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FINDING OF NO SIGNIFICANT IMPACT ENGINEERING EVALUATION/COST ANALYSIS - ENVIRONMENTAL ASSESSMENT K-65 SILOS REMOVAL ACTION FERNALD ENVIRONMENTAL

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FINDING OF NO SIGNIFICANT IMPACT

ENGINEERING EVALUATION/COST ANALYSIS - ENVIRONMENTAL ASSESSMENT

3271

K-65 SILOS REMOVAL ACTION

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

AGENCY: U. S. Department of Energy

ACTION: Finding of No Significant Impact for the Engineering Evaluation/Cost Analysis-Environmental Assessment for the K-65 Silos Removal Action, Fernald Environmental Management Project

SUMMARY: The Department of Energy (DOE) has prepared an Engineering Evaluation/Cost Analysis-Environmental Assessment (EE/CA-EA) for the proposed K-65 silos removal action at the Fernald Environmental Management Project (FEMP) located near Fernald, Ohio. Because the waste stored therein poses a potential threat to human health and the environment, DOE is pursuing a removal action consisting of covering the K-65 silos waste with a gas barrier material (bentonite) to control the emanation of radon gas from the silos and to minimize the amount of waste to be addressed in the final remedial action. This

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removal action is intended to abate, prevent, minimize, stabilize, mitigate, and eliminate a release or threat of release of radon. This action would occur prior to final remediation and would be consistent with final remediation to the greatest extent practicable. Based on the analysis in the EE/CA-EA, DOE has determined that this removal action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, preparation of an environmental impact statement (EIS) is not required and the Department is issuing this finding of no significant impact. Nothing herein is intended to represent a determination on the legal applicability of NEPA to remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

COPIES OF THE EE/CA-EA ARE AVAILABLE FROM:

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BACKGROUND: The FEMP site is located on 1050 acres in a rural area approximately 20 miles northwest of downtown Cincinnati, Ohio. Prior to 1985, solid slurried wastes from site processes were disposed of in the on-site Waste Pit Area. The Waste Pit Area lies west of the 136-acre production area located near the center of the site.

During the early 1950s, FEMP processed pitchblende (uranium-rich ore) from the Belgian Congo. No chemical separation or purification was performed on the radium-rich ore before it arrived at FEMP. One process stream was termed K-65, the residues of which were precipitated and separated per contract with African Metals, Inc. Between 1951 and 1955, these residues were slurried to Silos 1 and 2, where they are currently stored. The total estimated volume of K-65 residues is 195,000 cubic feet (approximately 8,800 metric tons).

The radiological constituents of the K-65 residues have been estimated to include 7 Curies (Ci) of uranium (0.71 percent U-235), 3,300 Ci of radium (Ra-226), and 1810 Ci of thorium (Th-230). Prior to installation of the protective coatings on

the dome of the silos, the external radon flux ranged from 13 to 3×10^7 pCi/m^2-s.

Current chronic emissions of radon from the K-65 silos are estimated to result in an incremental lifetime risk of fatal lung cancer of 9×10^{-3} to a member of the general public. The incremental lifetime risk of fatal lung cancer from a spontaneous failure of the silos is estimated to be 9.2×10^{-7} to a member of the general public.

PROPOSED ACTION: The proposed action consists of covering the K-65 byproduct material with a gas barrier (bentonite slurry) that would retard the emanation of radon gas into the space between the residues and the silo domes. The material would be introduced into the silo through the man-way openings in the silo domes. To minimize the possibility of displacing radon gas from the silo during filling activities, the existing radon treatment system (RTS) would be employed to reduce the build-up of radon gas within the silos to the lowest practicable level prior to introducing the bentonite slurry. The RTS reduces radon concentrations, allowing worker access to the silos.

The estimated time of construction for this removal action would be approximately 10 months, with a total capital cost of $2,900,000. This proposed action was determined to be the most environmentally sound and cost effective action among all

alternatives considered.

ENVIRONMENTAL EFFECTS: The fundamental objective of the removal action is to protect the public health and the environment by controlling the current radon emissions. Therefore, only the immediate effects of the airborne release to the public and environment were considered.

All possible measures (e.g., good construction planning to ensure proper phasing of major construction portions of the project) would be taken to mitigate any adverse impacts to surrounding areas resulting from any construction activities during the implementation of the proposed action.

Any noise or air quality impacts associated with the application of the bentonite alternative would be minimal and limited to on-site populations. There would be no permanent changes in land use, no effect on cultural resources, and no discernible effect on property values or other socioeconomic factors. The operation of the RTS would generate waste material (i.e., spent carbon filters) that would be disposed of in accordance with approved site procedures.

Procedures and administrative controls would be in place prior to commencement of the proposed removal action, to maintain radiation exposure to on-site personnel below that in DOE Orders

and site guidelines (5 and 3 rem/year, respectively). These controls would ensure that exposures are as low as reasonably achievable. 3271

ALTERNATIVES CONSIDERED: The following alternatives were considered:

o NO ACTION: There would be no additional abatement, remediation, or treatment activity in the K-65 silos. The selection of this alternative would not change the existing risk to the public and the environment. This alternative was considered as a base for comparison with the other alternatives.

o CONSTRUCTION OF TORNADO-RESISTANT ENCLOSURE: The second alternative was the construction of air-tight, tornado-resistant enclosures to protect the silo domes from tornado loads. The enclosures would prevent tornado loads from reaching the domes and prevent radon gas and K-65 residue release to the environment should the domes collapse. This alternative was rejected because of the relatively high cost, $5 million, and time required to implement the action.

o RELOCATION OF RESIDUES: This alternative involves the removal and interim storage of the K-65 residues. This alternative includes construction of surface/subsurface engineered canister units retention containers, siting, design, and construction of a

storage facility, construction of an air-tight temporary enclosure, removal of residues from Silos 1 and 2 by mechanical or hydraulic means, and transporting the materials in containers to the storage facility. This alternative was rejected because of high cost, $60 million, and time required to implement the action.

o **CONSTRUCTION OF LIGHT STRUCTURE ENCLOSURE WITH CONTINUOUS RADON REMOVAL:** This alternative consists of constructing a light, temporary air-tight enclosure around the K-65 silos to prevent the release of radon gas in the event of spontaneous dome failure and to eliminate the chronic radon emissions. A continuous radon treatment system would be employed to control the quantity of radon gas that could be released into the enclosure by removing radon from the silo space inventory. This alternative was rejected because it does not provide primary containment near the surface of the K-65 residues.

o **REDUCTION OF RADON INVENTORY:** For this alternative, the silos' free space atmosphere would be circulated through radon treatment equipment. The objective would be to reduce the radon inventory in the silo atmosphere such that, in the event of sudden dome failure, the level of radon dispersed into the atmosphere would remain within acceptable limits. This alternative was rejected because it does not significantly improve the short-term or long-term protection of the public

health in the event of a dome failure.

o ADMINISTRATIVE CONTROLS: In this alternative, no abatement, remediation or treatment activities would be undertaken for the K-65 silos. Instead, an administrative program would be developed to provide necessary actions to be taken for each of the three considered failure modes. This alternative was rejected because it does not significantly improve the short-term or long-term protection of the public health in the event of a dome failure.

DETERMINATION: The proposed application of a gas barrier to the K-65 waste contained in Silos 1 and 2 would reduce emission of radon gas and would minimize the amount of waste for the final remedial action. The proposed removal action also attains the design requirements of the identified applicable or relevant and appropriate regulations. The proposed action would have only temporary, construction-related, environmental impacts. The selection of this alternative represents the most environmentally preferable and cost effective action. This project does not represent a major Federal action significantly affecting the quality of the human environment, within the meaning of NEPA. This finding is based on the analyses in the EE/CA-EA.

Therefore, the preparation of an EIS for the proposed action is not required. Nothing herein is intended to represent a statement on the legal applicability of NEPA to remedial actions under CERCLA.

Issued at Washington, D.C., this 14th day of November, 1991.

Paul L. Ziemer, Ph.D.
Assistant Secretary
Environment, Safety and Health