the GCL, geosynthetic clay liner. On top of that is this black material, the GML, and this is the process that is eventually moved all the way across, and we are now in the primary liner system. So it looks like this here on top of an entire system of GML, GCL, and rock at this point.

I believe that's the last picture. Is there any questions?

Okay, next for OU-3 I would like to call up Art Murphy and Jamie Jameson.

MR. MURPHY: Good evening, I'm Art Murphy, the project manager for Plant 9 and Operable Unit 3 process area, where I've spent about the last five years with DOE.

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Our project schedule, when you look at this graph, the way I like to look at it that makes the most sense to me is as if the blue were a highway and you're driving down that highway and you're seeing a billboard associated with each of those dates, and that's how this would shake out. In OU-3 a lot of things are happening now. Things are really picking up and you can see there as the dates start to tick off, we're into 2/3, which I'll talk about some more and working on the safe shutdown of that, and as it commences forward, you can read those yourself, you don't need me to read those. Go ahead.

Again, our safe shutdown is going along very well. Most of the materials and the items that you'll see on here will have to do with completing holdup material removal or energy isolation, which means we're going to disconnect power from that associated component. We've also done some underground utility line work.

Continuing on with our 90-day look ahead, we began to work into 2/3 with the asbestos, but again you'll see several things jump out here at you. Asbestos removal, energy isolation, holdup material, it's just taking place in different buildings, and this slide is pretty much self-explanatory. Again that ongoing underground utility line work for some of the outlying buildings.

We're in the boiler plant now. If we look ahead to our D&D, major work activities in October, boiler plant/water plant have been going real well. I know two months ago we were here and told you that we would drop both the east and west precipitator in the silo, and I wanted to make a point of telling you that I'm here tonight with a film to show you we have done just what we said.

Along with this, some other items, the water plant demolition, the railroad scale house removal, but the thorium Plant 9 complex, which has kicked into gear now with that contract being awarded and we're seeing people mobilized, and another thing that we told you we were thinking about doing and we've done and we're back here to tell you that we've done, we've utilized Building 81 as a changeout/dressout facility. This probably saved us at least a half million dollars having to set up a trailer for that activity. It was thought out real well and it's working real well, and should be a key to the success of that cleanup. We've got the office trailers and all their supporting utilities hooked up now. They're in there working, the contractor, NFC. Mobilization is starting. We have areas fenced off. The magnesium warehouse, we're in that ready to start. Some activities even started today. I was out myself today and we did a full dressout, walkdown of Plant 9 and started to begin to strategize about how that is going to exactly happen detail by detail. So things are going really well.

Again, our 90-day look ahead, hopefully these things here I will show you in just a moment have been done, demolition of the electrostatic precipitators, fly ash silo, pipe bridge, wet salt storage bin, and clearwell building. The transite removal is going on in the interior there at the boiler plant and, of course, that associated sizing and segregation. Everything is rolling along real well, and what's really going to be interesting, if you work in this field, as a lot of you do, you kind of wait for that. As they say, true characterization comes out during remediation, and that's my favorite part when we actually can do some work. So it's really buzzing out there and you see a lot of people moving around and things happening. If you look ahead and think of that, the northeast quadrant, once you get out those 13 or so buildings and 9 of them, we'll come back and get the boiler plant. I feel like we're really making a dent.

Again, on a daily basis with Plant 9 I'm getting -- Veterans Day we worked and we got 13 submittals and individual work plans that deal with the different pieces of the total job. So our staff is busy reviewing those concurrently with FDF and all the other associated entities on-site that have to be in that loop, and then by getting involved up at the beginning of the project, I feel like that makes us proactive and prevents us from having a 13th hour disagreement, which has been known to happen in the past. And in the maintenance/tank form complex, we continue to work on that implementation plan.

Just a little side note on the D&D of the mag warehouse, if you're familiar with that, it looks like we'll start in the south end of that building in the bay taking down asbestos piping. It will be cut, glove bagged, dropped down by manlift, and then probably mechanically cut or maybe some of it needs to be torch cut, we don't think it will be, and then we'll follow with the interior removal of lighting windows, that type of thing, and then go up on the roof and start the asbestos and actual cutting and removing and lowering of the roof. Then we will come back inside with some shears and begin to cut the masonry rebar, whatever, before we knock those walls down.

So, again, safe shutdown is rolling right along. Monty Morris and people are doing a great job. Jane is keeping people moving.

I've already told you about the boiler plant, the reactivators and now -- go ahead, see what else we've got here.

This is the removal of the MAWS equipment, which was a pilot system we had in there in Plant 9. It had to come out before anything else could be done, and apparently it's going to be done at Ford International University, discussing with those folks. They had some interesting ideas. We did a rather successful OU-3 by relocating some equipment, we moved our soil washing equipment out of Plant 8 and moved it up to RMI, and we're going to try to find a home for this, but we couldn't get that done quite in time, so we stored it, properly wrapped it and sealed all the controls, and we got that stored on the north Plant 5, on that pad outside with a roof, so it's in good shape and it's going to go somewhere. And it's already generated a lot of attention.

Go ahead. That's it, okay. Then I want you to just take a quick second and look at this video so that you can see that we in fact did what we told you we would do 60 days ago. As you can see here, what they've done with each of these, I think you'll see it consists of cutting methodology where they're weakening the columns and then pulling, I think they pulled this silo. On the precipitator, they pulled one down to the east and one to the west. We were able to do them both in the same day. Fortunately, we had enough daylight left, but, again, to go out there now, we're really starting to see activity and people getting things done and it's a different work atmosphere.

Weakened here, weakened here the columns, and then basically pulled them down, see them come out in a very controlled fall. You can see that they're on this dust with water. One of these show, I believe they've got the water going for dust control. So everything is kind of -- here's another one. You'll see it in the evening, they ran out of daylight, but that was a good day.

Once again, 60 days ago we told you this is what we were going to do, we're back here now telling you we did it, trying to do a good job for you. Took advantage of Building 81 so we didn't have to build a half million dollar decon facility, and things are looking up. So thank you.

MR. STEGNER: Dave Yockman, OU-4.

MR. YOCKMAN: My name is Dave Yockman, and I'm going to give you a brief status on the Operable Unit 4.

If you look at the schedule here, that lays out the regulatory milestones that we agreed to in the dispute resolution. As you can see, we've met the first one, the draft ESD to

EPA.

Take a look at some of the activities we did in October. As far as Silo 1 and 2 proof of principle, we got back responses from 21 different vendors, and we're in the process of evaluating those responses. We're also working on developing or during the month of October we worked on developing the scope of work and the evaluation criteria, and in addition we started scoping out what it would take to revise the FS.

As far as Silo 3 work in October, we completed rescoping of the Silo 3 RFP based on some of the changes resulting from the private -- pulling it out of privitization, and also some of the headquarters comments, as many of you are probably familiar with.

In addition, in October, as far as the ESD was concerned, we worked on revising and getting a draft final of that. We also, from a silo integrity standpoint, we worked on doing some core borings on Silo 4. That was complete, and we're currently in the process of evaluating the results from that and drafting up a final report. There were no enforceable milestones due in

October.

If we take a look ahead, actually some of this stuff has already taken place in November. Of course, the first bullet, after tonight's progress briefing, we're going to have a public hearing on the ESD, and as far as the RFP goes, we've released that for the regulators, vendors, and stakeholders to review.

One of the things that we're also working on with Silo 3 is trying to get some material, a small amount of material out of that silo to provide to vendors, and we're currently -- actually, that date is wrong there, it should be December of '97, we're going to do a mock-up on Silo 4 before we go ahead with that. And on December 2nd we're also going -- essentially the same presentation you're going to see tonight will be given to the cab out in the back. That will happen December 2nd.

In December -- let's see, those dates are also wrong. Those dates should be January of '97 and February of '98 to complete the start-up. We're going to get some lessons learned from the mock-up of Silo 4, and then we're going to get

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ready in December and then -- or in January, and then try to do the -- initiate operations in February.

MS. CRAWFORD: So it should be 1/98 and 2/98?

MR. YOCKMAN: It should be 1/98 and 2/98. As I said earlier, the final report should be complete for Silo 4, the compressive strength test and the petrographic analysis should be done and we should have a report for folks to look at. The Silo 1 and 2 waste retrieval, we've been working on in December, we're going to work towards completing the design basis for that.

One other thing I'll point out is that also in December we're going to try to do an independent technical review of the strategy for the accelerated waste retrieval, and right now we're tentatively set up for the second week of December, and the public and whoever wants to attend may sit in on those meetings. We'll let you know more specifics as we get them solidified.

Let's see, I guess in January we're going to try to finalize things with the ESD and also the RFP.

Then the final thing, some of the SEP's, the work plans for three of the -- you can see two of them we've submitted this week, and then there's a third one we'll submit towards the end of December.

This here is a picture of the -- they're preparing the area around Silo 4 for the mock-up, and they did that in October, November time frame.

This here, the title is wrong, it should say Silo 4, we didn't take cores from Silo 3. This is the machine that was used to pull a 4-inch core from the Silo 4 wall, and six cores were taken from around the silo, and those are the cores that are being evaluated. Like I said, those are complete, we're evaluating those, and we're going to have a final report sometime in December.

That's all I have for you on Silo 4. If you have any quick questions.

MR. HOPPER: Can you briefly explain the accelerated waste retrieval effort and what you're going to do in December.

MR. YOCKMAN: The accelerated waste retrieval, basically we've laid out a strategy to go in and try to look at a strategy to take the material out sooner than we had originally looked at doing it with the original baseline. As far as the December -- early in December an independent review team, we're just going to have somebody come in -- actually not somebody, it's a group, right now it's looking like four individuals to come in and just do a review of the strategy to make sure we're heading in the right direction.

Any other quick questions?

MR. HANSEN: How confident do you feel the core samples should give you a good indication of what --

MR. YOCKMAN: I think preliminary results look good, but what I would say is wait until the report comes out in December. It's only I would say about two weeks away. I don't know, but preliminary results look good.

MR. HANSEN: That's what I mean, how confident are you that Silo 4 cores will be indicative of what is in there?

MR. YOCKMAN: One of the things they're going to look at in that report is they're going to look at that issue to see if we need to go in and do cores out of 3 and 1 and 2. So you should get an answer on that.

MS. CRAWFORD: Would it be -- since 4 has sat out in the weather all these years since there's no berms around it or -- is there berms around 3 -- no. So 3 and 4, okay -- Let me start over. It's been a long day.

MR. YOCKMAN: I think a lot of the questions you're about to bring up are going to be answered in that because I brought up the same questions, and I think a lot of those are going to be brought up and explained in the report, in the final report, because they're going to have to look at those in order to make a determination for the other silos.

MS. CRAWFORD: Okay.

MR. STEGNER: John Kappa starting off on OU-5.

MR. KAPPA: Before we get into schedule, I'm just going to take a minute to set the stage where we're at in the operable restoration project. Hopefully by taking a minute now you'll see how the rest of these activities we're going to talk about tie into our overall goal, which is to remediate the Great Miami aquifer. Right now we're at a real important stage in operable restoration. For the past four years, since about August of '93, we've been in a plume containment mode, that as we have four groundwater extraction wells that are located at the leading edge of our plume, and right now we're in the midst of a number of projects where we're going to switch to active plume remediation; we're going to be going after the heart of the plume. So it's an exciting time right now, there's a lot going on, and hopefully this will all tie in.

If I can figure out how this thing works here. As you can see by the schedule, through mid 1998 we have a lot of activities going on. First big milestone is meet 20 parts per billion discharge limit. Come January 1st, per our OU-5 ROD, our effluent going out to the Great Miami River has to be below 20 parts per billion. So that's an ambitious goal.

We're in the midst of relocating our sewage treatment plant.

Another big project we have ongoing is the AWWT expansion project. We're currently operating AWWT at a design treatment rate of about 1100 gallons per minute. What the expansion project is going to do is increase our treatment capabilities for groundwater exclusively by an additional 1800 gallons per minute.

Also coming up is a couple of projects, and most of you have probably seen these, these are the ones that are taking place around Wiley Road, it's our south plume optimization project, which is two extraction wells that are going on the property south of the FEMP, our south field extraction and a reinjection operation. As I said, a lot of the construction activities you see ongoing is the pipelines for bringing pipe in to feed our injection wells as well as laying pipe to take our extracted groundwater to treatment.

Major work activities, we've just hit on a bunch of these, we're continuing with the AWWT expansion project construction. Also, our ion exchange regeneration system, what this project is going to do is give us the ability to regenerate our resins. Currently we don't have that regeneration capability. By having that we're going to be able to save a lot of money by not

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having to buy new resin whenever it's exhausted.

In conjunction with the injection demonstration project, we have groundwater monitoring wells going in with each of those injection wells. We talked about the south plume optimization, those are the two wells south of FEMP. Sewage treatment plant we talked about. Also in October we submitted our final operations and maintenance master plans to EPA. That lays out our operating philosophy for treatment facilities.

Enforceable milestones for October, we submitted our final DMEPP report. We're currently working on agency comments. We'll be responding back in early December on those. We also submitted our permit renewal application to Ohio EPA for NPDES permit. Our permit expires, I believe it's in April or so of next year, so that process is underway.

The 90-day look ahead, just hit on the DMEPP comments. Also we have comments going in on the draft final baseline remedial strategy report. That's a report I think we talked about a couple of months ago. It lays out our strategy on how we can try to clean the aquifer up in about a ten-year time frame. Draft final injection demonstration plan, that's going to be going to the agencies in December. And also another document in January, south field extraction system, south plume optimization. Those are start-up of monitoring plans that are tied to the projects we just talked about in south field.

Enforceable milestones. Each month to Ohio EPA we submit NPDES update, and then again January '98 our effluent to the Great Miami River has to be below 20 parts per billion.

Those are a couple of photos. Behind us is Wiley Road, so we're looking south. This is one of the injection wells, and this is a concrete footer they're getting ready to pour above the concrete pad there. The injection water is going to come up this pour, over, and down into the injection well.

I think I mentioned a sewage treatment plant. The sewage treatment plant that we currently have on the east side of the property, it's old and it's in the way basically. So we had to come up with a new plan. So we're utilizing existing equipment we have on-site. It's our biodenitrification effluent treatment system. We relocated that equipment just east of the AWWT facility. They moved that equipment the first couple of days of November. So they're just in the midst of finishing up that project.

Then the south field, I mentioned all the pipeline we're laying, and if you've driven by, you've seen it. We have varying sizes from 6-inch to 20-inch line high density polyethylene, and this is a fusion machine. Basically with this portion here they plane it off to get smooth edges, then they insert another plate to heat it up and basically jam it together and melt it together to fuse it to get a watertight seal.

This is part of that project. I think we're up by the basins here actually. I think I mentioned earlier we have water coming in the south field, we have water going. So we're utilizing the same trench wherever we can do that.

This is I think the final slide, just looking in the south field area. This is our access road. Here's Wiley Road. Our injector wells, you've probably seen those, those are right along the fence line. We have our ten or so extraction wells all throughout the south field area.

Any questions?

MS. SCHROER: Just the one on the pipe welding. You test those also?

MR. KAPPA: Yes.

MS. SCHROER: You test for leakage?

MR. KAPPA: Right. Before that goes into service, they'll hydro test those lines, they'll fill them with water and have a pressure gauge on the end, and if there's a leak, they will be able to detect that pressure drop.

MS. CRAWFORD: How close are we to 20 ppb's for the river?

MR. KAPPA: The last few months we've been real good.

MS. CRAWFORD: What is real good?

MR. KAPPA: Below 20.

MS. CRAWFORD: Below 20?

MR. KAPPA: Yeah, consistently. The biggest hurdle we had on that was our filtration system at AWWT, the multimedia filter project which we finished four or five months ago. That's helped us get a lot better flows and a lot cleaner water through the system. It's not gumming up our ion exchange resins, we're keeping them cleaner, and our effluents have been real well.

MS. CRAWFORD: But officially January of '98 you have to be --

MR. KAPPA: Right, that's the enforceable date.

MS. CRAWFORD: And what happens if you're not?

MR. KAPPA: We need to talk about that if it happens.

MS. CRAWFORD: Okay.

MR. KAPPA: Try to work through the problem. Identify the problem and work through it. Any others?

MR. STEGNER: Thank you, John.

MR. KAPPA: John Sattler, waste management is next.

Oh, did I get ahead? I'm sorry, Mark.

MR. JUETT: Actually, next on the agenda is our soil project. It's the second half of Operable Unit 5. I'm Mark Juett. You normally see me attached to the aquifer restoration project. I'm pinch-hitting for Dennis Carr and Rob Jenke tonight where we stand with the soil effort.

This slide, like the others, gives you a view of the time line and what's going on with soils. Let me give you a quick overview to set the stage for what's going on. Basically the soils remedy for the site consists of excavating about 1.8 million cubic yards of affected soils and moving the vast majority of that material into the OSDF. By volume comparison, the soils is the largest volume generating remedial action project we have on the site. Practically all that 1.8 million yards of material is viewed to be acceptable to go into the OSDF. Current estimates show that probably around 50,000 yards of it may be above the waste acceptance criteria for the OSDF and will have to be shipped off-site.

To move that much material in accelerated remedy as planned for the site, we had to break this into areas and phases so that we can keep pace with the D&D project. As they complete their efforts, we'll come in and take the soils out. It's also in lock step with the funding profile for the site.

So there's seven key areas that the remedy is broken into or divided into. Area 1, Phase I is the northeast portion of the site. You've heard a lot about that area in the past few months of presentation because that's the area that we cleared to make the site ready for the first two cells of the OSDF. Cells 1 and 2 reside on a clear and certified area in the northeast corner. That was A1 PI. We basically completed that work this summer.

The next two areas that are up on the screen for us are going to be very active in terms of seeing activity on the site is Area 2, Phase I, which is the crew two southern waste units, the fly ash piles and the south field. Those are all being done in conjunction with the soil project. We're hot and heavy and have operated a launch on the field work for that area, and in tandem we're going to begin Area 1, Phase II, which is the southeast portion of the site. This will basically clear the area for the remaining cells of the OSDF, cells 3 through 9 if we use all 9 cells. So we're really going to move hot and heavy on those two areas.

The next one that is in the queue is

Area 3, which is the northeast portion of the production area, and it has the D&D, and when that area gets complete, we'll be coming right on in to remove soils from that area, and the rest of the areas are shown here.

The major work activities for October that were done in soils, you may have heard last meeting that we had an erosion problem in Paddy's Run that we wanted to take care of. That work basically is complete from the field work in terms of removing the downed trees and the loose soil that we found that was of an erosion issue, and some of that material was contaminated, so that's all been excavated and brought back on-site. What's left to do for that is complete a design for stabilizing, basically putting riprap along the eroded area and getting it stable geotechnically. That design is underway, and we should have a crew to go forward with that stabilization next month.

As we move through these areas and begin our remediation, there's really four key steps we have to accomplish. The first step is to characterize the areas, figure out exactly where our boundaries are so we can attack them with the best data that we can. That's really a two-step process in itself. We look at all the RI data that's been generated over the same study, see if there's any data gaps, and then come in with a really hard core sampling program called a preexcavation survey where we fill in any data gaps. So together that's the major first step.

We then move forward with a big design effort that's subject to EPA approval. Put out a big design package. They approve it, and once it's through that loop, we then begin Phase III, which is the actual excavation process. That's where all the dirt is moved, all the excavation work is completed and the material moved to the OSDF. But then there's still one more stage after that, which is called certification, and that's where we come back again with an intensive sampling program to show that the remediation is complete and that we've met our cleanup levels throughout the whole area.

So as we sequenced our way through this, we're basically moving through each of these steps kind of in just a forward moving progress. As we're excavating one area, we're getting ready

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to do characterization of another. So the two areas that are about to come into the queue here, which is the southern waste units area and then the southeast portion of the property, we're just moving forward and in October got all our characterization work done for that, and now we're ready to move forward with design. As we get through that design, you'll start to see a lot of fur flying here and a lot of soil work starting really next spring after the winter season clears.

We really only have one enforceable milestone for October, which was really to get the design package for Area 2, Phase I to the agencies. We basically met that test, that's in their hands now, and we're still working through some waste acceptance criteria issues on that design, but we're about ready to get approval on that and then move forward with the excavation activity.

Our 90-day look ahead, we want to complete that embankment stabilization project that I referred to, that should be complete once we get design approval from the agencies. We're going to continue doing field work in what's called a site

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preparation package for Area 2, Phase I, the southern area, southern waste units area. Basically what site prep is, it's where we come in, build all our sedimentation ponds and erosion control measures, and then begin to do the active remediation. So there's a lot of ground clearing and pond building that goes on ahead of the cleanup, and that effort is underway right now. We're going to keep moving ahead in the other remediation areas with our data collection so we can get our best boundary definitions that we possibly can.

Area 3 is of interest to everyone because that's where we first start getting into the production area, and in our next 90-day period here we hope to get into that Area 3 and begin some detailed characterization there. We're getting ready to submit what are known as project specific plans, which are the work plans for that characterization, and EPA has a hand in approving and overseeing, and those are just underway now for Area 3, and that's going to be a major step for the site as we move and shrink this thing down to the production area.

The only big enforceable milestone for us with the agencies in the 90 days is another design package. You see this nickname here a lot, this IRDP, that stands for integrated remedial design package. So that is our design document for soil. We're getting ready to go into Area 1, Phase II with a submittal to the agencies here in November.

A couple photos of what's going on down there. This is some of the work that you can actually see as you drive along the southern boundary of the site. This is the site prep work that I referred to. This is a stockpile area where as we excavate for these ponds, the material is contaminated, we want to stockpile it and hold it until such time as the OSDF is ready to take it. That area where we build our stockpiles has a synthetic liner placed in it for temporary purposes to control any leachate that might arise in the short time that we have a stockpile. So that's this liner. Think of it as like a mini version of the OSDF. It has a liner for leachate collection that works for the temporary or interim period that this pile is in existence, and that work is underway right now.

Okay, this is a view of the footprint of that stockpile area, and that's the same type of liner that you saw in Jay Jalovec's presentation that's going in for that stockpile, and this is what the footprint will look like and that's pretty much complete work.

These are the actual basins that are being built down there for sedimentation control. All the sediments from the areas that are under excavation, should they be mobilized for rainfall, will end up in these basins and be held until such time that the remediation is complete and these ponds are taken out of service, the material removed and disposed of just like the contaminated soil. So these ponds are underway. We should have them complete here shortly, and once that work is complete, we can begin actual remediation next spring.

MS. YOCUM: Will there be liners on the bottom of these ponds?

MR. SATTLER: Yes, they'll have earthen liners rather than synthetic. It will be clay type.

MS. YOCUM: Then will you take samples of the soil after you've drained them?

MR. SATTLER: You bet. The area beneath these areas still will be subject to remediation in its own cell, so once the pond is removed and the liner is removed, then we go and clean the whole area beneath that pond as well, and it goes through that certification process to complete the loop.

This just gives an aerial view of the southern waste units themselves. Probably the one orientation area is our stormwater retention basins that are on the right-hand side of the picture here. Just for orientation, everything is just south of those ponds, and it's the fly ash piles and the south field area that we're going to be attacking with this cleanup in the spring. And that's just an aerial view of the area.

I believe that's it. Now it's John Sattler's turn.

MR. SATTLER: This is the same schedule you saw last time we talked, and we've got the major, the street projects for the waste management group listed here. What this schedule doesn't show you are the more routine ongoing activities, the most notable of which would be low level waste disposal activities. The other thing I'll point out about this schedule is that the most important dates that drive this schedule aren't shown here. If you want to see those dates, the best schedule to look at is the one that Art showed you because when we sit down and we schedule our activities, waste project management, we really look to the other schedules, in particular the one for the facilities closure project to drive our activities.

For example, if you look at the schedule that Art showed you, the first two or three activities on there talk about safe shutdown of Plant 6 and also talks about the Plant 9 area. Well, two of these projects or one project here in waste management, the thorium stabilization project, is in the Plant 9 area, so we have to finish that project and clear out of there. Another notable one, as I just mentioned, is Plant 6. Right now we have safe shutdown activities ongoing in Plant 6 at the same time we have mixed waste project and moving material activities. So that's really driving us to maintain our schedule to clear out.

Probably the best example of all of kind of real-time work, Art mentioned two or three times himself about Building 81 and how they're using that for a staging facility. Well, until October that was a storage facility for mixed waste. So the folks had to clear all that stuff out and get it out of Building 64 area in order to allow them to proceed. So if you really want to see what our drivers are, look at Art's schedule.

What did we accomplish in October? The most notable thing in low level waste was not the shipments we did, but rather the fact that we had a very successful audit with the folks from Nevada Test Site, and the end result of that is they said we can go ahead and resume shipment of our residue waste stream, and that will be picking up in earnest over the next couple of months. So we will start resuming low level waste shipments.

Mixed waste, we wrapped up the demo phase of the organic extraction project. You'll recall that was part of the rapid commercial industrialization initiative project, and we are now in the process of sitting down and looking at the results to see how successful it was. We tested three different types of waste, we had soil and debris and sludge, and we were testing to see how effective this project was for removing PCB's as well as some other constituents, and once we finish taking a hard look at the data, we'll make a decision on how much more of the waste that we have on-site we're going to proceed with this project for treatment.

We continue bulking, we're starting bulking batch 9. Batch 7 and 8 are still on-site. They will be going out here in the relatively near future. The NPDS project, we treated 29 drums and one box as well. Most of that stuff in those 29 drums was neutralized first and then it was stabilized through the stabilization process, and in addition to that we were able to ship out over 300 drums of a listed mixed waste to Envirocare for disposal.

Nuclear materials, we continue the discussion of the T-hopper area and we continued packaging efforts. Those first two bullets are really in support of the last item on here, which

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is our contract with BNFL. Those are efforts to package the enriched material that we sold to BNFL. As a matter of fact, our first shipment went out in early November to BNFL, which was quite an accomplishment. It took a long time and a lot of work to establish that contract. This is a big thing for us in nuclear materials disposition.

The packaging of the normal ingots and depleted spill metal, the normal ingots, that supports one of the other projects, one of the other contracts we're working on. Unfortunately, the depleted spill metal will probably be sent to NTS for disposal. We are still looking into one possible alternative, but it looks now like most of the depleted metal will be earmarked for disposal.

MS. CRAWFORD: What's EURATOM?

MR. SATTLER: EURATOM.

MS. CRAWFORD: EURATOM, whatever it's called.

MR. SATTLER: That is an oversight type organization. We worked out the deal, the terms of the contract with BNFL, and once BNFL signed that contract, in order to implement that contract, they had to put it in front of this organization, and there are many European countries that are influenced by this organization and they have to get that checked off before they can proceed with the receipt of these nuclear materials.

MS. CRAWFORD: Okay.

MS. SATTLER: Where are we? Low level waste projects, 90-day look ahead, we're gearing up shipments of low level waste. Once again, for the most part it will be waste stream 6 residue.

Mixed waste project, I mentioned we're going to take a look at the data from the demo phase and make a decision on how we're going to proceed.

The thorium stabilization project, we're going to start shipping the low level waste portion of that project early next year, and we do have a requirement to submit a work plan to Ohio EPA next month. That will really be focusing on the mixed waste treatment portion of that particular project.

Liquid mixed waste, batch number 7 we plan to get out in December. That's about 20,000 gallons of mixed waste that will go down to TSCA for incineration. Batch 8 should be going out in early February of next year.

MS. CRAWFORD: And how many gallons is number 8?

MR. SATTLER: I'm not sure. Most of the batches are approximately the same volume, but I can find out for you.

MS. CRAWFORD: Okay.

MS. SATTLER: NPDS project, we have approximately 65 more drums that are ready for processing.

Nuclear materials, first bullet, award of contract for lab, that's already been done, we've already been sending samples off-site for analysis. This is in support of the BNFL contract, and we will continue to talk with folks on the normal compounds and the low enriched materials. We will be talking with BNFL some more about the normal. The low enriched, we're still evaluating responses to the RFP on that, see if we'll have some success in selling more of the enriched materials. The depleted uranium, we were recently successful in completing the terms of the contract with Lawrence Livermore to send out small amounts of depleted to them, and the normal metal we are continuing to talk with Allied for moving that material out.

T-hopper projects, we'll continue with construction activities and that, too, will support BNFL.

A few pictures. This is the organic extraction project involving Terra-Kleen. This is in Building 80. Some of you were able to take a look at this way back last spring I believe it was, we had a little ribbon cutting ceremony. It is not much more complicated looking than this, once we get enough boxes in place. The next slide I believe shows -- the one after this will show some sampling activities. This is a repackaging effort of the UF-4 and this is part of the materials that will be going to BNFL.

And this is in Plant 6. Part of the organic extraction project is actually taking place in Plant 6, where we have the staging of the boxes as well as sampling of the material in the boxes and the soil sampling associated with that project.

I think that's all. Very good. And Johnny.

MS. DASTILLUNG: Can I ask a quick question?

MR. SATTLER: Yes.

MS. DASTILLUNG: What does NPDS mean?

MR. SATTLER: That's neutralization/ precipitation/deactivation/stabilization.

MS. DASTILLUNG: One more time.

MR. SATTLER: Neutralization/ precipitation --

MR. HANSEN: It's on one of the slides.

MS. DASTILLUNG: Where? Oh, thank you.

MR. SATTLER: Okay.

MR. REISING: Thanks, John. Fortunately, I only have one brief quick slide, and I have no busy pictures, so we'll bring this to an end. All of the various activities that you've seen presented in the monthly update, fortunately or unfortunately, cannot be accomplished unless we actually have project management. Project management, the way I look at it, is basically our integration of baseline cost, schedule and scope of the activities we have to deal with, and hopefully by the presentations this evening you see the amount of activity that's ongoing, and hopefully you're starting to get a feel for the amount of integration that we as project managers have to try to put forth in order to make plans go and make it work. And as a result of this, we continually have to review our baseline, update our baselines, and look at the integrated schedules, cost, and scope and where we're going.

As a result, as you remember, last year we came out with the national plan, which some people may affectionately refer to as the AL-OMB plan. In actuality, even though it now has a new name, as those of you who were on some of the various video conferences with headquarters as the new plan was being presented, we like to refer to it locally as the accelerated plan, which is exactly what it is.

You'll remember approximately five or six years ago the baseline was asking for about 25 years. As a result of the exercise in the '95 IRB process, we were able to look at a 276 estimated case, which basically gave us the original Fernald ten-year plan. Then as a result of the national plan coming on-line, that had to be tweaked and readjusted due to different target funding that we were given, and we came up basically with our accelerated plan, which went out a little bit beyond that. Presently we are based on an estimate of about 2008 as far as the actual. Our current baseline is concerned anticipating potentially cell closure at this point in time by about 2006.

So just to give you an idea, for about the last four to six months there's been a large number of people working very diligently on updating this accelerated plan, and the way that it works is we have to evaluate our baseline, take a look at the target funding and schedule that we have, and to synthesize that into submittals to the Ohio field office. These submittals then are taken, tweaked, looked at, reviewed, commented upon, and then they will in the very near future be submitted to headquarters to be incorporated into the national plan.

The difference this year is this plan

is actually being utilized for the submittal of our budget requests as far as to the Office of Management and Business is concerned, that budget is concerned.

So here again is a quick idea of -- a lot of the activities again, there's been four to six months worth of activities building up to this month, with a lot of dashing to the finish lines that may need to come up with a submittal of the accelerated plan to the Ohio field office. We submitted the draft to the Ohio field office early in November, received a number of comments. Fortunately we've been able to work through those comments, have revised the document, and as recently as last week submitted that revised document up to the Ohio field office. That will then be reviewed for a few days and then submitted to Ohio and incorporated into the national plan to be submitted to OMB, as you can see, the latter part of December. Anticipate some type of a public release of that document in February. I'm talking to Mike Jacobs and Gary and others as far as when we have the opportunity to present this information from an Ohio and from a Fernald standpoint to the public, we will do that. Again, we'll have to see what these drafts are dealing with.

One of the products of this exercise is the integrated priority list, which many of you are very interested. It is for all the five project offices, area offices within Ohio to where we take a look at all the various activities, some 99, 110 plus that are at the PBS or the sub PBS level within the Ohio field office for the various area offices, and they are ranked as far as the priority and the various activities based upon the various sites. So we'll have drafts of that to share with you sometime in the near future, and hopefully in the relatively near future we'll have a meeting to discuss not only comments that we received last year on the plan that would have been incorporated into this plan, but also give you an opportunity to take a look at how this has been modified from the plan that was submitted last year. Again, kind of an iterative process, an ongoing process, more or less an updating of the baseline.

The submittal of this document to the Ohio field office was based upon our fiscal year

'99 replan that is presently being developed by FDS, going to be submitted to DOE by December 12th, and will go to review not only here but also at headquarters. So, again, this is basically an update of the accelerated plan, and as we're allowed to share bits and pieces with the public, we will be doing that. Thanks, Gary.

MR. STEGNER: Thank you. Let's take about a 10 or 15-minute break. Let's try to come back in here at 25 minutes after, and then we will get into the public hearing part.

(Brief recess.)

MR. STEGNER: I want to thank everybody and welcome to the second part of tonight's meeting. For those of you who did not sign in, would ask that you do so before you leave tonight.

The purpose of the public hearing tonight is to get your feedback on the draft final explanation of significant differences document which has been in circulation for a few days for Silo 3. I want to remind you that the comment period opened on the 17th of November and will close on the 16th of December. You do not have to comment tonight. You can submit your comments to me in writing. You can give me your comment card during, after the meeting. You can send your comments to me, again, anytime prior to or by December 16th.

We're going to follow the usual public hearing protocol that we have used and practiced here in the past. Terry Hagen will give a presentation tonight, sort of updating you, bringing you up to speed, more or less I guess reviewing what we've covered in the past as far as the ESD goes for Silo 3.

Following the presentation we will open the floor for questions, and depending on how long that takes, hopefully we will be able to answer everyone's questions before we get into the official public comment period. Once we get into the official public comment period, we will answer no more questions after that. Basically it will just be the stakeholders giving their impressions of the document.

As I say again, if you don't wish to comment tonight, you can certainly submit your comments to me in writing. There is a card at each place here where you can submit your comments to me in writing.

Again, I want to stress that the topic tonight is the explanation of significant differences for Silo 3 and that will be the only topic that we will be discussing during this period.

So let me now turn it over to Terry Hagen.

MR. HAGEN: What I would like to do tonight is give a fairly broad overview of the information on the Silo 3 proposed path forward that we covered in more detail in the public workshops we had in May, June, and July, and also as presented in more detail in the draft final explanation of significant differences.

Just as a logistics note, if there's anyone that doesn't have a copy of the draft final ESD and would like to pick one up tonight, there are five, six, seven copies here, and if we run out, just let myself, Gary, anyone know and we'll be sure to get you whatever you need.

To go back and cover a little bit of the history, as I suspect about everyone here knows, the Operable Unit 4, which includes Silo 3, Record of Decision was issued in December of 1994, and as its basics, it basically called for removal of contents of Silos 1, 2, and 3, treatment by vitrification, and off-site disposal at the Nevada Test Site.

With that in place, as I suspect everyone also knows, we implemented a pilot testing program that was designed to give us information to design, construct, and operate a full-scale vitrification treatment system. And in the course of operating that pilot plant, what we found was that the high sulfate content in Silo 3 introduced significant problems that were detrimental to success at vitrification for any material that would include Silo 3.

Now, within the draft final ESD there's more detail on what I just discussed in Section 1 and Section 3, and I encourage you to look there for a more detailed discussion of this first bullet. There are technically ways to address that high sulfate content, but what we also found, not only based on our pilot plant experiences but also some of the emerging experiences within the DOE complex and within industry, is that the ways to address it were either technically uncertain, such as the use of reductants, or cost prohibitive, such as just flat out diluting the material with other waste and then treating that diluted volume to where the sulfate contents were more manageable.

In light of what we had learned from the pilot plant testing campaigns and what we were seeing from the DOE complex and industry, there were some fairly constant themes that we were receiving and recommendations from the Fernald Citizens Task Force, as it was called then, or Advisory Board now. The independent review team, which as we discussed in some of our previous workshops, was chartered, made up of people from industry, government, experts in waste management. It was again chartered to give advice to DOE and Fluor Daniel on Silo 3 and silos' path forward in general and also from the Army Corps of Engineers, and the common theme that I referenced was really that we should separate treatment of Silo 3 from the treatment of Silos 1 and 2, and that specific to Silo 3 we should evaluate whether it was appropriate to go to some kind of alternative treatment process, alternative from vitrification.

With that being the case, we engaged in some discussions with the regulators as to what would be the appropriate regulatory mechanism to conduct that alternative technology evaluation, and the position of US EPA was essentially that an explanation of significant difference would be the appropriate way to go if three conditions were satisfied as are set forth here. One is that the alternate treatment technology was a stabilization/ solidification process that met the original remedial action objectives and former standards laid out in the December of 1994 Record of Decision. Number 2, that the alternate treatment, if it were to be selected, could be performed in roughly an equivalent cost as to what was estimated for vitrification of Silo 3 contents in the December 1994 Record of Decision, and that the remedy included disposal in an off-site facility that was deemed to be protective and appropriately permitted.

In a few minutes when we get to the path forward on ESD, I'll just highlight a couple of differences between ESD and a ROD amendment that were relevant to this process.

Given that we were going to go down or at least proposed to go down the explanation of significant difference path, it resulted in a document that is out for public review right now. Just a quick overview of its sections: 1, introduction; 2, summary of site history, contamination, and selected remedy are fairly self-explanatory, but most notably that's where we initially present the discussion of what the original selected remedy was, how we initiated some of the pilot plant testing operations, and what we saw that led to the recommendations and advice from the various groups that I referenced in the previous slide.

Section 3 is where the majority of the technical analysis supporting the proposed path forward lies. We go into additional detail again, supplementing what was in Section 1 on what were some of the problems we encountered during the attempt to vitrify Silo 3 material in combination with 1 and 2 during the pilot plant operations and what led to the decision that we needed to 000117 reevaluate the selected remedy. And then once that's established, it also presents the process by which we screened potentially applicable alternatives, narrowed that down to a few, and then conducted a more detailed evaluation as to whether they could be appropriate for consideration in treatment of Silo 3. So, again, Section 3 is really I think where the meat of what -- you can obviously decide for yourself what you're interested in, but it's where the majority of what I'm about to talk about is contained.

In Section 4, support agency, public comments and responsiveness summary. Here's I think where I would just like to say a quick word about the difference between ROD amendment and an explanation of significant difference. Basically under an explanation of significant difference all you're required to do by EPA regulations is publish the explanation of significant difference saying what was different, why, and put it out for public inspection. There's no requirement for public involvement, no requirement for public review. Recognizing that that wasn't consistent with what we've been doing here in terms of public involvement, we went with the ESD process, but we modified it and committed to conducting, number one, a formal public hearing -- public review period, which we're in the middle of, starting November 17th, it runs through December 16th; having a public hearing, which of course we're doing tonight; formally taking public comments and developing a responsiveness summary for each of those. And as I think you all probably remember for those of you who have worked with us at the proposed plan stages of the other projects, that's exactly what we did in establishing the Record of Decision for the previous five operable units. So to get to the point, that's where in the final ESD that responsiveness summary will lie.

Number 5, affirmation of statutory determination is basically a legal requirement whereby DOE and EPA as signatories affirm that what has been selected is consistent with the law for CERCLA.

Six is a chronology of the public involvement that we've had on the path forward graph. Really, Operable Unit 4 as a whole, it goes back to the IRT days and before, it also focuses on the workshops we have had on the Silo 3 path forward.

And, finally, 7 is references, which is pretty self-explanatory.

Back to where we were. We basically established consensus from the regulators and the stakeholders that it was at least appropriate to reevaluate whether vitrification was the right process. For Silo 3, as we discussed with you in our first session last May, we wanted to use a process that we were all familiar with and comfortable with. So the process that we used to evaluate technologies for appropriateness really mirrors what we did in the feasibility studies and proposed plan stages of each of the operable units, again in the process of establishing those Records of Decision.

And the first step after we nailed down the remedial action objectives, which have not changed for Silo 3 from what was presented in the original Operable Unit 4 Record of Decision, was to look at the universe of technologies that could possibly be applicable. We went to US EPA guidance to help us do that. This was, of course, in a presentation that Don Paine has gone through a couple of times. And what we found was that there were two general families of treatment technologies that we thought could be applicable. Vitrification, obviously, and we've discussed some of the reasons or maybe I should say some of the problems that we encountered in trying to implement that. And then secondly was the broad family of solidification/stabilization technologies. For one reason or another the ones that are shaded in the darker blue were judged not to meet remedial action objectives.

In Section 3 of the draft final ESD we go into quite a bit of detail discussing how the three alternatives, which I'm going to get to that, were considered in more detail, satisfy remedial action objectives. To maybe take the summarization of what those are to the lowest level possible, it was basically to be able to treat the RCRA metals to the regulatory limits, to address the disposability of the contamination for the purposes of workers' safety and also transportation safety, and then also to provide for long-term protectiveness with permanent disposal. These were the two that were judged to apply.

This slide basically presents the universe of stabilization/solidification technologies that EPA guidance suggests you should start with. On these two columns, the RI/FS with the check on it, what that indicates is that for those with the mark, those were considered at some level during the original RI/FS evaluation that led to the December 1994 Record of Decision. The additional checks under IRT, which is a little bit difficult to read, are those technologies that were considered at least at some level by the independent review team that I referenced earlier that was chartered to give advice to DOE and Fluor Daniel on the silo's path forward.

Working through the FS process, once we had identified a universe of technologies that could potentially apply, with the assumption that for one reason or another a lot of those aren't really going to be applicable, the next step in the process was to screen those using three criteria, and these are the same steps and criteria that we use to screen the broader number of alternatives at the FS stage of the project. And that's effectiveness, and these are some of the things that go into that evaluation, implementability and cost.

As you recall, Don Paine went into quite a bit of detail as to the screening of those individual technologies. Section 3 presents that information in detail. It kind of summarizes the conclusions of that process. There were three technologies that were judged to be appropriate for more detailed evaluation, chemical stabilization/ solidification, and then two polymer based encapsulation technologies, polymer (micro) encapsulation or sulfur/polymer encapsulation.

Now that we have kind of narrowed down the possibilities to a manageable group for more detailed evaluation, we went to the next step in the process that we again utilized during the FS stage of the game, and that was evaluation against a CERCLA nine criteria. As we've discussed before, to this point in the game, it's actually evaluation against the first seven of the nine. The two modifying criteria, state acceptance and community acceptance, come into play based on what we hear from you tonight or get in formal written comments.

A couple of words, as we said before, before a remedy can be selected, by law it has to be demonstrated to be protective of human health and the environment and it has to be compliant with applicable or relevant and appropriate requirements, which is why they're called threshold criteria. If a remedy can be demonstrated to achieve those two, then you can look at it against the balancing criteria, the five of which are referenced.

A slight difference in how we used the seven criteria in this process versus what we normally did during the process of establishing a single remedy in the Records of Decision. Historically, when we worked with this process together in the past, we would look at an individual alternative and ask the question did it satisfy the two threshold criteria. Then if it did, it was eligible for further consideration against the balancing criteria, and what we would do is for all of the alternatives that it basically passed the threshold criteria in evaluation, there was a comparative analysis to see how those

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alternatives really measured up against each other against the five, recognizing that one alternative might perform better in one area but poorly in another compared to the other alternatives going through detailed evaluation, and the idea was to select the technology that really had the best balance. The slight difference in how we've utilized these criteria in the ESD wasn't so much that we did a comparative analysis to identify a single technology that would be selected.

What we did was, number one, applied the threshold criteria evaluation, and if it survived, which all three of the technologies that I had on the previous slide did, then we did really an evaluation. It wasn't so much comparative in nature, but looked at those technologies individually, designed to ask the question is there any reason to rule this technology out or suggest that its performance against one of these criteria is so poor that we shouldn't allow it to come into play in terms of what the market might be able to provide for treating Silo 3. And to get to the bottom line, as we discussed before, we concluded that any one of the three technologies that we're going through the detailed evaluation satisfied the conditions of what would be accepted under the ESD that I laid out four or five slides ago. Which are, to summarize, stabilization or solidification of the Silo 3 contents using chemical stabilization/solidification or one of the two polymer based encapsulation technologies, the polymer (micro) encapsulation or the sulfur/polymer encapsulation, both part of that.

With that conclusion, that led to an overall proposed remedy for Silo 3 which includes what I just said, with the addition of off-site disposal at either the Nevada Test Site or an appropriately permitted commercial disposal facility, and that is a difference from what was in the original Record of Decision. The original Record of Decision only allowed for the possibility of disposal of these wastes at the Nevada Test Site. What this ESD does is expands at least the possibility for commercial disposal, presuming they can be demonstrated to be protective and it is appropriately permitted. That is, in essence, the proposal in the draft final ESD that's in front of you.

So where are we at? As I referenced earlier, we're in the middle of the formal public review period that started on November 17th, ends December 16th. Obviously we're at the public meeting stage of that tonight. We'll be accepting formal public comments later. We'll be taking them in writing up to the 16th. After the public comment period ends, we will be developing a responsiveness summary addressing each individual comment and, as appropriate, revising the draft final ESD, and then we will incorporate the responsiveness summary into Section 4, as I said, and then finalize the ESD, making that available publicly. Right now we think that will probably be in the January time frame. That's the process for the ESD.

We've also been working with you on the draft requests for proposal for treatment of Silo 3, assuming that the path forward that we have proposed tonight was going to be accepted. Obviously, if there's any change, we'll modify the RFP accordingly. The draft RFP has been out for comment for about 30 days. Expectation is that that review period will wrap up around the 3rd of

December of this year. Then we will go through a process of resolving those comments and revising the draft RFP accordingly. The expectation or goal is that that final RFP, which is the one that would actually solicit responses formally from vendors, would be in March of 1998.

MR. STEGNER: Thank you, Terry. The agenda says next, I'm not sure if that is appropriate or not, but we'll have comments from the regulators. Do you guys want to go now or do you want to wait until after the question and answer period?

MR. SARIC: It doesn't matter.

MS. CRAWFORD: Go ahead.

MR. SARIC: Just briefly, I guess that we've all been involved in this process together with Silos 1, 2 and 3, and certainly the whole pilot plant project and some of the difficulties we had there, I think it's something that you can expect whenever you're kind of implementing innovative technology, you do the smaller bench scale studies on the silos, and we did that back in '91 and '92 and we looked at those and looked at the viability of vitrification versus other remedies, and that was the first level. The next step was building the pilot plant and seeing what was the input, what would be possible, what would the technology really hold as you went to that next level before you built that full-scale facility, and that was something we went forward all together and we built that and learned from that experience that due to the high sulfate contents with the Silo 3 material, the vitrification was going to be extremely difficult, if not impossible. And the various review teams that were formed, independent review teams, the Army Corps of Engineers, all those groups that were together, the task force that looked at it, I think we all agreed there was certainly some need to separate Silo 3 from Silos 1 and 2 because the Silo 3 material, it is different material. And we've kind of all come forward to get a look at other technologies that brought us here today.

I think that this is something our agency supports, this path forward ESD. It's a faster path forward than the ROD path forward. It's certainly that we feel is allowable to do, and I guess from our perspective that we definitely support this remedy and this path forward where it allows the various technologies be looked at and to ultimately clean up and remove this material from Silo 3.

MR. STEGNER: Thank you, Jim. The State of Ohio. Kelly.

MR. KALETSKY: I'm Kelly Kaletsky, from Ohio EPA. Tom Schneider was unable to be here this evening and asked me to say a few words on his behalf.

I think Ohio EPA concurs with both the concept and the contents of the Silo 3 ESD. I think we're committed to, like everyone else, seeing the Silo 3 contents remediated in a safe, efficient manner, and we feel like that can be done through an ESD, and we look forward to working with DOE, Fluor Daniel, Fernald, and stakeholders, not only throughout the public comment period but through the entire remediation project, and we really look forward to hearing your comments, your concerns, or any questions that you might have about the ESD or the process. Thank you.

MR. STEGNER: Thank you, Kelly. Now we'll take questions if there are any.

MS. CRAWFORD: Can we turn the light on now?

MR. STEGNER: Yeah, we can turn the light on now, we can do that. Vicki Dastillung.

MS. DASTILLUNG: On page 34, Table 9 of the draft ESD it talks about NTS is giving preliminary confirmation of the acceptability of the treated waste under existing performance assessment. When will we get final confirmation that NTS will indeed take this?

MR. HAGEN: What they mean by preliminary evaluation versus final is that they have looked at the characteristics of the waste compared to what was assumed in the performance assessment that they would accept this under, and that the characteristics of the waste are consistent with what was assumed there. That's the basis of the preliminary determination that it can come there. We won't get final acceptance until we implement testing of the treated material that documents that actually what we're going to send there is the same stuff and is what we suggested it was when we gave them the data upon which the preliminary evaluation is done. So that -- I think what I'm saying is that they don't really give the final approval until we give them actual physical testing results on the treated material. But in looking at the existing characteristics of the waste and the expected characteristics of the treated waste form, if it is what we have said it is and it's what we have said it is in the data in the RI, then they can accept it under the existing performance assessment.

MS. CRAWFORD: Can we play devil's advocate here, you know, we get -- I mean, you get to that point and you send them some final test results or whatever and --

MR. HAGEN: The lynch pin, just to tell you what it is, it's not the radiological issues. The radiological constituents and concentrations don't require any further treatment other than packaging to go to NTS. The issue is treating it to reduce the RCRA metals to below regulatory levels. That's what they need the actual testing results on, the treated product, before they'll accept it, and the answer, Lisa, is that until we can treat it such that our on-site data shows that we're below those levels, we won't

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even offer it to send out there. If that were to happen, that means we've got a problem with the treatment process that's got to be fixed before we can ever send it to them. So it would be something we would kind of have to take care of our own problem; it wouldn't be their problem.

MS. DASTILLUNG: So we won't treat the bulk of it until we've done a little batch first and that's been okayed?

MR. HAGEN: That's generally right. I think you're kind of confusing two things there. What we're going to do in the process of bringing a vendor on board is make them demonstrate that their process works using actual Silo 3 material, treating it to what the NTS or commercial disposal facility WAC requirements are since that's allowed under the ESD. They still -- that's going to tell us and hopefully you that we've got a process that works. They still won't accept the treated waste until they get actual testing results on the material itself that we're sending. So that's just part of the routine process of sending the material out there. We're going to have to sample it at some frequency based on the volume going to

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demonstrate that what they're really getting passes the TCLP test. It won't be just based on a pilot test type run by the vendor that they'll do for us to let us know that we've got something that works. And, again, that's kind of the difference between what we mean by the preliminary acceptance versus final acceptance.

And I think the same would apply if we were to go to a commercial disposal facility, they would likely have certain waste acceptance criteria and conditions as their license permits, and our expectation is that we would have to sample the actual material going there on some frequency to show that it meets the conditions of the permitting license.

MR. STEGNER: The gentleman in the back and then Edwa.

UNIDENTIFIED SPEAKER: Yes, on page 29, Table 5, it gives two costs. Are those -- rough order of magnitude costs -- are those for just the on-site work or does that include transportation and disposal estimates also?

MR. HAGEN: Somebody correct me if I'm wrong, but I believe it includes transportation and disposal, yes.

UNIDENTIFIED SPEAKER: Is there any estimate of what the on-site engineer's estimate is?

MR. HAGEN: I don't know the breakdown. Does anyone? You're asking what the treatment portion of the cost is, the on-site treatment portion?

UNIDENTIFIED SPEAKER: Correct.

MR. HAGEN: I don't have those numbers at my fingertips. Does anybody from FDS have that breakdown available? We can get that information certainly in response to a comment.

UNIDENTIFIED SPEAKER: What's the time line for on-site, what's your expectations of duration of that project?

MR. HAGEN: That's going to depend on -- there's some discussion of that in here. Let me say the real answer is going to depend on the exact technology selected and the vendor and what they propose. I think we have an expectation, if you'll go to the detailed evaluation under implementability on cleanup time, which is on 35 at the bottom, we talk about an expectation that chemical stabilization can be done in nine months or less. That's the actual treatment processing time. And that the other two technologies discussed, based on EPA literature, that our expectation is the time frame would be roughly equivalent. So that is a rough expectation, but I guess I'll go back and say what I started with, it would be dependent upon which of these technologies and what the vendor proposed.

UNIDENTIFIED SPEAKER: Okay. And one last question: You have discussed an off-site location, a preliminary treatability on-site and then final stabilization off-site, and in the RFP you have stated that you would be -- accept responsive proposals on those particular technologies and techniques. Have any of those been received?

MR. HAGEN: I'm not really prepared to speak to the RFP.

MR. YOCKMAN: Karen, do you want to field that question?

MS. WENTZ: The RFP, we haven't received any input back. The comment period is the 3rd of December, so we'll wait and see if we get anything.

UNIDENTIFIED SPEAKER: But that would be available?

MS. WENTZ: That would be available.

MR. STEGNER: Edwa, you're next.

MS. YOCUM: Yes. On page 33, in chemical stabilization you mention secondary waste, and I would like to know what form that waste is in and how will it be disposed, and is the cost of disposing that secondary waste included?

MR. HAGEN: I'm just reading through to see exactly what this says to answer your question correctly.

MS. YOCUM: It's under volume.

MR. HAGEN: The point of that was, is that the expectation is that there would be next to no secondary waste.

MS. YOCUM: But what is the secondary waste?

MR. HAGEN: I'm not sure I can really speak to there being any. There would be minimal amounts of secondary waste from some of the elements that involve the offgas system and the contaminants that are going to be collected with the offgas system. The sense -- Here is my answer to that: I hadn't thought about that, but to be in regulatory compliance, because those are essentially Silo 3 materials, we would have to treat those and dispose of those in a way that's consistent with what we're doing with the contents of Silo 3. I believe -- I can't swear to this, I have to admit, Edwa, but we should have all secondary waste handling costs included in the estimate. It should be very minimal, though, too.

MS. YOCUM: Okay, then that will go to -- then are you saying the secondary waste is going to be your offgas?

MR. HAGEN: What I was saying is that there will probably be -- we would have to control the particulates. There could be some systems associated with controlling the particulates during movement.

MS. YOCUM: Like filters.

MR. HAGEN: Like filters, things of that nature, yes. That would be my expectation, the only real secondary waste that you would be dealing with. My experts in the back are nodding their heads too.

MS. YOCUM: That brings me back to explaining the offgas issues on page 35. You're talking about in the chemical stabilization it maintains moisture and resulting in particles, and then in your polymer you're saying that it would be generated and handled during material handling. Now, how can you, from what I'm understanding what material handling is, how do you handle material handled gas, offgases?

MR. HAGEN: Are you asking what's different between chemical stabilization and sulfur polymer?

MS. YOCUM: Yeah, I guess that would be easier.

MR. HAGEN: Basically it is my understanding that the principal difference between the two as it relates to offgas is chemical stabilizations are usually ambient processes, they're done at room temperature.

MS. YOCUM: They're what now?

MR. HAGEN: Done at room temperature. Whereas -- and you'll notice that we basically have the same discussion for the polymer (micro) encapsulation. Where there's a difference on the sulfur/polymer is that basically you're adding a molten sulfur to the waste stream, so you've got much higher operating temperatures, and those introduce some of the offgas issues that are associated really as much with the additive itself and the need to control offgas from the sulfur being in a molten stage than it is from there being greater particulate loadings because you're handling the waste a lot different. It's really a difference in the fact that for the chemical stabilization technology you put in whatever your additive is, whether it's cement or some proprietary agent that a vendor has. It's at room temperature, and you have to address particulate coming off of it as we talked about. With the sulfur polymer encapsulation, the additive is basically a molten sulfur, which puts off -- that material itself introduces offgas issues that have to be addressed, and that in the last sentence there, potential generation of SO_2 and hydrogen sulfide, that really comes directly from introducing the molten sulfur, which is an additive that you're putting in to achieve the encapsulation of the waste. So the increased offgas issues really deal directly with what the additive is as opposed to handling the waste differently. That's the way I would explain it.

MS. YOCUM: That's a little technical.

MR. STEGNER: We have a question -- we'll come back to you, Edwa -- we have a question in the back.

UNIDENTIFIED SPEAKER: Is off-site treatment not allowed?

MR. HAGEN: Under this ESD it calls for on-site treatment.

UNIDENTIFIED SPEAKER: I'm sorry.

MR. HAGEN: On-site treatment is what the ESD calls for.

MR. YOCKMAN: Hold on. Why don't we let Karen address that. She's shaking her head. I think off-site treatment is allowed.

MR. HAGEN: It's silent I guess.

UNIDENTIFIED SPEAKER: Is it allowed?

MR. STEGNER: Is there anyone who can, from DOE who can address that?

UNIDENTIFIED SPEAKER: Off-site

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treatment is allowed.

MR. STEGNER: Off-site treatment is allowed.

MS. CRAWFORD: It's spelled out in here somewhere.

THE WITNESS: One more question. What's the period of performance once the project starts, what's the expected amount of time for the entire process?

MR. HAGEN: The only expectation we expressed in the ESD was the treatment time expectation. It's discussed on the table that I referenced earlier. The final answer to that, I'm going to go back and give the same one I did earlier, it depends on what a vendor has to offer in terms of probably where they do the treatment at, where it's going, and what their process is. So the real answer is going to depend on the specific vendor and what they're proposing.

MS. CRAWFORD: It's on page 12.

MR. STEGNER: Do you have any more questions before we move to --

MS. CRAWFORD: No, you can't go, we have lots more questions.

MR. STEGNER: Keep going, please ask.

MS. CRAWFORD: Okay, I'll go next.

MR. STEGNER: Lisa Crawford.

MS. CRAWFORD: I have a list. I'm going to try to go quick. Because on page 12 in that very bullet that I just alerted you to, Terry, the last part, below RCRA TCLP limits and disposal facility WAC, that's at -- that's not here, that's there.

MR. HAGEN: There, yeah, be it NTS or a commercial facility.

MS. CRAWFORD: Okay, that was a little confusing the way it was worded.

MR. HAGEN: Not this.

MS. CRAWFORD: That's a little confusing. Also on page 36 under the cost issue, I guess I'm a little concerned that we have a rough order of magnitude cost for the chemical stabilization, but we don't even have an idea of what the other two are going to cost. I guess I have a real problem with that because I thought that was something we were really kind of looking at.

MR. HAGEN: I think that's a fair comment. The reason for that is I guess twofold. One is if you look at the implementability section, what we say is that there's just a lot more industry experience with chemical solidification stabilization than with these two. So there's not a lot of industry data out there as to how much it costs to implement these two technologies. The statements that you see in there we got from EPA guidance that said that they should be roughly equivalent to the chemical stabilization. That was the first thing. The second thing is that, I mean, frankly, we have just done a little bit more work dating all the way back to the original RI/FS evaluation on evaluating chemical stabilization than we have these other two. So I'm not saying in hindsight we don't wish we had more information, but the fact is that historically we focused more on that and probably had more of a basis for saying here's what we think the costs would be for Silo 3, and then given the lack of a lot of industry experience with the other two, about all we had to rely on is EPA guidance on the fact that they felt it should be about the same.

MS. CRAWFORD: Okay. Do you want me to keep going?

MR. STEGNER: Yeah. Are there any other questions out there?

MS. CRAWFORD: Anybody else just raise your hand. On page 33 under the volume, it's the same kind of a question, we've got an estimate for the chemical stabilization.

MR. HAGEN: Same answer. It's a valid question; unfortunately, it's the same answer. There's more industry experience and more site experience with Silo 3 materials related to this family of technologies than the other two.

MS. CRAWFORD: Let me be blunt with you, does that then mean when we move into this process that we automatically move to chemical stabilization and we don't look at the other two? That's the impression folks like us are going to get sitting out here in the audience.

MR. HAGEN: I would state that no. Here's what I would say, is that the reason that we don't have as much data, though, is because there's not a lot of industry experience. I'm not saying there's no industry experience. I think the answer to your question is going to be it's wide open to any vendor that wants to come give meaningful data on these technologies. It might be reasonable to expect that we're going to get fewer expressions of interest for these technologies for chemical stabilization because there appear to be a lot more vendors out there that have got experience with the chemical stabilization, but that does not rule out the ability for some vendor because there is some limited commercial development to bring ideas to the table, and the RFP should be written to allow that and is written to allow that.

MS. CRAWFORD: And the RFP --

MR. HAGEN: The draft RFP, sorry.

MS. CRAWFORD: The draft RFP has already been written, right?

MR. HAGEN: The draft RFP has. Obviously it is out for your review, and right now it allows, and will continue because the way the ESD is written, to allow a vendor to be responsive to proposing any of these three methods.

MS. CRAWFORD: Because I guess I want to make sure in my mind that I have this correct. So the RFP -- I think we've already --

we've looked at the RFP, if I'm not mistaken. It clearly says it can be done on-site or off-site in the RFP, right? The RFP doesn't say it can be done off-site? How can we have an ESD that says it can be done off-site but we have an RFP that says it can't be done off-site? That to me doesn't make a lot of sense.

MS. WENTZ: I apologize, it does ask for input to treat it off-site. That was the comment he made earlier.

MS. CRAWFORD: Because that's been a real confusing piece for a lot of people, depending on how you read it and how you understand it, and if you follow this process, it's been confusing. I think you need to make it really clean and sure that folks understand that, that it can be done on-site or off-site with off-site disposal.

MR. HAGEN: I think there's two issues, one is being clear as to what the ESD says, which I screwed up and I apologize, and the second part is linking it to what the RFP says.

MS. CRAWFORD: Somebody may want to go back and make sure those two things are saying what they're supposed to be saying. When we get responses back to the final RFP, will those be shared with us at some point?

MR. HAGEN: Yes.

MS. CRAWFORD: And we can look at those?

MR. HAGEN: Yes. In that period of time between December 3rd and March, yes.

MS. CRAWFORD: Okay. All right, that's it.

MR. STEGNER: Any more questions out there before we move into the official public comment period? If not, what I want to do is to excuse Dave and Terry so as not to be a distraction.

So what I will do now is I will begin the formal public comment process, and I would ask that anyone who wants to comment on the record tonight verbally to please, you can stand up if you project well, if not, there's a microphone back there that you're welcome to use. State your name and please provide your comment. As I said also earlier, that you're under no obligation at all to comment tonight either verbally or in writing. The comment period is open until the 16th of December, and you can submit those comments to us in writing on or before the 16th of December.

Anybody want to talk, speak on the record tonight? Anyone prepared to do so? Going once, twice. Okay, I assume we're going to have a lot of comments in writing then.

Thank you all for coming tonight. I appreciate -- we all appreciate your attendance, your participation, and we will reconvene for next session on December 9th.

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PROCEEDINGS CONCLUDED

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C E R T I F I C A T E

I, LOIS A. ROELL, RPR, the undersigned, a notary public-court reporter, do hereby certify that at the time and place stated herein, I recorded in stenotypy and thereafter had transcribed with computer-aided transcription the within (92) ninety-two pages, and that the foregoing transcript of proceedings is a complete and accurate report of my said stenotypy notes.

Lois A. Roell

MY COMMISSION EXPIRES: LOIS A. ROELL, RPR
AUGUST 12, 2002. NOTARY PUBLIC-STATE OF OHIO

APPENDIX B

TRANSCRIPT OF DECEMBER 2, 1997 PUBLIC HEARING ON DRAFT FINAL ESD AT NORTH LAS VEGAS, NEVADA

FERNALD ENVIRONMENTAL PROJECT

UNITED STATES DEPARTMENT OF ENERGY

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PUBLIC STENOGRAPHER'S TRANSCRIPT

OF

PUBLIC ORAL STATEMENTS

DURING FORMAL PUBLIC COMMENT PERIOD

AT INFORMATION HEARING

* * * * * * * * *

RE: FERNALD SILOS PROJECT

ENVIRONMENTAL MANAGEMENT

* * * * * * * * *

On Tuesday, December 2, 1997
6:30 p.m. to 8:00 p.m.

At the Department of Energy Building
223 Energy Way
North Las Vegas, Nevada

Reported by: DEBBIE F. BARTLETT, CCR #62

APPEARANCES

Representatives from the Public Environmental Information Center:

Nina Akgunduz

Terry Hagen

Don Paine

* * * * * * * *

MEETING AGENDA AND RELATED CONTENTS

Welcome/Opening Remarks - Nina Akgunduz

Overview of Silo 3 - Draft Final Explanation of Significant Differences document - Terry Hagen (see indexed attachments)

Status of other Fernald Silos Projects - Don Paine

Question and Answer Session

Formal Public Comment Period - (see oral comments at Page 4, and indexed written attachment.)

Meeting Conclusion

Public Sign-In sheets (see indexed attachments)

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PUBLIC ATTENDANCE

(see attached sign-in sheets)

Name	Address
Dennis Bechtel (Affiliation: Self)	[redacted]
S. J. Gordon (Affiliation: HAZMED)	
Earl B. McGhee (Affiliation: Citizen)	
Frank Overbey (Affiliation: NTS CAB)	
Paul R. Ruttan (Affiliation: KDOL Radio - CAB)	
Dale Schutte (Affiliation: NTS CAB)	
Joan Schweda (Affiliation: NRAMP Stakeholder)	
Steve Schweda (Affiliation: NRAMP Stakeholder)	

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PUBLIC ORAL STATEMENTS

Name	Address	Page
Dennis A. Bechtel	[redacted]	5
Earl B. McGhee		9
Dale Schutte		14

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WHEREUPON,

Following an informational overview and introduction by representatives from Fernald Environmental Management, oral statements/comments were made to the public stenographer for inclusion in the record as follows:

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EARL McGHEE
[redacted]

My name is Earl McGhee. I live in Armagosa Valley, and I see by all of the things that are happening, you want to destroy people. You want to destroy a perfect habitat for humanity and wildlife, and you are putting it all at risk.

Being 30 years in construction, I had to debate and discuss with and catch engineers in a lot of mistakes. I'll name one project, which is O'Danna Junior High School in San Pedro, where I tried to tell an inspector that, "Hey, this won't work."

On the plans, they had designed a 12-inch square going into a 14 and a half inch circle, and there is no way that that would work. We went, you know, went round and round.

This intellectual kept telling me, "The man that drew that out went to a university, a college. He knows what he's doing and you don't."

And I had a crew there. So I stayed, put the tools on, and worked with them. When you start to put this 12-inch square in that 14 and a half inch circle, we had to use a sledge hammer.

He came over and said, "This isn't going to work. We can't do this." And I told him where to go. He said, "What are we going to do?"

And I had fabricated 3,000 extra ties, and this was a division of Raymond's International. So he finally backed off. He said, "Well, what can we do?"

I said, "I'll tell you what you can do. You get the hell away from me and get away from this concrete pour," and what have you, "and do it right."

And we had to eat the 3,000 that we sent out there. We didn't have to, but they didn't backcharge, and we went ahead and did it the way it was supposed to be done.

In Santa Monica Shores, they had designed 14 bars in a pile where it shows as a four radius hook. These engineers weren't bright either. They couldn't do it. The people couldn't place one bar of steel.

A friend of mine with Economy Steel Southwest in Rolling Hills, he was following this, so I called him up and I told him, I said, "Chuck, if I put this in or have the men put it in the way it shows, you won't be able to do a thing," because they had number 18 bars going across this.

I'm just telling you about some stumbling and bumbling, and this was federal funds that was in that project, and he laughed like I was trying to get out of the 10 or $20,000 worth of fabrication.

I told him, "You draw it out to scale and take a look at it. It won't work." So I waited about an hour. He just laughs. I didn't start the fabrication, and about within an hour, I got a phone call in the office.

And he says, "Hey, did you start that with that material?"

I said, "No. I've been waiting for your phone call."

He said, "Don't touch it." He said, "We're calling a structural right now." So just bumbling stunts and stupid mistakes.

The courthouse in Norwalk, same thing. Somebody wasn't using their head and they changed their design.

So you wonder why people are

skeptical about any of this? This is one of the reasons I'm skeptical. I've seen mistakes. I could write a book on them after 30 years in construction, but it wouldn't make any difference anyways.

I thank you very much, and that's my public comment.

---o0o---

DENNIS A. BECHTEL
[redacted]

My name is Dennis Bechtel. I'm a Community Advisory Board member and a citizen and resident of Henderson, Nevada.

I apologize. I haven't had a chance to review the document, and I believe you have answered some of my thoughts, but I'll share them anyway.

What I would like to say, as a member of the CAB, I would like to say I appreciate your coming out here and having this public meeting. I think this is something that I think the Department of Energy can learn from.

Most of the issues we're dealing with involves multiple sites. So I think there should be multiple measures, not just on this, but on other venues.

So I think this is good, and I would like to -- I hope this works out as the Nevada Test Site interacts with other sites as time goes on.

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With regard to just some general comments, I'm glad to see that you are processing permits with the use of performance assessments to test materials.

And I think one of the concerns I had before as a member of the Board, we visited the Rocky Flats site, and, you know, the concrete and all these other stabilization systems that didn't work, there was some concern about the process there, and I'm a little more comfortable that I'm not from Missouri. We'll watch that process as it goes on, but I think the performance assessment should include more than just the operation of material.

You are going to have to -- this part relates to a couple of other comments that people had. You are going to have to get the stuff from Fernald to Nevada or to a commercial site, and I think there is a lot of ways you can test the performance, one of which is the transportation of the waste itself.

So I hope in your performance assessment -- I know you do ship things out here, but you are talking about a lot larger quantities, and I think there should be a performance assessment of things there like the packaging, training of the drivers, and I think that is an important consideration as well.

I had the question about the Silos 1 and 2, and I think you covered that. One concern we have had, we discussed this, is about our big issue out here regarding transportation and the fact that Fernald is looking at a number of operable units in their clean-up.

But even when you look at transportation, these things should be looked at separately, and I think this is an issue where we had a problem with the DOE in general.

There should be somebody looking at overall shipments of waste, and whether it's at an individual site, Fernald should be considering shipments from all of the operable units.

When you consider impact, there should a problematical explanation. This applies in a smaller sense to Fernald, and this is of particular concern to Nevada, as you are aware, as either being a site as a final disposal or treatment of waste.

I had a couple of comments with regards to the RFP. I was concerned about the time frame, whether there was a shut-off for public comments, but Section C.6.2, CAB, of Draft D, sets

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out here the criteria for waste packaging, transportation, and disposal of Fernald materials.

And I think one of the things I think should be noted in the RFP is the fact we are in the process right now of developing a feasibility study for the transfer of waste within Las Vegas, and I think this probably ultimately resulted in the development of environment assessments.

When putting out the RFP, they should be sensitive to the fact this is something that is kind of above DOE regulations. So they should be aware of that, and I think the DOE should modify as such.

The Section C.6.2.11 dealing with contingency planning and emergency response suggests -- mentioned the FEMP emergency plan. I don't know what that is. I guess it's like other emergency response plans.

But one of the issues we have had to discuss with DOE is just the fact that if there is an accident, the plan has to be sensitive to the fact of what's going to happen to the community.

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And since the locals will probably be the first responders, there should be some interaction. Maybe they already have, but just to make sure that that part of it works out.

That's all I have. Thank you.

---o0o---

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[redacted]

I'm Dale Schutte with the CAB. This is my own personal opinion, but I would like you to give serious consideration to shipping all this material by rail, as it appears to be safer than by truck.

The other problem I have, as a stakeholder in Nevada, this material that you have sent here in the past, and that's what you will be sending here in the future, does not cover the lifecycle cost of the handling of this material.

You pay only a portion of what it costs the Nevada Test Site here to handle this material. There is nothing that will help us pay for the closure of the sites, service thereto, monitoring the sites, the long-term stewardesship of these sites.

Your material is one of many that we have been getting and that we will be getting. We will, I hope, be able to come to some of the other sites in the future and ask for some help with this long-term lifecycle problem that is developing here in Nevada.

If this was a commercial permitted site, the performance assessments, the closures, and the licensing would already have been done, whereas here, it hasn't been done yet, only a portion of it, yet we are still accepting your waste and we're going to continue accepting your waste.

There is no law that says we can prohibit it from coming here, even though most surveys show that the majority of stakeholders in Nevada really don't want the material coming here. It's basically a liability.

There is no benefit to our accepting it, but the reality is, of course, that we have so much here right now, if you send more, it doesn't really make a lot of difference.

Just remember that you are only paying a portion of the lifecycle cost of this material, and we need pressure on Congress to help us with the full lifecycle cost.

Operating a waste disposal site on year-to-year funding is one of the poorest procedures I have ever seen. The commercial sites, you can't do that. You have to have something set up, a long-term funding, and Nevada does not have that. Thank you.

REPORTER'S CERTIFICATE

STATE OF NEVADA)
: ss
COUNTY OF CLARK)

I, Debbie F. Bartlett, CCR 62, do hereby certify that I took down in shorthand (stenotype) the oral comments of the public during the formal public comment period of said hearing held on Tuesday, December 2, 1997, commencing at 6:30 p.m., at the Department of Energy Building, 223 Energy Way, North Las Vegas, Nevada;

That thereafter said shorthand notes were transcribed by computer-aided transcription at and under my direction and supervision, and that the foregoing transcript constitutes a true and accurate transcript of the oral comments made by the public during the formal public comment period of said hearing.

Dated at Las Vegas, Nevada, this 11th day of January, 1998.

DEBBIE F. BARTLETT, CCR NO. 62

APPENDIX C

WRITTEN COMMENTS RECEIVED ON DRAFT FINAL ESD

Comments by:
Dennis A. Bechtel
[redacted]

SILO-3 EXPLANATION OF SIGNIFICANT DIFFERENCES (ESD) AND OTHER ISSUES

1. As a member of the Nevada Test Site (NTS) Community Advisory Board and a citizen of Clark County I, first, appreciate the time and effort taken by the Department of Energy at Fernald to have public meetings in Nevada and Ohio on these important issues. Since cleanup activities invariably affect multiple sites, I feel that this is an important initiative that should be replicated throughout the Complex.

2. More detailed comments will be sent prior to the deadline. Since more time is needed to review the Draft Explanation of Significant Differences (ESD), I am going to reiterate briefly a number of my concerns. It should be noted that I am making my comments as a private citizen and the comments are not those of the Community Advisory Board.

<u>General Comments</u>

1. With the change in the recommendation from the original ROD, it is important that a performance assessment be conducted of the stabilization processes selected. Given the problems experienced with the Pondcrete at Rocky Flats, and the K-25 waste stabilization the performance of the material must meet a number of demands.

2. *Performance Assessment* should include a range of considerations from the stabilization of the waste at Fernald to the final disposal at either the NTS or a commercial facility. *Performance standards* should be specified for quality control, waste handling, the "packaging" of the waste, and the multitude of issues associated with the transportation of the waste (e.g., driver training) need to be addressed as important elements of a performance assessment.

Other Issues

1. While the draft recommends Stabilization or Encapsulation for Silo-3 waste, it appears that, given the problems being experienced with the Vitrification Pilot Project at Fernald, Silos 1 and 2, may also become candidates for Stabilization, and, perhaps off-site disposal at the NTS. The future potential use of Stabilization for Silos 1 and 2 needs to be addressed.

Comments by Dennis A. Bechtel
on the Draft
Explanation of Significant Differences
December 2, 1997
Page 2

2. The fact that the cleanup of the Operable Units is organized independently, apparently has precluded the comprehensive evaluation of issues such as cumulative effects from the transportation of the waste. Individually each of the units have a moderate number of shipments and what is described basically as minimal impacts, but collectively the total number of shipments will be greater, and, potentially, the potential risk to the public greater as well. Because other sites are also in the queue to ship waste to the NTS, DOE needs to tackle the issue of cumulative shipments to the NTS.

Since the Nevada Test Site is being considered as either a regional or centralized site for the storage, treatment or disposal many shipments through urbanized, and rapidly growing Las Vegas, it is important that cumulative impacts must be addressed.

3. Section C.6.2.10 of the Draft D Request for Proposals sets the criteria for the waste packaging, transportation and disposal of the Fernald materials. State and local government planners and DOE are currently working on a *Feasibility Study* for intermodal transportation and routing of waste to the Nevada Test Site. It is important that the RFP incorporate the process being used in this work to guide the ultimate transportation of the waste in Nevada.

4. Section C.6.2.11 (Contingency Planning and Emergency Response). This may be covered but it is important that the FEMP Emergency Management Plan include a plan to interact with local governments which will probably be the first responders in the event of an accident.