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DEPARTMENT OF ENERGY

Finding of No Significant Impact
for Operation of the Glass Melter Thermal Treatment Unit at the
U.S. Department of Energy's Mound Plant, Miamisburg, Ohio

AGENCY: Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) has prepared an environmental assessment (DOE/EA-0821) for the proposed operation of the Glass Melter thermal treatment unit ("Glass Melter") at DOE's Mound Plant in Miamisburg, Ohio. The Glass Melter would thermally treat mixed waste (hazardous waste contaminated with radioactive constituents, largely tritium, plutonium-238, and/or thorium-230), that was generated at the Mound Plant and is now in storage, by stabilizing the waste in glass blocks. Depending upon the radiation level of the waste, the Glass Melter may operate for as short a time as one year, but not longer than six years. DOE considered two onsite alternatives to the proposed action and seven offsite alternatives.

Based on the analysis presented in the environmental assessment, DOE believes that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq. Therefore, the preparation of an environmental impact statement is not required and the DOE is issuing this finding of no significant impact.

DATES: Proposed operation of the Mound Plant Glass Melter thermal treatment unit was the subject of a public meeting in Miamisburg, Ohio, on March 10, 1994. No unfavorable written comments from stakeholders were received by the DOE as a result of this meeting. The environmental assessment for the proposed operation of the Glass Melter was approved by DOE on October 27, 1994. A proposed finding of no significant impact (FONSI) was published in the *Federal Register* (FR) on November 3, 1994 (FR 59 55085) for public review and comment. No comments on the proposed FONSI were received, although a small number of individuals requested, and were provided, copies of the environmental assessment (EA).

ADDRESS: Mail any requests for further information on the Glass Melter project, or the associated EA and FONSI, to:

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FOR FURTHER INFORMATION: For further information on the DOE National Environmental Policy Act process, contact:

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SUPPLEMENTARY INFORMATION: The proposed action would bring the Mound Plant Glass Melter out of cold shutdown mode and use it for treating mixed waste that was generated at the Mound Plant and is now in storage. The Glass Melter, housed in an annex of the Liquid Waste Disposal Building, consists of a burn chamber of stainless steel (lined with refractory material) with an exhaust (offgas) system connected to a system of pipes and scrubbers ending in a stack (scrubbers are devices that remove small particles, gasses, and airborne radionuclides generated during thermal treatment). Waste in sealed drums would be transported by truck from the Mound Hazardous Waste Storage Building or Radioactive Mixed-Waste Storage Building to the annex, staged on a concrete loading dock adjacent to the annex, and then moved individually to a fume hood in the annex where the contents would be transferred into a feed system for processing in the melter. The waste would be added to molten soda-lime silica glass in the burn chamber of the Glass Melter. Ash from the combustion process would fall to the glass surface, where it would be incorporated into the melt. When the molten glass would reach a prescribed chemical mix (or a prescribed level of radioactivity), it would be discharged from the melter into 19 liter (five gallon) containers. The containers would then be transferred to a storage area in the building using mechanical aids (e.g., hoists and a roller conveyor system) to cool and to await transport by truck to existing onsite storage facilities.

The Glass Melter would have an estimated annual capacity of approximately 48,000 kg (106,000 lb) of wastes, based on an average throughput of 23 kg/hour (51 lb/hr) and a 2,080-hour work year. As originally proposed by the DOE, and as analyzed in the environmental assessment, operating at this capacity would have enabled DOE to eliminate the existing backlog of approximately 43,000 kg (95,000 lb) of mixed waste in approximately six years, while processing hazardous and mixed wastes (approximately 39,000 kg (86,000 lb) annually of nonradioactive solvents and mixed wastes) as generated.

Since the environmental assessment was written, DOE has decided to close the Mound Plant. DOE proposes, therefore, to use the Glass Melter only for the mixed waste backlog. DOE has not yet fully characterized this waste for radioactive contamination levels. The radiation level of the waste feed would be limited by the need to comply with the Environmental Protection Agency's National Emissions Standards for Hazardous Air Pollutants and by internal Mound limitations. If, after characterization, the radiation level of the waste is determined to be low enough that the capacity of the Glass Melter would be the factor controlling the processing rate, then the schedule for treatment of the backlog waste could be as short as one year.

The environmental impacts of the proposed treatment of only the mixed waste backlog are adequately covered, and are bounded by, the analysis in the environmental assessment, because calculations of radiological exposures and impacts were based on assumptions of waste radioactivity content that would exceed the actual content under the current proposed action (according to the environmental assessment, the mixed waste backlog is estimated to have a total activity of 211 curies of tritium and 0.42 curies of plutonium-238; the calculations for Glass Melter operations, however, are based on a total waste activity content of 240 curies/yr of tritium and 0.48 curies/yr of plutonium-238). The discussion below, which is based on the environmental assessment, therefore, would apply equally to the new proposed action. If the DOE later proposes to use the Glass Melter to treat other than mixed waste backlog, it will undertake appropriate further review under the National Environmental Policy Act.

Routine operation of the Glass Melter would generate treated offgas, scrubber sludge, scrubber liquid effluent, and several solid waste streams. The sludge generated by the scrubbing operations (approximately 770 kg (170 lb) per year) would be transferred by pipeline: (1) back to a Glass Melter feed port for reprocessing, (2) to an existing cementation process for immobilization in concrete, or (3) to container storage for any subsequent additional treatment required under the Resource Conservation and Recovery Act (RCRA) land

disposal restrictions. Filtered liquid scrubber effluent (approximately 36,000 kg (79,000 lb) per year), depending on its composition, would be: (1) pumped to an existing wastewater treatment facility, (2) pumped to the cementation process for immobilization as concrete (if the waste processed involved significant tritium concentrations), or (3) packaged for any subsequent additional treatment required under RCRA land disposal restrictions. Most liquid effluent would be treated at Mound's existing radioactive wastewater treatment facility and released via an existing outfall permitted under the National Pollutant Discharge Elimination System (NPDES).

The Glass Melter would generate, per year, approximately 3,200 kg (7,000 lb) of glass block (mixed waste); 8,900 kg (20,000 lb) of cemented scrubber effluent and sludge (also mixed waste); and 1,900 kg (4,200 lb) of maintenance wastes (filters, replacement parts, etc.). The maintenance wastes would generally be considered mixed waste, although certain of the replacement parts may have only surface radioactive contamination or may not be hazardous waste. The mixed wastes would be stored onsite until a mixed waste disposal facility is available.

The immediate result of Glass Melter treatment would be the conversion of waste that is primarily liquid and combustible, to a stable, inorganic form that would present very little environmental concern in storage. Most of the waste would eventually require transport to a radioactive mixed waste land disposal facility. Any waste that is not mixed waste would be disposed of with other, similar Mound wastes (e.g., hazardous waste is shipped offsite for disposal).

Environmental Impacts: In a series of test burns conducted in January 1985, the Glass Melter demonstrated the capability to thermally treat hazardous wastes in compliance with regulatory requirements. In June 1987, the Glass Melter was further tested and demonstrated effective treatment of low-level radioactive waste while meeting applicable regulatory requirements. Proposed future treatment of wastes using the Glass Melter would also meet all applicable environmental requirements. The Glass Melter is considered a "thermal treatment unit," not an "incinerator," under the Environmental Protection Agency regulations (40 CFR 260.10). Under the regulations for miscellaneous treatment, storage, and disposal units (40 CFR Part 264, Subpart X), any permit for the glass melter may include appropriate conditions from the incinerator regulations (Subpart O). Thermal treatment is one of the limited options DOE currently has to meet the requirement for site treatment plans under the Federal Facility Compliance Act.

The Environmental Protection Agency issued a Draft Strategy for Combustion of Hazardous Waste in Incinerators and Boilers on May 18, 1993, initiating a reexamination of its existing regulations and policies on waste combustion. In the draft strategy, the Environmental Protection Agency indicates that, "if conducted in compliance with regulatory standards and guidance, combustion can be a safe and effective means of disposing [of] hazardous wastes." To the extent that the Glass Melter would destroy hazardous wastes it would effectively "dispose" of that portion of the mixed waste backlog. Nevertheless, the thermal treatment of mixed wastes would necessitate the disposal of treatment residues as a mixed waste. These residues would be stored, pending final disposal in an approved location.

Emissions of nonradiological pollutants to the air during routine operation of the Glass Melter would include arsenic, cadmium, chromium, lead, carbon monoxide, hydrogen chloride, nitrogen oxides, and particulates. Predicted concentrations of nonradiological pollutants would meet applicable National Ambient Air Quality Standards and the maximum acceptable ground-level concentrations established by the Ohio Environmental

Protection Agency. During routine operation of the Glass Melter, the effective dose equivalent of radiation to the maximally exposed individual at the Mound Plant boundary (approximately 470 meters (510 yd) north-northeast from the Glass Melter stack) would be 0.07 mrem/year (tritium, plutonium-238, and thorium-230) from inhalation and ingestion pathways. These emissions would not cause the Mound Plant to exceed the individual effective dose equivalent limit of 10 mrem/year in the Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants. Based on the 1990 population distribution surrounding the Mound Plant, the collective effective dose equivalent to the total population residing within 80 km (50 mi) of the facility would be 2.6 person-rem/year. The environmental assessment shows that the health risk from such exposures would be very small.

Onsite personnel would not be exposed to unique hazards and would be adequately protected from potential exposure to radionuclides or other hazards by the existing health and safety programs. Existing facility design features would reduce direct worker contact with radioactive materials.

The formation of dioxins from Glass Melter operation would be virtually precluded due to specific technological design features of the equipment. For instance, the elevated operating temperatures of the Glass Melter would result in a high destruction and removal efficiency (99.9999% in test burns). In addition, the rapid cooling of the offgases below dioxin-forming temperatures, as recommended by the Environmental Protection Agency for municipal waste incinerators, would also be used to preclude dioxin formation.

The worst reasonably foreseeable accident involving the Glass Melter would be a fire on the loading dock that would result in the complete vaporization of the contents of ten mixed waste storage drums. The estimated frequency of such an accident is once every 100,000 years. The effective dose equivalent to the maximally exposed individual (approximately 200 m (220 yd) downwind) would be 0.2 mrem, well below

Environmental Protection Agency standards. The environmental assessment shows that the health risk from such exposures would be very small. Predicted concentrations of nonradiological pollutants would meet the Ohio Environmental Protection Agency's maximum acceptable ground-level concentrations. Taking into account the low probability of such an event, and the small magnitude of the consequences, the health risk posed by the accident would be very small.

No endangered species, critical habitats, floodplains, wetlands, or historical or archaeological resources would be affected by the proposed action.

Alternatives Considered: In the environmental assessment, DOE considered two onsite alternatives to the proposed action and seven offsite alternatives in the context of the original proposed action (i.e., assuming the continuing operation of the Mound Plant). The discussion below, however, while being based on the environmental assessment, reflects the current proposed use of the Glass Melter (based on DOE's decision to close the Mound Plant), which is to treat only mixed waste backlog.

- No Action: The present practice of waste storage and disposal would continue and the Glass Melter would not be used. Most of the mixed waste backlog is liquid, and much of it is combustible. Storage of the untreated waste, therefore, could adversely impact human health and the environment, especially in the case of a fire in the storage facility.
- Administrative Action: Another alternative would be to rely upon the established Mound Waste Minimization and Pollution Prevention Program to identify, screen, and analyze options to reduce the generation of waste. Waste that is in storage would not be affected by this program. The need for treatment options would persist.

- Offsite Treatment and Disposal: These alternatives would involve the transportation of mixed wastes to designated sites. DOE considered seven options for offsite treatment. All of the offsite treatment alternatives, with the exception of the Nevada Test Site, would involve thermal treatment.

- Quadrex HPS, Inc. (Gainesville, FL): This commercial facility cannot accept certain of the Mound mixed wastes, so this alternative would not, by itself, address the need to treat such wastes.

- Diversified Scientific Services, Inc. (Kingston, TN): This commercial facility could accept most of the mixed waste from Mound. Treatment, however, may be restricted by air permit conditions limiting the type of waste used for fuel and by Environmental Protection Agency regulations for boilers and industrial furnaces (40 CFR 266.100-112 and Appendices I-IX).

- Idaho National Engineering Laboratory (INEL): INEL has a permitted incinerator facility, the Waste Experimental Reduction Facility (WERF), capable of burning radioactive material and hazardous waste. WERF is currently shut down, and its operation is contingent upon completion of National Environmental Policy Act review and DOE approval of a Safety Analysis Report. The current waste acceptance criteria for WERF limit the radioactive and chloride content of wastes and prohibit receipt of any free liquids. These criteria would prohibit the acceptance at WERF of almost all of the Mound waste proposed for treatment in the Glass Melter. The criteria could not be changed without substantial upgrades to WERF.

Los Alamos National Laboratory: The proposed Controlled Air Incinerator is currently being permitted and undergoing National Environmental Policy Act review for operation at production capacity. Current operational plans do not include acceptance of offsite wastes, and the draft RCRA permit proposes to prohibit treatment of offsite waste.

Savannah River Site: DOE is currently constructing the Consolidated Incinerator Facility under a construction permit from the State of South Carolina. This facility will not allow out-of-state waste to be treated. DOE is preparing an environmental impact statement on waste management at the Savannah River Site, which will include further analysis of operation of the Consolidated Incinerator Facility and other volume reduction alternatives. Trial burns and operation of the facility are being deferred until the completion of the environmental impact statement process.

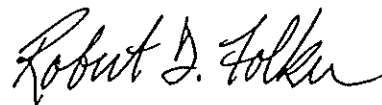
Oak Ridge Gaseous Diffusion Plant: The incinerator at the Oak Ridge Gaseous Diffusion Plant currently treats mixed waste. The primary sources of waste treated at this incinerator are the Paducah Gaseous Diffusion Plant, the Portsmouth Gaseous Diffusion Plant, and the Oak Ridge Reservation. A substantial backlog of waste exists that will take several years to treat. Thus, this alternative would not be available to Mound for several years and would not meet Mound's immediate needs.

Nevada Test Site: Disposal of mixed waste at the Nevada Test site is considered a possible alternative to treatment in the Glass Melter. Land disposal restrictions under the Resource Conservation and Recovery Act would require, however, that any mixed waste be treated before disposal. The Nevada Test Site would only,

therefore, be a reasonable alternative for Mound waste already treated at another facility. DOE has not yet decided to what extent the Nevada Test Site would be used for future disposal of offsite waste; such decisions will be made after completion of the Environmental Restoration and Waste Management Programmatic Environmental Impact Statement and the Nevada Test Site Sitewide Environmental Impact Statement.

Proposed Determination: Based on the information and the analysis in the environmental assessment, DOE believes the proposed action (i.e., operation of the Glass Melter for treatment of backlog mixed waste only) does not constitute a major Federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act. Therefore, the preparation of an environmental impact statement is not required and the DOE is issuing this finding of no significant impact.

Issued in Miamisburg, Ohio, on July 26, 1995.



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