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**CATEGORICAL EXCLUSION DETERMINATION
OPERABLE UNIT 4 PILOT PLAN PHASE I NEPA
DOC. NO. 373**

04/02/93

NEPA DOC. 412

DOE/DOE

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CAT EX

OU4

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

CATEGORICAL EXCLUSION (CX) DETERMINATION

Operable Unit 4 Pilot Plant Phase I
NEPA Document No. 412

Fernald Environmental Management Project (FEMP), Fernald, Ohio

Proposed Action

The United States Department of Energy (DOE) proposes to construct and operate the Operable Unit 4 (OU4) vitrification Pilot Plant Phase I.

Location

The proposed action will take place at OU4's Silo 4 and an area approximately 200 feet east of Silo 3. The silos are located at the western perimeter of the waste pit area. The 1050 acre FEMP site is located 18 miles northwest of downtown Cincinnati, Ohio.

Background

The proposed action involves the treatability studies for OU4, consisting of Silos 1, 2, 3, and 4, the silos' ancillary structures, and the surrounding soils. Silos 1 and 2 are the K-65 silos, used to store radium-bearing residues that were formed as by-products of uranium ore processing. Silo 3 holds metal oxides, obtained from slurries of the refinery operations that have been reduced to a dry material and then blown into the silo. Silo 4 has remained unused, but has previously contained amounts of contaminated rainwater that has been pumped out of the silo.

Samples collected from Silos 1 and 2 indicate that radon is emanating from the silos. The objective of the Remedial Investigation/Feasibility Study (RI/FS) for OU4 is to evaluate methods, treat, stabilize, or isolate the silos' contents, structures, and affected areas to prevent further release or migration of contaminants to the environment. Treatability studies are performed to ensure that a specific technology is adequately evaluated in sufficient detail to support the remedy selection in the Record of Decision (ROD) when it is issued. Present OU4 studies include assessment of vitrification technologies through the bench scale stage. The next step in the treatability studies is a pilot plant study.

Pilot plant treatability studies can provide performance and cost information needed to evaluate, select, and provide design information on treatment alternatives. The treatability studies will be conducted in Phase I and Phase II of the Pilot Plant Project with the primary goal set at demonstrating the proposed technology for remediating Silos 1 and 2. The secondary purpose of the Pilot scale studies is to confirm the performance of the proposed remediation technology.

Description of Proposed Action

The proposed action involves Phase I of a two-phase vitrification Pilot Plant Project. Phase I is to construct and operate a system on a surrogate material (sand and bentonite) to ensure all unit operations function safely before processing the K65 (Silos 1 and 2) waste. Phase I consists of work to be completed in three parts: 1) preparation of Silo 4; 2) construction of the pilot plant; and 3) operation of the pilot plant. These three parts of Phase I are discussed below in more detail.

1. Preparation of Silo 4

Silo 4 must first be prepared so that the Pilot Plant may be tested. Preparation of Silo 4 entails: a) removing the silo dome; b) installing the working platform on top of the silo; c) adding sand and bentonite clay; and d) installing the waste retrieval system.

a. Removing the Silo 4 Dome

To gain access to Silo 4, the dome covering the silo must be removed. The dome will be sawed or drilled into circular sections with the detached sections being lifted out by a crane. The sawing or drilling process will begin at the center of the dome, moving outward, removing the larger section pieces last.

Dome removal must be handled so that the silo contents are exposed for only a minimal amount of time. This precaution is taken to emulate the conditions that will occur with the Phase II dome removals of Silos 1 and 2. Silo 4 was analyzed in accordance with American Water Works Association (AWWA) standards for "Wire - Wound Circular - Prestressed Concrete Water Tanks" to determine how much of the dome to remove, while maintaining the integrity of the Silo 4 structure. The removed dome sections will be loaded into sea-land containers on a flatbed truck and removed from the Silo 4 site. The dome pieces will be managed according to the site's Removal Action 17 Work Plan for the Improved Storage of Soil and Debris (Removal Action 17 Work Plan).

b. Installing the Working Platform on the Silo

A working platform must be installed on top of Silo 4 so that working access can be gained to the silo. A gasketed mating surface will first be installed on the edge of the silo to create a seal between the concrete surface of the silo and the platform being installed. The platform will be an aluminum or steel pre-constructed, field-assembled structure that will be lifted by a crane onto the mating surface. The exact dimensions of the platform are not yet known; however, it is expected to be approximately 80 feet in diameter to fit the width of the silo.

The platform floor is expected to have several access ways so that entry can be gained to the silo from different positions on the platform. Any debris generated from this process will be managed according to the site's Removal Action 17 Work Plan. The silo will be examined to confirm that

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b. Constructing the Pilot Plant Building

A pre-engineered field-constructed steel structure will be constructed for the building that will house the equipment for the vitrification process. Standard construction equipment will be used to construct the building. Installation of the process equipment, building piping, electrical wiring, and instrumentation will occur next. Proper construction methods adhering to all applicable regulations, codes, and standards will be utilized in performance of the work.

3. Operation of the Pilot Plant

Operation of the Pilot Plant will begin with the retrieval of the sand and bentonite clay mixture from Silo 4 via the slurry pump. The removed mixture will be pumped through the slurry piping into the thickener, which acts as a settling device separating some of the liquid from the mixture. The separated liquid will be processed through a recycling line to the water tank, which supplies water for later parts of the process. The remaining mixture is pumped to the centrifuge feed, a process that separates more liquids from the mixture.

The de-watered mixture then travels on to the dryer. In drying, the mixture is processed onto a metal surface and rotated while being heated from steam. This drying process results in further separation of liquid from the mixture. The remaining mixture solids are then inventoried (broken down into smaller amounts by weight) and moved into the dry feed bin where sodium carbonate is added to help facilitate the vitrification process.

The mixture then travels on to the furnace via the furnace in-feed section. The electric furnace is kept at a temperature of approximately 1,500°C and "cooks" the mixture for approximately two days. The furnace allows air to enter the "cooking" process to produce a higher quality glass. The furnace produces a stream of molten glass that is passed through to the marble forming machine where it is cut into small pieces. The pieces are spiraled in a specialized marblizer to form the resultant glass bead product that will be stored in drums or boxes on a concrete pad near the drum or box fill station.

Any gas or emissions from plant operation will be processed by an off-gas system that will include a scrubber, a mist eliminator, a carbon filter, a High Efficiency Particulate Air filter (HEPA), and a blower for subsequent discharge to the atmosphere via a stack with an isokinetic sampler. The off-gas system will be used to establish parameters for treating the off-gases during future vitrification testing in Phase II.

Categorical Exclusion to be Applied

The authority for finding this project to be subject to NEPA Categorical Exclusion is contained in Subpart D of the revision to 10 CFR 1021, entitled "National Environmental Policy Act Implementing Procedures and Guidelines." The Final Rule and Notice, effective May 26, 1992, includes a list of categorical exclusions that are classes of actions that normally do not require the preparation of either an Environmental Impact Statement or an Environmental Assessment.

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The Final Rule and Notice specifically lists in Part 1021, Appendix B to Subpart D, Sec. 1021.410, B6.2, the following as types of actions that are Categorical Exclusions applicable to Specific Agency Actions:

The siting, construction, and operation of temporary (generally less than 2 years) pilot-scale waste collection and treatment facilities, and pilot-scale (generally less than one acre) waste stabilization and containment facilities (including siting, construction, and operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis) if the action:

(1) supports remedial investigations/feasibility studies under CERCLA, or similar studies under RCRA, such as RCRA facility investigation/corrective measure studies, or other authorities, and

(2) would not unduly limit the choice of reasonable remedial alternatives (by permanently altering substantial site area or by committing large amounts of funds relative to the scope of the remedial alternatives.)

This Categorical Exclusion is appropriate since the proposed action as described is the siting, construction, and operation of a structure over Silo 4 and a pilot plant. Phase I is temporary in that it will demonstrate the waste retrieval process on Silo 4 and the vitrification process that is proposed for remediating K-65 material in Silos 1 and 2. Phase I of the Pilot Plant Project is expected to last no longer than one year.

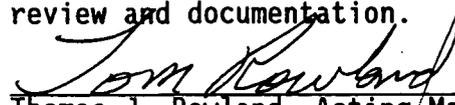
Phase I of the Pilot Plant Project is a waste treatment stabilization process that will occur on less than one acre of land. In addition, Phase I will support the RI/FS studies by providing information in support of the RI/FS process for OU4 and not unduly limit the choice of remedial alternatives. In the event that Phase I proves that vitrification is not the preferred alternative, the Pilot Plant could be used for the cementation process alternative through utilization of the Pilot Plant building and equipment.

The proposed action will not violate applicable statutory, regulatory, or permit requirements. The proposed actions will have no significant adverse impact on any environmentally sensitive areas (e.g., wetlands, floodplains, or the sole-source aquifer).

Compliance Action

I have determined that the proposed action meets the requirements for the CX referenced. Therefore, the proposed action is categorically excluded from further NEPA review and documentation.

Approval:


 Thomas J. Rowland, Acting Manager
 U.S. Department of Energy, Fernald Field Office

Date:

4/2/93

United States Government

Department of Energy

Fernald Field Office

memorandum

DATE: APR 02 1993

DOE-1541-93

REPLY TO: FN:Skintik
ATTN OF:

SUBJECT: CATEGORICAL EXCLUSION DETERMINATION (CX 412) - OPERABLE UNIT 4 PILOT PLANT
PHASE I

TO: Carol Borgstrom, EH-25, FORS

The subject categorical exclusion (attachment) under Section D of the Department of Energy's National Environmental Policy Act Guidelines has been approved and is being forwarded for your review.

The Department of Energy, Fernald Field Office (DOE-FN) requests that you notify us within two weeks, in accordance with the Interim Procedural Guidelines for implementation of SEN-15-90, whether you have any objection determination.

If you have any questions, please contact Ed Skintik at 513 648-3151.


Thomas J. Rowland
Acting Manager

Attachment: As Stated

cc w/att:

R. S. Scott, EM-20, FORS
K. A. Hayes, EM-424, TREV
L. Harris, EM-431, TREV
C. J. Brown, FERMCO/51-7