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*CATEGORICAL EXCLUSION DETERMINATION
MINIMUM ADDITIVE WASTE STABILIZATION (MAWS)
BENCH-SCALE DEMONSTRATION NEPA DOC. NO.
379*

07/02/92

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NEPA DOC. 379*

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NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
CATEGORICAL EXCLUSION (CX) DETERMINATION
MINIMUM ADDITIVE WASTE STABILIZATION (MAWS)
BENCH-SCALE DEMONSTRATION
NEPA Document No. 379
Fernald Environmental Management Project (FEMP)
Fernald, Ohio

Proposed Action

The U.S. Department of Energy (U.S. DOE) proposes to install and operate the MAWS system equipment in Plant 9 at the FEMP. The Bench-Scale Demonstration is intended to demonstrate that vitrification is an economical treatment alternative for some types of low-level radioactive and mixed wastes and that millions of dollars in cost savings are possible for the restoration effort at the FEMP. The potential savings are associated with the promise of integrating innovative technologies with vitrification in a synergistic fashion to achieve highly durable, long-lasting, treated waste forms with smaller volumes than are currently possible. The MAWS concept will be demonstrated using Pit 5 wastes. Then the MAWS will be used to develop glass formulas for other Pit/FEMP wastes. Plant 9 is proposed to house the equipment to process (vitrify) the pit materials to a glass form.

Location

Waste Pit 5 is located within the FEMP waste storage area. The FEMP waste storage area, which is located west of the FEMP process area, includes six low-level radioactive and/or mixed waste storage pits, a burn pit and a clearwell. The FEMP process area consists of 139 acres near the center of the 1050 acre FEMP Site. Plant 9 is located in the eastern side of the process area. The FEMP Site is located 18 miles northwest of downtown Cincinnati, Ohio.

Background

The MAWS program involves the participation of several organizations, i.e., DOE-HQ, DOE-FN, Argonne National Laboratory, GTS Duratek, AWC Lockheed, and Vitreous State Laboratory (VSL) of the Catholic University of America (CUA). The total program is divided into four phases as follows:

Phase 1: Characterization and Laboratory Studies - small laboratory-scale studies to determine the feasibility of solidification and vitrification. This phase, using materials from the FEMP site, is presently in progress under contract with GTS Duratek and CUA located in Washington D.C.

Phase 2: Bench-Scale Demonstration (1/2 to 1 ton/day) - after characterization of the wastes is completed and Phase 1 laboratory studies are well under way, demonstrations will start with a bench-scale, joule-heated vitrifier of approximately 1/2 to 1 ton/day. The vitrifier will mainly be used to prove the process and develop glass mixes using various wastes and glass formers. The MAWS concept will provide the bench-scale demonstration and the scale-up parameters for the pilot-scale demonstration.

Phase 3: Pilot-Scale Demonstration (20 to 25 tons/day) - studies to determine large scale operability and economics and to provide parameters for designing full-scale operations.

Phase 4: Full-Scale Operation (300 tons/day) - four 100-ton/day melters with one as a operating spare.

This NEPA document, CX 379, requests approval for Phase 2 only. The FEMP has an approved Categorical Exclusion, CX 376 "FEMP Soil collection and Shipments for Treatability Studies" that provides for Phase 1. Separate NEPA documentation will be prepared for Phase 3 at the time of design for the project begins. NEPA requirements for Phase 4 are being addressed in the Remedial Investigation and Feasibility Study-Environmental Impact Statement (RI/FS-EIS) for Operable Unit 1.

The MAWS program is an integrated technology demonstration/treatability process development activity under Comprehensive Environmental Response Compensation & Liability Act (CERCLA) to achieve highly durable, long-lasting, treated waste forms with smaller volumes than currently possible. The MAWS Program will be demonstrated using Pit 5 wastes. Then the MAWS will be used to develop glass formulas for other Pit/FEMP wastes. Pit 5 is a surface impoundment that was constructed in 1968 by cut and fill, using the excavated material to construct a dike which extends the pit to approximately 10 feet above grade. The surface area of the pit is approximately 183,700 square feet with an average depth of approximately 30 feet. During its normal operating life (1968 through August 1983), the pit received liquid waste slurries from the General Sump which included neutralized raffinate and General Sump slurries. Pit 5 also received waste waters from the General Sump which included nonradioactive Boiler Plant blowdowns, Water Plant lime sludges, filtrate from the Recovery Plant, and contaminated process waste waters. The General Sump, which discharged to Pit 5, collected waste process water from throughout the FEMP manufacturing facility. Plant 9 was referred to as the Special Products Plant. Operations in Plant 9 were uranium ingot casting, sawing, and machining; derby salt cleaning; and scrap metal decladding.

Description of the Proposed Action

The proposed action is to obtain maximum synergism by integrating vitrification, soil washing, and water waste treatment methods (MAWS). All water leaving the process will be cleaned before disposal to the General Sump. The water from the General Sump will be monitored prior to release to the Great Miami River. To minimize water usage and discharge, the MAWS water streams will be recycled. Vitrification cooling water and contaminated waste water from the soil washing will be processed through an organic ion exchange resin to clean and remove the radionuclides. Contaminants on the organic resin will be stripped and re-absorbed by a glass resin which will be vitrified in the vitrifier (glass melter). This should allow conventional disposal of the spent organic resin.

A feed tank, which will hold a seven day (≈ 7 tons) supply of pit wastes for vitrification, will be installed. Some modification to the Plant 9 facility is needed to operate the vitrifier at maximum capacity with minimum impact to the environment. Expected modifications include the installation of a new motor control center and a 5-ton hoist over the vitrifier, and connection of the vitrifier's off-gas exhaust to the HEPA filtration and exhaust system recently installed in Plant 9.

A staging area for process chemicals and soil will be installed for soil washing which will separate contaminated soil removed from around the pits into clean and contaminated streams. The remaining contaminated soil will be used as additives/ fillers for vitrification of the mixed wastes. All of the constituents for making glass can be found by blending the various site wastes streams in correct proportions precluding the need for buying expensive additives. While pit wastes have little silica-bearing compounds, they do contain flux-bearing compounds. Site contaminated soils and flyash will supply the necessary silica-bearing compounds. By blending these streams in correct proportions, production of a good glass is expected.

The vitrifier will be designed, built, and installed by GTS Duratek with technical support from the Catholic University of America. The system will include electrical equipment, instrumentation and monitoring equipment, and off-gas handling and cleaning equipment. The off-gas system will clean/scrub, cool, and filter the off-gas. The off-gas quality will meet all regulatory requirements for release and monitoring equipment will be provided. The system will be capable of dispensing the glass product into drums in the form of frit or glass marbles of two sizes to maximize packing. The drums of glass product will be stored in the Resource Conservation and Recovery Act (RCRA) storage facility until the characterization of the glass is completed. When characterization shows a batch of product to be non-RCRA, that batch of drums will then be moved to a non-RCRA storage facility consistent with radiological controls.

CX 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 the Existing Rule at 10 CFR part 1021, titled "Compliance with the National Environmental Policy Act," which incorporated revised provisions of DOE's Guidelines for Implementing the Procedural Provisions of the NEPA." The Final Rule, effective May 26, 1992, includes a revised and expanded list of categorical exclusions which are classes of actions that normally do not require the preparation of either an Environmental Impact Statement or an Environmental Assessment.

The Rule specifically lists in Part 1021, Appendix B of Subpart D, Sec. 1021.410, B3.10, the following as types of actions that are Categorical Exclusions Applicable to Specific Agency Actions:

"Small-scale research and development and small-scale pilot projects conducted (for generally less than two years) to verify a concept before demonstration actions, performed in an existing structure not requiring major modification."

The MAWS Bench-Scale Demonstration Project meets the requirements for the Categorical Exclusion listed above. Furthermore, the proposed action will not violate applicable statutory, regulatory, or permit requirements; it will not require siting and construction or major expansion of waste disposal, recovery or treatment facilities; and it will not impact 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: 
R. E. Tiller, Manager
U.S. Department of Energy, Fernald Field Office

Date: _____

EH-25 has reviewed this determination and has no objection.

Signature: _____
Carol Borgstrom, Director
Office on NEPA Oversight, EH-25

United States Government

Department of Energy

Fernald Office

memorandum

DATE: JUL 02 1992

DOE-1986-92

REPLY TO

ATTN OF: FN:Skintik

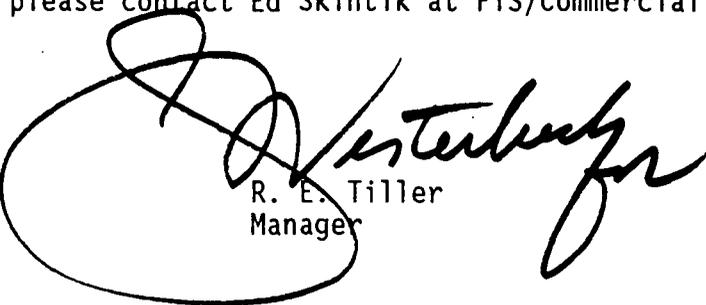
SUBJECT: CATEGORICAL EXCLUSION DETERMINATION (CX 379) - MINIMUM ADDITIVE WASTE
STABILIZATION (MAWS) BENCH SCALE DEMONSTRATION - FERNALD ENVIRONMENTAL
MANAGEMENT PROJECT (FEMP), FERNALD, OHIO

TO: Carol Borgstrom, EH-25, FORS

The subject categorical exclusion (attachment) under Subpart D of 10 CFR Part 1021 of the Department of Energy's National Environmental Policy Act Implementing Procedures 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 (2) weeks, in accordance with the Interim Procedural Guidelines for implementation of SEN-15-90, whether you have any objection to this determination.

If you have any questions, please contact Ed Skintik at FTS/Commercial (513) 738-6660.



R. E. Tiller
Manager

Attachment: As Stated

cc w/att.:

R. S. Scott, EM-20, FORS
K. A. Hayes, EM-424, TREV
L. Lawson, EM-431, TREV (2)
C. J. Brown, WEMCO

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