April 2022

Environmental Management Disposal Facility

Waste Acceptance Criteria

U.S. DEPARTMENT OF ENERGY

The ability to dispose of cleanup waste onsite has been fundamental to the success of the U.S. Department of Energy's (DOE) environmental management mission on the Oak Ridge Reservation (ORR). With the current disposal facility nearing capacity and significant cleanup remaining, the need for a new onsite facility is imminent.

The proposed facility, known as the Environmental Management Disposal Facility (EMDF), will allow DOE to maintain its cleanup momentum on the ORR, enhancing safety and enabling science and national security missions.

DOE has worked collaboratively with the U.S. Environmental Protection Agency (EPA) and Tennessee Department of Environment and Conservation (TDEC) on a science-driven approach to identify a suitable location for the facility. The selected site presents the best location on the ORR for a safe and protective facility.

Waste Acceptance Criteria

Waste Acceptance Criteria (WAC) are the requirements (i.e., federal and state laws) that determine which waste contaminants and how much of these waste/contaminants can be disposed at EMDF. DOE, EPA, and TDEC have worked extensively to determine appropriate and protective limits for the facility's WAC so residents can know they are safe and protected from the cleanup waste – now and in the future.

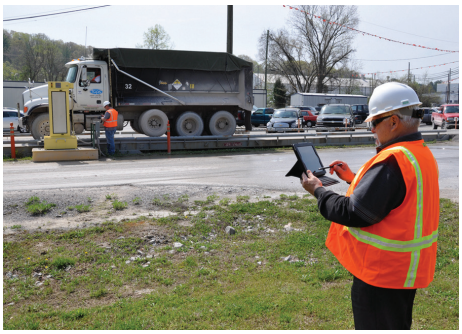
What does the WAC do?

1. Sets limits on the type and amount of waste that can go into EMDF based on:
   - Environmental laws, regulations, and guidance
   - The EMDF facility design
   - Geologic conditions of the EMDF site
2. Sets evaluation criteria and disposal methods for waste.

Path Forward/Next Steps

The final WAC have not been determined, but there is agreement on much of the criteria. DOE, EPA, and TDEC will continue to work together to determine the final requirements for EMDF that support ORR's environmental cleanup and are protective of human health and the environment. The administrative WAC will be approved before the Record of Decision is finalized.

What is **allowed** in EMDF?



EMDF will accept much of the same types of waste as the current onsite facility, which has operated safely for 20 years.

The waste will be comprised of demolition debris and soils from cleanup at the Y-12 National Security Complex and Oak Ridge National Laboratory. Demolition debris will comprise approximately 55% of the capacity with soils accounting for the remaining 45%.

DOE is committed to continue shipping all highly radioactive waste out of the state for permanent disposal.

What is **prohibited** from disposal in EMDF?

Prohibited or Limited Waste for EMDF
⦸ Waste generated outside Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-related cleanup activities on DOE's Oak Ridge Reservation
⦸ Transuranic waste, high-level waste, spent nuclear fuel, wastes produced by the extraction or concentration of uranium, and waste classified as greater than Nuclear Regulatory Commission Class C
⦸ Resource Conservation and Recovery Act (RCRA) listed hazardous wastes
⦸ Elemental and RCRA mercury characteristic hazardous waste
⦸ RCRA hazardous waste that does not meet land disposal restriction treatment requirements or alternative treatment standards for hazardous debris or soil
⦸ Infectious/pathogenic wastes and pyrophoric/detonatable/ explosive wastes
⦸ Free liquids, including RCRA and Toxic Substances Control Act waste packages
⦸ Bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents are added)
⦸ Bulk liquids exceeding 500 parts per million (ppm) polychlorinated biphenyls (PCBs) – bulk liquids containing PCBs at or below 500 ppm must be treated so they no longer contains free liquids
PCB containers with PCB liquids between 50 ppm and 500 ppm are allowed with additional sorbent material included.
Unless very small, containers must be either at least 90% full or crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.
Containerized compactible waste must have voids filled with soil/grout or be capable of being crushed by available landfill operations equipment. Non-crushable containers (such as B-25 boxes) must have remaining voids filled with non-compressible material.
Waste must not contain or be capable of generating quantities of toxic fumes or gases harmful to persons transporting, handling, or disposing the waste.
Waste shall be limited to prevent nuclear criticality during all phases of waste cell operation, including active disposal operations and inactive, post-closure periods.

95% of total radiological activity will be shipped off site

What are Analytic WAC?

Analytic WAC are limits for radionuclides to ensure the EMDF is protective of human health and the environment once it is at full capacity and closed. DOE achieves protectiveness by implementing requirements that limit various radionuclides to specific thresholds that keep risks minimal.

The numerical limits are applied in two ways: (1) to individual 'waste lots' as they are proposed for disposal and (2) to the total facility, as it is filled through its lifecycle.

A waste lot is the primary unit of waste used to determine WAC compliance for a cleanup project proposing waste for disposal in the EMDF. It is developed based on the waste characteristics such as material type and contaminants and also considers the associated mass and volume of the waste.

Requirements limit various radionuclides to specific thresholds that keep risks minimal.

EMDF Waste Lot Concentration Limits:

These limits are applied to the waste lots, not the landfill as a whole. These concentration limits come from an analysis of a hypothetical scenario with a maximally exposed individual. These limits protect human health in the case of future inadvertent intrusion into the disposal facility. Due to the thickness of the cap, there is no direct exposure to the waste under any evaluated future residential scenario.

The full table and listing is available in the Draft Record of Decision available online here: http://ucor.com/wp-content/uploads/2021/11/Draft-ROD-EMDF.pdf

EMDF Land ill Inventory Limits:

These limits are applied to the landfill as a whole. The landfill inventory limits are based on a hypothetical scenario where a maximally exposed individual is drinking contaminated groundwater and eating fish impacted by a release from EMDF. These limits are established to maintain protection of the public and environment after the facility is closed.

The performance assessment analysis evaluated exposures up to 1,000 years after closure, which indicated Landfill Inventory Limits for three radionuclides (Carbon-14, Hydrogen-3, Technetium-99) are needed to ensure protectiveness during this time frame. These are classified as 'Tier 1' radionuclides.

DOE conducted an additional analysis for the 1,000-year to 10,000-year timeframe to determine if any less mobile radionuclides should be considered or require Landfill Inventory Limits. Iodine-129 was added to the Tier 1 list of radionuclides and will be assigned an inventory limit.

DOE will perform supplemental modeling on additional post-closure scenarios to ensure inventory limits do not result in an unacceptable risk. DOE, EPA, and TDEC will complete this supplemental analysis and include the resulting inventory limits in the WAC Compliance Plan.

What is a WAC Compliance Plan?

DOE will develop a WAC Compliance Plan in consultation and with the approval of EPA and TDEC to explain the basis for WAC use and describe implementation. DOE will also complete an analysis for the landfill inventory throughout operations and at closure, limiting the overall radionuclide inventory that can be placed in the EMDF.

The WAC Compliance Plan will specify how these analyses are completed. DOE will also develop and include details regarding implementation of the WAC, roles and responsibilities of the waste generator versus the disposal facility, and how multiple isotopes in a single waste lot are summed and how landfill inventory limits will be tracked.

WAC set limits on the type and amount of waste based on:

- Environmental laws
- EMDF facility design
- Site geologic conditions

DOE will accept written comments on the EMDF fact sheets any time from May 9 to June 7, 2022. DOE considers and responds to every comment it receives in a responsiveness summary that details how it affected the final decision. You may submit your comments to:

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